IEC 62386-102

Edition 2.0 2014-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Digital addressable lighting interface – Part 102: General requirements – Control gear

Interface d'éclairage adressable numérique – Partie 102: Exigences générales – Appareillages de commande

IEC 62386-102:2014-11(en-fr)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2014 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue
The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,…). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

Electropedia - www.electropedia.org
The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in 14 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary
More than 55 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de l'IEC
La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC
Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Catalogue IEC - webstore.iec.ch/catalogue
Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

Recherche de publications IEC - www.iec.ch/searchpub
La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,…). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished
Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org
Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 14 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary
Plus de 55 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

Service Clients - webstore.iec.ch/csc
Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

IEC 62386-102

Edition 2.0 2014-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Digital addressable lighting interface – Part 102: General requirements – Control gear

Interface d'éclairage adressable numérique – Partie 102: Exigences générales – Appareillages de commande

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE
CODE PRIX XH

ICS 29.140, 29.140.50

ISBN 978-2-8322-1906-5

Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

® Registered trademark of the International Electrotechnical Commission
Marque déposée de la Commission Electrotechnique Internationale

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

CONTENTS

FOREWORD 12
INTRODUCTION 14
1 Scope 15
2 Normative references 15
3 Terms and definitions 15
4 General 18
4.1 General 18
4.2 Version number 18
5 Electrical specification 18
6 Interface power supply 18
7 Transmission protocol structure 19
7.1 General 19
7.2 16 bit forward frame encoding 19
7.2.1 General 19
7.2.2 Address byte 19
7.2.3 Opcode byte 19
8 Timing 19
9 Method of operation 20
9.1 General 20
9.2 Control gear 20
9.3 Dimming curve 20
9.4 Calculating *"targetLevel"* 23
9.5 Fading 23
9.5.1 General 23
9.5.2 Fade time 24
9.5.3 Fade rate 25
9.5.4 Extended fade time 26
9.5.5 Using the fade time 28
9.5.6 Using the fade rate 28
9.5.7 Behaviour during a fade 28
9.5.8 Behaviour during startup 28
9.5.9 Stopping a fade 28
9.6 Min and max level 29
9.7 Commands 29
9.7.1 General 29
9.7.2 Level instructions without fade 30
9.7.3 Level instructions initiating a fade 30
9.7.4 Configuration instructions 30
9.7.5 Queries 30
9.7.6 Special commands 31
9.7.7 Application extended commands 31
9.8 Command iterations 31
9.8.1 General 31
9.8.2 Command iteration of "UP" and "DOWN" commands 31
9.8.3 DAPC SEQUENCE (deprecated) 31

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

9.9 Modes of operation 32
9.9.1 General 32
9.9.2 Operating mode 0x00: standard mode 32
9.9.3 Operating mode 0x01 to 0x7F: reserved 32
9.9.4 Operating mode 0x80 to 0xFF: manufacturer specific modes 32
9.10 Memory banks 33
9.10.1 General 33
9.10.2 Memory map 33
9.10.3 Selecting a memory bank location 34
9.10.4 Memory bank reading 34
9.10.5 Memory bank writing 34
9.10.6 Memory bank 0 35
9.10.7 Memory bank 1 37
9.10.8 Manufacturer specific memory banks 39
9.10.9 Reserved memory banks 39
9.11 Reset 39
9.11.1 Reset operation 39
9.11.2 Reset memory bank operation 39
9.12 System failure 39
9.13 Power on 40
9.14 Assigning short addresses 41
9.14.1 General 41
9.14.2 Random address allocation 41
9.14.3 Identification of a device 42
9.14.4 Direct address allocation 43
9.15 Failure state behaviour 43
9.16 Status information 43
9.16.1 General 43
9.16.2 Bit 0: Control gear failure 43
9.16.3 Bit 1: Lamp failure 44
9.16.4 Bit 2: Lamp on 44
9.16.5 Bit 3: Limit error 44
9.16.6 Bit 4: Fade running 44
9.16.7 Bit 5: Reset state 44
9.16.8 Bit 6: Missing short address 44
9.16.9 Bit 7: Power cycle seen 45
9.17 Non-volatile memory 45
9.18 Device types and features 45
9.19 Using scenes 46
10 Declaration of variables 47
11 Definition of commands 49
11.1 General 49
11.2 Overview Sheets 49
11.3 Level instructions 55
11.3.1 DAPC (*level*) 55
11.3.2 OFF 55
11.3.3 UP 55
11.3.4 DOWN 55
11.3.5 STEP UP 55

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.3.6 STEP DOWN 56
11.3.7 RECALL MAX LEVEL 56
11.3.8 RECALL MIN LEVEL 56
11.3.9 STEP DOWN AND OFF 57
11.3.10 ON AND STEP UP 57
11.3.11 ENABLE DAPC SEQUENCE 57
11.3.12 GO TO LAST ACTIVE LEVEL 58
11.3.13 GO TO SCENE (*sceneNumber*) 58
11.4 Configuration instructions 58
11.4.1 General 58
11.4.2 RESET 58
11.4.3 STORE ACTUAL LEVEL IN DTR0 58
11.4.4 SAVE PERSISTENT VARIABLES 58
11.4.5 SET OPERATING MODE (*DTR0*) 59
11.4.6 RESET MEMORY BANK (*DTR0*) 59
11.4.7 IDENTIFY DEVICE 59
11.4.8 SET MAX LEVEL (*DTR0*) 60
11.4.9 SET MIN LEVEL (*DTR0*) 60
11.4.10 SET SYSTEM FAILURE LEVEL (*DTR0*) 60
11.4.11 SET POWER ON LEVEL (*DTR0*) 61
11.4.12 SET FADE TIME (*DTR0*) 61
11.4.13 SET FADE RATE (*DTR0*) 61
11.4.14 SET EXTENDED FADE TIME (*DTR0*) 61
11.4.15 SET SCENE (*DTR0, sceneX*) 62
11.4.16 REMOVE FROM SCENE (*sceneX*) 62
11.4.17 ADD TO GROUP (*group*) 62
11.4.18 REMOVE FROM GROUP (*group*) 62
11.4.19 SET SHORT ADDRESS (*DTR0*) 62
11.4.20 ENABLE WRITE MEMORY 63
11.5 Queries 63
11.5.1 General 63
11.5.2 QUERY STATUS 63
11.5.3 QUERY CONTROL GEAR PRESENT 63
11.5.4 QUERY CONTROL GEAR FAILURE 63
11.5.5 QUERY LAMP FAILURE 63
11.5.6 QUERY LAMP POWER ON 63
11.5.7 QUERY LIMIT ERROR 63
11.5.8 QUERY RESET STATE 63
11.5.9 QUERY MISSING SHORT ADDRESS 63
11.5.10 QUERY VERSION NUMBER 64
11.5.11 QUERY CONTENT DTR0 64
11.5.12 QUERY DEVICE TYPE 64
11.5.13 QUERY NEXT DEVICE TYPE 64
11.5.14 QUERY PHYSICAL MINIMUM 64
11.5.15 QUERY POWER FAILURE 64
11.5.16 QUERY CONTENT DTR1 64
11.5.17 QUERY CONTENT DTR2 64
11.5.18 QUERY OPERATING MODE 65
11.5.19 QUERY LIGHT SOURCE TYPE 65

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.5.20 QUERY ACTUAL LEVEL 65
11.5.21 QUERY MAX LEVEL 65
11.5.22 QUERY MIN LEVEL 66
11.5.23 QUERY POWER ON LEVEL 66
11.5.24 QUERY SYSTEM FAILURE LEVEL 66
11.5.25 QUERY FADE TIME/FADE RATE 66
11.5.26 QUERY EXTENDED FADE TIME 66
11.5.27 QUERY MANUFACTURER SPECIFIC MODE 66
11.5.28 QUERY SCENE LEVEL (*sceneX*) 66
11.5.29 QUERY GROUPS 0-7 66
11.5.30 QUERY GROUPS 8-15 66
11.5.31 QUERY RANDOM ADDRESS (H) 67
11.5.32 QUERY RANDOM ADDRESS (M) 67
11.5.33 QUERY RANDOM ADDRESS (L) 67
11.5.34 READ MEMORY LOCATION (*DTR1, DTR0*) 67
11.6 Application extended commands 67
11.6.1 General 67
11.6.2 QUERY EXTENDED VERSION NUMBER 67
11.7 Special commands 68
11.7.1 General 68
11.7.2 TERMINATE 68
11.7.3 DTR0 (*data*) 68
11.7.4 INITIALISE (*device*) 68
11.7.5 RANDOMISE 68
11.7.6 COMPARE 69
11.7.7 WITHDRAW 69
11.7.8 SEARCHADDRH (*data*) 69
11.7.9 SEARCHADDRM (*data*) 69
11.7.10 SEARCHADDRL (*data*) 69
11.7.11 PROGRAM SHORT ADDRESS (*data*) 70
11.7.12 VERIFY SHORT ADDRESS (*data*) 70
11.7.13 QUERY SHORT ADDRESS 70
11.7.14 ENABLE DEVICE TYPE (*data*) 70
11.7.15 DTR1 (*data*) 71
11.7.16 DTR2 (*data*) 71
11.7.17 WRITE MEMORY LOCATION (*DTR1, DTR0, data*) 71
11.7.18 WRITE MEMORY LOCATION – NO REPLY (*DTR1, DTR0, data*) 71
11.7.19 PING 72
12 Test procedures 72
12.1 General notes on test 72
12.1.1 Abbreviations 72
12.1.2 Test execution 72
12.1.3 Data transmission 72
12.1.4 Test setup 73
12.1.5 Test output 73
12.1.6 Fade time measurements based on light output 73
12.1.7 Description of test scheme for fast fade times on PWM dimmer 74
12.1.8 Test notation 75
12.1.9 Test execution limitation 75

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.1.10 Test results 75
12.1.11 Exception handling 75
12.1.12 Unexpected answer 75
12.2 Preamble 77
12.2.1 Test preamble 77
12.3 Physical operational parameters 94
12.3.1 Polarity test 94
12.3.2 Maximum and minimum system voltage 94
12.3.3 Overvoltage protection test 95
12.3.4 Current rating test 96
12.3.5 Transmitter voltages 97
12.3.6 Transmitter rising and falling edges 99
12.3.7 Transmitter bit timing 101
12.3.8 Transmitter frame timing 103
12.3.9 Receiver start-up behavior 104
12.3.10 Receiver threshold 105
12.3.11 Receiver bit timing 106
12.3.12 Extended receiver bit timing 110
12.3.13 Receiver forward frame violation 112
12.3.14 Receiver settling timing 112
12.3.15 Receiver frame timing FF-FF send twice 113
12.4 Configuration instructions 115
12.4.1 RESET 115
12.4.2 RESET: timeout / command in-between 119
12.4.3 Send-twice timeout 121
12.4.4 Commands in-between 129
12.4.5 STORE ACTUAL LEVEL IN DTR0 135
12.4.6 SAVE PERSISTENT VARIABLES 136
12.4.7 SET OPERATING MODE 136
12.4.8 SET MAX LEVEL 137
12.4.9 SET MIN LEVEL 137
12.4.10 SET SYSTEM FAILURE LEVEL 138
12.4.11 SET POWER ON LEVEL 139
12.4.12 SET FADE TIME 143
12.4.13 SET FADE RATE 143
12.4.14 SET SCENE / REMOVE FROM SCENE 144
12.4.15 ADD TO GROUP / REMOVE FROM GROUP 145
12.4.16 SET SHORT ADDRESS 146
12.4.17 SET EXTENDED FADE TIME 147
12.4.18 Reset/Power-on values 148
12.4.19 DTR0 / DTR1 / DTR2 154
12.5 Memory banks 154
12.5.1 READ MEMORY LOCATION on Memory Bank 0 154
12.5.2 READ MEMORY LOCATION on Memory Bank 1 159
12.5.3 READ MEMORY LOCATION on other Memory Banks 161
12.5.4 Memory bank writing 163
12.5.5 ENABLE WRITE MEMORY: writeEnableState 168
12.5.6 ENABLE WRITE MEMORY: timeout / command in-between 171
12.5.7 RESET MEMORY BANK: timeout / command in-between 172

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.5.8 RESET MEMORY BANK 175
12.6 Level instructions 176
12.6.1 Level instructions: Basic behaviour 176
12.6.2 FADE TIME: possible values 181
12.6.3 FADE TIME: transitions 182
12.6.4 FADE TIME: fading to 0 184
12.6.5 FADE TIME: small steps fading 186
12.6.6 FADE TIME: extended fade time 189
12.6.7 FADE RATE: possible values 191
12.6.8 FADE RATE: transitions 194
12.6.9 FADE RATE: extended fade time 195
12.6.10 FADE TIME/FADE RATE: stop fading by setting MIN/MAX levels 196
12.6.11 FADE TIME/FADE RATE: stop fading 201
12.6.12 FADE TIME/FADE RATE: stop fading when a command is sent, check timing 204
12.6.13 FADE TIME/FADE RATE: stop fading during startup 210
12.6.14 Level instructions: combined instructions 211
12.6.15 Power On Level - System Failure Level combined 213
12.6.16 ENABLE DAPC SEQUENCE 218
12.6.17 GO TO LAST ACTIVE LEVEL 219
12.6.18 GO TO SCENE 221
12.6.19 Power on: level control commands 222
12.6.20 Logarithmic dimming curve 224
12.6.21 Dimming curve: DAPC 225
12.6.22 Dimming curve: UP / DOWN 226
12.6.23 Dimming curve: STEP UP / STEP DOWN 227
12.6.24 FADE TIME/EXTENDED FADE TIME: light output behaviour 228
12.6.25 EXTENDED FADE TIME: light output behaviour 229
12.6.26 Behaviour during a fade 230
12.7 Special commands 232
12.7.1 INITIALISE – timer 232
12.7.2 TERMINATE 234
12.7.3 INITIALISE - device addressing 234
12.7.4 RANDOMISE 235
12.7.5 COMPARE 236
12.7.6 WITHDRAW 237
12.7.7 SEARCHADDRH / SEARCHADDRM / SEARCHADDRL 238
12.7.8 PROGRAM SHORT ADDRESS 239
12.7.9 VERIFY SHORT ADDRESS 241
12.7.10 QUERY SHORT ADDRESS 242
12.7.11 IDENTIFY DEVICE 244
12.7.12 IDENTIFY DEVICE THROUGH RECALL MIN/MAX LEVEL 246
12.8 Queries and reserved commands 250
12.8.1 QUERY STATUS - lampFailure/lampOn 250
12.8.2 QUERY STATUS - lampOn 253
12.8.3 QUERY STATUS - limitError/lampOn 254
12.8.4 QUERY STATUS - powerCycleSeen 258
12.8.5 QUERY CONTROL GEAR PRESENT 259
12.8.6 QUERY VERSION NUMBER 259

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.8.7 PING 260
12.8.8 Broadcast unaddressed 260
12.8.9 Reserved commands: standard commands 262
12.8.10 Reserved commands: special commands 262
12.8.11 Application extended commands 263
12.8.12 Not supported device types 264
12.8.13 Removed functionality 264
12.9 Cross contamination 266
12.9.1 DTR0 266
12.9.2 NVM variables 266
12.9.3 Random address generation 268
12.9.4 Addressing 1 269
12.9.5 Addressing 2 270
12.9.6 Addressing 3 272
12.10 General subsequences 273
12.10.1 GetVersionNumber 273
12.10.2 GetExtendedVersionNumber 273
12.10.3 GetSupportedDeviceTypes 274
12.10.4 GetSupportedLightSources 274
12.10.5 WaitForPowerOnPhaseToFinish 276
12.10.6 WaitForLampOn 276
12.10.7 WaitForLampOnAddressed 277
12.10.8 WaitForLampLevel 277
12.10.9 WaitForFadeToFinish 277
12.10.10 SetShortAddress 278
12.10.11 GetRandomAddress 278
12.10.12 GetLimitedRandomAddress 279
12.10.13 SetSearchAddress 279
12.10.14 ReadMemBankMultibyteLocation 279
12.10.15 FindImplementedMemoryBank 280
12.10.16 FindAllImplementedMemoryBanks 280
12.10.17 GetNumberOfLogicalUnits 280
12.10.18 GetIndexOfLogicalUnit 281
12.10.19 ConnectLamps 281
12.10.20 DisconnectLamps 281
12.10.21 PowerCycle 282
12.10.22 PowerCycleAndWaitForBusPower 282
12.10.23 PowerCycleAndWaitForDecoder 283
Annex A (informative) Examples of algorithms 284
A.1 Random address allocation 284
A.2 One single control gear connected to the control device 284
A.3 Using application extended commands 285
Annex B (normative) High resolution dimmer 286
Bibliography 288

Figure 1 – IEC 62386 graphical overview 14
Figure 2 – Control gear directly operating a light source 20
Figure 3 – Dimming curve 21

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Figure 4 – Level over time, fading up and down 24
Figure 5 – Timing and response when receiving a command iteration 31
Figure 6 – Fading from MIN LEVEL to MAX LEVEL 74
Figure 7 – Fading from MAX LEVEL to off 74
Figure 8 – Normal fading for a PWM dimmer 74
Figure 9 – Fading from MAX LEVEL to off for a PWM dimmer 75
Figure 10 – Current rating test 97
Figure B.1 – Level behaviour in cases of off-grid starting points 287

Table 1 – 16-bit command frame encoding 19
Table 2 – Dimming curve tolerance (%, rounded to two decimals) 21
Table 3 – Dimming curve 22
Table 4 – Fade times 25
Table 5 – Fade rates 26
Table 6 – Extended fade time - base value 27
Table 7 – Extended fade time - multiplier 27
Table 8 – Basic memory map of memory banks 33
Table 9 – Memory map of memory bank 0 36
Table 10 – Memory map of memory bank 1 38
Table 11 – Power on timing 41
Table 12 – Control gear status 43
Table 13 – Scenes 46
Table 14 – Declaration of variables 47
Table 15 – Standard commands 49
Table 16 – Special commands 53
Table 17 – Light source type encoding 65
Table 18 – Device addressing with “INITIALISE” 68
Table 19 – Unexpected outcome 76
Table 20 – Parameters for test sequence CheckFactoryDefault102 82
Table 21 – Parameters for test sequence CheckFactoryDefault201 86
Table 22 – Parameters for test sequence CheckFactoryDefault202 87
Table 23 – Parameters for test sequence CheckFactoryDefault203 88
Table 24 – Parameters for test sequence CheckFactoryDefault204 88
Table 25 – Parameters for test sequence CheckFactoryDefault205 89
Table 26 – Parameters for test sequence CheckFactoryDefault206 89
Table 27 – Parameters for test sequence CheckFactoryDefault207 90
Table 28 – Parameters for test sequence CheckFactoryDefault208 90
Table 29 – Parameters for test sequence CheckFactoryDefault209 91
Table 30 – Parameters for test sequence Maximum and minimum system voltage 95
Table 31 – Parameters for test sequence Transmitter voltages 99
Table 32 – Parameters for test sequence Transmitter rising and falling edges 100
Table 33 – Parameters for test sequence Transmitter rising and falling edges 101
Table 34 – Parameters for test sequence Transmitter bit timing 102

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 35 – Parameters for test sequence Receiver frame timing 104
Table 36 – Parameters for test sequence Receiver start-up behavior 105
Table 37 – Parameters for test sequence Receiver bit timing 107
Table 38 – Parameters for test sequence Extended receiver bit timing 111
Table 39 – Parameters for test sequence Receiver frame violation and recovering after frame size violation 112
Table 40 – Parameters for test sequence Receiver frame timing 113
Table 41 – Parameters for test sequence RESET 117
Table 42 – Parameters for test sequence Send twice timeout 122
Table 43 – Parameters for test sequence Commands in-between 131
Table 44 – Parameters for test sequence SET MAX LEVEL 137
Table 45 – Parameters for test sequence SET MIN LEVEL 138
Table 46 – Parameters for test sequence SET SYSTEM FAILURE LEVEL 139
Table 47 – Parameters for test sequence SET POWER ON LEVEL 142
Table 48 – Parameters for test sequence SET FADE TIME 143
Table 49 – Parameters for test sequence SET FADE RATE 144
Table 50 – Parameters for test sequence SET SCENE / REMOVE FROM SCENE 145
Table 51 – Parameters for test sequence ADD TO GROUP / REMOVE FROM GROUP 146
Table 52 – Parameters for test sequence SET SHORT ADDRESS 147
Table 53 – Parameters for test sequence SET EXTENDED FADE TIME 148
Table 54 – Parameters for test sequence Reset/Power-on values 151
Table 55 – Parameters for test sequence DTR0 / DTR1 / DTR2 154
Table 56 – Parameters for test sequence READ MEMORY LOCATION on Memory Bank 0 158
Table 57 – Parameters for test sequence READ MEMORY LOCATION on Memory Bank 1 161
Table 58 – Parameters for test sequence Memory bank writing 166
Table 59 – Parameters for test sequence ENABLE WRITE MEMORY: writeEnableState 169
Table 60 – Parameters for test sequence ENABLE WRITE MEMORY: timeout / command in-between 172
Table 61 – Parameters for test sequence RESET MEMORY BANK: timeout / command in-between 174
Table 62 – Parameters for test sequence RESET MEMORY BANK 176
Table 63 – Parameters for test sequence Level instructions: Basic behaviour 178
Table 64 – Parameters for test sequence FADE TIME: possible values 181
Table 65 – Parameters for test sequence FADE TIME: transitions 184
Table 66 – Parameters for test sequence FADE TIME: fading to 0 186
Table 67 – Parameters for test sequence FADE TIME: small steps fading 189
Table 68 – Parameters for test sequence FADE TIME: extended fade time 190
Table 69 – Parameters for test sequence FADE RATE: possible values 193
Table 70 – Parameters for test sequence FADE RATE: possible values 194
Table 71 – Parameters for test sequence FADE RATE: transitions 195
Table 72 – Parameters for test sequence FADE RATE: extended fade time 196
Table 73 – Parameters for test sequence FADE TIME/FADE RATE: stop fading by setting MIN/MAX levels 199

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 74 – Parameters for test sequence FADE TIME/FADE RATE: stop fading 203
Table 75 – Parameters for test sequence FADE TIME/FADE RATE: stop fading when a command is sent, check timing 205
Table 76 – Parameters for test sequence FADE TIME/FADE RATE: stop fading during startup 210
Table 77 – Parameters for test sequence Level instructions: combined instructions 212
Table 78 – Parameters for test sequence PowerOnLevel and SystemFailureLevel 217
Table 79 – Parameters for test sequence ENABLE DAPC SEQUENCE 219
Table 80 – Parameters for test sequence GO TO LAST ACTIVE LEVEL 220
Table 81 – Parameters for test sequence GO TO SCENE 222
Table 82 – Parameters for test sequence Power on: level control commands 224
Table 83 – Parameters for test sequence Logarithmic dimming curve 225
Table 84 – Parameters for test sequence Dimming curve: DAPC 226
Table 85 – Parameters for test sequence FADE TIME/EXTENDED FADE TIME: light output behaviour 229
Table 86 – Parameters for test sequence Behaviour during a fade 232
Table 87 – Parameters for test sequence INITIALISE - device addressing 235
Table 88 – Parameters for test sequence COMPARE 237
Table 89 – Parameters for test sequence WITHDRAW 238
Table 90 – Parameters for test sequence PROGRAM SHORT ADDRESS 241
Table 91 – Parameters for test sequence VERIFY SHORT ADDRESS 242
Table 92 – Parameters for test sequence QUERY SHORT ADDRESS 243
Table 93 – Parameters for test sequence IDENTIFY DEVICE 246
Table 94 – Parameters for test sequence IDENTIFY DEVICE THROUGH RECALL MIN/MAX LEVEL 250
Table 95 – Parameters for test sequence QUERY STATUS - lampFailure/lampOn 253
Table 96 – Parameters for test sequence QUERY STATUS - lampOn 254
Table 97 – Parameters for test sequence QUERY STATUS - limitError/lampOn 256
Table 98 – Parameters for test sequence QUERY STATUS - powerCycleSeen 258
Table 99 – Parameters for test sequence QUERY CONTROL GEAR PRESENT 259
Table 100 – Parameters for test sequence Broadcast unaddressed 261
Table 101 – Parameters for test sequence Reserved commands: standard commands 262
Table 102 – Parameters for test sequence Reserved commands: special commands 263
Table 103 – Parameters for test sequence Addressing 2 272

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 102: General requirements – Control gear

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62386-102 has been prepared by subcommittee 34C: Auxiliaries for lamps, of IEC technical committee 34: Lamps and related equipment.

This second edition cancels and replaces the first edition published in 2009. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) elimination of all non-control gear relevant definitions,
b) improvement of the requirements for control gear by clarifying the description,
c) improvement of the test command iterations to increase the compatibility,
d) addition of new commands, and
e) the deletion of the requirements for:

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

1) timing;
2) control devices.

The requirements for timing are now in Part 101 and the requirements for control devices are in Part 103.

The text of this standard is based on the following documents:

FDIS	Report on voting
34C/1099/FDIS	34C/1112/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This Part 102 is intended to be used in conjunction with Part 101, which contains general requirements for the relevant product type (system), and with the appropriate Part 2xx (particular requirements for control gear) containing clauses to supplement or modify the corresponding clauses in Parts 101 and 102 in order to provide the relevant requirements for each type of product.

A list of all parts of the IEC 62386 series, under the general title: *Digital addressable lighting interface*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC website under http://webstore.iec.ch in the data related to the specific publication. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

INTRODUCTION

IEC 62386 contains several parts, referred to as series. The 1xx series includes the basic specifications. Part 101 contains general requirements for system components, Part 102 extends this information with general requirements for control gear and Part 103 extends it further with general requirements for control devices.

The 2xx parts extend the general requirements for control gear with lamp specific extensions (mainly for backward compatibility with Edition 1 of IEC 62386) and with control gear specific features.

The 3xx parts extend the general requirements for control devices with input device specific extensions describing the instance types as well as some common features that can be combined with multiple instance types.

This second edition of IEC 62386-102 is published in conjunction with IEC 62386-101:2014 and with the various parts that make up the IEC 62386-2xx series for control gear, together with IEC 62386-103:2014 and the various parts that make up the IEC 62386-3xx series of particular requirements for control devices. The division into separately published parts provides for ease of future amendments and revisions. Additional requirements will be added as and when a need for them is recognised.

The setup of the standard is graphically represented in Figure 1 below.

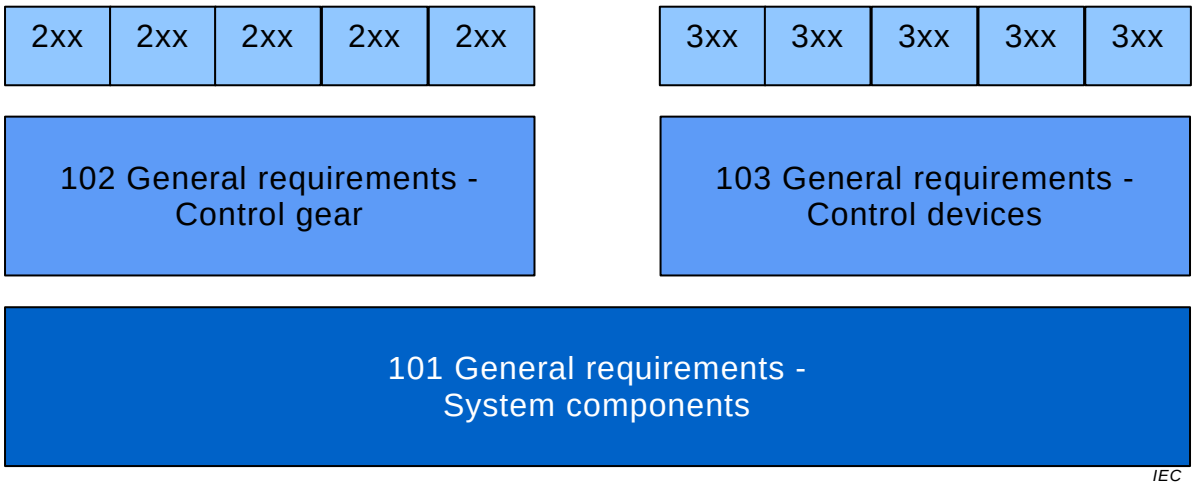


Figure 1 – IEC 62386 graphical overview

When this part of IEC 62386 refers to any of the clauses of the other two parts of the IEC 62386-1xx series, the extent to which such a clause is applicable and the order in which the tests are to be performed are specified. The other parts also include additional requirements, as necessary.

All numbers used in this International Standard are decimal numbers unless otherwise noted. Hexadecimal numbers are given in the format 0xVV, where VV is the value. Binary numbers are given in the format XXXXXXXXb or in the format XXXX XXXX, where X is 0 or 1 and "x" in binary numbers means "don't care".

The following typographic expressions are used:

Variables: *variableName* or *variableName[3:0]*, giving only bits 3 to 0 of *variableName*

Range of values: [lowest, highest]

Command: “COMMAND NAME”

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

DIGITAL ADDRESSABLE LIGHTING INTERFACE –

Part 102: General requirements – Control gear

1 Scope

This Part of IEC 62386 is applicable to control gear in a bus system for control by digital signals of electronic lighting equipment. This electronic lighting equipment should be in line with the requirments of IEC 61347, with the addition of d.c. supplies.

NOTE Tests in this standard are type tests. Requirements for testing individual control gear during production are not included.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61347 (all parts), *Lamp controlgear*

IEC 62386-101:2014, *Digital addressable lighting interface – Part 101: General requirements – System components*

IEC 62386-103:2014, *Digital addressable lighting interface – Part 103: General requirements – Control devices*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62386-101and the following apply.

3.1
actual level
value representing the current light output

3.2
arc power
power supplied to the light sources (lamps)

3.3
broadcast
type of address used to address all control gear in the system at once

3.4
broadcast unaddressed
type of address used to address all control devices in the system that have no short address at once

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

3.5
DAPC
direct arc power control
a method to directly control the light output

Note 1 to entry: The note to entry in French concerns the French text only.

3.6
DTR
data transfer register
multipurpose register used to exchange data

Note 1 to entry: The note to entry in French concerns the French text only.

3.7
group address
type of address used to address a group of control gear in the system all at once

3.8
GTIN
global trade item number
number used for the unique identification of trade items worldwide

Note 1 to entry: For further information see http://en.wikipedia.org/wiki/GTIN

Note 2 to entry: The number is comprised of a GS1 or U.P.C. company prefix followed by an item reference number and a check digit. It is described in the “GS1 General Specifications”.

Note 3 to entry: The note 3 to entry in French concerns the French text only.

3.9
identification
temporary state used during commissioning that allows the installer to identify particular control gear

3.10
level
8 bit value

3.11
MASK
the value 0xFF

3.12
monotonic
a function f defined on a subset of the real numbers with real values is called monotonically non-decreasing, if for all x and y such that $x \leq y$ one has $f(x) \leq f(y)$, so f preserves the order. Likewise, a function is called monotonically non-increasing if, whenever $x \leq y$, then $f(x) \geq f(y)$, so it reverses the order. For this standard monotonic is defined as either monotonically non-decreasing or monotonically non-increasing

3.13
NO
if a query is asked where the answer is NO, there will be no response, such that the sender of the query will conclude “no backward frame" following subclause 8.2.5 of IEC 62386-101:2014

Note 1 to entry: The answer NO could also be triggered by a missed query.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

3.14
NVM
non-volatile read/write memory, the content of which can be changed and will not be lost due to a power cycle

3.15
opcode
operation code
that part of a command frame that identifies the command to be executed

3.16
operating mode
set of states identified by a number in the range [0,255], characterised by a collection of variables and memory settings, and used to select a set of functionality to be exhibited by a control gear, including its required reaction to commands

Note 1 to entry: Control gear may support more than one operating mode

3.17
PHM
physical minimum level corresponding to the minimum light output the control gear can operate at

3.18
RAM
volatile read/write memory, the content of which can be changed and will be lost due to a power cycle

3.19
random address
random 24 bit number generated by the control gear on request during system initialisation

Note 1 to entry: Annex A.1 provides an example of how the search and random addresses are used.

3.20
reset state

state in which all NVM variables of the control gear have their reset value, except those that are marked “no change” or are otherwise explicitly excluded

3.21
ROM
non-volatile read only memory, the content of which is fixed

Note 1 to entry: In this standard read only is meant from a system perspective. A ROM variable may actually be implemented in NVM, but this standard does not provide any mechanism to change its value.

3.22
scene
configurable preset level

3.23
search address
24 bit number used to identify an individual control gear in the system during initialisation

Note 1 to entry: Annex A.1 provides an example of how the search and random addresses are used.

3.24
short address
type of address used to address an individual control gear in the system

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

3.25
startup
time needed to change from lamp off to normal operation of the lamp or failure state

Note 1 to entry: This time includes preheat and ignition.

3.26
strictly monotonic
a function *f* defined on a subset of the real numbers with real values is called monotonically increasing, if for all *x* and *y* such that $x < y$ one has $f(x) < f(y)$, so *f* preserves the order. Likewise, a function is called monotonically decreasing if, whenever $x < y$, then $f(x) > f(y)$, so it reverses the order. For this standard strictly monotonic is defined as either monotonically increasing or monotonically decreasing

3.27
target level
the target light output expected after completion of the current level command

3.28
YES
if a query is asked where the answer is YES, the response will be a backward frame containing the value of *MASK*

4 General

4.1 General

The requirements of IEC 62386-101:2014, Clause 4 apply, with the restrictions, changes and additions identified below.

4.2 Version number

This subclause replaces IEC 62386-101:2014, Subclause 4.2.

The version shall be in the format "x.y", where the major version number x is in the range of 0 to 62 and the minor version number y is in the range of 0 to 2. When the version number is encoded into a byte, the major version number x shall be placed in bits 7 to 2 and the minor version number y shall be placed in bits 1 to 0.

At each amendment to an edition of IEC 62386-102 the minor version number shall be incremented by one.

At a new edition of IEC 62386-102 the major version number shall be incremented by one and the minor version number shall be set to 0.

The current version number is "2.0".

NOTE Normally 2 amendments on IEC documents are made before a new edition is created.

5 Electrical specification

The requirements of IEC 62386-101:2014, Clause 5 apply.

6 Interface power supply

If a bus power supply is integrated into a control gear, the requirements of IEC 62386-101:2014, Clause 6 apply.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

7 Transmission protocol structure

7.1 General

The requirements of Clause 7 of IEC 62386-101:2014 apply, with the following additions.

7.2 16 bit forward frame encoding

7.2.1 General

For commands, the 16 bit forward frame shall be encoded as is depicted in Table 1.

Table 1 – 16-bit command frame encoding

Bytes/Bits									Device addressing method
Address byte								Opcode byte	
15	14	13	12	11	10	9	8[a]	7…0	
0	64 short addresses						x		Short addressing
1	0	0	16 group addresses				x		Group addressing
1	1	1	1	1	1	0	x		Broadcast unaddressed
1	1	1	1	1	1	1	x		Broadcast
1010 0000 to 1100 1011									Special command
1100 1100 to 1111 1011									Reserved
[a] Selector bit, see 7.2.2; 0 indicates DAPC, 1 indicates other command									

7.2.2 Address byte

The address byte provides

- the method of device addressing used by the application controller;
- the type of command transmitted in the opcode byte;
  Bit 8 ='1': standard command;
  Bit 8 ='0': direct arc power control (DAPC) command;
- address spaces for special commands;
- reserved device addresses.

Reserved addresses should not be used by the application controller.

7.2.3 Opcode byte

The opcode byte provides

- for DAPC commands, the requested light output;
- for standard commands, the opcode;
- command specific information for special commands;
- reserved information for reserved commands.

8 Timing

The requirements of IEC 62386-101, Clause 8 apply.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

9 Method of operation

9.1 General

The requirements of IEC 62386-101, Clause 9 apply with the following additions.

9.2 Control gear

Control gear may receive commands from an application controller. The application controller is specified by IEC 62386-103:2014.

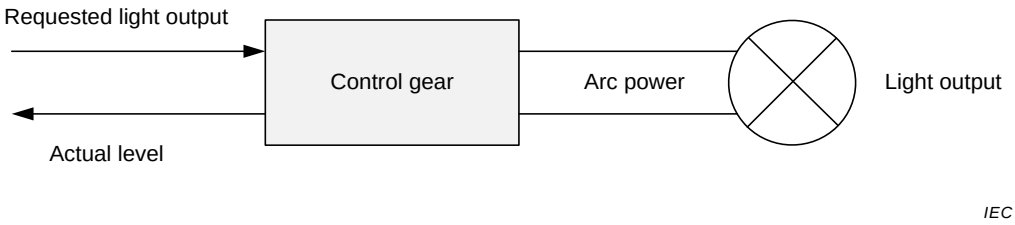


Figure 2 – Control gear directly operating a light source

Figure 2 shows how the various levels lead to light output. The maximum (light) output level of a control gear is referred to as 100 %. All levels are specified in a relative way. Physically there is a minimum that the control gear can supply whilst there is still light output. This is known as the physical minimum level (PHM).

NOTE PHM is gear specific, and is greater than 0.

Depending on the light source various phases of operation can be identified within a control gear. In general these are as follows.

- Standby: during this phase, the lamp is off.
- Startup: this is a transitional phase changing from standby to normal operation. This phase is sometimes noticeable as a delay. Examples are:
  - preheat: the lamp is heated to prepare for ignition. This is typically seen for fluorescent light sources;
  - ignition: the lamp is ignited. This is typically seen for HID light sources and fluorescent light sources after preheat;
  - power stage preparation.
- Normal operation: the lamp is emitting light and can be operated as expected.
- Failure: the lamp cannot be operated as expected.

9.3 Dimming curve

The dimming curve determines how the level shall be translated into light output.

An *"actualLevel"* greater than or equal to 1 and less than or equal to 254 shall be translated into light output according to

$$\text{Light output } (actualLevel) = 10^{\frac{actualLevel-1}{253/3}-1} \%.$$

Light output is expressed relative to the maximum possible light output of a given control-gear-lamp combination. The dimming curve starts at 0,1 % for *"actualLevel"* equal to 0x01 and

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

ends at 100 % for *"actualLevel"* equal to 0xFE. The dimming curve is strictly monotonic, and the relative accuracy shall be ±½ step. This shall be tested using a fade, excluding PHM.

NOTE 1 The dimming curve is intended to compensate the light sensitivity curve of the human eye.

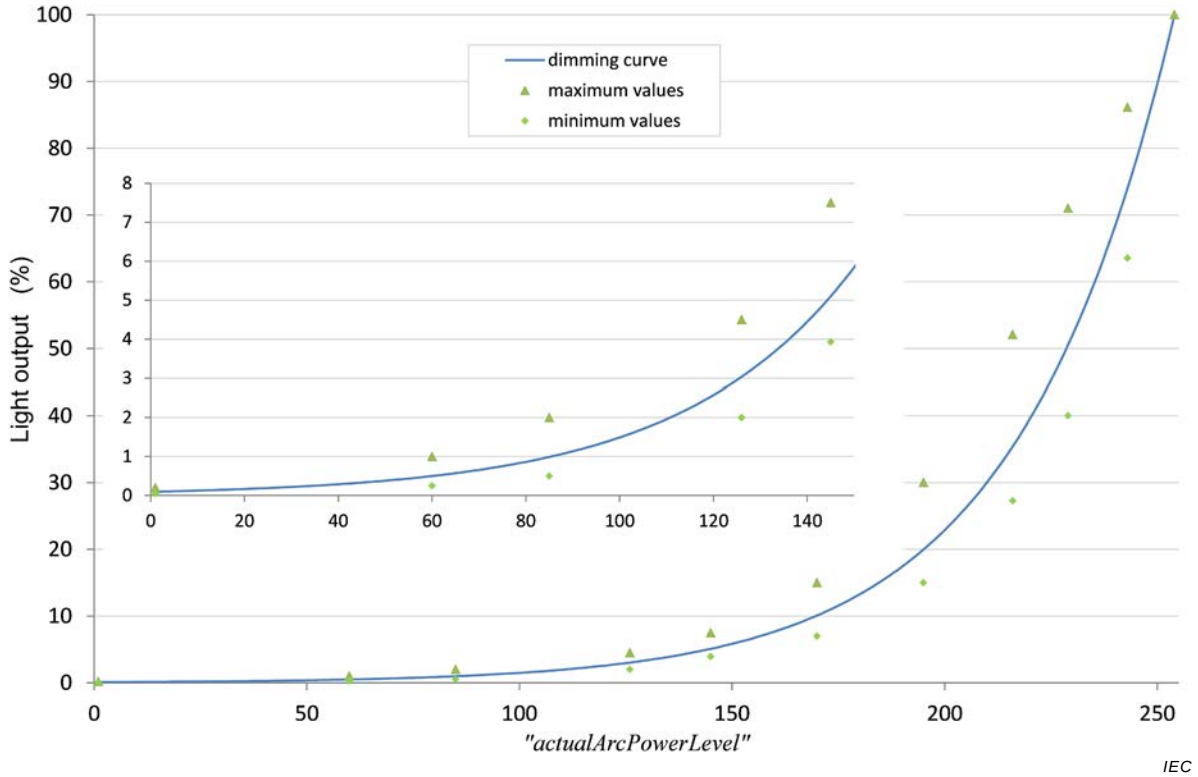


Figure 3 – Dimming curve

The accuracy of light output is specified by the test points given in Table 2. The test points of Table 2 and the dimming curve are depicted in Figure 3, and Table 3 shows the light output versus the level. The lamp type or load used during testing shall be stated for reproduceability.

NOTE 2 The minimum and maximum values are based on the test values that can be found in IEC 62386-102:2009.

Table 2 – Dimming curve tolerance (%, rounded to two decimals)

Arc power level	1	60	85	126	145	170	195	216	229	243	254
Minimum value	0,05	0,25	0,50	2,00	3,93	7,00	15,00	27,28	40,00	63,53	
Nominal value	0,10	0,50	0,99	3,04	5,10	10,09	19,97	35,43	50,53	74,05	100,00
Maximum value	0,20	1,00	2,00	4,50	7,50	15,0	30,00	52,09	71,00	86,14	

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 3 – Dimming curve

Level	Light output	Level	Light output	Level	Light output	Level	Light output	Level	Light output
1	0,100	52	0,402	103	1,620	154	6,520	205	26,241
2	0,103	53	0,414	104	1,665	155	6,700	206	26,967
3	0,106	54	0,425	105	1,711	156	6,886	207	27,713
4	0,109	55	0,437	106	1,758	157	7,076	208	28,480
5	0,112	56	0,449	107	1,807	158	7,272	209	29,269
6	0,115	57	0,461	108	1,857	159	7,473	210	30,079
7	0,118	58	0,474	109	1,908	160	7,680	211	30,911
8	0,121	59	0,487	110	1,961	161	7,893	212	31,767
9	0,124	60	0,501	111	2,015	162	8,111	213	32,646
10	0,128	61	0,515	112	2,071	163	8,336	214	33,550
11	0,131	62	0,529	113	2,128	164	8,567	215	34,479
12	0,135	63	0,543	114	2,187	165	8,804	216	35,433
13	0,139	64	0,559	115	2,248	166	9,047	217	36,414
14	0,143	65	0,574	116	2,310	167	9,298	218	37,422
15	0,147	66	0,590	117	2,374	168	9,555	219	38,457
16	0,151	67	0,606	118	2,440	169	9,820	220	39,522
17	0,155	68	0,623	119	2,507	170	10,091	221	40,616
18	0,159	69	0,640	120	2,577	171	10,371	222	41,740
19	0,163	70	0,658	121	2,648	172	10,658	223	42,895
20	0,168	71	0,676	122	2,721	173	10,953	224	44,083
21	0,173	72	0,695	123	2,797	174	11,256	225	45,303
22	0,177	73	0,714	124	2,874	175	11,568	226	46,557
23	0,182	74	0,734	125	2,954	176	11,888	227	47,846
24	0,187	75	0,754	126	3,035	177	12,217	228	49,170
25	0,193	76	0,775	127	3,119	178	12,555	229	50,531
26	0,198	77	0,796	128	3,206	179	12,902	230	51,930
27	0,203	78	0,819	129	3,294	180	13,260	231	53,367
28	0,209	79	0,841	130	3,386	181	13,627	232	54,844
29	0,215	80	0,864	131	3,479	182	14,004	233	56,362
30	0,221	81	0,888	132	3,576	183	14,391	234	57,922
31	0,227	82	0,913	133	3,675	184	14,790	235	59,526
32	0,233	83	0,938	134	3,776	185	15,199	236	61,173
33	0,240	84	0,964	135	3,881	186	15,620	237	62,866
34	0,246	85	0,991	136	3,988	187	16,052	238	64,607
35	0,253	86	1,018	137	4,099	188	16,496	239	66,395
36	0,260	87	1,047	138	4,212	189	16,953	240	68,233
37	0,267	88	1,076	139	4,329	190	17,422	241	70,121
38	0,275	89	1,105	140	4,449	191	17,905	242	72,062
39	0,282	90	1,136	141	4,572	192	18,400	243	74,057
40	0,290	91	1,167	142	4,698	193	18,909	244	76,107
41	0,298	92	1,200	143	4,828	194	19,433	245	78,213
42	0,306	93	1,233	144	4,962	195	19,971	246	80,378
43	0,315	94	1,267	145	5,099	196	20,524	247	82,603
44	0,324	95	1,302	146	5,240	197	21,092	248	84,889
45	0,332	96	1,338	147	5,385	198	21,675	249	87,239
46	0,342	97	1,375	148	5,535	199	22,275	250	89,654
47	0,351	98	1,413	149	5,688	200	22,892	251	92,135
48	0,361	99	1,452	150	5,845	201	23,526	252	94,686
49	0,371	100	1,492	151	6,007	202	24,177	253	97,307
50	0,381	101	1,534	152	6,173	203	24,846	254	100,000
51	0,392	102	1,576	153	6,344	204	25,534		

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

9.4 Calculating *"targetLevel"*

An application controller instructs the control gear on the requested light output and on the behaviour during the transition from the *"actualLevel"* to the *"targetLevel"* by means of appropriate opcodes.

The *"targetLevel"* shall be calculated on the basis of the requested light output as follows:

- 0x00 shall be accepted as *"targetLevel"* and turn off the light.
- Any value between 0x01 and *"minLevel"* shall result in *"targetLevel"="minLevel"*.
- Any value between *"maxLevel"* and 0xFE shall result in *"targetLevel"="maxLevel"*.
- "MASK" shall have no effect on *"targetLevel"* except when a fade is running, see subclause 9.5.9.
- All other values shall be accepted as *"targetLevel"*.

The requested target level calculation of *"targetLevel"* shall also be applied if the request is based on an internally stored value, such as a scene, *"powerOnLevel"*, or *"systemFailureLevel"*.

On every change of *"targetLevel*", with the exception of the initialisation caused by a power cycle, the control gear shall update *"limitError"* (see subclause 9.16.5) and shall set *"lastLightLevel"* to the new *"targetLevel"*. If "*targetLevel"* is not 0x00, *"lastActiveLevel"* shall be set to "*targetLevel"*.

9.5 Fading

9.5.1 General

Fading is a linear transition in time from *"actualLevel"* to *"targetLevel"*. The *"actualLevel"*, and thus the light output, shall be strictly monotonic according to the applicable dimming curve.

A fade can be started in two ways:

- using a fade time: this sets a time to use for the fade process;
- using a fade rate: this sets a speed to use for the fade process.

A fade shall not be started if the calculated *"targetLevel"* is equal to *"actualLevel"*.

When a fade starts, the fade timer shall be started and *"fadeRunning"* shall be set to TRUE (see 9.16.6.).

During the fade, the light output shall be maintained as close to the ideal fading curve as possible.

During a process of fading up, *"actualLevel"* shall be incremented at a time corresponding to the intersection of an ideal fading curve with the mid-point between *"actualLevel"* and *"actualLevel"* + 1. Likewise, when fading down, *"actualLevel"* shall be decremented at a time corresponding to the intersection of an ideal fading curve with the mid-point between *"actualLevel"* and *"actualLevel"* - 1. Figure 4 illustrates this.

Measurements of fade time / fade rate shall start after the stop condition of the command that triggers it. If the fade takes place immediately after startup, measurement shall be done from the moment "*lampOn*" is TRUE or, in case of total lamp failure, from the moment "*lampFailure*" is confirmed TRUE. A fade shall automatically end when the fade timer has been active for the applicable fade time. At this point the fade timer shall be stopped and *"fadeRunning"* shall be set to FALSE (see subclause 9.16.6.).

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

This means that the control gear fades to the target level even in case of a total lamp error.If a lamp is to be switched off at the end of the fade, the step from *"minLevel"* to 0x00 shall not contribute to the fade time. The step from *"minLevel"* to 0x00 shall be taken immediately after the fade time has elapsed.

If a lamp is to be lit at the beginning of the fade and dimmed to a certain value, the step from 0x00 to *"minLevel"* shall not contribute to the fade time. This means that the fade time starts when the lamp is on.

NOTE The transition from 0x00 to *"minLevel"* incorporates startup.

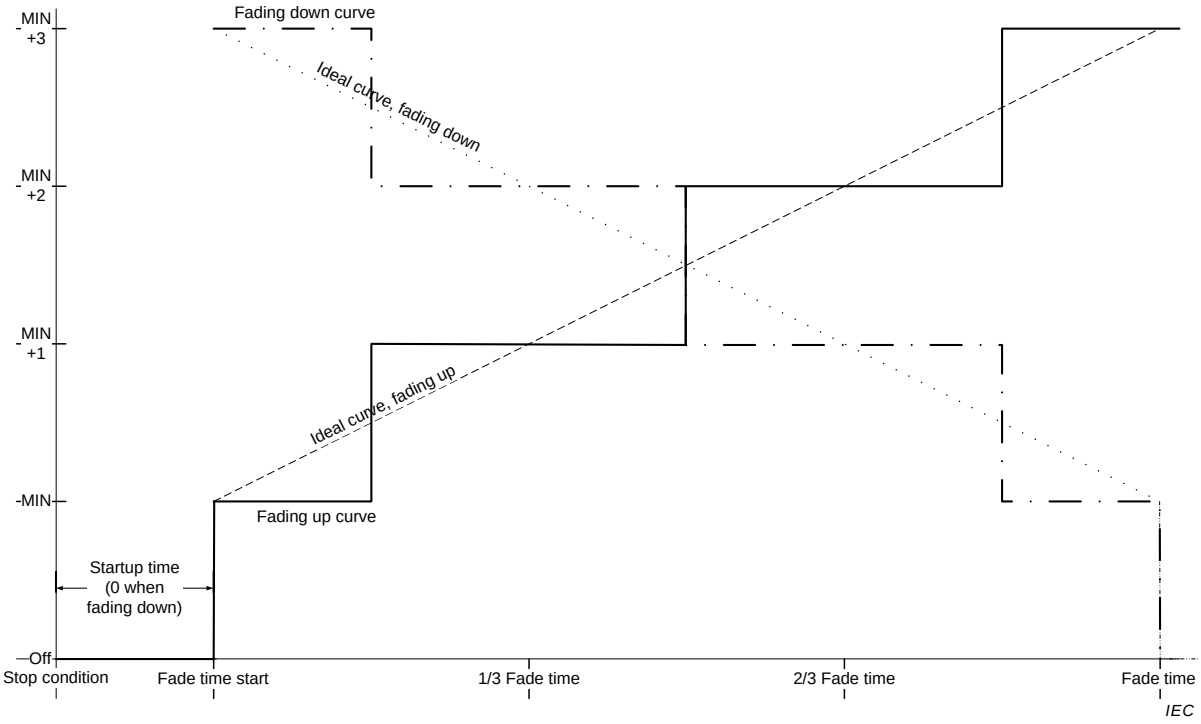


Figure 4 – Level over time, fading up and down

Testing shall be done with "*minLevel*" ≥ PHM+1. For further information, see Annex B.

9.5.2 Fade time

The fade time shall be according to Table 4:

"fadeTime" shall be set on receipt of the command "SET FADE TIME (*DTR0*)". "*fadeTime*" can be queried using QUERY FADE TIME/FADE RATE.

The *"fadeTime"* shall be set to a value according to the following steps:

- if *"DTR0"* > 15: 15
- in all other cases: *"DTR0"*

The fade time shall be calculated on the basis of *"fadeTime"* as follows:

- if *"fadeTime"* = 0: use Extended fade time
- if *"fadeTime"* is in the range [1,15]: $\frac{1}{2} \cdot \sqrt{2^{"fadeTime"}} \cdot 1\ \text{s}$

Table 4 lists the possible fade time values.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 4 – Fade times

"fadeTime"	Minimum fade time s	Nominal fade time s	Maximum fade time s
0	Extended fade		
1	0,6	0,7	0,8
2	0,9	1,0	1,1
3	1,3	1,4	1,6
4	1,8	2,0	2,2
5	2,5	2,8	3,1
6	3,6	4,0	4,4
7	5,1	5,7	6,2
8	7,2	8,0	8,8
9	10,2	11,3	12,4
10	14,4	16,0	17,6
11	20,4	22,6	24,9
12	28,8	32,0	35,2
13	40,7	45,3	49,8
14	57,6	64,0	70,4
15	81,5	90,5	99,6

9.5.3 Fade rate

The fade rate shall be according to Table 5, where for testing purposes the time is considered to be precisely 200 ms for the last command using the fade rate.

"fadeRate" shall be set on receipt of the command "SET FADE RATE (*DTR0*)". "*fadeRate*" can be queried using QUERY FADE TIME/FADE RATE.

The *"fadeRate"* shall be set to a value according to the following steps:

- if *"DTR0"* > 15: 15
- if *"DTR0"* = 0: 1
- in all other cases: *"DTR0"*

The fade rate shall be calculated on the basis of *"fadeRate"* as follows:

$$\text{Fade rate} = \frac{506}{\sqrt{2^{"fadeRate"}}} \text{ steps/s.}$$

Table 5 lists the possible fade rate values.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 5 – Fade rates

"fadeRate"	Minimum fade rate steps/s	Nominal fade rate steps/s	Maximum fade rate steps/s
1	322	358	394
2	228	253	278
3	161	179	197
4	114	127	139
5	80,5	89,4	98,4
6	56,9	63,3	69,6
7	40,3	44,7	49,2
8	28,5	31,6	34,8
9	20,1	22,4	24,6
10	14,2	15,8	17,4
11	10,1	11,2	12,3
12	7,1	7,9	8,7
13	5,0	5,6	6,1
14	3,6	4,0	4,3
15	2,5	2,8	3,1

9.5.4 Extended fade time

If "*fadeTime*" equals 0, and the fast fade time as defined in IEC 62386 Part 207 is implemented and equals 0, the extended fade time shall be used.

The extended fade time shall be according to Table 7.

The extended fade time can be set using a base value and a multiplier according to Table 6 and Table 7. The extended fade time can be calculated based on the base value and the multiplication factor.

Fade time = *extendedFadeTimeBase* * *extendedFadeTimeMultiplier*

This yields a range of 100 ms to 16 min, and a special value indicating no fade (as quickly as possible).

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 6 – Extended fade time - base value

Base bits	Base value
0000b	1
0001b	2
0010b	3
0011b	4
0100b	5
0101b	6
0110b	7
0111b	8
1000b	9
1001b	10
1011b	11
1011b	12
1100b	13
1101b	14
1110b	15
1111b	16

Table 7 – Extended fade time - multiplier

Multiplier bits	Multiplication factor		
	Minimum	Nominal	Maximum
000b	0 ms [a]	0 ms [a)]	0 ms [a]
001b	95 ms	100 ms	105 ms
010b	0,95 s	1 s	1,05 s
011b	9,5 s	10 s	10,5 s
100b	0,95 min	1 min	1,05 min
101b		Reserved	
110b		Reserved	
111b		Reserved	
[a] No fade (as quickly as possible)			

On reception of "SET EXTENDED FADE TIME (*DTR0*)" the control gear shall set the following values based on *"DTR0"*. The format used shall be 0YYYAAAAb, where YYYb equals the fade time multiplier, and AAAAb the fade time base: The resulting fade time shall be monotically increasing when the base time increases.

- If "*DTR0"* > 0100 1111b:
  - "*extendedFadeTimeBase*" shall be set to 0
  - "*extendedFadeTimeMultiplier*" shall be set to 0 ms, effectively setting the fade time to 0 s meaning no fade (as quickly as possible). The transition from *"actualLevel"* to *"targetLevel"* shall take place immediately and the light output shall be adjusted as quickly as possible.
- In all other cases:
  - "*extendedFadeTimeBase*" shall be set to AAAAb
  - "*extendedFadeTimeMultiplier*" shall be set to YYYb

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

The extended fade time can be queried using “QUERY EXTENDED FADE TIME”. The answer shall be 0 YYY AAAAb, where YYYb equals “*extendedFadeTimeMultiplier*” and AAAAb equals “*extendedFadeTimeBase*”.

9.5.5 Using the fade time

Commands that use a fade time shall start a fade using the applicable fade time. This time can be determined based on the following rules:

- If “*fadeTime*” > 0: see Table 4 – Fade times
- If “*fadeTime*” = 0: The extended fade time shall be used, see Table 6 – Extended fade time - base valueand Table 7 – Extended fade time - multiplier. The extended fade time can be calculated by multiplying the base value and the multiplier.
- If “*extendedFadeTimeMultiplier*” = 0 ms, the fade time equals 0 s, meaning no fade (as quickly as possible). The transition from *“actualLevel”* to *“targetLevel”* shall take place immediately and the light output shall be adjusted as quickly as possible.

The target level shall be calculated on the basis of the command parameter. After the fade time has expired, the calculated target level shall be reached.

Since the extended fade time also supports fade times below 0,7 s that might not be realised by all control gear and light source combinations, such gear may simply adjust the light output as quickly as possible when an extended fade time is requested that it physically cannot support. However, it should respond as if the fade has finished within the requested time.

9.5.6 Using the fade rate

Commands that use the fade rate shall start a 200 ms ± 20 ms fade.

“*targetLevel*” shall be calculated on the basis of the *“actualLevel”* using the applicable fade rate. After the 200 ms fade has expired, the calculated target level shall be reached.

NOTE 1 Since the fade rate is used, it is possible to reach *“minLevel”* or *“maxLevel”* before the end of the fade. This does not result in the *“fadeRunning”* bit being cleared.

NOTE 2 Because there are fade rate tolerances, different gear may react to commands that use the fade rate at slightly different effective rates. Consequently, after the processing of these relative dimming commands, different gear might have different values for *“targetLevel”* (and therefore also for “*actualLevel*” and *“lastLightLevel”*).

9.5.7 Behaviour during a fade

If *“fadeTime”,”extendedFadeTimeBase*“, *extendedFadeTimeMultiplier*” and/or *“fadeRate”* is changed during a running fade, then the running fade shall finish without the fade time and/or fade rate being recalculated. The next fade shall use the recalculated values.

9.5.8 Behaviour during startup

During startup, the fade process shall be pended with *“actualLevel”* equal to *“minLevel”*. The reaction to level commands shall be the same as if the lamp(s) were operating at *“minLevel”*. The fade shall start:

- As soon as *“lampOn”* is TRUE
- or, in case of total lamp failure, as soon as “*lampFailure*” is confirmed TRUE

9.5.9 Stopping a fade

Any command setting one or more of the following variables

- *“targetLevel”*, *“minLevel”*, *“maxLevel”*

as well as the reception of one of the following commands

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

- “DAPC(MASK)”, “SAVE PERSISTENT VARIABLES”, “IDENTIFY DEVICE”

shall stop a running fade.

NOTE 1 The fade stops even if the value of the affected variable does not change.

When a running fade is stopped by an application controller, the fade timer shall be stopped immediately. After the fade timer has been stopped, *“targetLevel”* shall be set to *“actualLevel”* and the command shall be executed (if applicable).

If a running fade is stopped whilst it was pending at *“minLevel”* during startup, the control gear shall finish the startup process.

NOTE 2 This implies that in such a case both *“targetLevel”* and *“actualLevel”* are equal to *“minLevel”*.

9.6 Min and max level

Changing the min or max level shall stop any running fade, before the storage of the new min or max level.

“SET MIN LEVEL (*DTR0*)” shall set *“minLevel”* depending on the *“DTR0”* value:

- if 0 ≤ *“DTR0”* ≤ PHM: PHM
- if *“DTR0”* ≥ *“maxLevel”* or MASK: *“maxLevel”*
- in all other cases: *“DTR0”*

If *“actualLevel”* > 0 and *“actualLevel”* < *“minLevel”* as a result of setting a new min level, *“targetLevel”* shall be re-calculated on the basis of the new *“minLevel”*. *“actualLevel”* shall be changed to *“targetLevel”* immediately and the light output shall be adjusted as quickly as possible.

“SET MAX LEVEL (*DTR0*)” shall set *“maxLevel”* depending on the *“DTR0”* value, as follows:

- if *“minLevel”* ≥ *“DTR0”*: *“minLevel”*
- if *“DTR0”* = MASK: 0xFE
- in all other cases: *“DTR0”*

If *“actualLevel”* > *“maxLevel”* as a result of setting a new max level, *“targetLevel”* shall be re-calculated on the basis of the new *“maxLevel”*. *“actualLevel”* shall be changed to *“targetLevel”* immediately and the light output shall be adjusted as quickly as possible.

NOTE *“minLevel”* and *“maxLevel”* can be used to compensate for differences in control gear properties. E.g. if control gear have different values for PHM, they can be made to behave in a similar way by adjusting *“minLevel”*.

9.7 Commands

9.7.1 General

A control gear shall check the device addressing scheme to see if it is addressed by a command. The control gear shall accept the command, unless any of the following conditions hold:

- The command is sent using Short addressing and given short address is not equal to *“shortAddress”.*
- The command is sent using Group addressing and given group does not match any of the groups identified by *“gearGroups”.*
- The command is sent using Reserved addressing.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

- The command is sent using Broadcast Unaddressed addressing and *"shortAddress"* is not MASK.
- The command is not defined.

The following command groups can be identified:

- Level instructions
  - Level instructions without fade
  - Level instructions initiating a fade
- Configuration instructions
- Queries
- Special commands
  - Instructions
  - Queries
- Application extended commands

9.7.2 Level instructions without fade

Level instructions without fade are instructions where the *"targetLevel"* shall be calculated; the transition from *"actualLevel"* to *"targetLevel"* shall take place immediately and the light output shall be adjusted as quickly as possible.

These commands can be divided into three categories:

- Absolute level commands
  - "OFF", "RECALL MIN LEVEL", "RECALL MAX LEVEL",
- Relative level commands
  - "STEP UP", "STEP DOWN", "ON AND STEP UP", "STEP DOWN AND OFF"
- Configuration commands
  - "RESET", "SET MIN LEVEL (*DTR0*)", "SET MAX LEVEL (*DTR0*)"

9.7.3 Level instructions initiating a fade

Level instructions initiating a fade are instructions where the *"targetLevel"* shall be calculated; *"actualLevel"* shall fade to the *"targetLevel"* using the applicable fade time/rate. If the fade time equals 0 s, the transition from *"actualLevel"* to *"targetLevel"* shall take place immediately and the light output shall be adjusted as quickly as possible.

These commands can be divided into two categories:

- Absolute level instructions using the fade time
  - "DAPC (*level*)", "GO TO SCENE (*sceneNumber*)", "GO TO LAST ACTIVE LEVEL"
- Relative level instructions using the fade rate
  - "UP", "DOWN"

9.7.4 Configuration instructions

Configuration instructions can be used to modify several control gear properties.

9.7.5 Queries

Queries can be used to request the value of several control gear properties.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

9.7.6 Special commands

The special commands are a group of commands that are not addressable. All control gear shall interpret the special commands.

9.7.7 Application extended commands

Commands with their opcode in the range 0xE0 to 0xFF are reserved for special device types or features. Each device type or feature re-defines these commands, except for the command with opcode 0xFF ("QUERY EXTENDED VERSION NUMBER"). See 9.18 for further information.

9.8 Command iterations

9.8.1 General

The requirements of subclause 9.4 of IEC 62386-101:2014 apply with the following additions.

9.8.2 Command iteration of "UP" and "DOWN" commands

"UP" and "DOWN" instructions can be sent as a command iteration. Upon reception of the first instruction of such an iteration, unless this is precluded by the values of "*minLevel*" or "*maxLevel*", one step ("*targetLevel*" = "*targetLevel*"±1) shall be made.

NOTE 1 This ensures that there is an effect at the start of an iteration.

After that first step, the 200 ms fade shall start using the applicable fade rate. Subsequent steps shall be executed at intervals determined by the applicable fade rate, as long as the iteration continues. Every "UP" or "DOWN" instruction received as a part of the iteration shall cause the 200 ms fade time to be restarted and *"targetLevel"* to be recalculated on the basis of *"actualLevel"* and the set fade rate.

NOTE 2 If the fade rate changes during a command iteration, the new fade rate is not used during the execution of this command iteration.

Figure 5 summarizes the required behaviour. The iterations start at Cmd 1, and end at Time out.

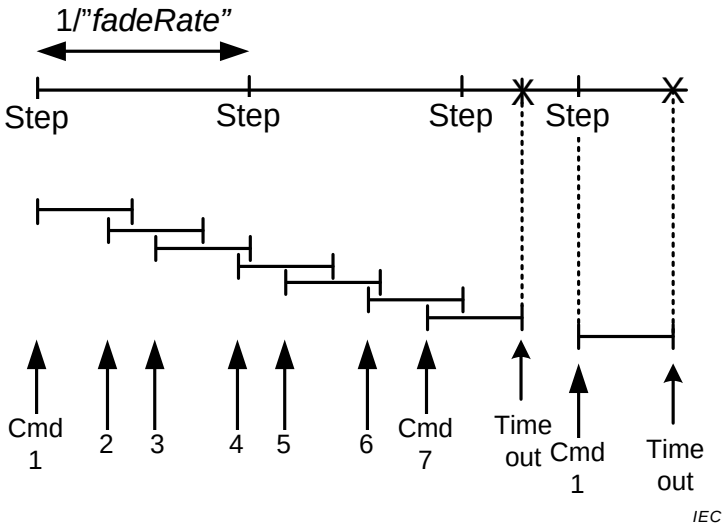


Figure 5 – Timing and response when receiving a command iteration

9.8.3 DAPC SEQUENCE (deprecated)

"ENABLE DAPC SEQUENCE" starts a direct arc power control (DAPC) command iteration that allows dynamic control of the light output.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Upon reception of “ENABLE DAPC SEQUENCE” the control gear shall temporarily use a fade time of 200 ms ± 20 ms while the command iteration is active independent of the actual fade/extended fade time. After the last fade of the sequence has finished, the original values shall be used.

NOTE As the fade time/rate variables do not change, the fade time/rate can be set and/or queried as normal.

The DAPC sequence shall end if 200 ms elapse without the control gear receiving a “DAPC (*level*)” command. The DAPC sequence shall be aborted on reception of an indirect arc power control command. “ENABLE DAPC SEQUENCE” received during an enabled DAPC command iteration, shall have no effect.

Upon reception of the first “DAPC (*level*)” after reception of the “ENABLE DAPC SEQUENCE” command the 200 ms fade shall start.

Since the DAPC sequence uses a fade time of 200 ms that might not be realised by all control gear and light source combinations, such gear may simply adjust the light output as quickly as possible. However, it should respond as if the fade has finished within the requested time.

9.9 Modes of operation

9.9.1 General

Different operating modes can be selected by means of command “SET OPERATING MODE (*DTR0*)”. The currently selected *“operatingMode”* can be queried by means of “QUERY OPERATING MODE”.

Operating modes 0x00 to 0x7F are defined in this standard. At least operating mode 0x00 shall be available. Operating modes 0x80 to 0xFF are manufacturer specific. The query “QUERY MANUFACTURER SPECIFIC MODE” can be used to determine whether the control gear is in an IEC 62386 standard operating mode or in a manufacturer specific mode.

9.9.2 Operating mode 0x00: standard mode

If a device is in standard mode (*“operatingMode”* = 0x00), its behaviour shall be as is required per this specification, until it is set in an operating mode different from 0x00.

9.9.3 Operating mode 0x01 to 0x7F: reserved

Operating modes 0x01 to 0x7F are reserved and shall not be used.

9.9.4 Operating mode 0x80 to 0xFF: manufacturer specific modes

Manufacturer specific modes should only be used if the features required by the application are not covered by the standard. If a control gear is in a manufacturer specific operating mode, the behaviour of the control gear may be manufacturer specific as well, with the following exceptions:

- as far as the control gear accesses the bus, it shall adhere to IEC 62386-101:2014;
- the control gear shall adhere to this specification at least as far as the following commands are concerned:
  - “SET OPERATING MODE (*DTR0*)”, “QUERY OPERATING MODE”, and “QUERY MANUFACTURER SPECIFIC MODE”.
  - all special commands (see 11.7) except WRITE MEMORY LOCATION (*DTR1, DTR0, data*), WRITE MEMORY LOCATION – NO REPLY (*DTR1, DTR0, data*) and PING.

For the above commands the various addressing methods shall apply, see 7.2.2.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

It is recommended that even in manufacturer specific modes, the commands as specified in this standard still be obeyed.

9.10 Memory banks

9.10.1 General

Memory banks are freely accessible memory spaces defined for e.g. identification of the control gear in a system. Not all consecutive memory banks need to be implemented. Also within a memory bank not all consecutive locations need to be implemented. All implemented memory bank locations of all implemented memory banks are readable using memory access commands. Part of the memory is read-only and programmed by the manufacturer of the control gear. For all other parts, write access using memory access commands can be enabled by the manufacturer. Write access to a memory bank location can be locked. Memory banks can be implemented using RAM, ROM or NVM.

The addressable memory space is limited to a maximum of almost 64 kBytes, organized in maximum 256 memory banks of maximum 255 bytes each. As this standard prescribes how to implement memory bank 0 and 1 (if present), and reserves memory banks 200 to 255, this leaves room for 198 memory banks for manufacturer specific purposes in the range of [2,199].

9.10.2 Memory map

If a manufacturer specific memory bank in the range of [2,199] is implemented, allocation of its content shall comply with the memory map provided in Table 8.

Table 8 – Basic memory map of memory banks

Address	Description	Default value (factory)	RESET value[b]	Memory type
0x00	Address of last accessible memory location	Factory burn-in, range [0x03,0xFE]	No change	ROM
0x01	Indicator byte [a]	[a]	[a]	Any[a]
0x02	Memory bank lock byte. Lockable bytes in the memory bank shall be read-only while the lock byte has a value different from 0x55.	0xFF	0xFF[c]	RAM
[0x03,0xFE]	Memory bank content [a]	[a]	[a]	Any[a]
0xFF	Reserved – not implemented	Answer NO	No change	n.a.

[a] Purpose, default/power on/reset value and memory access of these bytes shall be defined by the manufacturer.

[b] Reset value after “RESET MEMORY BANK”.

[c] Also used as power on value unless explicitly stated otherwise.

The byte in location 0x00 of each bank contains the address of the last accessible memory location of the bank. The value shall be in the range [0x03,0xFE].

The byte in location 0x01 is manufacturer specific. If implemented, the usage of this byte should be described by the manufacturer (as well as the entire content of the memory bank).

NOTE 1 It could be used for example to store a checksum in case of a memory bank with static content. Using a checksum on a memory bank where the content is changed by the control gear is not useful.

The byte in location 0x02 shall be used to lock write access. Memory location 0x02 itself shall never be locked for writing. While this memory location contains any value different from 0x55, all memory locations marked "(lockable)" of the corresponding memory bank shall be read only. The control gear shall not change the value of the lock byte other than as a

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

consequence of power cycle or a “RESET MEMORY BANK (*DTR0*)” or other command affecting the lock byte.

Location 0xFF is a reserved location in every memory bank, and is not accessible. This location shall not be implemented as a normal memory bank location. When addressed, the control gear shall respond as if this location is not implemented, and it shall not increment “*DTR0*”.

NOTE 2 This location is reserved in order to stop the auto increment of DTR0.

9.10.3 Selecting a memory bank location

In order to select a memory bank location, a combination of memory bank number and location inside the memory bank is required.

The memory bank shall be selected by setting the memory bank number in *“DTR1”*. The location in the memory bank shall be selected by the value in *“DTR0”*.

9.10.4 Memory bank reading

A selected memory bank location can be read by means of command “READ MEMORY LOCATION (*DTR1, DTR0*)”. The answer shall be the value of the byte at the addressed memory bank location.

If the selected memory bank is not implemented, the command shall be ignored. If the memory bank exists, and selected memory bank location is

- not implemented, or
- above the last accessible memory location,

the answer shall be NO.

If the selected memory bank location is below location 0xFF, *“DTR0”* shall be incremented by one, even if the memory location is not implemented. Otherwise, *“DTR0”* shall not change. This mechanism allows for easy consecutive reading of memory bank locations.

To ensure consistent data when reading a multi-byte value from a memory bank, it is recommended that a mechanism be implemented that latches all bytes of the multi-byte value when the first byte of the multi-byte value is read and that unlatches the bytes at any other command than “READ MEMORY LOCATION (*DTR1, DTR0*)”.

After reading a number of bytes from a memory bank, the application controller should check the value of “*DTR0*” to verify it is at the expected/desired location. Any mismatch indicates an error while reading.

9.10.5 Memory bank writing

Write commands are special commands and therefore not addressable. In order to select the correct control gear(s) the addressable command “ENABLE WRITE MEMORY” shall be used. Upon reception of “ENABLE WRITE MEMORY”, the addressed control gear(s) shall set *“writeEnableState”* to ENABLED.

Only while *“writeEnableState”* is ENABLED, and the addressed memory bank is implemented, the control gear shall accept the following commands to write to a selected memory bank location:

- “WRITE MEMORY LOCATION (*DTR1, DTR0, data*)”: The control gear shall confirm writing a memory location with an answer equal to the value *data*.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

NOTE 1 The value that can be read from the memory bank location is not necessarily *data*.

- "WRITE MEMORY LOCATION – NO REPLY (*DTR1, DTR0, data*)": Writing a memory location shall not cause the control gear to reply.

A control gear shall set *"writeEnableState"* to DISABLED if any command other than one of the following commands is received:

- "WRITE MEMORY LOCATION (*DTR1, DTR0, data*)", "WRITE MEMORY LOCATION – NO REPLY (*DTR1, DTR0, data*)"
- "DTR0 (*data*)", "DTR1 (*data*)" , "DTR2 (*data*)"
- "QUERY CONTENT DTR0", "QUERY CONTENT DTR1", "QUERY CONTENT DTR2"

If the selected memory bank location is

- not implemented, or
- above the last accessible memory location, or
- locked (see subclause 9.10.2), or
- not writeable,

the answer to "WRITE MEMORY LOCATION (*DTR1, DTR0, data*)" shall be NO and no memory location shall be written to.

If the selected memory bank location is below location 0xFF, *"DTR0"* shall be incremented by one. Otherwise, *"DTR0"* shall not change. This mechanism allows for easy consecutive writing to memory bank locations.

To ensure consistent data when writing a multi-byte value into a memory bank, it is recommended that a mechanism be implemented that only accepts the new multi-byte value for writing after all bytes of the multi-byte value have been received.

After writing a number of bytes to a memory bank, the application controller should check the value of "*DTR0*" to verify it is at the expected/desired location. Any mismatch indicates an error while writing.

NOTE 2 "*DTR0*" is also incremented if a non-implemented memory bank location is addressed before 0xFF is reached.

9.10.6 Memory bank 0

Memory bank 0 contains information about the control gear. Memory bank 0 shall be implemented in all control gear.

Memory bank 0 shall be implemented using the memory map shown in Table 9, with at least the memory locations up to address 0x7F implemented, excluding reserved locations.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 9 – Memory map of memory bank 0

Address	Description	Default value (factory)	Memory type
0x00	Address of last accessible memory location	factory burn-in	ROM
0x01	Reserved – not implemented	answer NO	n.a.
0x02	Number of last accessible memory bank	factory burn-in, range [0,0xFF]	ROM
0x03	GTIN byte 0 (MSB)[a]	factory burn-in	ROM
0x04	GTIN byte 1	factory burn-in	ROM
0x05	GTIN byte 2	factory burn-in	ROM
0x06	GTIN byte 3	factory burn-in	ROM
0x07	GTIN byte 4	factory burn-in	ROM
0x08	GTIN byte 5 (LSB)	factory burn-in	ROM
0x09	Firmware version (major)	factory burn-in	ROM
0x0A	Firmware version (minor)	factory burn-in	ROM
0x0B	Identification number byte 0 (MSB)	factory burn-in	ROM
0x0C	Identification number byte 1	factory burn-in	ROM
0x0D	Identification number byte 2	factory burn-in	ROM
0x0E	Identification number byte 3	factory burn-in	ROM
0x0F	Identification number byte 4	factory burn-in	ROM
0x10	Identification number byte 5	factory burn-in	ROM
0x11	Identification number byte 6	factory burn-in	ROM
0x12	Identification number byte 7 (LSB)	factory burn-in	ROM
0x13	Hardware version (major)	factory burn-in	ROM
0x14	Hardware version (minor)	factory burn-in	ROM
0x15	101 version number	factory burn-in, according to implemented version number	ROM
0x16	102 version number of all integrated control gear [b]	factory burn-in, according to implemented version number	ROM
0x17	103 version number of all integrated control devices [b]	factory burn-in, according to implemented version number	ROM
0x18	Number of logical control device units in the bus unit	factory burn-in, range [0,64]	ROM
0x19	Number of logical control gear units in the bus unit	factory burn-in, range [1,64]	ROM
0x1A	Index number of this logical control gear unit	factory burn-in, range [0,(location 0x19)-1]	ROM
[0x1B,0x7F]	Reserved – not implemented	answer NO	n.a.
[0x80,0xFE]	Additional control gear information [c]	[c]	ROM
0xFF	Reserved – not implemented	answer NO	n.a.

[a] It is recommended that the product GTIN is not re-used within the expected lifetime of the product after installation.

[b] Format of the version number is defined in Subclause 4.2. If not implemented, this is indicated by 0xFF.

[c] Purpose and (default) value of these bytes shall be defined by the manufacturer.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

If there is more than one logical unit built into one bus unit, all logical units shall have the same values in memory bank locations 0x03 up to and including 0x19.

A bus unit might contain both control gear and control devices. They share various numbers (e.g. GTIN, unique identification number...). To avoid problems when reading, and getting different answers depending on the addressing scheme used, the memory bank layout are the same for control gear and for control devices up to and including location 0x19. The data shall be the same as well. The application controller can use either the 102 or the 103 commands to identify the basic data, provided both are implemented.

The bytes in locations 0x03 to 0x08 (“GTIN 0” to “GTIN 5”) shall contain the Global Trade Item Number (GTIN), e.g. the EAN, in binary. The bytes shall be stored most significant first and filled with leading zeroes.

The bytes in locations 0x09 and 0x0A (“firmware version”) shall contain the firmware version of the bus unit.

The bytes in locations 0x0B to 0x12 (“identification number byte 0” to “identificaton number byte 7”) shall contain 64 bits of an identification number of the bus unit, prefereably the serial number. The identification number shall be stored with least significant byte in “identification number byte 7” and unused bits shall be filled with 0.

The combination of the identification number and the GTIN number shall be unique.

The byte in location 0x13 and 0x14 (“hardware version”) shall contain the hardware version of the bus unit.

The byte in location 0x15 shall contain the implemented IEC 62386-101 version number of the bus unit.

The byte in location 0x16 shall contain the implemented IEC 62386-102 version number of the bus unit. If no control gear is implemented, the version number shall be 0xFF.

The byte in location 0x17 shall contain the implemented IEC 62386-103 version number of the bus unit. If no control device is implemented, the version number shall be 0xFF.

The byte in location 0x18 shall contain the number of logical control device units integrated into the bus unit. The number of logical units shall be in the range of 0 to 64.

The byte in location 0x19 shall contain the number of logical control gear units integrated into the bus unit. The number of logical units shall be in the range of 1 to 64.

The byte in location 0x1A shall represent the unique index number of the logical control gear unit that implements that memory bank. The valid range of this index number is 0 to the total number of logical control gear units in the bus unit minus one.

NOTE As example there might be a product containing three logical devices with three different short addresses. Each of these control gear has the same GTIN and identification number, each reports as number of devices the value 3 and the index of the three control gear is reported as 0, 1 or 2 respectively. Reading location 0x1A using broadcast yields a backward frame according to IEC 62386-101:2014, Subclause 9.5.2 (overlapping backward frame).

9.10.7 Memory bank 1

Memory bank 1 is reserved for use by an OEM (original equipment manufacturer, e.g. a luminaire manufacturer) to store additional information, which has no impact on the functionality of the control gear. The control gear manufacturer may implement memory bank 1.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

If implemented, memory bank 1 shall at least implement the memory locations up to and including address 0x10. The fixed usage for location 0x00 to 0x02 and the recommended memory map usage for location 0x03 to 0x10 is shown in Table 10.

Table 10 – Memory map of memory bank 1

Address	Description	Default value (factory)	RESET value[b]	Memory type
0x00	Address of last accessible memory location	factory burn-in, range [0x10,0xFE]	no change	ROM
0x01	Indicator byte [a]	[a]	[a]	any[a]
0x02	Memory bank 1 lock byte. Lockable bytes in the memory bank shall be read-only while the lock byte has a value different from 0x55.	0xFF	0xFF[c]	RAM
0x03	OEM GTIN byte 0 (MSB)	0xFF	no change	NVM (lockable)
0x04	OEM GTIN byte 1	0xFF	no change	NVM (lockable)
0x05	OEM GTIN byte 2	0xFF	no change	NVM (lockable)
0x06	OEM GTIN byte 3	0xFF	no change	NVM (lockable)
0x07	OEM GTIN byte 4	0xFF	no change	NVM (lockable)
0x08	OEM GTIN byte 5 (LSB)	0xFF	no change	NVM (lockable)
0x09	OEM identification number byte 0 (MSB)	0xFF	no change	NVM (lockable)
0x0A	OEM identification number byte 1	0xFF	no change	NVM (lockable)
0x0B	OEM identification number byte 2	0xFF	no change	NVM (lockable)
0x0C	OEM identification number byte 3	0xFF	no change	NVM (lockable)
0x0D	OEM identification number byte 4	0xFF	no change	NVM (lockable)
0x0E	OEM identification number byte 5	0xFF	no change	NVM (lockable)
0x0F	OEM identification number byte 6	0xFF	no change	NVM (lockable)
0x10	OEM identification number byte 7 (LSB)	0xFF	no change	NVM (lockable)
≥ 0x11	Additional control gear information [a]	[a]	[a]	[a]
0xFF	Reserved – not implemented	answer NO	no change	n.a.

[a] Purpose, default/power on/reset value and memory access of these bytes shall be defined by the manufacturer.

[b] Reset value after “RESET MEMORY BANK”.

[c] Also used as power on value.

The bytes in locations 0x03 to 0x08 (“OEM GTIN 0” to “OEM GTIN 5”) should be used to identify the product containing the control gear. If the bytes are used for GTIN the bytes shall be stored most significant bit first and filled with leading zeroes. These bytes should be programmed by the OEM.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

The bytes in locations 0x09 to 0x10 (“OEM identification number byte 0” to “OEM identification number byte 7”) should contain 64 bits of an identification number of the OEM product. If the bytes are used for the identification number, it shall be stored with the least significant byte in “Identification number byte 7” and unused bits shall be filled with 0. These bytes should be programmed by the OEM.

The combination of OEM GTIN and OEM identification number should be unique.

9.10.8 Manufacturer specific memory banks

The manufacturer may use additional memory banks in the range of 2 to 199 to store additional information. The memory map of additional banks shall comply with Table 8.

9.10.9 Reserved memory banks

Memory banks 200 to 255 are reserved for future use and shall not be implemented.

9.11 Reset

9.11.1 Reset operation

A control gear shall implement a reset operation to set all variables to their reset values (see Table 14).

NOTE For some variables this operation could have no effect at all.

The reset operation shall take at most 300 ms to complete. While the reset operation is in progress, the control gear may or may not respond to any command. However, until the reset operation is complete, none of the affected variables needs to have a defined value.

An application controller can trigger the reset operation using the “RESET” instruction and should wait at least 350 ms to ensure all gear have finished the reset operation.

9.11.2 Reset memory bank operation

A control gear shall implement a reset operation to set the content of all unlocked memory banks to their reset values (see 9.10), followed by locking the memory banks.

NOTE For some memory bank locations this operation could have no effect at all.

The reset operation shall take at most 10 s to complete. While the reset operation is in progress, the control gear may or may not respond to any command. However, until the reset operation is complete, none of the affected memory bank locations have a defined value.

An application controller can trigger the reset operation for a specific memory bank, or for all implemented memory banks, using the “RESET MEMORY BANK (*DTR0*)” instruction and it should wait for at least 10,1 s so as to allow all gear enough time to finish the reset memory bank operation.

9.12 System failure

If the control gear detects system failure (see IEC 62386-101:2014, Subclause 4.11) and *“systemFailureLevel”* is not MASK, *“targetLevel”* shall be calculated on the basis of *“systemFailureLevel”*. The transition from *“actualLevel”* to *“targetLevel”* shall take place immediately and the light output shall be adjusted as quickly as possible.

If *“systemFailureLevel”* is MASK, the control gear shall not react to a system failure.

On restoration of the bus idle voltage the control gear shall not react.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

"systemFailureLevel" can be set and queried with "SET SYSTEM FAILURE LEVEL (*DTR0*)" and "QUERY SYSTEM FAILURE LEVEL" respectively.

When bus power is restored after a system failure, bus-powered control gear shall follow the power-on procedure defined in subclause 9.13 below. Consequently, the variable *"systemFailureLevel"* is not used. Nevertheless, all control gear, including bus-powered control gear, shall maintain *"systemFailureLevel"* and conform to the requirements of the specifications of all the commands relating to it.

NOTE Implementing *"systemFailureLevel"* although this variable is normally not applicable for bus powered devices, is done to avoid separate test conditions of control gear.

9.13 Power on

After an external power cycle (see IEC 62386-101 subclause 4.11.1), the device shall retain its most recent configuration, with the following exceptions:

- the memory bank write enable state shall be disabled for all memory banks and the lock byte shall be set to 0xFF;
- all running timers shall be stopped and cancelled/reset;
- *"powerCycleSeen"* shall be set to TRUE;
- *"actualLevel"* shall be set to 0x00 keeping the lamp off;
- *"lampOn"* shall be set to FALSE;
- *"limitError"* shall be set to FALSE;
- *"targetLevel"* shall be set to 0x00;
- the control gear may start preheating the lamp but the lamp shall not ignite. While preheating, "*actualLevel*" shall be kept at 0x00 contrary to normal startup activity.

Bus powered devices shall activate the power on level immediately. For externally powered devices the following holds:

If a level control command other than "GO TO SCENE (*sceneNumber*)" where the value of the scene equals MASK and other than DAPC(MASK) is received it shall be executed.

If "GO TO SCENE (*sceneNumber*)" where the value of the scene equals MASK is received, the control gear shall ignore the command and continue as if no level control command has been received.

If DAPC(MASK) is received, the control gear shall stop any startup activity.

NOTE 1 Since *"actualLevel"* = 0, this effectively keeps the lamp off.

The control gear shall activate the power on level according to Table 11 by calculating the *"targetLevel"* on the basis of *"powerOnLevel"*. If *"powerOnLevel"* equals MASK, "*targetLevel*" shall be set to "*lastLightLevel*". *"actualLevel"* shall be set to *"targetLevel"* immediately and the light output shall be adjusted as quickly as possible.

If a level control command is received before the power on level is activated, this command shall be executed immediately and the control gear shall not activate the power on level.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 11 – Power on timing

Power on behavior	Minimum time	Maximum time
Lamp off		540 ms
Grey area	> 540 ms	< 660 ms
Power on level	660 ms	

NOTE 2 Thus, there is an interval during which a control device can send a level control command which will be obeyed immediately, so DAPC(0x00) or DAPC(MASK) can be used to prevent from going automatically to *"powerOnLevel"*.

NOTE 3 It is possible that system failure is detected before the power on level has been reached. If "*systemFailureLevel*" is not MASK, the *"targetLevel"* is recalculated on the basis of *"systemFailureLevel"*.

"powerOnLevel" can be set and queried with "SET POWER ON LEVEL (*DTR0*)" and "QUERY POWER ON LEVEL" respectively.

After receiving the first 16 bit forward frame on the interface after power-on, the control gear shall only respond to frames described in IEC 62386-101.

9.14 Assigning short addresses

9.14.1 General

"shortAddress" shall be derived from *data* or *"DTR0"* depending on the command used. It shall be set on receipt of "PROGRAM SHORT ADDRESS (*data*)" or "SET SHORT ADDRESS (*DTR0*)" as follows:

- if *data* or *"DTR0"* = MASK: MASK (effectively deleting the short address)
- if *data* or *"DTR0"* = 1xxxxxxxb or xxxxxxx0b: no change
- in all other cases (0AAAAAA1b): 00AAAAAAb.

9.14.2 Random address allocation

A control gear shall implement an initialisation state, only in which, in addition to the other operations identified in this standard, a set of commands are enabled that allow an application controller to detect and uniquely identify control gear available on the bus and assign short addresses to these devices.

The initialisation state is a temporary state which is entered with the command "INITIALISE (*device*)". It shall end automatically 15 min ± 1,5 min after the last "INITIALISE (*device*)" command was received. Additionally, a power cycle or the command "TERMINATE" shall cause the control gear to leave the initialisation state immediately.

The control gear shall have three possible values for *"initialisationState"*:

- DISABLED, not in initialisation state;
- ENABLED, in initialisation state;
- WITHDRAWN, in initialisation state, yet identified and withdrawn.

The following (special) commands are initialisation commands:

- "RANDOMISE", "COMPARE" and "WITHDRAW"
- "SEARCHADDRH (*data*)", "SEARCHADDRM (*data*)" and "SEARCHADDRL (*data*)"
- "PROGRAM SHORT ADDRESS (*data*)", "VERIFY SHORT ADDRESS (*data*)" and "QUERY SHORT ADDRESS"
- "IDENTIFY DEVICE"

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

NOTE "IDENTIFY DEVICE" is by itself not an initialisation command, but typically used during initialisation

9.14.3 Identification of a device

9.14.3.1 General

During identification no variables shall be affected unless explicitly stated otherwise. Where appropriate, variables can be temporarily ignored, so that after the identification has ended, there are no side effects.

When identification is active, the light output may be at any level between off and 100 %, "*minLevel*" and "*maxLevel*" as well as "*actualLevel*" being in effect temporarily ignored.

Identification shall be stopped upon reception of any instruction other than INITIALISE (*device*), RECALL MIN LEVEL, RECALL MAX LEVEL or IDENTIFY DEVICE.

After identification has stopped, the light output shall be adjusted as quickly as possible to reflect "*actualLevel*" and the command shall be executed (if applicable).

9.14.3.2 Method one: single instruction

Identification can be started by sending the instruction "IDENTIFY DEVICE". This shall start or restart a 10 s ± 1 s timer. While the timer is running, a procedure enabling an observer to identify the selected control gear shall run. If the timer expires, identification shall stop.

NOTE The actual procedure is manufacturer specific.

While identification is active, the control gear shall, without interrupting the identification procedure:

- on RECALL MIN LEVEL: set "*actualLevel*" and "*targetLevel*" to "*minLevel*";
- on RECALL MAX LEVEL: set "*actualLevel*" and "*targetLevel*" to "*maxLevel*".

When identification is stopped by an application controller, the corresponding timer shall be cancelled immediately.

For examples of how to use the commands, see Annex A.

9.14.3.3 Method two: using "RECALL MAX LEVEL" and/or "RECALL MIN LEVEL" (deprecated)

While "*initialisationState*" is not DISABLED, the control gear shall:

- on RECALL MIN LEVEL: set "*actualLevel*" and "*targetLevel*" to "*minLevel*", and then adjust the light output as quickly as possible to its PHM level. If, however, PHM is not visibly significantly different from 100 %, then the lamp shall be temporarily switched off instead;
- on RECALL MAX LEVEL: set "*actualLevel*" and "*targetLevel*" to "*maxLevel*", and then adjust the light output as quickly as possible to 100 %.

If the device is unable to visually identify itself in this way, the control gear shall respond as if it received "IDENTIFY DEVICE" as well, starting or re-triggering the identification procedure.

NOTE It is acceptable for the process of identifying individual control gear to depend upon both commands being received in an alternating sequence.

Identification shall be stopped immediately when one of the following conditions hold:

- the "*initialisationState*" changes to DISABLED;
- upon reception of any instruction other than INITIALISE (*device*), RECALL MIN LEVEL, RECALL MAX LEVEL or IDENTIFY DEVICE.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

For examples of how to use the commands, see Annex A.

9.14.4 Direct address allocation

"SET SHORT ADDRESS (*DTR0*)" can be used to directly program a short address to the addressed gear.

9.15 Failure state behaviour

If the control gear is in a failure state, in which operation of the lamp(s) is not possible as intended (lamp failure and/or control gear failure) it shall react to level commands in the following way:

The control gear shall calculate *"targetLevel"* in accordance with the commands received, and control the lamp insofar as that is practicable. As a consequence of the fault, the normal relationship between *"actualLevel"* and light output could temporarily change.

NOTE For example, a control gear might, on detecting an excessively high temperature, protect itself from the risk of thermal damage by limiting the ight output.l

If the failure state is resolved, the control gear shall re-establish the normal relationship between *"actualLevel"* and light output.

9.16 Status information

9.16.1 General

Each control gear shall expose its status as a combination of device properties as given in Table 12.

Table 12 – Control gear status

Bit	Description	Value	See
0	*"controlGearFailure"* is TRUE?	"1" = "YES"	9.16.2
1	*"lampFailure"* is TRUE?	"1" = "YES"	9.16.3
2	*"lampOn"* is TRUE?	"1" = "YES"	9.16.4
3	*"limitError"* is TRUE?	"1" = "YES"	9.16.5
4	*"fadeRunning"* is TRUE?	"1" = "YES"	9.16.6
5	*"resetState"* is TRUE?	"1" = "YES"	9.16.7
6	*"shortAddress"* is MASK?	"1" = "YES"	9.16.8
7	*"powerCycleSeen"* is TRUE?	"1" = "YES"	9.16.9

The device status can be queried using "QUERY STATUS". The bits shall reflect the actual situation without delay unless explicitly stated otherwise.

9.16.2 Bit 0: Control gear failure

A control gear failure according to this standard is a situation in which the control gear cannot operate as intended.

NOTE Examples are mains under voltage, over temperature, unexpected watchdog timers firing etc.

If a control gear failure is detected, *"controlGearFailure"* shall be set to TRUE.

If the failure is no longer detected, and normal operation has been resumed, *"controlGearFailure"* shall be set to FALSE.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Control gear failure shall be detected and indicated latest after 30 s.

9.16.3 Bit 1: lamp failure

A lamp failure according to this standard is a situation in which the lamp cannot be operated as intended due to e.g. incorrect lamp connection or lamp defects.

If a lamp failure is detected, *"lampFailure"* shall be set to TRUE. Lamp failure shall be detected and indicated latest after 30 s when the control gear is not in standby (see 9.2).

Partial lamp failure should also be interpreted as lamp failure.

If "*lampFailure*" is TRUE, the control gear shall periodically check to determine whether the lamp situation has improved. This check shall be executed at least whenever "*targetLevel*" changes from 0x00 to a greater value. After a successful startup, *"lampFailure"* shall be set to FALSE.

For lamp type unkown there may be support for this bit. For lamp type none there may be support (e.g. based on load measurement).

9.16.4 Bit 2: lamp on

"lampOn" shall be set to FALSE when the lamp is off, during startup, and in case of total lamp failure, meaning no light output. In all other cases it shall be set to TRUE.

9.16.5 Bit 3: limit error

If the last requested target level has been modified in accordance with *"minLevel"* or *"maxLevel"* limitations, or *"targetLevel"* has been modified due to a change of *"minLevel"* or *"maxLevel"*, "*limitError*" shall be set to TRUE.

If the last target level requested by "DAPC (*level*)" equals "MASK", "*limitError*" shall not change.

In all other cases "*limitError*" shall be set to FALSE.

9.16.6 Bit 4: fade running

"fadeRunning" shall be set to FALSE except for the time during which the fade timer is running. *"fadeRunning"* shall be set to TRUE from the beginning of the fade (after startup) until the end of the fade time, regardless of whether *"targetLevel"* and *"actualLevel"* reach the same level.

9.16.7 Bit 5: reset state

"resetState" shall be set to TRUE if all the NVM variables mentioned in Table 14 except "*lastLightLevel*" are at their reset value. The NVM variables that are marked with 'no change' in the reset value column shall not be considered. NVM variables defined in implemented Parts 2xx shall be included.

In all other cases the bit shall be set to FALSE.

9.16.8 Bit 6: missing short address

This bit indicates whether a short address has been assigned to the gear, by checking *"shortAddress"*. The bit shall be TRUE if *"shortAddress"* = MASK.

In all other cases the bit shall be set to FALSE.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

9.16.9 Bit 7: power cycle seen

"powerCycleSeen" shall be set to TRUE after an external power cycle (see IEC 62386-101, Clause 4.11) has occurred.

"powerCycleSeen" shall be set to FALSE once one of the following commands has been received:

"RESET", "DAPC (*level*)", "OFF", "UP", "DOWN", "STEP UP", "STEP DOWN", "RECALL MAX LEVEL", "RECALL MIN LEVEL", "GO TO LAST ACTIVE LEVEL", "STEP DOWN AND OFF", "ON AND STEP UP", "GO TO SCENE (*sceneNumber*)".

9.17 Non-volatile memory

Physical non-volatile memory typically supports a limited number of write cycles. Since many variables are NVM type, the physical limitations need some attention.

A control gear should store NVM variables in such a way that their content is never lost and the intended lifetime of the device can be reached. This means that it may not be possible to physically write every change in a variable immediately. There may be situations in which the control gear is not able to physically write the variables to NVM, especially if a particular NVM variable is changed very frequently.

Since the application controller cannot know the control gear's internal mechanism for physically saving persistent variables, the instruction "SAVE PERSISTENT VARIABLES" is defined to force the control gear to physically write all variables of type NVM to memory. This command is an addition to the normal writing of NVM variables. Its intended use is to ensure that important changes made by an application controller cannot be lost, e.g. after assigning all short addresses or setting other important (and stable) configuration data. Clearly it is not intended to be used after every level change. Typically, this command is used only a handful of times for an entire installation.

NOTE 1 Typically the command can be used a few thousand times before causing physical damage to the control gear's NVM.

Physically saving the variables in response to the instruction shall take at most 300 ms to complete. While the saving operation is on-going, the light output may fluctuate and the control gear may or may not respond to any command. However, until the operation is complete, the value of the affected variables may be undefined. Moreover, if the light is off when the instruction is received, the light shall stay off; in this case, no flicker shall be visible.

The light output may not fluctuate during saving operations unless these are triggered by this command.

An application controller can trigger the save operation using the "SAVE PERSISTENT VARIABLES" instruction and should wait at least 350 ms to ensure all gear have finished the operation.

9.18 Device types and features

Commands with their opcode in the range 0xE0 to 0xFF are reserved for special device types or features. Each device type/feature re-defines these commands, except for the command with opcode 0xFF ("QUERY EXTENDED VERSION NUMBER").

The device type/feature specific command set can be selected by the instruction "ENABLE DEVICE TYPE (*data*)".

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

This instruction shall select the device type/feature for which only the next following application extended command (refer to subclauses 11.6) is valid. Receiving this instruction shall cancel any previous selection of a device type.

The enabling of the device type/feature shall be cancelled upon execution of the next following command addressed to the same control gear, and that command shall be executed according to its specification, regardless of whether it is an application extended command or not.

A control gear shall not react to a command which belongs to the application extended commands of a device type/feature not supported by this control gear.

The device types shall be coded as specified in the particular parts 2xx of IEC 62386.

An application controller can check which device types are supported by the control gear. “QUERY DEVICE TYPE” reports the supported device type. If more than one device type/feature is supported, “QUERY DEVICE TYPE” reports MASK. In that case, the application controller can check all supported device types by repeating “QUERY NEXT DEVICE TYPE” until 254 is received as an answer. Issuing “QUERY DEVICE TYPE” automatically ensure that the first supported device type/feature will be reported by “QUERY NEXT DEVICE TYPE”.

To check the version number of the supported device types, the application controller can send “ENABLE DEVICE TYPE (*data*) followed by “QUERY EXTENDED VERSION NUMBER”. This will report the version number of that specific device type/feature implementation.

Application controllers should be able to identify individual gear and store the relationship between gear's individual address and its device types.

9.19 Using scenes

A control gear shall support the use of 16 scenes. The following commands shall be supported:

“GO TO SCENE (*sceneNumber*)”, “REMOVE FROM SCENE (*sceneX*)”, “QUERY SCENE LEVEL (*sceneX*)”, and “SET SCENE (*DTR0, sceneX*)”.

These commands actually comprise 16 commands each, one for each scene. This is accomplished by selecting a block of 16 consecutive opcodes. The number of the scene to be used can thus easily be calculated.

Upon reception of one of the scene commands, *sceneNumber* shall be derived from the opcode: *sceneNumber* = opcode - opcodeBase. This identifies the scene to be used. The opcodeBase can be found in Table 13.

Table 13 – Scenes

Command	opcodeBase	Opcode range
GO TO SCENE (*sceneNumber*)	0x10	[0x10,0x1F]
REMOVE FROM SCENE (*sceneX*)	0x50	[0x50,0x5F]
QUERY SCENE LEVEL (*sceneX*)	0xB0	[0xB0,0xBF]
SET SCENE (*DTR0, sceneX*)	0x40	[0x40,0x4F]

The *“sceneX”* variable also stands for 16 individual variables, where *X* equals *sceneNumber* in the range of [0,15].

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

On receiving command “GO TO SCENE (*sceneNumber*)” the reaction of the control gear shall depend upon the current value of “*sceneX*”, where X is derived from *sceneNumber*. If “*sceneX*” equals MASK, “*targetLevel*” shall not be affected. Otherwise, the control gear shall behave exactly as if “DAPC (*level*)” had been received with level equal to "*sceneX*".

NOTE Using “DAPC (*level*)” implies the transition is made using the set fade time.

10 Declaration of variables

The default values, the reset values, power on values, the range of validity and the type of memory of the defined variables shall be as given in Table 14.

The variables that are declared in this clause shall not be made available for writing through a memory bank.

Table 14 – Declaration of variables

VARIABLE	DEFAULT VALUE (factory)	RESET VALUE	POWER ON VALUE	RANGE OF VALIDITY	MEMORY TYPE
“actualLevel”	[a]	0xFE	0x00	0, [*“minLevel”*, *“maxLevel”*]	RAM
“targetLevel”	[a]	0xFE	See 9.13 Power on	0, [*“minLevel”*, *“maxLevel”*]	RAM
“lastActiveLevel”	[a]	0xFE	*“maxLevel”*	[*“minLevel”*, *“maxLevel”*]	RAM
“lastLightLevel”	0xFE	0xFE [c]	no change	0, [*“minLevel”*, *“maxLevel”*]	NVM
“powerOnLevel”	0xFE	0xFE	no change	[0,0xFF]	NVM
“systemFailureLevel”	0xFE	0xFE	no change	[0,0xFF]	NVM
“minLevel”	PHM	PHM	no change	[PHM,*“maxLevel”*]	NVM
“maxLevel”	0xFE	0xFE	no change	[*“minLevel”*,0xFE]	NVM
“fadeRate”	7	7	no change	[1,0xF]	NVM
“fadeTime”	0	0	no change	[0,0xF]	NVM
“extendedFadeTimeBase”	0	0	no change	[0,1111b]	NVM
“extendedFadeTimeMultiplier”	0	0	no change	[0,100b]	NVM
“shortAddress”	MASK (no address)	no change	no change	[0,63], MASK	NVM
“searchAddress”	[a]	0xFF FF FF	0xFF FF FF	[0,0xFF FF FF]	RAM
“randomAddress”	0xFF FF FF	0xFF FF FF	no change	[0,0xFF FF FF]	NVM
“operatingMode”	factory burn-in	no change	no change	0,[0x80,0xFF]	NVM
“initialisationState”	[a]	no change	DISABLED	[ENABLED, DISABLED, WITHDRAWN]	RAM
“writeEnableState”	[a]	DISABLED	DISABLED	[ENABLED, DISABLED]	RAM
“controlGearFailure”	[a]	[b]	FALSE [d]	[TRUE, FALSE]	RAM
“lampFailure”	[a]	[b]	FALSE [d]	[TRUE, FALSE]	RAM
“lampOn”	[a]	[b]	FALSE	[TRUE, FALSE]	RAM
“limitError”	[a]	FALSE	FALSE [d]	[TRUE, FALSE]	RAM
“fadeRunning”	[a]	FALSE	FALSE	[TRUE, FALSE]	RAM

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

VARIABLE	DEFAULT VALUE (factory)	RESET VALUE	POWER ON VALUE	RANGE OF VALIDITY	MEMORY TYPE
"resetState"	TRUE	TRUE	TRUE [d]	[TRUE, FALSE]	RAM
"powerCycleSeen"	[a]	FALSE	TRUE	[TRUE, FALSE]	RAM
"gearGroups"	0x00 00 (no group)	0x00 00 (no group)	no change	[0,0xFF FF]	NVM
"sceneX" [e]	MASK	MASK	no change	[0,0xFF]	NVM
"DTR0"	[a]	no change	0x00	[0,0xFF]	RAM
"DTR1"	[a]	no change	0x00	[0,0xFF]	RAM
"DTR2"	[a]	no change	0x00	[0,0xFF]	RAM
PHM	factory burn-in	no change	no change	[1,0xFE]	ROM

[a] Not applicable.

[b] The value could change as a consequence of the RESET command execution.

[c] This NVM variable is excluded for "*resetState*".

[d] The value should reflect the actual situation as soon as possible.

[e] X is in the range 0x0 to 0xF, effectively there is one variable for each of the 16 scenes.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11 Definition of commands

11.1 General

Unused opcodes are reserved for future needs.

11.2 Overview sheets

Table 15 gives an overview of the standard commands. The special commands overview can be found in Table 16.

Table 15 – Standard commands

Command name	Address byte		Opcode byte	Ed. 1 cmd number	DTR0	DTR1	DTR2	Answer	Send twice	References	Command reference
	See 7.2.2	Selector bit									
DAPC (*level*)	*Device*	0	*level*	-						9.4, 9.7.3, 9.8	11.3.1
OFF	*Device*	1	0x00	0						9.7.2	11.3.2
UP	*Device*	1	0x01	1						9.7.3	11.3.3
DOWN	*Device*	1	0x02	2						9.7.3	11.3.4
STEP UP	*Device*	1	0x03	3						9.7.2	11.3.5
STEP DOWN	*Device*	1	0x04	4						9.7.2	11.3.6
RECALL MAX LEVEL	*Device*	1	0x05	5						9.7.2, 9.14.2	11.3.7
RECALL MIN LEVEL	*Device*	1	0x06	6						9.7.2, 9.14.2	11.3.8
STEP DOWN AND OFF	*Device*	1	0x07	7						9.7.2	11.3.9
ON AND STEP UP	*Device*	1	0x08	8						9.7.2	11.3.10

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Command name	Address byte		Opcode byte	Ed. 1 cmd number	DTR0	DTR1	DTR2	Answer	Send twice	References	Command reference
	See 7.2.2	Selector bit									
ENABLE DAPC SEQUENCE	*Device*	1	0x09	9						9.8	11.3.11
GO TO LAST ACTIVE LEVEL	*Device*	1	0x0A							9.7.3	11.3.12
GO TO SCENE (*sceneNumber*) [a]	*Device*	1	0x10 + *sceneNumber*	16 – 31						9.7.3, 9.19	11.3.13
RESET	*Device*	1	0x20	32					✓	9.11.1, 10	11.4.2
STORE ACTUAL LEVEL IN DTR0	*Device*	1	0x21	33	✓				✓		11.4.3
SAVE PERSISTENT VARIABLES	*Device*	1	0x22						✓	9.17, 10	11.4.4
SET OPERATING MODE (*DTR0*)	*Device*	1	0x23		✓				✓	9.9.4	11.4.5
RESET MEMORY BANK (*DTR0*)	*Device*	1	0x24		✓				✓	9.11.2	11.4.6
IDENTIFY DEVICE	*Device*	1	0x25						✓	9.14.2	11.4.7
SET MAX LEVEL (*DTR0*)	*Device*	1	0x2A	42	✓				✓	9.6	11.4.7
SET MIN LEVEL (*DTR0*)	*Device*	1	0x2B	43	✓				✓	9.6	11.4.9
SET SYSTEM FAILURE LEVEL (*DTR0*)	*Device*	1	0x2C	44	✓				✓	9.12	11.4.10
SET POWER ON LEVEL (*DTR0*)	*Device*	1	0x2D	45	✓				✓	9.13	11.4.11
SET FADE TIME (*DTR0*)	*Device*	1	0x2E	46	✓				✓	9.5.2	11.4.12
SET FADE RATE (*DTR0*)	*Device*	1	0x2F	47	✓				✓	9.5.3	11.4.13
SET EXTENDED FADE TIME (*DTR0*)	*Device*	1	0x30		✓				✓	9.5.4	11.4.14
SET SCENE (*DTR0, sceneX*)[a]	*Device*	1	0x40 + *sceneNumber*	64 – 79	✓				✓	9.19	11.4.14

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Command name	Address byte		Opcode byte	Ed. 1 cmd number	DTR0	DTR1	DTR2	Answer	Send twice	References	Command reference
	See 7.2.2	Selector bit									
REMOVE FROM SCENE (*sceneX*) [a]	*Device*	1	0x50 + *sceneNumber*	80 – 95					✓	9.19	11.4.16
ADD TO GROUP (*group*) [a]	*Device*	1	0x60 + *group*	96 – 111					✓		11.4.17
REMOVE FROM GROUP (*group*) [a]	*Device*	1	0x70 + *group*	112 – 127					✓		11.4.18
SET SHORT ADDRESS (*DTR0*)	*Device*	1	0x80	128	✓				✓	9.14.4	11.4.19
ENABLE WRITE MEMORY	*Device*	1	0x81	129					✓	9.10	11.4.20
QUERY STATUS	*Device*	1	0x90	144				✓		9.16	11.5.2
QUERY CONTROL GEAR PRESENT	*Device*	1	0x91	145				✓			11.5.3
QUERY LAMP FAILURE	*Device*	1	0x92	146				✓			11.5.4
QUERY LAMP POWER ON	*Device*	1	0x93	147				✓			11.5.6
QUERY LIMIT ERROR	*Device*	1	0x94	148				✓			11.5.7
QUERY RESET STATE	*Device*	1	0x95	149				✓			11.5.8
QUERY MISSING SHORT ADDRESS	*Device*	1	0x96	150				✓		9.14.2	11.5.9
QUERY VERSION NUMBER	*Device*	1	0x97	151				✓			11.5.10
QUERY CONTENT DTR0	*Device*	1	0x98	152	✓			✓		9.10	11.5.11
QUERY DEVICE TYPE	*Device*	1	0x99	153				✓		9.18	11.5.12
QUERY PHYSICAL MINIMUM	*Device*	1	0x9A	154				✓			11.5.13
QUERY POWER FAILURE	*Device*	1	0x9B	155				✓			11.5.15
QUERY CONTENT DTR1	*Device*	1	0x9C	156		✓		✓		9.10	11.5.16

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printed.

Command name	Address byte		Opcode byte	Ed. 1 cmd number	DTR0	DTR1	DTR2	Answer	Send twice	References	Command reference
	See 7.2.2	Selector bit									
QUERY CONTENT DTR2	*Device*	1	0x9D	157			✓	✓			11.5.17
QUERY OPERATING MODE	*Device*	1	0x9E					✓		9.9.4	11.5.18
QUERY LIGHT SOURCE TYPE	*Device*	1	0x9F		✓	✓	✓	✓			11.5.19
QUERY ACTUAL LEVEL	*Device*	1	0xA0	160				✓			11.5.20
QUERY MAX LEVEL	*Device*	1	0xA1	161				✓			11.5.21
QUERY MIN LEVEL	*Device*	1	0xA2	162				✓			11.5.22
QUERY POWER ON LEVEL	*Device*	1	0xA3	163				✓		9.13	11.5.23
QUERY SYSTEM FAILURE LEVEL	*Device*	1	0xA4	164				✓		9.12	11.5.24
QUERY FADE TIME/FADE RATE	*Device*	1	0xA5	165				✓			11.5.25
QUERY MANUFACTURER SPECIFIC MODE	*Device*	1	0xA6					✓		9.9	11.5.27
QUERY NEXT DEVICE TYPE	Device	1	0xA7					✓		9.18	11.5.13
QUERY EXTENDED FADE TIME	Device	1	0xA8					✓		9.5.4	11.5.26
QUERY CONTROL GEAR FAILURE	Device	1	0xAA					✓		9.16.2	11.5.4
QUERY SCENE LEVEL (*sceneX*) [a]	*Device*	1	0xB0 + *sceneNumber*	176 – 191				✓		9.19	11.5.28
QUERY GROUPS 0-7	*Device*	1	0xC0	192				✓			11.5.29
QUERY GROUPS 8-15	*Device*	1	0xC1	193				✓			11.5.30
QUERY RANDOM ADDRESS (H)	*Device*	1	0xC2	194				✓			11.5.31
QUERY RANDOM ADDRESS (M)	*Device*	1	0xC3	195				✓			11.5.32
QUERY RANDOM ADDRESS (L)	*Device*	1	0xC4	196				✓			11.5.33
READ MEMORY LOCATION (*DTR1*, *DTR0*)	*Device*	1	0xC5	197	✓	✓		✓		9.10	11.5.34

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Command name	Address byte		Opcode byte	Ed. 1 cmd number	DTR0	DTR1	DTR2	Answer	Send twice	References	Command reference
	See 7.2.2	Selector bit									
Application extended commands	*Device*	1	0xE0 – 0xFE	224 – 254	?	?	?	?	?	9.18	11.6
QUERY EXTENDED VERSION NUMBER	*Device*	1	0xFF	255				✓			11.6.2
[a] There is one command per scene, so there are actually 16 commands for scenes 0 – 5. Analogue for the 16 group commands.											

Table 16 – Special commands

Command name	Address byte	Opcode byte	Ed.1 cmd nr	DTR0	DTR1	DTR2	Answer	Send twice	References	Command reference
TERMINATE	0xA1	0x00	256						9.14.2	11.7.1
DTR0 (*data*)	0xA3	*data*	257	✓					9.10	11.7.3
INITIALISE (*device*)	0xA5	*device*	258					✓	9.14.2	11.7.4
RANDOMISE	0xA7	0x00	259					✓	9.14.2	11.7.5
COMPARE	0xA9	0x00	260				✓		9.14.2	11.7.6
WITHDRAW	0xAB	0x00	261						9.14.2	11.7.7
PING	0xAD	0x00								11.7.19

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Command name	Address byte	Opcode byte	Ed.1 cmd nr	DTR0	DTR1	DTR2	Answer	Send twice	References	Command reference
SEARCHADDRH (*data*)	0xB1	*data*	264						9.14.2	11.7.8
SEARCHADDRM (*data*)	0xB3	*data*	265						9.14.2	11.7.9
SEARCHADDRL (*data*)	0xB5	*data*	266						9.14.2	11.7.10
PROGRAM SHORT ADDRESS (*data*)	0xB7	*data*	267						9.14.2	11.7.11
VERIFY SHORT ADDRESS (*data*)	0xB9	*data*	268				✓		9.14.2	11.7.12
QUERY SHORT ADDRESS	0xBB	0x00	269				✓		9.14.2	11.7.13
ENABLE DEVICE TYPE (*data*)	0xC1	*data*	272						9.14.2	11.7.14
DTR1 (*data*)	0xC3	*data*	273		✓				9.10	11.7.15
DTR2 (*data*)	0xC5	*data*	274			✓				11.7.16
WRITE MEMORY LOCATION (*DTR1, DTR0, data*)	0xC7	*data*	275	✓	✓		✓		9.10	11.7.17
WRITE MEMORY LOCATION – NO REPLY (*DTR1, DTR0, data*)	0xC9	*data*		✓	✓				9.10	11.7.18

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.3 Level instructions

11.3.1 DAPC (*level*)

Upon reception of "DAPC (*level*)" (direct arc power control), *"targetLevel"* shall be calculated on the basis of *"level"*.

The transition from *"actualLevel"* to *"targetLevel"* shall start using the applicable fade time.

Refer to subclauses 9.4, 9.7.3 and 9.13 for further information.

11.3.2 OFF

"targetLevel" shall be set to 0x00 and the lamp(s) shall switch off.

The transition from *"actualLevel"* to *"targetLevel"* shall be immediate and the light output shall be adjusted as quickly as possible.

Refer to subclause 9.7.2 for further information.

11.3.3 UP

Dim up using a 200 ms fade with the set fade rate. *"targetLevel"* shall be calculated on the basis of *"actualLevel"* and the set fade rate.

To ensure that there is a reaction to the command, at least one step ("*targetLevel*" = "*targetLevel*"+1) shall be made upon reception of the first command. After that first step, the next steps shall be executed using the specified fade rate while the fading is running. Every "UP" instruction received as a part of an iteration shall cause the 200 ms fade to be restarted and *"targetLevel"* to be recalculated on the basis of *"actualLevel"* and the set fade rate.

There shall be no change to *"actualLevel"* if *"actualLevel"* is at *"maxLevel"* or 0x00.

Refer to subclauses 9.7.3 and 9.8.2 for further information.

11.3.4 DOWN

Dim down using a 200 ms fade with the set fade rate. *"targetLevel"* shall be calculated on the basis of *"actualLevel"* and the set fade rate.

To ensure that there is a reaction to the command, at least one step ("*targetLevel*" = "*targetLevel*"-1) shall be made upon reception of the first command. After that first step, the next steps shall be executed using the specified fade rate while the fading is running. Every "DOWN" instruction received as a part of an iteration shall cause the 200 ms fade to be restarted and *"targetLevel"* to be recalculated on the basis of *"actualLevel"* and the set fade rate.

There shall be no change to *"actualLevel"* if *"actualLevel"* is at *"minLevel"* or 0x00.

Refer to subclauses 9.7.3 and 9.8.2 for further information.

11.3.5 STEP UP

"targetLevel" shall be set to:

- if *"targetLevel"* = 0: 0x00
- if *"minLevel"* ≤ *"targetLevel"* < *"maxLevel": "targetLevel"*+1

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

- if *"targetLevel"* = *"maxLevel": "maxLevel"*

The transition from *"actualLevel"* to *"targetLevel"* shall be immediately and the light output shall be adjusted as quickly as possible.

Refer to subclauses 9.4 and 9.5.9 for further information.

11.3.6 STEP DOWN

"targetLevel" shall be set to:

- if *"targetLevel"* = 0: 0x00
- if *"minLevel"* < *"targetLevel"* ≤ *"maxLevel": "targetLevel"*-1
- if *"targetLevel" = "minLevel": "minLevel"*

The transition from *"actualLevel"* to *"targetLevel"* shall be immediately and the light output shall be adjusted as quickly as possible.

Refer to subclauses 9.4 and 9.5.9 for further information.

11.3.7 RECALL MAX LEVEL

When the *"initialisationState"* is DISABLED, *"targetLevel"* and *"actualLevel"* shall be set to *"maxLevel"* immediately and the light output shall be adjusted as quickly as possible.

Refer to subclause 9.7.2 for further information.

When the *"initialisationState"* is not DISABLED, the control gear shall set "*actualLevel*" and "*targetLevel*" to "*maxLevel*", and then adjust the light output as quickly as possible to 100 % temporarily ignoring "*maxLevel*" and "*actualLevel*".

If the device is unable to visually identify itself in this way, the control gear shall respond as if it received "IDENTIFY DEVICE" as well, starting or re-triggering the identification procedure.

NOTE It is acceptable for the process of identifying individual control gear to depend upon RECALL MAX LEVEL and RECALL MIN LEVEL commands being received in an alternating sequence.

During identification no variables shall be affected except when explicitly stated otherwise. Where appropriate, variables can be temporarily ignored, so that after the identification has ended, there are no side effects.

Identification shall be stopped immediately when the *"initialisationState"* changes to DISABLED and upon reception of any instruction other than INITIALISE (*device*), RECALL MIN LEVEL, RECALL MAX LEVEL or IDENTIFY DEVICE.

When the *"initialisationState"* changes to DISABLED, the identification shall stop immediately.

Refer to subclause 9.14.3 for further information.

11.3.8 RECALL MIN LEVEL

When the *"initialisationState"* is DISABLED, *"targetLevel"* and *"actualLevel"* shall be set to *"minLevel"* immediately and the light output shall be adjusted as quickly as possible.

Refer to subclause 9.7.2 for further information.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

When *"initialisationState"* is not DISABLED, the control gear shall set "*actualLevel*" and "*targetLevel*" to "*minLevel*" and then adjust the light output as quickly as possible to its PHM level temporarily ignoring "*minLevel*" and "*actualLevel*". If, however, PHM is not visibly significantly different from 100 %, then the lamp shall be temporarily switched off instead.

If the device is unable to visually identify itself in this way, the control gear shall respond as if it received "IDENTIFY DEVICE" as well, starting or re-triggering the identification procedure.

It is acceptable for the process of identifying individual control gear to depend upon RECALL MAX LEVEL and RECALL MIN LEVEL commands being received in an alternating sequence.

During identification no variables shall be affected except when explicitly stated otherwise. Where appropriate, variables can be temporarily ignored, so that after the identification has ended, there are no side effects.

Identification shall be stopped immediately when the *"initialisationState"* changes to DISABLED and upon reception of any instruction other than INITIALISE (*device*), RECALL MIN LEVEL, RECALL MAX LEVEL or IDENTIFY DEVICE.

When the *"initialisationState"* changes to DISABLED, identification shall stop immediately.

Refer to subclause 9.14.3 for further information.

11.3.9 STEP DOWN AND OFF

"targetLevel" shall be set to:

- if *"targetLevel"* = 0: 0x00
- if *"minLevel"* < *"targetLevel"* ≤ *"maxLevel": "targetLevel"*-1
- if *"targetLevel"* = *"minLevel"*: 0x00

The transition from *"actualLevel"* to *"targetLevel"* shall be immediately and the light output shall be adjusted as quickly as possible.

Refer to subclauses 9.4 and 9.5.9 for further information.

11.3.10 ON AND STEP UP

"targetLevel" shall be set to:

- if *"targetLevel"* = 0: *"minLevel"*
- if *"minLevel"* ≤ *"targetLevel"* < *"maxLevel": "targetLevel"*+1
- if *"targetLevel"* ≥ *"maxLevel": "maxLevel"*

The transition from *"actualLevel"* to *"targetLevel"* shall be immediately and the light output shall be adjusted as quickly as possible.

Refer to subclauses 9.4 and 9.5.9 for further information.

11.3.11 ENABLE DAPC SEQUENCE

Indicates the start of a command iteration of "DAPC (*level*)" commands.

Refer to subclause 9.8.3 for further information.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.3.12 GO TO LAST ACTIVE LEVEL

Upon reception of this command *"targetLevel"* shall be calculated based on *"lastActiveLevel"*.

The transition from *"actualLevel"* to *"targetLevel"* shall start using the set fade time.

Refer to subclauses 9.7.3 and 9.4 for further information.

11.3.13 GO TO SCENE (*sceneNumber*)

The control gear shall react depending on the actual value of *"sceneX"* where *X* is derived from *sceneNumber*:

- if *"sceneX"* = MASK: the command shall not affect "*targetLevel*";
- in all other cases: internally "DAPC (*level*)", with *level* equal to *"sceneX"* shall be executed.

NOTE Using "DAPC (*level*)" implies the transition is made using the set fade time.

Refer to subclauses 9.19 and 11.3.1 for further information.

11.4 Configuration instructions

11.4.1 General

Device configuration instructions are used to change the configuration and/or the mode of operation of the control gear. For this reason a device configuration instruction shall not be executed, unless it is received twice according to the requirements as stated in subclause 9.3 of IEC 62386-101:2014.

Unless explicitly stated otherwise in the description of particular device configuration instruction, the following holds:

- The instruction shall be ignored if so required by the provisions of subclause 9.7 of this standard.
- The control gear shall not reply to the instruction.

11.4.2 RESET

All variables shall be changed to their reset values. Control gear shall start to react properly to commands no later than 300 ms after the instruction has been received.

If during a reset mains power fails, it is not guaranteed that "RESET" is completed.

Refer to subclause 9.11.1 and Table 14 for further information.

11.4.3 STORE ACTUAL LEVEL IN DTR0

The *"actualLevel"* shall be stored in *"DTR0"*.

11.4.4 SAVE PERSISTENT VARIABLES

The control gear shall physically store all variables identified in Table 14 as non-volatile memory (NVM). This shall include all application extended NVM variables defined in the applicable parts 2xx.

The control gear might not react to commands after reception of this command. Control gear shall start to react properly to commands no later than 300 ms after the instruction has been received.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

During processing of this command, the light output may fluctuate. After processing is completed, the light output shall be at the level as expected before the reception of this command, based on *"targetLevel"* and the transition that was active (if any).

This command is recommended to be used typically after commissioning. Due to the limited number of write-cycles of persistent memory and due to the fact that there might be a visible reaction, the control devices should limit the use of this command.

As there might be visual artefacts, it is recommended to use this command only during the off state.

Refer to Table 14 and subclause 9.17 for further information.

11.4.5 SET OPERATING MODE (*DTR0*)

"operatingMode" shall be set *"DTR0"*.

If *"DTR0"* does not correspond to an implemented operating mode, the command shall be ignored.

Refer to subclause 9.9 for further information.

11.4.6 RESET MEMORY BANK (*DTR0*)

The command shall trigger the process to change the memory bank content to its reset values as follows:

- if *"DTR0"* = 0: all implemented and unlocked memory banks except memory bank 0 shall be reset
- in all other cases: the memory bank identified by *"DTR0"* shall be reset provided it is implemented and unlocked

A memory bank needs to be unlocked to allow both lockable and non-lockable locations to be reset.

Control gear shall start to react properly to commands no later than 10 s after the instruction has been received.

Refer to subclause 9.11.2 for further information.

11.4.7 IDENTIFY DEVICE

The control gear shall start or restart a 10 s ±1 s timer. While the timer is running, a procedure shall run which enables an observer to distinguish any control gear running this process from any devices (of the same type) which are not running it. If the timer expires, identification shall stop.

During identification no variables shall be affected except when explicitly stated otherwise. Where appropriate, variables can be temporarily ignored, so that after the identification has ended, there are no side effects.

When identification is active, the light output may be at any level between off and 100 %, MIN, MAX and "*actualLevel*" being in effect temporarily ignored.

Identification shall be stopped immediately upon reception of any instruction other than INITIALISE (*device*), RECALL MIN LEVEL, RECALL MAX LEVEL or IDENTIFY DEVICE.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

While identification is active, the control gear shall, without interrupting the identification procedure:

- on RECALL MIN LEVEL: set "*actualLevel*" and "*targetLevel*" to "*minLevel*";
- on RECALL MAX LEVEL: set "*actualLevel*" and "*targetLevel*" to "*maxLevel*".

When identification is stopped by an application controller, the corresponding timer shall be cancelled immediately.

After identification has stopped, the light output shall be adjusted as quickly as possible to reflect "*actualLevel*" and the command shall be executed (if applicable).

Identification can be used during commissioning in that it allows the installer to e.g. allocate the particular identified device to a particular device group.

The indication can be done e.g. by flashing a LED, by producing a sound or other visual or audible means. The exact process used to identify is manufacturer specific and should be described in the manual.

NOTE The application controller can also stop the identification process using a "RESET" command.

Refer to subclause 9.14.3 for further information.

11.4.8 SET MAX LEVEL (*DTR0*)

"maxLevel" shall be set to:

- if *"minLevel"* ≥ *"DTR0"*: *"minLevel"*
- if *"DTR0"* = MASK: 0xFE
- in all other cases: *"DTR0"*

If as a result of setting a new max level *"actualLevel"* > *"maxLevel"*, *"targetLevel"* shall be calculated on the basis of *"maxLevel"*. The transition from *"actualLevel"* to *"targetLevel"* shall start immediately and the light output shall be adjusted as quickly as possible.

Refer to subclause 9.7.2 for further information.

11.4.9 SET MIN LEVEL (*DTR0*)

"minLevel" shall be set to:

- if 0 ≤ *"DTR0"* ≤ PHM: PHM
- if *"DTR0"* ≥ *"maxLevel"* or MASK: *"maxLevel"*
- in all other cases: *"DTR0"*

If "*actualLevel*" > 0 and as a result of setting a new min level *"actualLevel"* < *"minLevel"*, *"targetLevel"* shall be calculated on the basis of *"minLevel"*. The transition from *"actualLevel"* to *"targetLevel"* shall be immediately and the light output shall be adjusted as quickly as possible. Refer to subclause 9.7.2 for further information.

11.4.10 SET SYSTEM FAILURE LEVEL (*DTR0*)

"systemFailureLevel" shall be set to *"DTR0"*.

Refer to subclause 9.12 for further information.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.4.11 SET POWER ON LEVEL (*DTR0*)

"powerOnLevel" shall be set to *"DTR0"*.

Refer to subclause 9.13 for further information.

11.4.12 SET FADE TIME (*DTR0*)

The *"fadeTime"* shall be set to a value according to the following steps:

- if *"DTR0"* > 15: 15
- in all other cases: *"DTR0"*

If "*fadeTime"* is not equal to 0, the fade time shall be calculated on the basis of *"fadeTime"*. If "*fadeTime"* is equal to 0, the extended fade time shall be used.

If a new fade time is stored during a running fade process, this process shall be finished first before the new value is used in the following fade.

Refer to subclauses 9.5, 9.7.3, 11.4.14 and 11.7.19 for further information.

11.4.13 SET FADE RATE (*DTR0*)

The *"fadeRate"* shall be set to a value according to the following steps:

- if *"DTR0"* > 15: 15
- if *"DTR0"* = 0: 1
- in all other cases: *"DTR0"*

The fade rate shall be calculated on the basis of *"fadeRate"*. If a new fade rate is stored during a running fade process, this process shall be finished first before the new value is used in the following fade.

Refer to subclause 9.5 and 9.7.3 for further information.

11.4.14 SET EXTENDED FADE TIME (*DTR0*)

The *"extendedFadeTimeBase"* and "*extendedFadeTimeMultiplier*" shall be set to a value according to the following steps:

- If "*DTR0"* > 0x4F (0100 1111b):
  - "*extendedFadeTimeBase*" shall be set to 0;
  - "*extendedFadeTimeMultiplier*" shall be set to 0.

Effectively selecting a fade as quickly as possible.

- For all other cases:
  - "*extendedFadeTimeBase*" shall be set to AAAAb where *"DTR0"* = xxxxAAAAb;
  - "*extendedFadeTimeMultiplier*" shall be set to YYYb where *"DTR0"* = xYYYxxxxb.
- The fade time shall be calculated by multiplying the base value and the multiplier.

If a new fade time is stored during a running fade process, this process shall be finished first before the new value is used in the following fade.

Refer to subclause 9.5.4 for further information.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.4.15 SET SCENE (*DTR0, sceneX*)

This command actually comprises 16 commands, one for each scene. This is accomplished by selecting a block of 16 consecutive opcodes.

Upon reception of "SET SCENE (*DTR0, sceneX*)", the scene number shall be derived from the opcode:*sceneNumber* = opcode – 0x40. This identifies the "*sceneX"* to be used.

"sceneX" shall be set to *"DTR0"*.

Refer to subclause 9.19 for further information

11.4.16 REMOVE FROM SCENE (*sceneX*)

This command actually comprises 16 commands, one for each scene. This is accomplished by selecting a block of 16 consecutive opcodes.

Upon reception of "SET SCENE (*DTR0, sceneX*)", the scene number shall be derived from the opcode: *sceneNumber* = opcode – 0x50. This identifies the "*sceneX"* to be used.

"sceneX" shall be set to MASK. This effectively removes the control gear as member from the scene.

Refer to subclause 9.19 for further information.

11.4.17 ADD TO GROUP (*group*)

This command actually comprises 16 commands, one for each group. This is accomplished by selecting a block of 16 consecutive opcodes.

Upon reception of "ADD TO GROUP (*group*)", *group* shall be derived from the opcode: *group* = opcode – 0x60. This identifies the *group* to be used.

bit[*group*] of *"gearGroups"* shall be set to TRUE. This implies that the control gear is a member of this group.

11.4.18 REMOVE FROM GROUP (*group*)

This command actually comprises 16 commands, one for each group. This is accomplished by selecting a block of 16 consecutive opcodes.

Upon reception of "REMOVE FROM GROUP (*group*)", *group* shall be derived from the opcode: *group* = opcode – 0x70. This identifies the *group* to be used.

bit[*group*] of *"gearGroups"* shall be set to FALSE. This implies that the control gear is not a member of this group.

11.4.19 SET SHORT ADDRESS (*DTR0*)

"shortAddress" shall be set to:

- if *"DTR0"* = MASK: MASK (effectively deleting the short address);
- if *"DTR0"* = 1xxxxxxxb or xxxxxxx0b: no change;
- in all other cases (0AAAAAA1b): 00AAAAAAb.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.4.20 ENABLE WRITE MEMORY

"writeEnableState" shall be set to ENABLED.

NOTE There is no command to explicitly disable memory write access, since any command that is not directly involved with writing into memory banks will automatically set *"writeEnableState"* to DISABLED.

Refer to subclause 9.10.5 for further information.

11.5 Queries

11.5.1 General

Queries are used to retrieve property values from a control gear. The addressed control gear returns the queried property value in a backward frame.

Unless explicitly stated otherwise in the description of a particular query, the following holds:

- The query shall be ignored if so required by the provisions of subclause 9.7.

When applicable, the query shall be ignored if any of the parameter values (in *"DTR0"*, *"DTR1"* and *"DTR2"*) are outside the range of validity of the addressed device variables, as given in Table 14.

11.5.2 QUERY STATUS

The answer shall be the status, which is formed by a combination of control gear properties.

Refer to subclause 9.16 for further information.

11.5.3 QUERY CONTROL GEAR PRESENT

The answer shall be YES.

NOTE The command is ignored if the gear is not addressed, effectively answering NO.

11.5.4 QUERY CONTROL GEAR FAILURE

The answer shall be YES if *"controlGearFailure"* is TRUE and NO otherwise.

11.5.5 QUERY LAMP FAILURE

The answer shall be YES if *"lampFailure"* is TRUE and NO otherwise.

11.5.6 QUERY LAMP POWER ON

The answer shall be YES if *"lampOn"* is TRUE and NO otherwise.

11.5.7 QUERY LIMIT ERROR

The answer shall be YES if *"limitError"* is TRUE and NO otherwise.

11.5.8 QUERY RESET STATE

The answer shall be YES if *"resetState"* is TRUE and NO otherwise.

11.5.9 QUERY MISSING SHORT ADDRESS

The answer shall be YES if *"shortAddress"* is equal to MASK and NO otherwise.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

NOTE Since the control gear answers only if no short address is stored, the use of the command is useful only in broadcast mode or if group addressing is used.

11.5.10 QUERY VERSION NUMBER

The answer shall be the content of memory bank 0 location 0x16.

Refer to Clause 4 and Table 9 for further information.

11.5.11 QUERY CONTENT DTR0

The answer shall be *"DTR0"*.

11.5.12 QUERY DEVICE TYPE

The answer shall be:

- if no Part 2xx is implemented: 254;
- if one device type/feature is supported: the device type/feature number;
- if more than one device type/feature is supported: MASK.

The coding of the device types shall be as specified in the particular Parts 2xx of IEC 62386.

Refer to subclauses 9.18 and 11.5.13 for further information.

11.5.13 QUERY NEXT DEVICE TYPE

The answer shall be:

- if directly preceded by "QUERY DEVICE TYPE", and more than one device type/feature is supported: the first and lowest device type/feature number;
- if directly preceded by "QUERY NEXT DEVICE TYPE", and not all device types have been reported: the next lowest device type/feature number;
- if directly preceded by "QUERY NEXT DEVICE TYPE", and all device types have been reported: 254;
- in all other cases: NO.

The sequence of commands shall only be accepted as long as they use the same address byte. Multi-master transmitters shall send such sequence as a transaction. The coding of the device types shall be as specified in the particular Parts 2xx of IEC 62386.

Refer to subclause 9.18 and 11.5.12 for further information.

11.5.14 QUERY PHYSICAL MINIMUM

The answer shall be PHM.

11.5.15 QUERY POWER FAILURE

The answer shall be YES if *"powerCycleSeen"* is TRUE and NO otherwise.

11.5.16 QUERY CONTENT DTR1

The answer shall be *"DTR1"*.

11.5.17 QUERY CONTENT DTR2

The answer shall be *"DTR2"*.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.5.18 QUERY OPERATING MODE

The answer shall be *"operatingMode"*.

Refer to subclause 9.9 for further information.

11.5.19 QUERY LIGHT SOURCE TYPE

The answer shall be the number of the light source type given in Table 17.

Table 17 – Light source type encoding

Type of light source	Encoding
Low pressure fluorescent	0
HID	2
Low voltage halogen	3
Incandescent	4
LED	6
OLED	7
Other than listed above	252
Unknown light source type [a]	253
No light source [b]	254
Multiple light source types	MASK
Reserved	1, 5, [8,251]

[a] Typically used in case of signal conversion, for example to 1-10 V.

[b] Used in cases where no light source is connected, for example a relay.

When MASK is answered the content of DTR0 shall contain a value representing the first light source type, DTR1 shall represent the second light source type, and DTR2 shall represent the third light source type.

When exactly two different light source types are available, DTR2 shall contain 254, indicating "no light source".

When more than three different light source types are available, DTR2 shall contain 255.

11.5.20 QUERY ACTUAL LEVEL

The answer shall be:

- if *"actualLevel"* = 0x00: 0x00 (see also 9.13);
- In all other cases:
  - during startup: MASK;
  - no light output (e.g. due to total lamp failure, control gear failure) while light output is expected: MASK;
  - in all other cases: *"actualLevel"*.

11.5.21 QUERY MAX LEVEL

The answer shall be *"maxLevel"*.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.5.22 QUERY MIN LEVEL

The answer shall be *"minLevel"*.

11.5.23 QUERY POWER ON LEVEL

The answer shall be *"powerOnLevel"*.

Refer to subclause 9.12 for further information.

11.5.24 QUERY SYSTEM FAILURE LEVEL

The answer shall be *"systemFailureLevel"*.

Refer to subclause 9.12 for further information.

11.5.25 QUERY FADE TIME/FADE RATE

The answer shall be XXXX YYYYb, where XXXXb equals *"fadeTime"* and YYYYb equals *"fadeRate"*.

11.5.26 QUERY EXTENDED FADE TIME

The answer shall be 0 XXX YYYYb, where XXXb equals "*extendedFadeTimeMultiplier*" and YYYYb equals "*extendedFadeTimeBase*".

11.5.27 QUERY MANUFACTURER SPECIFIC MODE

The answer shall be YES when *"operatingMode"* is in the range [0x80,0xFF] and NO otherwise.

11.5.28 QUERY SCENE LEVEL (*sceneX*)

This command actually comprises 16 commands, one for each scene. This is accomplished by selecting a block of 16 consecutive opcodes.

Upon reception of "QUERY SCENE LEVEL (*sceneX*)", the scene number shall be derived from the opcode: *sceneNumber* = opcode – 0xB0. This identifies the *"sceneX"* to be used.

The answer shall be *"sceneX"*.

Refer to subclause 9.19 for further information.

11.5.29 QUERY GROUPS 0-7

The answer shall be *"gearGroups[7:0]"*.

The membership of groups 0-7 shall be represented as an 8-bit value, with one bit for each group. "0" shall be interpreted as not a member, and "1" shall be interpreted as member of the group. Bit[*X*] shall represent membership of group *X*, where *X* is in the range [0,7].

11.5.30 QUERY GROUPS 8-15

The answer shall be *"gearGroups[15:8]"*.

The membership of groups 8-15 shall be represented as an 8-bit value, with one bit for each group. "0" shall be interpreted as not a member, and "1" shall be interpreted as member of the group. Bit[*X*] shall represent membership of group *X*+8, where *X* is in the range [0,7].

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.5.31 QUERY RANDOM ADDRESS (H)

The answer shall be *"randomAddress[23:16]"*.

11.5.32 QUERY RANDOM ADDRESS (M)

The answer shall be *"randomAddress[15:8]"*.

11.5.33 QUERY RANDOM ADDRESS (L)

The answer shall be *"randomAddress[7:0]"*.

11.5.34 READ MEMORY LOCATION (*DTR1, DTR0*)

The query shall be ignored if the addressed memory bank is not implemented.

If executed, the answer shall be the content of the memory location identified by *"DTR0"* within memory bank *"DTR1"*.

The control gear shall answer NO if the addressed memory location is not implemented.

NOTE 1 This allows holes in the memory bank implementation.

If the addressed location is below location 0xFF, the control gear shall increment *"DTR0"* by one.

NOTE 2 This allows efficient multi-byte reading within a transaction.

Refer to subclause 9.10 for further information.

11.6 Application extended commands

11.6.1 General

"ENABLE DEVICE TYPE (*data*)" shall be received before an application extended command to enable the correct device type/feature command set. For further requirements, see command "ENABLE DEVICE TYPE (*data*)" and 11.7.14.

If "ENABLE DEVICE TYPE (*data*)" is not received before an application extended command is received, the application extended command shall be ignored.

The definition of the extended commands is part of the application specific standards.

Refer to subclause 9.18 for further information.

11.6.2 QUERY EXTENDED VERSION NUMBER

The answer shall be the version number of Part 2xx of this standard for the corresponding device type/feature as an 8-bit number.

The answer shall be:

- if the enabled device type/feature is not implemented: NO;
- if the enabled device type/feature is supported: the version number belonging to the device type/feature number.

Refer to subclause 9.18 for further information.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.7 Special commands

11.7.1 General

All special mode commands shall be interpreted as instructions unless explicitly stated otherwise.

11.7.2 TERMINATE

The following processes shall be terminated immediately upon reception of this instruction:

- Initialisation, "*initialisationState*" shall be set to DISABLED.
- Identification, whether started as part of initialisation (using RECALL MAX LEVEL, RECALL MIN LEVEL) or as a standard operation (IDENTIFY DEVICE) shall be stopped.

The command could also terminate other processes as identified in the relevant 2xx parts.

Refer to subclause 9.14.2 for further information.

11.7.3 DTR0 (*data*)

"DTR0" shall be set to given *data*.

Refer to subclause 9.10 for further information.

11.7.4 INITIALISE (*device*)

This instruction shall not be executed, unless it is received twice according to the requirements as stated in Clause 9.3 of IEC 62386-101:2014.

Only devices matching the given *device* shall respond to the instruction, as follows in Table 18:

Table 18 – Device addressing with "INITIALISE"

Device	Responsive device(s)
0AAAAAA1b	Device(s) with *"shortAddress"* equal to 00AAAAAAb
11111111b	Control gear without *"shortAddress"* shall react
00000000b	All control gear shall react
Other	None

The instruction shall start or prolong the initialisation state, by setting *"initialisationState"* to ENABLED if it was DISABLED and (re-)trigger the timer. There shall be no answer.

Refer to subclause 9.14.2 for further information.

11.7.5 RANDOMISE

This instruction shall not be executed, unless it is received twice according to the requirements as stated in Clause 9.3 of IEC 62386-101:2014.

The instruction shall be ignored if *"initialisationState"* is DISABLED.

If executed, the instruction shall generate a random value for *"randomAddress"*, in the range of [0x000000,0xFFFFFE] which shall be available within 100 ms for use.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

If there are multiple logical units present and the instruction is received using broadcast addressing, the generated random addresses within the bus unit shall be unique, i.e. every logical unit shall have a random address that is not found in any of the other logical units contained in the bus unit.

There shall be no reply to this instruction.

Refer to subclause 9.14.2 for further information.

11.7.6 COMPARE

The query shall be ignored unless *"initialisationState"* is ENABLED.

If executed, the control gear shall answer:

- if "*randomAddress*" ≤ "*searchAddress*": YES;
- in all other cases: NO

Refer to subclause 9.14.2 for further information.

11.7.7 WITHDRAW

The instruction shall be ignored unless the following conditions hold:

- *"initialisationState"* is equal to ENABLED, and
- *"randomAddress"* is equal to *"searchAddress"*

If the instruction is executed, the control gear shall change *"initialisationState"* to WITHDRAWN.

Before withdrawing a control gear, the application controller may assign it a short address, using "PROGRAM SHORT ADDRESS (*data*)".

NOTE The effect is that the control gear is excluded from subsequent "COMPARE" operations, thus allowing the application controller to conduct a (binary) search operation across all devices until the "COMPARE" query leads to no answer (from any control gear) on the bus.

Refer to subclause 9.14.2 for further information.

11.7.8 SEARCHADDRH (*data*)

The instruction shall be ignored if *"initialisationState"* is equal to DISABLED.

If executed, *"searchAddress[23:16]"* shall be set to the given *data*.

Refer to subclause 9.14.2 for further information.

11.7.9 SEARCHADDRM (*data*)

The instruction shall be ignored if *"initialisationState"* is equal to DISABLED.

If executed, *"searchAddress[15:8]"* shall be set to the given *data*.

Refer to subclause 9.14.2 for further information.

11.7.10 SEARCHADDRL (*data*)

The instruction shall be ignored if *"initialisationState"* is equal to DISABLED.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

If executed, *"searchAddress[7:0]"* shall be set to the given *data*.

Refer to subclause 9.14.2 for further information.

11.7.11 PROGRAM SHORT ADDRESS (*data*)

The instruction shall be ignored unless the following conditions hold:

- *"initialisationState"* is equal to ENABLED or WITHDRAWN, and
- *"randomAddress"* is equal to *"searchAddress"*

If executed, *"shortAddress"* shall be set as follows:

- if *data* = MASK: MASK (effectively deleting the short address)
- if *data* = 1xxxxxxxb or xxxxxxx0b: no change
- in all other cases (0AAAAAA1b): 00AAAAAAb.

Refer to subclause 9.14.2 for further information.

11.7.12 VERIFY SHORT ADDRESS (*data*)

The query shall be ignored if *"initialisationState"* is equal to DISABLED.

If executed, the answer shall be YES if *"shortAddress"* is equal to 00AAAAAAb for *data* given by 0AAAAAA1b, and NO otherwise.

Refer to subclause 9.14.2 for further information.

11.7.13 QUERY SHORT ADDRESS

The query shall be ignored if:

- *"initialisationState"* is equal to DISABLED, or
- *"randomAddress"* is not equal to *"searchAddress"*.

If executed, the answer shall be 0AAAAAA1b, where "*shortAddress*" is equal to 00AAAAAAb', or MASK, in case "*shortAddress*" equals MASK.

Refer to subclause 9.14.2 for further information.

11.7.14 ENABLE DEVICE TYPE (*data*)

This instruction shall select the device type/feature for which the next following application extended command (refer to subclauses 11.6) is valid. Receiving this instruction shall cancel any previous selection of a device type. The selection is only valid for the next following application extended command.

The enabling of the device type/feature shall be cancelled upon execution of the next following command addressed to the same control gear, and that command shall be executed according to its specification, regardless of whether it is an application extended command or not.

The valid range of *data* shall be [0, 0xFD]. If *data* equals MASK or 254, the command shall be ignored.

A control gear shall not react to a command which belongs to the application extended commands of a device type/feature different from its own.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

All control gear shall be able to respond in an appropriate way to the standard range of commands.

The device types shall be coded as specified in the particular Parts 2xx of IEC 62386.

Control devices should be able to identify individual gears and store the relationship between gear's individual address and the device type/feature in a persistent memory.

11.7.15 DTR1 (*data*)

"DTR1" shall be set to given *data*.

Refer to subclause 9.10 for further information.

11.7.16 DTR2 (*data*)

"DTR2" shall be set to given *data*.

11.7.17 WRITE MEMORY LOCATION (*DTR1, DTR0, data*)

The instruction shall be ignored if any of the following conditions hold:

- the addressed memory bank is not implemented, or
- *"writeEnableState"* is DISABLED.

NOTE 1 This operation is a broadcast operation. Selective control gear addressing can be achieved by setting the write enable condition selectively.

If the instruction is executed, the control gear shall write *data* into the memory location identified by *"DTR0"* within memory bank *"DTR1"* and return *data* as an answer.

NOTE 2 Simultaneous writing to multiple control gear will probably lead to framing errors because of colliding answers.

NOTE 3 The value that can be read from the memory bank location is not necessarily *data*.

If the selected memory bank location is

- not implemented, or
- above the last accessible memory location, or
- locked (see subclause 9.10.2), or
- not writeable,

the answer to "WRITE MEMORY LOCATION (*DTR1*, *DTR0*, *data*)" shall be NO and no memory location shall be written to.

If the addressed location is below location 0xFF, the control gear shall increment *"DTR0"* by one.

NOTE 4 This allows efficient multi-byte writing within a transaction.

Refer to subclause 9.10 for further information.

11.7.18 WRITE MEMORY LOCATION – NO REPLY (*DTR1, DTR0, data*)

This instruction is identical to the "WRITE MEMORY LOCATION (*DTR1*, *DTR0*, *data*)" command except that the receiving control gear shall not reply to the command.

Refer to subclause 9.10 for further information.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.7.19 PING

The ping command is used by single master application controllers (see IEC 62386-103) to indicate their presence. The ping command shall be ignored by control gear.

12 Test procedures

12.1 General notes on test

The requirements of IEC 62386-101:2014, subclause 12.1 apply also for control gear tests.

12.1.1 Abbreviations

The following abbreviations are used within the tests:

- PHM physical minimum level;
- POL power on level;
- SFL system failure level.

12.1.2 Test execution

Subclause 12.2 is meant to prepare the DUT for testing, by

- setting the global variables;
- assigning a short address to each logical unit;
- getting information on which logical units need to be tested.

Tests described in subclause 12.2 to 12.8 shall always be performed for testing a device. Each test sequence indicates whether it shall be run for all logical devices in parallel or per selected logical device.

Tests described in subclause 12.9 shall be run only if device has multiple logical units.

If a bus powered device containing an internal bus power supply is tested according to this Part, such a device shall be handled as a bus powered device in all tests. There shall be no external power supply, effectively keeping the internal bus power supply off during testing.

If a device contains a bus power supply, the tests as defined in IEC 62386-101 shall be executed.

Before a test is executed, the nominal voltage *GLOBAL_internalVoltage* and current *GLOBAL_Ibus* shall be restored.

12.1.3 Data transmission

12.1.3.1 Based on test category

The addressing mode depends on how the test shall be executed, for all logical devices in parallel or per logical device. Therefore, the following addressing mode shall be used:

- broadcast, if test shall be run for all logical units in parallel
- short address of the logical unit under test, if test shall be run for each selected logical unit

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.1.3.2 Based on addressing mode

If not mentioned otherwise, each command shall be send using the addressing mode described in subsection 12.1.3.1. When a command has to be send to a different address, to address shall be given in the form of a byte, as follows:

COMMAND, send to *address*

where COMMAND is one of the commands defined in this standard and address can be:

- a short address, given in a byte form (e.g. short address 1 is given as 00000011b)
- a group address, given in a byte form (e.g. group address 2 is given as 00000010b)
- broadcast, given as “broadcast”
- broadcast unaddressed, given as “broadcast unaddressed”

12.1.3.3 Based on type of command

If not mentioned otherwise, the configuration commands shall be sent twice. When a command needs to be send once, it is noted as:

COMMAND, send once

An example of how to send a RESET command once is:

RESET, send once

12.1.4 Test setup

Before starting a test, DUT shall be connected to the mains power and bus interface, and to a working lamp.

The power supply shall be set to the values defined in subclause 12.2 by GLOBAL_VBusHigh, GLOBAL_VBusLow, GLOBAL_Ibus.

If not mentioned otherwise, the tester shall use the fall time, rise time, half bit time, double half time, and settling time (between any frame and a forward frame) given in the global variables. Moreover, the power supply shall be adjusted to the values defined by the global variables.

12.1.5 Test output

Each output message of the tests executed on a logical unit shall be preceded by the LogicalUnit followed by the short address of the logical unit under test. The output message shall look as:

error number LogicalUnit 1: string
report number LogicalUnit 1: string
warning number LogicalUnit 1: string
halt number LogicalUnit 1: string

12.1.6 Fade time measurements based on light output

The light measurements shall be performed using a light sensor connected to an oscilloscope.

In order to measure the duration of a fade time based on the light output both the bus interface and the light output need to be captured with an oscilloscope. The start point for measurements is the end of command which started the fade. The end point for measurements is the moment when light begins to stabilize (before an eventual overshoot or undershoot). Figure 6 indicates the start point and end point for measurements when fading from MIN LEVEL to MAX LEVEL.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

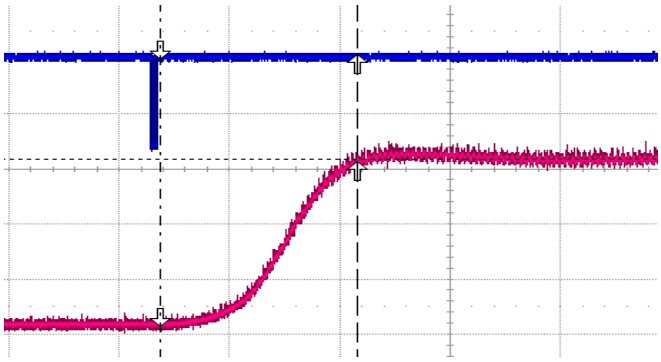


Figure 6 – Fading from MIN LEVEL to MAX LEVEL

Figure 7 shows how measurements shall be done when faing to off. The start point for measurements is as before the end of the command which triggered the fading, and the stop point for measurements is the moment the lamp turns off.

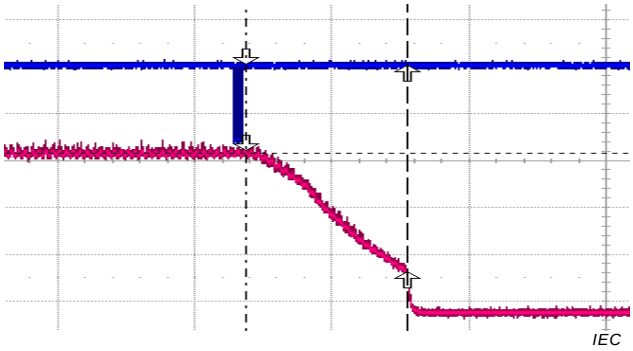


Figure 7 – Fading from MAX LEVEL to off

12.1.7 Description of test scheme for fast fade times on PWM dimmer

When operating an LED light source with a control gear using PWM for fading, the measured light output will directly reflect the pulse width modulated signal. A normal fading process will look like as illustrated in Figure 8, making it impossible to determine the precise start and ending of the fade.

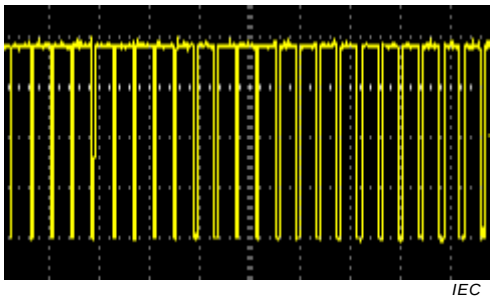


Figure 8 – Normal fading for a PWM dimmer

To get a visible indicator at the start and the end of a fading process, the fading has to start from a flat line e.g. typically at the maximum output power and also stop with a flat line e.g. usually in the off state.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

As the standard fading curve is not linear, the PWM signal gets extremely not symmetrical for values less than 170 and will not be detected by an oscilloscope when measuring at a range of several 100 ms to test for greater fast fade times.

From that a fading process starting from 254 down to 0 in combination with a configured MIN LEVEL of 170 will give a PWM signal with clear view to the start and ending point of the fade as illustrated in Figure 9.

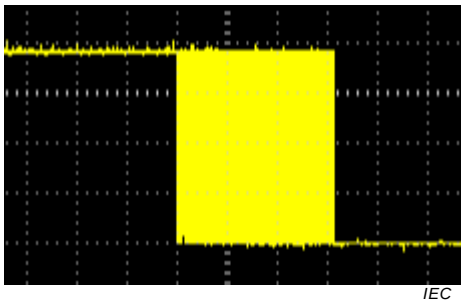


Figure 9 – Fading from MAX LEVEL to off for a PWM dimmer

12.1.8 Test notation

A dash ("-") given in the tables for "command" should be interpreted as "send nothing".

12.1.9 Test execution limitation

The current test procedures can be executed on a DUT with a maximum of 63 logical units. Short address 63 is reserved for testing purpose.

12.1.10 Test results

A DUT shall be claimed to be compliant to the IEC 62386 standard only if all tests are passed without any error for all logical units.

12.1.11 Exception handling

Whenenever within a test procedure an unexpected incident occurs, making it senseless to continue the test procedure, the current test procedure - or series of test procedures - shall be aborted (halted) at this point.

12.1.12 Unexpected answer

Whenenever within a test procedure a command is sent, a series of possible outcomes can follow:

- Backward Frame;
- No Answer;
- Any Violation (Bit Timing, Frame Sequence, Frame Size).

Depending on the command, the answer has to follow certain constraints:

- A query for a value has to be answered with a valid backward frame containing a value within a certain range of validity.
- A Yes/No query has to be answered with “No Answer” or a valid backward frame containing 255.
- Other commands have no answer.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

If there is any unexpected outcome, a general error shall be reported followed by an exception handling (see 12.1.11).

Often such incidents do not indicate a malfunction against the subject of the current test procedure, but a communication problem in general.

Table 19 shows all commands and their unintended outcomes.

Table 19 – Unexpected outcome

Command name	Unexpected		
	Violation	Value	No Answer
QUERY STATUS	✓		✓
QUERY CONTROL GEAR PRESENT	✓	[0, 254]	
QUERY LAMP FAILURE	✓	[0, 254]	
QUERY LAMP POWER ON	✓	[0, 254]	
QUERY LIMIT ERROR	✓	[0, 254]	
QUERY RESET STATE	✓	[0, 254]	
QUERY MISSING SHORT ADDRESS	✓	[0, 254]	
QUERY VERSION NUMBER	✓	[0,7],[9,255]	✓
QUERY CONTENT DTR0	✓		✓
QUERY DEVICE TYPE	✓		✓
QUERY PHYSICAL MINIMUM	✓	0, 255	✓
QUERY POWER FAILURE	✓	[0, 254]	
QUERY CONTENT DTR1	✓		✓
QUERY CONTENT DTR2	✓		✓
QUERY OPERATING MODE	✓		✓
QUERY LIGHT SOURCE TYPE	✓	1, 5, [8, 251]	✓
QUERY ACTUAL LEVEL	✓		✓
QUERY MAX LEVEL	✓	0	✓
QUERY MIN LEVEL	✓	0	✓
QUERY POWER ON LEVEL	✓		✓
QUERY SYSTEM FAILURE LEVEL	✓		✓
QUERY FADE TIME/FADE RATE	✓	xxxx 0000b	✓
QUERY MANUFACTURER SPECIFIC MODE	✓	[0, 254]	
QUERY NEXT DEVICE TYPE	✓		
QUERY EXTENDED FADE TIME	✓	[80, 255]	✓
QUERY CONTROL GEAR FAILURE	✓	[0, 254]	
QUERY SCENE LEVEL (*sceneX*)	✓		✓
QUERY GROUPS 0-7	✓		✓
QUERY GROUPS 8-15	✓		✓
QUERY RANDOM ADDRESS (H)	✓		✓
QUERY RANDOM ADDRESS (M)	✓		✓
QUERY RANDOM ADDRESS (L)	✓		✓

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Command name	Unexpected		
	Violation	Value	No Answer
READ MEMORY LOCATION (*DTR1, DTR0*)	✓		
QUERY EXTENDED VERSION NUMBER	✓		
COMPARE	✓	[0, 254]	
VERIFY SHORT ADDRESS (*data*)	✓	[0, 254]	
QUERY SHORT ADDRESS	✓	0xxx xxx0 b, [128, 254]	
WRITE MEMORY LOCATION (*DTR1, DTR0, data*)	✓		
WRITE MEMORY LOCATION – NO REPLY (*DTR1, DTR0, data*)	✓	[0,255]	
Any other command	✓	[0,255]	

If a test procedure has to test especially on such unintended outcome, as for example checking for no reaction of the DUT on using a different address than the DUT is configured for, it has to indicate which error(s) has to be excluded from this general exception for this particular command.

12.2 Preamble

12.2.1 Test preamble

The test preamble sets the global parameters, checks the default values if device is factory new, assigns to each logical unit a short address equal to its index. For each logical unit the following information is stored:

- deviceType (an array of supported device types);
- lightSource (an array of supported light sources);
- extendedVersionNumber (an array of extended version numbers);
- runTests (indicates whether tests shall be performed for that logical unit).

Test sequence shall be run for all logical units in parallel.

Test description:

```
// Set global parameters
GLOBAL_VbusHigh = 16 // in V - Default high voltage for testing
GLOBAL_VbusLow = 0 // in V - Default low voltage for testing
GLOBAL_Ibus = 250 // in mA - Default current for testing
GLOBAL_fallTime = 3 // in µs - Default fall time
GLOBAL_riseTime = 3 // in µs - Default rise time
GLOBAL_halfBitTime = 417 // in µs - Default half bit time
GLOBAL_doubleHalfBitTime = 833 // in µs - Default double half bit time
GLOBAL_settlingTime = 15 // in ms - Default settling time, between any frame and a forward frame
GLOBAL_busPowered = UserInput (Is DUT a bus-powered device?, YesNo)
GLOBAL_internalBPS = UserInput (Has device a bus power supply unit integrated?, YesNo)
if (GLOBAL_internalBPS == Yes)
    if (GLOBAL_busPowered == Yes)
        GLOBAL_internalBPS = No
        UserInput (This DUT shall not be connected to any external power supply for all tests, OK)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    else
        GLOBAL_internalVoltage = UserInput (Enter the open circuit voltage of the internal bus power supply, value [V])
        GLOBAL_internalCurrent = UserInput (Enter the specified maximum current of the internal bus power supply, value [mA])
        GLOBAL_VbusHigh = GLOBAL_internalVoltage
        GLOBAL_Ibus = 250 - GLOBAL_internalCurrent
    endif
endif
UserInput (Set power supply such to have GLOBAL_VbusHigh V bus high and GLOBAL_Ibus mA and connect the DUT, OK)
answer = QUERY CONTROL GEAR PRESENT, send to broadcast
if (answer != YES)
    halt 1 DUT not found
endif
GLOBAL_safeLampConnection = UserInput (Is it safe to disconnect and connect a lamp while external power is applied to DUT?, YesNo)
GLOBAL_startupTimeLimit = UserInput (Enter the default startup time limit (please enter the maximum for all lamps), 3 s minimum, value [s])
GLOBAL_startupTimeLimit = Max (3, GLOBAL_startupTimeLimit)
// Test factory default values - this part is optional
operatingMode = -1
PHM = -1
factoryNewDevice = UserInput (Is DUT factory new ?, YesNo)
if (factoryNewDevice == Yes)
    (operatingMode; PHM) = CheckFactoryDefault102 ()
else
    report 1 The check for factory default variables will be skipped for this DUT since device is not factory new.
    operatingMode = QUERY OPERATING MODE
endif
// Ask user which operating mode to use for further testing
if (operatingMode != 0)
    keepOperatingMode = UserInput (Use current operating mode ('No' forces operating mode 0)?, YesNo)
    if (keepOperatingMode == Yes)
        keepOperatingMode = UserInput (Are all instructions defined in this standard implemented in all manufacturer specific modes and is the memory bank 0 the same for all manufacturer specific modes?, YesNo)
    endif
    if (keepOperatingMode == No) // Force DUT to standard mode
        DTR0 (0)
        SET OPERATING MODE
    endif
endif
// Abort testing if device has 64 logical units
numberOfLogicalUnits = GetNumberOfLogicalUnits ()
if (numberOfLogicalUnits == 64)
    halt 2 Bus unit has 64 logical units. Short address 63 is used for testing, therefore testing of this device is aborted.
else
    // Assign a short address to each logical unit, short address shall be equal to the index of the logical unit
    GLOBAL_numberShortAddresses = AddressPreamble ()
    if (GLOBAL_numberShortAddresses == 0)
        halt 3 No units found.
    else if (GLOBAL_numberShortAddresses >= 64)
        halt 4 Too many units found.
    else
        if (GLOBAL_numberShortAddresses != numberOfLogicalUnits)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            error 1 Number assigned short addresses differs from number of logical units
            available in the bus unit. Expected: numberOfLogicalUnits. Actual:
            GLOBAL_numberShortAddresses.
        endif
        // Get information per logical unit and store them as global parameters
        for (logicalUnitAddress = 0; logicalUnitAddress < GLOBAL_numberShortAddresses;
        logicalUnitAddress++)
            (GLOBAL_logicalUnit[logicalUnitAddress].deviceType[])                    =
            GetSupportedDeviceTypes (logicalUnitAddress)
            (GLOBAL_logicalUnit[logicalUnitAddress].extendedVersionNumber[])         =
            GetExtendedVersionNumber                                  (logicalUnitAddress;
            GLOBAL_logicalUnit[logicalUnitAddress].deviceType[])
            (GLOBAL_logicalUnit[logicalUnitAddress].lightSource[])                   =
            GetSupportedLightSources (logicalUnitAddress)
        endfor
        // Test factory default values of the variables which are different per logical unit
        if (factoryNewDevice == Yes)
            for (logicalUnitAddress = 0; logicalUnitAddress <
            GLOBAL_numberShortAddresses; logicalUnitAddress++)
                CheckFactoryDefault102PerLogicalUnit                  (logicalUnitAddress;
                operatingMode; PHM)
                CheckFactoryDefault2xxPerLogicalUnit                  (logicalUnitAddress;
                GLOBAL_logicalUnit[logicalUnitAddress].deviceType[])
            endfor
        endif
        GLOBAL_currentUnderTestLogicalUnit = 0 // Define a variable to be used for further
        testing, to know which logical unit is under test
        // If multiple logical units are available in the bus unit, ask the user if tests shall be
        run for all logical units or for specific ones
        if (GLOBAL_numberShortAddresses != 1)
            answer = UserInput (Shall the tests be run for all logical units?, YesNo)
            if (answer == Yes)
                for (i = 0; i < GLOBAL_numberShortAddresses; i++)
                    GLOBAL_logicalUnit[i].runTests = true
                endfor
            else
                for (i = 0; i < GLOBAL_numberShortAddresses; i++)
                    answer = UserInput (Shall the tests be run for logical unit with index
                    i ?, YesNo)
                    if (answer == Yes)
                        GLOBAL_logicalUnit[i].runTests = true
                    else
                        GLOBAL_logicalUnit[i].runTests = false
                    endif
                endfor
            endif
        else
            GLOBAL_logicalUnit[0].runTests = true // Tests shall be run for the only one
            logical unit available in the bus unit
        endif
    endif
endif
GLOBAL_lightSourceType = UserInput (Enter the type of light source used for testing and its
wattage (or setup in case there is no light source available), value)
GLOBAL_outputCapDelay = 0
GLOBAL_outputCapDelay = UserInput (Enter the time for the output capacitor to discharge
so that the lamp can be safely disconnected, 0 if not present), value [s])
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.2.1.1 CheckFactoryDefault102

The test subsequence checks the 102 factory default variables. Two exceptions are the operating mode and the min level since operating mode and PHM can differ per logical unit. Depending on the answers received from QUERY OPERATING MODE and QUERY PHYSICAL MINIMUM, operating mode and minLevel are checked either in this subsequence or after each logical device has a short address assigned (CheckFactoryDefault102PerLogicalUnit() subsequence).

Subsequence shall be run for all logical units in parallel.

Test description:

(*operatingMode*; *PHM*) = CheckFactoryDefault102 ()

```
// Verify operating mode of DUT
operatingMode = -1
PHM = -1
answer = QUERY OPERATING MODE, accept Violation
if (answer is not a valid backward frame)
    report 1 Multiple logical units with different default operating modes are available in one physical device.
    answer = UserInput (Are all instructions defined in this standard implemented in all manufacturer specific modes and is the memory bank 0 the same for all manufacturer specific modes?, YesNo)
    if (answer == No)
        warning 1 Default operating mode for all logical devices cannot be verified. DUT is forced to operating mode 0x00.
        DTR0 (0)
        SET OPERATING MODE
        operatingMode = 0
    else
        report 2 Default operating mode needs to be tested after each logical device has a short address assigned.
    endif
else
    if (answer == 0)
        report 3 DUT is in the 0x00 operating mode.
        operatingMode = answer
    else if (0x01 <= answer AND answer <= 0x7F)
        error 1 DUT is in a reserved operating mode. Actual: answer. Expected: 0, [0x80,0xFF]. DUT is forced to operating mode 0x00.
        DTR0 (0)
        SET OPERATING MODE
        operatingMode = 0
    else
        report 4 DUT is in a manufacturer specific mode, operating mode answer.
        operatingMode = answer
    endif
endif
// Verify physical min level and min level of DUT
answer = QUERY PHYSICAL MINIMUM, accept Violation, Value
if (answer is not a valid backward frame)
    report 5 Multiple logical units with different PHMs are available in one physical device.
else
    if (answer == 0 OR answer == 255)
        halt 1 Wrong factory burn-in value for PHM. Actual: answer. Expected: [0x01,0xFE].
    endif
    PHM = answer
endif
if (PHM != -1)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    iStart = 0
else
    iStart = 1
endif
// Check default value of the 102 variables
for (i = iStart; i <= 28; i++)
    answer = query[i], accept Violation, Value
    if (answer is not a valid backward frame)
        error 2 Multiple logical units returned different default values for variable[i].
    else
        if (answer != expectedAnswer[i])
            error 3 Wrong default value for variable[i]. Actual: answer. Expected:
            expectedAnswer[i].
        endif
    endif
    if (i == 6)
        randomAddress = answer
    endif
endfor
// Verify initialisationState variable
answer = QUERY SHORT ADDRESS
if (answer != NO)
    error 4 At least one logical unit has an incorrect default initialisation state. Actual:
    ENABLED or WITHDRAWN. Expected: DISABLED.
endif
answer = COMPARE
if (answer != NO)
    error 5 At least one logical unit has an incorrect default initialisation state. Actual:
    ENABLED. Expected: DISABLED
endif
// Verify shortAddress variable
INITIALISE (0)
answer = QUERY SHORT ADDRESS, accept Violation, Value
if (answer is not a valid backward frame)
    error 6 Multiple logical units returned different default values for shortAddress.
else
    if (answer != 255)
        error 7 Wrong default value for shortAddress. Answer: answer. Expected: 255.
    endif
endif
// Verify searchAddress variable
if (randomAddress == 0xFF FF FF)
    answer = COMPARE
    if (answer == NO)
        error 8 Wrong default value for searchAddress since no answer was received from
        COMPARE command.
    endif
else
    warning 2 Default value for searchAddress variable not verified.
endif
TERMINATE
// Test default value for lastLightLevel variable
DTR0 (255)
SET POWER ON LEVEL
PowerCycleAndWaitForDecoder (5)
WaitForPowerOnPhaseToFinish ()
answer = QUERY ACTUAL LEVEL
if (answer != 0xFE)
    error 9 Wrong default value for lastLightLevel. Answer: answer. Expected: 0xFE.
endif
// Test default value for lastActiveLevel variable
OFF
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

GO TO LAST ACTIVE LEVEL
WaitForLampOnAddressed (broadcast)
answer = QUERY ACTUAL LEVEL
if (*answer* != 0xFE)
    error 10 Wrong default value for lastActiveLevel. Answer: *answer*. Expected: 0xFE.
endif
return (*operatingMode*; *PHM*)

Table 20 – Parameters for test sequence CheckFactoryDefault102

Test step i	query	variable	expectedAnswer
0	QUERY MIN LEVEL	minLevel	PHM
1	QUERY POWER ON LEVEL	powerOnLevel	0xFE
2	QUERY SYSTEM FAILURE LEVEL	systemFailureLevel	0xFE
3	QUERY MAX LEVEL	maxLevel	0xFE
4	QUERY FADE TIME/FADE RATE	fadeRate/fadeTime	0x07
5	QUERY EXTENDED FADE TIME	extendedFadeTimeBase/Multiplier	0
6	**GetRandomAddress** ()	randomAddress	0xFFFFFF
7	QUERY GROUP 0-7	gearGroups0-7	0x00
8	QUERY GROUP 8-15	gearGroups8-15	0x00
9	QUERY SCENE LEVEL 0	scene0	0xFF
10	QUERY SCENE LEVEL 1	scene1	0xFF
11	QUERY SCENE LEVEL 2	scene2	0xFF
12	QUERY SCENE LEVEL 3	scene3	0xFF
13	QUERY SCENE LEVEL 4	scene4	0xFF
14	QUERY SCENE LEVEL 5	scene5	0xFF
15	QUERY SCENE LEVEL 6	scene6	0xFF
16	QUERY SCENE LEVEL 7	scene7	0xFF
17	QUERY SCENE LEVEL 8	scene8	0xFF
18	QUERY SCENE LEVEL 9	scene9	0xFF
19	QUERY SCENE LEVEL 10	scene10	0xFF
20	QUERY SCENE LEVEL 11	scene11	0xFF
21	QUERY SCENE LEVEL 12	scene12	0xFF
22	QUERY SCENE LEVEL 13	scene13	0xFF
23	QUERY SCENE LEVEL 14	scene14	0xFF
24	QUERY SCENE LEVEL 15	scene15	0xFF
25	QUERY STATUS	statusByte	11100100b
26	QUERY CONTENT DTR0	DTR0	0x00
27	QUERY CONTENT DTR1	DTR1	0x00
28	QUERY CONTENT DTR2	DTR2	0x00

12.2.1.2 AddressPreamble

The test subsequence clears all short addresses, then discovers the logical units available in a bus unit and gives each of them a short address equal to their index number. The subsequence returns the number of logical units found.

Subsequence shall be run for all logical units in parallel.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test description:

```
numAssignedShortAddresses = AddressPreamble ()

searchCompleted = false
numAssignedShortAddresses = 0
assignedAddresses[63] = false
highestAssigned = -1
// Clear all short addresses, then detect all units and assign them short addresses
DTR0(255)
SET SHORT ADDRESS
INITIALISE (0)
RANDOMISE
wait 100 ms // after stop condition of RANDOMISE command
while (!searchCompleted)
    // Check if any unit is still unaddressed
    SetSearchAddress (0xFFFFFF)
    answer = COMPARE
    if (answer == NO)
        searchCompleted = true
    endif
    if (!searchCompleted)
        if (numAssignedShortAddresses < 63)
            searchAddress = 0xFFFFFF
            for (i = 23; i >= 0; i--)
                mask = (1 << i)
                searchAddress = searchAddress & (~mask)
                SetSearchAddress (searchAddress)
                answer = COMPARE
                if (answer == NO)
                    // No unit in the requested random address range => revert mask
                    searchAddress = searchAddress | mask
                else
                    // At least one unit is there => keep mask
                endif
            endfor
            // Last bit reached => set valid searchAddress
            SetSearchAddress (searchAddress)
            answer = COMPARE
            if (answer == YES)
                // Valid single unit found => program short address, where short address
                is the index of the logical unit
                PROGRAM SHORT ADDRESS ((63 << 1) + 1)
                address = GetIndexOfLogicalUnit (111111b) // short address 63
                if (address < 63)
                    if (assignedAddresses[address] == true)
                        halt 1 Unexpected duplicate index number found. Actual:
                        address.
                    else
                        PROGRAM SHORT ADDRESS ((address << 1) + 1)
                        WITHDRAW
                        numAssignedShortAddresses++
                        assignedAddresses[address] = true
                        if (address > highestAssigned)
                            highestAssigned = address
                        endif
                    endif
                else
                    halt 2 Unexpected high index number found in memorybank 0. Actual:
                    address. Expected: <63.
                endif
            else
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                    halt 3 No unit found at last search address.
                endif
            endif
        endif
        INITIALISE (0)
endwhile
TERMINATE
if (numAssignedShortAddresses -1 != highestAssigned)
        for (i = 0; i < highestAssigned; i++)
            if (assignedAddresses[i] == true)
                report 1 Address assigned: i.
            else
                report 2 Address not assigned: i.
            endif
        endfor
        halt 4 Unexpected gap in assigned short addresses detected.
endif
return numAssignedShortAddresses
```

12.2.1.3 CheckFactoryDefault102PerLogicalUnit

The test subsequence checks the default values of operating mode, PHM and min level, for each logical unit, in case these were not tested before.

Subsequence shall be run for the logical unit with short address given by address variable.

Test description:

CheckFactoryDefault102PerLogicalUnit (*address*; *operatingMode*; *PHM*)

```
if (operatingMode == -1)
        answer = QUERY OPERATING MODE, send to ((address << 1) + 1)
        if (answer == 0)
            report 1 Logical unit address is in the 0x00 operating mode.
        else if (0x01 <= answer AND answer <= 0x7F)
            error 1 Logical unit address: Logical unit is in a reserved operating mode. Actual:
            answer. Expected: 0, [0x80,0xFF].
            report 2 In order to proceed with testing, logical unit address is set to operating
            mode 0x00.
            DTR (0)
            SET OPERATING MODE, send to ((address << 1) + 1)
        else
            report 3 LogicalUnit address: Logical unit is in a manufacturer specific mode,
            operating mode answer.
        endif
endif
if (PHM == -1)
        answer = QUERY PHYSICAL MINIMUM, send to ((address << 1) + 1), accept Value
        if (answer == 0 OR answer == 255)
            halt 1 LogicalUnit address: Wrong factory burn-in value for PHM. Answer: answer.
            Expected: [0x01,0xFE].
        endif
        PHM = answer
        answer = QUERY MIN LEVEL, send to ((address << 1) + 1)
        if (answer != PHM)
            error 2 LogicalUnit address: Wrong default value for minLevel. Answer: answer.
            Expected: PHM.
        endif
endif
return
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.2.1.4 CheckFactoryDefault2xxPerLogicalUnit

The test subsequence checks all 2xx factory default variables, for each device type supported by logical unit. For all logical units supporting a device type greater than 8, or having an extended version number greater than 2, the test available in the latest 2xx standard should be run.

Subsequence shall be run for the logical unit with short address given by address variable.

Test description:

CheckFactoryDefault2xxPerLogicalUnit (*address*; *deviceType[]*)

```
if (deviceType[0] != -1)
    foreach (device in deviceType)
        ENABLE DEVICE TYPE (device)
        answer = QUERY EXTENDED VERSION NUMBER, send to ((address << 1) + 1)
        if (answer > 2 OR device >= 9)
            version = 201 + device
            UserInput (For logical unit address with device type device, please run now the
            factory default test available in the latest IEC 62386-version,OK)
        else
            switch (device)
                case 0:
                    report 1 Check compliancy with IEC 62386-201 Ed1
                    CheckFactoryDefault201 (address)
                    break
                case 1:
                    report 2 Check compliancy with IEC 62386-202 Ed1
                    CheckFactoryDefault202 (address)
                    break
                case 2:
                    report 3 Check compliancy with IEC 62386-203 Ed1
                    CheckFactoryDefault203 (address)
                    break
                case 3:
                    report 4 Check compliancy with IEC 62386-204 Ed1
                    CheckFactoryDefault204 (address)
                    break
                case 4:
                    report 5 Check compliancy with IEC 62386-205 Ed1
                    CheckFactoryDefault205 (address)
                    break
                case 5:
                    report 6 Check compliancy with IEC 62386-206 Ed1
                    CheckFactoryDefault206 (address)
                    break
                case 6:
                    report 7 Check compliancy with IEC 62386-207 Ed1
                    CheckFactoryDefault207 (address)
                    break
                case 7:
                    report 8 Check compliancy with IEC 62386-208 Ed1
                    CheckFactoryDefault208 (address)
                    break
                case 8:
                    report 9 Check compliancy with IEC 62386-209 Ed2
                    CheckFactoryDefault209 (address)
                    break
            endswitch
        endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    endfor
endif
return
```

12.2.1.4.1 CheckFactoryDefault201

This subsequence checks the factory default values of the variables defined in the 201 standard. Subsequence shall be run for the logical unit with short address given by address variable.

Test description:

CheckFactoryDefault201 (*address*)

```
for (i = 0; i < 2; i++)
    ENABLE DEVICE TYPE 0
    answer = query[i], send to ((address << 1) + 1)
    if (answer != expectedAnswer[i])
        error 1 LogicalUnit address: Wrong default value for variable[i]. Answer: answer.
        Expected: expectedAnswer[i].
    endif
endfor
return
```

Table 21 – Parameters for test sequence CheckFactoryDefault201

Test step i	query	variable	expectedAnswer
0	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	1
1	QUERY DEVICE TYPE	deviceType	0

12.2.1.4.2 CheckFactoryDefault202

This subsequence checks the factory default values of the variables defined in the 202 standard. Subsequence shall be run for the logical unit with short address given by address variable.

Test description:

CheckFactoryDefault202 (*address*)

```
ENABLE DEVICE TYPE 1
emergencyMinLevel = QUERY EMERGENCY MIN LEVEL, send to ((address << 1) + 1)
ENABLE DEVICE TYPE 1
emergencyMaxLevel = QUERY EMERGENCY MAX LEVEL, send to ((address << 1) + 1)
if (emergencyMinLevel == 0)
    error 1 LogicalUnit address: Wrong default value for emergencyMinLevel. Answer: 0.
    Expected: [1,emergencyMaxLevel] or MASK.
endif
if (emergencyMaxLevel == 0)
    error 2 LogicalUnit address: Wrong default value for emergencyMaxLevel. Answer: 0.
    Expected: [emergencyMinLevel,254] or MASK.
endif
if (emergencyMinLevel > emergencyMaxLevel)
    error 3 LogicalUnit address: emergencyMinLevel (emergencyMinLevel) greater than
    emergencyMaxLevel (emergencyMaxLevel).
endif
ENABLE DEVICE TYPE 1
answer = QUERY FEATURES, send to ((address << 1) + 1)
autoTestCapability = (answer >> 3) & 0x01
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
for (i = 0; i < 14; i++)
    command[i]
    ENABLE DEVICE TYPE 1
    answer = query[i], send to ((address << 1) + 1)
    if (answer != expectedAnswer[i,autoTestCapability])
        error 4 LogicalUnit address: Wrong default value for variable[i]. Answer: answer.
        Expected: expectedAnswer[i,autoTestCapability].
    endif
endfor
return
```

Table 22 – Parameters for test sequence CheckFactoryDefault202

Test step i	Command	query	variable	expectedAnswer	
				autoTestCapability = 0	autoTestCapability = 1
0	-	QUERY EMERGENCY LEVEL	emergencyLevel	*emergencyMaxLevel*	*emergencyMaxLevel*
1	DTR0 (7)	QUERY TEST TIMING	prolongTime	0	0
2	DTR0 (0)	QUERY TEST TIMING	functionTestDelayTimeHighByte	255	0 or 2
3	DTR0 (1)	QUERY TEST TIMING	functionTestDelayTimeLowByte	255	0 or 160
4	DTR0 (2)	QUERY TEST TIMING	durationTestDelayTimeHighByte	255	0 or 136
5	DTR0 (3)	QUERY TEST TIMING	durationTestDelayTimeLowByte	255	0 or 128
6	DTR0 (4)	QUERY TEST TIMING	functionTestInterval	0	7
7	DTR0 (5)	QUERY TEST TIMING	durationTestInterval	0	52
8	DTR0 (6)	QUERY TEST TIMING	testExecutionTimeout	7	7
9	-	QUERY DURATION TEST RESULT	durationTestResult	0	0
10	-	QUERY LAMP EMERGENCY TIME	lampEmergencyTime	0	0
11	-	QUERY LAMP TOTAL OPERATION TIME	lampTotalOperationTime	0	0
12	-	QUERY DEVICE TYPE	deviceType	1	1
13	-	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	1	1

12.2.1.4.3 CheckFactoryDefault203

This subsequence checks the factory default values of the variables defined in the 203 standard. Subsequence shall be run for the logical unit with short address given by address variable.

Test description:

CheckFactoryDefault203 (*address*)

```
for (i = 0; i < 7; i++)
    ENABLE DEVICE TYPE 2
    answer = query[i], send to ((address << 1) + 1)
    if (answer != expectedAnswer[i])
        error 1 LogicalUnit address: Wrong default value for variable[i]. Answer: answer.
        Expected: expectedAnswer[i].
    endif
endfor
return
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 23 – Parameters for test sequence CheckFactoryDefault203

Test step i	query	variable	expectedAnswer
0	QUERY DEVICE TYPE	deviceType	2
1	QUERY HID STATUS	hidStatus	0
2	QUERY ACTUAL HID FAILURE	actualHidFailure	0X000XXXb
3	QUERY STORED HID FAILURE	storedHidFailure	0X000XXXb
4	QUERY THERMAL OVERLOAD TIME HB	thermalOverloadTimeHighByte	0
5	QUERY THERMAL OVERLOAD TIME LB	thermalOverloadTimeLowByte	0
6	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	1

12.2.1.4.4 CheckFactoryDefault204

This subsequence checks the factory default values of the variables defined in the 204 standard. Subsequence shall be run for the logical unit with short address given by address variable.

Test description:

CheckFactoryDefault204 (*address*)

for (*i* = 0; *i* < 2; *i*++)
    ENABLE DEVICE TYPE 3
    answer = *query*[*i*], send to ((*address* << 1) + 1)
    if (*answer* != *expectedAnswer*[*i*])
        error 1 LogicalUnit *address*: Wrong default value for *variable*[*i*]. Answer: *answer*. Expected: *expectedAnswer*[*i*].
    endif
endfor
return

Table 24 – Parameters for test sequence CheckFactoryDefault204

Test step i	query	variable	expectedAnswer
0	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	1
1	QUERY DEVICE TYPE	deviceType	3

12.2.1.4.5 CheckFactoryDefault205

This subsequence checks the factory default values of the variables defined in the 205 standard. Subsequence shall be run for the logical unit with short address given by address variable.

Test description:

CheckFactoryDefault205 (*address*)

for (*i* = 0; *i* < 6; *i*++)
    ENABLE DEVICE TYPE 4
    answer = *query*[*i*], send to ((*address* << 1) + 1)
    if (*answer* != *expectedAnswer*[*i*])
        error 1 LogicalUnit *address*: Wrong default value for *variable*[*i*]. Answer: *answer*. Expected: *expectedAnswer*[*i*].

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    endif
endfor
return
```

Table 25 – Parameters for test sequence CheckFactoryDefault205

Test step i	query	variable	expectedAnswer
0	QUERY DIMMING CURVE	dimmingCurve	0
1	QUERY DIMMER STATUS	dimmerStatus	000000XXb
2	QUERY FAILURE STATUS	failureStatusByte1	XXX0XXXXb
3	QUERY CONTENT DTR1	failureStatusByte2	000XXXXXb
4	QUERY DEVICE TYPE	deviceType	4
5	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	1

12.2.1.4.6 CheckFactoryDefault206

This subsequence checks the factory default values of the variables defined in the 206 standard. Subsequence shall be run for the logical unit with short address given by address variable.

Test description:

CheckFactoryDefault206 (*address*)

```
for (i = 0; i < 6; i++)
    ENABLE DEVICE TYPE 5
    answer = query[i], send to ((address << 1) + 1)
    if (answer != expectedAnswer[i])
        error 1 LogicalUnit address: Wrong default value for variable[i]. Answer: answer.
        Expected: expectedAnswer[i].
    endif
endfor
return
```

Table 26 – Parameters for test sequence CheckFactoryDefault206

Test step i	query	variable	expectedAnswer
0	QUERY DIMMING CURVE	dimmingCurve	0
1	QUERY FAILURE STATUS	failureStatus	0
2	QUERY CONVERTERSTATUS	convertorStatus	0
3	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	1
4	QUERY DEVICE TYPE	deviceType	5
5	QUERY PHYSICAL MINIMUM	physicalMinLevel	1

12.2.1.4.7 CheckFactoryDefault207

This subsequence checks the factory default values of the variables defined in the 207 standard. Subsequence shall be run for the logical unit with short address given by address variable.

Test description:

CheckFactoryDefault207 (*address*)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
ENABLE DEVICE TYPE 6
minFastFadeTime = QUERY MIN FAST FADE TIME, send to ((address << 1) + 1)
if (minFastFadeTime == 0 OR minFastFadeTime > 27)
    error 1 LogicalUnit address: Wrong default value for minFastFadeTime. Answer: answer.
    Expected: [1,27].
endif
for (i = 0; i < 5; i++)
    ENABLE DEVICE TYPE 6
    answer = query[i], send to ((address << 1) + 1)
    if (answer != expectedAnswer[i])
        error 2 LogicalUnit address: Wrong default value for variable[i]. Answer: answer.
        Expected: expectedAnswer[i].
    endif
endfor
return
```

Table 27 – Parameters for test sequence CheckFactoryDefault207

Test step i	query	variable	expectedAnswer
0	QUERY FAST FADE TIME	fastFadeTime	0
1	QUERY OPERATING MODE	operatingMode	0000XXXXb
2	QUERY DIMMING CURVE	dimmingCurve	0
3	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	1
4	QUERY DEVICE TYPE	deviceType	6

12.2.1.4.8 CheckFactoryDefault208

This subsequence checks the factory default values of the variables defined in the 208 standard. Subsequence shall be run for the logical unit with short address given by address variable.

Test description:

CheckFactoryDefault208 (*address*)

```
for (i = 0; i < 11; i++)
    ENABLE DEVICE TYPE 7
    answer = query[i], send to ((address << 1) + 1)
    if (answer != expectedAnswer[i])
        error 1 LogicalUnit address: Wrong default value for variable[i]. Answer: answer.
        Expected: expectedAnswer[i].
    endif
endfor
return
```

Table 28 – Parameters for test sequence CheckFactoryDefault208

Test step i	query	variable	expectedAnswer
0	QUERY PHYSICAL MINIMUM	physicalMinLevel	254
1	QUERY MIN LEVEL	minLevel	254
2	QUERY MAX LEVEL	maxLevel	254
3	QUERY UP SWITCH-ON THRESHOLD	upSwitchOnThreshold	1
4	QUERY UP SWITCH-OFF THRESHOLD	upSwitchOffThreshold	255
5	QUERY DOWN SWITCH-ON THRESHOLD	downSwitchOnThreshold	255

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step i	query	variable	expectedAnswer
6	QUERY DOWN SWITCH-OFF THRESHOLD	downSwitchOffThreshold	0
7	QUERY ERROR HOLD-OFF TIME	errorHoldOffTime	0
8	QUERY SWITCH STATUS	switchStatus	X0000XXXb
9	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	1
10	QUERY DEVICE TYPE	deviceType	7

12.2.1.4.9 CheckFactoryDefault209

This subsequence checks the factory default values of the variables defined in the 209 standard. Subsequence shall be run for the logical unit with short address given by address variable.

Test description:

CheckFactoryDefault209 (*address*)

```
for (i = 0; i < 78; i++)
    command1[i], send to ((address << 1) + 1)
    command2[i]
    ENABLE DEVICE TYPE 8
    answer = query[i], send to ((address << 1) + 1)
    if (answer != expectedAnswer[i])
        error 1 LogicalUnit address: Wrong default value for variable[i]. Answer: answer.
        Expected: expectedAnswer[i].
    endif
endfor
return
```

Table 29 – Parameters for test sequence CheckFactoryDefault209

Test step i	command1	command2	query	variable	expectedAnswer
0	-	DTR0 (192)	QUERY COLOUR VALUE	Temporary x-coordinate_MSB	255
1	-	-	QUERY CONTENT DTR0	Temporary x-coordinate_LSB	255
2	-	DTR0 (193)	QUERY COLOUR VALUE	Temporary y-coordinate_MSB	255
3	-	-	QUERY CONTENT DTR0	Temporary y-coordinate_LSB	255
4	-	DTR0 (194)	QUERY COLOUR VALUE	Temporary colour temperature Tc_MSB	255
5	-	-	QUERY CONTENT DTR0	Temporary colour temperature Tc_LSB	255
6	-	DTR0 (195)	QUERY COLOUR VALUE	Temporary Primary N dimlevel 0_MSB	255
7	-	-	QUERY CONTENT DTR0	Temporary Primary N dimlevel 0_LSB	255
8	-	DTR0 (196)	QUERY COLOUR VALUE	Temporary Primary N dimlevel 1_MSB	255
9	-	-	QUERY CONTENT DTR0	Temporary Primary N dimlevel 1_LSB	255

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step i	command1	command2	query	variable	expectedAnswer
10	-	DTR0 (197)	QUERY COLOUR VALUE	Temporary Primary N dimlevel 2_MSB	255
11	-	-	QUERY CONTENT DTR0	Temporary Primary N dimlevel 2_LSB	255
12	-	DTR0 (198)	QUERY COLOUR VALUE	Temporary Primary N dimlevel 3_MSB	255
13	-	-	QUERY CONTENT DTR0	Temporary Primary N dimlevel 3_LSB	255
14	-	DTR0 (199)	QUERY COLOUR VALUE	Temporary Primary N dimlevel 4_MSB	255
15	-	-	QUERY CONTENT DTR0	Temporary Primary N dimlevel 4_LSB	255
16	-	DTR0 (200)	QUERY COLOUR VALUE	Temporary Primary N dimlevel 5_MSB	255
17	-	-	QUERY CONTENT DTR0	Temporary Primary N dimlevel 5_LSB	255
18	-	DTR0 (201)	QUERY COLOUR VALUE	Temporary Red dimlevel	255
19	-	DTR0 (202)	QUERY COLOUR VALUE	Temporary Green dimlevel	255
20	-	DTR0 (203)	QUERY COLOUR VALUE	Temporary Blue dimlevel	255
21	-	DTR0 (204)	QUERY COLOUR VALUE	Temporary White dimlevel	255
22	-	DTR0 (205)	QUERY COLOUR VALUE	Temporary Amber dimlevel	255
23	-	DTR0 (206)	QUERY COLOUR VALUE	Temporary FreeColour dimlevel	255
24	-	DTR0 (207)	QUERY COLOUR VALUE	Temporary RGBWAF control	255
25	-	DTR0 (224)	QUERY COLOUR VALUE	Report x-coordinate_MSB	255
26	-	-	QUERY CONTENT DTR0	Report x-coordinate_LSB	255
27	-	DTR0 (225)	QUERY COLOUR VALUE	Report y-coordinate_MSB	255
28	-	-	QUERY CONTENT DTR0	Report y-coordinate_LSB	255
29	-	DTR0 (226)	QUERY COLOUR VALUE	Report colour temperature Tc_MSB	255
30	-	-	QUERY CONTENT DTR0	Report colour temperature Tc_LSB	255
31	-	DTR0 (227)	QUERY COLOUR VALUE	Report Primary 0 dimlevel 0_MSB	255
32	-	-	QUERY CONTENT DTR0	Report Primary 0 dimlevel 0_LSB	255
33	-	DTR0 (228)	QUERY COLOUR VALUE	Report Primary 0 dimlevel 1_MSB	255
34	-	-	QUERY CONTENT DTR0	Report Primary 0 dimlevel 1_LSB	255
35	-	DTR0 (229)	QUERY COLOUR VALUE	Report Primary 0 dimlevel 2_MSB	255
36	-	-	QUERY CONTENT DTR0	Report Primary 0 dimlevel 2_LSB	255
37	-	DTR0 (230)	QUERY COLOUR VALUE	Report Primary 0 dimlevel 3_MSB	255
38	-	-	QUERY CONTENT DTR0	Report Primary 0 dimlevel 3_LSB	255
39	-	DTR0 (231)	QUERY COLOUR VALUE	Report Primary 0 dimlevel 4_MSB	255

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step i	command1	command2	query	variable	expectedAnswer
40	-	-	QUERY CONTENT DTR0	Report Primary 0 dimlevel 4_LSB	255
41	-	DTR0 (232)	QUERY COLOUR VALUE	Report Primary 0 dimlevel 5_MSB	255
42	-	-	QUERY CONTENT DTR0	Report Primary 0 dimlevel 5_LSB	255
43	-	DTR0 (233)	QUERY COLOUR VALUE	Report Red dimlevel	255
44	-	DTR0 (234)	QUERY COLOUR VALUE	Report Green dimlevel	255
45	-	DTR0 (235)	QUERY COLOUR VALUE	Report Blue dimlevel	255
46	-	DTR0 (236)	QUERY COLOUR VALUE	Report White dimlevel	255
47	-	DTR0 (237)	QUERY COLOUR VALUE	Report Amber dimlevel	255
48	-	DTR0 (238)	QUERY COLOUR VALUE	Report FreeColour dimlevel	255
49	-	DTR0 (239)	QUERY COLOUR VALUE	Report RGBWAF control	255
50	-	DTR0 (15)	QUERY COLOUR VALUE	RGBWAF control	255
51	-	DTR0 (1)	QUERY ASSIGNED COLOUR	Assigned colour channel 0	1
52	-	DTR0 (2)	QUERY ASSIGNED COLOUR	Assigned colour channel 1	2
53	-	DTR0 (3)	QUERY ASSIGNED COLOUR	Assigned colour channel 2	3
54	-	DTR0 (4)	QUERY ASSIGNED COLOUR	Assigned colour channel 3	4
55	-	DTR0 (5)	QUERY ASSIGNED COLOUR	Assigned colour channel 4	5
56	-	DTR0 (6)	QUERY ASSIGNED COLOUR	Assigned colour channel 5	6
57	-	DTR0 (208)	QUERY COLOUR VALUE	Temporary colour type	255
58	-	DTR0 (240)	QUERY COLOUR VALUE	Report colour type	255
59	QUERY SCENE LEVEL 0	DTR0 (240)	QUERY COLOUR VALUE	Scene 0 colour type	255
60	QUERY SCENE LEVEL 1	DTR0 (240)	QUERY COLOUR VALUE	Scene 1 colour type	255
61	QUERY SCENE LEVEL 2	DTR0 (240)	QUERY COLOUR VALUE	Scene 2 colour type	255
62	QUERY SCENE LEVEL 3	DTR0 (240)	QUERY COLOUR VALUE	Scene 3 colour type	255
63	QUERY SCENE LEVEL 4	DTR0 (240)	QUERY COLOUR VALUE	Scene 4 colour type	255
64	QUERY SCENE LEVEL 5	DTR0 (240)	QUERY COLOUR VALUE	Scene 5 colour type	255
65	QUERY SCENE LEVEL 6	DTR0 (240)	QUERY COLOUR VALUE	Scene 6 colour type	255
66	QUERY SCENE LEVEL 7	DTR0 (240)	QUERY COLOUR VALUE	Scene 7 colour type	255
67	QUERY SCENE LEVEL 8	DTR0 (240)	QUERY COLOUR VALUE	Scene 8 colour type	255
68	QUERY SCENE LEVEL 9	DTR0 (240)	QUERY COLOUR VALUE	Scene 9 colour type	255
69	QUERY SCENE LEVEL 10	DTR0 (240)	QUERY COLOUR VALUE	Scene 10 colour type	255

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step i	command1	command2	query	variable	expectedAnswer
70	QUERY SCENE LEVEL 11	DTR0 (240)	QUERY COLOUR VALUE	Scene 11 colour type	255
71	QUERY SCENE LEVEL 12	DTR0 (240)	QUERY COLOUR VALUE	Scene 12 colour type	255
72	QUERY SCENE LEVEL 13	DTR0 (240)	QUERY COLOUR VALUE	Scene 13 colour type	255
73	QUERY SCENE LEVEL 14	DTR0 (240)	QUERY COLOUR VALUE	Scene 14 colour type	255
74	QUERY SCENE LEVEL 15	DTR0 (240)	QUERY COLOUR VALUE	Scene 15 colour type	255
75	-	-	QUERY GEAR FEATURES/STATUS	gear features / status	XX000001b
76	-	-	QUERY DEVICE TYPE	deviceType	8
77	-	-	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	2

12.3 Physical operational parameters

12.3.1 Polarity test

Test sequence checks if DUT is polarity insensitive with regard to bus interface connections. Test sequence applies for DUTs without or with an inactive integrated bus power supply.

Test sequence shall be run for all logical units in parallel.

Test description:

```
if (GLOBAL_internalBPS == No)
    answer = QUERY CONTROL GEAR PRESENT
    if (answer == YES)
        report 1 Communication possible at current polarity.
    else
        error 1 No communication at current polarity.
    endif
    Change (Swap data wires at DUT bus interface)
    wait 100 ms
    answer = QUERY CONTROL GEAR PRESENT
    if (answer == YES)
        report 2 Communication possible at inverted polarity.
    else
        error 2 No communication at inverted polarity.
        Change (Swap data wires at DUT bus interface)
        wait 100 ms
    endif
else
    report 3 Polarity test not executed due to presence of internal power supply.
endif
```

12.3.2 Maximum and minimum system voltage

Test sequence checks if the interface is able to withstand the maximum and minimum voltage ratings.

Test sequence shall be run for all logical units in parallel.

Test description:

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
if (GLOBAL_Ibus == 0)
    report 1 Test not executed since device under test does not allow for additional external power supplies.
else
    Apply (Current of GLOBAL_Ibus mA + 10 mA on bus interface)
    for (i = 0; i < 2; i++)
        Vbus = voltage[i]
        Apply (Disconnect interface)
        Apply (Voltage of Vbus V on bus interface)
        Apply (Reconnect interface)
        // the voltage may change
        wait 1 min
        Apply (Voltage of GLOBAL_VbusHigh V on bus interface)
        DTR0 (13)
        for (j = 0; j < 12; j++)
            DTR0 (value[j])
            answer = QUERY CONTENT DTR0
            if (answer != value[j])
                error 1 No successful operation after applying rating of Vbus V at bus interface for 1 min. Actual: answer. Expected: value[j].
            endif
        endfor
    endfor
endif
```

Table 30 – Parameters for test sequence Maximum and minimum system voltage

Test step i	0	1
voltage [V]	22,5	-6,5

Test step j	0	1	2	3	4	5	6	7	8	9	10	11
value	0	1	2	4	8	16	32	64	85	128	170	255

12.3.3 Overvoltage protection test

Check over-voltage protection of the interface for the maximum rated external voltage of the system.

Test sequence shall be run for all logical units in parallel.

Test description:

```
overvoltageProtection = UserInput (Is overvoltage protection supported by DUT?, YesNo)
if (overvoltageProtection == Yes)
    maximumVoltage = UserInput (Enter the maximum rated external voltage supported by DUT, value [V])
    maximumFrequency = UserInput (Enter the maximum rated external frequency supported by DUT, value [Hz])
    answer = QUERY CONTROL GEAR PRESENT
    if (answer != YES)
        error 1 No communication possible.
    else
        if (GLOBAL_busPowered == Yes)
            Disconnect (Bus interface of DUT from the tester)
        else
            Switch_off (external power)
            Disconnect (External power and bus interface of DUT from the tester)
        endif
        Apply (Overvoltage of maximumVoltage V with a frequency of maximumFrequency Hz on bus interface)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            wait 1 min
            Remove (Overvoltage from bus interface)
            if (GLOBAL_busPowered == Yes)
                Connect (Bus interface of DUT to the tester)
            else
                Connect (External power and bus interface of DUT to the tester)
                Switch_on (external power)
            endif
            start_timer (timer)
            do
                answer = QUERY CONTROL GEAR PRESENT, accept No Answer
                timestamp = get_timer (timer)
                if (answer == YES)
                    report 1 Overvoltage protection supported by DUT.
                    break
                endif
            while (timestamp <= 1 min)
            if (answer == NO)
                error 2 No communication after 1 min after applying maximumVoltage V /
                maximumFrequency Hz on bus interface.
            endif
        endif
    else
        report 2 Overvoltage protection is not supported by DUT.
    endif
```

It is recommended that this test be repeated at the maximum and minimum operating temperature.

12.3.4 Current rating test

Test sequences checks current consumption while the bus is in idle state.

Test sequence shall be run for all logical units in parallel.

Test description:

```
if (GLOBAL_internalBPS == Yes)
    report 1 Test is not applicable.
else
    currentLimit = 2
    if (GLOBAL_busPowered)
        currentLimit = UserInput (Enter the current consumption shown on the label or
        stated in the literature, value [mA])
    endif
    Apply (Linear voltage change from 0 V to 22,5 V within 10 s to bus terminals as
    illustrated in Phase 1 of Figure 10)
    QUERY CONTENT DTR0
    // Voltage drop shall be applied directly after valid stop condition of forward frame to
    discharge internal capacitor of the receiver
    Apply (Immediate voltage drop from 22,5 V to 0 V - see Figure 10)
    Apply (Voltage of 0 V during 20 s - see Phase 2 in Figure 10)
    Apply (Immediate voltage change from 0 V to 22,5 V at end of Phase 2 of Figure 10)
    current1 = Measure (Maximum current consumption in mA at bus terminals during Phase
    1)
    current2 = Measure (Current consumption in mA at bus terminals during the immediate
    voltage change at end of Phase 2)
    if (current1 <= currentLimit)
        report 2 Maximum current consumption measured during Phase1 is current1 mA.
        Expected: <= currentLimit mA.
    else
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        error 1 Wrong maximum current consumption during Phase1. Actual: current1 mA.
        Expected: <= currentLimit mA.
    endif
    if (current2 <= currentLimit)
        report 3 Maximum current consumption measured at end of Phase 2 is current2 mA.
        Expected: <= currentLimit mA.
    else
        error 2 Wrong maximum current consumption at end of Phase 2. Actual: current2
        mA. Expected: <= currentLimit mA.
    endif
endif
```

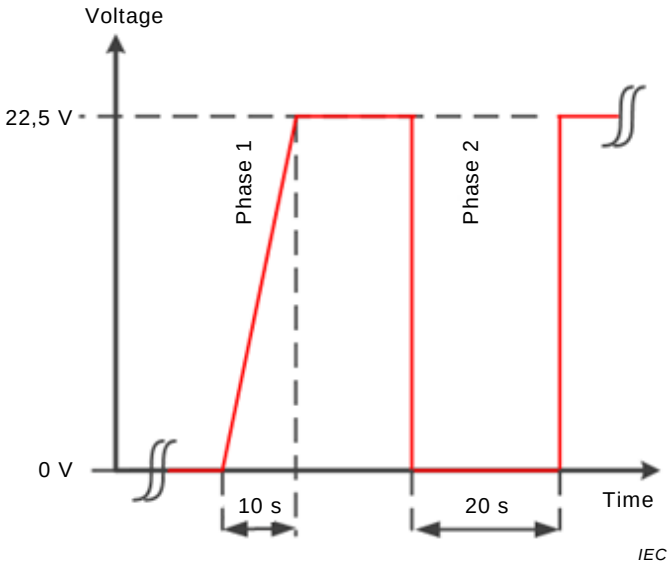


Figure 10 – Current rating test

It is recommended that this test be repeated at the maximum and minimum operating temperature.

12.3.5 Transmitter voltages

Test sequence checks

- if device responds for different voltage and current settings;
- low level voltage during active state of transmitter;
- high level voltage within backwards frame.

Test sequence shall be run for all logical units in parallel.

Test description:

```
// 250 mA if allowed, internal current in case of single internal BPS. Maximum current allowed
is provided.
Apply (Current of GLOBAL_Ibus mA on bus interface)
// Test at minimum voltage and maximum current
if (GLOBAL_internalBPS)
    Vbus = 12
    Apply (Clamp bus voltage to Vbus V on bus interface)
else
    Vbus = 10
    Apply (Voltage of Vbus V on bus interface)
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
CheckTxVoltages (Vbus; GLOBAL_Ibus)
if (GLOBAL_Ibus > 0)
    // Test at 20,5 V and maximum current. GLOBAL_Ibus = 0 in case of single internal BPS
    Apply (Voltage of 20,5 V on bus interface)
    CheckTxVoltages (20,5; GLOBAL_Ibus)
endif
if (GLOBAL_internalBPS)
    // Test at internal bus power supply voltage and maximum current if allowed
    Apply (Voltage of GLOBAL_internalVoltage V on bus interface)
    CheckTxVoltages (GLOBAL_internalVoltage; GLOBAL_Ibus)
    // Test using only internal bus power supply
    if (GLOBAL_Ibus > 0)
        // Switch off test power supply, minimum current
        Apply (Current of 0 mA on bus interface)
        CheckTxVoltages (GLOBAL_internalVoltage; 0)
    endif
else
    // Test for current of 8 mA and different voltages
    Apply (Current of 8 mA on bus interface)
    Apply (Voltage of 10 V on bus interface)
    CheckTxVoltages (10; 8)
    Apply (Voltage of 20,5 V on bus interface)
    CheckTxVoltages (20,5; 8)
endif
```

It is recommended that this test be repeated at the maximum and minimum operating temperature.

12.3.5.1 CheckTxVoltages

This subsequence checks the voltage of a signal sent by transmitter.

Test description:

CheckTxVoltages (*Vbus*; *Ibus*)

```
for (i = 0; i < 4; i++)
    DTR0 (value[i])
    current = Ibus + GLOBAL_internalCurrent
    answer = QUERY CONTENT DTR0, accept No Answer
    if (answer == NO)
        error 1 No reply received at Vbus V and current mA for QUERY CONTENT DTR0.
    else
        // Once the bus voltage has crossed 4,5 V for a low level or 10 V for a high level,
        this level shall be crossed once in the opposite direction at the end of the high or
        low period
        levelOkLow = UserInput (Are active low periods of answer within interval [-4,5 V;
        4,5 V]?, YesNo)
        levelOkHigh = UserInput (Is voltage high level of answer within interval [10 V; 22,5
        V]?, YesNo)
        if (levelOkLow == No)
            error 2 Active low voltage period outside -4,5 V < Vlow < 4.5 V at Vbus V and
            current mA in backward frame value[i].
        endif
        if (levelOkHigh == No)
            error 3 High level voltage period outside 10 V < Vhigh < 22,5 V at Vbus V and
            current mA in backward frame value[i].
        endif
    endif
endfor
return
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 31 – Parameters for test sequence Transmitter voltages

Test step i	value
0	255
1	170
2	85
3	0

12.3.6 Transmitter rising and falling edges

Test sequence evaluates correctness of first and last falling and rising edges within a backward frame at different voltage and current settings.

Test sequence shall be run for all logical units in parallel.

Test description:

```
// Test at 12 V and maximum current
Apply (Current of GLOBAL_Ibus mA on bus interface)
Vbus = 12
if (GLOBAL_internalBPS)
    Apply (Clamp bus voltage to Vbus V on bus interface)
else
    Apply (Voltage of Vbus V on bus interface)
endif
CheckMaximumTxRiseFallTimes (12; GLOBAL_Ibus)
// Test at 10 V and 250 mA if possible
if (!GLOBAL_internalBPS)
    Apply (Voltage of 10 V on bus interface)
    CheckMaximumTxRiseFallTimes (10; GLOBAL_Ibus)
endif
// Test using maximum voltage if possible
if (GLOBAL_Ibus > 0)
    Apply (Voltage of 20,5 V on bus interface)
    CheckMaximumTxRiseFallTimes (20,5; GLOBAL_Ibus)
    CheckMinimumTxRiseFallTimes (20,5; GLOBAL_Ibus)
endif
if (GLOBAL_internalBPS)
    // Test at internal bus power supply voltage and maximum current
    Apply (Voltage of GLOBAL_internalVoltage V on bus interface)
    CheckMaximumTxRiseFallTimes (GLOBAL_internalVoltage; GLOBAL_Ibus])
    // Test using only internal bus power supply if not covered by previous step
    if (GLOBAL_Ibus > 0)
        // Switch off test power supply
        Apply (Current of 0 mA on bus interface)
        CheckMaximumTxRiseFallTimes (GLOBAL_internalVoltage; 0)
    else
        CheckMinimumTxRiseFallTimes (GLOBAL_internalVoltage; 0)
    endif
else
    // Test for current of 8 mA and different voltages
    Apply (Current of 8 mA on bus interface)
    Apply (Voltage of 10 V on bus interface)
    CheckMaximumTxRiseFallTimes (10; 8)
    Apply (Voltage of 12 V on bus interface)
    CheckMaximumTxRiseFallTimes (12; 8)
    Apply (Voltage of 20,5 V on bus interface)
    CheckMaximumTxRiseFallTimes (20,5; 8)
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

It is recommended that this test be repeated at the maximum and minimum operating temperature.

12.3.6.1 CheckMinimumTxRiseFallTimes

This subsequence checks the minimum rise and fall times of a signal sent by transmitter.

Test description:

CheckMinimumTxRiseFallTimes (*Vbus*; *Ibus*)

```
for (i = 0; i < 2; i++)
    DTR0 (95)
    current = Ibus + GLOBAL_internalCurrent
    answer = QUERY CONTENT DTR0, accept No Answer
    if (answer == NO)
        error 1 No reply received at Vbus V and current mA for QUERY CONTENT DTR0.
    else
        fallTimeRelative = Measure (Time between 10 % and 90 % of the signal voltage
        swing for edge[i] falling edge in backward frame in µs)
        riseTimeRelative = Measure (Time between 10 % and 90 % of the signal voltage
        swing for edge[i] rising edge in backward frame in µs)
        if (fallTimeRelative < 3)
            error 2 Wrong fall time at Vbus V and current mA in edge[i] falling edge in
            backward frame. Actual: fallTimeRelative µs. Expected: >= 3 µs.
        endif
        if (riseTimeRelative < 3)
            error 3 Wrong rise time at Vbus V and current mA in edge[i] rising edge in
            backward frame. Actual: riseTimeRelative µs. Expected: >= 3 µs.
        endif
    endif
endfor
return
```

Table 32 – Parameters for test sequence Transmitter rising and falling edges

Test step i	edge
0	first
1	last

12.3.6.2 CheckMaximumTxRiseFallTimes

This subsequence checks the maximum rise and fall times of a signal sent by transmitter.

Test description:

CheckMaximumTxRiseFallTimes (*Vbus*; *Ibus*)

```
for (i = 0; i < 2; i++)
    DTR0 (95)
    current = Ibus + GLOBAL_internalCurrent
    answer = QUERY CONTENT DTR0, accept No Answer
    if (answer == NO)
        error 4 No reply received at Vbus V and current mA for QUERY CONTENT DTR0.
    else
        voltage = Measure (Last high voltage of signal before edge[i] edge in V)
        if (voltage < 12)
            fallTimeAbsolute = Measure (Time between (Vbus - 0,5) V and 4,5 V of edge[i]
            falling edge in backward frame in µs)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            riseTimeAbsolute = Measure (Time between 4,5 V and (Vbus - 0,5) V of edge[i]
            rising edge in backward frame in µs)
        else
            fallTimeAbsolute = Measure (Time between 11,5 V and 4,5 V of edge[i] falling
            edge in backward frame in µs)
            riseTimeAbsolute = Measure (Time between 4,5 V and 11,5 V of edge[i] rising
            edge in backward frame in µs)
        endif
        if (fallTimeAbsolute > 25)
            error 5 Wrong fall time at Vbus V and current mA in edge[i] falling edge in
            backward frame. Actual: fallTimeAbsolute µs. Expected: <= 25 µs.
        endif
        if (riseTimeAbsolute > 25)
            error 6 Wrong rise time at Vbus V and current mA in edge[i] rising edge in
            backward frame. Actual: riseTimeAbsolute µs. Expected: <= 25 µs.
        endif
    endif
endfor
return
```

Table 33 – Parameters for test sequence Transmitter rising and falling edges

Test step i	edge
0	first
1	last

12.3.7 Transmitter bit timing

This test sequence checks transmitter half bit time and double half bit timing being in limits.

Test sequence shall be run for all logical units in parallel.

Test description:

```
Apply (Current of GLOBAL_Ibus mA on bus interface)
if (GLOBAL_internalBPS)
    Vbus = 12
    Apply (Clamp bus voltage to Vbus V on bus interface)
else
    Vbus = 10
    Apply (Voltage of Vbus V on bus interface)
endif
// Test for maximum current and minimum voltage
CheckTxBitTiming (Vbus; GLOBAL_Ibus)
if (GLOBAL_Ibus > 0)
    // Test for 20,5 V and maximum current if possible
    Apply (Voltage of 20,5 V on bus interface)
    CheckTxBitTiming (20,5; GLOBAL_Ibus)
endif
if (GLOBAL_internalBPS)
    // Test at internal bus power supply voltage and maximum current if applicable
    Apply (Voltage of GLOBAL_internalVoltage V on bus interface)
    CheckTxBitTiming (GLOBAL_internalVoltage; GLOBAL_Ibus)
    // Test using only internal bus power supply if not covered by previous step
    if (GLOBAL_Ibus > 0)
        // Switch off test power supply
        Apply (Current of 0 mA on bus interface)
        CheckTxBitTiming (GLOBAL_internalVoltage; 0)
    endif
else
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    // Test for current equal to 8 mA and different voltages
    Apply (Current of 8 mA on bus interface)
    Apply (Voltage of 10 V on bus interface)
    CheckTxBitTiming (10; 8)
    Apply (Voltage of 20,5 V on bus interface)
    CheckTxBitTiming (20,5; 8)
endif
```

It is recommended that this test be repeated at the maximum and minimum operating temperature.

12.3.7.1 CheckTxBitTiming

This subsequence checks the bit timings of a signal sent by transmitter.

Test description:

CheckTxBitTiming (*Vbus*; *Ibus*)

```
for (i = 0; i < 24; i++)
    DTR0 (value[i])
    current = Ibus + GLOBAL_internalCurrent
    answer = QUERY CONTENT DTR0, accept No Answer
    if (answer == NO)
        error 1 No reply received at Vbus V and current mA for QUERY CONTENT DTR0.
    else
        // Note: high level measurements apply only after the start bit and before the stop condition
        timeTe = Measure (Time of period[i] of backward frame at 8 V in µs)
        if (TeNo[i] == 1)
            if (timeTe < 366,7 OR timeTe > 466,7)
                error 2 Incorrect half bit timing at period[i] in value[i]. Actual: timeTe µs. Expected: 366,7 µs <= half bit time <= 466,7 µs.
            else
                report 1 Half bit timing at period[i] in value[i]. Actual: timeTe µs.
            endif
        endif
        if (TeNo[i] == 2)
            if (timeTe < 733,3 OR timeTe > 933,3)
                error 3 Incorrect double half bit timing at period[i] in value[i]. Actual: timeTe µs. Expected: 733,3 µs <= double half bit time <= 933,3 µs.
            else
                report 2 Double half bit timing at period[i] in value[i]. Actual: timeTe µs.
            endif
        endif
    endif
endfor
return
```

Table 34 – Parameters for test sequence Transmitter bit timing

Test step i	period	value	TeNo
0	First low period	0	1
1	First high period	0	2
2	Second low period	0	1
3	Second high period	0	1
4	Last low period	0	1
5	Last high period	0	1
6	First low period	85	1

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step i	period	value	TeNo
7	First high period	85	1
8	Second low period	85	1
9	Second high period	85	2
10	Last low period	85	2
11	Last high period	85	2
12	First low period	170	1
13	First high period	170	1
14	Second low period	170	1
15	Second high period	170	2
16	Last low period	170	1
17	Last high period	170	2
18	First low period	255	1
19	First high period	255	1
20	Second low period	255	1
21	Second high period	255	1
22	Last low period	255	1
23	Last high period	255	1

12.3.8 Transmitter frame timing

Test sequence checks answer times being inside limits.

Test sequence shall be run for all logical units in parallel.

Test description:

```
minTime = 100
maxTime = 0
for (i = 0; i < 12; i++)
    DTR0 (value[i])
    for (j = 0; j < 10; j++)
        answer = QUERY CONTENT DTR0
        answerTime = Measure (Settling time between forward frame and backward frame of QUERY CONTENT DTR0 in ms)
        // Test transmitter forward backward frame settling time according to Table 17 IEC62386-101 Ed2.0
        if (answerTime < 5,5 OR answerTime > 10,5)
            error 1 Incorrect answer time at test step (i,j) = (i,j). Actual: answerTime ms. Expected: 5,5 ms <= settling time <= 10,5 ms.
        endif
        if (answerTime < minTime)
            minTime = answerTime
        endif
        if (answerTime > maxTime)
            maxTime = answerTime
        endif
    endfor
endfor
report 1 Minimum measured settling time is minTime ms.
report 2 Maximum measured settling time is maxTime ms.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 35 – Parameters for test sequence Receiver frame timing

Test step i	0	1	2	3	4	5	6	7	8	9	10	11
value	0	1	2	4	8	16	32	64	85	128	170	255

It is recommended that this test be repeated at the maximum and minimum operating temperature.

12.3.9 Receiver start-up behavior

Test sequences tests if

- 40 ms bus power interruptions are ignored by control gear; tested four times
- start-up behavior after a external power cycle is correct; tested four times. In case of no internal bus power supply four different times are used.
- start-up behavior after a bus power failure is correct

Test sequence shall be run for all logical units in parallel.

Test description:

```
for (i = 0; i < 4; i++)
    // 40 ms bus power interruption
    wait 7 s
    Apply (Voltage of 0 V on bus interface)
    wait 40 ms
    if (GLOBAL_internalBPS)
        Apply (Clamp voltage to 12 V on bus interface)
    else
        Apply (Voltage of 10 V on bus interface)
    endif
    wait 2,4 ms // stop condition
    answer = QUERY CONTROL GEAR PRESENT
    if (answer != YES)
        error 1 No communication after 40 ms bus power supply interruption at test step i =
        i.
    endif
    // External power cycle start-up
    if (!GLOBAL_internalBPS)
        Apply (Voltage of 0 V on bus interface)
    endif
    base = PowerCycleAndWaitForBusPower (60)
    start_timer (timer)
    if (GLOBAL_internalBPS)
        Apply (Clamp voltage to 12 V on bus interface)
    else
        wait delayTime[i] ms
        Apply (Voltage of 10 V on bus interface and a current supply of 8 mA)
    endif
    value = base + get_timer (timer) // Get time in ms between power cycle and bus power
    supply restored
    if (GLOBAL_busPowered)
        waitTime = 1200 // Maximum boot time
    else
        // Check for note e, table 6, IEC 62386-101 Ed2.0
        if (value < 350)
            waitTime = 450 – value
        else
            waitTime = 100
        endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    endif
    wait waitTime ms // Device should be ready now, all circumstances checked
    answer = QUERY CONTROL GEAR PRESENT
    if (answer != YES)
        error 2 No communication after waitTime ms after bus power supply available after external power cycle at test step i = i.
    endif
    // Bus power failure start-up
    wait 1200 ms
    Apply (Voltage of 0 V on bus interface)
    wait busPowerDown[i] ms
    if (GLOBAL_internalBPS)
        Apply (Clamp voltage to 12 V on bus interface)
    else
        Apply (Voltage of 10 V on bus interface)
    endif
    if (GLOBAL_busPowered)
        waitTime = 1200
    else
        waitTime = 100
    endif
    wait waitTime ms
    answer = QUERY CONTROL GEAR PRESENT
    if (answer != YES)
        error 3 No communication after waitTime ms after bus power down period of busPowerDown[i] ms at test step i = i.
    endif
endfor
```

Table 36 – Parameters for test sequence Receiver start-up behavior

Test step i	0	1	2	3
delayTime [ms]	50	250	340	500
busPowerDown [ms]	100	500	1000	2000

It is recommended that this test be repeated at the maximum and minimum operating temperature.

12.3.10 Receiver threshold

The test sequence checks if the receiver threshold is in the expected range.

Test sequence shall be run for all logical units in parallel.

Test description:

```
for (Vbus = 9,5; Vbus <= 10; Vbus = Vbus + 0,5)
    for (i = 0; i < 20; i++)
        DTR0 (55)
        Apply (Voltage of Vbus V on bus interface)
        Apply (DTR0 (255) with low voltage of 6,5 V)
        Apply (Voltage of GLOBAL_VbusHigh V on bus interface)
        answer = QUERY CONTENT DTR0, accept No Answer
        if (answer != 255)
            if (Vbus < 10)
                warning 1 DTR0 (255) not executed correctly for a bus high voltage of Vbus V and a bus low voltage of 6,5 V. Loop: i Actual: answer. Expected: 255.
            else
                error 1 DTR0 (255) not executed correctly for a bus high voltage of Vbus V and a bus low voltage of 6,5 V. Loop: i Actual: answer. Expected: 255.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            endif
        endif
    endfor
endfor
```

It is recommended that this test be repeated at the maximum and minimum operating temperature.

12.3.11 Receiver bit timing

The test sequence checks receiver decoder bit timing compliance:

- for different half bit timings;
- for half bit and double half bit timing violations;
- for different high and low bus voltages.

Test sequence shall be run for all logical units in parallel.

Test description:

```
Vbus = GLOBAL_VbusHigh
for (i = 0; i < 4; i++)
    // Command byte send with nominal timing; boundary combinations in 2nd byte.
    for (m = 0; m < 5; m++)
        lowTime = TeLowTime[m]
        for (n = 0; n < 5; n++)
            highTime = TeHighTime[n]
            for (j = 0; j < 10; j++)
                DTR0 (0)
                // All other commands shall be executed with nominal timing
                Apply (command[i] with bit timings given in Table)
                answer = QUERY CONTENT DTR0
                if (answer != expectation[i])
                    error 1 command[i] not correctly executed at half bit high time highTime µs half bit low time lowTime µs. Actual: answer. Expected: expectation[i].
                endif
            endfor
        endfor
    endfor
endfor
for (i = 4; i < 11; i++)
    // step 4: no violation
    // step 5: 750 µs half bit violation high bit 5
    // step 6: 750 µs half bit violation low bit 2
    // step 7: 1250 µs double half bit violation low bit 4 and 3
    // step 8: 1250 µs double half bit violation low bit 8 and 7
    // step 9: 1200 µs double half bit violation low bit 4 and 3
    // step 10:1200 µs double half bit violation low bit 8 and 7
    for (l = 0; l < 2; l++)
        if (GLOBAL_internalBPS)
            if (l == 1)
                Vbus = 12
            endif
        else
            Vbus = busVoltage[l]
        endif
        for (j = 0; j < 10; j++)
            DTR0 (0)
            Apply (command[i] with bit timings and voltages given in Table)
            answer = QUERY CONTENT DTR0
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                if (answer != expectation[i])
                    error 2 command[i] not correctly processed for bus voltage of Vbus V at
                    step i. Actual: answer. Expected: expectation[i].
                endif
            endfor
        endfor
    endfor
```

Table 37 – Parameters for test sequence Receiver bit timing

Test step m	0	1	2	3	4
TeLowTime [µs]	334	375	416	458	500

Test step n	0	1	2	3	4
TeHighTime [µs]	334	375	416	458	500

Test step l	0	1
busVoltage [V]	10	20,5

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step i	0		1		2		3		4		5		6		7		8		9		10	
command	DTR0 (240)		DTR0 (15)		DTR0 (85)		DTR0 (255)		DTR0 (15)		DTR0 (15)		DTR0 (15)		DTR0 (15)		DTR0 (15)		DTR0 (15)		DTR0 (15)	
expectation	240		15		85		255		15		0		0		0		0		0		0	
voltage / time	bus voltage [V]	time [µs] at 8V	bus voltage [V]	time [µs] at 8V	bus voltage [V]	time [µs] at 8V	bus voltage [V]	time [µs] at 8V	bus voltage [V]	time [µs] at 8V	bus voltage [V]	time [µs] at 8V	bus voltage [V]	time [µs] at 8V	bus voltage [V]	time [µs] at 8V	bus voltage [V]	time [µs] at 8V	bus voltage [V]	time [µs] at 8V	bus voltage [V]	time [µs] at 8V
start bit	0	416	0	416	0	416	0	416	0	334	0	334	0	334	0	334	0	334	0	334	0	334
	VBus	416	VBus	416	VBus	416	VBus	416	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500
bit 15	0	416	0	416	0	416	0	416	0	334	0	334	0	334	0	334	0	334	0	334	0	334
	VBus	416	VBus	416	VBus	416	VBus	416	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500
bit 14	VBus	416	VBus	416	VBus	416	VBus	416	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334
	0	416	0	416	0	416	0	416	0	500	0	500	0	500	0	500	0	500	0	500	0	500
bit 13	0	416	0	416	0	416	0	416	0	500	0	500	0	500	0	500	0	500	0	500	0	500
	VBus	416	VBus	416	VBus	416	VBus	416	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334
bit 12	VBus	416	VBus	416	VBus	416	VBus	416	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500
	0	416	0	416	0	416	0	416	0	334	0	334	0	334	0	334	0	334	0	334	0	334
bit 11	VBus	416	VBus	416	VBus	416	VBus	416	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500
	0	416	0	416	0	416	0	416	0	334	0	334	0	334	0	334	0	334	0	334	0	334
bit 10	VBus	416	VBus	416	VBus	416	VBus	416	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334
	0	416	0	416	0	416	0	416	0	334	0	334	0	334	0	334	0	334	0	334	0	334
bit 9	0	416	0	416	0	416	0	416	0	500	0	500	0	500	0	500	0	500	0	500	0	500
	VBus	416	VBus	416	VBus	416	VBus	416	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500
bit 8	0	416	0	416	0	416	0	416	0	500	0	500	0	500	0	500	0	500	0	500	0	500
	VBus	416	VBus	416	VBus	416	VBus	416	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	600
bit 7	0	lowTime	VBus	highTime	VBus	highTime	0	highTime	VBus	334	VBus	334	VBus	334	VBus	334	VBus	750	VBus	334	VBus	600
	VBus	highTime	0	lowTime	0	lowTime	VBus	lowTime	0	500	0	500	0	500	0	500	0	500	0	500	0	500
bit 6	0	lowTi	VBus	high	0	high	0	high	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Test step i	0		1		2		3		4		5		6		7		8		9		10	
		me		Time		Time		Time														
	VBus	high Time	0	lowTime	VBus	lowTime	VBus	lowTime	0	500	0	500	0	334	0	500	0	500	0	500	0	500
bit 5	0	lowTime	VBus	high Time	VBus	high Time	0	high Time	VBus	334	VBus	750	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334
	VBus	high Time	0	lowTime	0	lowTime	VBus	lowTime	0	334	0	334	0	334	0	334	0	500	0	500	0	334
bit 4	0	lowTime	VBus	high Time	0	high Time	0	high Time	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334
	VBus	high Time	0	lowTime	VBus	lowTime	VBus	lowTime	0	500	0	500	0	500	0	500	0	500	0	600	0	500
bit 3	VBus	high Time	0	lowTime	VBus	lowTime	0	lowTime	0	500	0	500	0	500	0	750	0	500	0	600	0	500
	0	lowTime	VBus	high Time	0	high Time	VBus	high Time	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334
bit 2	VBus	high Time	0	lowTime	0	lowTime	0	lowTime	0	500	0	500	0	750	0	500	0	500	0	500	0	500
	0	lowTime	VBus	high Time	VBus	high Time	VBus	high Time	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500
bit 1	VBus	high Time	0	lowTime	VBus	lowTime	0	lowTime	0	334	0	334	0	334	0	334	0	334	0	334	0	334
	0	lowTime	VBus	high Time	0	high Time	VBus	high Time	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334
bit 0	VBus	high Time	0	lowTime	0	lowTime	0	lowTime	0	334	0	334	0	334	0	334	0	334	0	334	0	334
	0	lowTime	VBus	high Time	VBus	high Time	VBus	high Time	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500

It is recommended that this test be repeated at the maximum and minimum operating temperature.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

12.3.12 Extended receiver bit timing

All phase lengths (half bits and double half bits) are set to the same value. One phase is set to special test value, resulting in a still valid waveform or causing a bit timing violation. The test is repeated for different idle bus voltages.

Test sequence shall be run for all logical units in parallel.

Test description:

```
waveForm[28]   = {417,  417,  417,  833,  833,  833,  417,  417,  417,  417,
                  833,  417,  417,  833,  417,  417,  417,  417,  417,  417,
                  833,  417,  417,  417,  417,  417,  417,  417}
                  // nominal timing for command DTR0(15)
for (i = 0; i <= 1; i++)
    for (j = 0; j <= 8; j++)
        for (k = 0; k <= 27; k ++) // k selects phase position to modify
            // assemble the test frame
            expected = expect[j]
            for (x = 0; x <= 27; x++)
                if (x == k)
                    // insert the modified phase length at the selected phase position
                    if (phase[x] == H)
                        // if a half bit starts in the middle of a logical bit it shall not be
                        extended as it would result in an valid double half bit and not in a
                        bit timing violation.
                        if (expect[j] == accept OR bitstart[x] == Y)
                            waveForm [x] = modHalf[j]
                        else
                            waveForm [x] = half[j]
                            expected = accept
                        endif
                    else
                        waveForm [x] = modDouble[j]
                    endif
                else
                    // use a valid phase length at all other phase positions
                    if (phase[x] == H)
                        waveForm [x] = half[j]
                    else
                        waveForm [x] = double[j]
                    endif
                endif
            endfor
            // send the test frame
            for (x = 0; x < 10; x++)
                DTR0(0)
                // All other commands shall be executed with nominal timing
                if (i == 0)
                    // minimum voltage
                    if (GLOBAL_internalBPS)
                        Apply (Clamp voltage to 12 V on bus interface)
                        busVoltage = 12
                    else
                        Apply (Voltage of 10 V on bus interface)
                        busVoltage = 10
                    endif
                else
                    // maximum voltage
                    if (GLOBAL_Ibus == 0)
                        Apply (Voltage of GLOBAL_VbusHigh V on bus interface)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                busVoltage = GLOBAL_VbusHigh
            else
                Apply (Voltage of 20,5 V on bus interface)
                busVoltage = 20,5
            endif
        endif
        Apply (waveForm[])
        Apply (Voltage of GLOBAL_VbusHigh on bus interface)
        answer = QUERY CONTENT DTR0
        if (expected == accept)
            if (answer != 15)
                error 1 Test command DTR0 (15) not correctly executed with a
                half bit time half[j] µs and double half bit time double[j] µs and a
                modified half bit time modHalf[j] µs respectively double half bit
                time modDouble[j] µs at signal phase k. Bus Voltage: busVoltage.
                Actual: answer. Expected: 15.
            endif
        else
            if (answer != 0)
                error 2 Test command DTR0 (15) not ignored or executed falsely
                with a half bit time half[j] µs and double half bit time double[j] µs
                and a modified half bit time modHalf[j] µs respectively double half
                bit time modDouble[j] µs at signal phase k. Bus Voltage:
                busVoltage. Actual: answer. Expected: 0.
            endif
        endif
    endfor
  endfor
 endfor
endfor
```

Table 38 – Parameters for test sequence Extended receiver bit timing

Test step j	half [µs]	double [µs]	modHalf [µs]	modDouble [µs]	expect
0	417	833	500	1 000	accept
1	417	833	334	667	accept
2	334	667	500	1 000	accept
3	500	1 000	334	667	accept
4	334	1 000	500	667	accept
5	500	667	334	1 000	accept
6	417	833	750	1 200	ignore
7	334	667	750	1 200	ignore
8	500	1 000	750	1 200	ignore

Phase x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
phase	H	H	H	D	D	D	H	H	H	H	D	H	H	D	H	H	H	H	H	H	D	H	H	H	H	H	H	H
bitstart	Y	N	Y	N	N	N	N	Y	N	Y	N	N	Y	N	N	Y	N	Y	N	Y	N	N	Y	N	Y	N	Y	N

It is recommended that this test be repeated at the maximum and minimum operating temperature.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.3.13 Receiver forward frame violation

The test sequences checks if the receiver is able to recover after the reception of a non-standard forward frame.

Test sequence shall be run for all logical units in parallel.

Test description:

```
for (i = 0; i < 5; i++)
    for (j = 0; j < 10; j++)
        DTR0 (value[i])
        // waveform sent directly after last rising edge of DTR0 command
        answer = waveForm[i]
        if (answer != value[i])
            error 1 text[i]. Loop: j. Actual: answer. Expected: value[i].
        endif
    endfor
endfor
```

Table 39 – Parameters for test sequence Receiver frame violation and recovering after frame size violation

Test step i	value	waveForm	text
0	7	2400 µs + 1101000111111100000b + 2400 µs + 11111111110011000b	DTR0 (240) with frame size violation changed the content of DTR0
1	10	2400 µs + 1010b + 2400 µs + 11111111110011000b	Few bits (frame size violation) changed the content of DTR0
2	0	2400 µs + 1101000110001010110101010b + 2400 µs + 11111111110011000b	20 bit frame containing DTR0 (15) in first 16 bits not ignored
3	0	2400 µs + 11010001100010101101010101010b + 2400 µs + 11111111110011000b	24 bit frame containing DTR0 (15) in first 16 bits not ignored
4	0	2400 µs + 110100011000101011010101010101010b + 2400 µs + 11111111110011000b	32 bit frame containing DTR0 (15) in first 16 bits not ignored

12.3.14 Receiver settling timing

Test sequence checks if

- forward-forward (FF-FF) frames with valid settling times are accepted;
- fForward-forward (FF-FF) frames with invalid settling times are rejected;
- backward-forward (BF-FF) frames with valid settling times are accepted;
- backward-forward (BF-FF) frames with invalid settling times are rejected.

Test sequence shall be run for all logical units in parallel.

Test description:

```
// FF-FF frame tests
for (i = 0; i < 4; i++)
    for (j = 0; j < 12; j++)
        DTR0 (13)
        DTR1 (13)
        DTR0 (value[j])
        wait settlingTime[i] ms // settling time between FF-FF
        DTR1 (value[j])
        answer0 = QUERY CONTENT DTR0
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        answer1 = QUERY CONTENT DTR1
        if (i < 2)
            if (answer0 != value[j])
                error 1 Unexpected value for DTR0 for FF-FF settling time set to settlingTime[i] ms. Actual: answer0. Expected: value[j].
            endif
            if (answer1 != value[j])
                error 2 Unexpected value for DTR1 for FF-FF settling time set to settlingTime[i] ms. Actual: answer1. Expected: value[j].
            endif
        else
            if (answer0 != 13)
                error 3 Unexpected value for DTR0 for FF-FF settling time set to settlingTime[i] ms. Actual: answer0. Expected: 13.
            endif
            if (answer1 != 13)
                error 4 Unexpected value for DTR1 for FF-FF settling time set to settlingTime[i] ms. Actual: answer1. Expected: 13.
            endif
        endif
    endfor
endfor
// BF-FF frame tests
for (i = 0; i < 4; i++)
    for (j = 0; j < 12; j++)
        DTR1 (13)
        answer0 = QUERY CONTENT DTR0
        wait settlingTime[i] ms // settling time between BF-FF
        DTR1 (value[j])
        answer1 = QUERY CONTENT DTR1
        if (i < 2)
            if (answer1 != value[j])
                error 5 DTR1 not accepted for BF-FF settling time set to settlingTime[i] ms. Actual: answer1. Expected: value[j].
            endif
        else
            if (answer1 != 13)
                error 6 DTR1 not ignored for BF-FF settling time set to settlingTime[i] ms. Actual: answer1. Expected: 13.
            endif
        endif
    endfor
endfor
```

Table 40 – Parameters for test sequence Receiver frame timing

Test step i	0	1	2	3
settlingTime [ms]	3	2,4	1,4	1,2

Test step j	0	1	2	3	4	5	6	7	8	9	10	11
value	0	1	2	4	8	16	32	64	85	128	170	255

It is recommended that this test be repeated at the maximum and minimum operating temperature.

12.3.15 Receiver frame timing FF-FF send twice

Test sequence checks if

- send twice frames with maximum send twice settling time between the forward frames are correctly received;

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

- if send twice commands with one command in-between for minimum settling times are ignored.

Test sequence shall be run for all logical units in parallel.

Test description:

```
for (value = 0; value < 16; value++)
    // Correct reception for maximum send twice settling time
    DTR0 (value)
    SET SCENE (value)
    DTR0 (value + 1)
    SET SCENE (value), send once
    wait 94 ms // settling time
    SET SCENE (value), send once
    answer = QUERY SCENE LEVEL (value)
    if (answer != value + 1)
        error 1 Send twice SET SCENE (value) within 94 ms settling time between forward
        frames not accepted. Actual: answer. Expected: value + 1.
    endif
    // Ignore send twice for too long send twice settling time
    DTR0 (value)
    SET SCENE (value)
    DTR0 (value + 1)
    SET SCENE (value), send once
    wait 105 ms // settling time
    SET SCENE (value), send once
    answer = QUERY SCENE LEVEL (value)
    if (answer != value)
        error 2 Send twice SET SCENE (value) within 105 ms settling time between forward
        frames not ignored. Actual: answer. Expected: value.
    endif
endfor
// Ignore send twice command for command in-between with minimum settling times
for (value = 0; value < 16; value++)
    DTR0 (value)
    DTR1 (255)
    SET SCENE (value)
    DTR0 (value + 1)
    SET SCENE (value), send once
    wait 13,5 ms // settling time
    DTR1 (value)
    wait 13,5 ms // settling time
    SET SCENE (value), send once
    answer = QUERY SCENE LEVEL (value)
    if (answer != value)
        error 3 Send twice not ignored for command in-between at test step = value. Actual:
        answer. Expected: value.
    endif
    answer = QUERY CONTENT DTR1
    if (answer != value)
        error 4 Command in-between DTR1 (value) not correctly executed at test step =
        value. Actual: answer. Expected: value.
    endif
endfor
// Ignore send twice command for command in-between with minimum settling times, accept
2nd send twice
for (value = 0; value < 16; value++)
    DTR0 (value)
    DTR1 (255)
    SET SCENE (value)
    DTR0 (value + 1)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    SET SCENE (value), send once
    wait 13,5 ms // settling time
    DTR1 (value)
    wait 13,5 ms // settling time
    SET SCENE (value), send once
    wait 80 ms // settling time
    SET SCENE (value), send once
    answer = QUERY SCENE LEVEL (value)
    if (answer != value + 1)
        error 5 Second send twice ignored for command in-between at test step = value.
        Actual: answer. Expected: value + 1.
    endif
    answer = QUERY CONTENT DTR1
    if (answer != value)
        error 6 Command in-between DTR1 (value) not correctly executed at test step =
        value. Actual: answer. Expected: value.
    endif
endfor
```

It is recommended that this test be repeated at the maximum and minimum operating temperature.

12.4 Configuration instructions

12.4.1 RESET

In this test sequence all user programmable parameters of DUT are set to non-reset values. After sending a RESET command or after setting the user programmable parameters of DUT back to their reset values, the parameters shall be checked for their reset values. The resetState and the status of DUT are checked also after each change of the parameters.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
answer = QUERY STATUS
if (answer != XX100XXXb)
    error 1 Wrong answer at QUERY STATUS after RESET command. Actual: answer.
    Expected: XX100XXXb.
endif
PHM = QUERY PHYSICAL MINIMUM
for (i = 0; i < 40; i++)
    for (j = 0; j < 2; j++)
        if (i == 2)
            DTR0 (PHM + 1)
        else
            DTR0 (1)
        endif
        command1[i]
        answer = QUERY RESET STATE
        if (answer != reset[i])
            error 2 Wrong answer at QUERY RESET STATE at test step (i,j) = (i,j). Actual:
            answer. Expected: reset[i].
        endif
        answer = QUERY STATUS
        if (answer != status[i])
            error 3 Wrong answer at QUERY STATUS at test step (i,j) = (i,j). Actual:
            answer. Expected: status[i].
        endif
        if (j == 0)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            RESET
            wait 300 ms
        else
            if (i == 5)
                DTR0 (0)
            else
                DTR0 (value[i])
            endif
            command2[i]
        endif
        answer = query[i]
        if (answer != value[i])
            error 4 No RESET of errorText[i] at test step (i,j) = (i,j). Actual: answer.
            Expected: value[i].
        endif
        answer = QUERY RESET STATE
        if (answer != YES)
            error 5 Wrong answer at QUERY RESET STATE at test step (i,j) = (i,j). Actual:
            answer. Expected: YES.
        endif
        answer = QUERY STATUS
        if (answer != XX100XXXb)
            error 6 Wrong answer at QUERY STATUS at test step (i,j) = (i,j). Actual:
            answer. Expected: XX100XXXb.
        endif
    endfor
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 41 – Parameters for test sequence RESET

Test step i	command1	command2	query	value	reset		status		errorText
					PHM != 254	PHM = 254	PHM != 254	PHM = 254	
0	SET POWER ON LEVEL	SET POWER ON LEVEL	QUERY POWER ON LEVEL	0xFE	NO	NO	XX000XXXb	XX000XXXb	powerOnLevel
1	SET SYSTEM FAILURE LEVEL	SET SYSTEM FAILURE LEVEL	QUERY SYSTEM FAILURE LEVEL	0xFE	NO	NO	XX000XXXb	XX000XXXb	systemFailureLevel
2	SET MIN LEVEL	SET MIN LEVEL	QUERY MIN LEVEL	*PHM*	NO	YES	XX000XXXb	XX100XXXb	minLevel
3	SET MAX LEVEL	SET MAX LEVEL	QUERY MAX LEVEL	0xFE	NO	YES	XX001XXXb	XX100XXXb	maxLevel
4	SET FADE RATE	SET FADE RATE	QUERY FADE TIME/FADE RATE	0x07	NO	NO	XX000XXXb	XX000XXXb	fadeRate/fadeTime
5	SET FADE TIME	SET FADE TIME	QUERY FADE TIME/FADE RATE	0x07	NO	NO	XX000XXXb	XX000XXXb	fadeRate/fadeTime
6	ADD TO GROUP 0	REMOVE FROM GROUP 0	QUERY GROUPS 0-7	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups0-7
7	ADD TO GROUP 1	REMOVE FROM GROUP 1	QUERY GROUPS 0-7	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups0-7
8	ADD TO GROUP 2	REMOVE FROM GROUP 2	QUERY GROUPS 0-7	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups0-7
9	ADD TO GROUP 3	REMOVE FROM GROUP 3	QUERY GROUPS 0-7	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups0-7
10	ADD TO GROUP 4	REMOVE FROM GROUP 4	QUERY GROUPS 0-7	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups0-7
11	ADD TO GROUP 5	REMOVE FROM GROUP 5	QUERY GROUPS 0-7	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups0-7
12	ADD TO GROUP 6	REMOVE FROM GROUP 6	QUERY GROUPS 0-7	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups0-7
13	ADD TO GROUP 7	REMOVE FROM GROUP 7	QUERY GROUPS 0-7	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups0-7
14	ADD TO GROUP 8	REMOVE FROM GROUP 8	QUERY GROUPS 8-15	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups8-15
15	ADD TO GROUP 9	REMOVE FROM GROUP 9	QUERY GROUPS 8-15	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups8-15
16	ADD TO GROUP 10	REMOVE FROM GROUP 10	QUERY GROUPS 8-15	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups8-15
17	ADD TO GROUP 11	REMOVE FROM GROUP 11	QUERY GROUPS 8-15	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups8-15
18	ADD TO GROUP 12	REMOVE FROM GROUP 12	QUERY GROUPS 8-15	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups8-15
19	ADD TO GROUP 13	REMOVE FROM GROUP	QUERY GROUPS 8-15	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups8-15

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Test step i	command1	command2	query	value	reset		status		errorText
					PHM != 254	PHM = 254	PHM != 254	PHM = 254	
		13							
20	ADD TO GROUP 14	REMOVE FROM GROUP 14	QUERY GROUPS 8-15	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups8-15
21	ADD TO GROUP 15	REMOVE FROM GROUP 15	QUERY GROUPS 8-15	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups8-15
22	SET SCENE 0	SET SCENE 0	QUERY SCENE LEVEL 0	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene0
23	SET SCENE 1	SET SCENE 1	QUERY SCENE LEVEL 1	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene1
24	SET SCENE 2	SET SCENE 2	QUERY SCENE LEVEL 2	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene2
25	SET SCENE 3	SET SCENE 3	QUERY SCENE LEVEL 3	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene3
26	SET SCENE 4	SET SCENE 4	QUERY SCENE LEVEL 4	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene4
27	SET SCENE 5	SET SCENE 5	QUERY SCENE LEVEL 5	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene5
28	SET SCENE 6	SET SCENE 6	QUERY SCENE LEVEL 6	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene6
29	SET SCENE 7	SET SCENE 7	QUERY SCENE LEVEL 7	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene7
30	SET SCENE 8	SET SCENE 8	QUERY SCENE LEVEL 8	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene8
31	SET SCENE 9	SET SCENE 9	QUERY SCENE LEVEL 9	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene9
32	SET SCENE 10	SET SCENE 10	QUERY SCENE LEVEL 10	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene10
33	SET SCENE 11	SET SCENE 11	QUERY SCENE LEVEL 11	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene11
34	SET SCENE 12	SET SCENE 12	QUERY SCENE LEVEL 12	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene12
35	SET SCENE 13	SET SCENE 13	QUERY SCENE LEVEL 13	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene13
36	SET SCENE 14	SET SCENE 14	QUERY SCENE LEVEL 14	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene14
37	SET SCENE 15	SET SCENE 15	QUERY SCENE LEVEL 15	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene15
38	SET EXTENDED FADE TIME	SET EXTENDED FADE TIME	QUERY EXTENDED FADE TIME	0x00	NO	NO	XX000XXXb	XX000XXXb	extendedFadeTimeBase/Multiplier
39	DAPC (*PHM*)	DAPC (254)	QUERY ACTUAL LEVEL	254	YES	YES	XX100XXXb	XX100XXXb	lastLightLevel

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printed.

12.4.2 RESET: timeout / command in-between

The command RESET shall be executed only if it is received twice.

This test sequence checks the behaviour of DUT in the following conditions:

- one single RESET command is sent instead of two identical commands;
- RESET command is sent twice with a settling time of 105 ms which is longer than the defined settling time;
- RESET command is sent with a frame in-between, frame which consists of few bits, but not a command;
- RESET command is sent with a command in-between, command which is broadcast sent;
- RESET command is sent with a command in-between, command which is sent to a certain group address;
- RESET command is sent with a command in-between, command which is sent to a certain short address;
- RESET command is sent with a command in-between, and RESET command is sent again once.

In the first five cases, the RESET command should not be executed. In the last case RESET command should be executed. Where given, the command in-between should be accepted.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
// Test send RESET once
ADD TO GROUP 0
RESET, send once
wait 400 ms //100 ms for "virtual" send-twice + 300 ms needed for RESET
answer = QUERY GROUPS 0-7
if (answer != 0x01)
    error 1 RESET sent once executed. Actual: answer. Expected: 0x01.
endif
// Test send RESET with timeout
ADD TO GROUP 0
RESET, send once
wait 105 ms // settling time
RESET, send once
wait 300 ms
answer = QUERY GROUPS 0-7
if (answer != 0x01)
    error 2 RESET with timeout executed. Actual: answer. Expected: 0x01.
endif
// Test send RESET with a frame in-between
ADD TO GROUP 0
// The following 3 steps must be sent within 75 ms, counted from the last rise bit of first "RESET, send once" command until first fall bit of second "RESET, send once" command
RESET, send once
idle 13 ms + 110010 + idle 13 ms // settling time: idle 13 ms followed by a frame, followed by 13 ms
RESET, send once
wait 300 ms
answer = QUERY GROUPS 0-7
if (answer != 0x01)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    error 3 RESET with few bits in-between executed. Actual: answer. Expected: 0x01.
endif
// Test send RESET with broadcast command in-between
ADD TO GROUP 0
RECALL MAX LEVEL
// The following 3 steps must be sent within 75 ms, counted from the last rise bit of first "RESET, send once" command until first fall bit of second "RESET, send once" command
RESET, send once
RECALL MIN LEVEL
RESET, send once
wait 300 ms
answer = QUERY GROUPS 0-7
if (answer != 0x01)
    error 4 RESET with command in-between executed. Actual: answer. Expected: 0x01.
endif
answer = QUERY ACTUAL LEVEL
if (answer != PHM)
    error 5 Command in-between RESET not executed. Actual: answer. Expected: PHM.
endif
// Test send RESET with group command in-between
ADD TO GROUP 0
RECALL MAX LEVEL
// The following 3 steps must be sent within 75 ms, counted from the last rise bit of first "RESET, send once" command until first fall bit of second "RESET, send once" command
RESET, send once
RECALL MIN LEVEL, send to 10000001b // gearGroup 0
RESET, send once
wait 300 ms
answer = QUERY GROUPS 0-7
if (answer != 0x01)
    error 6 RESET with command in-between executed. Actual: answer. Expected: 0x01.
endif
answer = QUERY ACTUAL LEVEL
if (answer != PHM)
    error 7 Command in-between RESET not executed. Actual: answer. Expected: PHM.
endif
// Test send RESET with short command in-between
ADD TO GROUP 0
RECALL MAX LEVEL
oldAddress = GLOBAL_currentUnderTestLogicalUnit
newAddress = 63
SetShortAddress (oldAddress; newAddress)
// The following 3 steps must be sent within 75 ms, counted from the last rise bit of first "RESET, send once" command until first fall bit of second "RESET, send once" command
RESET, broadcast, send once
RECALL MIN LEVEL, send to ((newAddress << 1) + 1)
RESET, broadcast, send once
wait 300 ms
answer = QUERY GROUPS 0-7, send to ((newAddress << 1) + 1)
if (answer != 0x01)
    error 8 RESET with command in-between executed. Actual: answer. Expected: 0x01.
endif
answer = QUERY ACTUAL LEVEL, send to ((newAddress << 1) + 1)
if (answer != PHM)
    error 9 Command in-between RESET not executed. Actual: answer. Expected: PHM.
endif
SetShortAddress (newAddress; oldAddress)
// Test send RESET with broadcast command in-between, and again a new RESET command sent once
ADD TO GROUP 0
DTR0 (0)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
// The following 4 steps must be sent within 75 ms, counted from the last rise bit of first "RESET, send once" command until first fall bit of third "RESET, send once" command
RESET, send once
DTR0 (1)
RESET, send once
RESET, send once
wait 300 ms
answer = QUERY GROUPS 0-7
if (answer != 0x00)
    error 10 RESET command not executed. Actual: answer. Expected: 0x00.
endif
answer = QUERY CONTENT DTR0
if (answer != 1)
    error 11 Command in-between RESET not executed. Actual: answer. Expected: 1.
endif
```

12.4.3 Send-twice timeout

Any configuration instruction shall be executed only it is received twice.

In this test sequence, all user programmable parameters of the DUT are attempted to be changed using configuration instructions sent as follows:

- one single command is sent instead of two identical commands, therefore the parameter should not change;
- command is sent twice with a settling time of 105 ms, which is longer than the defined settling time, therefore the parameter should not change;
- command is sent three times with a settling time between the first two commands of 105 ms and a settling time between the next two commands of 50 ms. Therefore, the first command should be ignored, and the next two should be interpreted as a send-twice command. As a consequence the parameter should change.

Test sequence shall be run for each selected logical unit.

Test description:

```
PHM = QUERY PHYSICAL MINIMUM
oldAddress = GLOBAL_currentUnderTestLogicalUnit
newAddress = 63
for (i = 0; i < 75; i++)
    RESET
    wait 300 ms
    for (j = 0; j < 3; j++)
        DTR0 (10)
        command1[i]
        if (j == 0) // Test send command once
            command2[i], send once
        else if (j == 1) // Test send command with timeout
            command2[i], send once
            wait 105 ms // settling time
            command2[i], send once
        else // Test send command with timeout followed by a new command
            command2[i], send once
            wait 105 ms // settling time
            command2[i], send once
            wait 50 ms // settling time
            command2[i], send once
        endif
        answer = query[i]
        if (answer != value[i])
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            error 1 Wrong setting of errorText[i] at test step (i,j) = (i,j). Actual: answer.
            Expected: value[i].
        endif
        if (i != 74)
            answer = QUERY RESET STATE
        else
            answer = QUERY RESET STATE, send to (address[j] << 1 + 1)
        endif
        if (answer != reset[i])
            error 2 Wrong answer at QUERY RESET STATE at test step (i,j) = (i,j). Actual:
            answer. Expected: reset[i].
        endif
        if (i != 74)
            answer = QUERY STATUS
        else
            answer = QUERY STATUS, send to (address[j] << 1 + 1)
        endif
        if (answer != status[i])
            error 3 Wrong answer at QUERY STATUS at test step (i,j) = (i,j). Actual:
            answer. Expected: status[i].
        endif
    endfor
    if (i == 69 OR i == 70)
        TERMINATE
    endif
endfor
SetShortAddress (newAddress; oldAddress)
```

Table 42 – Parameters for test sequence Send twice timeout

Test step j	address
0	oldAddress
1	oldAddress
2	newAddress

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step i	command1	command2	query	value			reset			status			errorText
				j != 2	j = 2		j != 2	j = 2		j != 2	j = 2		
					PHM != 254	PHM = 254		PHM != 254	PHM = 254		PHM != 254	PHM = 254	
0	-	ADD TO GROUP 0	QUERY GROUPS 0-7	0x00	1	1	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups0-7
1	ADD TO GROUP 0	REMOVE FROM GROUP 0	QUERY GROUPS 0-7	1	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups0-7
2	-	ADD TO GROUP 1	QUERY GROUPS 0-7	0x00	2	2	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups0-7
3	ADD TO GROUP 1	REMOVE FROM GROUP 1	QUERY GROUPS 0-7	2	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups0-7
4	-	ADD TO GROUP 2	QUERY GROUPS 0-7	0x00	4	4	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups0-7
5	ADD TO GROUP 2	REMOVE FROM GROUP 2	QUERY GROUPS 0-7	4	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups0-7
6	-	ADD TO GROUP 3	QUERY GROUPS 0-7	0x00	8	8	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups0-7
7	ADD TO GROUP 3	REMOVE FROM GROUP 3	QUERY GROUPS 0-7	8	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups0-7
8	-	ADD TO GROUP 4	QUERY GROUPS 0-7	0x00	16	16	YES	NO	NO	0X100100b	0X000100bb	0X000100b	gearGroups0-7
9	ADD TO GROUP 4	REMOVE FROM GROUP 4	QUERY GROUPS 0-7	16	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups0-7
10	-	ADD TO GROUP 5	QUERY GROUPS 0-7	0x00	32	32	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups0-7
11	ADD TO GROUP 5	REMOVE FROM GROUP 5	QUERY GROUPS 0-7	32	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups0-7
12	-	ADD TO GROUP 6	QUERY GROUPS 0-7	0x00	64	64	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups0-7
13	ADD TO GROUP 6	REMOVE FROM GROUP 6	QUERY GROUPS 0-7	64	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups0-7
14	-	ADD TO GROUP 7	QUERY GROUPS 0-7	0x00	128	128	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups0-7

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printed.

Test step i	command1	command2	query	value			reset			status			errorText
				j != 2	j = 2		j != 2	j = 2		j != 2	j = 2		
					PHM != 254	PHM = 254		PHM != 254	PHM = 254		PHM != 254	PHM = 254	
15	ADD TO GROUP 7	REMOVE FROM GROUP 7	QUERY GROUPS 0-7	128	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups0-7
16	-	ADD TO GROUP 8	QUERY GROUPS 8-15	0x00	1	1	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups8-15
17	ADD TO GROUP 8	REMOVE FROM GROUP 8	QUERY GROUPS 8-15	1	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups8-15
18	-	ADD TO GROUP 9	QUERY GROUPS 8-15	0x00	2	2	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups8-15
19	ADD TO GROUP 9	REMOVE FROM GROUP 9	QUERY GROUPS 8-15	2	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups8-15
20	-	ADD TO GROUP 10	QUERY GROUPS 8-15	0x00	4	4	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups8-15
21	ADD TO GROUP 10	REMOVE FROM GROUP 10	QUERY GROUPS 8-15	4	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups8-15
22	-	ADD TO GROUP 11	QUERY GROUPS 8-15	0x00	8	8	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups8-15
23	ADD TO GROUP 11	REMOVE FROM GROUP 11	QUERY GROUPS 8-15	8	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups8-15
24	-	ADD TO GROUP 12	QUERY GROUPS 8-15	0x00	16	16	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups8-15
25	ADD TO GROUP 12	REMOVE FROM GROUP 12	QUERY GROUPS 8-15	16	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups8-15
26	-	ADD TO GROUP 13	QUERY GROUPS 8-15	0x00	32	32	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups8-15
27	ADD TO GROUP 13	REMOVE FROM GROUP 13	QUERY GROUPS 8-15	32	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups8-15
28	-	ADD TO GROUP 14	QUERY GROUPS 8-15	0x00	64	64	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups8-15
29	ADD TO GROUP 14	REMOVE FROM GROUP 14	QUERY GROUPS 8-15	64	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups8-15

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Test step i	command1	command2	query	value			reset			status			errorText
				j != 2	j = 2		j != 2	j = 2		j != 2	j = 2		
					PHM != 254	PHM = 254		PHM != 254	PHM = 254		PHM != 254	PHM = 254	
30	-	ADD TO GROUP 15	QUERY GROUPS 8-15	0x00	128	128	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups8-15
31	ADD TO GROUP 15	REMOVE FROM GROUP 15	QUERY GROUPS 8-15	128	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups8-15
32	-	SET SCENE 0	QUERY SCENE LEVEL 0	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene0
33	SET SCENE 0	REMOVE FROM SCENE 0	QUERY SCENE LEVEL 0	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene0
34	-	SET SCENE 1	QUERY SCENE LEVEL 1	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene1
35	SET SCENE 1	REMOVE FROM SCENE 1	QUERY SCENE LEVEL 1	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene1
36	-	SET SCENE 2	QUERY SCENE LEVEL 2	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene2
37	SET SCENE 2	REMOVE FROM SCENE 2	QUERY SCENE LEVEL 2	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene2
38	-	SET SCENE 3	QUERY SCENE LEVEL 3	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene3
39	SET SCENE 3	REMOVE FROM SCENE 3	QUERY SCENE LEVEL 3	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene3
40	-	SET SCENE 4	QUERY SCENE LEVEL 4	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene4
41	SET SCENE 4	REMOVE FROM SCENE 4	QUERY SCENE LEVEL 4	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene4
42	-	SET SCENE 5	QUERY SCENE LEVEL 5	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene5
43	SET SCENE 5	REMOVE FROM SCENE 5	QUERY SCENE LEVEL 5	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene5
44	-	SET SCENE 6	QUERY SCENE LEVEL 6	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene6

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printed.

Test step i	command1	command2	query	value			reset			status			errorText
				j != 2	j = 2		j != 2	j = 2		j != 2	j = 2		
					PHM != 254	PHM = 254		PHM != 254	PHM = 254		PHM != 254	PHM = 254	
45	SET SCENE 6	REMOVE FROM SCENE 6	QUERY SCENE LEVEL 6	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene4
46	-	SET SCENE 7	QUERY SCENE LEVEL 7	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene7
47	SET SCENE 7	REMOVE FROM SCENE 7	QUERY SCENE LEVEL 7	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene7
48	-	SET SCENE 8	QUERY SCENE LEVEL 8	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene8
49	SET SCENE 8	REMOVE FROM SCENE 8	QUERY SCENE LEVEL 8	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene8
50	-	SET SCENE 9	QUERY SCENE LEVEL 9	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene9
51	SET SCENE 9	REMOVE FROM SCENE 9	QUERY SCENE LEVEL 9	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene9
52	-	SET SCENE 10	QUERY SCENE LEVEL 10	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene10
53	SET SCENE 10	REMOVE FROM SCENE 10	QUERY SCENE LEVEL 10	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene10
54	-	SET SCENE 11	QUERY SCENE LEVEL 11	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene11
55	SET SCENE 11	REMOVE FROM SCENE 11	QUERY SCENE LEVEL 11	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene11
56	-	SET SCENE 12	QUERY SCENE LEVEL 12	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene12
57	SET SCENE 12	REMOVE FROM SCENE 12	QUERY SCENE LEVEL 12	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene12
58	-	SET SCENE 13	QUERY SCENE LEVEL 13	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene13
59	SET SCENE 13	REMOVE FROM SCENE 113	QUERY SCENE LEVEL 13	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene13

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step i	command1	command2	query	value			reset			status			errorText
				j != 2	j = 2		j != 2	j = 2		j != 2	j = 2		
					PHM != 254	PHM = 254		PHM != 254	PHM = 254		PHM != 254	PHM = 254	
60	-	SET SCENE 14	QUERY SCENE LEVEL 14	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene14
61	SET SCENE 14	REMOVE FROM SCENE 14	QUERY SCENE LEVEL 14	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene14
62	-	SET SCENE 15	QUERY SCENE LEVEL 15	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene15
63	SET SCENE 15	REMOVE FROM SCENE 15	QUERY SCENE LEVEL 15	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene15
64	-	SET POWER ON LEVEL	QUERY POWER ON LEVEL	0xFE	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	powerOnLevel
65	-	SET SYSTEM FAILURE LEVEL	QUERY SYSTEM FAILURE LEVEL	0xFE	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	systemFailureLevel
66	-	SET FADE RATE	QUERY FADE TIME/FADE RATE	0x07	0x0A	0x0A	YES	NO	NO	0X100100b	0X000100b	0X000100b	fadeRate/fadeTime
67	-	SET FADE TIME	QUERY FADE TIME/FADE RATE	0x07	0xA7	0xA7	YES	NO	NO	0X100100b	0X000100b	0X000100b	fadeRate/fadeTime
68	DTR0 (18)	SET EXTENDED FADE TIME	QUERY EXTENDED FADE TIME	0	18	18	YES	NO	NO	0X100100b	0X000100b	0X000100b	extendedFadeTime
69	-	INITIALISE (*oldAddress*<<1+1)	QUERY SHORT ADDRESS	NO	*oldAddress*	*oldAddress*	YES	YES	YES	0X100100b	0X100100b	0X100100b	initialisationState
70	INITIALISE (*oldAddress*<<1+1)	RANDOMISE	**GetRandomAddress** ()	0xFF FF FF	!= 0xFF FF FF	!= 0xFF FF FF	YES	NO	NO	0X100100b	0X000100b	0X000100b	randomAddress
71	DTR0 (0)	STORE ACTUAL LEVEL IN DTR0	QUERY DTR0	0	254	254	YES	YES	YES	0X100100b	0X100100b	0X100100b	actualLevel
72	DTR0 (*PHM* + 1)	SET MIN LEVEL	QUERY MIN LEVEL	*PHM*	*PHM* + 1	*PHM*	YES	NO	YES	0X100100b	0X000100b	0X100100b	minLevel
73	DTR0 (*PHM* + 1)	SET MAX LEVEL	QUERY MAX LEVEL	0xFE	*PHM* + 1	0xFE	YES	NO	YES	0X100100b	0X001100b	0X100100b	maxLevel

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printed.

Test step i	command1	command2	query	value			reset			status			errorText
				j != 2	j = 2		j != 2	j = 2		j != 2	j = 2		
					PHM != 254	PHM = 254		PHM != 254	PHM = 254		PHM != 254	PHM = 254	
74	DTR0 (*newAddress* <<1+1)	SET SHORT ADDRESS	QUERY CONTROL GEAR PRESENT, send to (*address*[*i*] << 1 + 1)	YES	YES	YES	YES	YES	YES	0X100100b	0X100100b	0X100100b	shortAddress

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.4.4 Commands in-between

Any configuration instruction shall be executed only if it is received twice.

In this test sequence, all user programmable parameters of the DUT are attempted to be changed using configuration instructions sent as follows:

- configuration instruction is sent with a frame in-between, frame which consists of few bits, but not a command;
- configuration instruction is sent with a command in-between, command which is broadcast sent;
- configuration instruction is sent with a command in-between, command which is sent to a certain group address;
- configuration instruction is sent with a command in-between, command which is sent to a certain short address;
- configuration instruction is sent with a command in-between, and configuration instruction is sent again once.

In the first four cases, the configuration command should not be executed. In the last case the configuration instruction should be accepted. Where given, the command in-between should be accepted.

Test sequence shall be run for each selected logical unit.

Test description:

```
PHM = QUERY PHYSICAL MINIMUM
oldAddress = GLOBAL_currentUnderTestLogicalUnit
for (i = 0; i < 74; i++)
    // Test the rejection of the configuration instruction
    for (j = 0; j < 5; j++)
        RESET
        wait 300 ms
        DTR0 (1)
        command1[i]
        // The following steps must be sent within 75 ms, counted from the last rise bit of
        first "command2[i], send once" command until first fall bit of the last "command2[i],
        send once" command
        command2[i], send once
        if (j == 0)
            idle 13 ms + 110010 + idle 13 ms // Idle 13 ms followed by a frame, followed by
            13 ms - Test send command with a frame in-between
        else if (j == 1)
            RECALL MIN LEVEL, send to broadcast // Test send command with broadcast
            command in-between
        else if (j == 2)
            RECALL MIN LEVEL, send to 10000001b // Test send command with group
            command in-between - gearGroup 0
        else if (j == 3)
            RECALL MIN LEVEL, send to ((GLOBAL_currentUnderTestLogicalUnit << 1) +
            1) //Test send command with short command in-between
        else
            RECALL MIN LEVEL, send to ((63 << 1) + 1) //Test send command with short
            command in-between
        endif
        command2[i], send once
        answer = query[i]
        if (answer != value1[i])
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            error 1 Wrong setting of errorText[i] at step (i,j) = (i,j). Actual: answer.
            Expected: value1[i].
        endif
        answer = QUERY ACTUAL LEVEL
        if (j == 1 OR j == 3 OR (i == 1 AND j ==2))
            if (answer != PHM)
                error 2 Command in-between not executed at step (i,j) = (i,j). Actual:
                answer. Expected: PHM.
            endif
        else
            if (answer != 254)
                error 3 Command in-between executed at step (i,j) = (i,j). Actual: answer.
                Expected: 254.
            endif
        endif
    endfor
    // Test the acceptance of the configuration instruction
    RESET
    wait 300 ms
    if (i == 69)
        DTR0 (254)
    else
        DTR0 (1)
    endif
    DTR1 (0)
    command1[i]
    // The following four steps must be sent within 75 ms, counted from the last rise bit of
    first "command2[i], send once" command until first fall bit of the last "command2[i], send
    once" command
    command2[i], send once
    DTR1 (1)
    command2[i], send once
    command2[i], send once
    wait 100 ms
    answer = query[i]
    if (answer != value2[i])
        error 4 Wrong setting of errorText[i] at step i = i. Actual: answer. Expected:
        value2[i].
    endif
    answer = QUERY CONTENT DTR1
    if (answer != 1)
        error 5 Wrong value of DTR1 at step i = i. Actual: answer. Expected: 1.
    endif
    if (i == 72 OR i == 73)
        TERMINATE
    endif
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 43 – Parameters for test sequence Commands in-between

Test step i	command1	command2	query	value1	value2	errorText
0	-	ADD TO GROUP 0	QUERY GROUPS 0-7	0x00	1	gearGroups0-7
1	ADD TO GROUP 0	REMOVE FROM GROUP 0	QUERY GROUPS 0-7	1	0x00	gearGroups0-7
2	-	ADD TO GROUP 1	QUERY GROUPS 0-7	0x00	2	gearGroups0-7
3	ADD TO GROUP 1	REMOVE FROM GROUP 1	QUERY GROUPS 0-7	2	0x00	gearGroups0-7
4	-	ADD TO GROUP 2	QUERY GROUPS 0-7	0x00	4	gearGroups0-7
5	ADD TO GROUP 2	REMOVE FROM GROUP 2	QUERY GROUPS 0-7	4	0x00	gearGroups0-7
6	-	ADD TO GROUP 3	QUERY GROUPS 0-7	0x00	8	gearGroups0-7
7	ADD TO GROUP 3	REMOVE FROM GROUP 3	QUERY GROUPS 0-7	8	0x00	gearGroups0-7
8	-	ADD TO GROUP 4	QUERY GROUPS 0-7	0x00	16	gearGroups0-7
9	ADD TO GROUP 4	REMOVE FROM GROUP 4	QUERY GROUPS 0-7	16	0x00	gearGroups0-7
10	-	ADD TO GROUP 5	QUERY GROUPS 0-7	0x00	32	gearGroups0-7
11	ADD TO GROUP 5	REMOVE FROM GROUP 5	QUERY GROUPS 0-7	32	0x00	gearGroups0-7
12	-	ADD TO GROUP 6	QUERY GROUPS 0-7	0x00	64	gearGroups0-7
13	ADD TO GROUP 6	REMOVE FROM GROUP 6	QUERY GROUPS 0-7	64	0x00	gearGroups0-7
14	-	ADD TO GROUP 7	QUERY GROUPS 0-7	0x00	128	gearGroups0-7
15	ADD TO GROUP 7	REMOVE FROM GROUP 7	QUERY GROUPS 0-7	128	0x00	gearGroups0-7
16	-	ADD TO GROUP 8	QUERY GROUPS 8-15	0x00	1	gearGroups8-15
17	ADD TO GROUP 8	REMOVE FROM GROUP 8	QUERY GROUPS 8-15	1	0x00	gearGroups8-15
18	-	ADD TO GROUP 9	QUERY GROUPS 8-15	0x00	2	gearGroups8-15
19	ADD TO GROUP 9	REMOVE FROM GROUP 9	QUERY GROUPS 8-15	2	0x00	gearGroups8-15
20	-	ADD TO GROUP 10	QUERY GROUPS 8-15	0x00	4	gearGroups8-15
21	ADD TO GROUP 10	REMOVE FROM GROUP 10	QUERY GROUPS 8-15	4	0x00	gearGroups8-15
22	-	ADD TO GROUP 11	QUERY GROUPS 8-15	0x00	8	gearGroups8-15
23	ADD TO GROUP 11	REMOVE FROM GROUP 11	QUERY GROUPS 8-15	8	0x00	gearGroups8-15
24	-	ADD TO GROUP 12	QUERY GROUPS 8-15	0x00	16	gearGroups8-15

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Test step i	command1	command2	query	value1	value2	errorText
25	ADD TO GROUP 12	REMOVE FROM GROUP 12	QUERY GROUPS 8-15	16	0x00	gearGroups8-15
26	-	ADD TO GROUP 13	QUERY GROUPS 8-15	0x00	32	gearGroups8-15
27	ADD TO GROUP 13	REMOVE FROM GROUP 13	QUERY GROUPS 8-15	32	0x00	gearGroups8-15
28	-	ADD TO GROUP 14	QUERY GROUPS 8-15	0x00	64	gearGroups8-15
29	ADD TO GROUP 14	REMOVE FROM GROUP 14	QUERY GROUPS 8-15	64	0x00	gearGroups8-15
30	-	ADD TO GROUP 15	QUERY GROUPS 8-15	0x00	128	gearGroups8-15
31	ADD TO GROUP 15	REMOVE FROM GROUP 15	QUERY GROUPS 8-15	128	0x00	gearGroups8-15
32	-	SET SCENE 0	QUERY SCENE LEVEL 0	0xFF	1	scene0
33	SET SCENE 0	REMOVE FROM SCENE 0	QUERY SCENE LEVEL 0	1	0xFF	scene0
34	-	SET SCENE 1	QUERY SCENE LEVEL 1	0xFF	1	scene1
35	SET SCENE 1	REMOVE FROM SCENE 1	QUERY SCENE LEVEL 1	1	0xFF	scene1
36	-	SET SCENE 2	QUERY SCENE LEVEL 2	0xFF	1	scene2
37	SET SCENE 2	REMOVE FROM SCENE 2	QUERY SCENE LEVEL 2	1	0xFF	scene2
38	-	SET SCENE 3	QUERY SCENE LEVEL 3	0xFF	1	scene3
39	SET SCENE 3	REMOVE FROM SCENE 3	QUERY SCENE LEVEL 3	1	0xFF	scene3
40	-	SET SCENE 4	QUERY SCENE LEVEL 4	0xFF	1	scene4
41	SET SCENE 4	REMOVE FROM SCENE 4	QUERY SCENE LEVEL 4	1	0xFF	scene4
42	-	SET SCENE 5	QUERY SCENE LEVEL 5	0xFF	1	scene5
43	SET SCENE 5	REMOVE FROM SCENE 5	QUERY SCENE LEVEL 5	1	0xFF	scene5
44	-	SET SCENE 6	QUERY SCENE LEVEL	0xFF	1	scene6

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step i	command1	command2	query	value1	value2	errorText
			6			
45	SET SCENE 6	REMOVE FROM SCENE 6	QUERY SCENE LEVEL 6	1	0xFF	scene6
46	-	SET SCENE 7	QUERY SCENE LEVEL 7	0xFF	1	scene7
47	SET SCENE 7	REMOVE FROM SCENE 7	QUERY SCENE LEVEL 7	1	0xFF	scene7
48	-	SET SCENE 8	QUERY SCENE LEVEL 8	0xFF	1	scene8
49	SET SCENE 8	REMOVE FROM SCENE 8	QUERY SCENE LEVEL 8	1	0xFF	scene8
50	-	SET SCENE 9	QUERY SCENE LEVEL 9	0xFF	1	scene9
51	SET SCENE 9	REMOVE FROM SCENE 9	QUERY SCENE LEVEL 9	1	0xFF	scene9
52	-	SET SCENE 10	QUERY SCENE LEVEL 10	0xFF	1	scene10
53	SET SCENE 10	REMOVE FROM SCENE 10	QUERY SCENE LEVEL 10	1	0xFF	scene10
54	-	SET SCENE 11	QUERY SCENE LEVEL 11	0xFF	1	scene11
55	SET SCENE 11	REMOVE FROM SCENE 11	QUERY SCENE LEVEL 11	1	0xFF	scene11
56	-	SET SCENE 12	QUERY SCENE LEVEL 12	0xFF	1	scene12
57	SET SCENE 12	REMOVE FROM SCENE 12	QUERY SCENE LEVEL 12	1	0xFF	scene12
58	-	SET SCENE 13	QUERY SCENE LEVEL 13	0xFF	1	scene13
59	SET SCENE 13	REMOVE FROM SCENE 13	QUERY SCENE LEVEL 13	1	0xFF	scene13
60	-	SET SCENE 14	QUERY SCENE LEVEL 14	0xFF	1	scene14
61	SET SCENE 14	REMOVE FROM SCENE 14	QUERY SCENE LEVEL	1	0xFF	scene14

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printed.

Test step i	command1	command2	query	value1	value2	errorText
			14			
62	-	SET SCENE 15	QUERY SCENE LEVEL 15	0xFF	1	scene15
63	SET SCENE 15	REMOVE FROM SCENE 15	QUERY SCENE LEVEL 15	1	0xFF	scene15
64	-	SET POWER ON LEVEL	QUERY POWER ON LEVEL	0xFE	1	powerOnLevel
65	-	SET SYSTEM FAILURE LEVEL	QUERY SYSTEM FAILURE LEVEL	0xFE	1	systemFailureLevel
66	-	SET FADE RATE	QUERY FADE TIME/FADE RATE	0x07	0x01	fadeRate/fadeTime
67	-	SET FADE TIME	QUERY FADE TIME/FADE RATE	0x07	0x17	fadeRate/fadeTime
68	-	SET EXTENDED FADE TIME	QUERY EXTENDED FADE TIME	0	1	extendedFadeTime
69	-	SET MIN LEVEL	QUERY MIN LEVEL	*PHM*	254	minLevel
70	-	SET MAX LEVEL	QUERY MAX LEVEL	0xFE	*PHM*	maxLevel
71	-	STORE ACTUAL LEVEL IN DTR0	QUERY CONTENT DTR0	1	0xFE	actualLevel
72	-	INITIALISE ((*oldAddress* << 1) + 1)	QUERY SHORT ADDRESS	NO	(*oldAddress* << 1) + 1	initialisationState
73	INITIALISE (*oldAddress* << 1 + 1)	RANDOMISE	**GetRandomAddress** ()	0xFF FF FF	! 0xFF FF FF	randomAddress

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.4.5 STORE ACTUAL LEVEL IN DTR0

The test sequence shall be used to test command STORE ACTUAL LEVEL IN DTR0 at five different states of the DUT: MAX level, OFF, MIN level, during startup, and during total lamp failure.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
DTR0 (255)
// Test if max level is stored
STORE ACTUAL LEVEL IN DTR0
answer = QUERY CONTENT DTR0
if (answer != 254)
    error 1 MAX LEVEL not stored in DTR0. Actual: answer. Expected: 254.
endif
// Test if off level is stored
OFF
STORE ACTUAL LEVEL IN DTR0
answer = QUERY CONTENT DTR0
if (answer != 0)
    error 2 0 (OFF) not stored in DTR0. Actual: answer. Expected: 0.
endif
// Test if min level is stored
RECALL MIN LEVEL
WaitForLampOn ()
STORE ACTUAL LEVEL IN DTR0
answer = QUERY CONTENT DTR0
if (answer != PHM)
    error 3 MIN LEVEL not stored in DTR0. Actual: answer. Expected: PHM.
endif
// Test if actual level during startup is stored (during startup, actual level = 0)
PowerCycleAndWaitForDecoder (5)
STORE ACTUAL LEVEL IN DTR0
answer = QUERY CONTENT DTR0
if (answer != 0)
    error 4 0 (startup) not stored in DTR0. Actual: answer. Expected: 0.
endif
// Test if actual level during lamp failure is stored (during lamp failure, actual level = last target level)
WaitForPowerOnPhaseToFinish ()
DisconnectLamps (0)
delay = 30 s
foreach (lightSourceType in GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[])
    if (lightSourceType == 2) // This logical unit has a HID light source
        delay = delay + GLOBAL_startupTimeLimit
        break
    endif
endfor
wait delay // Lamp failure has been detected
STORE ACTUAL LEVEL IN DTR0
answer = QUERY CONTENT DTR0
if (answer != 254)
    error 5 254 (actual level during lamp failure) not stored in DTR0. Actual: answer.
    Expected: 254.
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

ConnectLamps ()

12.4.6 SAVE PERSISTENT VARIABLES

Manufacturer is recommended to check the correct behaviour of the SAVE PERSISTENT VARIABLES command.

12.4.7 SET OPERATING MODE

The test sequence checks if reserved modes (0x01 to 0x7F) are reserved by trying to set the DUT in one of those modes, and checks if there are any manufacturer specific modes (0x80 to 0xFF) and if so, the DUT should keep reacting according to specification.

Test sequence shall be run for each selected logical unit.

Test description:

```
initialOperatingMode = QUERY OPERATING MODE
for (i = 1; i < 0x80; i++)
    DTR0 (0)
    SET OPERATING MODE
    DTR0 (i)
    SET OPERATING MODE
    answer = QUERY OPERATING MODE
    if (answer != 0)
        error 1 SET OPERATING MODE executed with DTR0 set to the reserved operating
        mode i. Actual: answer. Expected: 0.
    endif
    answer = QUERY MANUFACTURER SPECIFIC MODE
    if (answer != NO)
        error 2 QUERY MANUFACTURER SPECIFIC MODE answered when operating
        mode set to mode 0, and DTR0 set to i. Actual: answer. Expected: NO.
    endif
endfor
for (i = 0x80; i <= 0xFF; i++)
    DTR0 (0)
    SET OPERATING MODE
    DTR0 (i)
    SET OPERATING MODE
    answer = QUERY OPERATING MODE
    if (answer == 0)
        answer = QUERY MANUFACTURER SPECIFIC MODE
        if (answer != NO)
            error 3 QUERY MANUFACTURER SPECIFIC MODE answered when operating
            mode set to mode 0, and DTR0 set to i. Actual: answer. Expected: NO.
        endif
    else if (answer == i)
        report 1 Manufacturer specific mode i implemented in DUT.
        answer = QUERY MANUFACTURER SPECIFIC MODE
        if (answer != YES)
            error 4 QUERY MANUFACTURER SPECIFIC MODE did not answer when DUT
            is in the manufacturer specific mode i. Actual: answer. Expected: YES.
        endif
    else //different value than 0 and i received
        error 5 Operating mode set to a completely different operating mode than allowed.
        Actual: answer. Expected: 0 or i.
    endif
endfor
DTR0 (initialOperatingMode)
SET OPERATING MODE
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.4.8 SET MAX LEVEL

The test sequence checks if MAX LEVEL is correctly set and if ACTUAL LEVEL changes accordingly, when MIN LEVEL is set to PHM + 1. The test values used are:

- test value <= MIN LEVEL: 0, PHM, PHM + 1
- MIN LEVEL < test value <= MAX LEVEL: (PHM + 254) >> 1, 253, 254
- test value > MAX LEVEL: 255.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
DTR0 (PHM + 1)
SET MIN LEVEL
for (i = 0; i < 7; i++)
    RECALL MAX LEVEL
    DTR0 (value[i])
    SET MAX LEVEL
    answer = QUERY MAX LEVEL
    if (answer != max[i])
        error 1 Wrong MAX LEVEL stored at test step i = i. Actual: answer. Expected:
        max[i].
    endif
    answer = QUERY ACTUAL LEVEL
    if (answer != level[i])
        error 2 Wrong ACTUAL LEVEL at test step i = i. Actual: answer. Expected: level[i].
    endif
endfor
```

Table 44 – Parameters for test sequence SET MAX LEVEL

Test step i	value	max		level	
		PHM < 253	PHM >= 253	PHM < 253	PHM >= 253
0	0	*PHM* + 1	254	*PHM* + 1	254
1	*PHM*	*PHM* + 1	254	*PHM* + 1	254
2	*PHM* + 1	*PHM* + 1	254	*PHM* + 1	254
3	(*PHM* + 254) >> 1	(*PHM* + 254) >> 1	254	*PHM* + 1	254
4	253	253	254	(*PHM* + 254) >> 1	254
5	254	254	254	253	254
6	255	254	254	254	254

12.4.9 SET MIN LEVEL

The test sequence checks if MIN LEVEL is correctly set and if ACTUAL LEVEL changes accordingly, when MAX LEVEL is set to 253. The test values used are:

- test value <= PHM: 0, PHM >> 1, PHM;
- PHM < test value <= MAX LEVEL: (PHM + 254) >> 1, 253;
- test value > MAX LEVEL: 254, 255.

Test sequence shall be run for each selected logical unit.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
DTR0 (253)
SET MAX LEVEL
RECALL MIN LEVEL
for (i = 0; i < 7; i++)
    DTR0 (value[i])
    SET MIN LEVEL
    answer = QUERY MIN LEVEL
    if (answer != min[i])
        error 1 Wrong MIN LEVEL stored at test step i = i. Actual: answer. Expected: min[i].
    endif
    answer = QUERY ACTUAL LEVEL
    if (answer != level[i])
        error 2 Wrong ACTUAL LEVEL at test step i = i. Actual: answer. Expected: level[i].
    endif
endfor
```

Table 45 – Parameters for test sequence SET MIN LEVEL

Test step i	value	min		level	
		PHM < 254	PHM = 254	PHM < 254	PHM = 254
0	0	*PHM*	254	*PHM*	254
1	*PHM* >> 1	*PHM*	254	*PHM*	254
2	*PHM*	*PHM*	254	*PHM*	254
3	(*PHM* + 254) >> 1	(*PHM* + 254) >> 1	254	(*PHM* + 254) >> 1	254
4	253	253	254	253	254
5	254	253	254	253	254
6	255	253	254	253	254

12.4.10 SET SYSTEM FAILURE LEVEL

The test sequence checks if SYSTEM FAILURE LEVEL is correctly set to different test values. The correct detection and operation of the DUT in case of system failure is also checked. The SYSTEM FAILURE LEVEL is expected to be set to the given value, only the actual level should change between the MIN LEVEL and MAX LEVEL. The test values used are: 0, 1, PHM, PHM, (PHM + 254) >> 1, 254, 255.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
for (i = 0; i < 6; i++) // Loop through the value given in table below
    DTR0 (value[i])
    SET SYSTEM FAILURE LEVEL
    answer = QUERY SYSTEM FAILURE LEVEL
    if (answer != system[i])
        error 1 Wrong SYSTEM FAILURE LEVEL stored at test step i = i. Actual: answer.
        Expected: system[i].
    endif
    for (j = 0; j < 2; j++) // Check the time limits for detecting SFL
        RECALL MIN LEVEL
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            WaitForLampOn ()
            Apply (Voltage of 0 V on bus interface)
            if (j == 0) // System failure must not be detected
                if (GLOBAL_busPowered)
                    wait 40 ms
                else
                    wait 450 ms
                endif
            else // System failure must be detected
                wait 550 ms
            endif
            Apply (Voltage of GLOBAL_VbusHigh V on bus interface)
            if (GLOBAL_busPowered)
                wait 1200 ms
                if (j == 1)
                    WaitForLampOn ()
                endif
            else
                wait 100 ms
            endif
            answer = QUERY ACTUAL LEVEL
            if (answer != level[GLOBAL_busPowered,i,j])
                error 2 Wrong ACTUAL LEVEL at test step (i,j) = (i,j). Actual: answer.
                Expected: level[GLOBAL_busPowered,i,j].
            endif
            RECALL MAX LEVEL
            wait 700 ms
        endfor
    endfor
```

Table 46 – Parameters for test sequence SET SYSTEM FAILURE LEVEL

Test step i	value	system	level		
			j = 0 (no SFL)	j = 1 (SFL)	
				GLOBAL_busPowered =false (SFL)	GLOBAL_busPowered =true (POL)
0	0	0	*PHM*	0	254
1	1	1	*PHM*	*PHM*	254
2	(*PHM* + 254) >> 1	(*PHM* + 254) >> 1	*PHM*	(*PHM* + 254) >> 1	254
3	*PHM*	*PHM*	*PHM*	*PHM*	254
4	254	254	*PHM*	254	254
5	255	255	*PHM*	*PHM*	254

12.4.11 SET POWER ON LEVEL

The test sequence checks if POWER ON LEVEL is correctly set to different test values. The correct detection and operation of the DUT in case of power on is also checked. Both the bus interface and the light behaviour are checked after power on. The POWER ON LEVEL is expected to be set to the given value, only the light level should change between the MIN LEVEL and MAX LEVEL. The test values used are: 0, 1, PHM, PHM + 1, (PHM + 254) >> 1, 253, 254, 255.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
PHM = QUERY PHYSICAL MINIMUM
DTR0 (PHM + 1)
SET MIN LEVEL
DTR0 (253)
SET MAX LEVEL
lightSource = true
if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
    lightSource = false // This logical unit has no light source
endif
for (i = 0; i < 8; i++)
    RECALL MIN LEVEL
    DTR0 (value[i])
    SET POWER ON LEVEL
    answer = QUERY POWER ON LEVEL
    if (answer != value[i])
        error 1 Wrong POWER ON LEVEL stored at test step i = i. Actual: answer.
        Expected: value[i].
    else
        exitLoop = false
        if (lightSource)
            UserInput (Prepare to check the bus interface and the light behaviour until
            lamp turns on after external power is switched on, OK)
            Start (Light measurement)
        endif
        start_timer (timer)
        timestamp = PowerCycleAndWaitForBusPower (5)
        powerCycleDelay = 5000
        if (GLOBAL_busPowered)
            powerCycleDelay = 550
        endif
        do
            queryTime = get_timer (timer) // Get time of sending the query in ms
            answer = QUERY ACTUAL LEVEL, accept No Answer
            finalTime = queryTime - powerCycleDelay - timestamp
            if (answer == NO)
                if (GLOBAL_busPowered)
                    if (queryTime >= powerCycleDelay + timestamp + 1200)) //
                    PowerCycle + WaitForBusPower + WaitForDecoder
                        error 2 No reply received from Query Actual Level (finalTime) ms
                        after power-on at test step i = i.
                        exitLoop = true
                    endif
                else
                    if (GLOBAL_internalBPS AND timestamp > 350)
                        if (queryTime >= powerCycleDelay + timestamp + 100)) //
                        PowerCycle + WaitForBusPower + WaitForDecoder
                            error 3 No reply received from Query Actual Level
                            (finalTime) ms after power-on at test step i = i.
                            exitLoop = true
                        endif
                    else
                        if (queryTime >= powerCycleDelay + 450)) // PowerCycle +
                        WaitForDecoder
                            error 4 No reply received from Query Actual Level
                            (queryTime - powerCycleDelay) ms after power-on at test
                            step i = i.
                            exitLoop = true
                        endif
                    endif
                endif
            else
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                if (!GLOBAL_busPowered AND (finalTime < 660)) // Wait for POL to be activated
                    if (finalTime <= 540) // Lamp is not allowed to turn on
                        if (i == 0)
                            if (answer != 0)
                                error 5 Based on the reported actual level, lamp did not remain off at test step i = i.
                                exitLoop = true
                            endif
                        else
                            if (answer != 0 AND answer != 255)
                                error 6 Based on the reported actual level, lamp turned on finalTime ms after power-on at test step i = i.
                                exitLoop = true
                            endif
                        endif
                    else // Grey area - lamp might turn on
                        if (i == 0)
                            if (answer != 0)
                                error 7 Based on the reported actual level, lamp did not remain off at test step i = i.
                                exitLoop = true
                            endif
                        else
                            if (answer == level[i])
                                exitLoop = true
                            else
                                if (answer != 0 AND answer != 255)
                                    error 8 Based on the reported actual level, lamp turned on finalTime ms after power-on at test step i = i. Actual: answer, Expected: 0, 255 or level[i].
                                    exitLoop = true
                                endif
                            endif
                        endif
                    endif
                else // POL activated
                    if (i == 0)
                        if (answer != 0) // No need to start the startup phase
                            error 9 Based on the reported actual level, lamp did not remain off at test step i = i.
                        endif
                        exitLoop = true
                    else
                        if (answer == level[i])
                            exitLoop = true
                        else
                            if (answer != 255)
                                error 10 Lamp turned on at incorrect level at test step i = i. Actual: answer. Expected: level[i] or 255.
                                exitLoop = true
                            endif
                        endif
                    endif
                endif
            endif
            if (finalTime >= GLOBAL_startupTimeLimit)
                error 11 Startup lasts more than the preset startup time limit = GLOBAL_startupTimeLimit s at test step i = i.
                exitLoop = true
            endif
        while (!exitLoop)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        if (i != 0 AND answer == level[i])
            report 1 Based on the reported actual level, lamp turned on finalTime ms after
            power-on at test step i = i.
        endif
        if (lightSource)
            Stop (Light measurement)
            if (i == 0)
                lampTurnedOn = UserInput (Did lamp turn on?, YesNo)
                if (lampTurnedOn == Yes)
                    error 12 Based on the observed light output, lamp turned on after
                    power-on at test step i = 0.
                endif
            else
                if (GLOBAL_busPowered)
                    lightTime = Measure (Time needed for the logical unit to switch on the
                    lamp(s) from the moment the bus power is switched on until lamp(s)
                    turn on in ms, based on the light measurements)
                else
                    lightTime = Measure (Time needed for the logical unit to switch on the
                    lamp(s) from the moment the external power is switched on until
                    lamp(s) turn on in ms, based on the light measurements)
                endif
                if (!GLOBAL_busPowered AND lightTime <= 540 ms)
                    error 13 Based on the measured light output, lamp turned on
                    lightTime ms after power-on at test step i = i.
                else
                    report 2 Based on the measured light output, lamp turned on
                    lightTime ms after power-on at test step i = i.
                endif
                // Test in there is a difference between the actual moment when light turn
                on and the reported one, taking a maximum deviation of 40 ms in between
                if (finalTime > lightTime + 40)
                    error 14 Based on monitored interface and measured light output,
                    light turned on earlier than communicated via the interface at test step
                    i = i.
                else if (finalTime < lightTime - 40)
                    error 15 Based on monitored interface and measured light output,
                    light turned on later than communicated via the interface at test step i
                    = i.
                endif
            endif
        endif
    endif
endfor
```

Table 47 – Parameters for test sequence SET POWER ON LEVEL

Test step i	value	level	
		PHM < 253	PHM >= 253
0	0	0	0
1	1	*PHM* + 1	254
2	*PHM*	*PHM* + 1	254
3	*PHM* + 1	*PHM* + 1	254
4	(*PHM* + 254) >> 1	(*PHM* + 254) >> 1	254
5	253	253	254
6	254	253	254
7	255	*PHM* + 1	254

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.4.12 SET FADE TIME

The test sequence checks if FADE TIME is correctly set to different test values. The correct answers to QUERY RESET STATE and QUERY STATUS are also tested.

Test sequence shall be run for all logical units in parallel.

Test description:

```
for (i = 0; i < 8; i++)
    RESET
    wait 300 ms
    DTR0 (value[i])
    SET FADE TIME
    answer = QUERY FADE TIME/FADE RATE
    if (answer != fadeTime[i])
        error 1 Wrong FADE TIME stored at test step i = i. Actual: answer. Expected: fadeTime[i].
    endif
    answer = QUERY RESET STATE
    if (answer != reset[i])
        error 2 Wrong answer at QUERY RESET STATE and text[i] FADE TIME at test step i = i. Actual: answer. Expected: reset[i].
    endif
    answer = QUERY STATUS
    if (answer != status[i])
        error 3 Wrong answer at QUERY STATUS and text[i] FADE TIME at test step i = i. Actual: answer. Expected: status[i].
    endif
endfor
```

Table 48 – Parameters for test sequence SET FADE TIME

Test step i	value	fadeTime	text	reset	status
0	0	0x07	unchanged	YES	XX1XXXXXb
1	1	0x17	valid	NO	XX0XXXXXb
2	5	0x57	valid	NO	XX0XXXXXb
3	14	0xE7	valid	NO	XX0XXXXXb
4	15	0xF7	valid	NO	XX0XXXXXb
5	16	0xF7	not valid	NO	XX0XXXXXb
6	128	0xF7	not valid	NO	XX0XXXXXb
7	255	0xF7	not valid	NO	XX0XXXXXb

12.4.13 SET FADE RATE

The test sequence checks if FADE RATE is correctly set to different test values. The correct answers to QUERY RESET STATE and QUERY STATUS are also tested.

Test sequence shall be run for all logical units in parallel.

Test description:

```
for (i = 0; i < 9; i++)
    RESET
    wait 300 ms
    DTR0 (value[i])
    SET FADE RATE
    answer = QUERY FADE TIME/FADE RATE
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    if (answer != fadeRate[i])
        error 1 Wrong FADE RATE stored at test step i = i. Actual: answer. Expected:
        fadeRate[i].
    endif
    answer = QUERY RESET STATE
    if (answer != reset[i])
        error 2 Wrong answer at QUERY RESET STATE and text[i] FADE RATE at test step
        i = i. Actual: answer. Expected: reset[i].
    endif
    answer = QUERY STATUS
    if (answer != status[i])
        error 3 Wrong answer at QUERY STATUS and text[i] FADE RATE at test step i = i.
        Actual: answer. Expected: status[i].
    endif
endfor
```

Table 49 – Parameters for test sequence SET FADE RATE

Test step i	value	fadeRate	text	reset	status
0	7	0x07	unchanged	YES	XX1XXXXXb
1	0	0x01	not valid	NO	XX0XXXXXb
2	1	0x01	valid	NO	XX0XXXXXb
3	5	0x05	valid	NO	XX0XXXXXb
4	14	0x0E	valid	NO	XX0XXXXXb
5	15	0x0F	valid	NO	XX0XXXXXb
6	16	0x0F	not valid	NO	XX0XXXXXb
7	128	0x0F	not valid	NO	XX0XXXXXb
8	255	0x0F	not valid	NO	XX0XXXXXb

12.4.14 SET SCENE / REMOVE FROM SCENE

The test sequence checks if storage and removal of the scenes are correctly done. Initially, each of the test values (0, 1, 128, 253, 254, 255, PHM) is stored to every scene register of DUT by usage of SET SCENE, then the value is removed by usage of REMOVE FROM SCENE. The correct answers to QUERY RESET STATE and QUERY STATUS are also tested.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
for (i = 0; i < 16; i++)
    for (j = 0; j < 7; j++)
        DTR0 (value[j])
        SET SCENE i
        answer = QUERY SCENE LEVEL i
        if (answer != scene[j])
            error 1 Wrong SCENE LEVEL i stored at test step (i,j) = (i,j). Actual: answer.
            Expected: scene[j].
        endif
        answer = QUERY RESET STATE
        if (answer != reset[j])
            error 2 Wrong answer at QUERY RESET STATE and programmed SCENE i at
            test step (i,j) = (i,j). Actual: answer. Expected: reset[j].
        endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        answer = QUERY STATUS
        if (answer != status[j])
            error 3 Wrong answer at QUERY STATUS and programmed SCENE i at test step (i,j) = (i,j). Actual: answer. Expected: status[j].
        endif
    endfor
    REMOVE FROM SCENE i
    answer = QUERY SCENE LEVEL i
    if (answer != 255)
        error 4 SCENE LEVEL i not removed at test step i = i. Actual: answer. Expected: 255.
    endif
    answer = QUERY RESET STATE
    if (answer != YES)
        error 5 Wrong answer at QUERY RESET STATE and removed SCENE i at test step i = i. Actual: answer. Expected: YES.
    endif
    answer = QUERY STATUS
    if (answer != XX1XXXXXb)
        error 6 Wrong answer at QUERY STATUS and removed SCENE i at test step i = i. Actual: answer. Expected: XX1XXXXXb.
    endif
endfor
```

Table 50 – Parameters for test sequence SET SCENE / REMOVE FROM SCENE

Test step j	value	scene	reset	status
0	0	0	NO	XX0XXXXXb
1	1	1	NO	XX0XXXXXb
2	128	128	NO	XX0XXXXXb
3	253	253	NO	XX0XXXXXb
4	254	254	NO	XX0XXXXXb
5	255	255	YES	XX1XXXXXb
6	*PHM*	*PHM*	NO	XX0XXXXXb

12.4.15 ADD TO GROUP / REMOVE FROM GROUP

The test sequence checks if addition to a group and removal from a group of a DUT is correctly done. Initially, DUT is added to a group by usage of ADD TO GROUP command, then it is removed from group usage of REMOVE FROM GROUP command. Test also checks the group addressing, by sending a query to group X after DUT was added and removed from that particular group X.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
for (i = 0; i < 16; i++)
    ADD TO GROUP i
    answer = QUERY GROUPS 0-7
    if (answer != groups0-7[i])
        error 1 Wrong answer at QUERY GROUPS 0-7 and added to GROUP i. Actual: answer. Expected: groups0-7[i].
    endif
    answer = QUERY GROUPS 8-15
    if (answer != groups8-15[i])
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        error 2 Wrong answer at QUERY GROUPS 8-15 and added to GROUP i. Actual:
        answer. Expected: groups8-15[i].
    endif
    groupAddress = (i << 1) + 10000001b // gearGroups i
    answer = QUERY PHYSICAL MINIMUM, send to groupAddress
    if (answer != PHM)
        error 3 Wrong answer at QUERY PHYSICAL MINIMUM and added to GROUP i.
        Actual: answer. Expected: PHM.
    endif
    REMOVE FROM GROUP i
    answer = QUERY GROUPS 0-7
    if (answer != 0)
        error 4 Wrong answer at QUERY GROUPS 0-7 and removed from GROUP i. Actual:
        answer. Expected: 0.
    endif
    answer = QUERY GROUPS 8-15
    if (answer != 0)
        error 5 Wrong answer at QUERY GROUPS 8-15 and removed from GROUP i.
        Actual: answer. Expected: 0.
    endif
    answer = QUERY PHYSICAL MINIMUM, send to groupAddress
    if (answer != NO)
        error 6 Wrong answer at QUERY PHYSICAL MINIMUM and removed from GROUP
        i. Actual: answer. Expected: NO.
    endif
endfor
```

Table 51 – Parameters for test sequence ADD TO GROUP / REMOVE FROM GROUP

Test step i	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
groups0-7	1	2	4	8	16	32	64	128	0	0	0	0	0	0	0	0
groups8-15	0	0	0	0	0	0	0	0	1	2	4	8	16	32	64	128

12.4.16 SET SHORT ADDRESS

The test sequence checks if storage of the short address is correctly programmed using the short address programmed in the step before. QUERY MISSING SHORT ADDRESS and the short address bit of the QUERY STATUS answer are also tested.

Test sequence shall be run for each selected logical unit.

Test description:

```
oldAddress = GLOBAL_currentUnderTestLogicalUnit
lastAssignedAddress = oldAddress
if (GLOBAL_numberShortAddresses < 62)
    numberNotAssignedAddresses = 62 - GLOBAL_numberShortAddresses + 1
    intermediateAddress = GLOBAL_numberShortAddresses + (oldAddress %
    numberNotAssignedAddresses)
    iEnd = 7
else
    iEnd = 6
endif
for (i = 0; i < iEnd; i++)
    DTR0 (value[i])
    SET SHORT ADDRESS, send to address1[i]
    answer = QUERY MISSING SHORT ADDRESS, send to address2[i]
    if (answer != test1[i])
        error 1 Wrong answer at QUERY MISSING SHORT ADDRESS at test step i = i.
        Actual: answer. Expected: test1[i].
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    endif
    answer = QUERY STATUS, send to address2[i]
    if (answer != test2[i])
        error 2 Wrong answer at QUERY STATUS at test step i = i. Actual: answer.
        Expected: test2[i].
    endif
    lastAssignedAddress = address2[i]
endfor
SetShortAddress (lastAssignedAddress; oldAddress)
```

Table 52 – Parameters for test sequence SET SHORT ADDRESS

Test step i	value	description	address1	address2	test1	test2
0	01111111b	short address 63	*oldAddress*<<1+1	01111111b	NO	X0XXXXXXb
1	11111111b	delete short address	01111111b	broadcast unaddressed	YES	X1XXXXXXb
2	*oldAddress*<<1+1	*oldAddress*	broadcast unaddressed	*oldAddress*<<1+1	NO	X0XXXXXXb
3	10000001b	no change	*oldAddress*<<1+1	*oldAddress*<<1+1	NO	X0XXXXXXb
4	00000000b	no change	*oldAddress*<<1+1	*oldAddress*<<1+1	NO	X0XXXXXXb
5	10000000b	no change	*oldAddress*<<1+1	*oldAddress*<<1+1	NO	X0XXXXXXb
6	*intermediateAddress*<<1+1	a short address	*oldAddress*<<1+1	*intermediateAddress*<<1+1	NO	X0XXXXXXb

12.4.17 SET EXTENDED FADE TIME

The test sequence checks if EXTENDED FADE TIME is correctly set to different test values. The correct answers to QUERY RESET STATE and QUERY STATUS are also tested.

Test sequence shall be run for all logical units in parallel.

Test description:

```
for (i = 0; i < 10; i++)
    RESET
    wait 300 ms
    DTR0 (value[i])
    SET EXTENDED FADE TIME
    answer = QUERY EXTENDED FADE TIME
    if (answer != extendedFadeTime[i])
        error 1 Wrong EXTENDED FADE TIME stored at test step i = i. Actual: answer.
        Expected: extendedFadeTime[i].
    endif
    answer = QUERY RESET STATE
    if (answer != reset[i])
        error 2 Wrong answer at QUERY RESET STATE and text[i] EXTENDED FADE TIME
        at test step i = i. Actual: answer. Expected: reset[i].
    endif
    answer = QUERY STATUS
    if (answer != status[i])
        error 3 Wrong answer at QUERY STATUS and text[i] EXTENDED FADE TIME at
        test step i = i. Actual: answer. Expected: status[i].
    endif
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 53 – Parameters for test sequence SET EXTENDED FADE TIME

Test step i	value	extendedFadeTime	text	reset	status
0	00000000b	00000000b	valid	YES	XX1XXXXXb
1	00000001b	00000001b	valid	NO	XX0XXXXXb
2	10111111b	00000000b	not valid	YES	XX1XXXXXb
3	00001111b	00001111b	valid	NO	XX0XXXXXb
4	01010000b	00000000b	not valid	YES	XX1XXXXXb
5	00010000b	00010000b	valid	NO	XX0XXXXXb
6	01100101b	00000000b	not valid	YES	XX1XXXXXb
7	01000000b	01000000b	valid	NO	XX0XXXXXb
8	01110001b	00000000b	not valid	YES	XX1XXXXXb
9	01001111b	01001111b	valid	NO	XX0XXXXXb

12.4.18 Reset/Power-on values

The test sequence checks the reset and the power-on values of the 102 variables. The reset and power-on values of the 2xx variables are assumed to be tested in IEC 62386-2xx standard.

Test sequence shall be run for each selected logical unit.

Test description:

```
operatingMode = QUERY OPERATING MODE
PHM = QUERY PHYSICAL MINIMUM
shortAddress = GLOBAL_currentUnderTestLogicalUnit
// Change value of 102 variables
INITIALISE (shortAddress << 1 + 1)
RANDOMISE
wait 100 ms
TERMINATE
randomAddress = GetRandomAddress ()
for (i = 4; i < 32; i++)
    command[i]
endfor
// Perform a RESET
RESET
wait 300 ms
// Check ROM variables after reset
i = 0
deviceType[] = GetSupportedDeviceTypes (shortAddress)
foreach (device in deviceType)
    if (device != GLOBAL_logicalUnit[shortAddress].deviceType[i])
        error 1 LogicalUnit shortAddress: Wrong deviceType after RESET. Actual: device.
        Expected: GLOBAL_logicalUnit[shortAddress].deviceType[i].
    endif
    i++
endfor
i = 0
extendedVersionNumber[] = GetExtendedVersionNumber (shortAddress; deviceType[])
foreach (version in extendedVersionNumber)
    if (version != GLOBAL_logicalUnit[shortAddress].extendedVersionNumber[i])
        error 2 LogicalUnit shortAddress: Wrong extendedVersionNumber after RESET.
        Actual: version. Expected:
        GLOBAL_logicalUnit[shortAddress].extendedVersionNumber[i].
    endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        i++
endfor
i = 0
lightSource[] = GetSupportedLightSources (shortAddress)
foreach (light in lightSource)
        if (light != GLOBAL_logicalUnit[shortAddress].lightSource[i])
                error 3 LogicalUnit shortAddress: Wrong lightSource after RESET. Actual: light.
                Expected: GLOBAL_logicalUnit[shortAddress].lightSource[i].
        endif
        i++
endfor
// Check reset value of 102 variables
for (i = 0; i < 32; i++)
        answer = query[i]
        if (answer != reset[i])
                error 4 Wrong reset value for variable[i]. Answer: answer. Expected: reset[i].
        endif
endfor
// Change value of 102 variables
INITIALISE (shortAddress << 1 + 1)
RANDOMISE
wait 100 ms
TERMINATE
randomAddress = GetRandomAddress ()
for (i = 4; i < 32; i++)
        command[i]
endfor
// Perform a power cycle
wait 1 s
PowerCycleAndWaitForDecoder (60)
// Check ROM variables after power cycle
i = 0
deviceType[] = GetSupportedDeviceTypes (shortAddress)
foreach (device in deviceType)
        if (device != GLOBAL_logicalUnit[shortAddress].deviceType[i])
                error 5 LogicalUnit shortAddress: Wrong deviceType after power cycle. Actual:
                device. Expected: GLOBAL_logicalUnit[shortAddress].deviceType[i].
        endif
        i++
endfor
i = 0
extendedVersionNumber[] = GetExtendedVersionNumber (shortAddress; deviceType[])
foreach (version in extendedVersionNumber)
        if (version != GLOBAL_logicalUnit[shortAddress].extendedVersionNumber[i])
                error 6 LogicalUnit shortAddress: Wrong extendedVersionNumber after power cycle.
                Actual: version. Expected:
                GLOBAL_logicalUnit[shortAddress].extendedVersionNumber[i].
        endif
        i++
endfor
i = 0
lightSource[] = GetSupportedLightSources (shortAddress)
foreach (light in lightSource)
        if (light != GLOBAL_logicalUnit[shortAddress].lightSource[i])
                error 7 LogicalUnit shortAddress: Wrong lightSource after power cycle. Actual: light.
                Expected: GLOBAL_logicalUnit[shortAddress].lightSource[i].
        endif
        i++
endfor
// Check power on value of 102 variables
for (i = 0; i < 32; i++)
        answer = query[i]
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    if (answer != powerOn[i])
        error 8 Wrong power on value for variable[i] at test step i = i. Answer: answer.
        Expected: powerOn[i].
    endif
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 54 – Parameters for test sequence Reset/Power-on values

Test step i	command	query	variable	reset	powerOn		
					PHM = 1	1 < PHM < 254	PHM = 254
0	-	QUERY OPERATING MODE	operatingMode	*operatingMode*	*operatingMode*	*operatingMode*	*operatingMode*
1	-	QUERY CONTROL GEAR PRESENT	shortAddress	YES	YES	YES	YES
2	-	**GetRandomAddress** ()	randomAddress	0xFF FF FF	*randomAddress*	*randomAddress*	*randomAddress*
3	-	**GetVersionNumber** ()	versionNumber	2.0	2.0	2.0	2.0
4	DTR0 (*PHM* + 1) SET MIN LEVEL	QUERY MIN LEVEL	minLevel	*PHM*	*PHM* + 1	*PHM* + 1	254
5	DTR0 (*PHM* + 1) SET MAX LEVEL	QUERY MAX LEVEL	maxLevel	254	*PHM* + 1	*PHM* + 1	254
6	DTR0 (1) SET POWER ON LEVEL	QUERY POWER ON LEVEL	powerOnLevel	0xFE	1	1	1
7	DTR0 (1) SET SYSTEM FAILURE LEVEL	QUERY SYSTEM FAILURE LEVEL	systemFailureLevel	0xFE	1	1	1
8	DTR0 (15) SET FADE RATE SET FADE TIME	QUERY FADE TIME/FADE RATE	fadeRate/fadeTime	0x07	0xFF	0xFF	0xFF
9	DTR0 (43) SET EXTENDED FADE TIME	QUERY EXTENDED FADE TIME	extendedFadeTimeBase/Multiplier	0	43	43	43
10	ADD TO GROUP 0 ADD TO GROUP 1 ADD TO GROUP 2 ADD TO GROUP 3 ADD TO GROUP 4 ADD TO GROUP 5	QUERY GROUP 0-7	gearGroups0-7	0x00	0xFF	0xFF	0xFF

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printed.

Test step i	command	query	variable	reset	powerOn		
					PHM = 1	1 < PHM < 254	PHM = 254
	ADD TO GROUP 6 ADD TO GROUP 7						
11	ADD TO GROUP 8 ADD TO GROUP 9 ADD TO GROUP 10 ADD TO GROUP 11 ADD TO GROUP 12 ADD TO GROUP 13 ADD TO GROUP 14 ADD TO GROUP 15	QUERY GROUP 8-15	gearGroups8-15	0x00	0xFF	0xFF	0xFF
12	DTR0 (0) SET SCENE 0	QUERY SCENE LEVEL 0	scene0	0xFF	0	0	0
13	DTR0 (1) SET SCENE 1	QUERY SCENE LEVEL 1	scene1	0xFF	1	1	1
14	DTR0 (2) SET SCENE 2	QUERY SCENE LEVEL 2	scene2	0xFF	2	2	2
15	DTR0 (3) SET SCENE 3	QUERY SCENE LEVEL 3	scene3	0xFF	3	3	3
16	DTR0 (4) SET SCENE 4	QUERY SCENE LEVEL 4	scene4	0xFF	4	4	4
17	DTR0 (5) SET SCENE 5	QUERY SCENE LEVEL 5	scene5	0xFF	5	5	5
18	DTR0 (6) SET SCENE 6	QUERY SCENE LEVEL 6	scene6	0xFF	6	6	6
19	DTR0 (7) SET SCENE 7	QUERY SCENE LEVEL 7	scene7	0xFF	7	7	7
20	DTR0 (8)	QUERY SCENE LEVEL 8	scene8	0xFF	8	8	8

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step i	command	query	variable	reset	powerOn		
					PHM = 1	1 < PHM < 254	PHM = 254
	SET SCENE 8						
21	DTR0 (9) SET SCENE 9	QUERY SCENE LEVEL 9	scene9	0xFF	9	9	9
22	DTR0 (10) SET SCENE 10	QUERY SCENE LEVEL 10	scene10	0xFF	10	10	10
23	DTR0 (11) SET SCENE 11	QUERY SCENE LEVEL 11	scene11	0xFF	11	11	11
24	DTR0 (12) SET SCENE 12	QUERY SCENE LEVEL 12	scene12	0xFF	12	12	12
25	DTR0 (13) SET SCENE 13	QUERY SCENE LEVEL 13	scene13	0xFF	13	13	13
26	DTR0 (14) SET SCENE 14	QUERY SCENE LEVEL 14	scene14	0xFF	14	14	14
27	DTR0 (15) SET SCENE 15	QUERY SCENE LEVEL 15	scene15	0xFF	15	15	15
28	DTR0 (0xAA)	QUERY CONTENT DTR0	DTR0	0xAA	0x00	0x00	0x00
29	DTR1 (0xAB)	QUERY CONTENT DTR1	DTR1	0xAB	0x00	0x00	0x00
30	DTR2 (0xAC)	QUERY CONTENT DTR2	DTR2	0xAC	0x00	0x00	0x00
31	DAPC (1)	QUERY STATUS	statusByte	00100100b	10000100b	10001100b	10001100b

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

12.4.19 DTR0 / DTR1 / DTR2

The test sequence checks the correct function of the DTR registers, by reading from and writing to them. They need to be correct before proceeding with the next tests. They do not (should not) influence the factory default values of NVM variables at all.

Test sequence shall be run for all logical units in parallel.

Test description:

```
for (i = 0; i < 9; i++)
    DTR0 (data0[i])
    DTR1 (data1[i])
    DTR2 (data2[i])
    answer = QUERY CONTENT DTR0
    if (answer != data0[i])
        error 1 Wrong value of DTR0 stored at test step i = i. Actual: answer. Expected:
        data0[i].
    endif
    answer = QUERY CONTENT DTR1
    if (answer != data1[i])
        error 2 Wrong value of DTR1 stored at test step i = i. Actual: answer. Expected:
        data1[i].
    endif
    answer = QUERY CONTENT DTR2
    if (answer != data2[i])
        error 3 Wrong value of DTR2 stored at test step i = i. Actual: answer. Expected:
        data2[i].
    endif
endfor
```

Table 55 – Parameters for test sequence DTR0 / DTR1 / DTR2

Test step i	data0	data1	data2
0	00000001b	11111111b	10000000b
1	00000010b	00000001b	11111111b
2	00000100b	00000010b	00000001b
3	00001000b	00000100b	00000010b
4	00010000b	00001000b	00000100b
5	00100000b	00010000b	00001000b
6	01000000b	00100000b	00010000b
7	10000000b	01000000b	00100000b
8	11111111b	10000000b	01000000b

12.5 Memory banks

12.5.1 READ MEMORY LOCATION on Memory Bank 0

The test sequence checks the correct function of the READ MEMORY LOCATION command and whether memory bank 0 is implemented according to specification.

Test sequence shall be run for all logical units in parallel.

Test description:

DTR0 (0)
DTR1 (0)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
answer = READ MEMORY LOCATION
if (answer == NO)
    error 1 No answer received when reading the size of memory bank 0. Actual: NO. Expected: not NO.
else // Read memory bank 0
    // Read memory bank location 0x00, which may differ per logical unit
    DTR1 (0)
    DTR2 (128)
    for (address = 0; address < GLOBAL_numberShortAddresses; address++)
        DTR0 (0)
        laml[address] = READ MEMORY LOCATION, send to ((address << 1) + 1)
        if (answer == NO)
            error 2 LogicalUnit address: No answer received when reading memory bank location 0. Actual: NO. Expected: not NO.
        else
            if (laml[address] < 0x1A) // Check that all mandatory memory bank locations are implemented
                error 3 LogicalUnit address: Not all mandatory memory locations implemented. Actual: laml[address]. Expected: answer >= 0x1A.
            endif
            if (laml[address] >= 0x1B AND laml[address] <= 0x7F) // Check that none of the reserved memory bank locations [0x1B,0x7F] is given as last accessible memory location
                error 4 LogicalUnit address: Reserved memory bank location laml[address] returned as last memory bank location. Actual: laml[address]. Expected: 0x1A or [0x80,0xFE].
            endif
            if (laml[address] == 0xFF) // Check that reserved memory bank location 0xFF is not given as last accessible memory location
                error 5 LogicalUnit address: Reserved 0xFF memory bank location returned as last memory bank location. Actual: laml[address]. Expected: 0x1A or [0x80,0xFE].
            endif
        endif
        answer = QUERY CONTENT DTR0, send to ((address << 1) + 1) // Check that DTR0 incremented after reading a valid memory bank location
        if (answer != 1)
            error 6 LogicalUnit address: DTR0 not incremented after reading a valid memory bank location. Actual: answer. Expected: 1.
        endif
        answer = QUERY CONTENT DTR1, send to ((address << 1) + 1) // Check that DTR1 not changed after reading memory bank location
        if (answer != 0)
            error 7 LogicalUnit address: DTR1 modified after reading a valid memory bank location. Actual: answer. Expected: 0.
            DTR1 (0)
        endif
        answer = QUERY CONTENT DTR2, send to ((address << 1) + 1) // Check that DTR2 not changed after reading memory bank location
        if (answer != 128)
            error 8 LogicalUnit address: DTR2 modified after reading a valid memory bank location. Actual: answer. Expected: 128.
            DTR2 (128)
        endif
    endfor
    // Read memory bank location 0x01, which shall not be implemented on the logical units
    DTR0 (1)
    DTR2 (64)
    answer = READ MEMORY LOCATION // Check that reserved memory bank location 0x01 is not implemented
    if (answer != NO)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        error 9 Answer received when reading reserved - not implemented memory bank location 0x01. Actual: answer. Expected: NO.
endif
answer = QUERY CONTENT DTR0 // Check that DTR0 incremented after reading a not implemented memory bank location
if (answer != 2)
        error 10 DTR0 not incremented after reading a not implemented memory bank location. Actual: answer. Expected: 2.
endif
answer = QUERY CONTENT DTR1 // Check that DTR1 not changed after reading memory bank location
if (answer != 0)
        error 11 DTR1 modified after reading a not implemented memory bank location. Actual: answer. Expected: 0.
        DTR1 (0)
endif
answer = QUERY CONTENT DTR2 // Check that DTR2 not changed after reading memory bank location
if (answer != 64)
        error 12 DTR2 modified after reading a not implemented memory bank location. Actual: answer. Expected: 64.
endif
// Read the content of must be implemented memory bank locations
// Read memory bank location 0x02, which may differ per logical unit
for (address = 0; address < GLOBAL_numberShortAddresses; address++)
        DTR0 (2)
        answer = READ MEMORY LOCATION, send to ((address << 1) + 1)
        if (answer == NO)
                error 13 LogicalUnit address: An error occurred when reading valid memory bank location 0x02.
        else
                if (answer <= 199)
                        report 1 LogicalUnit address: Last accessible memory bank = answer.
                else
                        error 14 LogicalUnit address: Wrong last accessible memory bank reported. Actual: answer. Expected: [0, 199].
                endif
        endif
        answer = QUERY CONTENT DTR0, send to ((address << 1) + 1) // Check that DTR0 incremented after reading a valid memory bank location
        if (answer != 3)
                error 15 LogicalUnit address: DTR0 not incremented after reading valid memory bank location. Actual: answer. Expected: 3.
        endif
endfor
// Read memory bank locations 0x03 - 0x19, which shall be common for all logical units
loc0x19 = 0
DTR0 (3)
for (i = 0; i < 11; i++)
        multibyte = ReadMemBankMultibyteLocation (nrBytes[i])
        if (multibyte != -1)
                // multibyte shall be displayed as a decimal value
                report 2 text[i] = multibyte
                // Check allowed range for each memory bank location
                if (address[i] == 0x19)
                        loc0x19 = multibyte
                endif
                if (address[i] == 0x15)
                        if (multibyte == 0xFF)
                                error 16 For this DUT, the 101 standard must be implemented.
                        else if (multibyte < 00001000b)
                                error 17 text[i] must be at least 2.0 (00001000b).
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                endif
            else if (address[i] == 0x16)
                if (multibyte == 0xFF)
                    error 18 For this DUT, the 102 standard must be implemented.
                else if (multibyte != 00001000b)
                    error 19 text[i] must be 2.0 (00001000b).
                endif
            else if (address[i] == 0x17)
                if (multibyte == 0xFF)
                    report 3 For this DUT, the 103 standard is not implemented.
                else if (multibyte < 00001000b)
                    error 20 text[i] must be at least 2.0 (00001000b).
                endif
            else if (address[i] == 0x18 AND multibyte > 64)
                error 21 text[i] must be in the range [0,64].
            else if (address[i] == 0x19 AND (multibyte < 1 OR multibyte > 64))
                error 22 text[i] must be in the range [1,64].
            endif
            answer = QUERY CONTENT DTR0 // Check that DTR0 incremented after
            reading a valid memory bank location
            if (answer != dtrValue[i])
                error 23 DTR0 not incremented after reading valid memory bank location.
                Actual: answer. Expected: dtrValue[i].
                DTR0 (dtrValue[i])
            endif
        else
            error 24 An error occurred when reading valid memory bank location address[i].
            DTR0 (dtrValue[i])
        endif
    endfor
    // Read memory bank location 0x1A, which should differ per logical unit
    if (loc0x19 == 0)
        error 25 Location 0x1A cannot be verified since an error occurred when reading
        location 0x19.
    else
        for (address = 0; address < GLOBAL_numberShortAddresses; address++)
            DTR0 (0x1A)
            answer = READ MEMORY LOCATION, send to ((address << 1) + 1)
            if (answer != NO)
                if (answer > (loc0x19 - 1))
                    error 26 LogicalUnit address: Index number of this logical control gear
                    unit must be in the range [0, loc0x19 - 1].
                else
                    report 4 LogicalUnit address: Index number of this logical control gear
                    unit = answer.
                endif
            else
                error 27 LogicalUnit address: An error occurred when reading valid
                memory bank location 0x1A.
            endif
            answer = QUERY CONTENT DTR0, send to ((address << 1) + 1) // Check that
            DTR0 incremented after reading a valid memory bank location
            if (answer != 0x1B)
                error 28 LogicalUnit address: DTR0 not incremented after reading memory
                bank location 0x1A. Actual: answer. Expected: 0x1B.
            endif
        endfor
    endif
    // Check that reserved memory bank locations 0x1B-0x7F are not implemented in none of
    the logical units
    DTR0 (0x1B)
    for (i = 0x1B; i <= 0x7F; i++)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        answer = READ MEMORY LOCATION
        if (answer != NO)
            error 29 Answer received when reading the not implemented memory bank location i. Actual: answer. Expected: NO.
        endif
        answer = QUERY CONTENT DTR0 // Check that DTR0 incremented after reading a not implemented memory bank location
        if (answer != i + 1)
            error 30 DTR0 not incremented after reading the not implemented memory bank location i. Actual: answer. Expected: i + 1.
            DTR0 (i + 1)
        endif
    endfor
    for (address = 0; address < GLOBAL_numberShortAddresses; address++)
        // If available, read the additional control gear information, per logical unit
        DTR0 (0x80)
        additionalData = 0
        for (i = 0x80; i <= 254; i++)
            answer = READ MEMORY LOCATION, send to ((address << 1) + 1)
            if (answer != NO)
                additionalData = additionalData + 1
                report 5 LogicalUnit address: Additional control gear information at location i is answer.
                if (i > laml[address])
                    error 31 LogicalUnit address: Additional control gear information found at location i . Last accessible memory location is laml[address].
                endif
            endif
            answer = QUERY CONTENT DTR0, send to ((address << 1) + 1) // Check that DTR0 incremented after reading a valid memory bank location
            if (answer != i + 1)
                error 32 LogicalUnit address: DTR0 not incremented after reading valid memory bank location i. Actual: answer. Expected: i + 1.
                DTR0 (i + 1)
            endif
        endfor
        if (additionalData == 0 AND laml[address] >= 0x80)
            error 33 LogicalUnit address: No answer received when reading additional data, however additional data expected.
        endif
    endfor
    // Read the last memory bank location
    DTR0 (0xFF)
    answer = READ MEMORY LOCATION
    if (answer != NO)
        error 34 Answer received when reading memory location 0xFF. Actual: answer. Expected: NO.
    endif
    answer = QUERY CONTENT DTR0
    if (answer != 255)
        error 35 DTR0 modified after reading memory location 0xFF. Actual: answer. Expected: 255.
    endif
endif
```

Table 56 – Parameters for test sequence READ MEMORY LOCATION on Memory Bank 0

Test step i	address	nrBytes	dtrValue	text
0	0x03	6	9	GTIN (decimal)
1	0x09	1	10	Firmware version (major)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step i	address	nrBytes	dtrValue	text
2	0x0A	1	11	Firmware version (minor)
3	0x0B	8	19	Identification number (decimal)
4	0x13	1	20	HW version (major)
5	0x14	1	21	HW version (minor)
6	0x15	1	22	101 version number
7	0x16	1	23	102 version number
8	0x17	1	24	103 version number
9	0x18	1	25	Number of logical control devices units in the bus unit
10	0x19	1	26	Number of logical control gear units in the bus unit

12.5.2 READ MEMORY LOCATION on Memory Bank 1

The test sequence checks the correct function of the READ MEMORY LOCATION command and whether memory bank 1 is implemented according to specification.

Test sequence shall be run for each selected logical unit.

Test description:

```
DTR0 (0)
DTR1 (1)
laml = READ MEMORY LOCATION
if (laml != NO)
    report 1 Memory bank 1 is implemented and the last accessible memory location is laml.
    if (laml < 0x10) // Check that all mandatory memory bank locations are implemented
        error 1 Not all mandatory memory locations implemented. Actual: laml. Expected:
        answer >= 0x10.
    endif
    if (laml == 0xFF) // Check that reserved memory bank location 0xFF is not given as last
    accessible memory location
        error 2 Reserved 0xFF memory bank location. Actual: laml. Expected: [0x10,0xFE].
    endif
    answer = QUERY CONTENT DTR0 // Check that DTR0 incremented after reading a valid
    memory bank location
    if (answer != 1)
        error 3 DTR0 not incremented after reading a valid memory bank location. Actual:
        answer. Expected: 1.
    endif
    answer = QUERY CONTENT DTR1 // Check that DTR1 not changed after reading
    memory bank location
    if (answer != 1)
        error 4 DTR1 modified after reading a valid memory bank location. Actual: answer.
        Expected: 1.
    endif
    DTR0 (1)
    DTR1 (1)
    answer = READ MEMORY LOCATION // Read the indicator byte location 0x01
    report 2 Indicator byte (memory bank 1 location 1) = answer
    answer = QUERY CONTENT DTR0 // Check that DTR0 incremented after reading the
    manufacturer specific memory bank location
    if (answer != 2)
        error 5 DTR0 not incremented after reading the manufacturer specific memory bank
        location. Actual: answer. Expected: 2.
    endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        answer = QUERY CONTENT DTR1 // Check that DTR1 not changed after reading
        memory bank location
        if (answer != 1)
            error 6 DTR1 modified after reading the manufacturer specific memory bank
            location. Actual: answer. Expected: 1.
            DTR1 (1)
        endif
        // Read the content of must be implemented memory bank locations
        DTR0 (2)
        for (i = 0; i < 3; i++)
            if (address[i] + nrBytes[i] - 1 <= laml)
                multibyte = ReadMemBankMultibyteLocation (nrBytes[i])
                if (multibyte != -1)
                    report 3 text[i] = multibyte
                else
                    error 7 An error occurred when reading valid memory bank location
                    (text[i]).
                endif
            else
                error 8 Not all mandatory memory bank locations implemented.
            endif
        endfor
        // Read above last accessible memory bank location
        DTR0 (laml + 1)
        for (i = laml + 1; i <= 0xFE; i++)
            answer = READ MEMORY LOCATION
            if (answer != NO)
                error 9 Answer received when reading not implemented memory bank location
                i. Actual: answer. Expected: NO.
            endif
            answer = QUERY CONTENT DTR0
            if (answer != i + 1)
                error 10 DTR0 not incremented after reading above the last accessible memory
                location. Actual: answer. Expected: i + 1.
            endif
        endfor
        // Read the last memory bank location
        DTR0 (0xFF)
        answer = READ MEMORY LOCATION
        if (answer != NO)
            error 11 Answer received when reading memory location 0xFF. Actual: answer.
            Expected: NO.
        endif
        answer = QUERY CONTENT DTR0
        if (answer != 255)
            error 12 DTR0 modified after reading memory location 0xFF. Actual: answer.
            Expected: 255.
        endif
    else
        report 4 Memory bank 1 is not implemented.
        // Check that indeed memory bank 1 is not implemented
        for (i = 1; i <= 255; i++)
            DTR0 (i)
            answer = READ MEMORY LOCATION
            if (answer != NO)
                error 13 Answer received when reading the not implemented memory bank 1,
                location i. Actual: answer. Expected: NO.
            endif
            answer = QUERY CONTENT DTR0
            if (answer != i)
                error 14 DTR0 modified after reading the not implemented memory bank 1,
                location i. Actual: answer. Expected: i.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        endif
        answer = QUERY CONTENT DTR1 // Check that DTR1 not changed after reading
        memory bank location
        if (answer != 1)
            error 15 DTR1 modified after reading the not implemented memory bank 1,
            location i.. Actual: answer. Expected: 1.
            DTR1 (1)
        endif
    endfor
endif
```

Table 57 – Parameters for test sequence READ MEMORY LOCATION on Memory Bank 1

Test step i	address	nrBytes	text
0	2	1	Memory bank 1 lock byte
1	3	6	OEM GTIN (decimal)
2	9	8	OEM identification number (decimal)

12.5.3 READ MEMORY LOCATION on other Memory Banks

The test sequence checks the correct function of the READ MEMORY LOCATION command and checks if all other memory banks besides 0 and 1 are implemented according to specification.

Test sequence shall be run for each selected logical unit.

Test description:

```
DTR0 (2)
DTR1 (0)
lamb = READ MEMORY LOCATION
if (lamb < 2)
    report 1 No other memory bank besides 0 or 1 are implemented.
else
    if (lamb <= 199)
        report 2 Last accessible memory bank is lamb.
    else
        error 1 Wrong last accessible memory bank reported. Actual: lamb. Expected: [2,
        199].
        lamb = 199
    endif
    // Find an implemented memory bank between MB 2 and MB lamb
    for (i = 2; i <= lamb; i++)
        DTR0 (0)
        DTR1 (i)
        laml = READ MEMORY LOCATION
        if (laml == NO)
            report 3 Memory bank i is not implemented.
        else
            report 4 Memory bank i is implemented.
            if (laml < 3 OR laml == 0xFF)
                error 2 Wrong memory location for memory bank i. Actual: laml. Expected:
                [0x03,0xFE].
            endif
            answer = QUERY CONTENT DTR0 // Check that DTR0 incremented after
            reading a valid memory bank location
            if (answer != 1)
                error 3 DTR0 not incremented after reading location 0 of memory bank i.
                Actual: answer. Expected: 1.
            endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            // Check location 0x02
            DTR0 (2)
            answer = READ MEMORY LOCATION
            if (answer == NO)
                error 4 No answer received when reading location 0x02 of memory bank i.
                Actual: NO. Expected: not NO.
            endif
            // Check that at least one location between 0x03 and laml is implemented.
            numberOfAnswers = 0
            DTR0 (3)
            for (j = 3; j <= laml; j++)
                answer = READ MEMORY LOCATION
                if (answer != NO)
                    numberOfAnswers++
                endif
                answer = QUERY CONTENT DTR0
                if (answer != j + 1)
                    error 5 DTR0 not incremented after reading location j of memory bank
                    i. Actual: answer. Expected: j + 1.
                endif
            endfor
            if (numberOfAnswers == 0)
                error 6 At least one memory bank location of memory bank i must be
                implemented in the range [0x03, laml].
            endif
            // Read above last accessible memory bank location
            DTR0 (laml + 1)
            for (j = laml + 1; j <= 0xFE; j++)
                answer = READ MEMORY LOCATION
                if (answer != NO)
                    error 7 Answer received when reading the not implemented memory
                    bank location j of memory bank i. Actual: answer. Expected: NO.
                endif
                answer = QUERY CONTENT DTR0
                if (answer != j + 1)
                    error 8 DTR0 not incremented after reading above the last accessible
                    memory location j of memory bank i. Actual: answer. Expected: j + 1.
                endif
            endfor
            // Read the last memory bank location
            DTR0 (0xFF)
            answer = READ MEMORY LOCATION
            if (answer != NO)
                error 9 Answer received when reading location 0xFF of memory bank i.
                Actual: answer. Expected: NO.
            endif
            answer = QUERY CONTENT DTR0
            if (answer != 255)
                error 10 DTR0 modified after reading location 0xFF of memory bank i.
                Actual: answer. Expected: 255.
            endif
        endif
    endfor
    // Check that memory banks from lamb +1 until 199 are not implemented - no reply
    expected when reading MB
    DTR0 (0)
    for (i = lamb + 1; i < 200; i++)
        DTR1 (i)
        answer = READ MEMORY LOCATION
        if (answer != NO)
            error 11 Answer received when reading above the last accessible memory
            bank: memory bank i. Actual: answer. Expected: NO.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            endif
            answer = QUERY CONTENT DTR0
            if (answer != 0)
                error 12 DTR0 modified after reading the not implemented memory bank i. Actual: answer. Expected: 0.
                DTR0 (0)
            endif
        endfor
        // Check that memory banks from 200 until 255 are reserved - no reply expected when reading MB
        DTR0 (0)
        for (i = 200; i < 256; i++)
            DTR1 (i)
            answer = READ MEMORY LOCATION
            if (answer != NO)
                error 13 Answer received when reading the reserved memory bank i. Actual: answer. Expected: NO.
            endif
            answer = QUERY CONTENT DTR0
            if (answer != 0)
                error 14 DTR0 modified after reading the reserved memory bank i. Actual: answer. Expected: 0.
                DTR0 (0)
            endif
        endfor
endif
```

12.5.4 Memory bank writing

The test sequence checks the correct function of the WRITE MEMORY LOCATION and WRITE MEMORY LOCATION - NO REPLY commands. Before proceeding with the test, an implemented memory bank is needed.

Test sequence shall be run for each selected logical unit.

Test description:

```
(memoryBankNr; memoryBankLoc) = FindImplementedMemoryBank ()
if (memoryBankNr != 0)
    report 1 Memory bank memoryBankNr is implemented and will be used for testing.
    DTR0 (memoryBankNr)
    RESET MEMORY BANK
    wait 11 s
    DTR0 (3)
    DTR1 (memoryBankNr)
    loc0x03 = READ MEMORY LOCATION
    if (memoryBankNr == 1)
        if (memoryBankLoc <= 253)
            iArray = {0,1,2,3,4,5,6,7,8,9,10,11}
        else
            iArray = {0,1,2,3,4,5,6,7,8,9}
        endif
    else
        if (memoryBankLoc <= 253)
            iArray = {0,1,2,3,4,5,6,7,10,11}
        else
            iArray = {0,1,2,3,4,5,6,7}
        endif
    endif
    foreach (i in iArray)
        DTR0 (2) // Select memory bank location
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            DTR1 (memoryBankNr) // Select memory bank
            if (i != 1 AND i != 3)
                ENABLE WRITE MEMORY // ENABLE WRITE MEMORY for certain steps
            endif
            command1[i] // WRITE MEMORY LOCATION - NO REPLY for certain steps
            command2[i] // DTR0 for certain steps
            answer = command3[i] // WRITE MEMORY LOCATION with or withour reply
            if (answer != writeValue[i])
                error 1 Writing to valid memory bank location text1[i] at test step i = i. Actual:
                answer. Expected: writeValue[i].
            endif
            answer = QUERY CONTENT DTR0 // Check if DTR0 changed after writing a valid
            memory bank location in different conditions
            if (answer != dtrValue[i])
                error 2 DTR0 text2[i] at test step i = i. Actual: answer. Expected: dtrValue[i].
            endif
            answer = QUERY CONTENT DTR1 // Check that DTR1 not changed after writing a
            memory bank location
            if (answer != memoryBankNr)
                error 3 DTR1 modified at test step i = i. Actual: answer. Expected:
                memoryBankNr.
            endif
            DTR0 (address[i])
            DTR1 (memoryBankNr)
            answer = READ MEMORY LOCATION // Check by reading if the location was
            correctly written - this will also disable the writeEnableState
            if (answer != readValue[i])
                error 4 Wrong content of memory bank location at test step i = i. Actual:
                answer. Expected: readValue[i].
            endif
        endfor
    else
        report 2 No other memory bank besides memory bank 0 is implemented.
        DTR1 (0) // Select memory bank 0
        // Read and store all values written in memory bank 0
        for (j = 0; j < 256; j++)
            DTR0 (j)
            valueOnLocation[j] = READ MEMORY LOCATION
        endfor
        // Try writing memory bank 0
        for (j = 0; j < 2; j++)
            for (k = 0; k < 256; k++)
                ENABLE WRITE MEMORY
                DTR0 (k)
                if (valueOnLocation[k] == NO)
                    value = 255
                else
                    value = ~valueOnLocation[k]
                endif
                if (j == 0)
                    answer = WRITE MEMORY LOCATION (value)
                    if (answer != NO)
                        error 5 Writing a ROM memory bank location confirmed at test step
                        (j,k) = (j,k). Actual: answer. Expected: NO.
                    endif
                else
                    WRITE MEMORY LOCATION - NO REPLY (value)
                endif
                answer = QUERY CONTENT DTR0 // Check DTR0
                if (k == 255)
                    if (answer != 255)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                    error 6 DTR0 changed at test step (j,k) = (j,k). Actual: answer.
                    Expected: 255.
                endif
            else
                if (answer != k + 1)
                    error 7 DTR0 not incremented at test step (j,k) = (j,k). Actual: answer.
                    Expected: k + 1.
                endif
            endif
            answer = QUERY CONTENT DTR1 // Check that DTR1 not changed after trying
            to write a memory bank location
            if (answer != 0)
                error 8 DTR1 modified at test step (j,k) = (j,k). Actual: answer. Expected:
                0.
                DTR1 (0)
            endif
            DTR0 (k)
            answer = READ MEMORY LOCATION // Check by reading if location was
            written - this will also disable the writeEnableState
            if (answer != valueOnLocation[k])
                error 9 Wrong content of memory bank location at test step (j,k) = (j,k).
                Actual: answer. Expected: valueOnLocation[k].
                ENABLE WRITE MEMORY
                DTR0 (k)
                WRITE MEMORY LOCATION – NO REPLY (valueOnLocation[k])
            endif
        endfor
    endfor
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 58 – Parameters for test sequence Memory bank writing

Test step i	command1	command2	command3	writeValue	text1	dtrValue	text2	address	readValue	test step descripton
0	-	-	WRITE MEMORY LOCATION (0x00)	0x00	not confirmed	3	not incremented	2	0x00	Check writing of a valid location when writeEnableState = enabled
1	-	-	WRITE MEMORY LOCATION (0x01)	NO	confirmed	2	incremented	2	0x00	Check writing of a valid location when writeEnableState = disabled
2	-	-	WRITE MEMORY LOCATION - NO REPLY (0x02)	NO	confirmed	3	not incremented	2	0x02	Check writing of a valid location when writeEnableState = enabled
3	-	-	WRITE MEMORY LOCATION - NO REPLY (0x03)	NO	confirmed	2	incremented	2	0x02	Check writing of a valid location when writeEnableState = disabled
4	WRITE MEMORY LOCATION - NO REPLY (0x55)	DTR0 (255)	WRITE MEMORY LOCATION (0x04)	NO	confirmed	255	incremented	255	NO	Check writing when writeEnableState = enabled AND location is not implemented (loc0xFF-don't increment DTR0)
5	WRITE MEMORY LOCATION - NO REPLY (0x55)	DTR0 (255)	WRITE MEMORY LOCATION - NO REPLY (0x05)	NO	confirmed	255	incremented	255	NO	
6	WRITE MEMORY LOCATION - NO REPLY (0x55)	DTR0 (0)	WRITE MEMORY LOCATION (0x06)	NO	confirmed	1	not incremented	0	*memoryBankLoc*	Check writing when writeEnableState = enabled AND location is not writable (0x00)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step i	command1	command2	command3	writeValue	text1	dtrValue	text2	address	readValue	test step descripton
7	WRITE MEMORY LOCATION - NO REPLY (0x55)	DTR0 (0)	WRITE MEMORY LOCATION - NO REPLY (0x07)	NO	confirmed	1	not incremented	0	*memoryBankLoc*	
8	WRITE MEMORY LOCATION - NO REPLY (0x00)	DTR0 (3)	WRITE MEMORY LOCATION (0x08)	NO	confirmed	4	not incremented	3	*loc0x03*	Check writing when writeEnableState = enabled AND location is lockable and MB is locked for writing
9	WRITE MEMORY LOCATION - NO REPLY (0x00)	DTR0 (3)	WRITE MEMORY LOCATION - NO REPLY (0x09)	NO	confirmed	4	not incremented	3	*loc0x03*	
10	WRITE MEMORY LOCATION - NO REPLY (0x55)	DTR0 (*memoryBankLoc*+1)	WRITE MEMORY LOCATION (0x0A)	NO	confirmed	*memoryBankLoc*+2	not incremented	*memoryBankLoc*+1	NO	Check writing when writeEnableState = enabled AND location is beyond the laml
11	WRITE MEMORY LOCATION - NO REPLY (0x55)	DTR0 (*memoryBankLoc*+1)	WRITE MEMORY LOCATION - NO REPLY (0x0B)	NO	confirmed	*memoryBankLoc*+2	not incremented	*memoryBankLoc*+1	NO	

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.5.5 ENABLE WRITE MEMORY: writeEnableState

The test sequence checks the correct function of the ENABLE WRITE MEMORY command and as well as the correct implementation writeEnableState variable. Before proceeding with the test, an implemented memory bank is needed.

Test sequence shall be run for each selected logical unit.

Test description:

```
(memBankNr; memoryBankLoc) = FindImplementedMemoryBank ()
if (memBankNr == 0)
    report 1 No other memory bank besides memory bank 0 is implemented.
else
    report 2 Memory bank memBankNr is implemented and will be used for testing.
    for (i = 0; i < 15; i++)
        STEP UP // command should disable the writeEnableState
        command1[i]
        command2[i]
        ENABLE WRITE MEMORY
        if (i >= 8)
            answer = command3[i]
            if (answer != value1[i])
                error 1 Wrong value at test step i = i. Actual: answer. Expected: value1[i].
            endif
        endif
        command4[i]
        answer = WRITE MEMORY LOCATION (i)
        if (answer != value2[i])
            error 2 Wrong value for writeEnableState at test step i = i. text[i].
        endif
    endfor
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 59 – Parameters for test sequence ENABLE WRITE MEMORY: writeEnableState

Test step i	command1	command2	command3	value1	command4	value2	text
0	DTR0 (2)	DTR1 (*memBankNr*)	-	-	-	0	Actual: DISABLED. Expected: ENABLED.
1	DTR0 (0)	DTR1 (*memBankNr*)	-	-	DTR0 (2)	1	Actual: DISABLED. Expected: ENABLED.
2	DTR0 (2)	DTR1 (0)	-	-	DTR1 (*memBankNr*)	2	Actual: DISABLED. Expected: ENABLED.
3	DTR0 (2)	DTR1 (*memBankNr*)	-	-	DTR2 (0)	3	Actual: DISABLED. Expected: ENABLED.
4	DTR0 (2)	DTR1 (*memBankNr*)	-	-	ENABLE WRITE MEMORY	4	Actual: DISABLED. Expected: ENABLED.
5	DTR0 (2)	DTR1 (*memBankNr*)	-	-	OFF	NO	Actual: ENABLED. Expected: DISABLED.
6	DTR0 (2)	DTR1 (*memBankNr*)	-	-	RESET wait 300 ms	NO	Actual: ENABLED. Expected: DISABLED.
7	DTR0 (2)	DTR1 (*memBankNr*)	-	-	**PowerCycleAndWaitForDecoder** (5) DTR1 (*memBankNr*) DTR0 (2)	NO	Actual: ENABLED. Expected: DISABLED.
8	DTR0 (2)	DTR1 (*memBankNr*)	QUERY CONTENT DTR0	2	-	8	Actual: DISABLED. Expected: ENABLED.
9	DTR0 (2)	DTR1 (*memBankNr*)	QUERY CONTENT DTR1	*memBankNr*	-	9	Actual: DISABLED. Expected: ENABLED.
10	DTR0 (2)	DTR1 (*memBankNr*)	QUERY CONTENT DTR2	0	-	10	Actual: DISABLED. Expected: ENABLED.
11	DTR0 (2)	DTR1 (*memBankNr*)	READ MEMORY LOCATION	10	-	NO	Actual: ENABLED. Expected: DISABLED.
12	DTR0 (2)	DTR1 (*memBankNr*)	WRITE MEMORY LOCATION (80)	80	DTR0 (2)	12	Actual: DISABLED. Expected: ENABLED.
13	DTR0 (2)	DTR1 (*memBankNr*)	WRITE MEMORY LOCATION - NO REPLY (90)	NO	DTR0 (2)	13	Actual: DISABLED. Expected: ENABLED.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Test step i	command1	command2	command3	value1	command4	value2	text
14	DTR0 (2)	DTR1 (*memBankNr*)	WRITE MEMORY LOCATION (100)	100	DTR0 (*memoryBankLoc* + 1)	NO	Actual: ENABLED. Expected: DISABLED.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.5.6 ENABLE WRITE MEMORY: timeout / command in-between

The test sequence checks the correct function of the ENABLE WRITE MEMORY command. Before proceeding with the test, an implemented memory bank is needed. The command shall be executed only if it is received twice.

This test sequence checks the behaviour of DUT in the following conditions:

- one single command is sent instead of two identical commands;
- command is sent twice with a settling time of 105 ms which is longer than the defined settling time;
- command is sent with a frame in-between, frame which consists of few bits, but not a command;
- command is sent with another command in-between, command which is broadcast sent;
- command is sent with another command in-between, command which is sent to a certain group address;
- command is sent with another command in-between, command which is sent to a certain short address.

In all these cases, the command should not be executed. Where given, the command in-between should be accepted.

Test sequence shall be run for each selected logical unit.

Test description:

```
(memBankNr; memoryBankLoc) = FindImplementedMemoryBank ()
if (memBankNr == 0)
    report 1 No other memory bank besides memory bank 0 is implemented.
else
    report 2 Memory bank memBankNr is implemented and will be used for testing.
    PHM = QUERY PHYSICAL MINIMUM
    for (i = 0; i < 3; i++)
        RESET
        wait 300 ms
        DTR0 (2)
        DTR1 (memBankNr)
        if (i == 0) // Test send command once
            ENABLE WRITE MEMORY, send once
        else if (i == 1) // Test send command with timeout
            ENABLE WRITE MEMORY, send once
            wait 105 ms // settling time
            ENABLE WRITE MEMORY, send once
        else // Test send command with timeout followed by a new command
            ENABLE WRITE MEMORY, send once
            wait 105 ms // settling time
            ENABLE WRITE MEMORY, send once
            wait 50 ms // settling time
            ENABLE WRITE MEMORY, send once
        endif
        answer = WRITE MEMORY LOCATION (0x01)
        if (answer != value[i])
            error 1 writeEnableState text[i] at test step i = i. Actual: answer. Expected:
            value[i].
        endif
    endfor
    for (i = 0; i < 5; i++)
        RESET
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            wait 300 ms
            DTR0 (2)
            DTR1 (memBankNr)
            // The following steps must be sent within 75 ms, counted from the last rise bit of first "ENABLE WRITE MEMORY, send once" command until first fall bit of second "ENABLE WRITE MEMORY, send once" command
            ENABLE WRITE MEMORY, send once
            if (i == 0)
                idle 13 ms + 110010 + idle 13 ms // settling time: idle 13 ms and send a frame followed by 13 ms - Test send command with a frame in-between
            else if (i == 1)
                RECALL MIN LEVEL, send to broadcast // Test send command with broadcast command in-between
            else if (i == 2)
                RECALL MIN LEVEL, send to 10000001b // Test send command with group command in-between - gearGroups0
            else if (i == 3)
                RECALL MIN LEVEL, send to ((GLOBAL_currentUnderTestLogicalUnit << 1) + 1) //Test send command with short command in-between
            else
                RECALL MIN LEVEL, send to ((63 << 1) + 1) //Test send command with short command in-between
            endif
            ENABLE WRITE MEMORY, send once
            answer = WRITE MEMORY LOCATION (i)
            if (answer != NO)
                error 2 writeEnableState enabled at test step i = i. Actual: answer. Expected: NO.
            endif
            answer = QUERY ACTUAL LEVEL
            if (i == 1 OR i == 3)
                if (answer != PHM)
                    error 3 Command in-between not executed. Actual: answer. Expected: PHM.
                endif
            else
                if (answer != 254)
                    error 4 Command in-between executed. Actual: answer. Expected: 254.
                endif
            endif
        endfor
    endif
```

Table 60 – Parameters for test sequence ENABLE WRITE MEMORY: timeout / command in-between

Test step i	value	text
0	NO	enabled
1	NO	enabled
2	0x01	not enabled

12.5.7 RESET MEMORY BANK: timeout / command in-between

The test sequence checks the correct function of the RESET MEMORY BANK command. Before proceeding with the test, an implemented memory bank is needed. The command shall be executed only if it is received twice.

This test sequence checks the behaviour of DUT in the following conditions:

- one single command is sent instead of two identical commands

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

- command is sent twice with a settling time of 105 ms which is longer than the defined settling time
- command is sent with a frame in-between, frame which consists of few bits, but not a command
- command is sent with another command in-between, command which is broadcast sent
- command is sent with another command in-between, command which is sent to a certain group address
- command is sent with another command in-between, command which is sent to a certain short address

In all these cases, the command should not be executed. Where given, the command in-between should be accepted.

Test sequence shall be run for each selected logical unit.

Test description:

```
(memBankNr; memoryBankLoc) = FindImplementedMemoryBank ()
if (memBankNr == 0)
    report 1 No other memory bank besides memory bank 0 is implemented.
else
    report 2 Memory bank memBankNr is implemented and will be used for testing.
    PHM = QUERY PHYSICAL MINIMUM
    // Check timeout behaviour
    for (i = 0; i < 3; i++)
        RESET
        wait 300 ms
        DTR0 (2)
        DTR1 (memBankNr)
        ENABLE WRITE MEMORY
        answer = WRITE MEMORY LOCATION (0x55)
        if (answer != 0x55)
            error 1 Wrong value written at test step i = i. Actual: answer. Expected: 0x55.
        endif
        DTR0 (memBankNr)
        if (i == 0) // Test send command once
            RESET MEMORY BANK, send once
        else if (i == 1) // Test send command with timeout
            RESET MEMORY BANK, send once
            wait 105 ms // settling time
            RESET MEMORY BANK, send once
        else // Test send command with timeout followed by a new command
            RESET MEMORY BANK, send once
            wait 105 ms // settling time
            RESET MEMORY BANK, send once
            wait 50 ms // settling time
            RESET MEMORY BANK, send once
        endif
        wait 10,1 s
        DTR0 (2)
        answer = READ MEMORY LOCATION
        if (answer != value[i])
            error 2 Memory bank memBank text[i] at test step i = i. Actual: answer.
            Expected: value[i].
        endif
    endfor
    // Check behaviour when a command is sent in-between the sendf twice
    for (i = 0; i < 5; i++)
        RESET
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            wait 300 ms
            DTR0 (2)
            DTR1 (memBankNr)
            ENABLE WRITE MEMORY
            answer = WRITE MEMORY LOCATION (i)
            if (answer != i)
                error 3 Wrong value written at test step i = i. Actual: answer. Expected: i.
            endif
            DTR0 (memBankNr)
            // The following steps must be sent within 75 ms, counted from the last rise bit of
            first "RESET MEMORY BANK, send once" command until first fall bit of second
            "RESET MEMORY BANK, send once" command
            RESET MEMORY BANK, send once
            if (i == 0)
                idle 13 ms + 110010 + idle 13 ms // settling time: idle 13 ms followed by a
                frame, followed by 13 ms - Test send command with a frame in-between
            else if (i == 1)
                RECALL MIN LEVEL, send to broadcast // Test send command with broadcast
                command in-between
            else if (i == 2)
                RECALL MIN LEVEL, send to 10000001b // Test send command with group
                command in-between - gearGroups0
            else if (i == 3)
                RECALL MIN LEVEL, send to ((GLOBAL_currentUnderTestLogicalUnit << 1) +
                1) //Test send command with short command in-between
            else
                RECALL MIN LEVEL, send to ((63 << 1) + 1) //Test send command with short
                command in-between
            endif
            RESET MEMORY BANK, send once
            wait 10,1 s
            DTR0 (2)
            answer = READ MEMORY LOCATION
            if (answer != i)
                error 4 Memory bank memBankNr reset at test step i = i. Actual: answer.
                Expected: i.
            endif
            answer = QUERY ACTUAL LEVEL
            if (i == 1 OR i == 3)
                if (answer != PHM)
                    error 5 Command in-between not executed. Actual: answer. Expected:
                    PHM.
                endif
            else
                if (answer != 254)
                    error 6 Command in-between executed. Actual: answer. Expected: 254.
                endif
            endif
        endfor
    endif
```

Table 61 – Parameters for test sequence RESET MEMORY BANK: timeout / command in-between

Test step i	value	text
0	0x55	reset
1	0x55	reset
2	0xFF	not reset

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.5.8 RESET MEMORY BANK

The test sequence checks the correct function of the RESET MEMORY BANK. Before proceeding with the test, an implemented memory bank is needed.

Test sequence shall be run for each selected logical unit.

Test description:

```
(memBankNr[]; memBankLoc[]) = FindAllImplementedMemoryBanks ()
if (memBankNr[0] == 0)
    report 1 No other memory bank besides memory bank 0 is implemented.
else
    for (i = 0; i < 4; i++)
        // Change lock byte of all implemented memory banks
        ENABLE WRITE MEMORY
        foreach (memBank in memBankNr)
            DTR0 (2)
            DTR1 (memBank)
            if (i <= 1)
                WRITE MEMORY LOCATION - NO REPLY (i)
            else
                WRITE MEMORY LOCATION - NO REPLY (0x55)
            endif
        endfor
        // Reset memory bank
        DTR0 (dtr[i])
        RESET MEMORY BANK
        wait 10,1 s
        // Check if the reset of selected memory bank was executed
        foreach (memBank in memBankNr)
            DTR0 (2)
            DTR1 (memBank)
            answer = READ MEMORY LOCATION
            if (i <= 1)
                if (answer != i)
                    error 1 Memory bank memBank reset with memory bank locked for
                    writing at test step i = i. Actual: answer. Expected: i.
                endif
            else if (i == 2)
                if (memBank == memBankNr[0] AND answer != 0xFF)
                    error 2 Selected memory bank memBank not reset at test step i = i.
                    Actual: answer. Expected: 0xFF.
                else if (memBank != memBankNr[0] AND answer != 0x55)
                    error 3 Unselected memory bank memBank reset at test step i = i.
                    Actual: answer. Expected: 0x55.
                endif
            else
                if (answer != 0xFF)
                    error 4 Memory bank memBank not reset at test step i = i. Actual:
                    answer. Expected: 0xFF.
                endif
            endif
        endfor
    endfor
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 62 – Parameters for test sequence RESET MEMORY BANK

Test step i	dtr	test description
0	*memBankNr*[0]	no reset (memory bank is locked)
1	0	no reset (memory bank is locked)
2	*memBankNr*[0]	reset the first memory bank; the other memory banks remain unchanged
3	0	reset all memory bank; all reset

12.6 Level instructions

12.6.1 Level instructions: Basic behaviour

This test sequence checks the basic behaviour of the level instructions.

The first part of the test checks the behaviour of the following instructions: DAPC, OFF, UP, DOWN, STEP UP, STEP DOWN, RECALL MAX LEVEL, RECALL MIN LEVEL, STEP DOWN AND OFF, ON AND STEP UP. Those commands are sent while having the DUT at four different known levels (OFF, MIN LEVEL, middle point between the maximum dimming range, and MAX LEVEL) and with different values for MIN and MAX levels. The commands QUERY ACTUAL LEVEL and QUERY STATUS are used for checking the correct function.

The second part of the test checks if fading bit is set and reset by DAPC command.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
mid = (PHM + 254) >> 1
for (i = 0; i < 2; i++)
    if (i == 1)
        DTR0 (PHM + 1)
        SET MIN LEVEL
        DTR0 (253)
        SET MAX LEVEL
    endif
    min = QUERY MIN LEVEL
    max = QUERY MAX LEVEL
    for (j = 0; j < 42; j++)
        DAPC (dapcLevel[j])
        WaitForLampLevel (min(dapcLevel[j], max))
        command[j]
        if (j == 2 OR j == 26 OR j == 30 OR j == 38)
            WaitForLampOn ()
        endif
        answer = QUERY ACTUAL LEVEL
        if (answer != level[i,j])
            error 1 Wrong ACTUAL LEVEL at test step (i,j) = (i,j). Actual: answer.
            Expected: level[i,j].
        endif
        answer = QUERY STATUS
        if (answer != status[i,j])
            error 2 Wrong lamp status at test step (i,j) = (i,j). Actual: answer. Expected:
            level[i,j].
        endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    endfor
endfor
if (PHM == 254)
    report 1 Control gear is not dimmable.
else
    RECALL MAX LEVEL
    DTR0 (4)
    SET FADE TIME
    DAPC (1)
    answer = QUERY STATUS
    if (answer != XXX1XXXXb)
        error 3 fadeRunning bit in QUERY STATUS not set. Actual: answer. Expected:
        XXX1XXXXb.
    endif
    DAPC (255)
    answer = QUERY STATUS
    if (answer != XXX0XXXXb)
        error 4 fadeRunning bit in QUERY STATUS not cleared. Actual: answer. Expected:
        XXX0XXXXb.
    endif
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 63 – Parameters for test sequence Level instructions: Basic behaviour

Test step j	dapcLevel	command	level						status
			i = 0			i = 1			
			PHM <= 252	PHM = 253	PHM = 254	PHM <= 250	PHM = 251	PHM => 252	
0	254	DAPC (0)	0	0	0	0	0	0	XXX0X0XXb
1	0	DAPC (255)	0	0	0	0	0	0	XXX0X0XXb
2	0	DAPC (1)	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
3	*min*	DAPC (*min*)	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
4	*min*	DAPC (255)	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
5	*min*	DAPC (*mid*)	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	XXX0X1XXb
6	*mid*	DAPC (*max*)	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
7	*max*	DAPC (254)	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
8	*max*	DAPC (255)	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
9	*max*	OFF	0	0	0	0	0	0	XXX0X0XXb
10	0	UP wait 300 ms	0	0	0	0	0	0	XXX0X0XXb
11	*min*	UP wait 300 ms	> *min*	> *min*	*min*	> *min*	> *min*	*min*	XXX0X1XXb
12	*mid*	UP wait 300 ms	> *mid*	> *mid*	*min*	> *mid*	> *mid*	*min*	XXX0X1XXb
13	*max*	UP wait 300 ms	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
14	0	DOWN wait 300 ms	0	0	0	0	0	0	XXX0X0XXb
15	*min*	DOWN wait 300 ms	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
16	*mid*	DOWN wait 300 ms	< *mid*	< *mid*	*min*	< *mid*	< *mid*	*min*	XXX0X1XXb

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step j	dapcLevel	command	level						status
			i = 0			i = 1			
			PHM <= 252	PHM = 253	PHM = 254	PHM <= 250	PHM = 251	PHM => 252	
17	*max*	DOWN wait 300 ms	< *max*	< *max*	*max*	< *max*	< *max*	*max*	XXX0X1XXb
18	0	STEP UP	0	0	0	0	0	0	XXX0X0XXb
19	*min*	STEP UP	*min* + 1	*min* + 1	*min*	*min* + 1	*min* + 1	*min*	XXX0X1XXb
20	*mid*	STEP UP	*mid* + 1	*max*	*max*	*mid* + 1	*max*	*max*	XXX0X1XXb
21	*max*	STEP UP	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
22	0	STEP DOWN	0	0	0	0	0	0	XXX0X0XXb
23	*min*	STEP DOWN	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
24	*mid*	STEP DOWN	*mid* - 1	*mid* - 1	*max*	*mid* - 1	*mid* - 1	*max*	XXX0X1XXb
25	*max*	STEP DOWN	*max* - 1	*max* - 1	*max*	*max* - 1	*max* - 1	*max*	XXX0X1XXb
26	0	RECALL MAX LEVEL	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
27	*min*	RECALL MAX LEVEL	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
28	*mid*	RECALL MAX LEVEL	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
29	*max*	RECALL MAX LEVEL	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
30	0	RECALL MIN LEVEL	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
31	*min*	RECALL MIN LEVEL	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
32	*mid*	RECALL MIN LEVEL	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
33	*max*	RECALL MIN LEVEL	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
34	0	STEP DOWN AND OFF	0	0	0	0	0	0	XXX0X0XXb
35	*min*	STEP DOWN AND OFF	0	0	0	0	0	0	XXX0X0XXb
36	*mid*	STEP DOWN AND OFF	*mid* - 1	*mid* - 1	*min*	*mid* - 1	*mid* - 1	*min*	XXX0X1XXb
37	*max*	STEP DOWN AND OFF	*max* - 1	*max* - 1	*max*	*max* - 1	*max* - 1	*max*	XXX0X1XXb
38	0	ON AND STEP UP	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
39	*min*	ON AND STEP UP	*min* + 1	*min* + 1	*min*	*min* + 1	*min* + 1	*min*	XXX0X1XXb
40	*mid*	ON AND STEP UP	*mid* + 1	*max*	*max*	*mid* + 1	*max*	*max*	XXX0X1XXb

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printed.

Test step j	dapcLevel	command	level						status
			i = 0			i = 1			
			PHM <= 252	PHM = 253	PHM = 254	PHM <= 250	PHM = 251	PHM => 252	
41	*max*	ON AND STEP UP	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.6.2 FADE TIME: possible values

The test sequence checks the correct processing of all possible FADE TIME values. DAPC command is used to dim from MAX LEVEL to MIN LEVEL and from MIN LEVEL to MAX LEVEL. At each test step, the fading time is measured and compared with the expectations. The fade time is based on the fadeRunning bit (bit 4) in the answer of QUERY STATUS. The QUERY ACTUAL LEVEL command is used for checking the target level.

Note regarding test execution: DAPC and QUERY STATUS commands should to be sent as fast as possible after each other (a query can be sent 2,4 ms after an answer was received).

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report 1 Control gear is not dimmable.
else
    for (i = 1; i < 16; i++)
        DTR0 (i)
        SET FADE TIME
        timeLimit = tMAX[i] + 0,1 s
        for (j = 0; j < 2; j++)
            command[j]
            DAPC (level[j])
            start_timer (timer) // Timer starts after stop condition of DAPC command
            do
                answer = QUERY STATUS
                timestamp = get_timer (timer) - 10 ms // Subtract 10 ms which is the
                approximate length of the backward frame to get the start moment of the
                backward frame
            while (answer == XXX1XXXXb AND timestamp < timeLimit)
            if (timestamp >= timeLimit)
                error 1 Fading not stopped after timeLimit s.
            else
                if (timestamp < tMIN[i] OR timestamp > tMAX[i])
                    error 2 FADE TIME out of range at test step (i,j) = (i,j). Actual:
                    timestamp. Expected: tMIN[i] <= time <= tMAX[i].
                endif
            endif
            answer = QUERY ACTUAL LEVEL
            if (answer != value[j])
                error 3 Wrong ACTUAL LEVEL after fading finished at test step (i,j) = (i,j).
                Actual: answer. Expected: value[j].
            endif
        endfor
    endfor
endif
```

Table 64 – Parameters for test sequence FADE TIME: possible values

Test step i	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
tMIN [s]	0,6	0,9	1,3	1,8	2,5	3,6	5,1	7,2	10,2	14,4	20,4	28,8	40,7	57,6	81,5
tMAX [s]	0,8	1,1	1,6	2,2	3,1	4,4	6,2	8,8	12,4	17,4	24,9	35,2	49,8	70,4	99,6

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step j	0	1
command	RECALL MAX LEVEL	RECALL MIN LEVEL
level	1	254
value	*PHM*	254

12.6.3 FADE TIME: transitions

The test sequence check if the fading between off, min, middle, max levels is correctly processed with three different fade times. Test also checks the fading behaviour during startup (test steps j=12) and total lamp failure (test steps j=14). At each test step, the fading time is measured and compared with the expectations. The fade time is based on the fadeRunning bit (bit 4) in the answer of QUERY STATUS. The QUERY ACTUAL LEVEL command is used for checking the target level.

Based on the specifications, at test steps j={0,2,5,15} no fade should take place, since target level and actual level are equal. Check if level transitions for a given fade time are executed according to specification including status byte behaviour.

Transitions from-to indicated by test step j

from\to	0	min	mid	max
0	j=15	j=10	j=12	j=14
min	j=11	j=2	j=7	j=3
mid	j=13	j=6	j=5	j=8
max	j=9	j=1	j=4	j=0

Note regarding test execution: DAPC and QUERY STATUS commands should to be sent as fast as possible after each other (a query can be sent 2,4ms after an answer was received)

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report 1 Control gear is not dimmable.
else
    mid = (PHM + 254) >> 1
    delay = 30 s + GLOBAL_startupTimeLimit
    lightSource = true
    if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
        lightSource = false // This logical unit has no light source
    endif
    for (i = 0; i < 3; i++)
        DTR0 (fade[i])
        SET FADE TIME
        RECALL MAX LEVEL
        WaitForLampLevel (254)
        for (j = 0; j < 16; j++)
            DTR0 (254)
            SET POWER ON LEVEL
            if (j == 15) // Turn off lamps with command OFF
                OFF
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
else if (j == 14) // Disconnect all lamps to have a total lamp failure
    DisconnectLamps (0)
endif
DAPC (level[j])
start_timer (timer) // Timer starts after stop condition of DAPC command
// Check whether fading started
switch (j)
    case 0:
    case 2:
    case 5:
    case 15:
        // Check fadeRunning bit when targetLevel == actualLevel
        answer = QUERY STATUS
        if (answer != XXX0XXXXb)
            error 1 Fade started at test step (i,j) = (i,j). Actual: answer.
            Expected: XXX0XXXXb.
        endif
        break
    case 10:
    case 12:
    case 14:
        // delay and reset timer on actual fade start moment
        expected = XXXXX0XXb // Fade starts after lamp(s) turn on - check
        lampOn bit
        if (j == 14 AND lightSource)
            expected = XXXXXX0Xb // Fade starts after lamp failure is
            detected
        endif
        start_timer (timer2)
        do
            answer = QUERY STATUS
            start_timer (timer) // Timer starts after stop condition of answer
        while ((answer == expected) AND (get_timer (timer2) < delay))
    default:
        // Check fadeRunning bit when targetLevel != actualLevel
        do
            answer = QUERY STATUS
            fadeTime = get_timer (timer) - 10 ms // Subtract 10 ms which is
            the approximate length of the backward frame to get the start
            moment of the backward frame
        while (answer == XXX1XXXXb AND fadeTime < timeLimit[i]) // Check
        fadeRunning bit
        if (fadeTime >= timeLimit[i])
            error 2 Fading not stopped after timeLimit[i] s.
        else
            if (fadeTime < tMIN[i] OR fadeTime > tMAX[i])
                error 3 FADE TIME out of range at test step (i,j) = (i,j).
                Actual: fadeTime. Expected: tMIN[i] <= time <= tMAX[i].
            endif
        endif
        break
endswitch
// Reconnect all lamps to remove the total lamp failure
if (j == 14)
    ConnectLamps ()
    WaitForLampOn ()
endif
// Check actual level
answer = QUERY ACTUAL LEVEL
if (answer != value[j])
    error 4 Wrong ACTUAL LEVEL after fading finished at test step (i,j) = (i,j).
    Actual: answer. Expected: value[j].
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                DTR0 (0)
                SET FADE TIME
                DAPC (value[j]) // Set level to expected level to ensure that next step starts
                from the correct level
                DTR0 (fade[i])
                SET FADE TIME
            endif
        endfor
    endfor
endif
```

Table 65 – Parameters for test sequence FADE TIME: transitions

Test step i	fade	tMin [s]	tMax [s]	timeLimit [s]
0	1	0,6	0,8	0,9
1	4	1,8	2,2	2,3
2	9	10,2	12,4	12,5

Test step j	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
level	254	1	1	254	*mid*	*mid*	1	*mid*	254	0	1	0	*mid*	0	254	0
value	254	*PHM*	*PHM*	254	*mid*	*mid*	*PHM*	*mid*	254	0	*PHM*	0	*mid*	0	254	0

12.6.4 FADE TIME: fading to 0

The test sequence checks the behaviour of DUT while fading to off. The same fade is started twice, first time to check whether fadeRunning and lampOn bits in the answer of QUERY STATUS are set and cleared simultaneously, and the second time to check whether the lamp turns off when fade is done. Test also checks if during fading the steps are made at the expected moment.

Note regarding test execution: DAPC and QUERY STATUS commands, as well as DAPC and QUERY ACTUAL LEVEL commands should to be sent as fast as possible after each other (a query can be sent 2,4 ms after an answer was received).

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM > 250)
    report 1 This test cannot be performed. A DUT with a PHM less or equal to 250 is
    required.
else
    DTR0 (PHM + 1)
    SET MIN LEVEL
    timeLimit = 36 s
    // Start fading to 0 and check fadeRunning and lampOn bits
    DAPC (PHM + 4)
    DTR0 (12)
    SET FADE TIME // Set a fade of 32 s
    i = 0
    DAPC (0)
    start_timer (timer) // Timer starts after stop condition of DAPC command
    do
        status[i] = QUERY STATUS
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        fadeRunningBitTime[i] = get_timer (timer) - 10 ms // Subtract 10 ms which is the approximate length of the backward frame to get the start moment of the backward frame
        i++
    while (status[i - 1] == XXX1XXXXb AND fadeRunningBitTime[i - 1] < timeLimit)
    statusLength = i
    if (fadeRunningBitTime[i - 1] >= timeLimit)
        error 1 Fading not stopped after timeLimit s.
    else
        // Check if fadeRunning and lampOn bits are set/cleared simultaneously
        for (i = 0; i < statusLength; i++)
            fadeRunningBit = (status[i] >> 4) & 0x01
            lampOnBit = (status[i] >> 2) & 0x01
            if (fadeRunningBit != lampOnBit)
                error 2 fadeRunning and lampOn bits not set/cleared simultaneously after fadeRunningBitTime[i] [s] of fading. Status byte: status[i].
            endif
        endfor
        // Start the same fade and check actual level
        DTR0 (0)
        SET FADE TIME
        DAPC (PHM + 4)
        WaitForLampLevel (PHM + 4)
        DTR0 (12)
        SET FADE TIME
        i = 0
        DAPC (0)
        start_timer (timer) // Timer starts after stop condition of DAPC command
        do
            level[i] = QUERY ACTUAL LEVEL
            fadeRunningLevelTime[i] = get_timer (timer) - 10 ms // Subtract 10 ms which is the approximate length of the backward frame to get the start moment of the backward frame
            i++
        while (level[i-1] != 0 AND fadeRunningLevelTime[i - 1] < timeLimit)
        levelLength = i
        if (fadeRunningLevelTime[i - 1] >= timeLimit)
            error 3 Fading not stopped after timeLimit s.
        else
            // Check if the moment when fade bit is reset overlaps with the moment when lamp turns off
            fadeRunningTimestamp = fadeRunningBitTime[statusLength - 2]
            fadeStoppedTimestamp = fadeRunningBitTime[statusLength - 1]
            lampOnTimestamp = fadeRunningLevelTime[levelLength - 2]
            lampOffTimestamp = fadeRunningLevelTime[levelLength - 1]
            minLimit = Max (fadeRunningTimestamp,lampOnTimestamp)
            maxLimit = Min (fadeStoppedTimestamp,lampOffTimestamp)
            if (minLimit > maxLimit)
                error 4 Lamp did not turn off when fade stopped.
            endif
            // Check if actual level is monotonic and when the fade step is made
            j = 0
            for (i = 1; i < levelLength; i++)
                if (level[i] > level[i - 1])
                    error 5 Actual level is not decreasing monotonically.
                else
                    if (level[i] != level[i - 1]) // a step was made
                        if (j > 3)
                            error 6 DUT made more light level steps than expected.
                            break
                        endif
                        if (level[i] != value[j])
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                        error 7 Wrong changed light level. Actual: level[i]. Expected:
                        value[j].
                    endif
                    if (fadeRunningLevelTime[i] < tMIN[j] OR
                    fadeRunningLevelTime[i] > tMAX[j])
                        error 8 Wrong moment of the light level. Actual:
                        fadeRunningLevelTime[i]. Expected: tMIN[j] <= time <=
                        tMAX[j].
                    endif
                    j++
                endif
            endif
        endfor
    endif
  endif
endif
```

Table 66 – Parameters for test sequence FADE TIME: fading to 0

Test step j	value	tMin [s]	tMax [s]
0	*PHM* + 3	4,8	5,8
1	*PHM* + 2	14,4	17,6
2	*PHM* + 1	23,9	29,2
3	0	28,8	35,2

12.6.5 FADE TIME: small steps fading

The test sequence checks if level transitions to small steps for a given fade time are executed according to specification. At each test step fading is started twice, once to monitor the actual level on the interface, and once to monitor the status byte. The bus interface should be continuously monitored such that measurements can be done. Based on acquired information, the following checks are performed:

- as long as fadeRunning bit is set, lampOn bit is also set; only for the case when fading to or from level 0;
- fade takes 4 s - based on status byte;
- when the actual fade steps are made - based on actual level.

Regarding test execution: DAPC and QUERY STATUS commands, as well as DAPC and QUERY ACTUAL LEVEL commands should to be sent as fast as possible after each other (a query can be sent 2,4 ms after an answer was received).

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
DTR0 (PHM + 1)
SET MIN LEVEL
min = QUERY MIN LEVEL
mid = (min + 254) >> 1
switch (PHM)
    case 254:
    case 253:
        mStart = 6
        break
    case 252:
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            mStart = 3
            break
        case 251:
            mStart = 2
            break
        case 250:
            mStart = 1
            break
        default:
            mStart = 0
            break
endswitch
for (m = mStart; m < 8; m++)
    // Start fading and store status byte
    DTR0 (0)
    SET FADE TIME
    DAPC (fromLevel[m])
    WaitForLampLevel (fromLevel[m])
    DTR0 (6)
    SET FADE TIME
    i = 0
    DAPC (toLevel[m])
    start_timer (timer) // Timer starts after stop condition of DAPC command
    if (m == 5 OR m == 7)
        start_timer (timer2)
        do
            answer = QUERY STATUS
            start_timer (timer) // Timer starts after stop condition of answer
        while (answer == XXXX X0XXb) AND (get_timer (timer2) <
        GLOBAL_startupTimeLimit)) // Keep querying until lamp(s) turn on - check lampOn
        bit
    endif
    do
        status[i] = QUERY STATUS
        statusTimestamp[i] = get_timer (timer) - 10 ms // Subtract 10 ms which is the
        approximate length of the backward frame to get the start moment of the backward
        frame
        i++
    while (status[i - 1] == XXX1 XXXXb AND statusTimestamp[i - 1] < 4,5 s)
    statusLength = i
    if (statusTimestamp[i - 1] >= 4,5 s)
        error 1 Fading not stopped after 4,5 s.
    else
        // Check that fade takes 4 s - based on status byte
        if (statusTimestamp[i - 1] < 3,6 s OR statusTimestamp[i - 1] > 4,4 s)
            error 2 Wrong fade time at test step m = m. Actual: statusTimestamp[i - 1] s.
            Expected: 3,6 s < fade time < 4,4 s.
        endif
        // Check that as long as fadeRunning bit is set, also lampOn bit is set; only for the
        case when fading to or from level 0
        if (fromLevel[m] == 0 OR toLevel[m] == 0)
            if (fromLevel[m] == 0)
                iEnd = statusLength - 1 // exclude the last answer last expected answer
                should be XXX0 X1XXb
            else
                iEnd = statusLength
            endif
            for (i = 0; i < iEnd; i++)
                fadeRunningBit = (status[i] >> 4) & 0x01
                lampOnBit = (status[i] >> 2) & 0x01
                if (fadeRunningBit != lampOnBit) // if (bit 2 and bit 4 are not simultaneously
                set to TRUE)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                    error 3 fadeRunning and lampOn bits not simultaneously set or cleared. Status byte: status[i].
                endif
            endfor
        endif
    endif
    // Start fading between the same levels as before and store the reported actual level
    DTR0 (0)
    SET FADE TIME
    DAPC (fromLevel[m])
    WaitForLampLevel (fromLevel[m])
    DTR0 (6)
    SET FADE TIME // Set a fade of 4 s
    i = 0
    DAPC (toLevel[m])
    start_timer (timer) // Timer starts after stop condition of DAPC command
    if (m == 5 OR m == 7)
        WaitForLampOn ()
    endif
    do
        actualLevel[i] = QUERY ACTUAL LEVEL
        actualLevelTimestamp[i] = get_timer (timer) - 10 ms // Subtract 10 ms which is the approximate length of the backward frame to get the start moment of the backward frame
        i++
    while (actualLevel[i - 1] != toLevel[m] AND actualLevelTimestamp[i - 1] < 4,5 s)
    actualLevelLength = i
    if (actualLevelTimestamp[i - 1] >= 4,5 s)
        error 4 Fading not stopped after 4,5 s.
    else
        // Check when fade steps are made - based on actual level
        if (m != 7)
            step = 1
            for (i = 1; i < actualLevelLength; i++)
                if (actualLevel[i - 1] != actualLevel[i])
                    if (step <= nrSteps[m])
                        if (step == 1)
                            minLimit = t1Min[m]
                            maxLimit = t1Max[m]
                        else
                            minLimit = t2Min[m]
                            maxLimit = t2Max[m]
                        endif
                        if (actualLevelTimestamp[i] < minLimit OR actualLevelTimestamp[i] > maxLimit)
                            error 5 Wrong moment of changing the light level for step = step at test step m = m. Actual: actualLevelTimestamp[i] s. Expected: minLimit s <= time <= maxLimit s.
                        endif
                        step++
                    else
                        error 6 DUT made more steps than expected.
                        break
                    endif
                endif
            endfor
        endif
    endif
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 67 – Parameters for test sequence FADE TIME: small steps fading

Test step m	fromLevel	toLevel	nrSteps	t1Min	t1Max	t2Min	t2Max
0	*mid*	*mid* - 2	2	0,9	1,1	2,7	3,3
1	*mid*	*mid* + 2	2	0,9	1,1	2,7	3,3
2	*mid*	*mid* - 1	1	1,8	2,2	-	-
3	*mid*	*mid* + 1	1	1,8	2,2	-	-
4	*min* + 1	0	2	1,8	2,2	3,6	4,4
5	0	*min* + 1	1	1,8	2,2	-	-
6	*Min*	0	1	3,6	4,4	-	-
7	0	*Min*	0	-	-	-	-

12.6.6 FADE TIME: extended fade time

The test sequence checks the correct processing of few possible EXTENDED FADE TIME values. DAPC command is used to dim from

- MAX LEVEL to MIN LEVEL (test step j = 0);
- MIN LEVEL to MAX LEVEL (test step j = 1);
- MAX LEVEL to a middle level (test step j = 2);
- a middle level to MAX LEVEL (test step j = 3).

At each test step, the fading time is measured and compared with the expectations. The fade time is based on the fadeRunning bit (bit 4) in the answer of QUERY STATUS. The QUERY ACTUAL LEVEL command is used for checking the target level.

Regarding test execution: DAPC and QUERY STATUS commands should to be sent as fast as possible after each other (a query can be sent 2,4 ms after an answer was received).

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report 1 Control gear is not dimmable.
else
    mid = (PHM + 254) >> 1
    // Check the usage of extended fade time
    for (i = 0; i < 4; i++)
        for (j = 0; j < 4; j++)
            fadeTime = 200 s
            for (k = 0; k < kEnd[i]; k++)
                DTR0 (0)
                SET EXTENDED FADE TIME
                command[j] // Set starting level for fading
                DTR0 (dtrValue[i])
                SET EXTENDED FADE TIME
                DAPC (level[j]) // Start fading
                start_timer (timer) // Timer starts after stop condition of DAPC command
                wait k ms // Shift the moment of sending QUERY STATUS such to find the
                moment when fade bit is reset
                do
                    answer = QUERY STATUS
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                    timestamp = get_timer (timer) - 10 ms // Subtract 10 ms which is the
                    approximate length of the backward frame to get the start moment of
                    the backward frame
                while (answer == XXX1XXXXb AND timestamp < timeLimit[i])
                if (k == 0 AND timestamp >= timeLimit[i])
                    error 1 Fading not stopped after timeLimit[i] s.
                    break
                endif
                if (timestamp < fadeTime)
                    fadeTime = timestamp
                endif
            endfor
            if (fadeTime != 200)
                if (fadeTime < tMin[i] OR fadeTime > tMax[i])
                    error 2 EXTENDED FADE TIME not used or FADE TIME out of range
                    at test step (i,j) = (i,j). Actual: fadeTime s. Expected: tMin[i] <= time <=
                    tMax[i].
                endif
            endif
            answer = QUERY ACTUAL LEVEL
            if (answer != value[j])
                error 3 Wrong ACTUAL LEVEL after extended fading finished at test step
                (i,j) = (i,j). Actual: answer. Expected: value[j].
            endif
        endfor
    endfor
    // Check if change of light is done as fast as possible
    DTR0 (0)
    SET EXTENDED FADE TIME
    RECALL MAX LEVEL
    i = 0
    DAPC (1)
    start_timer(timer) // Timer starts after the stop condition of DAPC command
    do
        answer[i] = QUERY STATUS
        i++
    while (get_timer(timer) < 1s)
    foreach (i in answer)
        if (i == XXX1XXXXb)
            error 4 fadeRunning bit set during a transition which should have been
            performed immediately.
        endif
    endfor
    RECALL MAX LEVEL
    DAPC (1)
    answer = QUERY ACTUAL LEVEL
    if (answer != PHM)
        error 5 Target level differs from actual level, when transition to target level had to be
        performed immediately. Answer: answer. Expected: PHM.
    endif
endif
```

Table 68 – Parameters for test sequence FADE TIME: extended fade time

Test step i	dtrValue	tMin [s]	tMax [s]	kEnd	timeLimit
0	00010001b	0,19	0,21	40	0,25
1	00101111b	15,2	16,8	1	17
2	00110011b	38	42	1	43
3	01000010b	171	189	1	190

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step j	command	level	value
0	RECALL MAX LEVEL	1	*PHM*
1	RECALL MIN LEVEL	254	254
2	RECALL MAX LEVEL	*mid*	*mid*
3	DAPC (*mid*)	254	254

12.6.7 FADE RATE: possible values

The test sequence checks the correct processing of all possible FADE RATE values. In the first part of the test, one DOWN command is sent. In the second part of the test, the DOWN command is repeated a certain number of times n(j). For both cases, the number of steps the DUT fade and the fading time of 200 ms are queried. The test is repeated with UP command.

For the second part of the test, the number of commands to be sent is dependent on the PHM of DUT and the FADE RATE chosen. For each FADE RATE (without taking care of PHM) the maximum and minimum steps which can be made within 100 ms are given by sMin1 and sMin2, respectively. Having the sMin1 and sMin2 for each FADE RATE, and the PHM of DUT, the number of times a command can be sent and the maximum and minimum expected steps are calculated, so that a difference can be seen.

Note regarding test execution: command2[i] and QUERY STATUS commands should to be sent as fast as possible after each other (a query can be sent 2,4 ms after an answer was received).

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report 1 Control gear is not dimmable.
else
    (n[]; sMin2[]; sMax2[]) = CalculateFadeRate (PHM)
    for (i = 0; i < 2; i++)
        for (j = 1; j < 16; j++)
            // Test behaviour when sending one command
            if (sMax1[j] <= (254 - PHM))
                DTR0 (j)
                SET FADE RATE
                fadeTime = 300 ms
                for (k = 0; k < 40; k++)
                    command1[i]
                    wait 770 ms
                    command2[i]
                    start_timer (timer) // Timer starts after stop condition of command2[i]
                    wait k ms // Shift the moment of sending QUERY STATUS such to find
                    the moment when fade bit is reset
                    do
                        answer = QUERY STATUS
                        timestamp = get_timer (timer) - 10 ms // Subtract 10 ms which is
                        the approximate length of the backward frame to get the start
                        moment of the backward frame
                    while (answer == XXX1XXXXb AND timestamp < 250 ms)
                    if (k == 0 AND timestamp >= 250 ms)
                        error 1 Fading not stopped after 250 ms.
                        break
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            endif
            if (timestamp < fadeTime)
                fadeTime = timestamp
            endif
        endfor
        if (k == 40)
            if (fadeTime < 180 ms OR fadeTime > 220 ms)
                error 2 Wrong fade time initiated by command2[i] at FADE RATE
                j. Actual: fadeTime ms. Expected: 180 ms <= time <= 220 ms.
            endif
        endif
        answer = QUERY ACTUAL LEVEL
        if (i == 0)
            s = 254 - answer
        else
            s = answer - PHM
        endif
        if (sMin1[j] > s OR s > sMax1[j])
            error 3 Wrong number of steps at command2[i] and FADE RATE j.
            Actual: s. Expected: sMin1[j] <= s <= sMax1[j].
        endif
    endif
    // Test behaviour when sending multiple commands
    DTR0 (j)
    SET FADE RATE
    fadeTime = 300 ms
    for (k = 0; k < 40; k++)
        command1[i]
        wait 770 ms
        counter = n[j]
        // All command2[i] need to be sent at each 100 ms. After the last
        command2[i], start sending as fast as possible after each other QUERY
        STATUS (query can be sent 2,4 ms after BF was received)
        while (counter != 0)
            wait 90 ms // Please ensure that 90 ms are between the two forward
            frames - to have 100 ms between reception of commands=half fade
            rate time
            command2[i]
            counter--
        endwhile
        start_timer (timer) // Timer starts after stop condition of the last
        command2[i]
        wait (k * 1) ms
        do
            answer = QUERY STATUS
            timestamp = get_timer (timer) - 10 ms // Subtract 10 ms which is the
            approximate length of the backward frame to get the start moment of
            the backward frame
        while (answer == XXX1XXXXb AND timestamp < 250 ms)
        if (k == 0 AND timestamp >= 250 ms)
            error 4 Fading not stopped after 250 ms.
            break
        endif
        if (timestamp < fadeTime)
            fadeTime = timestamp
        endif
    endfor
    if (k == 40)
        if (fadeTime < 180 ms OR fadeTime > 220 ms)
            error 5 Wrong fade time initiated by command2[i] at FADE RATE j.
            Actual: fadeTime ms. Expected: 180 ms <= time <= 220 ms.
        endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                endif
                answer = QUERY ACTUAL LEVEL
                if (i == 0)
                    s = 254 - answer
                else
                    s = answer - PHM
                endif
                if (sMin2[j] > s OR s > sMax2[j])
                    error 6 Wrong number of steps at command2[i] and FADE RATE j. Actual:
                    s. Expected: sMin2[j] <= s <= sMax2[j].
                endif
            endfor
        endfor
endif
```

Table 69 – Parameters for test sequence FADE RATE: possible values

Test step i	command1	command2
0	RECALL MAX LEVEL	DOWN
1	RECALL MIN LEVEL	UP

Test step j	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
sMin1	65	46	33	23	17	12	9	6	5	3	3	2	2	1	1
sMax1	80	57	41	29	21	15	11	8	6	5	4	3	3	2	2

12.6.7.1 CalculateFadeRate

Test subsequence calculates, based on the PHM of logical unit, the number of commands which can be sent for a certain fade, as well as the expected minimum and the maximum number of steps to be made.

Test description:

(*n[]*; *sMin[]*; *sMax[]*) = CalculateFadeRate (*PHM*)

```
maxSteps = 254 - PHM
for (fade = 1; fade < 16; fade++)
    for (steps = 1; steps < 256; steps++)
        // Calculate the number of steps to be made when sending 'steps' commands with
        fade rate 'fade'
        tmps = (steps + 1) * steps100ms[fade]
        tmpmin = RoundDown (0,9 * tmps) + 1
        tmpmax = RoundUp (1,1 * tmps) + 1
        if (tmpmax > maxSteps)
            // Exit the 'steps' loop since no more steps than maxSteps can be made
            if (steps == 1)
                // Calculate the minimum and maximum steps to be made in case only one
                command can be sent
                n[fade] = 1
                sMin[fade] = Min (tmpmin, maxSteps)
                sMax[fade] = Min (tmpmax, maxSteps)
            endif
            break
        endif
        // Store minimum, maximum number of steps to be made when sending n commands
        n[fade] = steps
        sMin[fade] = tmpmin
        sMax[fade] = tmpmax
    endfor
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

return (*n*[], *sMin*[], *sMax*[])

Table 70 – Parameters for test sequence FADE RATE: possible values

Test step fade	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
steps100ms	35,8	25,3	17,9	12,7	8,94	6,33	4,47	3,16	2,24	1,58	1,12	0,79	0,56	0,4	0,28

12.6.8 FADE RATE: transitions

The test sequence check if fading with UP and DOWN commands is correctly processed in the following situation:

- start a fade between the same levels (from 254 to 254, from PHM to PHM). No fading should start since actual and target levels are equal;
- start a fade between two consecutive levels (from 253 to 254, from PHM+1 to PHM). A fade of 200 ms shall start.

The QUERY ACTUAL LEVEL command is used for checking the target level.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report 1 Control gear is not dimmable.
else
    DTR0 (2)
    SET FADE RATE
    // Check that no fade is started
    for (i = 0; i < 2; i++)
        command1[i]
        command2[i]
        answer = QUERY STATUS
        if (answer != XXX0XXXXb)
            error 1 Fade started at test step i = i. Actual: answer. Expected: XXX0XXXXb.
        endif
        answer = QUERY ACTUAL LEVEL
        if (answer != level[i])
            error 2 Wrong ACTUAL LEVEL at test step i = i. Actual: answer. Expected:
            level[i].
        endif
    endfor
    // Check that a fade of 200 ms is started
    for (i = 2; i < 4; i++)
        fadeTime = 300 ms
        for (j = 0; j < 40; j++)
            command1[i]
            command2[i]
            start_timer (timer) // Timer starts after stop condition of command2[j]
            wait j ms // Shift the moment of sending QUERY STATUS such to find the
            moment when fade bit is reset
            do
                answer = QUERY STATUS
                timestamp = get_timer (timer) - 10 ms // Subtract 10 ms which is the
                approximate length of the backward frame to get the start moment of the
                backward frame
            while (answer == XXX1XXXXb AND timestamp < 250 ms)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            if (j == 0 AND timestamp >= 250 ms)
                error 3 Fading not stopped after 250 ms at test step i = i.
                break
            endif
            if (timestamp < fadeTime)
                fadeTime = timestamp
            endif
        endfor
        if (j == 40)
            if (fadeTime < 180 ms OR fadeTime > 220 ms)
                error 4 Wrong moment of stopping the fade at test step i = i. Actual:
                fadeTime ms. Expected: 180 ms <= time <= 220 ms.
            endif
        endif
        answer = QUERY ACTUAL LEVEL
        if (answer != level[i])
            error 5 Wrong ACTUAL LEVEL at test step i = i. Actual: answer. Expected:
            level[i].
        endif
    endfor
endif
```

Table 71 – Parameters for test sequence FADE RATE: transitions

Test step i	command1	command2	level
0	RECALL MAX LEVEL	UP	254
1	RECALL MIN LEVEL	DOWN	*PHM*
2	DAPC (253)	UP	254
3	DAPC (*PHM* + 1)	DOWN	*PHM*

12.6.9 FADE RATE: extended fade time

The test sequence checks if during fading with a given fade rate, fade time and extended fade time remain unchanged.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report 1 Control gear is not dimmable.
else
    for (i = 0; i < 2; i++)
        // Set fading variables
        DTR0 (5)
        SET FADE TIME
        SET FADE RATE
        DTR0 (00101101b)
        SET EXTENDED FADE TIME
        // The following commands need to be sent as fast as possible after each other
        (queries can be sent 2,4 ms after BF was received)
        command[i]
        answer = QUERY FADE TIME/FADE RATE
        if ((answer & 0x0F) != 5)
            error 1 fadeRate changed during a fading started by command[i]. Actual:
            (answer & 0x0F). Expected: 5.
        endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            if ((answer >> 4) != 5)
                error 2 fadeTime changed during a fading started by command[i]. Actual:
                (answer >> 4). Expected: 5.
            endif
            answer = QUERY EXTENDED FADE TIME
            if ((answer & 0x0F) != 13)
                error 3 extendedFadeTimeBase changed during a fading started by
                command[i]. Actual: (answer & 0x0F). Expected: 13.
            endif
            if ((answer >> 4) != 2)
                error 4 extendedFadeTimeMultiplier changed during a fading started by
                command[i]. Actual: (answer >> 4). Expected: 2.
            endif
            wait 200 ms
            // Check if initial values are not changed
            answer = QUERY FADE TIME/FADE RATE
            if ((answer & 0x0F) != 5)
                error 5 fadeRate changed after fading with command[i] finished. Actual:
                (answer & 0x0F). Expected: 5.
            endif
            if ((answer >> 4) != 5)
                error 6 fadeTime changed after fading with command[i] finished. Actual:
                (answer >> 4). Expected: 5.
            endif
            answer = QUERY EXTENDED FADE TIME
            if ((answer & 0x0F) != 13)
                error 7 extendedFadeTimeBase changed after fading with command[i] finished.
                Actual: (answer & 0x0F). Expected: 13.
            endif
            if ((answer >> 4) != 2)
                error 8 extendedFadeTimeMultiplier changed after fading with command[i]
                finished. Actual: (answer >> 4). Expected: 2.
            endif
        endfor
endif
```

Table 72 – Parameters for test sequence FADE RATE: extended fade time

Test step i	command
0	UP
1	DOWN

12.6.10 FADE TIME/FADE RATE: stop fading by setting MIN/MAX levels

The test sequence checks if fade is stopped according to specification upon reception of SET MAX LEVEL and SET MIN LEVEL commands. DUT is set to a reference level, then a fade is started. During fading, MIN and MAX levels are set. The actual level reached by DUT as well as the setting of max and min levels are checked while fading as follows:

- from MAX LEVEL to MIN LEVEL and from MIN LEVEL to MAX LEVEL using the fade time;
- from MAX LEVEL to MIN LEVEL and from MIN LEVEL to MAX LEVEL using the extended fade time;
- from MAX LEVEL to down and from MIN LEVEL to up using the fade rate.

In the beginning of the test the expected range for the actual levels is computed. At test steps k=0 and k=1 fade is started using DAPC and GO TO SCENE commands, and after 1 s (a quarter of the fading time) the min/max levels are set. At test step k=3, the fade is started by a DAPC command, then after 1 s of fading GO TO LAST ACTIVE LEVEL command is sent, command which starts a new fade towards the target set by DAPC command. One second

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

later, the min/max levels are set. In case of fading using the fade rate, fading is stopped after 100 ms (half way fading).

Test sequence shall be run for each selected logical unit.

Test description:

```
PHM = QUERY PHYSICAL MINIMUM
if (PHM >= 253)
    report 1 Control gear is not dimmable enough.
else
    // Determine expected level after 1/4 of fading when fading from max to min level, with fade time and extended fade time
    FT_Max2Min = ((254 - (PHM + 1)) >> 2) // Expected level after 1/4 of fading when fading from max to min level
    FT_Max2Min_min10p = 254 - FT_Max2Min * 1,1 // Minimum expected level when using the fade time
    FT_Max2Min_min5p = 254 - FT_Max2Min * 1,05 // Minimum expected level when using the extended fade time
    FT_Max2Min_max5p = 254 - FT_Max2Min * 0,95 // Maximum expected level when using the extended fade time
    FT_Max2Min_max10p = 254 - FT_Max2Min * 0,9 // Maximum expected level when using the fade time
    // Determine expected level after 1/4 of the new fading when fading from the previous point to min level, with fade time and extended fade time
    FT_Max2Min_2Min_min10p = FT_Max2Min_min10p - ((FT_Max2Min_min10p - (PHM + 1)) >> 2) * 1,1 // Minimum expected level when using the fade time
    FT_Max2Min_2Min_min5p = FT_Max2Min_min5p - ((FT_Max2Min_min5p - (PHM + 1)) >> 2) * 1,05 // Minimum expected level when using the extended fade time
    FT_Max2Min_2Min_max5p = FT_Max2Min_max5p - ((FT_Max2Min_max5p - (PHM + 1)) >> 2) * 0,95 // Maximum expected level when using the extended fade time
    FT_Max2Min_2Min_max10p = FT_Max2Min_max10p - ((FT_Max2Min_max10p - (PHM + 1)) >> 2) * 0,9 // Maximum expected level when using the fade time
    // Determine expected level after 1/4 of fading when fading from min to max level, with fade time and extended fade time
    FT_Min2Max = ((254 - (PHM + 1)) >> 2) // Expected level after 1/4 of fading when fading from min to max level
    FT_Min2Max_min10p = (PHM + 1) + FT_Min2Max * 0,9 // Minimum expected level when using the fade time
    FT_Min2Max_min5p = (PHM + 1) + FT_Min2Max * 0,95 // Minimum expected level when using the extended fade time
    FT_Min2Max_max5p = (PHM + 1) + FT_Min2Max * 1,05 // Maximum expected level when using the extended fade time
    FT_Min2Max_max10p = (PHM + 1) + FT_Min2Max * 1,1 // Maximum expected level when using the fade time
    // Determine expected level after 1/4 of the new fading when fading from the previous point to max level, with fade time and extended fade time
    FT_Min2Max_2Max_min10p = FT_Min2Max_min10p + ((254 - FT_Min2Max_min10p) >> 2) * 0,9 // Minimum expected level when using the fade time
    FT_Min2Max_2Max_min5p = FT_Min2Max_min5p + ((254 - FT_Min2Max_min5p) >> 2) * 0,95 // Minimum expected level when using the extended fade time
    FT_Min2Max_2Max_max5p = FT_Min2Max_max5p + ((254 - FT_Min2Max_max5p) >> 2) * 1,05 // Maximum expected level when using the extended fade time
    FT_Min2Max_2Max_max10p = FT_Min2Max_max10p + ((254 - FT_Min2Max_max10p) >> 2) * 1,1 // Maximum expected level when using the fade time
    FR_Min = 22 // Minimum number of steps to be made with a fade rate of 2 within 100 ms
    FR_Max = 28 // Maximum number of steps to be made by DUT with a fade rate of 2 within 100 ms
    for (i = 0; i < 3; i++)
        for (j = 0; j < 6; j++)
            for (k = 0; k < 3; k++)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                    RESET
                    wait 300 ms
                    DTR0 (PHM + 1)
                    SET MIN LEVEL
                    DTR0 (value1[i])
                    command1[i]
                    command2[j]
                    if (i < 2)
                        if (k == 0)
                            command3[j]
                        else if (k == 1)
                            DTR0 (1)
                            SET SCENE 5
                            DTR0 (254)
                            SET SCENE 7
                            command4[j]
                        else
                            command3[j]
                            wait 1 s
                            GO TO LAST ACTIVE LEVEL
                        endif
                        wait 1 s
                        DTR0 (value2[j])
                    else
                        DTR0 (value2[j])
                        command5[j]
                        wait 90 ms
                    endif
                    command6[j]
                    answer = QUERY STATUS
                    if (answer != XXX0XXXXb)
                        error 1 Fade not stopped at test step (i,j,k) = (i,j,k). Actual: answer.
                        Expected: XXX0XXXXb.
                    endif
                    answer = QUERY ACTUAL LEVEL
                    if (answer != level[i,j,k])
                        error 2 Wrong actual level after sending command command6[j] at
                        test step (i,j,k) = (i,j,k). Actual: answer. Expected: level[i,j,k].
                    endif
                    answer = command7
                    if (answer != value2[j])
                        error 3 command6[j] not executed at test step (i,j,k) = (i,j,k). Actual:
                        answer. Expected: value2[j].
                    endif
                    if (i == 2)
                        k = 2 // Do not repeat the test for UP/DOWN
                    endif
                endfor
            endfor
        endfor
    endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 73 – Parameters for test sequence FADE TIME/FADE RATE: stop fading by setting MIN/MAX levels

Test step i			0	1	2
value1			6	0010 0011	2
command1			SET FADE TIME	SET EXTENDED FADE TIME	SET FADE RATE
level	k != 2	j <= 1	**Max** (**RoundDown** (*FT_Max2Min_min10p*),*minLevel*[*j*]) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max10p*),*minLevel*[*j*])	**Max** (**RoundDown** (*FT_Max2Min_min5p*),*minLevel*[*j*]) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max5p*),*minLevel*[*j*])	**Max** (254 - *FR_Max*,*minLevel*[*j*]) <= answer <= **Max** (254 - *FR_Min*,*minLevel*[*j*])
		j = 2	253	253	253
		j = 3	*PHM* + 2	*PHM* + 2	*PHM* + 2
		j >= 4	**Min** (**RoundDown** (*FT_Min2Max_min10p*),*maxLevel*[*j*]) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max10p*),*maxLevel*[*j*])	**Min** (**RoundDown** (*FT_Min2Max_min5p*),*maxLevel*[*j*]) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max5p*),*maxLevel*[*j*])	**Min** (*PHM* + 1 + *FR_Min*,*maxLevel*[*j*]) <= answer <= **Min** (*PHM* + 1 + *FR_Max*,*maxLevel*[*j*])
	k = 2	j <= 2	**Max** (**RoundDown** (*FT_Max2Min_2Min_min10p*),*minLevel*[*j*]) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max10p*),*minLevel*[*j*])	**Max** (**RoundDown** (*FT_Max2Min_2Min_min5p*),*minLevel*[*j*]) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max5p*),*minLevel*[*j*])	-
		j >= 3	**Min** (**RoundDown** (*FT_Min2Max_2Max_min10p*),*maxLevel*[*j*]) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max10p*),*maxLevel*[*j*])	**Min** (**RoundDown** (*FT_Min2Max_2Max_min5p*),*maxLevel*[*j*]) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max5p*),*maxLevel*[*j*])	-

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step j	command2	command3	command4	command5	value2	command6	minLevel	maxLevel	command7	test description
0	RECALL MAX LEVEL	DAPC (1)	GO TO SCENE 5	DOWN	*PHM* + 1	SET MIN LEVEL	*PHM* + 1	254	QUERY MIN LEVEL	start a fade from MAX LEVEL to MIN LEVEL/down
1	RECALL MAX LEVEL	DAPC (1)	GO TO SCENE 5	DOWN	*PHM* + 2	SET MIN LEVEL	*PHM* + 2	254	QUERY MIN LEVEL	
2	RECALL MAX LEVEL	DAPC (1)	GO TO SCENE 5	DOWN	253	SET MIN LEVEL	253	254	QUERY MIN LEVEL	
3	RECALL MIN LEVEL	DAPC (254)	GO TO SCENE 7	UP	*PHM* + 2	SET MAX LEVEL	*PHM* + 1	*PHM* + 2	QUERY MAX LEVEL	start a fade from MIN LEVEL to MAX LEVEL/up
4	RECALL MIN LEVEL	DAPC (254)	GO TO SCENE 7	UP	253	SET MAX LEVEL	*PHM* + 1	253	QUERY MAX LEVEL	
5	RECALL MIN LEVEL	DAPC (254)	GO TO SCENE 7	UP	254	SET MAX LEVEL	*PHM* + 1	254	QUERY MAX LEVEL	

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.6.11 FADE TIME/FADE RATE: stop fading

The test sequence checks if fade is stopped according to specification upon reception of DAPC(255), SAVE PERSISTENT VARIABLES, and IDENTIFY DEVICE commands. DUT is set to a reference level, then a fade is started. The actual level reached by DUT is checked after fading as follows:

- from MAX LEVEL to MIN LEVEL and from MIN LEVEL to MAX LEVEL using the fade time;
- from MAX LEVEL to MIN LEVEL and from MIN LEVEL to MAX LEVEL using the extended fade time;
- from MAX LEVEL to down and from MIN LEVEL to up using the fade rate.

In the beginning of the test the expected range for the actual levels is computed. At test steps k=0 and k=1 fade is started using DAPC and GO TO SCENE commands, and after 1 s (a quarter of the fading time) fade is stopped. At test step k=3, the fade is started by a DAPC command, then after 1 s of fading GO TO LAST ACTIVE LEVEL command is sent, command which starts a new fade towards the target set by DAPC command. One second later, fade is stopped. In case of fading using the fade rate, fading is stopped after 100 ms (half way fading).

Test sequence shall be run for each selected logical unit.

Test description:

```
PHM = QUERY PHYSICAL MINIMUM
if (PHM >= 253)
    report 1 Control gear is not dimmable enough.
else
    minLevel = PHM + 1
    // Determine expected level after 1/4 of fading when fading from max to min level, with fade time and extended fade time
    FT_Max2Min = ((254 - minLevel) >> 2) // Expected level after 1/4 of fading when fading from max to min level
    FT_Max2Min_min10p = 254 - FT_Max2Min * 1,1 // Minimum expected level when using the fade time
    FT_Max2Min_min5p = 254 - FT_Max2Min * 1,05 // Minimum expected level when using the extended fade time
    FT_Max2Min_max5p = 254 - FT_Max2Min * 0,95 // Maximum expected level when using the extended fade time
    FT_Max2Min_max10p = 254 - FT_Max2Min * 0,9 // Maximum expected level when using the fade time
    // Determine expected level after 1/4 of the new fading when fading from the previous point to min level, with fade time and extended fade time
    FT_Max2Min_2Min_min10p = FT_Max2Min_min10p - ((FT_Max2Min_min10p - minLevel) >> 2) * 1,1 // Minimum expected level when using the fade time
    FT_Max2Min_2Min_min5p = FT_Max2Min_min5p - ((FT_Max2Min_min5p - minLevel) >> 2) * 1,05 // Minimum expected level when using the extended fade time
    FT_Max2Min_2Min_max5p = FT_Max2Min_max5p - ((FT_Max2Min_max5p - minLevel) >> 2) * 0,95 // Maximum expected level when using the extended fade time
    FT_Max2Min_2Min_max10p = FT_Max2Min_max10p - ((FT_Max2Min_max10p - minLevel) >> 2) * 0,9 // Maximum expected level when using the fade time
    // Determine expected level after 1/4 of fading when fading from min to max level, with fade time and extended fade time
    FT_Min2Max = ((254 - minLevel) >> 2) // Expected level after 1/4 of fading when fading from min to max level
    FT_Min2Max_min10p = minLevel + FT_Min2Max * 0,9 // Minimum expected level when using the fade time
    FT_Min2Max_min5p = minLevel + FT_Min2Max * 0,95 // Minimum expected level when using the extended fade time
    FT_Min2Max_max5p = minLevel + FT_Min2Max * 1,05 // Maximum expected level when using the extended fade time
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    FT_Min2Max_max10p = minLevel + FT_Min2Max * 1,1 // Maximum expected level when
    using the fade time
    // Determine expected level after 1/4 of the new fading when fading from the previous
    point to max level, with fade time and extended fade time
    FT_Min2Max_2Max_min10p = FT_Min2Max_min10p + ((254 - FT_Min2Max_min10p) >>
    2) * 0,9 // Minimum expected level when using the fade time
    FT_Min2Max_2Max_min5p = FT_Min2Max_min5p + ((254 - FT_Min2Max_min5p) >> 2) *
    0,95 // Minimum expected level when using the extended fade time
    FT_Min2Max_2Max_max5p = FT_Min2Max_max5p + ((254 - FT_Min2Max_max5p) >> 2)
    * 1,05 // Maximum expected level when using the extended fade time
    FT_Min2Max_2Max_max10p = FT_Min2Max_max10p + ((254 -
    FT_Min2Max_max10p) >> 2) * 1,1 // Maximum expected level when using the fade time
    FR_Min = 22 // Minimum number of steps to be made with a fade rate of 2 within 100 ms
    FR_Max = 28 // Maximum number of steps to be made with a fade rate of 2 within 100 ms
    for (i = 0; i < 3; i++)
        for (j = 0; j < 6; j++)
            for (k = 0; k < 3; k++)
                RESET
                wait 300 ms
                DTR0 (minLevel)
                SET MIN LEVEL
                command2[j]
                DTR0 (value[i])
                command1[i]
                if (i < 2)
                    if (k == 0)
                        command3[j]
                    else if (k == 1)
                        DTR0 (1)
                        SET SCENE 4
                        DTR0 (254)
                        SET SCENE 15
                        command4[j]
                    else
                        command3[j]
                        wait 1 s
                        GO TO LAST ACTIVE LEVEL
                    endif
                    wait 1 s
                else
                    command5[j]
                    wait 90 ms
                endif
                command6[j]
                answer = QUERY STATUS
                if (answer != XXX0XXXXb)
                    error 1 Fade not stopped at test step (i,j,k) = (i,j,k). Actual: answer.
                    Expected: XXX0XXXXb.
                endif
                answer = QUERY ACTUAL LEVEL
                if (answer != level[i,j,k])
                    error 2 Wrong actual level at test step (i,j,k) = (i,j,k). Actual: answer.
                    Expected: level[i,j,k].
                endif
                if (i == 2)
                    k = 2 // Do not repeat the test for UP/DOWN
                endif
            endfor
        endfor
    endfor
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 74 – Parameters for test sequence FADE TIME/FADE RATE: stop fading

Test step i			0	1	2
value1			6	00100011b	2
command1			SET FADE TIME	SET EXTENDED FADE TIME	SET FADE RATE
level	k != 2	j <= 2	**Max** (**RoundDown** (*FT_Max2Min_min10p*),*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max10p*),*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_min5p*),*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max5p*),*minLevel*)	**Max** (254 - *FR_Max*,*minLevel*) <= answer <= **Max** (254 - *FR_Min*,*minLevel*)
		j >= 3	**Min** (**RoundDown** (*FT_Min2Max_min10p*),254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max10p*),254)	**Min** (**RoundDown** (*FT_Min2Max_min5p*),254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max5p*),254)	**Min** (*minLevel* + *FR_Min*,254) <= answer <= **Min** (*minLevel* + *FR_Max*,254)
	k = 2	j <= 2	**Max** (**RoundDown** (*FT_Max2Min_2Min_min10p*),*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max10p*),*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_2Min_min5p*),*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max5p*),*minLevel*)	-
		j >= 3	**Min** (**RoundDown** (*FT_Min2Max_2Max_min10p*),254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max10p*),254)	**Min** (**RoundDown** (*FT_Min2Max_2Max_min5p*),254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max5p*),254)	-

Test step j	command2	command3	command4	command5	command6
0	RECALL MAX LEVEL	DAPC (1)	GO TO SCENE 4	DOWN	DAPC (255)
1	RECALL MAX LEVEL	DAPC (1)	GO TO SCENE 4	DOWN	SAVE PERSISTENT VARIABLES wait 300 ms
2	RECALL MAX LEVEL	DAPC (1)	GO TO SCENE 4	DOWN	IDENTIFY DEVICE wait 11 s
3	RECALL MIN LEVEL	DAPC (254)	GO TO SCENE 15	UP	DAPC (255)
4	RECALL MIN LEVEL	DAPC (254)	GO TO SCENE 15	UP	SAVE PERSISTENT VARIABLES wait 300 ms
5	RECALL MIN LEVEL	DAPC (254)	GO TO SCENE 15	UP	IDENTIFY DEVICE wait 11 s

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.6.12 FADE TIME/FADE RATE: stop fading when a command is sent, check timing

The test sequence checks whether the fade is stopped when an absolute or a relative command is received.

Test sequence shall be run for each selected logical unit.

Test description:

PHM = QUERY PHYSICAL MINIMUM
if (*PHM* >= 246)
    report 1 Control gear is not dimmable enough.
else
    minLevel = *PHM* + 1
    // Determine expected level after 1/4 of fading when fading from max to min level, with fade time and extended fade time
    FT_Max2Min = ((254 - *minLevel*) >> 2) *// Expected level after 1/4 of fading when fading from max to min level*
    FT_Max2Min_min10p = 254 - *FT_Max2Min* * 1,1 *// Minimum expected level when using the fade time*
    FT_Max2Min_min5p = 254 - *FT_Max2Min* * 1,05 *// Minimum expected level when using the extended fade time*
    FT_Max2Min_max5p = 254 - *FT_Max2Min* * 0,95 *// Maximum expected level when using the extended fade time*
    FT_Max2Min_max10p = 254 - *FT_Max2Min* * 0,9 *// Maximum expected level when using the fade time*
    // Determine expected level after 1/4 of the new fading when fading from the previous point to min level, with fade time and extended fade time
    FT_Max2Min_2Min_min10p = *FT_Max2Min_min10p* - ((*FT_Max2Min_min10p* - *minLevel*) >> 2) * 1,1 *// Minimum expected level when using the fade time*
    FT_Max2Min_2Min_min5p = *FT_Max2Min_min5p* - ((*FT_Max2Min_min5p* - *minLevel*) >> 2) * 1,05 *// Minimum expected level when using the extended fade time*
    FT_Max2Min_2Min_max5p = *FT_Max2Min_max5p* - ((*FT_Max2Min_max5p* - *minLevel*) >> 2) * 0,95 *// Maximum expected level when using the extended fade time*
    FT_Max2Min_2Min_max10p = *FT_Max2Min_max10p* - ((*FT_Max2Min_max10p* - *minLevel*) >> 2) * 0,9 *// Maximum expected level when using the fade time*
    // Determine expected level after 1/4 of fading when fading from min to max level, with fade time and extended fade time
    FT_Min2Max = ((254 - *minLevel*) >> 2) *// Expected level after 1/4 of fading when fading from min to max level*
    FT_Min2Max_min10p = *minLevel* + *FT_Min2Max* * 0,9 *// Minimum expected level when using the fade time*
    FT_Min2Max_min5p = *minLevel* + *FT_Min2Max* * 0,95 *// Minimum expected level when using the extended fade time*
    FT_Min2Max_max5p = *minLevel* + *FT_Min2Max* * 1,05 *// Maximum expected level when using the extended fade time*
    FT_Min2Max_max10p = *minLevel* + *FT_Min2Max* * 1,1 *// Maximum expected level when using the fade time*
    // Determine expected level after 1/4 of the new fading when fading from the previous point to max level, with fade time and extended fade time
    FT_Min2Max_2Max_min10p = *FT_Min2Max_min10p* + ((254 - *FT_Min2Max_min10p*) >> 2) * 0,9 *// Minimum expected level when using the fade time*
    FT_Min2Max_2Max_min5p = *FT_Min2Max_min5p* + ((254 - *FT_Min2Max_min5p*) >> 2) * 0,95 *// Minimum expected level when using the extended fade time*
    FT_Min2Max_2Max_max5p = *FT_Min2Max_max5p* + ((254 - *FT_Min2Max_max5p*) >> 2) * 1,05 *// Maximum expected level when using the extended fade time*
    FT_Min2Max_2Max_max10p = *FT_Min2Max_max10p* + ((254 - *FT_Min2Max_max10p*) >> 2) * 1,1 *// Maximum expected level when using the fade time*
    // Determine number of steps to be made with a fade rate of 2 within 100 ms
    FR_Min = 22 *// Minimum number of steps*
    FR_Max = 28 *// Maximum number of steps*

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    FR_Max2Min_min10p = Max (254 - FR_Max,minLevel)
    FR_Max2Min_max10p = Max (254 - FR_Min,minLevel)
    FR_Min2Max_min10p = Min (minLevel + FR_Min,254)
    FR_Min2Max_max10p = Min (minLevel + FR_Max,254)
    for (i = 0; i < 3; i++)
        if (i < 2)
            jstart = 0
            jend = 5
            delay = 1000 ms // Wait 1/4 of the fade time
        else
            jstart = 6
            jend = 7
            delay = 90 ms //Wait half of the fade rate time - to have 100 ms between
            reception of commands
        endif
        for (j = jstart; j <= jend; j++)
            for (k = 0; k < 8; k++)
                RESET
                wait 300 ms
                WaitForLampLevel (254)
                DTR0 (minLevel)
                SET MIN LEVEL
                DTR0 (value[i])
                command1[i]
                command2[j]
                DTR0 (1)
                SET SCENE 3
                DTR0 (254)
                SET SCENE 10
                command3[j]
                wait delay ms // settling time
                command4[k]
                answer = QUERY STATUS
                if (answer != XXX0 XXXXb)
                    error 1 Fade not stopped at test step (i,j,k) = (i,j,k). Actual: answer.
                    Expected: XXX0 XXXXb.
                endif
                answer = QUERY ACTUAL LEVEL
                if (answer != level[i,j,k])
                    error 2 Wrong actual level at test step (i,j,k) = (i,j,k). Actual: answer.
                    Expected: level[i,j,k].
                endif
            endfor
        endfor
    endfor
endif
```

Table 75 – Parameters for test sequence FADE TIME/FADE RATE: stop fading when a command is sent, check timing

Test step i	value	command1	description
0	6	SET FADE TIME	fade of 4 s
1	00100011b	SET EXTENDED FADE TIME	fade of 4 s
2	2	SET FADE RATE	fade of 25 steps/100 ms

Test step j	command2	command3
0	RECALL MAX LEVEL	DAPC (1)
1	RECALL MAX LEVEL	GO TO SCENE 3
2	RECALL MIN LEVEL	DAPC (254)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step j	command2	command3
3	RECALL MIN LEVEL	GO TO SCENE 10
4	RECALL MAX LEVEL	DAPC(1) wait 1 s GO TO LAST ACTIVE LEVEL
5	RECALL MIN LEVEL	DAPC(254) wait 1 s GO TO LAST ACTIVE LEVEL
6	RECALL MAX LEVEL	DOWN
7	RECALL MIN LEVEL	UP

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step k			0	1	2	3	4	5	6	7
command4			OFF	RECALL MIN LEVEL	RECALL MAX LEVEL	RESET wait 300 ms	STEP UP	STEP DOWN	ON AND STEP UP	STEP DOWN AND OFF
level	**i = 0**	**j = {0,1}**	0	*minLevel*	254	254	**Max** (**RoundDown** (*FT_Max2Min_min10p*) + 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max10p*) + 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_min10p*) - 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max10p*) - 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_min10p*) + 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max10p*) + 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_min10p*) - 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max10p*) - 1,*minLevel*)
		j = {2,3}	0	*minLevel*	254	254	**Min** (**RoundDown** (*FT_Min2Max_min10p*) + 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max10p*) + 1,254)	**Min** (**RoundDown** (*FT_Min2Max_min10p*) - 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max10p*) - 1,254)	**Min** (**RoundDown** (*FT_Min2Max_min10p*) + 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max10p*) + 1,254)	**Min** (**RoundDown** (*FT_Min2Max_min10p*) - 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max10p*) - 1,254)
		j = 4	0	*minLevel*	254	254	**Max** (**RoundDown** (*FT_Max2Min_2Min_min10p*) + 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max10p*) + 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_2Min_min10p*) - 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max10p*) - 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_2Min_min10p*) + 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max10p*) + 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_2Min_min10p*) - 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max10p*) - 1,*minLevel*)
		j = 5	0	*minLevel*	254	254	**Min** (**RoundDown** (*FT_Min2Max_2Max_min10p*) + 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max10p*) + 1,254)	**Min** (**RoundDown** (*FT_Min2Max_2Max_min10p*) - 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max10p*) - 1,254)	**Min** (**RoundDown** (*FT_Min2Max_2Max_min10p*) + 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max10p*) + 1,254)	**Min** (**RoundDown** (*FT_Min2Max_2Max_min10p*) - 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max10p*) - 1,254)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printed.

Test step k			0	1	2	3	4	5	6	7
command4			OFF	RECALL MIN LEVEL	RECALL MAX LEVEL	RESET wait 300 ms	STEP UP	STEP DOWN	ON AND STEP UP	STEP DOWN AND OFF
	i = 1	j = {0,1}	0	*minLevel*	254	254	**Max** (**RoundDown** (*FT_Max2Min_min5p*) + 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max5p*) + 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_min5p*) - 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max5p*) - 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_min5p*) + 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max5p*) + 1,*minLevel*)	**Max** (**RoundDown**(*FT_Max2Min_min5p*) - 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max5p*) - 1,*minLevel*)
		j = {2,3}	0	*minLevel*	254	254	**Min** (**RoundDown** (*FT_Min2Max_min5p*) + 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max5p*) + 1,254)	**Min** (**RoundDown** (*FT_Min2Max_min5p*) - 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max5p*) - 1,254)	**Min** (**RoundDown** (*FT_Min2Max_min5p*) + 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max5p*) + 1,254)	**Min** (**RoundDown** (*FT_Min2Max_min5p*) - 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max5p*) - 1,254)
		j = 4	0	*minLevel*	254	254	**Max** (**RoundDown** (*FT_Max2Min_2Min_min5p*) + 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max5p*) + 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_2Min_min5p*) - 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max5p*) - 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_2Min_min5p*) + 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max5p*) + 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_2Min_min5p*) - 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max5p*) - 1,*minLevel*)
		j = 5	0	*minLevel*	254	254	**Min** (**RoundDown** (*FT_Min2Max_2Max_min5p*) + 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max5p*) + 1,254)	**Min** (**RoundDown** (*FT_Min2Max_2Max_min5p*) - 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max5p*) - 1,254)	**Min** (**RoundDown** (*FT_Min2Max_2Max_min5p*) + 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max5p*) + 1,254)	**Min** (**RoundDown** (*FT_Min2Max_2Max_min5p*) - 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max5p*) - 1,254)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step k			0	1	2	3	4	5	6	7
command4			OFF	RECALL MIN LEVEL	RECALL MAX LEVEL	RESET wait 300 ms	STEP UP	STEP DOWN	ON AND STEP UP	STEP DOWN AND OFF
	i = 2	j = 6	0	*minLevel*	254	254	**Max** (*FR_Max2Min_min10p* + 1,*minLevel*) <= answer <= **Max** (*FR_Max2Min_max10p* + 1,*minLevel*)	**Max** (*FR_Max2Min_min10p* - 1,*minLevel*) <= answer <= **Max** (*FR_Max2Min_max10p* - 1,*minLevel*)	**Max** (*FR_Max2Min_min10p* + 1,*minLevel*) <= answer <= **Max** (*FR_Max2Min_max10p* + 1,*minLevel*)	**Max** (*FR_Max2Min_min10p* - 1,*minLevel*) <= answer <= **Max** (*FR_Max2Min_max10p* - 1,*minLevel*)
		j = 7	0	*minLevel*	254	254	**Min** (*FR_Min2Max_min10p* + 1,254) <= answer <= **Min** (*FR_Min2Max_max10p* + 1,254)	**Min** (*FR_Min2Max_min10p* - 1,254) <= answer <= **Min** (*FR_Min2Max_max10p* - 1,254)	**Min** (*FR_Min2Max_min10p* + 1,254) <= answer <= **Min** (*FR_Min2Max_max10p* + 1,254)	**Min** (*FR_Min2Max_min10p* - 1,254) <= answer <= **Min** (*FR_Min2Max_max10p* - 1,254)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.6.13 FADE TIME/FADE RATE: stop fading during startup

The test sequence checks whether fading is stopped according to specification during startup.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM >= 253)
    report 1 Test not useful for devices with PHM >= 253. Actual PHM = PHM.
else
    DTR0 (15)
    SET FADE TIME // Set the longest fade time (2,8 steps/s --> 1 step/360 ms)
    SET FADE RATE
    DTR0 (PHM + 1)
    for (i = 0; i < 10; i++)
        OFF
        wait 1 s
        // The following two commands (DAPC(254) and command) need be sent with the
        minimum allowed settling time
        DAPC (254)
        command[i]
        answer = QUERY STATUS
        if (answer != XXX0XXXXb)
            error 1 Fade not stopped at test step i = i. Actual: answer. Expected:
            XXX0XXXXb.
        endif
        if (i != 8)
            WaitForLampOn ()
        endif
        answer = QUERY ACTUAL LEVEL
        if (answer != level[i])
            error 2 Wrong actual level at test step i = i. Actual: answer. Expected: level[i].
        endif
    endfor
endif
```

Table 76 – Parameters for test sequence FADE TIME/FADE RATE: stop fading during startup

Test step i	command	level
0	SET MIN LEVEL DTR0 (254)	*PHM* + 1
1	SET MAX LEVEL	*PHM* + 1
2	DAPC (255)	*PHM* + 1
3	SAVE PERSISTENT VARIABLES wait 300 ms	*PHM* + 1
4	UP wait 220 ms	*PHM* + 2
5	DOWN wait 220 ms	*PHM* + 1
6	STEP UP	*PHM* + 2
7	STEP DOWN	*PHM* + 1
8	STEP DOWN AND OFF	0

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step i	command	level
9	ON AND STEP UP	*PHM* + 2

12.6.14 Level instructions: combined instructions

The test sequence checks the correct function of DUT when several sequences of level control instructions are sent, with or without fading.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM >= 253)
    report 1 Control gear is not dimmable enough.
else
    minLevel = PHM + 1
    DTR0 (minLevel)
    SET MIN LEVEL
    DTR0 (2)
    SET FADE RATE
    for (i = 0; i < 12; i++)
        command1[i]
        wait 700 ms
        command2[i]
        command3[i]
        wait 600 ms
        answer = QUERY ACTUAL LEVEL
        if (value1Min[i] > answer OR answer > value1Max[i])
            error 1 Wrong actual level at test step i = i. Actual: answer. Expected:
            value1Min[i] <= level <= value1Max[i].
        endif
    endfor
    for (i = 0; i < 12; i++)
        command1[i]
        wait 700 ms
        command2[i]
        command3[i]
        wait 90 ms
        command3[i]
        wait 450 ms
        answer = QUERY ACTUAL LEVEL
        if (value2Min[i] > answer OR answer > value2Max[i])
            error 2 Wrong actual level at test step i = i. Actual: answer. Expected:
            value2Min[i] <= level <= value2Max[i].
        endif
    endfor
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 77 – Parameters for test sequence Level instructions: combined instructions

Test step i	command1	command2	command3	value1Min	value1Max	value2Min	value2Max
0	DAPC (254)	DAPC (*minLevel*)	UP	**Max** (*minLevel*, **Min** (*minLevel* + 45, 254))	**Min** (**Max** (*minLevel*, *minLevel* + 56), 254)	**Max** (*minLevel*, **Min** (*minLevel* + 69, 254))	**Min** (**Max** (*minLevel*, *minLevel* + 83), 254)
1	DAPC (254)	DAPC (*minLevel*)	STEP UP	**Min** (*minLevel* + 1, 254)	**Min** (*minLevel* + 1, 254)	**Min** (*minLevel* + 2, 254)	**Min** (*minLevel* + 2, 254)
2	DAPC (254)	DAPC (*minLevel*)	ON AND STEP UP	**Min** (*minLevel* + 1, 254)	**Min** (*minLevel* + 1, 254)	**Min** (*minLevel* + 2, 254)	**Min** (*minLevel* + 2, 254)
3	DAPC (254)	RECALL MIN LEVEL	UP	**Max** (*minLevel*, **Min** (*minLevel* + 45, 254))	**Max** (*minLevel*, **Min** (*minLevel* + 56, 254))	**Max** (*minLevel*, **Min** (*minLevel* + 69, 254))	**Max** (*minLevel*, **Min** (*minLevel* + 83, 254))
4	DAPC (254)	RECALL MIN LEVEL	STEP UP	**Min** (*minLevel* + 1, 254)	**Min** (*minLevel* + 1, 254)	**Min** (*minLevel* + 2, 254)	**Min** (*minLevel* + 2, 254)
5	DAPC (254)	RECALL MIN LEVEL	ON AND STEP UP	**Min** (*minLevel* + 1, 254)	**Min** (*minLevel* + 1, 254)	**Min** (*minLevel* + 2, 254)	**Min** (*minLevel* + 2, 254)
6	DAPC (*minLevel*)	DAPC (254)	DOWN	**Max** (*minLevel*, **Min** (254 - 56, 254))	**Max** (*minLevel*, **Min** (254 - 45, 254))	**Max** (*minLevel*, **Min** (254 - 83, 254))	**Max** (*minLevel*, **Min** (254 - 69, 254))
7	DAPC (*minLevel*)	DAPC (254)	STEP DOWN	**Max** (*minLevel*, (254 - 1))	**Max** (*minLevel*, (254 - 1))	**Max** (*minLevel*, (254 - 2))	**Max** (*minLevel*, (254 - 2))
8	DAPC (*minLevel*)	DAPC (254)	STEP DOWN AND OFF	**Max** (*minLevel*, (254 - 1))	**Max** (*minLevel*, (254 - 1))	**Max** (*minLevel*, (254 - 2))	**Max** (*minLevel*, (254 - 2))
9	DAPC (*minLevel*)	RECALL MAX LEVEL	DOWN	**Max** (*minLevel*, **Min** (254 - 56, 254))	**Max** (*minLevel*, **Min** (254 - 45, 254))	**Max** (*minLevel*, **Min** (254 - 83, 254))	**Max** (*minLevel*, **Min** (254 - 69, 254))
10	DAPC (*minLevel*)	RECALL MAX LEVEL	STEP DOWN	**Max** (*minLevel*, (254 - 1))	**Max** (*minLevel*, (254 - 1))	**Max** (*minLevel*, (254 - 2))	**Max** (*minLevel*, (254 - 2))
11	DAPC (*minLevel*)	RECALL MAX LEVEL	STEP DOWN AND OFF	**Max** (*minLevel*, (254 - 1))	**Max** (*minLevel*, (254 - 1))	**Max** (*minLevel*, (254 - 2))	**Max** (*minLevel*, (254 - 2))

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

12.6.15 Power On Level - System Failure Level combined

The test sequence checks if DUT power-on-level and system-failure levels are set according to specification after applying a power cycle and a system failure.

Test sequence shall be run for each selected logical unit.

Test description:

```
PHM = QUERY PHYSICAL MINIMUM
if (PHM >= 253)
    report 1 Control gear is not dimmable enough.
else
    capable = false
    if (!GLOBAL_busPowered)
        capable = DetectSFLbeforePOL ()
    endif
    lightSource = true
    if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
        lightSource = false // This logical unit has no light source
    endif
    RESET
    wait 300 ms
    // Find a fade rate to use in the test
    minSteps = {0, 65, 46, 33, 23, 17, 12, 9, 6, 5, 3, 3, 2, 2, 1, 1} // rounded down
    maxSteps = {0, 80, 57, 41, 29, 21, 15, 11, 8, 6, 5, 4, 3, 3, 2, 2} // rounded up
    maxStepsToMake = 254 - PHM
    for (fr = 1; fr < 16; fr++)
        if (maxStepsToMake > maxSteps[fr])
            fadeRate = fr + 1 // try not to reach 254/PHM with one UP/DOWN command
            break
        endif
    endfor
    DTR0 (PHM)
    SET SCENE 3
    midPoint = (PHM + 254) >> 1
    DTR0 (fadeRate)
    SET FADE RATE
    if (lightSource)
        UserInput (All light measurements need to be done at stabilized light, OK)
        // Get expected light levels
        WaitForLampLevel (254)
        light254 = Measure (Light output)
        DAPC (midPoint)
        lightMid = Measure (Light output)
        RECALL MIN LEVEL
        lightPHM = Measure (Light output)
        UP
        lightUP = Measure (Light output)
        RECALL MAX LEVEL
        DOWN
        lightDOWN = Measure (Light output)
        OFF
        lightOff = Measure (Light output)
    endif
    for (i = 0; i < 2; i++)
        for (j = 0; j < 7; j++)
            for (m = 0; m < 3; m++) // [0] no fade time; [1] fade time != 0; [2] fade rate
                if (i == 0) // [0] set POL and SFL, then go to a target (set POL and SFL
                before command2 is sent);
                    DTR0 (powerOn[j])
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        SET POWER ON LEVEL
        DTR0 (systemFailure[j])
        SET SYSTEM FAILURE LEVEL
    else // [1] go to a target, then set POL and SFL (set POL and SFL after command2 is sent)
        DTR0 (254)
        SET POWER ON LEVEL
        SET SYSTEM FAILURE LEVEL
    endif
    DTR0 (fade[m])
    if (m <= 1)
        SET FADE TIME
        kStart = 0
        kEnd = 4
    else
        SET FADE RATE
        kStart = 4
        kEnd = 6
    endif
    for (k = kStart; k < kEnd; k++)
        command1[k]
        WaitForLampOn ()
        command2[k]
        if (i == 1)
            DTR0 (powerOn[j])
            SET POWER ON LEVEL
            DTR0 (systemFailure[j])
            SET SYSTEM FAILURE LEVEL
        endif
        if (GLOBAL_busPowered)
            Disconnect (Interface)
            wait 5 s
            if (lightSource)
                UserInput (Prepare to check the light behaviour after restoration of bus idle voltage, OK)
                Connect (Interface)
                Start (Light measurement)
            else
                Connect (Interface)
            endif
            wait 1,5 s
            if (expectedLevel[j] == 0)
                wait 10 s
            else
                WaitForPowerOnPhaseToFinish ()
            endif
            if (lightSource)
                Stop (Light measurement)
                lightOutput = Measure (Final light output)
                if (expectedLight[j] * 0,9 > lightOutput OR lightOutput > expectedLight[j] * 1,1)
                    error 1 Incorrect light output level at system failure at test step (i,j,k)=(i,j,k). Actual: lightOutput. Expected: expectedLight[j] * 0,9 <= lightOutput <= expectedLight[j] * 1,1.
                endif
                oneSwitch = UserInput (Did the light output change from off to final value immediately?, YesNo)
                if (oneSwitch)
                    report 2 Light output went directly to POL.
                else
                    error 2 Light output did no go directly to POL.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            endif
        endif
        answer = QUERY ACTUAL LEVEL
        errorString = -1
        if ( (j == 1 OR j == 3 OR j == 6) AND (k == 4 OR k == 5) )
            if (k == 4 AND (answer < PHM + minSteps[fadeRate] OR
            answer > PHM + maxSteps[fadeRate]))
                errorString = "PHM + minSteps[fadeRate] <=
                actualLevel <= PHM + maxSteps[fadeRate]"
            else (k == 5 AND (answer < 254 - maxSteps[fadeRate] OR
            answer > 254 - minSteps[fadeRate]))
                errorString = "254 - maxSteps[fadeRate] <= actualLevel
                <= 254 - minSteps[fadeRate]"
            endif
        else
            if (answer != expectedLevel[j])
                errorString = expectedLevel[j]
            endif
        endif
        if (errorString != -1)
            error 3 Incorrect actual level on restoration of idle bus
            voltage at test step (i,j,k)=(i,j,k). Actual: answer. Expected:
            errorString.
        endif
    else
        Switch_off (mains power)
        wait 5 s //Wait before disconnecting the interface to ensure that
        DUT will not go first to SFL in case it has more power
        Disconnect (Interface)
        wait 1 s
        if (lightSource)
            UserInput (Prepare to check the light behaviour after mains
            power are switched on, OK)
            Switch_on (mains power)
            Start (Light measurement)
            wait 10 s
            if (expectedLevel[j] != 0)
                UserInput (Wait for light to turn on and stabilise, OK)
            endif
            Stop (Light measurement)
            lightOutput = Measure (Final light output)
            if (expectedLight[j] * 0,9 > lightOutput OR lightOutput >
            expectedLight[j] * 1,1)
                error 4 Incorrect light output level at system failure at
                test step (i,j,k)=(i,j,k). Actual: lightOutput. Expected:
                expectedLight[j] * 0,9 <= lightOutput <= expectedLight[j]
                * 1,1.
            endif
            oneSwitch = UserInput (Did the light output change from off
            to final value immediately?, YesNo)
            if (oneSwitch)
                report 3 Light output went directly to SFL.
            else
                if (capable)
                    error 5 Light output went first to POL then to SFL
                    while DUT is capable to detect SFL before going to
                    POL.
                else
                    report 4 Light output went first to POL then to SFL
                    since DUT is not capable to detect SFL before
                    going to POL.
                endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                                    endif
                                    UserInput (Prepare to check the light behaviour after restoration of idle bus voltage, OK)
                                    Connect (Interface)
                                    Start (Light measurement)
                                    wait 1,5 s
                                    lightChange = UserInput (Did light output change on restoration of idle bus voltage?, YesNo)
                                    if (lightChange)
                                        error 6 Light output changed on restoration of idle bus voltage at test step (i,j,k)=(i,j,k).
                                    endif
                                    Stop (Light measurement)
                                    lightOutput = Measure (Final light output)
                                    if (expectedLight[j] * 0,9 > lightOutput OR lightOutput > expectedLight[j] * 1,1)
                                        error 7 Incorrect light output level on restoration of bus idle voltage at test step (i,j,k)=(i,j,k). Actual: lightOutput. Expected: expectedLight[j] * 0,9 <= lightOutput <= expectedLight[j] * 1,1.
                                    endif
                                else
                                    Switch_on (mains power)
                                    wait 10 s
                                    Connect (Interface)
                                    wait 1,5 s
                                endif
                                answer = QUERY ACTUAL LEVEL
                                errorString = -1
                                if ( (j == 1) AND (k == 4 OR k == 5) )
                                    if (k == 4 AND (answer < PHM + minSteps[fadeRate] OR answer > PHM + maxSteps[fadeRate]))
                                        errorString = "PHM + minSteps[fadeRate] <= actualLevel <= PHM + maxSteps[fadeRate]"
                                    elseif (k == 5 AND (answer < 254 - maxSteps[fadeRate] OR answer > 254 - minSteps[fadeRate]))
                                        errorString = "254 - maxSteps[fadeRate] <= actualLevel <= 254 - minSteps[fadeRate]"
                                    endif
                                else
                                    if (answer != expectedLevel[j])
                                        errorString = expectedLevel[j]
                                    endif
                                endif
                                if (errorString != -1)
                                    error 8 Incorrect actual level on restoration of idle bus voltage at test step (i,j,k)=(i,j,k). Actual: answer. Expected: errorString.
                                endif
                            endif
                        endfor
                    endfor
                endfor
            endfor
        endfor
    endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 78 – Parameters for test sequence PowerOnLevel and SystemFailureLevel

Test step j	powerOn	systemFailure	expectedLevel		expectedLight	
			busPowered = false	busPowered = true	busPowered = false	busPowered = true
0	*midPoint*	255	*midPoint*	*midPoint*	*lightMid*	*lightMid*
1	255	255	*lastLightLevel*[*k*]	*lastLightLevel*[*k*]	*lastLightOutput*[*k*]	*lastLightOutput*[*k*]
2	*PHM*	*midPoint*	*midPoint*	*PHM*	*lightMid*	*lightPHM*
3	255	*midPoint*	*midPoint*	*lastLightLevel*[*k*]	*lightMid*	*lastLightOutput*[*k*]
4	0	255	0	0	*lightOff*	*lightOff*
5	*PHM*	0	0	*PHM*	*lightOff*	*lightPHM*
6	255	0	0	*lastLightLevel*[*k*]	*lightOff*	*lastLightOutput*[*k*]

Test step m	fade
0	0
1	8
2	*fadeRate*

Test step k	command1	command2	lastLightLevel	lastLightOutput
0	RECALL MAX LEVEL	DAPC (0)	0	*lightOff*
1	RECALL MAX LEVEL	DAPC (*PHM*)	*PHM*	*lightPHM*
2	RECALL MIN LEVEL	DAPC (254)	254	*light254*
3	RECALL MAX LEVEL	GO TO SCENE 3	*PHM*	*lightPHM*
4	RECALL MIN LEVEL	UP	*PHM* + *maxSteps*[*fadeRate*]	*lightUp*
5	RECALL MAX LEVEL	DOWN	254 - *minSteps*[*fadeRate*]	*lightDown*

12.6.15.1 DetectSFLbeforePOL

This subsequence checks whether DUT is capable of not to detect system failure level before going to power on level.

Test description:

capability = DetectSFLbeforePOL ()

capability = false
RESET
wait 300 ms
DTR0 (253)
SET POWER ON LEVEL
DTR0 (0)
SET SYSTEM FAILURE LEVEL
Switch_off (mains power)
wait 5 s
Apply (Voltage of 0 V on bus interface)
wait 1 s
Switch_on (mains power)
wait 660 ms
Apply (Voltage of *GLOBAL_VbusHigh* V on bus interface)
do
    answer = QUERY ACTUAL LEVEL, **accept** No Answer
while (*answer* == NO OR *answer* == 255)
if (*answer* == 0)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    report 1 DUT is capable to detect SYSTEM FAILURE before going to POWER ON LEVEL.
    capability = true
else if (answer == 253)
    report 2 DUT is not capable to detect SYSTEM FAILURE before going to POWER ON LEVEL.
    capability = false
else
    halt 1 DUT returned an unexpected actual level. Test is aborted.
endif
return capability
```

12.6.16 ENABLE DAPC SEQUENCE

The test sequence checks the dimming curve at fade tasks with a sequence of direct arc power control commands. At the beggining of the sequence command ENABLE DAPC SEQUENCE is sent. The dimming curve has to be strictly monotonic. The measurement is done with a photometer connected to a digital storage oscilloscope. Test also check if the timer triggered by ENABLE DAPC SEQUENCE command is implemented according to specification.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report 1 Control gear is not dimmable.
else
    lightSource = true
    if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
        lightSource = false // This logical unit has no light source
    endif
    if (lightSource)
        // Start DAPC sequence and check whether dimming curve is striclymonotonic
        UserInput (Prepare to check the light behaviour, OK)
        ENABLE DAPC SEQUENCE
        for (i = 0; i < 14; i++)
            if (level[i] >= PHM)
                DAPC(level[i])
                wait 170 ms
            endif
        endfor
        monotonicCurve = UserInput (Is dimming curve strictly monotonic?, YesNo)
        if (monotonicCurve != Yes)
            error 1 Dimming curve not strictly monotonic.
        endif
    endif
    // Check when timer expires
    fadeTime = 300 ms
    for (i = 0; i < 40; i++)
        RECALL MAX LEVEL
        ENABLE DAPC SEQUENCE
        DAPC (1)
        start_timer (timer) // Timer starts after stop condition of DAPC command
        wait i ms // Shift the moment of sending QUERY STATUS such to find the moment when fade bit is reset
        do
            answer = QUERY STATUS
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            timestamp = get_timer (timer) - 10 ms // Subtract 10 ms which is the approximate length of the backward frame to get the start moment of the backward frame
        while (answer == XXX1XXXXb AND timestamp < 250 ms)
        if (i == 0 AND timestamp >= 250 ms)
            error 2 DAPC SEQUENCE not stopped after 250 ms.
            break
        endif
        if (timestamp < fadeTime)
            fadeTime = timestamp
        endif
    endfor
    if (i == 40)
        if (fadeTime < 180 ms OR fadeTime > 220 ms)
            error 3 Wrong moment of stopping DAPC SEQUENCE. Actual: fadeTime ms. Expected: 180 ms <= time <= 220 ms.
        endif
    endif
    // Check when sequence is continued/stopped
    for (j = 0; j < 2; j++)
        ENABLE DAPC SEQUENCE
        DAPC (254)
        wait delay[j] ms // Delay shall be interpreted as settling time
        DAPC (1)
        answer = QUERY STATUS
        if (answer != status[j])
            error 4 DAPC SEQUENCE text[j] at test step j = j. Actual: answer. Expected: status[j].
        endif
        wait 220 ms
    endfor
endif
```

Table 79 – Parameters for test sequence ENABLE DAPC SEQUENCE

Test step i	0	1	2	3	4	5	6	7	8	9	10	11	12	13
level	254	250	246	241	235	229	221	210	195	170	145	85	60	1

Test step j	delay	status	text
0	170	XXX1XXXXb	cancelled too early
1	230	XXX0XXXXb	not cancelled

12.6.17 GO TO LAST ACTIVE LEVEL

The test sequence checks the correct function of GO TO LAST ACTIVE LEVEL command, when sent with or without fading. QUERY STATUS is used to check the status of the fadeRunning bit and QUERY ACTUAL LEVEL is used to check the target level.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM >= 253)
    report 1 Control gear is not dimmable enough.
else
    DTR0 (0)
    SET POWER ON LEVEL
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
SET SYSTEM FAILURE LEVEL
for (i = 0; i < 3; i++)
    if (i == 1)
        DTR0 (33) // Set a fade of 2 s using extended fade time
        SET EXTENDED FADE TIME
    else if (i == 2) // Set a fade of 2 s using fade time
        DTR0 (4)
        SET FADE TIME
    endif
    for (j = 0; j < 5; j++)
        command[j]
        wait 1 s
        action[j]
        GO TO LAST ACTIVE LEVEL
        WaitForPowerOnPhaseToFinish ()
        if (i >= 1 AND j > 0) // Check if fade started
            answer = QUERY STATUS
            if (answer != XXX1XXXXb)
                error 1 Fade not started at test step (i,j) = (i,j). Actual: answer.
                Expected: XXX1XXXXb.
            endif
            wait 2,3 s
        endif
        answer = QUERY STATUS // Check if fade finished
        if (answer != XXX0XXXXb)
            if (i == 0 OR ((i >= 1 AND j == 0))
                error 2 Fade started at test step (i,j) = (i,j). Actual: answer. Expected:
                XXX0XXXXb.
            else
                error 3 Fade not stopped at test step (i,j) = (i,j). Actual: answer.
                Expected: XXX0XXXXb.
            endif
        endif
        answer = QUERY ACTUAL LEVEL
        if (answer != level[j])
            error 4 Wrong actual level at test step (i,j) = (i,j). Actual: answer.
            Expected: level[j].
        endif
    endfor
endfor
endif
```

Table 80 – Parameters for test sequence GO TO LAST ACTIVE LEVEL

Test step j	command	action	level	description
0	RECALL MIN LEVEL	-	*PHM*	change level from MIN LEVEL to MIN LEVEL
1	DAPC(254)	-	254	at i=0, change level from MAX LEVEL to MAX LEVEL at i=1, change level from half way between middle and 254 to 254
2	RECALL MIN LEVEL	**PowerCycleAndWaitForDecoder** (5)	254	change level from off to 254
3	OFF	-	254	change level from OFF (0) to MAX LEVEL

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step j	command	action	level	description
4	RECALL MAX LEVEL	**Apply** (Voltage of 0 V on bus interface) wait 1 s **Apply** (Voltage of *GLOBAL_VbusHigh* V on bus interface) wait 1,2 s	254	change level from SYSTEM FAILURE LEVEL (0) to level which was before lamp turned off (MAX LEVEL)

12.6.18 GO TO SCENE

The test sequence checks the correct function of GO TO SCENE command for each scene. In the first part of the test scenes with different values are recalled, with and without fade.

The second part of the test sequence checks whether fade is stopped by GO TO SCENE command, with scene programmed as 255.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM >= 252)
    report 1 Control gear is not dimmable enough.
else
    middle = (254 + PHM) >> 1
    DTR0 (PHM + 1)
    SET MIN LEVEL
    DTR0 (253)
    SET MAX LEVEL
    for (i = 0; i < 16; i++) // For each scene
        for (k = 0; k < 3; k++) // Set different fades
            if (k == 0)
                DTR0 (0) // Set no fading
                SET FADE TIME
                SET EXTENDED FADE TIME
            else if (k == 1)
                DTR0 (33) // Set a fade of 2 s using extended fade time
                SET EXTENDED FADE TIME
            else if (k == 2)
                DTR0 (4)// Set a fade of 2 s using fade time
                SET FADE TIME
            endif
            RECALL MAX LEVEL
            for (j = 0; j < 10; j++) // Set different values to the scenes
                DTR0 (value[j])
                SET SCENE i
                GO TO SCENE i
                if (j == 2)
                    do
                        answer = QUERY STATUS
                    while (answer == XXXXX0XXb) //Wait for lampOn bit to be set
                endif
                if (k >= 1)
                    answer = QUERY STATUS
                    if (answer != status[j])
                        error 1 text1[j] at test step (i,j,k) = (i,j,k). Actual: answer.
                        Expected: status[j].
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                    endif
                    wait 2,2 s
                endif
                answer = QUERY STATUS
                if (answer != XXX0XXXXb)
                    if (k == 0)
                        error 2 Fade started at test step (i,j,k) = (i,j,k). Actual: answer.
                        Expected: XXX0XXXXb.
                    else if (k >= 1 AND value[j] != 255)
                        error 3 text2[j] at test step (i,j,k) = (i,j,k). Actual: answer.
                        Expected: XXX0XXXXb.
                    endif
                    WaitForFadeToFinish (5000) // Give 5 s to finish fading
                endif
                answer = QUERY ACTUAL LEVEL
                if (answer != level[j])
                    error 4 Wrong actual level at test step (i,j,k) = (i,j,k). Actual: answer.
                    Expected: level[j].
                endif
            endfor
        endfor
    endfor
    // Check behaviour of DUT when it is set to a scene with value 255
    DTR0 (4)
    SET FADE TIME
    for (i = 0; i < 16; i++)
        DTR0 (255)
        SET SCENE i
        RECALL MAX LEVEL
        DAPC(1)
        wait 1 s
        GO TO SCENE i
        answer = QUERY STATUS
        if (answer != XXX1XXXXb)
            error 5 GO TO SCENE with value MASK accepted, and stopped a running fade
            at test step i. Actual: answer. Expected: XXX1XXXXb.
        endif
    endfor
endif
```

Table 81 – Parameters for test sequence GO TO SCENE

Test step j	value	level	status	text1	text2
0	0	0	XXX1XXXXb	Fade not started	Fade not stopped
1	255	0	XXX0XXXXb	Command not ignored and fade started	-
2	*middle*	*middle*	XXX1XXXXb	Fade not started	Fade not stopped
3	1	*PHM* + 1	XXX1XXXXb	Fade not started	Fade not stopped
4	255	*PHM* + 1	XXX0XXXXb	Command not ignored and fade started	-
5	253	253	XXX1XXXXb	Fade not started	Fade not stopped
6	254	253	XXX0XXXXb	Fade started	-
7	255	253	XXX0XXXXb	Command not ignored and fade started	-
8	*PHM*	*PHM* + 1	XXX1XXXXb	Fade not started	Fade not stopped
9	255	*PHM* + 1	XXX0XXXXb	Command not ignored and fade started	-

12.6.19 Power on: level control commands

The test sequence checks the behaviour of DUT immediately after mains power is connected by sending commands as follows:

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

- one command is sent 450 ms after mains power is connected;
- same command is sent for 540 ms from the moment the mains power is connected

The light output is also checked using a light sensor.

Test sequence shall be run for each selected logical unit.

Test description:

```
if (!GLOBAL_busPowered)
    lightSource = true
    if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
        lightSource = false // This logical unit has no light source
    endif
    RESET
    wait 300 ms
    PHM = QUERY PHYSICAL MINIMUM
    mid = (PHM + 254) >> 1
    DTR0 (254)
    SET SCENE 0
    DTR0 (255)
    SET SCENE 1
    DTR0 (mid)
    SET POWER ON LEVEL
    for (i = 0; i < 2; i++)
        for (j = 0; j < 15; j++)
            command1[j]
            WaitForLampOn ()
            if (lightSource)
                UserInput (Prepare to check the light behaviour after mains power are switched on, OK)
                Start (Light observation)
            endif
            timestamp = PowerCycleAndWaitForBusPower (5)
            if (timestamp > 420)
                report 1 Internal bus power supply recovered too slow for this test.
                j = 15
                i = 2
            else
                if (i == 0)
                    wait (520 - timestamp) ms // Receiver ready latest at 520 ms
                    command2[j] // Send command only once
                else
                    start_timer(timer)
                    do
                        command2[j]
                    while (get_timer(timer) < 540 ms) // Keep sending the same command for 540 ms
                endif
                if (lightSource)
                    if (expectedLevel[j] == 0)
                        wait 5 s
                        Stop (Light observation)
                        lampOn = UserInput (Did lamp turn on?, YesNo)
                        if (lampOn == Yes)
                            error 1 Based on the light output, lamp turned on after receiving command command2[j] at test step (i,j) = (i,j).
                        endif
                    else
                        WaitForPowerOnPhaseToFinish ()
                        Stop (Light observation)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                        lampOn = UserInput (Did lamp turn on?, YesNo)
                        if (lampOn == Yes)
                            flickering = UserInput (Was there any flickering?, YesNo)
                            if (flickering == Yes)
                                error 2 Lamp flickered while going to the target level at
                                test step (i,j) = (i,j).
                            endif
                        else
                            error 3 Based on the light output, lamp did not turn on after
                            receiving command command2[j] at test step (i,j) = (i,j).
                        endif
                    endif
                else
                    if (expectedLevel[j] == 0)
                        wait 5 s
                    else
                        WaitForPowerOnPhaseToFinish ()
                    endif
                endif
                answer = QUERY ACTUAL LEVEL
                if (answer != expectedLevel[j])
                    error 4 Wrong actual level after receiving command command2[j] at
                    test step (i,j) = (i,j). Actual: answer. Expected: expectedLevel[j].
                endif
            endif
        endfor
    endfor
endif
```

Table 82 – Parameters for test sequence Power on: level control commands

Test step j	command1	command2	expectedLevel	
			i = 0	i = 1
0	RECALL MIN LEVEL	DAPC (0)	0	0
1	RECALL MIN LEVEL	DAPC (254)	254	254
2	RECALL MIN LEVEL	DAPC (255)	0	0
3	RECALL MIN LEVEL	OFF	0	0
4	RECALL MIN LEVEL	UP	0	0
5	RECALL MIN LEVEL	DOWN	0	0
6	RECALL MIN LEVEL	STEP UP	0	0
7	RECALL MIN LEVEL	STEP DOWN	0	0
8	RECALL MIN LEVEL	RECALL MAX LEVEL	254	254
9	RECALL MAX LEVEL	RECALL MIN LEVEL	*PHM*	*PHM*
10	RECALL MIN LEVEL	STEP DOWN AND OFF	0	0
11	RECALL MAX LEVEL	ON AND STEP UP	*PHM*	>= *PHM*
12	RECALL MAX LEVEL	GO TO LAST ACTIVE LEVEL	254	254
13	RECALL MIN LEVEL	GO TO SCENE 0	254	254
14	RECALL MAX LEVEL	GO TO SCENE 1	*mid*	*mid*

12.6.20 Logarithmic dimming curve

The test sequence checks the light output at defined arc power levels. The measurement is done using a light sensor.

Test sequence shall be run for each selected logical unit.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report 1 Control gear is not dimmable.
else
    lightSource = true
    if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
        lightSource = false // This logical unit has no light source
    endif
    if (lightSource)
        UserInput (All light measurements need to be done at stabilized light, OK)
        light254 = Measure (Light output)
        for (i = 0; i < 10; i++)
            if (level[i] >= PHM)
                DAPC (level[i])
                lightAtLevel = Measure (Light output)
                value = (lightAtLevel / light254) * 100
                if (minimum[i] > value OR value > maximum[i])
                    error 1 Value i out of tolerances. Actual: value. Expected: minimum[i]
                    <= value <= maximum[i].
                endif
            endif
        endfor
    else
        report 2 Control gear has no light source available.
    endif
endif
```

Table 83 – Parameters for test sequence Logarithmic dimming curve

Test step i	level	minimum	nominal	maximum
0	243	63,53	74,05	86,14
1	229	40,00	50,53	71,00
2	216	27,28	35,43	52,09
3	195	15,00	19,97	30,00
4	170	7,00	10,09	15,00
5	145	3,93	5,10	7,50
6	126	2,00	3,04	4,50
7	85	0,50	0,99	2,00
8	60	0,25	0,50	1,00
9	1	0,05	0,10	0,20

12.6.21 Dimming curve: DAPC

The test sequence shall be used to check the dimming curve at fade tasks with DAPC command. The logical unit is programmed with a fade time of 4 s. The logical unit is caused to dim to minLevel and afterwards to the maxLevel. The dimming curve has to be strictly monotonic. The measurement is done with a photometer connected to a digital storage oscilloscope.

Test sequence shall be run for each selected logical unit.

Test description:

RESET

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report 1 Control gear is not dimmable.
else
    lightSource = true
    if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
        lightSource = false // This logical unit has no light source
    endif
    if (lightSource)
        for (i = 0; i < 2; i++)
            DTR0 (value[i])
            command[i] //Set a fade of 4 s
            UserInput (Prepare to check the light behaviour, OK)
            DAPC (PHM)
            wait 5 s
            monotonicCurve = UserInput (Is dimming curve strictly monotonic?, YesNo)
            if (monotonicCurve != Yes)
                error 1 Dimming curve not strictly monotonic at test step i = i.
            endif
            UserInput (Prepare to check the light behaviour, OK)
            DAPC (254)
            wait 5 s
            monotonicCurve = UserInput (Is dimming curve strictly monotonic?, YesNo)
            if (monotonicCurve != Yes)
                error 2 Dimming curve not strictly monotonic at test step i = i.
            endif
        endfor
    else
        report 2 Control gear has no light source available.
    endif
endif
```

Table 84 – Parameters for test sequence Dimming curve: DAPC

Test step i	value	command
0	00100011b	SET EXTENDED FADE TIME
1	6	SET FADE TIME

12.6.22 Dimming curve: UP / DOWN

The test sequence shall be used to check the dimming curve at fade tasks with UP and DOWN commands. The dimming curve has to be strictly monotonic. The measurement is done with a photometer connected to a digital storage oscilloscope.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report 1 Control gear is not dimmable.
else
    lightSource = true
    if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
        lightSource = false // This logical unit has no light source
    endif
    if (lightSource)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        UserInput (Prepare to check the light behaviour, OK)
        for (i = 0; i < 61; i++)
            DOWN
            wait 90 ms // Please ensure that the settling time is of 90 ms such to have 100 ms between reception of commands=half fade rate time
        endfor
        monotonicCurve = UserInput (Is dimming curve strictly monotonic?, YesNo)
        if (monotonicCurve != Yes)
            error 1 Dimming curve not strictly monotonic.
        endif
        UserInput (Prepare to check the light behaviour, OK)
        for (i = 0; i < 61; i++)
            UP
            wait 90 ms // Please ensure that the settling time is of 90 ms such to have 100 ms between reception of commands=half fade rate time
        endfor
        monotonicCurve = UserInput (Is dimming curve strictly monotonic?, YesNo)
        if (monotonicCurve != Yes)
            error 2 Dimming curve not strictly monotonic.
        endif
    else
        report 2 Control gear has no light source available.
    endif
endif
```

12.6.23 Dimming curve: STEP UP / STEP DOWN

The test sequence shall be used to check the dimming curve at fade tasks with STEP UP and STEP DOWN commands. The dimming curve has to be stricly monotonic. The measurement is done with a photometer connected to a digital storage oscilloscope.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report 1 Control gear is not dimmable.
else
    lightSource = true
    if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
        lightSource = false // This logical unit has no light source
    endif
    if (lightSource)
        iEnd = 254 - PHM
        UserInput (Prepare to check the light behaviour, OK)
        for (i = 0; i < iEnd; i++)
            STEP DOWN
            wait 50 ms
        endfor
        monotonicCurve = UserInput (Is dimming curve strictly monotonic?, YesNo)
        if (monotonicCurve != Yes)
            error 1 Dimming curve not strictly monotonic.
        endif
        UserInput (Prepare to check the light behaviour, OK)
        for (i = 0; i < iEnd; i++)
            STEP UP
            wait 50 ms
        monotonicCurve = UserInput (Is dimming curve strictly monotonic?, YesNo)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        if (monotonicCurve != Yes)
            error 2 Dimming curve not strictly monotonic.
        endif
    else
        report 2 Control gear has no light source available.
    endif
endif
```

12.6.24 FADE TIME/EXTENDED FADE TIME: light output behaviour

The test sequence shall be used to check whether the moment of switching off the lamp (based on the light output) is reflected in the reported actual level (given on the bus interface). This check is performed while DUT needs to fade from maximum level to off, using either a FADE TIME or an EXTENDED FADE TIME.

Test sequence shall be run for each selected logical unit.

Test description:

```
lightSource = true
if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
    lightSource = false // This logical unit has no light source
endif
if (lightSource)
    RESET
    wait 300 ms
    for (i = 0; i < 2; i++)
        RECALL MAX LEVEL
        WaitForLampOn ()
        DTR0 (value[i])
        command[i] // Set a fade of 4 s
        Start (Monitoring the behaviour of the light output and of interface, OK)
        DAPC (0)
        start_timer (timer) // Timer starts after stop condition of DAPC command
        do
            answer = QUERY ACTUAL LEVEL
            timestamp = get_timer (timer)
        while (answer != 0 AND timestamp < 5 s)
        if (timestamp >= 5 s)
            error 1 Based on actual level, light did not turn off after 5 s of fading.
        endif
        Stop (Monitoring the behaviour of the light output and of interface, OK)
        lampOff = UserInput (Is light off?, YesNo)
        if (lampOff != Yes)
            error 2 Light did not turn off after 5 s of fading.
        else
            // Check that moment of switching the lamp on/off is reflected in reported actual
            level
            answer = UserInput (Based on light output and interface monitoring, did lamp
            turn off when sending of commands stopped?, YesNo)
            if (answer == No)
                error 3 Switching off the lamp and reported actual level are not
                synchronized.
            endif
        endif
    endfor
else
    report 1 Control gear has no light source available.
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 85 – Parameters for test sequence FADE TIME/EXTENDED FADE TIME: light output behaviour

Test step i	value	command
0	00100011b	SET EXTENDED FADE TIME
1	6	SET FADE TIME

12.6.25 EXTENDED FADE TIME: light output behaviour

The test sequence shall be used to verify if the light output in the transition from max level to off is performed

- without fade or with an extended fade time lower than what device is physically capable. Light output shall be adjusted as quickly as possible;
- with an extended fade time greater than what device is physically capable. Light output shall be adjusted as given by the set fade.

The test also checks whether the moment of switching off the lamp (based on the light output) is reflected in the reported actual level (given on the bus interface).

Test sequence shall be run for each selected logical unit.

Test description:

```
lightSource = true
if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
    lightSource = false // This logical unit has no light source
endif
if (lightSource)
    RESET
    wait 300 ms
    // Without starting a fade check how long device needs to turn lamp off
    Start (Monitoring the behaviour of the light output and of interface and prepare to measure the time needed for the lamp to turn off, OK)
    DAPC (0)
    start_timer (timer) // Timer starts after stop condition of DAPC command
    do
        answer = QUERY ACTUAL LEVEL
        timestamp = get_timer (timer)
    while (answer != 0 AND timestamp < 1 s)
    if (timestamp >= 1 s)
        error 1 Based on actual level, light did not turn off after 1 s.
    endif
    Stop (Monitoring the behaviour of the light output and of interface, OK)
    lampOff = UserInput (Is light off?, YesNo)
    if (lampOff != Yes)
        error 2 Light did not turn off after 1 s of fading.
    else
        lampOffNoFade = UserInput (Enter time from the stop condition of DAPC command until light turns off, value [ms])
        if (lampOffNoFade < 100 ms)
            report 1 Test not useful for a device which can dim in less than 100 ms without fading.
        else
            if (lampOffNoFade > 600 ms)
                error 3 Based on the measured light output, light did not turn off as expected. Actual lampOffNoFade ms. Expected: <= 600 ms.
            endif
            // Find the lower and upper limits for fading using extended fade time
            fadeLimit[0] = Max (0, (RoundDown (lampOffNoFade / 100)) - 1)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                fadeLimit[1] = fadeLimit[0] + 1
                level[0] = lampOffNoFade
                level[1] = fadeLimit[1] * 100
                // Start fading using extended fade time
                for (i = 0; i < 2; i++)
                    RECALL MAX LEVEL
                    WaitForLampOn ()
                    DTR0 (16 + fadeLimit[i])
                    SET EXTENDED FADE TIME
                    Start (Monitoring the behaviour of the light output and of interface, OK)
                    DAPC (0)
                    start_timer (timer) // Timer starts after stop condition of DAPC command
                    do
                        answer = QUERY ACTUAL LEVEL
                        timestamp = get_timer (timer)
                    while (answer != 0 AND timestamp < 1 s)
                    if (timestamp >= 1 s)
                        error 4 Based on actual level, light did not turn off after 1 s of fading.
                    endif
                    Stop (Monitoring the behaviour of the light output and of interface, OK)
                    lampOff = UserInput (Is light off?, YesNo)
                    if (lampOff != Yes)
                        error 5 Light did not turn off after 1 s of fading.
                    else
                        fadingTime = UserInput (Enter time from the stop condition of DAPC
                        command until light turns off, value [ms])
                        if (i == 0 AND (fadingTime < level[i] - 10 ms OR fadingTime > level[i] +
                        10 ms))
                            error 6 Based on the measured light output, light did not turn off
                            as expected. Actual fadingTime ms. Expected: (level[i] - 10) ms
                            <= time <= (level[i] + 10) ms.
                        endif
                        if (i == 1 AND (fadingTime < level[i] * 0,95 OR fadingTime > level[i] *
                        1,05))
                            error 7 Based on the measured light output, light did not turn off
                            as expected. Actual fadingTime ms. Expected: (level[i] *0,95) ms
                            <= time <= (level[i] * 1,05) ms.
                        endif
                        // Check that moment of switching the lamp on/off is reflected in
                        reported actual level
                        answer = UserInput (Based on light output and interface monitoring,
                        did lamp turn off when sending of commands stopped?, YesNo)
                        if (answer == No)
                            error 8 Switching off the lamp and reported actual level are not
                            synchronized.
                        endif
                    endif
                endfor
            endif
        endif
    else
        report 2 Control gear has no light source available.
    endif
```

12.6.26 Behaviour during a fade

The test sequence checks whether a change of fadeTime, extendedFadeTimeBase, extendedFadeTimeMultiplier, or fadeRate during a running fade will not affect the running fade, and that the next fade will use the recalculated values. Test can be performed on a logical unit which is dimmable.

Test sequence shall be run for each selected logical unit.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test description:

```
PHM = QUERY PHYSICAL MINIMUM
if (PHM >= 247)
    report 1 Control gear is not dimmable enough.
else
    RESET
    wait 300 ms
    for (i = 0; i < 4; i++)
        RECALL MAX LEVEL
        DTR0 (value1[i])
        command1[i] // Set fade setting
        command2[i] // Start fade
        start_timer (timer) // Timer starts after stop condition of DAPC command
        wait delay[i] ms
        DTR0 (value2[i])
        command1[i] // Change fade settings
        do // Check when fade ends
            answer = QUERY STATUS
            timestamp = get_timer (timer) // Get time in ms
        while (answer == XXX1XXXXb AND timestamp < fade1Limit[i])
        if (timestamp >= fade1Limit[i])
            error 1 Fading not stopped after fade1Limit[i] ms at test step i = i.
        else
            if (i < 3)
                if (timestamp < fade1Min[i] OR timestamp > fade1Max[i])
                    error 2 FADE TIME changed at test step i = i. Actual: timestamp ms.
                    Expected: fade1Min[i] ms <= time <= fade1Max[i] ms.
                endif
            else
                answer = QUERY ACTUAL LEVEL
                s = 254 - answer
                if (s < fade1Min[i] OR s > fade1Max[i])
                    error 3 FADE RATE changed at test step i = i. Actual number of steps
                    made: s. Expected: fade1Min[i] <= s <= fade1Max[i].
                endif
            endif
        endif
        RECALL MAX LEVEL
        command2[i] // Start a new fade
        start_timer (timer) // Timer starts after stop condition of DAPC command
        do // Check when fade ends
            answer = QUERY STATUS
            timestamp = get_timer (timer) // Get time in ms
        while (answer == XXX1XXXXb AND timestamp < fade2Limit[i])
        if (timestamp >= fade2Limit[i])
            error 4 Fading not stopped after fade2Limit[i] ms at test step i = i.
        else
            if (i < 3)
                if (timestamp < fade2Min[i] OR timestamp > fade2Max[i])
                    error 5 Incorrect FADE TIME applied at test step i = i. Actual:
                    timestamp ms. Expected: fade2Min[i] ms <= time <= fade2Max[i] ms.
                endif
            else
                answer = QUERY ACTUAL LEVEL
                s = 254 - answer
                if (s < fade2Min[i] OR s > fade2Max[i])
                    error 6 Incorrect FADE RATE applied at test step i = i. Actual number
                    of steps made: s. Expected: fade2Min[i] <= s <= fade2Max[i].
                endif
            endif
        endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    endfor
endif
```

Table 86 – Parameters for test sequence Behaviour during a fade

Test step i	0	1	2	3
value1	00100000b	00100000b	2	13
value2	00100011b	00110000b	6	8
command1	SET EXTENDED FADE TIME	SET EXTENDED FADE TIME	SET FADE TIME	SET FADE RATE
command2	DAPC (1)	DAPC (1)	DAPC (1)	DOWN
delay	500	500	500	100
fade1Min	950 ms	950 ms	950 ms	1
fade1Max	1 050 ms	1 050 ms	1 100 ms	2
fade1Limit	1 200 ms	1 200 ms	1 200 ms	250 ms
fade2Min	3 800 ms	9 500 ms	3 600 ms	5
fade2Max	4 200 ms	10 500 ms	4 400 ms	7
fade2Limit	4 300 ms	10 600 ms	4 500 ms	250 ms
test step description	change extended fade time base	change extended fade time multiplier	change fade time	change fade rate

12.7 Special commands

12.7.1 INITIALISE – timer

The test sequence checks the following:

- the reset and power on values for initialisationState variable;
- initialisationState is DISABLED by RESET command;
- the correct function of the 15 min timer (starting, stopping and prolonging of the timer);
- enabling of initialisationState while lamp is off.

Test sequence shall be run for each selected logical unit.

Test description:

```
responsiveDevice = GLOBAL_currentUnderTestLogicalUnit << 1 + 1
// Test reset value for initialisationState variable
TERMINATE
RESET
wait 300 ms
INITIALISE (responsiveDevice) // initialisationState = ENABLED
RESET
wait 300 ms
RANDOMISE
wait 100 ms
answer = GetRandomAddress ()
if (answer == 0xFF FF FF)
    error 1 initialisationState disabled by RESET command. Execution of RANDOMISE
    command expected after RESET command.
endif
TERMINATE
INITIALISE (responsiveDevice)
WITHDRAW // initialisationState = WITHDRAWN
RESET
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
wait 300 ms
RANDOMISE
wait 100 ms
answer = GetRandomAddress ()
if (answer == 0xFF FF FF)
    error 2 initialisationState disabled by RESET command. Execution of RANDOMISE command expected after RESET command.
endif
// Test power on value for initialisationState variable
TERMINATE
INITIALISE (responsiveDevice)
PowerCycleAndWaitForDecoder (5)
RANDOMISE
wait 100 ms
answer = GetRandomAddress ()
if (answer != 0xFF FF FF)
    error 3 Wrong power on value for initialisationState. No execution of RANDOMISE command expected after power cycle.
endif
TERMINATE
// Test that initialisationState is enabled by INITIALISE command, and that timer ends after 15 min
INITIALISE (responsiveDevice)
start_timer (timer)
answer = QUERY SHORT ADDRESS
if (answer != responsiveDevice)
    error 4 initialisationState not enabled. Actual: answer. Expected: responsiveDevice.
endif
do
    time = get_timer (timer)
    answer = QUERY SHORT ADDRESS
    if (answer != responsiveDevice)
        break
    endif
while (time < 17 min)
if (time < (15 - 1,5))
    error 5 Initialisation timer expires too early. Actual: time min. Expected: 13,5 min < timer < 16,5 min.
else if (time > (15 + 1,5))
    error 6 Initialisation timer expires too late. Actual: time min. Expected: 13,5 min < timer < 16,5 min.
endif
TERMINATE
// Test that timer is prolonged
INITIALISE (responsiveDevice)
start_timer (timer)
wait 5 min
INITIALISE (responsiveDevice)
do
    time = get_timer (timer)
    answer = QUERY SHORT ADDRESS
    if (answer != responsiveDevice)
        break
    endif
while (time < 22 min)
if (time < ((15 + 5) - 1,5))
    error 7 Re-triggered initialisation timer expires too early. Actual: time min. Expected: 18,5 min < timer < 21,5 min.
else if (time > ((15 + 5) + 1,5))
    error 8 Re-triggered initialisation timer expires too late. Actual: time min. Expected: 18,5 min < timer < 21,5 min.
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
TERMINATE
// Test that initialisationState is enabled while lamp is off
RESET
wait 300 ms
OFF
INITIALISE (responsiveDevice)
answer = QUERY SHORT ADDRESS
if (answer != responsiveDevice)
    error 9 initialisationState not enabled with lamp off. Actual: answer. Expected:
    responsiveDevice.
endif
TERMINATE
```

12.7.2 TERMINATE

Test sequence checks if TERMINATE command disables the initialisationState.

Test sequence shall be run for each selected logical unit.

Test description:

```
PowerCycleAndWaitForDecoder (5)
RESET
wait 300 ms
responsiveDevice = GLOBAL_currentUnderTestLogicalUnit << 1 + 1
INITIALISE (responsiveDevice)
answer = QUERY SHORT ADDRESS
if (answer != responsiveDevice)
    error 1 initialisationState not enabled. Actual: answer. Expected: responsiveDevice.
endif
TERMINATE
answer = QUERY SHORT ADDRESS
if (answer != NO)
    error 2 initialisationState not disabled. Actual: answer. Expected: NO.
endif
```

12.7.3 INITIALISE - device addressing

The test sequence checks the device addressing scheme defined in the standard, in two cases: when DUT has no short address and when DUT has a short address assigned.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
oldAddress = GLOBAL_currentUnderTestLogicalUnit
newAddress = 63
for (i = 0; i < 2; i++)
    SetShortAddress (fromAddress[i]; toAddress[i])
    for (j = 0; j < 5; j++)
        INITIALISE (device[j])
        answer = QUERY SHORT ADDRESS
        if (answer != shortAddress[i,j])
            error 1 Wrong responsive logical unit at test step (i,j) = (i,j). Actual: answer.
            Expected: shortAddress[i,j].
        endif
        TERMINATE
    endfor
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

SetShortAddress (*newAddress*; *oldAddress*)

Table 87 – Parameters for test sequence INITIALISE - device addressing

Test step i	fromAddress	toAddress
0	*oldAddress*	MASK
1	MASK	*newAddress*

Test step j	device	*GLOBAL_numberShortAddresses*	shortAddress		test step description
			i = 0 (no shortAddress)	i = 1 (shortAddress = newAddress)	
0	0	1	MASK	*newAddress*<<1+1	All logical units react
		>1	invalid backward frame	invalid backward frame	
1	255		MASK	NO	Only logical units without shortAddress react
2	*newAddress* <<1+1		NO	*newAddress*<<1+1	Only logical units with shortAddress = *newAddress* react
3	01111110b		NO	NO	No logical unit reacts
4	11111110b		NO	NO	No logical unit reacts

12.7.4 RANDOMISE

The test sequence checks the correct function of the RANDOMISE command when initialisationState has one of the following values: disabled, enabled or withdrawn.

Test sequence shall be run for each selected logical unit.

Test description:

RESET
wait 300 ms
TERMINATE
RANDOMISE
wait 100 ms
randomAddress = **GetRandomAddress** ()
if (*randomAddress* != 0xFF FF FF)
    error 1 Command executed when initialisationState is disabled. Actual: *randomAddress*. Expected: 0xFF FF FF.
endif
RESET
wait 300 ms
responsiveDevice = *GLOBAL_currentUnderTestLogicalUnit* << 1 + 1
INITIALISE (*responsiveDevice*)
RANDOMISE
wait 100 ms
randomAddress1 = **GetRandomAddress** ()
if (*randomAddress1* == 0xFFFFFF)
    error 2 Command not executed when initialisationState is enabled. Generated random address is 0xFF FF FF.
endif

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
SetSearchAddress (randomAddress1)
WITHDRAW
RANDOMISE
wait 100 ms
randomAddress2 = GetRandomAddress ()
if (randomAddress2 == randomAddress1)
    error 3 Command not executed when initialisationState is withdrawn. No new random
    address generated.
endif
TERMINATE
```

12.7.5 COMPARE

The test sequence checks the correct function of the COMPARE command when initialisationState is either disabled or enabled. Test also checks whenever DUT should send an answer to COMPARE command, depending on the randomAddress and searchAddress stored in DUT.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
TERMINATE
responsiveDevice = GLOBAL_currentUnderTestLogicalUnit << 1 + 1
answer = COMPARE
if (answer != NO)
    error 1 Command executed when initialisationState is disabled and randomAddress =
    searchAddress = 0xFF FF FF. Actual: answer. Expected: NO.
endif
INITIALISE (responsiveDevice)
answer = COMPARE
if (answer != YES)
    error 2 Command not executed when initialisationState is enabled and randomAddress =
    searchAddress = 0xFF FF FF. Actual: answer. Expected: YES.
endif
randomAddress = GetLimitedRandomAddress (responsiveDevice)
if (randomAddress == 0xFF FF FF)
    error 3 Bad random generator. For testing purpose each byte of the random address
    must be in [0x01, 0xFE] range.
else
    INITIALISE (responsiveDevice)
    for (i = 0; i < 7; i++)
        SetSearchAddress (data[i])
        answer = COMPARE
        if (answer != value[i])
            error 4 errorText[i] at test step i = i. Actual: answer. Expected: value[i].
        endif
    endfor
    TERMINATE
    answer = COMPARE
    if (answer != NO)
        error 5 Command executed when initialisationState is disabled and randomAddress
        = searchAddress and different from 0xFF FF FF. Actual: answer. Expected: NO.
    endif
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 88 – Parameters for test sequence COMPARE

Test step i	data	value	errorText
0	*randomAddress* + 0x01 00 00	YES	Command not executed at RANDOM ADDRESS < SEARCH ADDRESS
1	*randomAddress* + 0x00 01 00	YES	Command not executed at RANDOM ADDRESS < SEARCH ADDRESS
2	*randomAddress* + 0x00 00 01	YES	Command not executed at RANDOM ADDRESS < SEARCH ADDRESS
3	*randomAddress* - 0x01 00 00	NO	Command executed at RANDOM ADDRESS > SEARCH ADDRESS
4	*randomAddress* - 0x00 01 00	NO	Command executed at RANDOM ADDRESS > SEARCH ADDRESS
5	*randomAddress* - 0x00 00 01	NO	Command executed at RANDOM ADDRESS > SEARCH ADDRESS
6	*randomAddress*	YES	Command not executed at RANDOM ADDRESS = SEARCH ADDRESS

12.7.6 WITHDRAW

The test sequence checks the correct function of the WITHDRAW command. Test also checks that the INITIALISE command should not restart the compare process and should not prolong the initialisation timer.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
responsiveDevice = GLOBAL_currentUnderTestLogicalUnit << 1 + 1
randomAddress = GetLimitedRandomAddress (responsiveDevice)
if (randomAddress == 0xFF FF FF)
    error 1 Bad random generator. For testing purpose each byte of the random address
    must be in [0x01, 0xFE] range.
else
    for (i = 0; i < 7; i++)
        TERMINATE
        INITIALISE (responsiveDevice)
        SetSearchAddress (data[i])
        WITHDRAW
        SetSearchAddress (randomAddress)
        answer = COMPARE
        if (answer != value[i])
            error 2 errorText[i] at test step i = i. Actual: answer. Expected: value[i].
        endif
    endfor
    INITIALISE (responsiveDevice)
    answer = COMPARE
    if (answer != NO)
        error 3 INITIALISE resets initialisationState to ENABLED. Actual: answer. Expected:
        NO.
    endif
    TERMINATE
endif
// Test that the initialisationState timer is re-triggered when initialisationState = WITHDRAWN
state
RESET
wait 300 ms
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
INITIALISE (responsiveDevice)
start_timer (timer)
wait 5 min
WITHDRAW
INITIALISE (responsiveDevice)
do
    time = get_timer (timer)
    answer = QUERY SHORT ADDRESS
    if (answer != responsiveDevice)
        break
    endif
while (time < 22 min)
if (time < ((15 + 5) - 1,5) OR time > ((15 + 5) + 1,5))
    error 4 Initialisation timer not re-triggering while initialisationState is withdrawn. Actual: time min. Expected: 18,5 min < timer < 21,5 min.
endif
TERMINATE
```

Table 89 – Parameters for test sequence WITHDRAW

Test step i	data	value	errorText	initialisationState after WITHDRAW
0	*randomAddress* + 0x01 00 00	YES	Command executed at RANDOM ADDRESS < SEARCH ADDRESS	ENABLED
1	*randomAddress* + 0x00 01 00	YES	Command executed at RANDOM ADDRESS < SEARCH ADDRESS	ENABLED
2	*randomAddress* + 0x00 00 01	YES	Command executed at RANDOM ADDRESS < SEARCH ADDRESS	ENABLED
3	*randomAddress* - 0x01 00 00	YES	Command executed at RANDOM ADDRESS > SEARCH ADDRESS	ENABLED
4	*randomAddress* - 0x00 01 00	YES	Command executed at RANDOM ADDRESS > SEARCH ADDRESS	ENABLED
5	*randomAddress* - 0x00 00 01	YES	Command executed at RANDOM ADDRESS > SEARCH ADDRESS	ENABLED
6	*randomAddress*	NO	Command not executed at RANDOM ADDRESS = SEARCH ADDRESS	WITHDRAWN

12.7.7 SEARCHADDRH / SEARCHADDRM / SEARCHADDRL

The test sequence checks first the reset and power on values for searchAddress variable. After that, the correct function of the SEARCHADDRH, SEARCHADDRM, SEARCHADDRL commands is checked when initialisationState is disabled, enabled or withdrawn.

Test sequence shall be run for each selected logical unit.

Test description:

```
// Test reset value for searchAddress variable
responsiveDevice = GLOBAL_currentUnderTestLogicalUnit << 1 + 1
RESET
wait 300 ms
INITIALISE (responsiveDevice)
SetSearchAddress (0x01 01 01)
answer = QUERY SHORT ADDRESS
if (answer != NO)
    error 1 Wrong reset value for randomAddress. No answer expected from QUERY SHORT ADDRESS after setting the searchAddress. Actual: answer. Expected: NO
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
endif
RESET
wait 300 ms
answer = QUERY SHORT ADDRESS
if (answer != responsiveDevice)
    error 2 Wrong reset value for searchAddress. Answer expected from QUERY SHORT
    ADDRESS after resetting the variables. Actual: answer. Expected: responsiveDevice
endif
TERMINATE
// Test power on value for searchAddress variable
SetSearchAddress (0x01 01 01)
PowerCycleAndWaitForDecoder (5)
INITIALISE (responsiveDevice)
answer = QUERY SHORT ADDRESS
if (answer != responsiveDevice)
    error 3 Wrong power on value for searchAddress. Answer expected from QUERY
    SHORT ADDRESS after power on cycle. Actual: answer. Expected: responsiveDevice
endif
// Test whether searchAddress variable is correctly set
RESET
wait 300 ms
randomAddress = GetLimitedRandomAddress (responsiveDevice)
if (randomAddress == 0xFF FF FF)
    error 4 Bad random generator. For testing purpose each byte of the random address
    must be in [0x01, 0xFE] range.
else
    answer = COMPARE
    if (answer != NO)
        error 5 COMPARE executed when initialisationState was disabled. Actual: answer.
        Expected: NO.
    endif
    INITIALISE (responsiveDevice)
    SetSearchAddress (randomAddress + 0x00 01 00)
    answer = COMPARE
    if (answer != YES)
        error 6 searchAddress not set when initialisationState was enabled. Actual: answer.
        Expected: YES.
    endif
    SetSearchAddress (randomAddress)
    WITHDRAW
    SetSearchAddress (randomAddress + 0x01 00 00)
    TERMINATE
    INITIALISE (responsiveDevice)
    answer = COMPARE
    if (answer != YES)
        error 7 searchAddress not set when initialisationState was withdrawn. Actual:
        answer. Expected: YES.
    endif
    TERMINATE
endif
```

12.7.8 PROGRAM SHORT ADDRESS

The test sequence checks the correct function of the PROGRAM SHORT ADDRESS command when initialisationState is disabled, enabled or withdrawn. Test also checks whenever command is accepted or not when different formats (valid and invalid) of the address to be stored are given.

Test sequence shall be run for each selected logical unit.

Test description:

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
RESET
wait 300 ms
TERMINATE
oldAddress = GLOBAL_currentUnderTestLogicalUnit
newAddress = 63
PROGRAM SHORT ADDRESS ((newAddress << 1) + 1)
answer = QUERY CONTROL GEAR PRESENT, send to ((newAddress << 1) + 1)
if (answer != NO)
    error 1 Command executed when initialisationState is disabled. Actual: answer.
    Expected: NO.
    SetShortAddress (newAddress; oldAddress)
endif
randomAddress = GetLimitedRandomAddress ((oldAddress << 1) + 1)
if (randomAddress == 0xFF FF FF)
    error 2 Bad random generator. For testing purpose each byte of the random address
    must be in [0x01, 0xFE] range.
else
    INITIALISE ((oldAddress << 1) + 1)
    for (i = 0; i < 7; i++)
        SetSearchAddress (data[i])
        PROGRAM SHORT ADDRESS ((newAddress << 1) + 1)
        answer = QUERY CONTROL GEAR PRESENT, sent to ((newAddress << 1) + 1)
        if (answer != value[i])
            error 3 errorText1[i] at test step i = i. Actual: answer. Expected: value[i].
            if (i != 6)
                SetShortAddress (newAddress; oldAddress)
            else
                SetShortAddress (oldAddress; newAddress)
            endif
        endif
    endfor
    SetSearchAddress (randomAddress)
    for (j = 0; j < 6; j++)
        PROGRAM SHORT ADDRESS (address[j])
        answer = QUERY CONTROL GEAR PRESENT, send to queryAddress[j]
        if (answer != YES)
            halt 1 PROGRAM SHORT ADDRESS command errorText2[j] at test step j = j.
            Actual: answer. Expected: YES.
        endif
    endfor
    // Test for all available short addresses
    for (j = GLOBAL_numberShortAddresses; j < 64; j++)
        shortAddressToSet = j << 1 +1
        PROGRAM SHORT ADDRESS (shortAddressToSet)
        answer = QUERY SHORT ADDRESS, send to shortAddressToSet
        if (answer != shortAddressToSet)
            halt 2 PROGRAM SHORT ADDRESS command at test step j = j failed. Actual:
            answer. Expected: shortAddressToSet.
        endif
    endfor
    WITHDRAW
    PROGRAM SHORT ADDRESS ((oldAddress << 1) + 1)
    answer = QUERY CONTROL GEAR PRESENT, send to ((oldAddress << 1) + 1)
    if (answer != YES)
        error 4 Command not executed when initialisationState is withdrawn. Actual:
        answer. Expected: YES.
        SetShortAddress (63; oldAddress)
    endif
    TERMINATE
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 90 – Parameters for test sequence PROGRAM SHORT ADDRESS

Test step i	data	value	errorText1
0	*randomAddress* + 0x01 00 00	NO	Command executed at RANDOM ADDRESS < SEARCH ADDRESS
1	*randomAddress* + 0x00 01 00	NO	Command executed at RANDOM ADDRESS < SEARCH ADDRESS
2	*randomAddress* + 0x00 00 01	NO	Command executed at RANDOM ADDRESS < SEARCH ADDRESS
3	*randomAddress* - 0x01 00 00	NO	Command executed at RANDOM ADDRESS > SEARCH ADDRESS
4	*randomAddress* - 0x00 01 00	NO	Command executed at RANDOM ADDRESS > SEARCH ADDRESS
5	*randomAddress* - 0x00 00 01	NO	Command executed at RANDOM ADDRESS > SEARCH ADDRESS
6	*randomAddress*	YES	Command not executed at RANDOM ADDRESS = SEARCH ADDRESS

Test step j	address	description	queryAddress	errorText2
0	*oldAddress*<<1+1	initial address	*oldAddress*<<1+1	not executed
1	01111111b	short address 63	01111111b	not executed
2	10000001b	no change	01111111b	executed
3	00000000b	no change	01111111b	executed
4	10000000b	no change	01111111b	executed
5	11111111b	delete short address	broadcast unaddressed	not executed

12.7.9 VERIFY SHORT ADDRESS

The test sequence checks the correct function of the VERIFY SHORT ADDRESS command when initialisationState is disabled, enabled or withdrawn. Test also checks whenever answer is received from DUT when different formats (valid and invalid) of the address to be verified are given.

Test sequence shall be run for each selected logical unit.

Test description:

RESET
wait 300 ms
TERMINATE
oldAddress = *GLOBAL_currentUnderTestLogicalUnit*
answer = VERIFY SHORT ADDRESS ((*oldAddress* << 1) + 1)
if (*answer* != NO)
    error 1 Command executed when initialisationState is disabled. Actual: *answer*. Expected: NO.
endif
for (*i* = 0; *i* < 8; *i*++)
    INITIALISE (*address*[*i*])
    DTR0 (*setAddress*[*i*])
    SET SHORT ADDRESS, send to *address*[*i*])
    answer = VERIFY SHORT ADDRESS (*data*[*i*])
    if (*answer* != *value*[*i*])
        error 2 *errorText*[*i*] when initialisationState is enabled at test step i = *i*. Actual: *answer*. Expected: *value*[*i*].
    endif

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    WITHDRAW
    answer = VERIFY SHORT ADDRESS (data[i])
    if (answer != value[i])
        error 3 errorText[i] when initialisationState is withdrawn at test step i = i. Actual: answer. Expected: value[i].
    endif
    TERMINATE
endfor
SetShortAddress (255; oldAddress)
```

Table 91 – Parameters for test sequence VERIFY SHORT ADDRESS

Test step i	address	setAddress	data	value	errorText
0	*oldAddress* << 1 + 1	*oldAddress* << 1 + 1	*oldAddress* << 1 + 1	YES	Command not executed
1	*oldAddress* << 1 + 1	*oldAddress* << 1 + 1	*oldAddress* << 1 + 3	NO	Command executed
2	*oldAddress* << 1 + 1	01111111b	01111111b	YES	Command not executed
3	01111111b	01111111b	01111101b	NO	Command executed
4	01111111b	01111111b	01111110b	NO	Command executed
5	01111111b	01111111b	11111111b	NO	Command executed
6	01111111b	01111111b	11111110b	NO	Command executed
7	01111111b	11111111b	11111111b	NO	Command executed

12.7.10 QUERY SHORT ADDRESS

The test sequence checks the correct function of the QUERY SHORT ADDRESS command. Initially the correct format of short address returned by command is checked, and after that the behaviour of DUT when initialisationState is disabled, enabled or withdrawn is tested.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
oldAddress = GLOBAL_currentUnderTestLogicalUnit
// Check answer format of QUERY SHORT ADDRESS, expected: 11111111b or 0AAAAAA1b
INITIALISE ((oldAddress << 1) + 1)
for (i = 0; i < 3; i++)
    DTR0 (validAddress[i])
    SET SHORT ADDRESS, send to address[i]
    answer = QUERY SHORT ADDRESS, accept Value
    if (answer != addressFormat[i])
        error 1 Wrong format of returned short address at test step i = i. Actual: answer. Expected format: addressFormat[i].
    endif
endfor
TERMINATE
// Check behaviour of DUT with initialisationState = disabled
answer = QUERY SHORT ADDRESS
if (answer != NO)
    error 2 Command executed when initialisationState is disabled. Actual: answer. Expected: NO.
endif
randomAddress = GetLimitedRandomAddress (01111111b)
if (randomAddress == 0xFF FF FF)
    error 3 Bad random generator. For testing purpose each byte of the random address must be in [0x01, 0xFE] range.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    SetShortAddress (63; oldAddress)
else
    // Check behaviour of DUT with initialisationState = enabled and different values for
    randomAddress and searchAddress
    INITIALISE (01111111b)
    for (j = 0; j < 7; j++)
        SetSearchAddress (data[j])
        answer = QUERY SHORT ADDRESS
        if (answer != value[j])
            error 4 errorText[j] when initialisationState is enabled at test step j = j. Actual:
            answer. Expected: value[j].
        endif
    endfor
    WITHDRAW
    // Check behaviour of DUT with initialisationState = withdrawn and different values for
    randomAddress and searchAddress
    for (j = 0; j < 7; j++)
        SetSearchAddress (data[j])
        answer = QUERY SHORT ADDRESS
        if (answer != value[j])
            error 5 errorText[j] when initialisationState is withdrawn at test step j = j.
            Actual: answer. Expected: value[j].
        endif
    endfor
    TERMINATE
    // Check answer of QUERY SHORT ADDRESS when DUT has no short address assigned
    DTR0 (255)
    SET SHORT ADDRESS, send to 01111111b // Delete short address
    INITIALISE (255)
    SetSearchAddress (randomAddress)
    answer = QUERY SHORT ADDRESS
    if (answer != 255)
        error 6 Wrong answer when no short address is assigned and initialisationState is
        enabled. Actual: answer. Expected: 255.
    endif
    WITHDRAW
    answer = QUERY SHORT ADDRESS
    if (answer != 255)
        error 7 Wrong answer when no short address is assigned and initialisationState is
        withdrawn. Actual: answer. Expected: 255.
    endif
    TERMINATE
    SetShortAddress (255; oldAddress)
endif
```

Table 92 – Parameters for test sequence QUERY SHORT ADDRESS

Test step i	validAddress	address	addressFormat
0	(*oldAddress* << 1) + 1	(*oldAddress* << 1) + 1	(*oldAddress* << 1) + 1
1	11111111b	(*oldAddress* << 1) + 1	11111111b
2	01111111b	broadcast unaddressed	01111111b

Test step j	data	value	errorText
0	*randomAddress* + 0x01 00 00	NO	Command executed at RANDOM ADDRESS < SEARCH ADDRESS
1	*randomAddress* + 0x00 01 00	NO	Command executed at RANDOM ADDRESS < SEARCH ADDRESS
2	*randomAddress* + 0x00 00 01	NO	Command executed at

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step j	data	value	errorText
			RANDOM ADDRESS < SEARCH ADDRESS
3	*randomAddress* - 0x01 00 00	NO	Command executed at RANDOM ADDRESS > SEARCH ADDRESS
4	*randomAddress* - 0x00 01 00	NO	Command executed at RANDOM ADDRESS > SEARCH ADDRESS
5	*randomAddress* - 0x00 00 01	NO	Command executed at RANDOM ADDRESS > SEARCH ADDRESS
6	*randomAddress*	01111111b	Command not executed at RANDOM ADDRESS = SEARCH ADDRESS

12.7.11 IDENTIFY DEVICE

The test sequence checks the correct function of the IDENTIFY DEVICE command. The identification procedure timer is also checked if it is started, finished, prolonged, or aborted according to the specification.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
responsiveDevice = GLOBAL_currentUnderTestLogicalUnit << 1 + 1
// Test if identification procedure is started and finished within 10 s ± 1 s
UserInput (After accepting this message please check if logical unit starts an identification procedure and measure how long the identification procedure takes (in s), OK)
IDENTIFY DEVICE
wait 12 s
started = UserInput (Did identification procedure start?, YesNo)
if (started != Yes)
    error 1 Identification procedure not started by IDENTIFY DEVICE command.
else
    stopped = UserInput (Did identification procedure stop?, YesNo)
    if (stopped == Yes)
        stoppedTime = UserInput (Enter the length of identification procedure, value [s])
        if (stoppedTime < 9)
            error 2 Identification procedure stopped earlier than 9 s.
        else if (stoppedTime > 11)
            error 3 Identification procedure not stopped after 11 s.
        endif
    else
        error 4 Identification procedure not stopped after 11 s.
        UserInput (Wait until identification procedure stops, OK)
    endif
endif
// Test if identification procedure timer is prolonged
UserInput (After accepting this message please check if logical unit starts an identification procedure of 15 s ± 1 s, OK)
IDENTIFY DEVICE
wait 5 s
IDENTIFY DEVICE
wait 12 s
started = UserInput (Did logical unit start an identification procedure of 15 s ± 1 s?, YesNo)
if (started != Yes)
    error 5 Identification procedure not restart on reception of a second IDENTIFY DEVICE command.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
endif
PHM = QUERY PHYSICAL MINIMUM
mid = (254 + PHM) >> 1
// Test if identification procedure timer is not stopped
for (i = 0; i < 6; i++)
    command1[i]
    if (i == 3)
        WaitForLampOn ()
    endif
    UserInput (After accepting this message please check if logical unit starts an identification procedure of 10 s ± 1 s, OK)
    IDENTIFY DEVICE
    wait 5 s
    if (i < 4)
        command2[i]
    else
        answer = command2[j]
        if (answer != value1[i])
            error 6 text1[i] command not executed.
        endif
    endif
    wait 12 s
    started = UserInput (Did identification procedure last for 10 s ± 1 s?, YesNo)
    if (started != Yes)
        error 7 Identification procedure stopped on reception of text1[i].
    endif
    answer = QUERY ACTUAL LEVEL
    if (answer != level1[i])
        error 8 Wrong actual level after reception of text1[i] during identification procedure.
    endif
    if (i == 3)
        answer = query1[i]
        if (answer != value1[i])
            error 9 text1[i] command not executed.
        endif
        TERMINATE
    endif
endfor
// Test if identification procedure is aborted
DTR0 (1)
for (j = 0; j < 6; j++)
    command3[j]
    if (j == 3)
        WaitForLampOn ()
    endif
    UserInput (After accepting this message logical unit will start an identification procedure. Please check if identification procedure is stopped after 4 s, OK)
    IDENTIFY DEVICE
    wait 4 s
    command4[j]
    stopped = UserInput (Did logical unit start an identification procedure of 4 s?, YesNo)
    if (stopped == NO)
        error 10 Identification procedure not stopped by text2[j] command.
        wait 8 s
    endif
    answer = QUERY ACTUAL LEVEL
    if (answer != level2[j])
        error 11 Wrong actual level after reception of text2[j] during identification procedure.
    endif
    if (j >= 2)
        answer = query2[j]
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            if (answer != value2[j])
                error 12 text2[j] command not executed.
            endif
            if (j == 2)
                TERMINATE
            endif
        endif
endfor
```

Table 93 – Parameters for test sequence IDENTIFY DEVICE

Test step i	command1	command2	level1	text1	query1	value1
0	RECALL MIN LEVEL	RECALL MAX LEVEL	254	RECALL MAX LEVEL	-	-
1	RECALL MAX LEVEL	RECALL MIN LEVEL	PHM	RECALL MIN LEVEL	-	-
2	OFF	PING	0	PING	-	-
3	RECALL MIN LEVEL	INITIALISE (*responsiveDevice*)	PHM	INITIALISE	VERIFY SHORT ADDRESS (*responsiveDevice*)	YES
4	DAPC (*mid*)	COMPARE	*mid*	COMPARE	-	YES
5	DAPC (*mid*)	QUERY STATUS	*mid*	QUERY STATUS	-	0010XX00b

Test step j	command 3	command4	level2	text2	query2	value2
0	RECALL MIN LEVEL	TERMINATE	*PHM*	TERMINATE	-	-
1	DAPC (*mid*)	DAPC (*mid*)	*mid*	DAPC	-	-
2	OFF INITIALISE (*responsiveDevice*)	WITHDRAW	0	WITHDRAW	COMPARE	NO
3	DAPC (*mid*)	SET POWER ON LEVEL	*mid*	SET POWER ON LEVEL	QUERY POWER ON LEVEL	1
4	RECALL MAX LEVEL	RESET **wait** 300 ms	254	RESET	QUERY POWER ON LEVEL	254
5	OFF	DTR0 (2)	0	DTR0	QUERY CONTENT DTR0	2

12.7.12 IDENTIFY DEVICE THROUGH RECALL MIN/MAX LEVEL

The test sequence checks the correct function of RECALL MAX LEVEL and RECALL MIN LEVEL commands for identification of a device.

Test sequence shall be run for each selected logical unit.

Test description:

RESET
wait 300 ms
responsiveDevice = *GLOBAL_currentUnderTestLogicalUnit* << 1 + 1
PHM = QUERY PHYSICAL MINIMUM

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
mid = (PHM + 254) >> 1
UserInput (After accepting this message please check if logical unit starts an identification procedure of 10 s ± 1 s, OK)
INITIALISE (responsiveDevice)
RECALL MAX LEVEL
wait 12 s
startedAsIdentifyDevice = UserInput (Did logical unit start an identification procedure of 10 s ± 1 s?, YesNo)
if (startedAsIdentifyDevice == Yes)
    report 1 Logical unit responds to RECALL MAX LEVEL as if it received IDENTIFY DEVICE.
    TERMINATE
    UserInput (After accepting this message please check if logical unit starts an identification procedure of 10 s ± 1 s, OK)
    RECALL MAX LEVEL
    INITIALISE (responsiveDevice)
    RECALL MIN LEVEL
    wait 12 s
    identification = UserInput (Did logical unit start an identification procedure of 10 s ± 1 s?, YesNo)
    if (identification != Yes)
        error 1 Logical unit did not respond to RECALL MIN LEVEL as if it received IDENTIFY DEVICE.
    endif
    TERMINATE
    // RECALL MAX triggers IDENTIFY DEVICE, runs for 10 s
    extraTime = 10
else
    report 2 Logical unit responds to RECALL MAX LEVEL different than to IDENTIFY DEVICE.
    extraTime = 0
endif
// Add repetition time in case RECALL MAX triggers IDENTIFY DEVICE
identificationTime = 10 + extraTime
for (k = 0; k < 2; k++)
    RECALL MAX LEVEL
    WaitForLampOn ()
    if (k == 1)
        DTR0 (mid)
        SET MIN LEVEL
        SET MAX LEVEL
    else
        DTR0 (mid - 1)
        SET MIN LEVEL
        DTR0 (mid + 1)
        SET MAX LEVEL
    endif
    minLevel = QUERY MIN LEVEL
    maxLevel = QUERY MAX LEVEL
    INITIALISE (responsiveDevice)
    // Test if logical unit starts an identification procedure
    UserInput (After accepting this message please check if logical unit starts an identification procedure of identificationTime s ± 1 s, OK)
    for (m = 0; m < 10; m++)
        RECALL MIN LEVEL
        wait 480 ms
        RECALL MAX LEVEL
        wait 480 ms
    endfor
    RECALL MIN LEVEL
    wait extraTime + 2 s
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
identification = UserInput (Did logical unit start an identification procedure of identificationTime s ± 1 s?, YesNo)
if (identification != Yes)
    error 2 Logical unit did not start an identification procedure of identificationTime s ± 1 s at test step k = k.
endif
TERMINATE
answer = QUERY MIN LEVEL
if (answer != minLevel)
    error 3 Wrong min level after initialization process was terminated. Actual: answer. Expected: minLevel.
endif
answer = QUERY MAX LEVEL
if (answer != maxLevel)
    error 4 Wrong max level after initialization process was terminated. Actual: answer. Expected: maxLevel.
endif
answer = QUERY ACTUAL LEVEL
if (answer != minLevel)
    error 5 Wrong actual level after initialization process was terminated. Actual: answer. Expected: minLevel.
endif
RECALL MAX LEVEL
WaitForLampOn ()
// Test if identification procedure is aborted once the initialisation timer elapses
INITIALISE (responsiveDevice)
wait 10 min
UserInput (After accepting this message please check if logical unit starts an identification procedure of 5 min ± 1,5 min, OK)
start_timer (timer)
do
    RECALL MAX LEVEL
    wait 500 ms
    RECALL MIN LEVEL
    wait 500 ms
while (get_timer (timer) < 7 min)
identification = UserInput (Did identification procedure last for 5 min ± 1,5 min?, YesNo)
if (identification == No)
    error 6 Identification procedure not stopped after the timer triggered by INITIALISE command elapsed.
endif
TERMINATE// Test if identification procedure timer is not stopped
for (i = 0; i < 6; i++)
    INITIALISE (responsiveDevice)
    UserInput (After accepting this message please check if logical unit starts an identification procedure of identificationTime s ± 1 s, OK)
    for (m = 0; m < 5; m++)
        RECALL MIN LEVEL
        wait 480 ms
        RECALL MAX LEVEL
        wait 480 ms
    endfor
    if (i < 4)
        command1[i]
    else
        answer = command1[i]
        if (answer != value1[i])
            error 7 text1[i] command not executed.
        endif
    endif
    for (m = 0; m < 5; m++)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                RECALL MIN LEVEL
                wait 480 ms
                RECALL MAX LEVEL
                wait 480 ms
            endfor
            RECALL MIN LEVEL
            wait extraTime + 2 s
            identification = UserInput (Did identification procedure last for identificationTime s ± 1 s?, YesNo)
            if (identification == No)
                error 8 Identification procedure stopped on reception of text1[i] command.
            endif
            if (i == 3)
                answer = query1[i]
                if (answer != value1[i])
                    error 9 text1[i] command not executed.
                endif
            endif
            TERMINATE
            answer = QUERY ACTUAL LEVEL
            if (answer != minLevel)
                error 10 Wrong actual level after reception of text1[i] during identification procedure.
            endif
        endfor
        // Test if identification procedure is aborted on reception of a command
        DTR0 (1)
        RECALL MIN LEVEL
        for (j = 0; j < 6; j++)
            INITIALISE (responsiveDevice)
            UserInput (After accepting this message please check if logical unit starts an identification procedure of 5 s, OK)
            for (m = 0; m < 5; m++)
                RECALL MIN LEVEL
                wait 480 ms
                RECALL MAX LEVEL
                wait 480 ms
            endfor
            RECALL MIN LEVEL
            command2[j]
            identification = UserInput (Did logical unit start an identification procedure of 5 s?, YesNo)
            if (identification != Yes)
                error 11 Identification procedure not stopped by text2[j] command.
            endif
            if (j >= 2)
                answer = query2[j]
                if (answer != value2[j])
                    error 12 text2[j] command not executed.
                endif
            endif
            TERMINATE
            answer = QUERY ACTUAL LEVEL
            if (answer != level[j])
                error 13 Wrong actual level after reception of text2[j] during identification procedure.
            endif
        endfor
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 94 – Parameters for test sequence IDENTIFY DEVICE THROUGH RECALL MIN/MAX LEVEL

Test step i	command1	text1	query1	value1
0	RECALL MAX LEVEL	RECALL MAX LEVEL	-	-
1	RECALL MIN LEVEL	RECALL MIN LEVEL	-	-
2	PING	PING	-	-
3	INITIALISE (*responsiveDevice*)	INITIALISE	VERIFY SHORT ADDRESS (*responsiveDevice*)	YES
4	COMPARE	COMPARE	-	YES
5	QUERY STATUS	QUERY STATUS	-	0000XX00b

Test step j	command2	level	text2	query2	value2
0	TERMINATE	*minLevel*	TERMINATE	-	-
1	DAPC (*mid*)	*mid*	DAPC	-	-
2	WITHDRAW	*minLevel*	WITHDRAW	COMPARE	NO
3	SET POWER ON LEVEL	*minLevel*	SET POWER ON LEVEL	QUERY POWER ON LEVEL	1
4	DTR0 (2)	*minLevel*	DTR0	QUERY CONTENT DTR0	2
5	RESET **wait** 300 ms	254	RESET	QUERY POWER ON LEVEL	254

12.8 Queries and reserved commands

12.8.1 QUERY STATUS - lampFailure/lampOn

The test sequence checks if the lampFailure and the lampOn bits in the answer of QUERY STATUS are correctly set during partial of total lamp failure. Test checks also that the answers to QUERY LAMP POWER ON and QUERY LAMP FAILURE commands are in line with the values of the lampOn and lampFailure bits. QUERY ACTUAL LEVEL is used to verify the light level set by DUT.

Based on the number of lamps connected to DUT, test is run once or twice. If there is one lamp connected to DUT, test is performed once to check the behaviour during total lamp failure. In case there is more than one lamp connected, test is run twice, first time to check behaviour during total lamp failure, and the second time to check behaviour during partial lamp failure.

In case it is not safe to disconnect or connect the lamp(s) while mains power is applied to DUT, the disconnection and reconnection of lamp(s) should be done only after switching the mains power off.

Note regarding test execution: DAPC and QUERY STATUS commands should to be sent as fast as possible after each other (a query can be sent 2,4 ms after an answer was received).

Test sequence shall be run for each selected logical unit.

Test description:

```
// Ask user how many lamps are connected to DUT
numberLamps = UserInput (Enter the number of lamps connected to DUT?, value)
if (numberLamps == 1)
    imax = 1 // Test to be run once
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
else
    imax = 2 // Test to be run twice
endif
delay = 30 s + GLOBAL_startupTimeLimit
delayLimit = 33 s + GLOBAL_startupTimeLimit
lightSource = true
if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
    lightSource = false // This logical unit has no light source
endif
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (lightSource)
    // Test if bits are correctly set when no fade is started
    for (i = 0; i < imax; i++)
        for (j = 0; j < 4; j++)
            RECALL MAX LEVEL
            if (j == 3)
                WaitForLampOn ()
            endif
            DisconnectLamps (i) // Disconnect lamps to trigger the lamp failure
            start_timer (timer)
            do
                answer = QUERY LAMP FAILURE
                timestamp = get_timer (timer) - 10 ms // Subtract 10 ms which is the
                approximate length of the backward frame to get the start moment of the
                backward frame
            while (answer == NO AND timestamp < delayLimit)
            if (timestamp >= delayLimit)
                error 1 Lamp failure not detected after delayLimit s at test step (i,j) = (i,j).
            endif
            command[j]
            answer = QUERY LAMP FAILURE
            if (answer != YES)
                error 2 lampFailure not detected at test step (i,j) = (i,j). Actual: answer.
                Expected: YES.
            endif
            lampOn = NO
            status = XXXXX01Xb
            statusText = "lampFailure bit"
            actualLevel = MASK
            if (i == 1) // partial lamp failure
                lampOperational = UserInput (Is at least one of the lamps still
                operational?, YesNo)
                if (lampOperational == true)
                    lampOn = YES
                    status = XXXXX11Xb
                    statusText = "lampFailure and lampOn bits"
                    actualLevel = level[j]
                endif
            endif
            answer = QUERY LAMP POWER ON
            if (answer != lampOn)
                error 3 lampOn not correctly set at test step (i,j) = (i,j). Actual: answer.
                Expected: lampOn.
            endif
            answer = QUERY STATUS
            if (answer != status)
                error 4 statusText in QUERY STATUS not correctly set at test step (i,j) =
                (i,j). Actual: answer. Expected: status.
            endif
            answer = QUERY ACTUAL LEVEL
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                if (answer != actualLevel)
                    error 5 Wrong actual level at test step (i,j) = (i,j). Actual: answer. Expected: actualLevel.
                endif
                ConnectLamps () // Connect lamps to remove the lamp failure
                if (j != 2)
                    WaitForLampOn ()
                endif
                answer = QUERY LAMP FAILURE
                if (answer != lampFailureBit[j])
                    error 6 lampFailure not correctlt set with all lamp(s) connected at test step (i,j) = (i,j). Actual: answer. Expected: lampFailureBit[j].
                endif
                answer = QUERY LAMP POWER ON
                if (answer != lampOnBit[j])
                    error 7 lampOn not correctly set with all lamp(s) connected at test step (i,j) = (i,j). Actual: answer. Expected: lampOnBit[j].
                endif
                answer = QUERY STATUS
                if (answer != statusByte[j])
                    error 8 lampFailure and lampOn bits in QUERY STATUS not correctly set with all lamp(s) connected at test step (i,j) = (i,j). Actual: answer. Expected: statusByte[j].
                endif
                answer = QUERY ACTUAL LEVEL
                if (answer != level[j])
                    error 9 Wrong actual level with all lamp(s) connected at test step (i,j) = (i,j). Actual: answer. Expected: level[j].
                endif
            endfor
        endfor
    endif
    // Test if bits are correctly set when a fade is started
    DTR0 (4)
    SET FADE TIME
    DTR0 (0)
    SET POWER ON LEVEL
    kMax = 2
    if (lightSource)
        kMax = 3
    endif
    for (k = 0; k < kMax; k++)
        action[k]
        count = 0
        DAPC (254)
        start_timer (timer2)
        do
            answer[count] = QUERY STATUS
            start_timer (timer) // Timer starts after stop condition of the backward frame
        while (answer[count++] == status[k] AND get_timer (timer2) < GLOBAL_startupTimeLimit)
        do
            answer[count] = QUERY STATUS
            timestamp = get_timer (timer) - 10 ms // Subtract 10 ms which is the approximate length of the backward frame to get the start moment of the backward frame
        while (answer[count++] == XXX1XXXXb AND timestamp < 2,5 s)
        if (timestamp >= 2,5 s)
            error 10 Fade not stopped after 2,5 s at test step k = k.
        else
            for (i = 0; i < count - 1; i++)
                bit4 = (answer[i] >> 4) & 0x01
                bit = (answer[i] >> shiftBit[k]) & 0x01
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            if (bit != bit4) // if (bit1 and bit4), or (bit2 and bit 4) not simultaneously set
                error 11 fadeRunning and text[k] bit not simultaneously set at test step k =
                k.
                break
            endif
        endfor
    endif
endfor
ConnectLamps ()
```

Table 95 – Parameters for test sequence QUERY STATUS - lampFailure/lampOn

Test step j	command	lampFailureBit	lampOnBit	statusByte	level
0	RECALL MIN LEVEL	NO	YES	XXXXX10Xb	*PHM*
1	RESET **wait** (300 ms + *delay*)	NO	YES	XXXXX10Xb	254
2	OFF	YES	NO	XXXXX01Xb	255
3	**PowerCycleAndWaitForDecoder** (5) **wait** *delay*	NO	YES	XXXXX10Xb	254

Test step k	action	status	shiftBit	text	test step description
0	OFF	XXXXX0XXb	2	lampOn	fade from 0 to 254 with all lamps connected
1	**PowerCycleAndWaitForDecoder** (5)	XXXXX0XXb	2	lampOn	fade from min level (startup) to 254 with all lamps connected
2	**DisconnectLamps** (0) **PowerCycleAndWaitForDecoder** (5)	XXXXXX0Xb	1	lampFailure	fade from min level (startup) to 254 with all lamps disconnected

12.8.2 QUERY STATUS - lampOn

The test sequence checks if the lampOn bit in the answer of QUERY STATUS is correctly set. First the lamp of logical unit is turned off through commands or power cycle, and then the lamp is turned on. Test checks also that the answer to QUERY LAMP POWER ON command is in line with the value of the lampOn bit, before and after turning the lamp on. QUERY ACTUAL LEVEL is used to verify the light level set by logical unit.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
DTR0 (0)
SET POWER ON LEVEL
SET SCENE 5
DTR0 (254)
SET SCENE 12
for (i = 0; i < 6; i++)
    // Turn off the lamp and test when lamp is off
    command1[i]
    answer = QUERY STATUS
    if (answer != XXXXX0XXb)
        error 1 lampOn bit in QUERY STATUS not cleared with lamp off at test step i = i.
        Actual: answer. Expected: XXXXX0XXb.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    endif
    answer = QUERY LAMP POWER ON
    if (answer != NO)
        error 2 lampOn not cleared with lamp off at test step i = i. Actual: answer. Expected:
        NO.
    endif
    answer = QUERY ACTUAL LEVEL
    if (answer != 0)
        error 3 Wrong actual level with lamp off at test step i = i. Actual: answer. Expected:
        0.
    endif
    // Turn on the lamp and test when lamp is on
    command2[i]
    WaitForLampOn ()
    answer = QUERY STATUS
    if (answer != XXXXX1XXb)
        error 4 lampOn bit in QUERY STATUS not set with lamp on at test step i = i. Actual:
        answer. Expected: XXXXX1XXb.
    endif
    answer = QUERY LAMP POWER ON
    if (answer != YES)
        error 5 lampOn not set with lamp on at test step i = i. Actual: answer. Expected:
        YES.
    endif
    answer = QUERY ACTUAL LEVEL
    if (answer != level[i])
        error 6 Wrong actual level with lamp on at test step i = i. Actual: answer. Expected:
        level[i].
    endif
endfor
```

Table 96 – Parameters for test sequence QUERY STATUS - lampOn

Test step i	command1	command2	level
0	DAPC (0)	DAPC (1)	*PHM*
1	OFF	DAPC (254)	254
2	RECALL MIN LEVEL STEP DOWN AND OFF	RECALL MIN LEVEL	*PHM*
3	**PowerCycleAndWaitForDecoder** (5)	RECALL MAX LEVEL	254
4	GO TO SCENE 5	GO TO SCENE 12	254
5	OFF	ON AND STEP UP	*PHM*

12.8.3 QUERY STATUS - limitError/lampOn

The test sequence checks if the limitError and lampOn bits in the answer of QUERY STATUS are correctly set after target level is changed due to a change in min or max levels and due to a level instruction. Each test step assumes a correct implementation of the previous step.

Test checks also that the answer to QUERY LAMP POWER ON and QUERY LIMIT ERROR commands are in line with the value of the lampOn and limitError bits. QUERY ACTUAL LEVEL is used to verify the light level set by logical unit.

Test sequence shall be run for each selected logical unit.

Test description:

RESET
wait 300 ms

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
PHM = QUERY PHYSICAL MINIMUM
for (i = 0; i < 31; i++)
    command[i]
    if (i == 30)
        PowerCycleAndWaitForDecoder (5)
        WaitForPowerOnPhaseToFinish ()
    endif
    if (i != 3 AND i != 4 AND i != 5 AND i != 8)
        WaitForLampOn ()
    endif
    answer = QUERY STATUS
    if (answer != status[i])
        error 5 Wrong setting of lampOn and/or limitError bits in QUERY STATUS at test
        step i = i. Actual: answer. Expected: status[i].
    endif
    answer = QUERY LAMP POWER ON
    if (answer != powerOn[i])
        error 6 lampOn bit not correctly set at test step i = i. Actual: answer. Expected:
        powerOn[i].
    endif
    answer = QUERY LIMIT ERROR
    if (answer != limit[i])
        error 7 limitError bit not correctly set at test step i = i. Actual: answer. Expected:
        limit[i].
    endif
    answer = QUERY ACTUAL LEVEL
    if (answer != level[i])
        error 8 Wrong actual level at test step i = i. Actual: answer. Expected: level[i].
    endif
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Table 97 – Parameters for test sequence QUERY STATUS - limitError/lampOn

Test step i	command	status		powerOn	limit		level	
		PHM < 254	PHM = 254		PHM < 254	PHM = 254	PHM < 254	PHM = 254
0	RECALL MIN LEVEL DTR0 (*PHM* + 1) SET MIN LEVEL	0X001100b	0X000100b	YES	YES	NO	*PHM* + 1	254
1	RECALL MIN LEVEL	0X000100b	0X000100b	YES	NO	NO	*PHM* + 1	254
2	STEP DOWN	0X001100b	0X001100b	YES	YES	YES	*PHM* + 1	254
3	STEP DOWN AND OFF	0X000000b	0X000000b	NO	NO	NO	0	0
4	DAPC (255)	0X000000b	0X000000b	NO	NO	NO	0	0
5	UP	0X000000b	0X000000b	NO	NO	NO	0	0
6	ON AND STEP UP	0X000100b	0X000100b	YES	NO	NO	*PHM* + 1	254
7	DTR0 (1) SET SCENE 0 GO TO SCENE 0	0X001100b	0X001100b	YES	YES	YES	*PHM* + 1	254
8	OFF	0X000000b	0X000000b	NO	NO	NO	0	0
9	DAPC(1)	0X001100b	0X001100b	YES	YES	YES	*PHM* + 1	254
10	DAPC (255)	0X001100b	0X001100b	YES	YES	YES	*PHM* + 1	254
11	DTR0 (255) SET SCENE 10 GO TO SCENE 10	0X001100b	0X001100b	YES	YES	YES	*PHM* + 1	254
12	RECALL MAX LEVEL	0X000100b	0X000100b	YES	NO	NO	254	254
13	DTR0 (253) SET MAX LEVEL	0X001100b	0X000100b	YES	YES	NO	253	254
14	DTR0 (*PHM* + 1) SET SCENE 1 GO TO SCENE 1	0X000100b	0X001100b	YES	NO	YES	*PHM* + 1	254
15	DOWN	0X001100b	0X001100b	YES	YES	YES	*PHM* + 1	254
16	DTR0 (253) SET SCENE 2 GO TO SCENE 2	0X000100b	0X001100b	YES	NO	YES	253	254
17	STEP UP	0X001100b	0X001100b	YES	YES	YES	253	254

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step i	command	status		powerOn	limit		level	
		PHM < 254	PHM = 254		PHM < 254	PHM = 254	PHM < 254	PHM = 254
18	RECALL MAX LEVEL	0X000100b	0X000100b	YES	NO	NO	253	254
19	DAPC (254)	0X001100b	0X000100b	YES	YES	NO	253	254
20	RECALL MAX LEVEL	0X000100b	0X000100b	YES	NO	NO	253	254
21	UP	0X001100b	0X001100b	YES	YES	YES	253	254
22	RECALL MAX LEVEL	0X000100b	0X000100b	YES	NO	NO	253	254
23	DTR0 (*PHM* + 1) SET MIN LEVEL	0X000100b	0X000100b	YES	NO	NO	253	254
24	DTR0 (254) SET SCENE 0 GO TO SCENE 0	0X001100b	0X000100b	YES	YES	NO	253	254
25	DTR0 (254) SET MAX LEVEL	0X000100b	0X000100b	YES	NO	NO	253	254
26	DAPC (*PHM* + 1)	0X000100b	0X000100b	YES	NO	NO	*PHM* + 1	254
27	OFF DTR0 (*PHM* + 2) SET MIN LEVEL GO TO LAST ACTIVE LEVEL	0X001100b	0X000100b	YES	YES	NO	*PHM* + 2	254
28	DAPC (254)	0X000100b	0X000100b	YES	NO	NO	254	254
29	OFF DTR0 (253) SET MAX LEVEL GO TO LAST ACTIVE LEVEL	0X001100b	0X000100b	YES	YES	NO	253	254
30	-	1X001100b	1X000100b	YES	YES	NO	253	254

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.8.4 QUERY STATUS - powerCycleSeen

The test sequence checks if the powerCycleSeen bit in the answer of QUERY STATUS are correctly set. Test checks also that the answer to QUERY POWER FAILURE command is in line with the value of the powerCycleSeen bit. Immediately after the power cycle the powerCycleSeen bit should be set, and an instruction is received the bit should be cleared.

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
DTR0 (1)
SET SCENE 4
SET SCENE 9
for (i = 0; i < 26; i++)
    PowerCycleAndWaitForDecoder (5)
    wait 1 s
    answer = QUERY STATUS
    if (answer != 1XXXXXXXb)
        error 1 powerCycleSeen bit in QUERY STATUS not set after an external power
        cycle at test step i = i. Actual: answer. Expected: 1XXXXXXXb.
    endif
    answer = QUERY POWER FAILURE
    if (answer != YES)
        error 2 powerCycleSeen not detected after an external power cycle at test step i = i.
        Actual: answer. Expected: YES.
    endif
    command[i]
    answer = QUERY STATUS
    if (answer != status[i])
        error 3 powerCycleSeen bit in QUERY STATUS not correctly set after receiving
        command[i] at test step i = i. Actual: answer. Expected: status[i].
    endif
    answer = QUERY POWER FAILURE
    if (answer != powerFailure[i])
        error 4 powerCycleSeen not correctly set after receiving command[i] at test step i =
        i. Actual: answer. Expected: powerFailure[i].
    endif
endfor
```

Table 98 – Parameters for test sequence QUERY STATUS - powerCycleSeen

Test step i	command	status	powerFailure
0	RESET wait 300 ms	0XXXXXXXb	NO
1	DAPC (1)	0XXXXXXXb	NO
2	OFF	0XXXXXXXb	NO
3	UP	0XXXXXXXb	NO
4	DOWN	0XXXXXXXb	NO
5	STEP UP	0XXXXXXXb	NO
6	STEP DOWN	0XXXXXXXb	NO
7	RECALL MAX LEVEL	0XXXXXXXb	NO
8	RECALL MIN LEVEL	0XXXXXXXb	NO
9	GO TO LAST ACTIVE LEVEL	0XXXXXXXb	NO
10	STEP DOWN AND OFF	0XXXXXXXb	NO

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step i	command	status	powerFailure
11	ON AND STEP UP	0XXXXXXXb	NO
12	GO TO SCENE 0	0XXXXXXXb	NO
13	GO TO SCENE 4	0XXXXXXXb	NO
14	GO TO SCENE 9	0XXXXXXXb	NO
15	GO TO SCENE 15	0XXXXXXXb	NO
16	DTR0 (1)	1XXXXXXXb	YES
17	SET MIN LEVEL	1XXXXXXXb	YES
18	SET FADE TIME	1XXXXXXXb	YES
19	SET SCENE 2	1XXXXXXXb	YES
20	ADD TO GROUP 11	1XXXXXXXb	YES
21	READ MEMORY BANK	1XXXXXXXb	YES
22	ENABLE DAPC SEQUENCE	1XXXXXXXb	YES
23	TERMINATE	1XXXXXXXb	YES
24	INITIALISE (0)	1XXXXXXXb	YES
25	PING	1XXXXXXXb	YES

12.8.5 QUERY CONTROL GEAR PRESENT

Test sequence checks the correct function of the QUERY CONTROL GEAR PRESENT command. Command is sent to the short address of the logical unit under test and to a different short address.

Test sequence shall be run for each selected logical unit.

Test description:

```
answer = QUERY CONTROL GEAR PRESENT
if (answer == NO)
    error 1 No DUT is present on the bus interface.
else
    oldAddress = GLOBAL_currentUnderTestLogicalUnit
    newAddress = 63
    SetShortAddress (oldAddress; newAddress)
    for (i = 0; i < 2; i++)
        answer = QUERY CONTROL GEAR PRESENT, send to ((address[i] << 1) + 1)
        if (answer != expected[i])
            error 2 Wrong answer when command was sent text[i]. Actual: answer.
            Expected: expected[i].
        endif
    endfor
    SetShortAddress (newAddress; oldAddress)
endif
```

Table 99 – Parameters for test sequence QUERY CONTROL GEAR PRESENT

Test step i	address	expected	test step description
0	*newAddress*	YES	to device's short address
1	*oldAddress*	NO	to a different short address

12.8.6 QUERY VERSION NUMBER

The test sequence checks the version number of the standard, implemented by DUT.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test sequence shall be run for all logical units in parallel.

Test description:

```
// Get version using QUERY VERSION NUMBER
answer = GetVersionNumber ()
if (answer == 2.0)
    report 1 Version number is answer.
else if (answer == 2)
    warning 1 Version number is answer, but it does not have the right format. Expected: 2.0.
else if (answer < 2)
    warning 2 DUT is not compliant with the latest version of the standard. Version number is answer.
else
    error 1 Incorrect version number. Actual: answer. Expected: 0, 1, or 2.0.
endif
// Compare version number given in memory bank 0 with the answer to Query Version Number
DTR0 (0x16)
DTR1 (0)
answerMB = READ MEMORY LOCATION
answerQVN = QUERY VERSION NUMBER, accept Value
if (answerMB != answerQVN)
    error 2 Version number given in the memory bank 0 does not match to the answer of QUERY VERSION NUMBER. Version number given in memory bank 0: answerMB. Answer to Query Version Number: answerQVN.
endif
```

12.8.7 PING

The test sequence cheks whether device reacts at PING command, sent either once or twice.

Test sequence shall be run for all logical units in parallel.

Test description:

```
RESET
wait 300 ms
for (i = 0; i < 2; i++)
    if (i == 0)
        answer = PING, send once
    else
        answer = PING, send twice
    endif
    if (answer != NO)
        error 1 Answer after receiving PING command at step i = i.
    endif
    answer = QUERY RESET STATE
    if (answer != YES)
        error 2 DUT not in reset state after receiving PING command at step i = i.
        RESET
        wait 300 ms
    endif
endfor
```

12.8.8 Broadcast unaddressed

The test sequence checks the behaviour of a logical unit at a broadcast unaddressed command.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test sequence shall be run for each selected logical unit.

Test description:

```
RESET
wait 300 ms
oldAddress = GLOBAL_currentUnderTestLogicalUnit
PHM = QUERY PHYSICAL MINIMUM, send to ((oldAddress << 1) + 1)
SetShortAddress (oldAddress; 255)
answer = QUERY MISSING SHORT ADDRESS, send to broadcast unaddressed
if (answer != YES)
    error 1 Short address not deleted.
endif
for (i = 0; i < 2; i++)
    for (j = 0; j < 13; j++)
        DTR0 (data[j])
        command[j], send to broadcast unaddressed
        answer = query[j], send to address[i]
        if (answer != value[i,j])
            if (i == 0)
                error 2 Broadcast unaddressed command[j] not executed although no
                short address assigned. Actual: answer. Expected: value[i,j].
            else
                error 3 Broadcast unaddressed command[j] is executed although a short
                address is assigned. Actual: answer. Expected: value[i,j].
            endif
        endif
    endfor
    // Assign a short address
    if (i == 0)
        RESET
        wait 300 ms
        SetShortAddress (255; oldAddress)
        answer = QUERY CONTROL GEAR PRESENT, send to ((oldAddress << 1) + 1)
        if (answer != YES)
            error 4 Short address not assigned.
        endif
    endif
endfor
```

Table 100 – Parameters for test sequence Broadcast unaddressed

Test step i	address
0	broadcast unaddressed
1	(*oldAddress* << 1) + 1

Test step j	data	command	query	value	
				i = 0	i = 1
0	0	RECALL MIN LEVEL	QUERY ACTUAL LEVEL	*PHM*	254
1	0	RECALL MAX LEVEL	QUERY ACTUAL LEVEL	254	254
2	0	DAPC (1)	QUERY ACTUAL LEVEL	*PHM*	254
3	0	DAPC (254)	QUERY ACTUAL LEVEL	254	254
4	170	SET POWER ON LEVEL	QUERY POWER ON LEVEL	170	254
5	4	SET FADE TIME	QUERY FADE TIME/FADE RATE	0x47	0x07
6	150	SET SCENE 0	QUERY SCENE LEVEL 0	150	255
7	200	SET SCENE 10	QUERY SCENE LEVEL 10	200	255
8	0	ADD TO GROUP 1	QUERY GROUPS 0-7	00000010b	0

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test step j	data	command	query	value	
				i = 0	i = 1
9	0	ADD TO GROUP 15	QUERY GROUPS 8-15	10000000b	0
10	0	-	QUERY CONTROL GEAR PRESENT	YES	YES
11	10	-	QUERY CONTENT DTR0	10	10
12	0	-	QUERY RESET STATE	NO	YES

12.8.9 Reserved commands: standard commands

The test sequence checks whether device reacts on one of the reserved standard commands.

Test sequence shall be run for all logical units in parallel.

Test description:

```
RESET
wait 300 ms
for (i = 0; i < 6; i++)
    for (j = 0; j < counterMax[i]; j++)
        opcode = offset[i] + j
        answer = Send twice broadcast command with opcode opcode, accept Violation, Value
        if (answer != NO)
            error 1 Answer after receiving reserved standard command with opcode opcode.
        endif
        answer = QUERY RESET STATE
        if (answer != YES)
            error 2 DUT not in reset state after receiving reserved standard command with opcode opcode.
            RESET
            wait 300 ms
        endif
    endfor
endfor
```

Table 101 – Parameters for test sequence Reserved commands: standard commands

Test step i	offset	counterMax	test step description
0	11	5	Commands 11 to 15
1	38	4	Commands 38 to 41
2	49	15	Commands 49 to 63
3	130	14	Commands 130 to 143
4	170	6	Commands 170 to 175
5	198	26	Commands 198 to 223

12.8.10 Reserved commands: special commands

The test sequence checks whether device reacts on one of the reserved special commands, while initialisationState is either DISABLED or ENABLED.

Test sequence shall be run for all logical units in parallel.

Test description:

RESET

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
wait 300 ms
for (m = 0; m < 2; m++)
    if (m == 1)
        INITIALISE (0)
    endif
    for (i = 0; i < 13; i++)
        for (j = 0; j < counterMax[i]; j++)
            address = offset[i] + 2 * j
            for (k = 0; k < 10; k++)
                opcode = opcodeByte[k]
                answer = Send twice to address command with opcode opcode, accept
                Violation, Value
                if (answer != NO)
                    error 1 Answer after receiving reserved command to address address
                    and with opcode opcode at test step m = m.
                endif
                answer = QUERY RESET STATE
                if (answer != YES)
                    error 2 DUT not in reset state after receiving reserved command to
                    address address and with opcode opcode at test step m = m.
                    RESET
                    wait 300 ms
                endif
            endfor
        endfor
    endfor
endfor
TERMINATE
```

Table 102 – Parameters for test sequence Reserved commands: special commands

Test step i	offset	counterMax	test step description
0	175	1	Address byte 10101111b
1	189	2	Address byte 101111X1b
2	203	1	Address byte 11001011b
3	205	2	Address byte 110011X1b
4	209	8	Address byte 1101XXX1b
5	225	8	Address byte 1110XXX1b
6	241	4	Address byte 11110XX1b
7	249	2	Address byte 111110X1b
8	160	16	Address byte 101XXXX0b
9	192	16	Address byte 110XXXX0b
10	224	8	Address byte 1110XXX0b
11	240	4	Address byte 11110XX0b
12	248	2	Address byte 111110X0b

Test step k	0	1	2	3	4	5	6	7	8	9
opcodeByte	0	1	3	5	9	17	33	65	129	255

12.8.11 Application extended commands

The test sequence checks whether device reacts on one of the application extended commands without being preceded by ENABLE DEVICE TYPE (data) command.

Test sequence shall be run for all logical units in parallel.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test description:

```
RESET
wait 300 ms
for (i = 0; i < 31; i++)
    opcode = 224 + i
    answer = Send twice broadcast command with opcode opcode, accept Violation, Value
    if (answer != NO)
        error 1 Answer after receiving application extended command with opcode opcode.
    endif
    answer = QUERY RESET STATE
    if (answer != YES)
        error 2 DUT not in reset state after receiving application extended command with
        opcode opcode.
        RESET
        wait 300 ms
    endif
endfor
```

12.8.12 Not supported device types

The test sequence checks whether device reacts on application extended commands of not supported device types.

Test sequence shall be run for all logical units in parallel.

Test description:

```
RESET
wait 300 ms
for (i = 0; i < 255; i++)
    ENABLE DEVICE TYPE (i)
    answer = QUERY EXTENDED VERSION NUMBER
    if (answer != NO)
        report 1 Device Type i is supported.
    else
        for (j = 0; j < 31; j++)
            opcode = 224 + j
            ENABLE DEVICE TYPE (i)
            answer = Send twice broadcast command with opcode opcode, accept
            Violation, Value
            if (answer != NO)
                error 1 Answer after receiving application extended command with opcode
                opcode.
            endif
            answer = QUERY RESET STATE
            if (answer != YES)
                error 2 DUT not in reset state after receiving application extended
                command with opcode opcode.
                RESET
                wait 300 ms
            endif
        endfor
    endif
endfor
```

12.8.13 Removed functionality

The test sequence checks that the old functionality of command with address = 10111101b and opcode = 00000000b (PHYSICAL SELECTION command) is not available for the current standard.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test sequence shall be run for each selected logical unit.

Test description:

```
lightSource = true
if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
    lightSource = false // This logical unit has no light source
endif
if (GLOBAL_safeLampConnection == Yes AND lightSource)
    RESET
    wait 300 ms
    oldAddress = GLOBAL_currentUnderTestLogicalUnit
    address = 10111101b
    opcode = 00000000b
    DTR0 (255)
    SET SHORT ADDRESS
    INITIALISE (255)
    answer = QUERY SHORT ADDRESS
    if (answer != YES)
        error 1 No reply from QUERY SHORT ADDRESS.
    endif
    RANDOMISE
    wait 100 ms
    answer = QUERY SHORT ADDRESS
    if (answer != NO)
        halt 1 Random address equal to search address after RANDOMISE command.
    endif
    Send command with address = address and opcode = opcode
    answer = QUERY SHORT ADDRESS
    if (answer != NO)
        halt 2 Unexpected response after sending old PHYSICAL SELECTION command.
    endif
    DisconnectLamps (0)
    start_timer (timer)
    do
        answer = QUERY STATUS, send to broadcast unaddressed
        timestamp = get_timer (timer)
        while (answer == XXXXXX0Xb AND timestamp < 33 s)  //Keep querying until lamp
        failure is detected - check lampFailure bit
    if (timestamp > 33)
        error 2 Lamp failure bit not set after 33 s. Maximum time: 30 s.
    endif
    answer = QUERY SHORT ADDRESS
    if (answer != NO)
        error 3 Reply received from QUERY SHORT ADDRESS when lamp(s) disconnected
        and old PHYSICAL SELECTION command sent.
    endif
    PROGRAM SHORT ADDRESS (63)
    answer = QUERY CONTROL GEAR PRESENT, send to 01111111b
    if (answer == YES)
        error 4 Programming of short address succeded due to old physical selection.
        DTR0 (255)
        SET SHORT ADDRESS, send to 01111111b
    endif
    ConnectLamps ()
    Send command with address = address and opcode = opcode
    answer = QUERY SHORT ADDRESS
    if (answer != NO)
        error 5 Unexpected response after sending old PHYSICAL SELECTION command.
    endif
    TERMINATE
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    SetShortAddress (255; oldAddress)
else
    if (lightSource)
        report 1 Test sequence is not applicable.
    else
        warning 1 Test sequence cannot be executed, unsafe to disconnect and reconnect
        the lamp.
    endif
endif
```

12.9 Cross contamination

12.9.1 DTR0

Test sequence checks that the change of the DTR0 register on one logical unit will not affect the value of the registers of the other logical units. DTR0 register shall be tested via memory banks. After each read of a memory bank location DTR0 shall be incremented.

Test sequence shall be run for all logical units in parallel.

Test description:

```
if (GLOBAL_numberShortAddresses == 1)
    report 1 Only one logical device implemented.
else
    DTR0 (10)
    DTR1 (0)
    answer = READ MEMORY LOCATION
    for (address = 0; address < GLOBAL_numberShortAddresses; address++)
        for (k = 0; k < address; k++)
            READ MEMORY LOCATION, send to ((address << 1) + 1)
        endfor
    endfor
    for (address = 0; address < GLOBAL_numberShortAddresses; address++)
        answer = QUERY CONTENT DTR0, send to ((address << 1) + 1)
        expectedValue = 10 + 1 + address
        if (answer != expectedValue)
            error 1 LogicalUnit address: Wrong value of DTR0. Actual: answer. Expected:
            expectedValue.
        endif
    endfor
endif
```

12.9.2 NVM variables

Test sequence checks that the change of some variables on one logical unit will not affect the values of the variables of the other logical units.

Test sequence shall be run for all logical units in parallel.

Test description:

```
if (GLOBAL_numberShortAddresses == 1)
    report 1 Only one logical device implemented.
else
    RESET
    wait 300 ms
    // Change variables on logical units
    for (address = 0; address < GLOBAL_numberShortAddresses; address++)
        PHM = QUERY PHYSICAL MINIMUM, send to ((address << 1) + 1)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        DTR0 (address)
        SET SCENE 3, send to ((address << 1) + 1)
        SET SCENE 8, send to ((address << 1) + 1)
        SET SCENE 14, send to ((address << 1) + 1)
        SET POWER ON LEVEL, send to ((address << 1) + 1)
        SET SYSTEM FAILURE LEVEL, send to ((address << 1) + 1)
        DTR0 (address % 16)
        SET FADE TIME, send to ((address << 1) + 1)
        SET EXTENDED FADE TIME, send to ((address << 1) + 1)
        DTR0 ((address % 15) + 1)
        SET FADE RATE, send to ((address << 1) + 1)
        ADD TO GROUP (address % 16), send to ((address << 1) + 1)
        DTR0 (PHM + (address % (255 - PHM)))
        SET MIN LEVEL, send to ((address << 1) + 1)
        SET MAX LEVEL, send to ((address << 1) + 1)
    endfor
    // Check change of variables
    for (address = 0; address < GLOBAL_numberShortAddresses; address++)
        PHM = QUERY PHYSICAL MINIMUM, send to ((address << 1) + 1)
        expected = PHM + (address % (255 - PHM))
        answer = QUERY ACTUAL LEVEL, send to ((address << 1) + 1)
        if (answer != expected)
            error 1 LogicalUnit address: Wrong value for actualLevel. Actual: answer.
            Expected: expected.
        endif
        answer = QUERY MIN LEVEL, send to ((address << 1) + 1)
        if (answer != expected)
            error 2 LogicalUnit address: Wrong value for minLevel. Actual: answer.
            Expected: expected.
        endif
        answer = QUERY MAX LEVEL, send to ((address << 1) + 1)
        if (answer != expected)
            error 3 LogicalUnit address: Wrong value for maxLevel. Actual: answer.
            Expected: expected.
        endif
        answer = QUERY SCENE LEVEL 3, send to ((address << 1) + 1)
        if (answer != address)
            error 4 LogicalUnit address: Wrong value for scene3. Actual: answer.
            Expected: address.
        endif
        answer = QUERY SCENE LEVEL 8, send to ((address << 1) + 1)
        if (answer != address)
            error 5 LogicalUnit address: Wrong value for scene8. Actual: answer.
            Expected: address.
        endif
        answer = QUERY SCENE LEVEL 14, send to ((address << 1) + 1)
        if (answer != address)
            error 6 LogicalUnit address: Wrong value for scene14. Actual: answer.
            Expected: address.
        endif
        answer = QUERY POWER ON LEVEL, send to ((address << 1) + 1)
        if (answer != address)
            error 7 LogicalUnit address: Wrong value for powerOnLevel. Actual: answer.
            Expected: address.
        endif
        answer = QUERY SYSTEM FAILURE LEVEL, send to ((address << 1) + 1)
        if (answer != address)
            error 8 LogicalUnit address: Wrong value for systemFailureLevel. Actual:
            answer. Expected: address.
        endif
        answer = QUERY FADE TIME/FADE RATE, send to ((address << 1) + 1)
        expected = (address %16) << 4 + ((address % 15) + 1)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        if (answer != expected)
            error 9 LogicalUnit address: Wrong value for fadeRate/fadeTime. Actual:
            answer. Expected: expected.
        endif
        answer = QUERY EXTENDED FADE TIME, send to ((address << 1) + 1)
        if (answer != (address %16))
            error 10 LogicalUnit address: Wrong value for extendedFadeTime. Actual:
            answer. Expected: (address %16).
        endif
        group = address %16
        if (group <= 7)
            group0-7 = 1 << group
            group8-15 = 0
        else
            group0-7 = 0
            group8-15 = 1 << (group – 8)
        endif
        answer = QUERY GROUPS 0-7, send to ((address << 1) + 1)
        if (answer != group0-7)
            error 11 LogicalUnit address: Wrong value for gearGroups0-7. Actual: answer.
            Expected: group0-7.
        endif
        answer = QUERY GROUPS 8-15, send to ((address << 1) + 1)
        if (answer != group8-15)
            error 12 LogicalUnit address: Wrong value for gearGroups8-15. Actual: answer.
            Expected: group8-15.
        endif
    endfor
endif
```

12.9.3 Random address generation

Test sequence checks that:

- all logical units generate an unique random address, when RANDOMISE command is sent using broadcast as addressing mode;
- only the addressed logical unit generates a random address, when RANDOMISE command is sent using the short address of the selected logical unit.

Test sequence shall be run for all logical units in parallel.

Test description:

```
if (GLOBAL_numberShortAddresses == 1)
    report 1 Only one logical device implemented.
else
    RESET
    wait 300 ms
    // All logical units shall generate an unique random address
    INITIALISE (0)
    RANDOMISE
    wait 100 ms
    for (address = 0; address < GLOBAL_numberShortAddresses; address++)
        randomAddress[address] = GetRandomAddress (address)
    endfor
    for (i = 0; i < GLOBAL_numberShortAddresses; i++)
        if (randomAddress[i] == 0xFFFFFF)
            error 1 LogicalUnit i: Wrong random address generated. Actual: 0xFFFFFF.
            Expected: not 0xFFFFFF.
        endif
        for (j = i + 1; j < GLOBAL_numberShortAddresses; j++)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                if (randomAddress[i] == randomAddress[j])
                    error 2 LogicalUnit i and LogicalUnit j generated the same random address
                    randomAddress[i].
                endif
            endfor
        endfor
        RESET
        wait 300 ms
        TERMINATE
        // Only one logical unit should generate a random address
        for (address = 0; address < GLOBAL_numberShortAddresses; address++)
            answer = QUERY RESET STATE, send to ((address << 1) + 1)
            if (answer != YES)
                error 3 LogicalUnit address: is not in the reset state. Actual: N0. Expected:
                YES.
            endif
            INITIALISE (address <<1 + 1)
            RANDOMISE
            wait 100 ms
            TERMINATE
            answer = QUERY RESET STATE, send to ((address << 1) + 1)
            if (answer != NO)
                error 4 LogicalUnit address: is still in the reset state. Actual: YES. Expected:
                N0.
            endif
        endfor
endif
```

12.9.4 Addressing 1

Test sequence checks the answer sent by all logical units at broadcast queries. Test sets the light of half of the logical units off. The expected answer is YES for a YES-NO query, and an invalid backward frame for an 8-bit query.

Test sequence shall be run for all logical units in parallel.

Test description:

```
if (GLOBAL_numberShortAddresses == 1)
    report 1 Only one logical device implemented.
else
    RESET
    wait 300 ms
    WaitForLampOnAddressed (broadcast)
    // All lamps of logical units are on
    answer = QUERY LAMP POWER ON
    if (answer != YES)
        error 1 Wrong answer received from all logical units at a YES-NO query with all
        lamps on. Actual: answer. Expected: YES.
    endif
    answer = QUERY STATUS
    if (answer != 00100100b)
        error 2 Wrong answer received from all logical units at an 8-bit query with all lamps
        on. Actual: answer. Expected: 00100100b.
    endif
    // All lamps of one logical unit are off, the rest are on
    for (address = 0; address < GLOBAL_numberShortAddresses; address++)
        RECALL MAX LEVEL
        WaitForLampOnAddressed (broadcast)
        OFF, send to ((address << 1) + 1)
        for (i = 0; i < GLOBAL_numberShortAddresses; i++)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            answer = QUERY LAMP POWER ON, send to ((i << 1) + 1)
            if (i == address)
                if (answer != NO)
                    error 3 Wrong answer received from logical unit address at a YES-NO
                    query with the lamps of LogicalUnit address off. Actual: answer.
                    Expected: NO.
                endif
            else
                if (answer != YES)
                    error 4 Wrong answer received from logical unit i at a YES-NO query
                    with the lamps of LogicalUnit address off. Actual: answer. Expected:
                    YES.
                endif
            endif
        endfor
        answer = QUERY LAMP POWER ON
        if (answer != YES)
            error 5 Wrong answer received from all logical units at a YES-NO query with
            the lamps of LogicalUnit address off. Actual: answer. Expected: YES.
        endif
        answer = QUERY STATUS, accept Violation
        if (answer is a valid backward frame)
            error 6 Wrong answer received from all logical units at an 8-bit query with the
            lamps of LogicalUnit address off. Actual: answer. Expected: invalid backward
            frame.
        endif
    endfor
    // All lamps of logical units are off
    OFF
    answer = QUERY LAMP POWER ON
    if (answer != NO)
        error 7 Wrong answer received from all logical units at a YES-NO query with all
        lamps off. Actual: answer. Expected: NO.
    endif
    answer = QUERY STATUS, accept Violation
    if (answer != 00100000b)
        error 8 Wrong answer received from all logical units at an 8-bit query with all lamps
        off. Actual: answer. Expected: 00100000b.
    endif
endif
```

12.9.5 Addressing 2

Test sequence checks the answer sent by all logical units at queries sent using broadcast and grouping addressing. Test checks the behaviour of the logical units when all of them are added to one group, and after that when half of them are in one group and the other half in a different group. Test sets the light of the logical units as follows:

- all on;
- first half of the group lamps off and the rest of the lamps on, with all logical units in one group; Group0 lamps off and Group1 lamps on, with logical units split into two groups
- first half of the group lamps on and the rest of the lamps off, with all logical units in one group; Group0 lamps on and Group1 lamps off with logical units split into two groups
- all off

Test shall be run for all logical units in parallel.

Test description:

```
if (GLOBAL_numberShortAddresses == 1)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    report 1 Only one logical device implemented.
else
    RESET
    wait 300 ms
    for (i = 0; i < 2; i++)
        if (i == 0)
            ADD TO GROUP 1
        else
            for (address = 0; address < (GLOBAL_numberShortAddresses >> 1);
            address++)
                REMOVE FROM GROUP 1, send to ((address << 1) + 1)
                ADD TO GROUP 0, send to ((address << 1) + 1)
            endfor
        endif
        for (j = 0; j < 4; j++)
            switch (j)
                case 0: // All lamps are on
                    RECALL MAX LEVEL
                    WaitForLampOnAddressed (broadcast)
                    break
                case 1:
                    if (i == 0) // First half of the group - lamps are off, the rest - lamps are
                    on
                        for (address = 0; address < (GLOBAL_numberShortAddresses >>
                        1); address++)
                            OFF, send to ((address << 1) + 1)
                        endfor
                    else // Group0 - lamps are off, Group1 - lamps are on
                        OFF, send to 10000001b //gearGroups0
                    endif
                    break
                case 2:
                    if (i == 0) // First half of the group - lamps are on, the rest - lamps are
                    off
                        for (address = 0; address < (GLOBAL_numberShortAddresses >>
                        1); address++)
                            RECALL MAX LEVEL, send to ((address << 1) + 1)
                            WaitForLampOnAddressed ((address << 1) + 1)
                        endfor
                        for (address = (GLOBAL_numberShortAddresses >> 1); address
                        < GLOBAL_numberShortAddresses; address++)
                            OFF, send to ((address << 1) + 1)
                        endfor
                    else // Group0 - lamps are on, Group1 - lamps are off
                        RECALL MAX LEVEL, send to 10000001b //gearGroups0
                        OFF, send to 10000011b //gearGroups1
                        WaitForLampOnAddressed (10000001b)
                    endif
                    break
                case 3: // All lamps are off
                    if (i == 0)
                        OFF
                    else
                        OFF, send to 10000001b //gearGroups0
                    endif
                    break
            endswitch
            answer = QUERY LAMP POWER ON
            if (answer != lampOnBroadcast[j])
                error 1 Wrong answer received from all logical units at a YES-NO query at
                test step (i,j) = (i,j). Actual: answer. Expected: lampOnBroadcast[j].
            endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            answer = QUERY STATUS, accept Violation
            if (answer != statusBroadcast[j])
                error 2 Wrong answer received from all logical units at an 8-bit query at test step (i,j) = (i,j). Actual: answer. Expected: statusBroadcast[j].
            endif
            answer = QUERY LAMP POWER ON, send to 10000011b //gearGroups1
            if (answer != lampOnG1[i,j])
                error 3 Wrong answer received from all logical units in gearGroups1 at a YES-NO query. Actual: answer. Expected: lampOnG1[i,j].
            endif
            answer = QUERY STATUS, send to 10000011b //gearGroups1
            if (answer != statusG1[i,j])
                error 4 Wrong answer received from all logical units in gearGroups1 at an 8-bit query at test step (i,j) = (i,j). Actual: answer. Expected: statusG1[i,j].
            endif
            if (i == 1)
                answer = QUERY LAMP POWER ON, send to 10000001b //gearGroups0
                if (answer != lampOnG0[j])
                    error 5 Wrong answer received from all logical units in gearGroups0 at a YES-NO query. Actual: answer. Expected: lampOnG0[j].
                endif
                answer = QUERY STATUS, send to 10000001b //gearGroups0
                if (answer != statusG0[j])
                    error 6 Wrong answer received from all logical units in gearGroups0 at an 8-bit query at test step (i,j) = (i,j). Actual: answer. Expected: statusG0[j].
                endif
            endif
        endfor
    endfor
endif
```

Table 103 – Parameters for test sequence Addressing 2

Test step j		0	1	2	3
lampOnBroadcast		YES	YES	YES	NO
statusBroadcast		00000100b	invalid backward frame	invalid backward frame	00000000b
i = 0	**lampOnG1**	YES	YES	YES	NO
	statusG1	00000100b	invalid backward frame	invalid backward frame	00000000b
i = 1	**lampOnG1**	YES	YES	NO	NO
	statusG1	00000100b	00000100b	00000000b	00000000b
	lampOnG0	YES	NO	YES	NO
	statusG0	00000100b	00000000b	00000100b	00000000b

12.9.6 Addressing 3

The test sequence checks the behaviour of a logical unit at a broadcast unaddressed query.

Test sequence shall be run for each selected logical unit.

Test description:

```
if (GLOBAL_numberShortAddresses == 1)
    report 1 Only one logical device implemented.
else
    RESET
    wait 300 ms
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    oldAddress = GLOBAL_currentUnderTestLogicalUnit
    SetShortAddress (oldAddress; 255)
    INITIALISE (0)
    RANDOMISE
    wait 100 ms
    answer = QUERY RANDOM ADDRESS(H), send to broadcast unaddressed, accept Violation
    if (answer is not a valid backward frame)
        error 1 Multiple logical units answered at broadcast unaddressed command.
    endif
    answer = QUERY RANDOM ADDRESS(M), send to broadcast unaddressed, accept Violation
    if (answer is not a valid backward frame)
        error 2 Multiple logical units answered at broadcast unaddressed command.
    endif
    answer = QUERY RANDOM ADDRESS(L), send to broadcast unaddressed, accept Violation
    if (answer is not a valid backward frame)
        error 3 Multiple logical units answered at broadcast unaddressed command.
    endif
    SetShortAddress (255; oldAddress)
    TERMNATE
endif
```

12.10 General subsequences

12.10.1 GetVersionNumber

Test subsequence returns the version number of the control gear.

Test description:

```
versionNumber = GetVersionNumber ()

versionNumber = -1
answer = QUERY VERSION NUMBER, accept Value
if (answer > 3)
    minor = answer & 0x03
    major = answer >> 2
    versionNumber = major + minor / 10
else
    versionNumber = answer
endif
return versionNumber
```

12.10.2 GetExtendedVersionNumber

Test subsequence returns an array with the version number of parts 2xx of this standard for each supported device type of the undertest logical unit.

Test description:

```
extendedVersionNumber[] = GetExtendedVersionNumber (address; deviceType[])

extendedVersionNumber[0] = -1
if (deviceType[0] != -1)
    i = 0
    foreach (device in deviceType)
        ENABLE DEVICE TYPE (device)
        answer = QUERY EXTENDED VERSION NUMBER, send to ((address << 1) + 1)
        if (answer > 3)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            minor = answer & 0x03
            major = answer >> 2
            answer = major + minor / 10
        else
            if (device >= 10)
                error 1 LogicalUnit address: Incorrect version number/format reported for
                device. Expected: >=2.0 Actual: answer
            endif
        endif
        extendedVersionNumber[i] = answer
        i++
    endfor
endif
return extendedVersionNumber[]
```

12.10.3 GetSupportedDeviceTypes

Test subsequence checks the correct function of the QUERY DEVICE TYPE command and returns an array with all supported device types of the undertest logical unit.

Test description:

```
deviceType[] = GetSupportedDeviceTypes (address)

answer = QUERY DEVICE TYPE, send to ((address << 1) + 1)
i = 0
deviceType[0] = -1
if (answer == 254)
    report 1 LogicalUnit address: No 2xx Part is supported.
else if (answer == 255)
    do
        answer = QUERY NEXT DEVICE TYPE, send to ((address << 1) + 1)
        switch (answer)
            case NO:
            case 255:
                error 1 LogicalUnit address: Wrong answer to QUERY NEXT DEVICE
                TYPE. Actual: answer. Expected: [0,254].
                i = 256
                break
            case 254:
                break
            default:
                deviceType[i] = answer
                i++
                break
        endswitch
    while (answer != 254 AND i < 255)
    if (i == 255)
        error 2 LogicalUnit address: More than 254 device types reported.
    endif
else
    deviceType[0] = answer
endif
return deviceType[]
```

12.10.4 GetSupportedLightSources

Test subsequence checks the correct function of the QUERY LIGHT SOURCE TYPE command and returns an array with all supported light source types of the undertest logical unit.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Test description:

lightSource[] = GetSupportedLightSources (*address*)

lightSource[0] = -1
lightSource[1] = -1
lightSource[2] = -1
answer = QUERY LIGHT SOURCE TYPE, send to ((*address* << 1) + 1)
if (*answer* == 255)
    answer = QUERY CONTENT DTR0, send to ((*address* << 1) + 1)
    switch (*answer*)
        case 0:
        case 2:
        case 3:
        case 4:
        case 6
        case 7:
        case 252:
        case 253:
            lightSource[0] = *answer*
            break
        default:
            error 1 LogicalUnit *address*: Incorrect lightsource 1 reported. Actual: *answer*. Expected: 0, 2, 3, 4, 6, 7, 252 or 253.
            break
    endswitch
    answer = QUERY CONTENT DTR1, send to ((*address* << 1) + 1)
    switch (*answer*)
        case 0:
        case 2:
        case 3:
        case 4:
        case 6
        case 7:
        case 252:
        case 253:
            lightSource[1] = *answer*
            break
        default:
            error 2 LogicalUnit *address*: Incorrect lightsource 2 reported. Actual: *answer*. Expected: 0, 2, 3, 4, 6, 7, 252 or 253.
            break
    endswitch
    answer = QUERY CONTENT DTR2, send to ((*address* << 1) + 1)
    switch (*answer*)
        case 0:
        case 2:
        case 3:
        case 4:
        case 6
        case 7:
        case 252:
        case 253:
            lightSource[2] = *answer*
            break
        case 254:
            report 1 LogicalUnit *address*: Exaclty two light source type indicated.
            break
        case 255:
            report 2 LogicalUnit *address*: Third light source type indicates multiple light source types.
            break

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            default:
                error 3 LogicalUnit address: Incorrect lightsource reported. Actual: answer.
                Expected: 0, 2, 3, 4, 6, 7, 252, 253 or 255.
                break
        endswitch
        endif
else
        lightSource[0] = answer
endif
return lightSource[]
```

12.10.5 WaitForPowerOnPhaseToFinish

Test subsequence waits until lamps turn on after a power cycle. If lamps do not turn on within a given time, subsequence gives an error and stops checking the actual level.

Test description:

WaitForPowerOnPhaseToFinish ()

```
start_timer (timer)
do
        answer = QUERY ACTUAL LEVEL, accept No Answer
        if (get_timer (timer) >= GLOBAL_startupTimeLimit)
                error 1 Startup lasts more than the preset startup time limit =
                GLOBAL_startupTimeLimit s. Loop stopped.
                break
        endif
while (answer == NO OR answer == 0 OR answer == 255)
return
```

12.10.6 WaitForLampOn

Test subsequence waits until lamps turn on after they were off. If lamps do not turn on within a given time, subsequence gives an error and stops checking the actual level.

Test description:

WaitForLampOn ()

```
start_timer (timer)
error = false
do
        answer = QUERY ACTUAL LEVEL
        if (get_timer (timer) >= GLOBAL_startupTimeLimit)
                error 1 Turning on the lamp lasts more than the preset startup time limit =
                GLOBAL_startupTimeLimit s. Loop stopped.
                break
        endif
        if (!error AND answer == 0)
                error 2 Actual level 0 reported while waiting for lamp to turn on.
                error = true
        endif
while (answer == 255 OR answer == 0)
return
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.10.7 WaitForLampOnAddressed

Test subsequence waits until lamps turn on after they were off. If lamps do not turn on within a given time, subsequence gives an error and stops checking the actual level. Function expects all lamps to go to level 254.

Test description:

WaitForLampOnAddressed (*address*)

```
start_timer (timer)
do
    answer = QUERY ACTUAL LEVEL, sent to address, accept Violation
    if (get_timer (timer) >= GLOBAL_startupTimeLimit)
        error 1 Turning on the lamps lasts more than the preset startup time limit =
        GLOBAL_startupTimeLimit s. Loop stopped.
        break
    endif
while (answer != 254)
return
```

12.10.8 WaitForLampLevel

Test subsequence waits until actual level reaches a desired 'level'. If desired level is not reached within a given time, subsequence gives an error and stops checking the actual level.

Test description:

WaitForLampLevel (*level*)

```
start_timer (timer)
do
    answer = QUERY ACTUAL LEVEL
    if (get_timer (timer) >= GLOBAL_startupTimeLimit)
        error 1 Going to light level level lasts more than the preset startup time limit =
        GLOBAL_startupTimeLimit s. Loop stopped.
        break
    endif
while (answer != level)
return
```

12.10.9 WaitForFadeToFinish

Test subsequence waits until a fade stops. If fading lasts more than a given 'timeLimit', subsequence gives an error and stops checking the fading bit.

Test description:

WaitForFadeToFinish (*timeLimit*)

```
start_timer (timer)
do
    answer = QUERY STATUS
    if (get_timer (timer) >= timeLimit)
        error 1 Fade did not finish after timeLimit ms. Loop stopped.
        break
    endif
while (answer != XXX0XXXXb)
return
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.10.10 SetShortAddress

Test subsequence sets new short address (toAddress) using SET SHORT ADDRESS, and using the following addressing mode:

- short address of logical unit: if logical unit already has a short address assigned (fromAddress);
- broadcast unaddressed: if logical unit has no short address assigned.

Test description:

SetShortAddress (*fromAddress*; *toAddress*)

```
if (toAddress == 255)
    dtrValue = 255
else if (toAddress <= 63)
    dtrValue = (toAddress << 1) + 1
else
    halt 1 Invalid toAddress argument in subsequence SetShortAddress. Actual: toAddress.
endif
DTR0 (dtrValue)
if (fromAddress != 255)
    if (fromAddress <= 63)
        answer = QUERY CONTROL GEAR PRESENT, send to (fromAddress << 1) + 1
        if (answer == YES)
            SET SHORT ADDRESS, send to (fromAddress << 1) + 1
        else
            halt 2 Invalid fromAddress argument in subsequence SetShortAddress. Actual:
            fromAddress.
        endif
    else
        halt 3 Invalid fromAddress argument in subsequence SetShortAddress. Actual:
        fromAddress.
    endif
else
    answer = QUERY CONTROL GEAR PRESENT, send to broadcast unaddressed
    if (answer == YES)
        SET SHORT ADDRESS, send to broadcast unaddressed
    else
        halt 4 Invalid fromAddress argument in subsequence SetShortAddress. Actual:
        fromAddress.
    endif
endif
return
```

12.10.11 GetRandomAddress

Test subsequence returns the random address.

Test description:

```
randomAddress = GetRandomAddress ()

answerH = QUERY RANDOM ADDRESS (H)
answerM = QUERY RANDOM ADDRESS (M)
answerL = QUERY RANDOM ADDRESS (L)
randomAddress = answerH << 16 + answerM << 8 + answerL
return randomAddress
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.10.12 GetLimitedRandomAddress

Test subsequence tries 50 times to find a random address which has each generated byte different than 0x00 and 0xFF.

Test description:

randomAddress = GetLimitedRandomAddress (*logicalUnit*)

randomAddress = 0xFF FF FF
TERMINATE
INITIALISE (*logicalUnit*)
for (*i* = 0; *i* < 50; *i*++)
    RANDOMISE
    wait 100 ms
    randomH = QUERY RANDOM ADDRESS (H), send to *logicalUnit*
    randomM = QUERY RANDOM ADDRESS (M), send to *logicalUnit*
    randomL = QUERY RANDOM ADDRESS (L), send to *logicalUnit*
    if ((*randomH* != 0x00) AND (*randomH* != 0xFF) AND (*randomM* != 0x00) AND (*randomM* != 0xFF) AND (*randomL* != 0x00) AND (*randomL* != 0xFF))
        randomAddress = *answerH* << 16 + *answerM* << 8 + *answerL*
        break
    endif
endfor
TERMINATE
return *randomAddress*

12.10.13 SetSearchAddress

Test subsequence sets the search address to 'data'.

Test description:

SetSearchAddress (*data*)

SEARCHADDRH (*data* >> 16)
SEARCHADDRM ((*data* >> 8) & (0x00 FF))
SEARCHADDRL (*data* & 0x00 00 FF)
return

12.10.14 ReadMemBankMultibyteLocation

Test subsequence returns content of 'nrBytes' memory bank locations. If a gap is encountered, the value -1 is returned.

Test description:

multibyte = ReadMemBankMultibyteLocation (*nrBytes*)

multibyte = 0
for (*i* = 0; *i* < *nrBytes*; *i*++)
    answer = READ MEMORY LOCATION
    if (*answer* == NO)
        multibyte = -1
        break
    endif
    multibyte = *multibyte* + *answer* * 256 $^{nrBytes - 1 - i}$
endfor
return *multibyte*

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.10.15 FindImplementedMemoryBank

Test subsequence returns the number of the first implemented memory bank above memory bank 0 and the address of the last accessible memory location of that memory bank, for the selected logical unit.

Test description:

(*memoryBankNr*; *memoryBankLoc*) = FindImplementedMemoryBank ()

```
memoryBankNr = 0
memoryBankLoc = 0
DTR0 (2)
DTR1 (0)
lastMemBank = READ MEMORY LOCATION
for (i = 1; i <= lastMemBank; i++)
    DTR0 (0)
    DTR1 (i)
    answer = READ MEMORY LOCATION
    if (answer != NO)
        memoryBankNr = i
        memoryBankLoc = answer
        break
    endif
endfor
return (memoryBankNr; memoryBankLoc)
```

12.10.16 FindAllImplementedMemoryBanks

Test subsequence returns all implemented memory banks and the address of the last accessible memory location of each implemented memory bank above bank 0, for the selected logical unit.

Test description:

(*memoryBankNr[]*; *memoryBankLoc[]*) = FindAllImplementedMemoryBanks ()

```
memoryBankNr[0] = 0
memoryBankLoc[0] = 0
count = 0
DTR0 (2)
DTR1 (0)
lastMemBank = READ MEMORY LOCATION
for (i = 1; i <= lastMemBank; i++)
    DTR0 (0)
    DTR1 (i)
    answer = READ MEMORY LOCATION
    if (answer != NO)
        memoryBankNr[count] = i
        memoryBankLoc[count] = answer
        count++
    endif
endfor
return (memoryBankNr[]; memoryBankLoc[])
```

12.10.17 GetNumberOfLogicalUnits

Test subsequence returns the number of the logical control gear units present in the bus unit.

Test description:

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

numberLogicalUnits = GetNumberOfLogicalUnits ()

DTR1 (0)
DTR0 (0x19)
answer = READ MEMORY LOCATION
return *answer*

12.10.18 GetIndexOfLogicalUnit

Test subsequence returns the index number of the logical control gear unit.

Test description:

indexNumberLogicalUnit = GetIndexOfLogicalUnit (*address*)

DTR1 (0)
DTR0 (0x1A)
answer = READ MEMORY LOCATION, send to ((*address* << 1) + 1)
return *answer*

12.10.19 ConnectLamps

Test subsequence shall be used for connecting all lamps.

Test description:

ConnectLamps ()

```
if (GLOBAL_safeLampConnection == No)
    maxLevel = QUERY MAX LEVEL
    answer = QUERY ACTUAL LEVEL
    if (answer != 0)
        DTR0 (answer)
        SET MAX LEVEL
        OFF
    endif
    wait GLOBAL_outputCapDelay
    Connect (All lamps)
    if (answer != 0)
        RECALL MAX LEVEL
        DTR0 (maxLevel)
        SET MAX LEVEL
    endif
else
    Connect (All lamps)
endif
wait 30 s //max 30 s to set lamp failure and other status bits
return
```

12.10.20 DisconnectLamps

Test subsequence shall be used for disconnecting one or all lamps.

Test description:

DisconnectLamps (*numberLamps*)

```
if (GLOBAL_safeLampConnection == No)
    maxLevel = QUERY MAX LEVEL
    answer = QUERY ACTUAL LEVEL
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    if (answer != 0)
        DTR0 (answer)
        SET MAX LEVEL
        OFF
    endif
    if (numberLamps == 0)
        Disconnect (All lamps)
    else
        Disconnect (One lamp)
    endif
    if (answer != 0)
        RECALL MAX LEVEL
        DTR0 (maxLevel)
        SET MAX LEVEL
    endif
else
    if (numberLamps == 0)
        Disconnect (All lamps)
    else
        Disconnect (One lamp)
    endif
endif
return
```

12.10.21 PowerCycle

Test subsequence performs an external power cycle for both bus powered and external bus powered devices. The duration of the power interruption is given in s.

Test description:

```
PowerCycle (delay)

if (GLOBAL_busPowered)
    if (delay == 5)
        delay = 0,550 // 5 s default for externally powered, change to 550 ms
    endif
    Disconnect (interface)
    wait delay s
    Connect (interface)
else
    Switch_off (external power)
    wait delay s
    Switch_on (external power)
endif
return
```

12.10.22 PowerCycleAndWaitForBusPower

Test subsequence performs a PowerCycle and waits for the bus power to be restored. The duration of the power interruption is given in s. Subsequence returns the time (in ms) between finishing PowerCycle and the bus power being available.

Test description:

```
time = PowerCycleAndWaitForBusPower (delay)

if (GLOBAL_internalBPS)
    // Switch off test power supply
    Apply (Current of 0 mA on bus interface)
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
PowerCycle (delay)
start_timer (timer)
if (GLOBAL_internalBPS)
    do
        voltage = Measure (Voltage on bus interface in V)
        timestamp = get_timer (timer) // Get time in seconds
        if (timestamp > 7)
            halt 1 Internal bus power supply not available after 7 s.
        endif
    while (voltage < 12)
    if (timestamp > 5)
        error 1 Internal bus power supply not available after 5 s.
    endif
    // Restore test power supply
    Apply (Current of GLOBAL_Ibus mA on bus interface)
endif
return (get_timer (timer))
```

12.10.23 PowerCycleAndWaitForDecoder

Test subsequence performs a PowerCycleAndWaitForBusPower and waits for the decoder to be ready. The duration of the power interruption is given in s. The subsequence works for both bus powered and external bus powered devices.

Test description:

PowerCycleAndWaitForDecoder (*delay*)

```
timestamp = PowerCycleAndWaitForBusPower (delay)
if (GLOBAL_busPowered)
    waitTime = 1200
else
    // Check for note e, Table 6, IEC 62386-101 Ed2.0
    if (timestamp < 350)
        waitTime = 450 - timestamp
    else
        waitTime = 100
    endif
endif
wait waitTime ms
return
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Annex A
(informative)

Examples of algorithms

A.1 Random address allocation

The control gear are connected to a control device that uses random address allocation for setup of the system.

a) Start the algorithm with “INITIALISE (device)” which enables the addressing commands for a time period of 15 min.

b) Send “RANDOMISE”; all control gear choose a *randomAddress* so that $0 \leq$ *randomAddress* $\leq +2^{24}-2$.

c) The control device searches the control gear with the lowest random address by means of an algorithm which uses “SEARCHADDRH (*data*)”, “SEARCHADDRM (*data*)”, “SEARCHADDRL (*data*)” and “COMPARE”. The control gear with the lowest random address is found. At this point, the control device needs to be able to handle different timing in backward frames coming from different control gear. Also, there is a chance that control gear generated the same *randomAddress* in which case randomisation should be restarted for the remaining gear.

d) The short address is programmed to the control gear found with aid of “PROGRAM SHORT ADDRESS (*data*)”.

e) “VERIFY SHORT ADDRESS (*data*)” can be used to verify the correct programming.

f) The found control gear can be identified by using “IDENTIFY DEVICE”, or use an alternating sequence of “RECALL MAX LEVEL” and “RECALL MIN LEVEL” with the programmed short address to record the local position of the respective control gear

g) If needed, the short address can be changed going back to step d)

h) The control gear found shall be removed from the search process by means of “WITHDRAW”.

i) Repeat from step c) on until no further control gear can be found. Use “INITIALISE (device)” to prolong the 15 min timer if needed.

j) Stop the process with “TERMINATE”.

In the event of two or more control gear having the same short address, restart the addressing procedure only for these control gear with “INITIALISE (*device*)” (using the short address in the second byte) followed by steps b) to j).

A.2 One single control gear connected to the control device

Only one control gear is connected to a control device that uses the following algorithm to program a short address.

a) Transmit the new short address (0AAA AAA1b) by “DTR0 (*data*)”.

b) Verify the content of the DTR0 by “QUERY CONTENT DTR0”.

c) Send “SET SHORT ADDRESS (*DTR0*)” twice in accordance with the requirements as stated in IEC 62386-101:2014 subclause 9.3.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

A.3 Using application extended commands

A control device using application extend commands needs to detect which application extended commands are supported by the different control gear. The following algorithm can be used:

a) Initialisation process and address allocation.

b) Query the device type/feature of every control gear in the system. If the received answer is 'MASK' the device supports more than one device type. In this case the following procedure can be used to get a list of the device types the control gear belongs to:

1) Send "QUERY EXTENDED VERSION NUMBER" command preceded by "ENABLE DEVICE TYPE (*data*)" with *data* equal to "0". If there is an answer, the control gear belongs to device type 0.

2) Repeat step a) with all other device types supported by the control device.

c) The control device shall send "ENABLE DEVICE TYPE (*data*)" before every application extended command.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Annex B
(normative)

High resolution dimmer

A high resolution dimmer is not mandatory. However, if it is implemented, it shall be implemented according to this annex.

The *"actualLevel"* shall report the nearer arc power level, after rounding of an internal value as can be seen in Figure B.1.

Light output shall always match a discrete point on the selected dimming curve, except when:

- a fade is running (via ideal, or high resolution internal curve);
- a fade is stopped before the fade time has elapsed;
- another dimming curve is selected;
- an arc power level was programmed with another dimming curve (typically the scenes, including power on level and system failure level, store the level as well as the corresponding dimming curve, to allow representing in other curves and back without loss).

When light output is "in between" two discrete points on the selected dimming curve:

- *"actualLevel"* is set to the nearest of these two points;
- a new fade starts from the actual light output (which may not match a discrete point on the selected dimming curve) and ends at the target light output (which may not match a discrete point on the selected dimming curve, i.e. when a preset is used that was set using another dimming curve);
- the fade shall always follow the ideal or internal high resolution curve without making jumps to a discrete point on the selected dimming curve;
- there are some consequences for testing:
  - after stopping a fade, or switching dimming curve, a first step might be less than or more than a full step in the active dimming curve;
  - testing with levels from more than one dimming curve at a time is complex, perhaps better avoided

Behaviour that can be experienced:

- theoretically a minimal fade is possible while *"actualLevel"* is not changed;
- Direct Arc Power Command (DAPC) to the actual level might fade from the point on the high resolution dimmer to the discrete point (less than half a dim step);
- a STEP UP or STEP DOWN can worst case result in a "half step" delta or "one and a half step"; e.g. HighRes dimmer that ended at stepsize+0,49 stepsize: response to step up is 0,51 stepsize, while the response to step down is 1,49 stepsize to end at a discrete step;
- the "fade running" status is set to "1" at Fade time start and lasts until FadeTime has elapsed, even when "Actual Level" is already at the final level;
- actual level always represents the nearer discrete point on the dimming curve.

Special cases:

- When a fade is started from "Lamp off" condition, the first step from off to "Min Level" must be made at fade start time. The step from off to min level is not part of the fade time.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

- When a fade is started to “Lamp off” condition, the last step from “Min Level” to off must be made at fade start time + FadeTime. The step from min level to off is not part of the fade time.

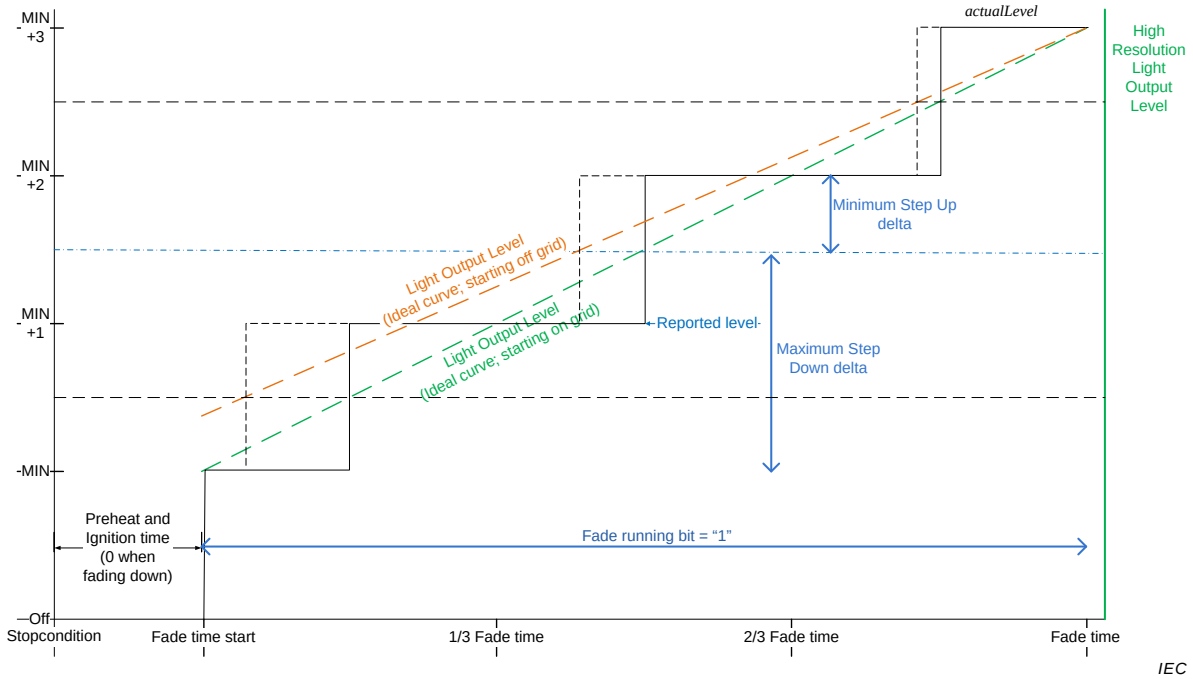


Figure B.1 – Level behaviour in cases of off-grid starting points

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Bibliography

IEC 60598-1, *Luminaires – Part 1: General requirements and tests*

IEC 60669-2-1, *Switches for household and similar fixed electrical installations – Part 2-2, Particular requirements – Electronic switches*

IEC 60921, *Ballasts for tubular fluorescent lamps – Performance requirements*

IEC 60923, *Auxiliaries for lamps – Ballasts for discharge lamps (excluding tubular fluorescent lamps – Performance requirements*

IEC 60925, *D.C.-supplied electronic ballasts for tubular fluorescent lamps – performance requirements*

IEC 61547, *Equipment for general lighting purposes – EMC immunity requirements*

IEC 62386-102:2009, *Digital addressable lighting interface – Part 102: General requirements – Control gear*

CISPR 15, *Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment*

GS1 General Specification, Version 14: Jan-2014, [cited 2014-07-15] . Available at: http://www.google.ch/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=2&ved=0CCIQFjAB&url=http%3A%2F%2Fwww.gs1.at%2Findex.php%3Foption%3Dcom_phocadownload%26view%3Dcategory%26download%3D289%3Ags1-general-specifications-v14-en%26id%3D9%3Ags1-spezifikationen-a-richtlinien%26Itemid%3D304&ei=znm2U4PqFoP20gXXmIHgAQ&usg=AFQjCNHoqaUjWXvLbyJfVJoGxgOAl63mCw

_____

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

SOMMAIRE

AVANT-PROPOS 301
INTRODUCTION 303
1 Domaine d'application 305
2 Références normatives 305
3 Termes et définitions 305
4 Généralités 308
4.1 Généralités 308
4.2 Numéro de version 308
5 Spécifications électriques 309
6 Alimentation électrique de l'interface 309
7 Structure du protocole de transmission 309
7.1 Généralités 309
7.2 Codage de trame en avant à 16 bits 309
7.2.1 Généralités 309
7.2.2 Octet d'adresse 309
7.2.3 Octet de code de fonctionnement 310
8 Cadencement 310
9 Méthode de fonctionnement 310
9.1 Généralités 310
9.2 Appareillages de commande 310
9.3 Courbe de gradation 311
9.4 Calcul de "*targetLevel*" 314
9.5 Modification de l'intensité lumineuse 314
9.5.1 Généralités 314
9.5.2 Durée de modification de l'intensité lumineuse 316
9.5.3 Vitesse de modification de l'intensité lumineuse 317
9.5.4 Durée étendue de modification de l'intensité lumineuse 318
9.5.5 Utilisation de la durée de modification de l'intensité lumineuse 320
9.5.6 Utilisation de la vitesse de modification de l'intensité lumineuse 320
9.5.7 Comportement lors d'une modification de l'intensité lumineuse 320
9.5.8 Comportement lors du démarrage 321
9.5.9 Interruption d'une modification de l'intensité lumineuse 321
9.6 Niveau min et max 321
9.7 Commandes 322
9.7.1 Généralités 322
9.7.2 Instructions de niveau sans modification de l'intensité lumineuse 322
9.7.3 Instructions de niveau déclenchant une modification de l'intensité lumineuse 323
9.7.4 Instructions de configuration 323
9.7.5 Requêtes 323
9.7.6 Commandes spéciales 323
9.7.7 Commandes d'application étendues 323
9.8 Itérations de commandes 323
9.8.1 Généralités 323
9.8.2 Itération des commandes "UP" et "DOWN" 323

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

9.8.3 DAPC SEQUENCE (déconseillé) 324
9.9 Modes de fonctionnement 325
9.9.1 Généralités 325
9.9.2 Mode de fonctionnement 0x00: mode normal 325
9.9.3 Mode de fonctionnement 0x01 à 0x7F: réservé 325
9.9.4 Mode de fonctionnement 0x80 à 0xFF: modes spécifiques au fabricant 325
9.10 Blocs de mémoire 325
9.10.1 Généralités 325
9.10.2 Carte de mémoire 326
9.10.3 Sélection d'un emplacement de bloc de mémoire 327
9.10.4 Lecture dans le bloc de mémoire 327
9.10.5 Écriture dans le bloc de mémoire 327
9.10.6 Bloc de mémoire 0 328
9.10.7 Bloc de mémoire 1 331
9.10.8 Blocs de mémoire spécifiques au fabricant 332
9.10.9 Blocs de mémoire réservés 332
9.11 Réinitialisation 332
9.11.1 Opération de réinitialisation 332
9.11.2 Opération de réinitialisation des blocs de mémoire 333
9.12 Défaillance système 333
9.13 Mise sous tension 333
9.14 Attribution d'adresses courtes 335
9.14.1 Généralités 335
9.14.2 Affectation d'adresses aléatoires 335
9.14.3 Identification d'un dispositif 335
9.14.4 Affectation d'adresses directes 336
9.15 Comportement en état de défaillance 337
9.16 Information d'état 337
9.16.1 Généralités 337
9.16.2 Bit 0: Défaillance de l'appareillage de commande (Control gear failure) 337
9.16.3 Bit 1: Lampe grillée (Lampe failure) 338
9.16.4 Bit 2: Lampe allumée (Lamp on) 338
9.16.5 Bit 3: Erreur limite (Limit error) 338
9.16.6 Bit 4: Modification de l'intensité lumineuse en cours (fade running) 338
9.16.7 Bit 5: Etat réinitialisé (Reset state) 338
9.16.8 Bit 6: Absence d'adresse courte (Missing short address) 338
9.16.9 Bit 7: Observation du cycle de mise sous tension (Power cycle seen) 339
9.17 Mémoire non volatile (non-volatile memory) 339
9.18 Types et caractéristiques de dispositifs 340
9.19 Utilisation de scénarii 340
10 Déclaration des variables (Declaration of variables) 341
11 Définition des commandes 344
11.1 Généralités 344
11.2 Fiches de vue d'ensemble 344
11.3 Instructions de niveau 349
11.3.1 DAPC (*level*) 349
11.3.2 OFF 349
11.3.3 UP 349
11.3.4 DOWN 349

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.3.5 STEP UP 350
11.3.6 STEP DOWN 350
11.3.7 RECALL MAX LEVEL 350
11.3.8 RECALL MIN LEVEL 351
11.3.9 STEP DOWN AND OFF 351
11.3.10 ON AND STEP UP 351
11.3.11 ENABLE DAPC SEQUENCE 352
11.3.12 GO TO LAST ACTIVE LEVEL 352
11.3.13 GO TO SCENE (*sceneNumber*) 352
11.4 Instructions de configuration 352
11.4.1 Généralités 352
11.4.2 RESET 352
11.4.3 STORE ACTUAL LEVEL IN DTR0 353
11.4.4 SAVE PERSISTENT VARIABLES 353
11.4.5 SET OPERATING MODE (*DTR0*) 353
11.4.6 RESET MEMORY BANK (*DTR0*) 353
11.4.7 IDENTIFY DEVICE 354
11.4.8 SET MAX LEVEL (*DTR0*) 354
11.4.9 SET MAX LEVEL (*DTR0*) 355
11.4.10 SET SYSTEM FAILURE LEVEL (*DTR0*) 355
11.4.11 SET POWER ON LEVEL (*DTR0*) 355
11.4.12 SET FADE TIME (*DTR0*) 355
11.4.13 SET FADE RATE (*DTR0*) 355
11.4.14 SET EXTENDED FADE TIME (*DTR0*) 356
11.4.15 SET SCENE (*DTR0, sceneX*) 356
11.4.16 REMOVE FROM SCENE (*sceneX*) 356
11.4.17 ADD TO GROUP (*group*) 356
11.4.18 REMOVE FROM GROUP (*group*) 357
11.4.19 SET SHORT ADDRESS (*DTR0*) 357
11.4.20 ENABLE WRITE MEMORY 357
11.5 Requêtes 357
11.5.1 Généralités 357
11.5.2 QUERY STATUS 357
11.5.3 QUERY CONTROL GEAR PRESENT 358
11.5.4 QUERY CONTROL GEAR FAILURE 358
11.5.5 QUERY LAMP FAILURE 358
11.5.6 QUERY LAMP POWER ON 358
11.5.7 QUERY LIMIT ERROR 358
11.5.8 QUERY RESET STATE 358
11.5.9 QUERY MISSING SHORT ADDRESS 358
11.5.10 QUERY VERSION NUMBER 358
11.5.11 QUERY CONTENT DTR0 358
11.5.12 QUERY DEVICE TYPE 358
11.5.13 QUERY NEXT DEVICE TYPE 359
11.5.14 QUERY PHYSICAL MINIMUM 359
11.5.15 QUERY POWER FAILURE 359
11.5.16 QUERY CONTENT DTR1 359
11.5.17 QUERY CONTENT DTR2 359
11.5.18 QUERY OPERATING MODE 359

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.5.19 QUERY LIGHT SOURCE TYPE 359
11.5.20 QUERY ACTUAL LEVEL 360
11.5.21 QUERY MAX LEVEL 360
11.5.22 QUERY MIN LEVEL 360
11.5.23 QUERY POWER ON LEVEL 360
11.5.24 QUERY SYSTEM FAILURE LEVEL 361
11.5.25 QUERY FADE TIME/FADE RATE 361
11.5.26 QUERY EXTENDED FADE TIME 361
11.5.27 QUERY MANUFACTURER SPECIFIC MODE 361
11.5.28 QUERY SCENE LEVEL (*sceneX*) 361
11.5.29 QUERY GROUPS 0-7 361
11.5.30 QUERY GROUPS 8-15 361
11.5.31 QUERY RANDOM ADDRESS (H) 361
11.5.32 QUERY RANDOM ADDRESS (M) 362
11.5.33 QUERY RANDOM ADDRESS (L) 362
11.5.34 READ MEMORY LOCATION (*DTR1, DTR0*) 362
11.6 Commandes d'application étendues 362
11.6.1 Généralités 362
11.6.2 QUERY EXTENDED VERSION NUMBER 362
11.7 Commandes spéciales 363
11.7.1 Généralités 363
11.7.2 TERMINATE 363
11.7.3 DTR0 (*data*) 363
11.7.4 INITIALISE (*device*) 363
11.7.5 RANDOMISE 363
11.7.6 COMPARE 364
11.7.7 WITHDRAW 364
11.7.8 SEARCHADDRH (*data*) 364
11.7.9 SEARCHADDRM (*data*) 364
11.7.10 SEARCHADDRL (*data*) 365
11.7.11 PROGRAM SHORT ADDRESS (*data*) 365
11.7.12 VERIFY SHORT ADDRESS (*data*) 365
11.7.13 QUERY SHORT ADDRESS 365
11.7.14 ENABLE DEVICE TYPE (*data*) 365
11.7.15 DTR1 (*data*) 366
11.7.16 DTR2 (*data*) 366
11.7.17 WRITE MEMORY LOCATION (*DTR1, DTR0, data*) 366
11.7.18 WRITE MEMORY LOCATION – NO REPLY (*DTR1, DTR0, data*) 367
11.7.19 PING 367
12 Procédures d'essai 367
12.1 Notes générales d'essai 367
12.1.1 Abréviations 367
12.1.2 Exécution des essais 367
12.1.3 Transmission des données 368
12.1.4 Configuration d'essai 368
12.1.5 Résultat des essais 369
12.1.6 Mesure de la durée de modification de l'intensité lumineuse basés sur le rendement lumineux 369

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.1.7 Description du programme d'essai pour les durées rapides de modification de l'intensité lumineuse sur un gradateur à modulation de largeur d'impulsion (PWM ou pulse width modulation) 370
12.1.8 Notation d'essai 371
12.1.9 Limitation d'exécution des essais 371
12.1.10 Résultats d'essai 371
12.1.11 Traitement des exceptions 371
12.1.12 Réponse fortuite 371
12.2 Préambule 373
12.2.1 Préambule d'essai 373
12.3 Paramètres fonctionnels physiques 391
12.3.1 Polarity test (Essai de polarité) 391
12.3.2 Maximum and minimum system voltage (Tension du système maximale et minimale) 391
12.3.3 Overvoltage protection test (Essai de protection contre la surtension) 392
12.3.4 Current rating test (Essai de courant assigné) 393
12.3.5 Transmitter voltages (Tensions de l'émetteur) 394
12.3.6 Transmitter rising and falling edges (Fronts montant et descendant de l'émetteur) 396
12.3.7 Transmitter bit timing (Cadencement des bits de l'émetteur) 398
12.3.8 Transmitter frame timing (Cadencement des trames de l'émetteur) 400
12.3.9 Receiver start-up behavior (Comportement au démarrage du récepteur) 401
12.3.10 Receiver threshold (Seuil du récepteur) 403
12.3.11 Receiver bit timing (Cadencement des bits du récepteur) 403
12.3.12 Extended receiver bit timing (Cadencement des bits étendus du récepteur) 407
12.3.13 Receiver forward frame violation (Violation de la trame en avant du récepteur) 409
12.3.14 Receiver settling timing (Cadencement de l'établissement du récepteur) 409
12.3.15 Receiver frame timing FF-FF send twice (Cadencement des trames du récepteur FF-FF 'send twice') 411
12.4 Instructions de configuration 412
12.4.1 RESET 412
12.4.2 RESET: timeout / command in-between (RESET: temporisation / commande intermédiaire) 416
12.4.3 Send-twice timeout (Temporisation de commande 'send-twice') 418
12.4.4 Commands in-between (Commandes intermédiaires) 426
12.4.5 STORE ACTUAL LEVEL IN DTR0 432
12.4.6 SAVE PERSISTENT VARIABLES 433
12.4.7 SET OPERATING MODE 433
12.4.8 SET MAX LEVEL 434
12.4.9 SET MIN LEVEL 434
12.4.10 SET SYSTEM FAILURE LEVEL 435
12.4.11 SET POWER ON LEVEL 436
12.4.12 SET FADE TIME 440
12.4.13 SET FADE RATE 441
12.4.14 SET SCENE / REMOVE FROM SCENE 442
12.4.15 ADD TO GROUP / REMOVE FROM GROUP 443
12.4.16 SET SHORT ADDRESS 444
12.4.17 SET EXTENDED FADE TIME 445
12.4.18 Reset/Power-on values (Valeurs de réinitialisation/Mise sous tension) 446

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.4.19 DTR0 / DTR1 / DTR2 452
12.5 Blocs de mémoire 452
12.5.1 READ MEMORY LOCATION on Memory Bank 0 (READ MEMORY LOCATION sur bloc de mémoire 0) 452
12.5.2 READ MEMORY LOCATION on Memory Bank 1 (READ MEMORY LOCATION sur bloc de mémoire 0) 457
12.5.3 READ MEMORY LOCATION on other Memory Banks (READ MEMORY LOCATION sur d'autres blocs de mémoire) 459
12.5.4 Écriture dans le bloc de mémoire 461
12.5.5 ENABLE WRITE MEMORY: writeEnableState 466
12.5.6 ENABLE WRITE MEMORY: timeout / command in-between (ENABLE WRITE MEMORY: temporisation / commande intermédiaire) 468
12.5.7 RESET: timeout / command in-between (RESET: temporisation / commande intermédiaire) 470
12.5.8 RESET MEMORY BANK 472
12.6 Instructions de niveau 473
12.6.1 Level instructions: Basic behaviour (Instructions de niveau: Comportement de base) 473
12.6.2 FADE TIME: possible values (FADE TIME: valeurs possibles) 477
12.6.3 FADE TIME: transitions 478
12.6.4 FADE TIME: fading to 0 (FADE TIME: processus de modification de l'intensité lumineuse pour atteindre le niveau 0) 480
12.6.5 FADE TIME: small steps fading (FADE TIME: processus de modification de l'intensité lumineuse par pas réduits) 483
12.6.6 FADE TIME: extended fade time (FADE TIME: durée étendue de modification de l'intensité lumineuse) 486
12.6.7 FADE RATE: possible values (FADE RATE: valeurs possibles) 488
12.6.8 FADE RATE: transitions 491
12.6.9 FADE RATE: extended fade time (FADE RATE: durée étendue de modification de l'intensité lumineuse) 493
12.6.10 FADE TIME/FADE RATE: stop fading by setting MIN/MAX levels (FADE TIME/FADE RATE: interrompre le processus de modification de l'intensité lumineuse par le réglage des niveaux MIN/MAX 494
12.6.11 FADE TIME/FADE RATE: stop fading (FADE TIME/FADE RATE: interrompre le processus de modification de l'intensité lumineuse) 500
12.6.12 FADE TIME/FADE RATE: stop fading when a command is sent, check timing (FADE TIME/FADE RATE: interrompre le processus de modification de l'intensité lumineuse lors de l'envoi d'une commande, vérifier le cadencement) 504
12.6.13 FADE TIME/FADE RATE: stop fading during startup (FADE TIME/FADE RATE: interrompre le processus de modification de l'intensité lumineuse lors du démarrage) 510
12.6.14 Level instructions: combined instructions (Instructions de niveau: instructions combinées) 511
12.6.15 Power On Level – System Failure Level combined (Niveau de mise sous tension – Niveau de défaillance système combinés) 514
12.6.16 ENABLE DAPC SEQUENCE 519
12.6.17 GO TO LAST ACTIVE LEVEL 521
12.6.18 GO TO SCENE 522
12.6.19 Power on: level control commands (Mise sous tension: commande de contrôle de niveau) 524
12.6.20 Logarithmic dimming curve (courbe de gradation logarithmique) 526
12.6.21 Courbe de gradation DAPC (contrôle direct de la puissance d'arc) 527

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.6.22 Courbe de gradation: UP / DOWN 528
12.6.23 Courbe de gradation: STEP UP / STEP DOWN 529
12.6.24 FADE TIME/EXTENDED FADE TIME: light output behaviour (FADE TIME/EXTENDED FADE TIME: comportement de rendement lumineux) 530
12.6.25 EXTENDED FADE TIME: light output behaviour (EXTENDED FADE TIME: comportement de rendement lumineux) 531
12.6.26 Comportement lors d'une modification de l'intensité lumineuse 533
12.7 Commandes spéciales 535
12.7.1 INITIALISE – minuterie 535
12.7.2 TERMINATE 537
12.7.3 INITIALISE – device addressing (INITIALISE – adressage de dispositif) 537
12.7.4 RANDOMISE 538
12.7.5 COMPARE 539
12.7.6 WITHDRAW 540
12.7.7 SEARCHADDRH / SEARCHADDRM / SEARCHADDRL 541
12.7.8 PROGRAM SHORT ADDRESS 543
12.7.9 VERIFY SHORT ADDRESS 544
12.7.10 QUERY SHORT ADDRESS 545
12.7.11 IDENTIFY DEVICE 547
12.7.12 IDENTIFY DEVICE THROUGH RECALL MIN/MAX LEVEL 550
12.8 Queries and reserved commands (Requêtes et commandes réservées) 554
12.8.1 QUERY STATUS – lampFailure/lampOn 554
12.8.2 QUERY STATUS – lampOn 557
12.8.3 QUERY STATUS – limitError/lampOn 559
12.8.4 QUERY STATUS – powerCycleSeen 562
12.8.5 QUERY CONTROL GEAR PRESENT 563
12.8.6 QUERY VERSION NUMBER 564
12.8.7 PING 564
12.8.8 Broadcast unaddressed (Diffusion non adressée) 565
12.8.9 Reserved commands: standard commands (Commandes réservées: commandes normalisées) 566
12.8.10 Reserved commands: special commands (Commandes réservées: commandes spéciales) 567
12.8.11 Commandes d'application étendues 568
12.8.12 Types de dispositif non pris en charge 568
12.8.13 Fonctionnalité supprimée 569
12.9 Contamination croisée 570
12.9.1 DTR0 570
12.9.2 Variables NVM 571
12.9.3 Génération d'adresses aléatoires 573
12.9.4 Addressing 1 (Adressage 1) 574
12.9.5 Addressing 2 (Adressage 2) 575
12.9.6 Addressing 3 (Adressage 3) 577
12.10 Sous-séquences générales 578
12.10.1 GetVersionNumber 578
12.10.2 GetExtendedVersionNumber 578
12.10.3 GetSupportedDeviceTypes 579
12.10.4 GetSupportedLightSources 579
12.10.5 WaitForPowerOnPhaseToFinish 581
12.10.6 WaitForLampOn 581

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.10.7 WaitForLampOnAddressed 581
12.10.8 WaitForLampLevel 582
12.10.9 WaitForFadeToFinish 582
12.10.10 SetShortAddress 583
12.10.11 GetRandomAddress 583
12.10.12 GetLimitedRandomAddress 584
12.10.13 SetSearchAddress 584
12.10.14 ReadMemBankMultibyteLocation 584
12.10.15 FindImplementedMemoryBank 585
12.10.16 FindAllImplementedMemoryBanks 585
12.10.17 GetNumberOfLogicalUnits 585
12.10.18 GetIndexOfLogicalUnit 586
12.10.19 ConnectLamps 586
12.10.20 DisconnectLamps 586
12.10.21 PowerCycle 587
12.10.22 PowerCycleAndWaitForBusPower 587
12.10.23 PowerCycleAndWaitForDecoder 588
Annexe A (informative) Exemples d'algorithmes 589
A.1 Affectation d'adresses aléatoires 589
A.2 Un seul appareillage raccordé au dispositif de commande 589
A.3 Utilisation des commandes d'application étendues 590
Annexe B (normative) Gradateur à haute résolution 591
Bibliographie 594

Figure 1 – Vue d'ensemble graphique de l'IEC 62386 303
Figure 2 – Appareillages de commande faisant fonctionner directement une source de lumière 310
Figure 3 – Courbe de gradation 312
Figure 4 – Niveau par rapport à la durée, modification ascendante et descendante de l'intensité lumineuse 316
Figure 5 – Cadencement et réponse lors de la réception d'une itération de commande 324
Figure 6 – Modification de l'intensité lumineuse de MIN LEVEL à MAX LEVEL 369
Figure 7 – Modification de l'intensité lumineuse de MAX LEVEL à la mise hors tension 370
Figure 8 – Modification normale de l'intensité lumineuse pour un gradateur à modulation de largeur d'impulsion 370
Figure 9 – Modification de l'intensité lumineuse de MAX LEVEL à la mise hors tension pour un gradateur à modulation de largeur d'impulsion 371
Figure 10 – Essai de courant assigné 394
Figure B.1 – Comportement des niveaux dans le cas de points de départ hors réseau 593

Tableau 1 – Codage de la trame en avant à 16 bits 309
Tableau 2 – Tolérance de la courbe de gradation (%, arrondi à deux décimales) 312
Tableau 3 – Courbe de gradation 313
Tableau 4 – Durées de modification de l'intensité lumineuse 317
Tableau 5 – Vitesses de modification de l'intensité lumineuse 318
Tableau 6 – Durée étendue de modification de l'intensité lumineuse – valeur de base 319
Tableau 7 – Durée étendue de modification de l'intensité lumineuse – multiplicateur 319

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 8 – Carte de mémoire de base des blocs de mémoire 326
Tableau 9 – Carte de la mémoire du bloc de mémoire 0 329
Tableau 10 – Carte de la mémoire du bloc de mémoire 1 331
Tableau 11 – Cadencement de la mise sous tension 334
Tableau 12 – État de l'appareillage de commande 337
Tableau 13 – Scénarii 341
Tableau 14 – Déclaration des variables 342
Tableau 15 – Commandes normalisées 344
Tableau 16 – Commandes spéciales 348
Tableau 17 – Codage du type de source de lumière 360
Tableau 18 – Adressage de dispositif avec “INITIALISE” 363
Tableau 19 – Résultat fortuit 372
Tableau 20 – Paramètres pour la séquence d’essai CheckFactoryDefault102 378
Tableau 21 – Paramètres pour la séquence d’essai CheckFactoryDefault201 382
Tableau 22 – Paramètres pour la séquence d’essai CheckFactoryDefault202 383
Tableau 23 – Paramètres pour la séquence d’essai CheckFactoryDefault203 384
Tableau 24 – Paramètres pour la séquence d’essai CheckFactoryDefault204 385
Tableau 25 – Paramètres pour la séquence d’essai CheckFactoryDefault205 385
Tableau 26 – Paramètres pour la séquence d’essai CheckFactoryDefault206 386
Tableau 27 – Paramètres pour la séquence d’essai CheckFactoryDefault207 386
Tableau 28 – Paramètres pour la séquence d’essai CheckFactoryDefault208 387
Tableau 29 – Paramètres pour la séquence d’essai CheckFactoryDefault209 388
Tableau 30 – Paramètres pour la séquence d’essai 'Maximum and minimum system voltage' 392
Tableau 31 – Paramètres pour la séquence d’essai 'Transmitter voltages' 396
Tableau 32 – Paramètres pour la séquence d’essai 'Transmitter rising and falling edges' 397
Tableau 33 – Paramètres pour la séquence d’essai 'Transmitter rising and falling edges' 398
Tableau 34 – Paramètres pour la séquence d’essai 'Transmitter bit timing' 400
Tableau 35 – Paramètres pour la séquence d’essai 'Receiver frame timing' 401
Tableau 36 – Paramètres pour la séquence d’essai 'Receiver start-up behavior' 402
Tableau 37 – Paramètres pour la séquence d’essai 'Receiver bit timing' 404
Tableau 38 – Paramètres pour la séquence d’essai 'Extended receiver bit timing' 408
Tableau 39 – Paramètres pour la séquence d’essai 'Receiver frame violation and recovering after frame size violation' 409
Tableau 40 – Paramètres pour la séquence d’essai 'Receiver frame timing' 410
Tableau 41 – Paramètres pour la séquence d’essai 'RESET' 414
Tableau 42 – Paramètres pour la séquence d’essai 'Send twice timeout' 419
Tableau 43 – Paramètres pour la séquence d’essai 'Commands in-between' 428
Tableau 44 – Paramètres pour la séquence d’essai SET MAX LEVEL 434
Tableau 45 – Paramètres pour la séquence d’essai SET MIN LEVEL 435
Tableau 46 – Paramètres pour la séquence d’essai SET SYSTEM FAILURE LEVEL 436
Tableau 47 – Paramètres pour la séquence d’essai SET POWER ON LEVEL 440

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 48 – Paramètres pour la séquence d'essai SET FADE TIME 441
Tableau 49 – Paramètres pour la séquence d'essai SET FADE RATE 442
Tableau 50 – Paramètres pour la séquence d'essai SET SCENE / REMOVE FROM SCENE 443
Tableau 51 – Paramètres pour la séquence d'essai ADD TO GROUP' / 'REMOVE FROM GROUP 444
Tableau 52 – Paramètres pour la séquence d'essai SET SHORT ADDRESS 445
Tableau 53 – Paramètres pour la séquence d'essai SET EXTENDED FADE TIME 446
Tableau 54 – Paramètres pour la séquence d'essai 'Reset/Power-on values' 449
Tableau 55 – Paramètres pour la séquence d'essai DTR0 / DTR1 / DTR2 452
Tableau 56 – Paramètres pour la séquence d'essai READ MEMORY LOCATION sur le bloc de mémoire 0 457
Tableau 57 – Paramètres pour la séquence d'essai READ MEMORY LOCATION sur le bloc de mémoire 1 459
Tableau 58 – Paramètres pour la séquence d'essai 'Memory Bank writing' 464
Tableau 59 – Paramètres pour la séquence d'essai ENABLE WRITE MEMORY: writeEnableState 467
Tableau 60 – Paramètres pour la séquence d'essai ENABLE WRITE MEMORY: temporisation / commande intermédiaire 469
Tableau 61 – Paramètres pour la séquence d'essai RESET MEMORY BANK: temporisation / commande intermédiaire 472
Tableau 62 – Paramètres pour la séquence d'essai 'RESET MEMORY BANK' 473
Tableau 63 – Paramètres pour la séquence d'essai 'Level instructions: Basic behaviour' 475
Tableau 64 – Paramètres pour la séquence d'essai 'FADE TIME: possible values' 478
Tableau 65 – Paramètres pour la séquence d'essai 'FADE TIME: transitions' 480
Tableau 66 – Paramètres pour la séquence d'essai 'FADE TIME: fading to 0' 482
Tableau 67 – Paramètres pour la séquence d'essai ' small steps fading' 486
Tableau 68 – Paramètres pour la séquence d'essai 'FADE TIME: extended fade time' 488
Tableau 69 – Paramètres pour la séquence d'essai 'FADE RATE: possible values' 490
Tableau 70 – Paramètres pour la séquence d'essai 'FADE RATE: possible values' 491
Tableau 71 – Paramètres pour la séquence d'essai 'FADE RATE: transitions' 493
Tableau 72 – Paramètres pour la séquence d'essai 'FADE RATE: extended fade time' 494
Tableau 73 – Paramètres pour la séquence d'essai 'FADE TIME/FADE RATE: stop fading by setting MIN/MAX levels' 498
Tableau 74 – Paramètres pour la séquence d'essai 'FADE TIME/FADE RATE: stop fading' 503
Tableau 75 – Paramètres pour la séquence d'essai 'FADE TIME/FADE RATE: stop fading when a command is sent, check timing' 506
Tableau 76 – Paramètres pour la séquence d'essai 'FADE TIME/FADE RATE: stop fading during startup' 511
Tableau 77 – Paramètres pour la séquence d'essai 'Level instructions: combined instructions' 513
Tableau 78 – Paramètres pour la séquence d'essai "PowerOnLevel and SystemFailureLevel" 518
Tableau 79 – Paramètres pour la séquence d'essai "ENABLE DAPC SEQUENCE" 521
Tableau 80 – Paramètres pour la séquence d'essai 'GO TO LAST ACTIVE LEVEL' 522

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 81 – Paramètres pour la séquence d’essai 'GO TO SCENE' 524
Tableau 82 – Paramètres pour la séquence d’essai 'Power on: level control commands' 526
Tableau 83 – Paramètres pour la séquence d’essai 'Logarithmic dimming curve' 527
Tableau 84 – Paramètres pour la séquence d’essai 'Dimming curve: DAPC’ (contrôle direct de la puissance d'arc) 528
Tableau 85 – Paramètres pour la séquence d’essai 'FADE TIME/EXTENDED FADE TIME: light output behaviour' 531
Tableau 86 – Paramètres pour la séquence d’essai 'Behaviour during a fade' 535
Tableau 87 – Paramètres pour la séquence d’essai "INITIALISE – device addressing" 538
Tableau 88 – Paramètres pour la séquence d’essai 'COMPARE' 540
Tableau 89 – Paramètres pour la séquence d’essai 'WITHDRAW' 541
Tableau 90 – Paramètres pour la séquence d’essai 'PROGRAM SHORT ADDRESS' 544
Tableau 91 – Paramètres pour la séquence d’essai 'VERIFY SHORT ADDRESS' 545
Tableau 92 – Paramètres pour la séquence d’essai 'QUERY SHORT ADDRESS' 547
Tableau 93 – Paramètres pour la séquence d’essai 'IDENTIFY DEVICE’ 549
Tableau 94 – Paramètres pour la séquence d’essai 'IDENTIFY DEVICE THROUGH RECALL MIN/MAX LEVEL' 554
Tableau 95 – Paramètres pour la séquence d’essai 'QUERY STATUS – lampFailure/lampOn' 557
Tableau 96 – Paramètres pour la séquence d’essai 'QUERY STATUS – lampOn' 559
Tableau 97 – Paramètres pour la séquence d’essai 'QUERY STATUS – limitError/lampOn' 560
Tableau 98 – Paramètres pour la séquence d’essai 'QUERY STATUS - powerCycleSeen' 563
Tableau 99 – Paramètres pour la séquence d’essai 'QUERY CONTROL GEAR PRESENT' 564
Tableau 100 – Paramètres pour la séquence d’essai 'Broadcast unaddressed’ 566
Tableau 101 – Paramètres pour la séquence d’essai 'Reserved commands: standard commands’ 567
Tableau 102 – Paramètres pour la séquence d’essai 'Reserved commands: special commands’ 568
Tableau 103 – Paramètres pour la séquence d’essai 'Addressing 2’ 577

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

_____

INTERFACE D'ÉCLAIRAGE ADRESSABLE NUMÉRIQUE –

Partie 102: Exigences générales – Appareillages de commande

AVANT-PROPOS

1) La Commission Electrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. A cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
2) Les décisions ou accords officiels de l'IEC concernant les questions techniques représentent, dans la mesure du possible, un accord international sur les sujets étudiés, étant donné que les Comités nationaux de l'IEC intéressés sont représentés dans chaque comité d'études.
3) Les Publications de l'IEC se présentent sous la forme de recommandations internationales et sont agréées comme telles par les Comités nationaux de l'IEC. Tous les efforts raisonnables sont entrepris afin que l'IEC s'assure de l'exactitude du contenu technique de ses publications; l'IEC ne peut pas être tenue responsable de l'éventuelle mauvaise utilisation ou interprétation qui en est faite par un quelconque utilisateur final.
4) Dans le but d'encourager l'uniformité internationale, les Comités nationaux de l'IEC s'engagent, dans toute la mesure possible, à appliquer de façon transparente les Publications de l'IEC dans leurs publications nationales et régionales. Toutes divergences entre toutes Publications de l'IEC et toutes publications nationales ou régionales correspondantes doivent être indiquées en termes clairs dans ces dernières.
5) L'IEC elle-même ne fournit aucune attestation de conformité. Des organismes de certification indépendants fournissent des services d'évaluation de conformité et, dans certains secteurs, accèdent aux marques de conformité de l'IEC. L'IEC n'est responsable d'aucun des services effectués par les organismes de certification indépendants.
6) Tous les utilisateurs doivent s'assurer qu'ils sont en possession de la dernière édition de cette publication.
7) Aucune responsabilité ne doit être imputée à l'IEC, à ses administrateurs, employés, auxiliaires ou mandataires, y compris ses experts particuliers et les membres de ses comités d'études et des Comités nationaux de l'IEC, pour tout préjudice causé en cas de dommages corporels et matériels, ou de tout autre dommage de quelque nature que ce soit, directe ou indirecte, ou pour supporter les coûts (y compris les frais de justice) et les dépenses découlant de la publication ou de l'utilisation de cette Publication de l'IEC ou de toute autre Publication de l'IEC, ou au crédit qui lui est accordé.
8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
9) L'attention est attirée sur le fait que certains des éléments de la présente Publication de l'IEC peuvent faire l'objet de droits de brevet. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié de tels droits de brevets et de ne pas avoir signalé leur existence.

La Norme internationale IEC 62386-102 a été établie par le sous-comité 34C: Appareils auxiliaires pour lampes, du comité d'études 34 de l'IEC: Lampes et équipements associés.

Cette deuxième édition annule et remplace la première édition parue en 2009. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) suppression de toutes les définitions non associées aux appareillages de commande,
b) amélioration des exigences pour les appareillages de commande par une clarification de la description,
c) amélioration des itérations de commandes d'essai pour une meilleure compatibilité,

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

d) addition de nouvelles commandes, et

e) suppression des exigences pour:

1) le cadencement;

2) les dispositifs de commande;

Les exigences pour le cadencement sont désormais incluses dans la Partie 101 et les exigences pour les dispositifs de commande le sont dans la Partie 103.

Le texte anglais de cette norme est issu des documents 34C/1099/FDIS et 34C/1112/RVD. Le rapport de vote 34C/1112/RVD donne toute information sur le vote ayant abouti à l'approbation de cette norme.

La version française de cette norme n'a pas été soumise au vote.

Cette publication a été rédigée selon les Directives ISO/IEC, Partie 2.

La présente Partie 102 est destinée à être utilisée conjointement avec la Partie 101, qui contient les exigences générales pour le type de produit applicable (système), et avec la Partie 2XX appropriée (exigences particulières pour les appareillages de commande) qui comporte les articles complétant ou modifiant les articles correspondants de la Partie 101 et de la Partie 102, afin de fournir les exigences correspondantes pour chaque type de produit.

Une liste de toutes les parties de la série IEC 62386, publiées sous le titre général: *Interface d'éclairage adressable numérique*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de cette publication ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "http://webstore.iec.ch" dans les données relatives à la publication recherchée. A cette date, la publication sera

- reconduite,
- supprimée,
- remplacée par une édition révisée, ou
- amendée.

IMPORTANT – Le logo "colour inside" qui se trouve sur la page de couverture de cette publication indique qu'elle contient des couleurs qui sont considérées comme utiles à une bonne compréhension de son contenu. Les utilisateurs devraient, par conséquent, imprimer cette publication en utilisant une imprimante couleur.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

INTRODUCTION

L'IEC 62386 est composée de plusieurs parties désignées en référence en série. Les parties de la série 1xx constituent les spécifications de base. La Partie 101 contient les exigences générales relatives aux composants de système, la Partie 102 étend ces informations avec les exigences générales relatives aux appareillages de commande et la Partie 103 étend ces informations avec les exigences générales relatives aux dispositifs de commande.

Les parties de la série 2xx étendent les exigences générales relatives aux appareillages de commande aux extensions spécifiques aux lampes (principalement pour la rétrocompatibilité avec l'Édition 1 de l'IEC 62386) et aux caractéristiques spécifiques aux appareillages de commande.

Les parties de la série 3xx étendent les exigences générales relatives aux dispositifs de commande aux extensions spécifiques aux dispositifs d'entrée décrivant les types d'instance ainsi que certaines caractéristiques communes qui peuvent être combinées à plusieurs types d'instance.

Cette deuxième édition de l'IEC 62386-102 est publiée conjointement avec l'IEC 62386-101:2014 et avec les diverses parties qui composent la série IEC 62386-2xx relatives aux appareillages de commande, ainsi qu'avec l'IEC 62386-103:2014 et les diverses parties qui composent la série IEC 62386-3xx donnant des exigences particulières pour les dispositifs de commande. La présentation en parties publiées séparément facilitera les futurs amendements et révisions. Des exigences supplémentaires seront ajoutées si et quand le besoin en sera reconnu.

La **Error! Reference source not found.** ci-dessous illustre la configuration de la norme.

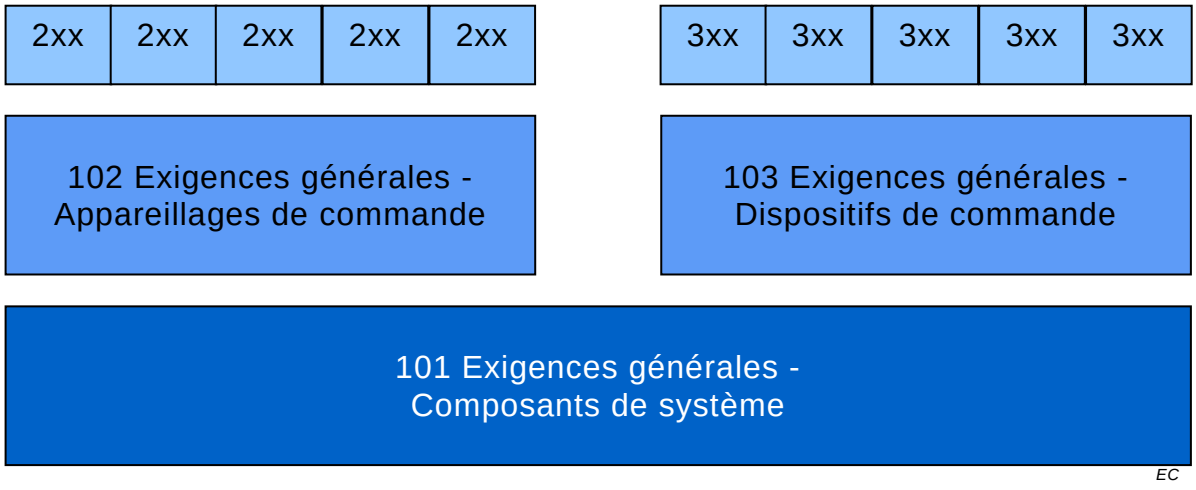


Figure 1 – Vue d'ensemble graphique de l'IEC 62386

La présente partie de l'IEC 62386, tout en faisant référence à un article quelconque des deux autres parties de la série IEC 62386-1xx, spécifie la mesure dans laquelle un article s'applique et l'ordre dans lequel les essais sont à effectuer. Les parties contiennent également des exigences supplémentaires, s'il y a lieu.

Tous les nombres utilisés dans la présente Norme internationale sont des nombres décimaux, sauf indication contraire. Les nombres hexadécimaux sont donnés dans le format 0xVV, où VV est la valeur. Les nombres binaires sont donnés dans le format XXXXXXXXb ou dans le format XXXX XXXX, où X est 0 ou 1; "x" dans les nombres binaires signifie que "la valeur n'a pas d'influence".

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Les expressions typographiques suivantes sont utilisées:

Variables: *variableName* ou *variableName[3:0]*, qui donne uniquement les bits 3 à 0 de *variableName*

Plage de valeurs: [lowest, highest]

Commande: “COMMAND NAME”

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

INTERFACE D'ÉCLAIRAGE ADRESSABLE NUMÉRIQUE –

Partie 102: Exigences générales – Appareillages de commande

1 Domaine d'application

La présente partie de l'IEC 62386 est applicable aux appareillages de commande dans un système à bus de commande par signaux numériques des équipements d'éclairage électroniques. Il convient que ces équipements soient conformes aux exigences de l'IEC 61347, avec l'ajout des sources d'alimentation en courant continu.

NOTE Les essais décrits dans la présente norme sont des essais de type. Les exigences relatives aux essais des appareillages de commande individuels en cours de production ne sont pas incluses.

2 Références normatives

Les documents suivants sont cités en référence de manière normative, en intégralité ou en partie, dans le présent document et sont indispensables pour son application. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 61347, *Appareillages de lampes*

IEC 62386-101:2014*, Interface d'éclairage adressable numérique – Partie 101: Exigences générales – Composants de système*

IEC 62386-103:2014, *Interface d'éclairage adressable numérique – Partie 103: Exigences générales – Dispositifs de commande*

3 Termes et définitions

Pour les besoins du présent document, les termes et définitions donnés dans l'IEC 62386-101, ainsi que les suivants, s'appliquent.

3.1
niveau réel
valeur représentant le rendement lumineux actuel

3.2
puissance d'arc
puissance fournie aux sources d'éclairage (lampes)

3.3
diffusion
type d'adresse utilisé pour adresser simultanément l'ensemble des appareillages de commande dans le système

3.4
diffusion non adressée
type d'adresse utilisé pour adresser simultanément l'ensemble des dispositifs de commande dans le système qui n'ont pas d'adresse courte

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

3.5
contrôle direct de la puissance d'arc
DAPC
méthode de contrôle direct du rendement lumineux

Note 1 à l'article: L'abréviation "DAPC" est dérivée du terme anglais développé correspondant "Direct Arc Power Control".

3.6
registre de transfert des données
DTR
registre polyvalent utilisé pour l'échange de données

Note 1 à l'article: L'abréviation "DTR" est dérivée du terme anglais développé correspondant "Data Transfer Register".

3.7
adresse de groupe
type d'adresse utilisé pour adresser simultanément un groupe d'appareillages de commande dans le système

3.8
code article international
GTIN
numéro utilisé pour identifier de façon univoque, partout dans le monde, les articles commercialisés

Note 1 à l'article: Pour d'autres d'informations, voir http://en.wikipedia.org/wiki/GTIN.

Note 2 à l'article: Ce code est composé d'un préfixe de société GS1 ou CUP, suivi d'un numéro de référence d'article et d'un chiffre de contrôle. Il est décrit dans les "GS1 General Specifications" («Spécifications générales GS1»).

Note 3 à l'article: L'abréviation "GTIN" est dérivée du terme anglais développé correspondant "Global Trade Item Number".

3.9
identification
état provisoire appliqué lors de la mise en service qui permet à l'installateur d'identifier un appareillage de commande spécifique

3.10
niveau
valeur à 8 bits

3.11
MASK
valeur 0xFF

3.12
monotonique
une fonction *f* définie sur un sous-ensemble de nombres réels avec des valeurs réelles est appelée fonction non décroissante monotonique, si pour toutes les valeurs de *x* et *y* telles que $x \leq y$, on obtient $f(x) \leq f(y)$, et *f* conserve cet ordre. De même, une fonction est appelée non croissante monotonique si, lorsque $x \leq y$, alors $f(x) \geq f(y)$, inversant ainsi cet ordre. Dans le cadre de la présente norme, monotonique est définie comme non décroissante monotonique ou non croissante monotonique

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

3.13
NO
si une requête est formulée pour laquelle la réponse est NO, il n'y aura pas de réponse, de sorte que l'émetteur de la requête conclura “pas de trame en arrière" suivant 8.2.5 de l'IEC 62386-101:2014

Note 1 à l'article: Une absence de requête pourrait également déclencher la réponse NO.

3.14
NVM
mémoire en lecture/écriture non volatile dont le contenu peut être modifié et ne sera pas perdu en raison d'un cycle de mise sous tension

3.15
opcode
code de fonctionnement
partie d'une trame de commande qui identifie la commande à exécuter

3.16
mode de fonctionnement
ensemble d'états identifiés par un nombre compris dans la plage [0,255], caractérisé par un groupe de variables et paramètres de mémoire, et utilisé pour sélectionner un ensemble de fonctionnalités à présenter par un appareillage de commande, y compris sa réaction nécessaire aux commandes

Note 1 à l'article: Un appareillage de commande peut prendre en charge deux modes de fonctionnement ou plus.

3.17
PHM
niveau minimum physique correspondant au rendement lumineux minimum auquel l'appareillage de commande peut fonctionner

3.18
RAM
mémoire en lecture/écriture volatile dont le contenu peut être modifié, et sera perdu en raison d'un cycle de mise sous tension

3.19
adresse aléatoire
numéro à 24 bits aléatoire généré par l’appareillage de commande sur demande au cours de l’initialisation du système

Note 1 à l'article: L'Annexe A.1 fournit un exemple de pratique d'utilisation des adresses de recherche et aléatoires.

3.20
état réinitialisé
état dans lequel toutes les variables NVM de l'appareillage de commande présentent des valeurs réinitialisées, sauf celles qui portent le marquage “pas de modification” ou qui sont explicitement exclues de toute autre manière

3.21
ROM
mémoire en lecture seule non volatile dont le contenu est fixe

Note 1 à l'article: Dans la présente norme, le terme "en lecture seule" est défini par rapport au système. Une variable ROM peut effectivement être mise en œuvre dans la NVM, mais la présente norme ne prévoit aucun mécanisme de changement de sa valeur.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

3.22
scénario
niveau préréglé pouvant être configuré

3.23
adresse de recherche
nombre à 24 bits utilisé pour identifier un appareillage de commande individuel dans le système au cours de l'initialisation

Note 1 à l'article: L'Annexe A.1 fournit un exemple de pratique d'utilisation des adresses de recherche et aléatoires.

3.24
adresse courte
type d'adresse utilisé pour adresser un appareillage de commande individuel dans le système

3.25
démarrage
temps nécessaire pour passer de l'état hors tension de la lampe au fonctionnement normal de la lampe ou à l'état de défaillance

Note 1 à l'article: Ce temps inclut le préchauffage et l'amorçage.

3.26
strictement monotonique
une fonction *f* définie sur un sous-ensemble de nombres réels avec des valeurs réelles est appelée fonction croissante monotonique, si pour toutes les valeurs de *x* et *y* telles que $x < y$, on obtient $f(x) < f(y)$, et *f* conserve cet ordre. De même, une fonction est appelée décroissante monotonique si, lorsque $x < y$, alors $f(x) \geq f(y)$, inversant ainsi cet ordre. Dans le cadre de la présente norme, strictement monotonique est définie comme croissante monotonique ou décroissante monotonique

3.27
niveau cible
représente le rendement lumineux cible prévu après exécution de la commande de niveau réel

3.28
YES
si une requête est formulée pour laquelle la réponse est YES, la réponse sera une trame en arrière contenant la valeur de *MASK*

4 Généralités

4.1 Généralités

Les exigences de l'Article 4 de l'IEC 62386101:2014 s'appliquent avec les restrictions, modifications et additions identifiées ci-dessous.

4.2 Numéro de version

Le présent article remplace 4.2 de l'IEC 62386-101:2014.

La version doit se présenter sous le format "x.y", où le numéro de version principale x se situe dans la plage comprise entre 0 et 62 et le numéro de version secondaire y se situe dans la plage comprise entre 0 et 2. Lorsque le numéro de version est codé par octet, le numéro de version principale x doit se situer entre les bits 7 à 2 et le numéro de version secondaire y doit se situer dans les bits 1 à 0.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

À chaque amendement d'une édition de l'IEC 62386-102, le numéro de version secondaire doit être augmenté de un.

Lors d'une nouvelle édition de l'IEC 62386-102, le numéro de version principale doit être augmenté de un et le numéro de version secondaire doit être égal à 0.

Le numéro de version actuel est "2.0".

NOTE Généralement, les documents IEC font l'objet de 2 amendements avant toute nouvelle édition.

5 Spécifications électriques

Les exigences de l'Article 5 de l'IEC 62386-101:2014 s'appliquent.

6 Alimentation électrique de l'interface

Lorsqu'une alimentation de bus est intégrée à un appareillage de commande, les exigences de l'Article 6 de l'IEC 62386-101:2014 s'appliquent.

7 Structure du protocole de transmission

7.1 Généralités

Les exigences de l'Article 7 de l'IEC 62386-101:2014 s'appliquent avec les additions suivantes.

7.2 Codage de trame en avant à 16 bits

7.2.1 Généralités

Pour les commandes, la trame en avant à 16 bits doit être codée comme indiqué dans le Tableau 1.

Tableau 1 – Codage de la trame en avant à 16 bits

<table>
<tr><th colspan="8">Octets/Bits</th><th rowspan="3">Méthode d'adressage des dispositifs</th></tr>
<tr><th colspan="8">Octet d'adresse</th><th>Octet de code de fonctionnement</th></tr>
<tr><th>15</th><th>14</th><th>13</th><th>12</th><th>11</th><th>10</th><th>9</th><th>8 [a]</th><th>7...0</th></tr>
<tr><td>0</td><td colspan="6">64 adresses courtes</td><td>x</td><td rowspan="4"></td><td>Adressage court</td></tr>
<tr><td>1</td><td>0</td><td>0</td><td colspan="4">16 adresses de groupe</td><td>x</td><td>Adressage de groupes</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td><td>x</td><td>Diffusion non adressée</td></tr>
<tr><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>x</td><td>Diffusion</td></tr>
<tr><td colspan="8">1010 0000 à 1100 1011</td><td rowspan="2"></td><td>Commande spéciale</td></tr>
<tr><td colspan="8">1100 1100 à 1111 1011</td><td>Réservé</td></tr>
<tr><td colspan="10">[a] Bit sélecteur, voir 7.2.2; 0 indique DAPC, 1 indique une autre commande</td></tr>
</table>

7.2.2 Octet d'adresse

L'octet d'adresse fournit

- la méthode d'adressage des dispositifs utilisée par le contrôleur d'application;
- le type de commande transmise dans l'octet de code de fonctionnement;

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Bit 8 ='1': commande normalisée;

Bit 8 ='0': commande de contrôle direct de la puissance d'arc (DAPC);

- espaces d'adressage pour les commandes spéciales;
- adresses de dispositif réservées.

Il convient que le contrôleur d'application n'utilise pas les adresses réservées.

7.2.3 Octet de code de fonctionnement

L'octet de code de fonctionnement fournit

- pour la commande DAPC, le rendement lumineux demandé;
- pour les commandes normalisées, le code de fonctionnement;
- l'information spécifique à la commande pour les commandes spéciales;
- l'information réservée pour les commandes réservées.

8 Cadencement

Les exigences de l'Article 8 de l'IEC 62386-101 s'appliquent.

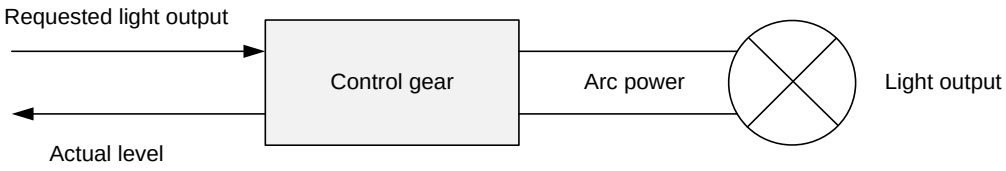
9 Méthode de fonctionnement

9.1 Généralités

Les exigences de l'Article 9 de l'IEC 62386-101 s'appliquent avec les additions suivantes.

9.2 Appareillages de commande

Les appareillages de commande peuvent recevoir des commandes d'un contrôleur d'application. Le contrôleur d'application est spécifié par l'IEC 62386-103:2014.



Légende

Anglais	Français
Requested light output	Rendement lumineux demandé
Actual level	Niveau réel
Control gear	Appareillage de commande
Light output	Rendement lumineux
Arc power	Puissance d'arc

Figure 2 – Appareillages de commande faisant fonctionner directement une source de lumière

La Figure 2 montre comment les différents niveaux génèrent le rendement lumineux. Le niveau de rendement (lumineux) maximum d'un appareillage de commande est défini comme étant égal à 100 %. Tous les niveaux sont spécifiés de manière relative. L'appareillage de

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

commande peut fournir un niveau physique minimum tout en maintenant un rendement lumineux effectif. Ce niveau est défini comme le niveau minimum physique (PHM).

NOTE PHM est spécifique à l'appareillage et est supérieur à 0.

Selon la source de lumière, diverses phases de fonctionnement peuvent être identifiées au sein d'un appareillage de commande. Généralement, ces phases sont les suivantes:

- Veille: au cours de cette phase, la lampe est éteinte.
- Démarrage: Il s'agit d'une phase de transition de l'état de veille au fonctionnement normal. Cette phase est parfois perçue comme un retard. Exemples:
  - préchauffage: la lampe est chauffée en vue de son amorçage. Ceci est observé typiquement pour les sources de lumière fluorescente;
  - amorçage: la lampe est amorcée: ceci est observé typiquement pour les sources de lumière HID et les sources de lumière fluorescente après préchauffage;
  - préparation des étages de puissance.
- Fonctionnement normal: la lampe émet de la lumière et peut fonctionner comme attendu.
- Défaillance: la lampe ne peut pas fonctionner comme attendu.

9.3 Courbe de gradation

La courbe de gradation détermine de quelle manière le niveau doit être transformé en rendement lumineux.

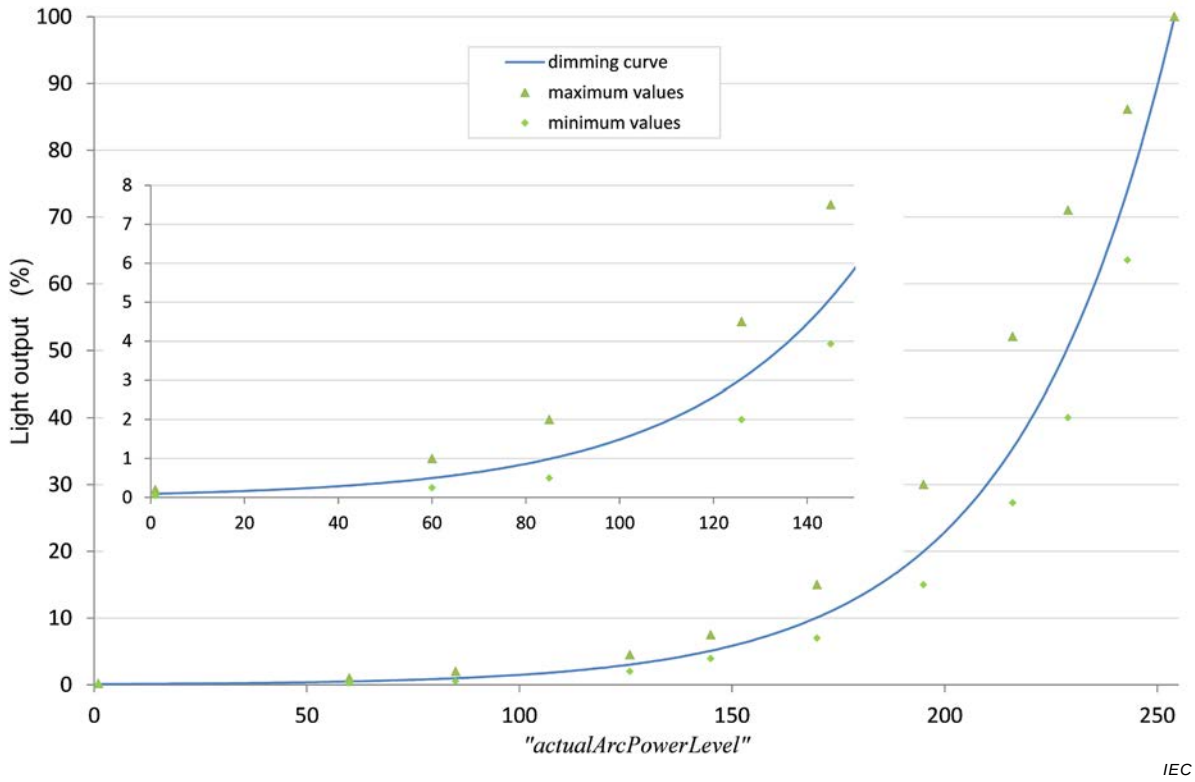
Un *"actualLevel"* supérieur ou égal à 1 et inférieur ou égal à 254 doit être transformé en rendement lumineux selon

$$\text{Rendement lumineux } (actualLevel) = 10^{\frac{actualLevel-1}{253/3}-1} \%\,.$$

Le rendement lumineux est exprimé par rapport au rendement lumineux maximum possible d'une combinaison appareillage de commande-lampe donnée. La courbe de gradation commence à 0,1 % pour *"actualLevel"* égal à 0x01 et finit à 100 % pour *"actualLevel"* égal à 0xFE. La courbe de gradation est strictement monotonique, et la précision relative doit être de ±½ pas. Ceci doit être vérifié par essai utilisant une intensité lumineuse, en excluant le PHM.

NOTE 1 La courbe de gradation est destinée à compenser la courbe de sensibilité à la lumière de l'œil humain.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe



Légende

Anglais	Français
Light output	Rendement lumineux
Dimming curve	Courbe de gradation
Maximum values	Valeurs maximales
Minimum values	Valeurs minimales

Figure 3 – Courbe de gradation

La précision du rendement lumineux est spécifiée par les points d'essai donnés dans le Tableau 2. Les points d'essai du Tableau 2 et la courbe de gradation sont illustrés à la Figure 3, et le Tableau 3 montre le rendement lumineux par rapport au niveau. Le type de lampe ou la charge utilisé(e) lors des essais doivent être indiqués à des fins de reproductibilité.

NOTE 2 Les valeurs minimale et maximale sont basées sur les valeurs d'essai que l'on peut identifier dans l'IEC 62386-102:2009.

Tableau 2 – Tolérance de la courbe de gradation (%, arrondi à deux décimales)

Niveau de puissance d'arc	1	60	85	126	145	170	195	216	229	243	254
Valeur minimale	0,05	0,25	0,50	2,00	3,93	7,00	15,00	27,28	40,00	63,53	
Valeur nominale	0,10	0,50	0,99	3,04	5,10	10,09	19,97	35,43	50,53	74,05	100,00
Valeur maximale	0,20	1,00	2,00	4,50	7,50	15,0	30,00	52,09	71,00	86,14	

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 3 – Courbe de gradation

Niveau	Rendement lumineux	Niveau	Rendement lumineux	Niveau	Rendement lumineux	Niveau	Rendement lumineux	Niveau	Rendement lumineux
1	0,100	52	0,402	103	1,620	154	6,520	205	26,241
2	0,103	53	0,414	104	1,665	155	6,700	206	26,967
3	0,106	54	0,425	105	1,711	156	6,886	207	27,713
4	0,109	55	0,437	106	1,758	157	7,076	208	28,480
5	0,112	56	0,449	107	1,807	158	7,272	209	29,269
6	0,115	57	0,461	108	1,857	159	7,473	210	30,079
7	0,118	58	0,474	109	1,908	160	7,680	211	30,911
8	0,121	59	0,487	110	1,961	161	7,893	212	31,767
9	0,124	60	0,501	111	2,015	162	8,111	213	32,646
10	0,128	61	0,515	112	2,071	163	8,336	214	33,550
11	0,131	62	0,529	113	2,128	164	8,567	215	34,479
12	0,135	63	0,543	114	2,187	165	8,804	216	35,433
13	0,139	64	0,559	115	2,248	166	9,047	217	36,414
14	0,143	65	0,574	116	2,310	167	9,298	218	37,422
15	0,147	66	0,590	117	2,374	168	9,555	219	38,457
16	0,151	67	0,606	118	2,440	169	9,820	220	39,522
17	0,155	68	0,623	119	2,507	170	10,091	221	40,616
18	0,159	69	0,640	120	2,577	171	10,371	222	41,740
19	0,163	70	0,658	121	2,648	172	10,658	223	42,895
20	0,168	71	0,676	122	2,721	173	10,953	224	44,083
21	0,173	72	0,695	123	2,797	174	11,256	225	45,303
22	0,177	73	0,714	124	2,874	175	11,568	226	46,557
23	0,182	74	0,734	125	2,954	176	11,888	227	47,846
24	0,187	75	0,754	126	3,035	177	12,217	228	49,170
25	0,193	76	0,775	127	3,119	178	12,555	229	50,531
26	0,198	77	0,796	128	3,206	179	12,902	230	51,930
27	0,203	78	0,819	129	3,294	180	13,260	231	53,367
28	0,209	79	0,841	130	3,386	181	13,627	232	54,844
29	0,215	80	0,864	131	3,479	182	14,004	233	56,362
30	0,221	81	0,888	132	3,576	183	14,391	234	57,922
31	0,227	82	0,913	133	3,675	184	14,790	235	59,526
32	0,233	83	0,938	134	3,776	185	15,199	236	61,173
33	0,240	84	0,964	135	3,881	186	15,620	237	62,866
34	0,246	85	0,991	136	3,988	187	16,052	238	64,607
35	0,253	86	1,018	137	4,099	188	16,496	239	66,395
36	0,260	87	1,047	138	4,212	189	16,953	240	68,233
37	0,267	88	1,076	139	4,329	190	17,422	241	70,121
38	0,275	89	1,105	140	4,449	191	17,905	242	72,062
39	0,282	90	1,136	141	4,572	192	18,400	243	74,057
40	0,290	91	1,167	142	4,698	193	18,909	244	76,107
41	0,298	92	1,200	143	4,828	194	19,433	245	78,213
42	0,306	93	1,233	144	4,962	195	19,971	246	80,378
43	0,315	94	1,267	145	5,099	196	20,524	247	82,603
44	0,324	95	1,302	146	5,240	197	21,092	248	84,889
45	0,332	96	1,338	147	5,385	198	21,675	249	87,239
46	0,342	97	1,375	148	5,535	199	22,275	250	89,654
47	0,351	98	1,413	149	5,688	200	22,892	251	92,135
48	0,361	99	1,452	150	5,845	201	23,526	252	94,686
49	0,371	100	1,492	151	6,007	202	24,177	253	97,307
50	0,381	101	1,534	152	6,173	203	24,846	254	100,000
51	0,392	102	1,576	153	6,344	204	25,534		

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

9.4 Calcul de "*targetLevel*"

Un contrôleur d'application indique à l'appareillage de commande le rendement lumineux demandé et le comportement effectif au cours du passage de *"actualLevel"* à *"targetLevel"* au moyen de codes de fonctionnement appropriés.

Le *"targetLevel"* doit être calculé sur la base du rendement lumineux demandé comme suit:

- 0x00 doit être accepté comme *"targetLevel"* et avec la lampe éteinte.
- Toute valeur comprise entre 0x01 et *"minLevel"* doit donner *"targetLevel"*=*"minLevel".*
- Toute valeur comprise entre *"maxLevel"* et 0xFE doit donner *"targetLevel"*=*"maxLevel".*
- "MASK" ne doit pas influer sur *"targetLevel"* sauf lorsque la modification de l'intensité lumineuse est en cours, voir 9.5.9.
- Toutes les autres valeurs doivent être acceptées comme *"targetLevel".*

Le calcul du niveau cible demandé de *"targetLevel"* doit également être appliqué si la demande est basée sur une valeur enregistrée, telle qu'un scénario, *"powerOnLevel"* ou *"systemFailureLevel".*

À chaque modification de *"targetLevel"*, à l'exception de l'initialisation provoquée par un cycle de mise sous tension, l'appareillage de commande doit actualiser *"limitError"* (voir 9.16.5) et doit régler *"lastLightLevel"* sur le nouveau *"targetLevel".* Si "*targetLevel"* n'est pas égal à 0x00, *"lastActiveLevel"* doit être réglé sur "*targetLevel".*

9.5 Modification de l'intensité lumineuse

9.5.1 Généralités

Le processus de modification de l'intensité lumineuse correspond à un temps de transition linéaire entre *"actualLevel"* et *"targetLevel"*. Le *"actualLevel",* et donc le rendement lumineux, doivent être strictement monotoniques selon la courbe de gradation applicable.

On peut lancer une modification de l'intensité lumineuse de deux manières:

- utilisation d'une durée de modification de l'intensité lumineuse: cette méthode définit une durée d'utilisation du processus de modification de l'intensité lumineuse;
- utilisation d'une vitesse de modification de l'intensité lumineuse: cette méthode définit une vitesse d'utilisation du processus de modification de l'intensité lumineuse.

Une modification de l'intensité lumineuse ne doit pas être lancée si le *"targetLevel"* calculé équivaut à *"actualLevel"*.

Lorsqu'une modification de l'intensité lumineuse est lancée, la minuterie associée doit être déclenchée et *"fadeRunning"* doit être réglé sur TRUE (voir 9.16.6.).

Au cours de la modification de l'intensité lumineuse, le rendement lumineux doit être maintenu le plus près possible de la courbe de modification de l'intensité lumineuse théorique.

Au cours d'un processus de modification ascendante de l'intensité lumineuse, *"actualLevel"* doit être augmenté selon une durée correspondant à l'intersection d'une courbe de modification de l'intensité lumineuse théorique avec le point milieu entre *"actualLevel"* et *"actualLevel"* + 1. De même, au cours d'une modification de l'intensité lumineuse descendante, *"actualLevel"* doit être diminué selon une durée correspondant à l'intersection d'une courbe de modification de l'intensité lumineuse théorique avec le point milieu entre *"actualLevel"* et *"actualLevel"* – 1. La Figure 4 illustre ce phénomène.

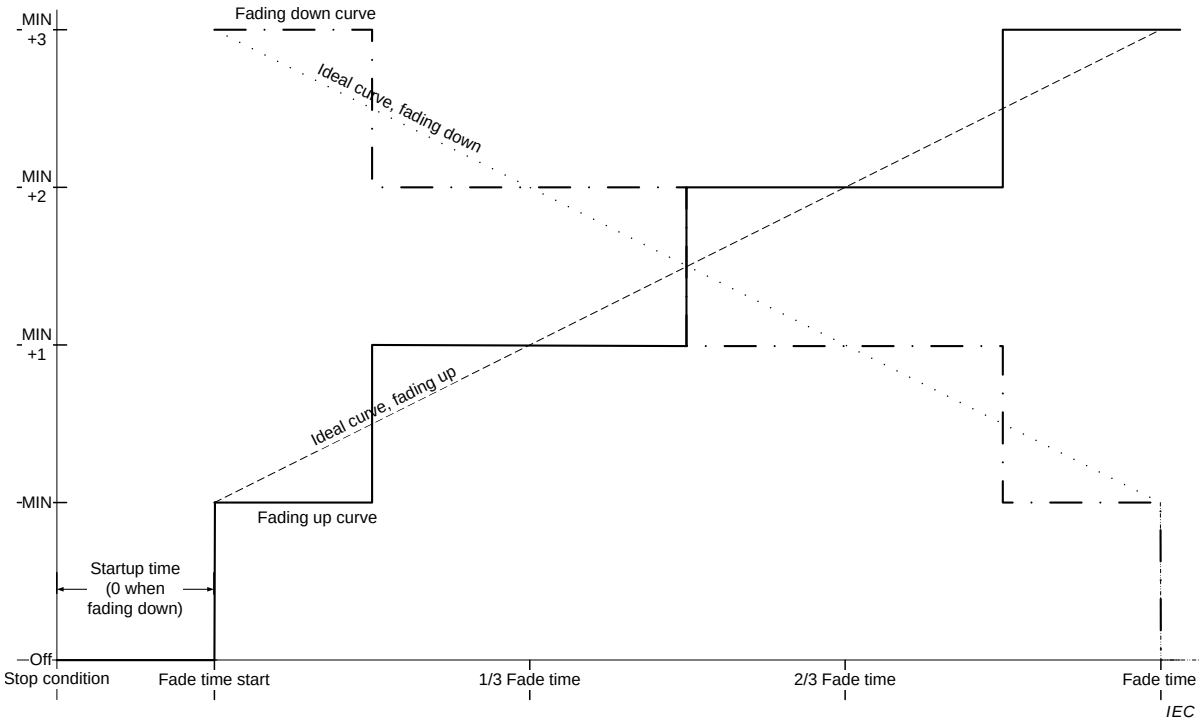
Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Les mesures de la durée / vitesse de modification de l'intensité lumineuse doivent débuter après l'arrêt de la commande qui les déclenche. Lorsque la modification de l'intensité lumineuse se produit immédiatement après le démarrage, les mesures doivent être effectués à partir du moment où "*lampOn*" est confirmé comme TRUE ou, dans le cas d'une défaillance totale des lampes, à partir du moment où "*lampFailure*" est confirmé comme TRUE. Une modification de l'intensité lumineuse doit s'interrompre automatiquement lorsque la minuterie associée est active pendant la durée correspondante applicable. À ce stade, la minuterie de modification de l'intensité lumineuse doit être interrompue et *"fadeRunning"* doit être réglé sur FALSE (voir 9.16.6.).

Cela signifie que l'appareillage de commande modifie l'intensité lumineuse jusqu'au niveau cible même dans le cas d'une erreur de lampe totale. Si une lampe est tenue d'être mise hors tension à la fin de la modification de l'intensité lumineuse, la phase de transition de *"minLevel"* à 0x00 ne doit pas contribuer à la durée de ladite modification. La phase de transition de *"minLevel"* à 0x00 doit être suivie immédiatement après écoulement de la durée de modification de l'intensité lumineuse.

Si une lampe est tenue d'être allumée au début de la modification de l'intensité lumineuse et si son intensité lumineuse est à modifier pour atteindre une certaine valeur, la phase de transition de 0x00 à *"minLevel"* ne doit pas contribuer à la durée de ladite modification. Cela signifie que la durée de modification de l'intensité lumineuse commence lorsque la lampe est allumée.

NOTE Le passage de 0x00 à *"minLevel"* comprend le démarrage.



Légende

Anglais	Français
Fading down curve	Courbe de modification descendante de l'intensité lumineuse
Ideal curve, fading down	Courbe théorique, modification descendante de l'intensité lumineuse
Ideal curve, fading up	Courbe théorique, modification ascendante de l'intensité lumineuse
Fading up curve	Courbe de modification ascendante de l'intensité lumineuse
Startup time (0 when fading down)	Temps de démarrage (0 lorsque modification descendante de l'intensité lumineuse)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Anglais	Français
Fade time start	Début de la durée de modification de l'intensité lumineuse
Off, stop condition	Arrêt (lampe éteinte), interruption
Fade time	Durée de modification de l'intensité lumineuse

Figure 4 – Niveau par rapport à la durée, modification ascendante et descendante de l'intensité lumineuse

Les essais doivent être réalisés avec "*minLevel*" ≥ PHM+1. Pour plus d'informations, voir Annexe B.

9.5.2 Durée de modification de l'intensité lumineuse

Elle doit être conforme au Tableau 4:

"fadeTime" doit être défini à réception de la commande "SET FADE TIME (DTR0)". "*fadeTime*" peut faire l'objet d'une requête en utilisant QUERY FADE TIME/FADE RATE.

"fadeTime" doit être réglé sur une valeur selon les phases suivantes:

- si *"DTR0"* > 15: 15
- dans tous les autres cas: *"DTR0"*

La durée de modification de l'intensité lumineuse doit être calculée sur la base de *"fadeTime"* comme suit:

- si *"fadeTime"* = 0: utiliser
- Durée étendue de modification de l'intensité lumineuse
- si *"fadeTime"* se situe dans la plage [1,15]: $\frac{1}{2} \cdot \sqrt{2^{"fadeTime"}} \cdot 1\text{s}$

Le Tableau 4 énumère les valeurs possibles de durée de modification de l'intensité lumineuse.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 4 – Durées de modification de l'intensité lumineuse

"fadeTime"	Durée minimale de modification de l'intensité lumineuse s	Durée nominale de modification de l'intensité lumineuse s	Durée maximale de modification de l'intensité lumineuse s
0	Modification de l'intensité lumineuse étendue		
1	0,6	0,7	0,8
2	0,9	1,0	1,1
3	1,3	1,4	1,6
4	1,8	2,0	2,2
5	2,5	2,8	3,1
6	3,6	4,0	4,4
7	5,1	5,7	6,2
8	7,2	8,0	8,8
9	10,2	11,3	12,4
10	14,4	16,0	17,6
11	20,4	22,6	24,9
12	28,8	32,0	35,2
13	40,7	45,3	49,8
14	57,6	64,0	70,4
15	81,5	90,5	99,6

9.5.3 Vitesse de modification de l'intensité lumineuse

La vitesse de modification de l'intensité lumineuse doit être conforme au Tableau 5, lorsque, à des fins d'essai, la durée est considérée comme étant exactement égale à 200 ms pour la dernière commande qui utilise cette même vitesse.

"fadeRate" doit être définie à réception de la commande "SET FADE RATE (DTR0)". "*fadeRate*" peut faire l'objet d'une requête en utilisant QUERY FADE TIME/FADE RATE.

"fadeRate" doit être réglé sur une valeur selon les phases suivantes:

- si *"DTR0"* > 15: 15
- si *"DTR0"* = 0: 1
- dans tous les autres cas: *"DTR0"*

La vitesse de modification de l'intensité lumineuse doit être calculée sur la base de *"fadeRate"* comme suit:

Vitesse de modification de l'intensité lumineuse $= \frac{506}{\sqrt{2^{"fadeRa}}}$ pas/s.

Le Tableau 5 énumère les valeurs possibles de vitesse de modification de l'intensité lumineuse.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 5 – Vitesses de modification de l'intensité lumineuse

"fadeRate"	Vitesse minimale de modification de l'intensité lumineuse pas/s	Vitesse nominale de modification de l'intensité lumineuse pas/s	Vitesse maximale de modification de l'intensité lumineuse pas/s
1	322	358	394
2	228	253	278
3	161	179	197
4	114	127	139
5	80,5	89,4	98,4
6	56,9	63,3	69,6
7	40,3	44,7	49,2
8	28,5	31,6	34,8
9	20,1	22,4	24,6
10	14,2	15,8	17,4
11	10,1	11,2	12,3
12	7,1	7,9	8,7
13	5,0	5,6	6,1
14	3,6	4,0	4,3
15	2,5	2,8	3,1

9.5.4 Durée étendue de modification de l'intensité lumineuse

Si "*fadeTime*" est égale à 0, et si la durée rapide de modification de l'intensité lumineuse telle que définie dans la partie 107 de l'IEC 62386 est mise en œuvre et est égale à 0, la durée étendue de modification de l'intensité lumineuse doit être utilisée.

La durée étendue de modification de l'intensité lumineuse doit être conforme au Tableau 7.

La durée étendue de modification de l'intensité lumineuse peut être définie en utilisant une valeur de base et un multiplicateur selon le Tableau 6 et le Tableau 7. La durée étendue de modification de l'intensité lumineuse peut être calculée à partir de la valeur de base et du facteur de multiplication.

Durée de modification de l'intensité lumineuse = *extendedFadeTimeBase* * *extendedFadeTimeMultiplier*

Ceci donne une plage de 100 ms pour une durée de 16 min, et une valeur spéciale indiquant aucune modification de l'intensité lumineuse (le plus rapidement possible).

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 6 – Durée étendue de modification de l'intensité lumineuse – valeur de base

Bits de base	Valeur de base
0000b	1
0001b	2
0010b	3
0011b	4
0100b	5
0101b	6
0110b	7
0111b	8
1000b	9
1001b	10
1011b	11
1011b	12
1100b	13
1101b	14
1110b	15
1111b	16

Tableau 7 – Durée étendue de modification de l'intensité lumineuse – multiplicateur

Bits de multiplicateur	Facteur de multiplication		
	Minimum	Nominal	Maximum
000b	0 ms [a]	0 ms[a]	0 ms [a]
001b	95 ms	100 ms	105 ms
010b	0,95 s	1 s	1,05 s
011b	9,5 s	10 s	10,5 s
100b	0,95 min	1 min	1,05 min
101b		Réservé	
110b		Réservé	
111b		Réservé	

[a] Aucune modification de l'intensité lumineuse (le plus rapidement possible)

À réception de "SET EXTENDED FADE TIME (DTR0)", l'appareillage de commande doit définir les valeurs suivantes sur la base de *"DTR0"*. Le format utilisé doit être 0YYYAAAAb, où YYYb est égal au multiplicateur de la durée de modification de l'intensité lumineuse, et AAAAb équivaut à la base de calcul de cette même durée: La durée de modification de l'intensité lumineuse résultante doit être augmentée de façon monotonique lorsque le temps de base augmente.

- Si "*DTR0*">01001111b:
  - "*extendedFadeTimeBase*" doit être réglée sur 0
  - "*extendedFadeTimeMultiplier*" doit être réglé sur 0 ms, en réglant effectivement la durée de modification de l'intensité lumineuse sur 0 s, ce qui signifie aucune modification de l'intensité lumineuse (le plus rapidement possible). Le passage de *"actualLevel"* à *"targetLevel"*doit être immédiat et le rendement lumineux doit être ajusté le plus rapidement possible.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

- Dans tous les autres cas:
  - "*extendedFadeTimeBase*" doit être réglée sur AAAAb
  - "*extendedFadeTimeMultiplier*" doit être réglé sur YYYb

La durée étendue de modification de l'intensité lumineuse peut faire l'objet d'une requête en utilisant "QUERY EXTENDED FADE TIME". La réponse doit être 0 YYY AAAAb, où YYYb équivaut à "*extendedFadeTimeMultiplier*" et AAAAb équivaut à "*extendedFadeTimeBase*".

9.5.5 Utilisation de la durée de modification de l'intensité lumineuse

Les commandes qui utilisent une durée de modification de l'intensité lumineuse doivent initier la modification en utilisant la durée applicable. Cette durée peut être déterminée sur la base des règles suivantes:

- Si "*fadeTime*" > 0: voir.
- Si "*fadeTime*" = 0: La durée étendue de modification de l'intensité lumineuse doit être utilisée, voir Tableau 6 – Durée étendue de modification de l'intensité lumineuse – valeur de base et Tableau 7 – Durée étendue de modification de l'intensité lumineuse – multiplicateur. La durée étendue de modification de l'intensité lumineuse peut être calculée par multiplication de la valeur de base et du multiplicateur.
- Si "*extendedFadeTimeMultiplier*" = 0 ms, la durée de modification de l'intensité lumineuse est égale à 0 s, ce qui signifie aucune modification de l'intensité lumineuse (le plus rapidement possible). Le passage de *"actualLevel"* à *"targetLevel"* doit être immédiat et le rendement lumineux doit être ajusté le plus rapidement possible.

Le niveau cible doit être calculé sur la base du paramètre de commande. Le niveau cible calculé doit être atteint après expiration de la durée de modification de l'intensité lumineuse.

Dans la mesure où la durée étendue de modification de l'intensité lumineuse prend également en charge des durées de modification inférieures à 0,7 s qui pourraient ne pas être exécutées par toutes les combinaisons d'appareillages de commande et de source de lumière, ce type d'appareillage de commande peut simplement ajuster le rendement lumineux le plus rapidement possible en cas de demande d'une durée étendue de modification de l'intensité lumineuse qu'il ne peut pas prendre physiquement en charge. Il convient toutefois qu'il réponde comme si la modification de l'intensité lumineuse était achevée dans la durée demandée.

9.5.6 Utilisation de la vitesse de modification de l'intensité lumineuse

Les commandes qui utilisent la vitesse de modification de l'intensité lumineuse doivent initier une telle modification d'une durée de 200 ms ± 20 ms.

"*targetLevel*" doit être calculé sur la base de *"actualLevel"* en utilisant la vitesse de modification de l'intensité lumineuse applicable. Le niveau cible calculé doit être atteint après expiration de la modification de l'intensité lumineuse d'une durée de 200 ms.

NOTE 1 Étant donné que la vitesse de modification de l'intensité lumineuse est utilisée, il est possible d'atteindre *"minLevel"* ou *"maxLevel"* avant la fin de la modification. Ceci n'entraîne pas la suppression du bit *"fadeRunning"*.

NOTE 2 Du fait des tolérances relatives à la vitesse de modification de l'intensité lumineuse, différents appareillages de commande peuvent réagir aux commandes qui utilisent des vitesses effectives sensiblement différentes. Par conséquent, après le traitement de ces commandes de gradation relative, différents appareillages de commande peuvent avoir des valeurs différentes pour *"targetLevel"* (et par conséquent également pour "*actualLevel"* et *"lastLightLevel"*).

9.5.7 Comportement lors d'une modification de l'intensité lumineuse

Si *"fadeTime","extendedFadeTimeBase*", *extendedFadeTimeMultiplier*" et/ou *"fadeRate"* sont modifiées lors d'une modification de l'intensité lumineuse en cours, cette dernière doit alors s'achever sans recalculer la durée et/ou la vitesse de modification de l'intensité lumineuse. La modification de l'intensité lumineuse suivante doit utiliser les valeurs recalculées.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

9.5.8 Comportement lors du démarrage

Lors du démarrage, le processus de modification de l'intensité lumineuse doit être mis en attente avec *"actualLevel"* équivalant à *"minLevel"*. La réaction aux commandes de niveau doit être identique à ce qu'elle serait si la (les) lampe(s) fonctionnai(en)t au *"minLevel"*. La modification de l'intensité lumineuse doit commencer:

- dès que *"lampOn"* est TRUE
- ou, dans le cas d'une défaillance totale des lampes, dès que "*lampFailure*" est confirmée comme TRUE

9.5.9 Interruption d'une modification de l'intensité lumineuse

Toute commande qui règle une ou plusieurs des variables suivantes

- *"targetLevel"*, *"minLevel"*, *"maxLevel"*

ainsi que la réception de l'une des commandes suivantes

- "DAPC(MASK)", "SAVE PERSISTENT VARIABLES", "IDENTIFY DEVICE"

doit interrompre une modification de l'intensité lumineuse en cours.

NOTE 1 La modification de l'intensité lumineuse s'interrompt même si la valeur de la variable concernée ne change pas.

Lorsqu'une modification de l'intensité lumineuse en cours est interrompue par un contrôleur d'application, la minuterie associée doit être arrêtée immédiatement. Après l'interruption de la minuterie, *"targetLevel"* doit être réglé sur *"actualLevel"* et la commande doit être exécutée (le cas échéant).

Lorsqu'une modification de l'intensité lumineuse en cours est interrompue alors qu'elle était en attente à l'état *"minLevel"* lors du démarrage, l'appareillage de commande doit achever le processus de démarrage.

NOTE 2 Ceci implique que dans ce type de cas, *"targetLevel"* et *"actualLevel"* équivalent à *"minLevel"*.

9.6 Niveau min et max

La modification du niveau min ou max doit interrompre toute modification de l'intensité lumineuse en cours, avant la mémorisation du nouveau niveau min ou max.

"SET MAX LEVEL (DTR0)" doit définir *"minLevel"* selon la valeur *"DTR0":*

- si 0 ≤ *"DTR0"* ≤ PHM: PHM
- si *"DTR0"* ≥ *"maxLevel"* ou MASK: *"maxLevel"*
- dans tous les autres cas: *"DTR0"*

Si "actualLevel" > 0 et *"actualLevel"* < *"minLevel" suite au réglage d'un nouveau niveau min., "targetLevel"* doit être recalculé sur la base du nouveau *"minLevel"*. *"actualLevel"* doit être modifié en *"targetLevel"*immédiatement et le rendement lumineux doit être ajusté le plus rapidement possible.

"SET MAX LEVEL (DTR0)" doit définir *"maxLevel"* selon la valeur *"DTR0"* , comme suit:

- si *"minLevel"* ≥ *"DTR0"*: *"minLevel"*
- si *"DTR0"* = MASK: 0xFE
- dans tous les autres cas: *"DTR0"*

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Si *"actualLevel"* > *"maxLevel"* suite au réglage d'un nouveau niveau max, *"targetLevel"* doit être recalculé sur la base du nouveau *"maxLevel"*. *"actualLevel"* doit être modifié en *"targetLevel"*immédiatement et le rendement lumineux doit être ajusté le plus rapidement possible.

NOTE *"minLevel"* et *"maxLevel"* peuvent être utilisés pour compenser les différences de propriétés des appareillages de commande. Par exemple, si les appareillages de commande ont des valeurs différentes pour PHM, ils peuvent être réglés de manière à se comporter de façon similaire en ajustant *"minLevel"*.

9.7 Commandes

9.7.1 Généralités

Un appareillage de commande doit vérifier le schéma d'adressage du dispositif afin de déterminer si ce dernier est adressé par une commande. L'appareillage de commande doit accepter la commande, à moins qu'une ou plusieurs des conditions suivantes s'appliquent:

- La commande est envoyée par Short addressing (adressage court) et l'adresse courte attribuée n'équivaut pas à *"shortAddress"*.
- La commande est transmise par Group addressing (adressage de groupes) et le groupe attribué ne correspond pas aux groupes identifiés par *"gearGroups"*.
- La commande est envoyée par Reserved addressing (adressage réservé).
- La commande est envoyée par Broadcast Unaddressed addressing (adressage de diffusion non adressée) et *"shortAddress"* n'est pas la valeur MASK.
- La commande n'est pas définie.

Les groupes de commande suivants peuvent être identifiés:

- Instructions de niveau
  - Instructions de niveau sans modification de l'intensité lumineuse
  - Instructions de niveau déclenchant une modification de l'intensité lumineuse
- Instructions de configuration
- Requêtes
- Commandes spéciales
  - Instructions
  - Requêtes
- Commandes d'application étendues

9.7.2 Instructions de niveau sans modification de l'intensité lumineuse

Les instructions de niveau sans modification de l'intensité lumineuse sont des instructions où le *"targetLevel"* doit être calculé; le passage de *"actualLevel"* à *"targetLevel"*doit être immédiat et le rendement lumineux doit être ajusté le plus rapidement possible.

Ces commandes peuvent être réparties en trois catégories:

- Commandes de niveau absolu
  - "OFF", "RECALL MIN LEVEL", "RECALL MAX LEVEL",
- Commandes de niveau relatif
  - "STEP UP", "STEP DOWN", "ON AND STEP UP", "STEP DOWN AND OFF"
- Commandes de configuration
  - "RESET", "SET MAX LEVEL (DTR0)", "SET MAX LEVEL (DTR0)"

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

9.7.3 Instructions de niveau déclenchant une modification de l'intensité lumineuse

Les instructions de niveau déclenchant une modification de l'intensité lumineuse sont des instructions où le *"targetLevel"* doit être calculé; *"actualLevel"* doit effectuer une modification de l'intensité lumineuse vers *"targetLevel"* en utilisant les durée/vitesse correspondantes applicables. Si la durée de modification de l'intensité lumineuse est égale à 0 s, le passage de *"actualLevel"* à *"targetLevel"* doit être immédiat et le rendement lumineux doit être ajusté le plus rapidement possible.

Ces commandes peuvent être réparties en deux catégories:

- Instructions de niveau absolu utilisant la durée de modification de l'intensité lumineuse
  - "DAPC (*level*)", "GO TO SCENE (*sceneNumber*)", "GO TO LAST ACTIVE LEVEL"
- Instructions de niveau relatif utilisant la vitesse de modification de l'intensité lumineuse
  - "UP", "DOWN"

9.7.4 Instructions de configuration

Elles peuvent être utilisées pour modifier plusieurs propriétés d'appareillages de commande.

9.7.5 Requêtes

Elles peuvent être utilisées pour demander la valeur de plusieurs propriétés d'appareillages de commande.

9.7.6 Commandes spéciales

Ces commandes constituent un groupe de commandes non adressables. Tous les appareillages de commande doivent interpréter les commandes spéciales.

9.7.7 Commandes d'application étendues

Les commandes dont le code de fonctionnement se situe dans la plage de 0xE0 à 0xFF sont réservées aux types ou aux caractéristiques de dispositifs spéciaux. Chaque type ou caractéristique de dispositif redéfinit ces commandes, sauf la commande avec le code de fonctionnement 0xFF ("QUERY EXTENDED VERSION NUMBER"). Voir 9.189.18 pour de plus amples informations.

9.8 Itérations de commandes

9.8.1 Généralités

Les exigences de 9.4 de l'IEC 62386-101:2014 s'appliquent avec les additions suivantes.

9.8.2 Itération des commandes "UP" et "DOWN"

Les instructions "UP" et "DOWN" peuvent être transmises en tant qu'itération de commandes. À réception de la première instruction de ce type d'itération, à moins que les valeurs de "*minLevel*" ou "*maxLevel*" ne l'excluent, un pas ("*targetLevel*" = "*targetLevel*"±1) doit être exécuté.

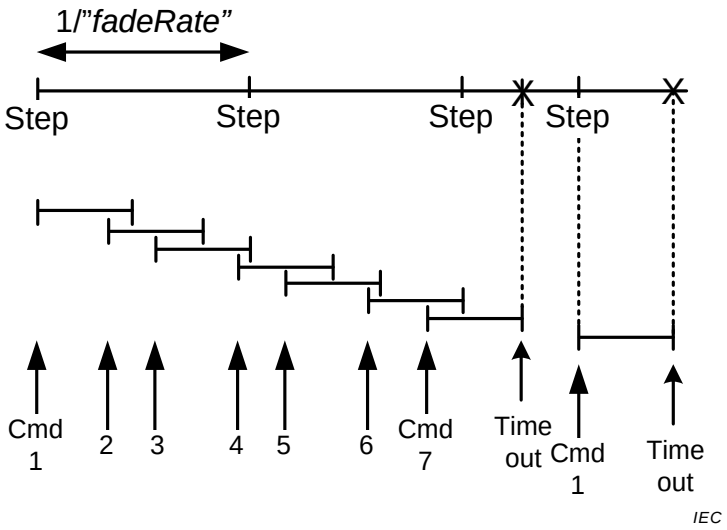
NOTE 1 Ceci garantit un impact certain au début d'une itération.

Au terme de ce premier pas, la modification de l'intensité lumineuse d'une durée de 200 ms doit débuter à la vitesse correspondante applicable. Les pas ultérieurs doivent être exécutés à des intervalles déterminés par la vitesse de modification de l'intensité lumineuse applicable, tant que l'itération se poursuit. Chaque instruction "UP" ou "DOWN" reçue comme partie intégrante de l'itération doit provoquer le redémarrage du processus de modification de l'intensité lumineuse d'une durée de 200 ms et un nouveau calcul de *"targetLevel"* sur la base de *"actualLevel"* et de la vitesse de modification de l'intensité lumineuse définie.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

NOTE 2 Lorsque la vitesse de modification de l'intensité lumineuse change au cours d'une itération de commande, la nouvelle vitesse n'est pas appliquée lors de l'exécution de cette itération de commande.

La Figure 5 résume le comportement nécessaire. Les itérations débutent à Cmd 1 et s'achèvent à Time out.



Légende

Anglais	Français
Step	Pas

Figure 5 – Cadencement et réponse lors de la réception d'une itération de commande

9.8.3 DAPC SEQUENCE (déconseillé)

"ENABLE DAPC SEQUENCE" initie une itération de commande de contrôle direct de la puissance d'arc (DAPC) qui permet un contrôle dynamique du rendement lumineux.

À réception de "ENABLE DAPC SEQUENCE", l'appareillage de commande doit utiliser provisoirement une durée de modification de l'intensité lumineuse de 200 ms ± 20 ms, tandis que l'itération de commande est active indépendamment de la durée de modification réelle/étendue. Une fois la dernière modification de la séquence achevée, les valeurs d'origine doivent être utilisées.

NOTE Étant donné que les variables de durée/vitesse de modification de l'intensité lumineuse ne changent pas, la durée/vitesse de modification peut être définie comme normale et/ou faire l'objet d'une requête en ce sens.

La séquence DAPC doit se terminer si au bout de 200 ms, l'appareillage de commande ne reçoit pas de commande "DAPC (level)". La séquence DAPC doit être abandonnée à la réception d'une commande de contrôle indirect de la puissance d'arc. "ENABLE DAPC SEQUENCE" reçue lors d'une itération de commande DAPC activée ne doit avoir aucun effet.

À réception de la première "DAPC (level)" après réception de la commande "ENABLE DAPC SEQUENCE", la modification de l'intensité lumineuse d'une durée de 200 ms doit débuter.

Dans la mesure où la séquence DAPC utilise une durée de modification de l'intensité lumineuse de 200 ms qui peut ne pas être exécutée par toutes les combinaisons d'appareillages de commande et de source de lumière, ce type d'appareillage peut simplement ajuster le rendement lumineux le plus rapidement possible. Il convient toutefois

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

qu'il réponde comme si la modification de l'intensité lumineuse était achevée dans la durée demandée.

9.9 Modes de fonctionnement

9.9.1 Généralités

Différents modes de fonctionnement peuvent être sélectionnés au moyen de la commande “SET OPERATING MODE (DTR0)”. Le *“operatingMode”* actuellement sélectionné peut faire l'objet d'une requête au moyen de “QUERY OPERATING MODE”.

Les modes de fonctionnement 0x00 à 0x7F sont définis dans la présente norme. Le mode de fonctionnement 0x00 au moins doit être disponible. Les modes de fonctionnement 0x80 à 0xFF sont spécifiques au fabricant. La requête “QUERY MANUFACTURER SPECIFIC MODE” peut être utilisée pour déterminer si le mode de fonctionnement de l'appareillage de commande est un mode normal défini dans la norme IEC 62386 ou un mode spécifique au fabricant.

9.9.2 Mode de fonctionnement 0x00: mode normal

Lorsqu'un dispositif est en mode normal (*“operatingMode”*= 0x00), son comportement doit être tel qu'exigé par cette spécification, jusqu'à ce qu'il soit réglé en mode de fonctionnement différent de 0x00.

9.9.3 Mode de fonctionnement 0x01 à 0x7F: réservé

Les modes de fonctionnement 0x01 à 0x7F sont réservés et ne doivent pas être utilisés.

9.9.4 Mode de fonctionnement 0x80 à 0xFF: modes spécifiques au fabricant

Il convient d'utiliser les modes spécifiques au fabricant uniquement si les caractéristiques exigées par l'application ne sont pas couvertes par la norme. Lorsque le mode de fonctionnement d'un appareillage de commande est spécifique au fabricant, le comportement dudit appareillage peut également être spécifique au fabricant, avec les exceptions suivantes:

- tant que l'appareillage de commande a accès au bus de terrain, il doit être conforme à l'IEC 62386-101:2014.
- l'appareillage de commande doit être conforme à cette spécification au moins tant que les commandes suivantes sont concernées:
  - “SET OPERATING MODE (DTR0)”, “QUERY OPERATING MODE”, et “QUERY MANUFACTURER SPECIFIC MODE”.
  - Toutes les commandes spéciales (voir 11.7) sauf WRITE MEMORY LOCATION (DTR1, DTR0, data), WRITE MEMORY LOCATION – NO REPLY (DTR1, DTR0, data) et PING.

Pour les commandes ci-dessus, les diverses méthodes d'adressage doivent s'appliquer, voir 7.2.2.

Il est recommandé de continuer à suivre les commandes spécifiées dans la présente norme même dans le cas de modes spécifiques au fabricant.

9.10 Blocs de mémoire

9.10.1 Généralités

Les blocs de mémoire sont des espaces mémoire librement accessibles définis, par exemple, pour l’identification de l’appareillage de commande dans un système. Il n'est pas nécessaire de mettre en œuvre tous les blocs de mémoire consécutifs. De même au sein d'un bloc de mémoire, il n'est pas nécessaire de mettre en œuvre tous les emplacements consécutifs.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tous les emplacements de blocs de mémoire mis en œuvre de tous les blocs de mémoire également mis en œuvre peuvent être lus au moyen de commandes d'accès de la mémoire. Une partie de la mémoire est en lecture seule et programmée par le fabricant de l'appareillage de commande. Pour toutes les autres parties, l'accès en écriture au moyen de commandes d'accès de la mémoire peut être activé par le fabricant. L'accès en écriture à un emplacement de bloc de mémoire peut être verrouillé. Les blocs de mémoire peuvent être mis en œuvre en utilisant une mémoire RAM, ROM ou NVM.

L'espace mémoire adressable est limité à un espace maximum de près de 64 koctets, organisé en 256 blocs de mémoire au maximum, chaque bloc comportant 255 octets au maximum. Dans la mesure où la présente norme précise comment mettre en œuvre les blocs de mémoire 0 et 1 (lorsqu'ils existent), et réserve les blocs de mémoire 200 à 255, ceci laisse de l'espace pour 198 blocs de mémoire pour des besoins spécifiques au fabricant dans la plage de [2,199].

9.10.2 Carte de mémoire

Lorsqu'un bloc de mémoire spécifique au fabricant dans la plage de [2,199] est mis en œuvre, l'affectation de son contenu doit être conforme à la carte de mémoire fournie dans le Tableau 8.

Tableau 8 – Carte de mémoire de base des blocs de mémoire

Adresse	Description	Valeur par défaut (valeur d'origine)	Valeur RESET [b]	Type de mémoire
0x00	Adresse du dernier emplacement de mémoire accessible	Rodage en usine, plage [0x03,0xFE]	Pas de modification	ROM
0x01	Octet indicateur [a]	[a]	[a]	Tout type [a]
0x02	octet de verrouillage du bloc de mémoire. Les octets verrouillables dans le bloc de mémoire doivent être en lecture seule tandis que l'octet de verrouillage a une valeur différente de 0x55.	0xFF	0xFF[c]	RAM
[0x03,0xFE]	Contenu de bloc de mémoire [a]	[a]	[a]	Tout type [a]
0xFF	Réservée – non mise en œuvre	Réponse NO	Pas de modification	n.a.

[a] L'objet, la valeur par défaut/de mise sous tension/de réinitialisation et l'accès mémoire de ces octets doivent être définis par le fabricant

[b] Valeur réinitialisée “RESET MEMORY BANK”

[c] Également utilisée comme valeur de mise sous tension sauf indication contraire explicite

L'octet se trouvant dans l'emplacement 0x00 de chaque bloc contient l'adresse du dernier emplacement de mémoire accessible du bloc. La valeur doit être comprise dans la plage [0x03,0xFE].

L'octet dans l'emplacement 0x01 est spécifique au fabricant. Lorsqu'il est mis en œuvre, il convient que le fabricant décrive l'utilisation de cet octet (ainsi que l'ensemble du contenu du bloc de mémoire).

NOTE 1 Il peut être utilisé, par exemple, pour mémoriser une somme de contrôle dans le cas d'un bloc de mémoire à contenu statique. Il n'est pas utile d'utiliser une somme de contrôle dans un bloc de mémoire dont le contenu est modifié par l'appareillage de commande.

L'octet de l'emplacement 0x02 doit être utilisé pour verrouiller l'accès en écriture. L'emplacement de mémoire 0x02 proprement dit ne doit jamais être verrouillé pour écriture. Alors que cet emplacement de mémoire contient toute valeur différente de 0x55, tous les emplacements de mémoire marqués "(verrouillables)" du bloc de mémoire correspondant

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

doivent être en lecture seule. L'appareillage de commande ne doit pas modifier la valeur de l'octet de verrouillage autrement que suite au cycle de mise sous tension, à un "RESET MEMORY BANK (DTR0)" ou à toute autre commande affectant l'octet de verrouillage.

L'emplacement 0xFF est un emplacement réservé dans chaque bloc de mémoire et n'est pas accessible. Cet emplacement ne doit pas être mis en œuvre comme emplacement de bloc de mémoire normal. Lorsqu'il est adressé, l'appareillage de commande doit répondre comme si cet emplacement n'était pas mis en œuvre, et il ne doit pas augmenter "*DTR0*".

NOTE 2 Cet emplacement est réservé pour interrompre l'augmentation automatique de DTRO.

9.10.3 Sélection d'un emplacement de bloc de mémoire

Pour sélectionner un emplacement de bloc de mémoire, une combinaison de numéro et d'emplacement au sein du bloc de mémoire est exigée.

Le bloc de mémoire doit être sélectionné par un réglage du numéro de bloc de mémoire en *"DTR1"*. L'emplacement dans le bloc de mémoire doit être sélectionné par la valeur en *"DTR0"*.

9.10.4 Lecture dans le bloc de mémoire

Un emplacement de bloc de mémoire sélectionné peut être lu au moyen de la commande "READ MEMORY LOCATION (DTR1, DTR0)". La réponse doit être la valeur de l'octet à l'emplacement de bloc de mémoire adressé.

Lorsque le bloc de mémoire sélectionné n'est pas mis en œuvre, la commande doit être ignorée. Lorsque le bloc de mémoire existe, et l'emplacement de bloc de mémoire sélectionné

- n'est pas mis en œuvre, ou
- se situe au-dessus du dernier emplacement de mémoire accessible,

la réponse doit être NO.

Lorsque l'emplacement de bloc de mémoire sélectionné se situe en dessous de l'emplacement 0xFF, *"DTR0"* doit être augmenté de un, même si l'emplacement de mémoire n'est pas mis en œuvre. Dans le cas contraire, *"DTR0"* ne doit pas varier. Ce mécanisme permet une lecture consécutive facile des emplacements de blocs de mémoire.

Afin de garantir l'existence de données cohérentes lors de la lecture d'une valeur à plusieurs octets issue d'un bloc de mémoire, il est recommandé de mettre en œuvre un mécanisme qui verrouille tous les octets de la valeur à plusieurs octets lors de la lecture du premier octet de ladite valeur, et qui déverrouille les octets à réception de toute commande autre que "READ MEMORY LOCATION (DTR1, DTR0)".

Après lecture de nombreux octets issus d'un bloc de mémoire, il convient que le contrôleur d'application vérifie la valeur de "*DTR0*" afin de s'assurer que son emplacement est celui attendu/souhaité. Tout défaut d'adaptation indique une erreur de lecture.

9.10.5 Écriture dans le bloc de mémoire

Les commandes en écriture sont des commandes spéciales et ne sont par conséquent pas adressables. Afin de sélectionner le ou les appareillages de commande corrects, la commande adressable "ENABLE WRITE MEMORY" doit être utilisée. À réception de "ENABLE WRITE MEMORY", le ou les appareils de commande adressés doivent régler *"writeEnableState"* sur ENABLED.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

L'appareillage de commande doit accepter les commandes suivantes d'écriture dans un emplacement de bloc de mémoire sélectionné uniquement lorsque *"writeEnableState"* est ENABLED et lorsque le bloc de mémoire adressé est mis en œuvre:

- "WRITE MEMORY LOCATION (DTR1, DTR0, data)": L'appareillage de commande doit confirmer l'écriture dans un emplacement de mémoire par une réponse équivalant à la valeur *data*.

NOTE 1 La valeur qui peut être lue à partir de l'emplacement de bloc de mémoire n'est pas nécessairement *data*.

- "WRITE MEMORY LOCATION – NO REPLY (DTR1, DTR0, data)": L'écriture dans un emplacement de mémoire ne doit pas entraîner de réponse de l'appareillage de commande.

Un appareillage de commande doit régler *"writeEnableState"* sur DISABLED en cas de réception de toute commande autre que l'une des commandes suivantes:

- "WRITE MEMORY LOCATION (DTR1, DTR0, data)", "WRITE MEMORY LOCATION – NO REPLY (DTR1, DTR0, data)"
- "*DTR0* (data)", "*DTR1* (data)", "*DTR2* (data)"
- "QUERY CONTENT DTR0", "QUERY CONTENT DTR1", "QUERY CONTENT DTR2"

Lorsque l'emplacement de bloc de mémoire sélectionné

- n'est pas mis en œuvre, ou
- se situe au-dessus du dernier emplacement de mémoire accessible, ou
- est verrouillé (voir 9.10.2), ou
- n'est pas inscriptible

la réponse à "WRITE MEMORY LOCATION (DTR1, DTR0, data)" doit être NO et aucun emplacement de mémoire ne doit être en mode écriture.

Lorsque l'emplacement de bloc de mémoire sélectionné se situe en dessous de l'emplacement 0xFF, *"DTR0"* doit être augmenté de un. Dans le cas contraire, *"DTR0"* ne doit pas varier. Ce mécanisme permet une écriture consécutive facile dans les emplacements de blocs de mémoire.

Afin de garantir l'existence de données cohérentes lors de la saisie d'une valeur à plusieurs octets dans un bloc de mémoire, il est recommandé de mettre en œuvre un mécanisme qui accepte uniquement la nouvelle valeur à plusieurs octets à saisir après réception de tous les octets de ladite valeur.

Après la saisie de nombreux octets dans un bloc de mémoire, il convient que le contrôleur d'application vérifie la valeur de "*DTR0*" afin de s'assurer que son emplacement est celui attendu/souhaité. Tout défaut d'adaptation indique une erreur d'écriture.

NOTE 2 "*DTR0*" est également augmenté lorsqu'un emplacement de bloc de mémoire non mis en œuvre est adressé avant d'atteindre 0xFF.

9.10.6 Bloc de mémoire 0

Il contient les informations concernant les appareillages de commande. Le bloc de mémoire 0 doit être mis en œuvre dans tous les appareillages de commande.

Le bloc de mémoire 0 doit être mis en œuvre en utilisant la carte de mémoire présentée dans le Tableau 9, avec mise en œuvre d'au moins les emplacements de mémoire jusqu'à l'adresse 0x7F, en excluant les emplacements réservés.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 9 – Carte de la mémoire du bloc de mémoire 0

Adresse	Description	Valeur par défaut (valeur d'origine)	Type de mémoire
0x00	adresse du dernier emplacement de mémoire accessible	rodage en usine	ROM
0x01	Réservée – non mise en œuvre	réponse NO	n.a.
0x02	numéro du dernier bloc de mémoire accessible	rodage en usine, plage [0,0xFF]	ROM
0x03	Octet GTIN 0 (octet de poids fort) [a]	rodage en usine	ROM
0x04	Octet GTIN 1	rodage en usine	ROM
0x05	Octet GTIN 2	rodage en usine	ROM
0x06	Octet GTIN 3	rodage en usine	ROM
0x07	Octet GTIN 4	rodage en usine	ROM
0x08	Octet GTIN 5 (octet de poids faible)	rodage en usine	ROM
0x09	version du microprogramme (principale)	rodage en usine	ROM
0x0A	version du microprogramme (secondaire)	rodage en usine	ROM
0x0B	Octet de numéro d'identification 0 (octet de poids fort)	rodage en usine	ROM
0x0C	Octet de numéro d'identification 1	rodage en usine	ROM
0x0D	Octet de numéro d'identification 2	rodage en usine	ROM
0x0E	Octet de numéro d'identification 3	rodage en usine	ROM
0x0F	Octet de numéro d'identification 4	rodage en usine	ROM
0x10	Octet de numéro d'identification 5	rodage en usine	ROM
0x11	Octet de numéro d'identification 6	rodage en usine	ROM
0x12	Octet de numéro d'identification 7 (octet de poids faible)	rodage en usine	ROM
0x13	version du matériel (principale)	rodage en usine	ROM
0x14	version du matériel (secondaire)	rodage en usine	ROM
0x15	numéro de version 101	rodage en usine, selon le numéro de version mis en œuvre	ROM
0x16	numéro de version 102 de tous les appareillages de commande intégrés [b]	rodage en usine, selon le numéro de version mis en œuvre	ROM
0x17	numéro de version 103 de tous les dispositifs de commande intégrés [b]	rodage en usine, selon le numéro de version mis en œuvre	ROM
0x18	nombre de dispositifs de commande logiques dans le bus	rodage en usine, plage [0,64]	ROM
0x19	nombre d'appareillages de commande logiques dans le bus	rodage en usine, plage [1,64]	ROM
0x1A	indice de cet appareillage de commande logique	rodage en usine, plage [0,(emplacement 0x19)-1]	ROM
[0x1B,0x7F]	Réservée – non mise en œuvre	réponse NO	n.a.
[0x80,0xFE]	informations supplémentaires concernant les appareillages de commande [c]	[c]	ROM
0xFF	Réservée – non mise en œuvre	réponse NO	n.a.

[a] Il est recommandé de ne pas réutiliser le produit GTIN au cours de la durée de vie prévue du produit après installation.

[b] Le format du numéro de version est défini en 4.2. Lorsqu'il n'est pas mis en œuvre, ceci est indiqué par 0xFF.

[c] L'objet et la valeur (par défaut) de ces octets doivent être définis par le fabricant.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Lorsqu'un bus comporte deux unités logiques ou plus, toutes les unités logiques doivent avoir les mêmes valeurs dans les emplacements de blocs de mémoire 0x03 jusqu'à et y compris 0x19.

Un bus peut contenir à la fois des appareillages de commande et des dispositifs de commande. Ceux-ci partagent différents numéros (par exemple, GTIN, numéro d'identification unique…). Afin d'éviter les problèmes en lecture et d'obtenir différentes réponses selon le schéma d'adressage utilisé, la présentation du bloc de mémoire est identique pour les appareillages de commande et les dispositifs de commande jusqu'à et y compris l'emplacement 0x19. Les données doivent être également identiques. Le contrôleur d'application peut utiliser les commandes 102 ou 103 afin d'identifier les données de base, à condition que ces deux commandes soient mises en oeuvre.

Les octets des emplacements 0x03 à 0x08 (“GTIN 0” à “GTIN 5”) doivent contenir le code article international (GTIN), par exemple, le numéro EAN en binaire. Les octets doivent être mémorisés en commençant par le bit de poids fort et doivent contenir des zéros non significatifs.

Les octets des emplacements 0x09 et 0x0A (“version du microprogramme”) doivent contenir la version du microprogramme du bus.

Les octets des emplacements 0x0B à 0x12 («octet de numéro d'identification 0» à «octet de numéro d'identification 7») doivent contenir 64 bits d'un numéro d'identification du bus, de préférence le numéro de série. Le numéro d'identification doit être mémorisé avec l'octet de poids fort dans l' “octet de numéro d'identification 7” et les bits non utilisés doivent être remplis de 0.

La combinaison du numéro d'identification et du numéro GTIN doit être unique.

L'octet des emplacements 0x13 et 0x14 (“version du matériel”) doit contenir la version du matériel du bus.

L'octet de l'emplacement 0x15 doit contenir le numéro de version IEC 62386-101 mis en œuvre du bus.

L'octet de l'emplacement 0x16 doit contenir le numéro de version IEC 62386-102 mis en œuvre du bus. En l'absence de mise en œuvre d'un appareillage de commande, le numéro de version doit être 0xFF.

L'octet de l'emplacement 0x17 doit contenir le numéro de version IEC 62386-103 mis en œuvre du bus. En l'absence de mise en œuvre d'un dispositif de commande, le numéro de version doit être 0xFF.

L'octet de l'emplacement 0x18 doit contenir le numéro de dispositifs de commande logiques intégrés dans le bus. Le nombre d'unités logiques doit être compris entre 0 et 64.

L'octet de l'emplacement 0x19 doit contenir le numéro d'appareillages de commande logiques intégrés dans le bus. Le nombre d'unités logiques doit être compris entre 1 et 64.

L'octet de l'emplacement 0x1A doit représenter l'indice unique de l'appareillage de commande logique qui met en œuvre ce bloc de mémoire. La plage valide de cet indice est comprise entre 0 et le nombre total d'appareillages de commande logiques intégrés au bus de terrain moins un.

NOTE À titre d'exemple, un produit peut contenir trois dispositifs logiques avec trois adresses courtes différentes. Chaque appareillage de commande a le même GTIN et le même numéro d'identification, et chacun de ces appareillages consigne la valeur 3 pour le nombre de dispositifs, l'indice des trois appareillages de commande

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

étant pour sa part consigné comme valeur 0, 1 ou 2 respectivement. La lecture de l'emplacement 0x1A par diffusion produit une trame en arrière conformément à 9.5.2 de l'IEC 62386-101:2014 (trame en arrière de chevauchement).

9.10.7 Bloc de mémoire 1

Il est réservé pour être utilisé par un EOM (fabricant d'origine (ou Original Equipment Manufacturer en anglais), par exemple, fabricant de luminaire) pour mémoriser des informations supplémentaires n'ayant aucune influence sur la fonctionnalité de l'appareillage de commande. Le fabricant de l'appareillage de commande peut mettre en œuvre le bloc de mémoire 1.

Lorsqu'il est mis en œuvre, le bloc de mémoire 1 doit au moins mettre en œuvre les emplacements de mémoire jusqu'à et y compris l'adresse 0x10. L'utilisation fixe pour l'emplacement 0x00 à 0x02 et l'utilisation de la carte de mémoire recommandée pour l'emplacement 0x03 à 0x10 est présentée dans le Tableau 10.

Tableau 10 – Carte de la mémoire du bloc de mémoire 1

Adresse	Description	Valeur par défaut (valeur d'usine)	Valeur RESET [b]	Type de mémoire
0x00	adresse du dernier emplacement de mémoire accessible	rodage en usine, plage [0x10,0xFE]	pas de modification	ROM
0x01	octet indicateur [a]	[a]	[a]	tout type[a]
0x02	octet de verrouillage du bloc de mémoire 1. Les octets verrouillables dans le bloc de mémoire doivent être en lecture seule tandis que l'octet de verrouillage a une valeur différente de 0x55.	0xFF	0xFF[c]	RAM
0x03	Octet GTIN fabricant d'origine 0 (octet de poids fort)	0xFF	pas de modification	NVM (verrouillable)
0x04	Octet GTIN fabricant d'origine 1	0xFF	pas de modification	NVM (verrouillable)
0x05	Octet GTIN fabricant d'origine 2	0xFF	pas de modification	NVM (verrouillable)
0x06	Octet GTIN fabricant d'origine 3	0xFF	pas de modification	NVM (verrouillable)
0x07	Octet GTIN fabricant d'origine 4	0xFF	pas de modification	NVM (verrouillable)
0x08	Octet GTIN fabricant d'origine 5 (octet de poids faible)	0xFF	pas de modification	NVM (verrouillable)
0x09	Octet de numéro d'identification fabricant d'origine 0 (octet de poids fort)	0xFF	pas de modification	NVM (verrouillable)
0x0A	Octet de numéro d'identification fabricant d'origine 1	0xFF	pas de modification	NVM (verrouillable)
0x0B	Octet de numéro d'identification fabricant d'origine 2	0xFF	pas de modification	NVM (verrouillable)
0x0C	Octet de numéro d'identification fabricant d'origine 3	0xFF	pas de modification	NVM (verrouillable)
0x0D	Octet de numéro d'identification fabricant d'origine 4	0xFF	pas de modification	NVM (verrouillable)
0x0E	Octet de numéro d'identification fabricant d'origine 5	0xFF	pas de modification	NVM (verrouillable)
0x0F	Octet de numéro d'identification fabricant d'origine 6	0xFF	pas de modification	NVM (verrouillable)
0x10	Octet de numéro d'identification fabricant d'origine 7 (octet de poids faible)	0xFF	pas de modification	NVM (verrouillable)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Adresse	Description	Valeur par défaut (valeur d'usine)	Valeur RESET [b]	Type de mémoire
0x11	informations supplémentaires concernant les appareillages de commande [a]	[a]	[a]	[a]
0xFF	Réservée – non mise en œuvre	réponse NO	pas de modification	n.a.

[a] L'objet, la valeur par défaut/de mise sous tension/de réinitialisation et l'accès mémoire de ces octets doivent être définis par le fabricant

[b] Valeur réinitialisée “RESET MEMORY BANK”

[c] Également utilisée comme valeur de mise sous tension

Il convient d'utiliser les octets des emplacements 0x03 à 0x08 («GTIN fabricant d’origine 0» à «GTIN fabricant d’origine 5») pour identifier le produit contenant l'appareillage de commande. Lorsque les octets sont utilisés pour le GTIN, ils doivent être mémorisés en commençant par le bit de poids fort et doivent contenir des zéros non significatifs. Il convient que ces octets soient programmés par le fabricant d'origine.

Il convient que les octets des emplacements 0x09 à 0x10 («Octet de numéro d'identification fabricant d’origine 0» à «Octet de numéro d'identification fabricant d’origine 7») contiennent 64 bits d'un numéro d'identification du produit du fabricant d'origine. Lorsque les octets sont utilisés pour le numéro d'identification, ils doivent être mémorisés avec l'octet de poids faible dans l' “octet de numéro d'identification 7” et les bits non utilisés doivent être remplis de 0. Il convient que ces octets soient programmés par le fabricant d'origine.

Il convient que la combinaison du GTIN fabricant d'origine et du numéro d'identification fabricant d'origine soit unique.

9.10.8 Blocs de mémoire spécifiques au fabricant

Le fabricant peut utiliser des blocs de mémoire supplémentaires dans la plage de 2 à 199 afin de mémoriser des informations supplémentaires. La carte de la mémoire des blocs supplémentaires doit être conforme au Tableau 8.

9.10.9 Blocs de mémoire réservés

Les blocs de mémoire 200 à 255 sont réservés pour une utilisation future et ne doivent pas être mis en œuvre.

9.11 Réinitialisation

9.11.1 Opération de réinitialisation

Un appareillage de commande doit effectuer une opération de réinitialisation afin de régler toutes les variables sur leurs valeurs réinitialisées (voir Tableau 14).

NOTE Pour certaines variables, cette opération pourrait n'avoir strictement aucun impact.

La réalisation de l'opération de réinitialisation doit durer au plus 300 ms. Au cours de l'exécution de l'opération de réinitialisation, l'appareillage de commande peut ou non répondre à toute commande. Toutefois, tant que l'opération de réinitialisation n'est pas achevée, il n'est pas nécessaire de définir une valeur pour les variables concernées quelles qu'elles soient.

Un contrôleur d'application peut déclencher l'opération de réinitialisation au moyen de l'instruction “RESET” et il convient que ce dernier attende au moins 350 ms pour s'assurer que tous les appareillages de commande ont achevé l'opération de réinitialisation.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

9.11.2 Opération de réinitialisation des blocs de mémoire

Un appareillage de commande doit effectuer une opération de réinitialisation afin de régler le contenu de tous les blocs de mémoire non verrouillés sur leurs valeurs réinitialisées (voir 9.10), suivie par le verrouillage des blocs de mémoire.

NOTE Pour certains emplacements de blocs de mémoire, cette opération pourrait n'avoir strictement aucun impact.

La réalisation de l'opération de réinitialisation doit durer au plus 10 s. Au cours de l'exécution de l'opération de réinitialisation, l'appareillage de commande peut ou non répondre à toute commande. Toutefois, tant que l'opération de réinitialisation n'est pas achevée, il n'est pas nécessaire de définir une valeur pour les emplacements de blocs de mémoire concernés quels qu'ils soient.

Un contrôleur d'application peut déclencher l'opération de réinitialisation pour un bloc de mémoire spécifique, ou pour tous les blocs de mémoire mis en œuvre, au moyen de l'instruction “RESET MEMORY BANK (DTR0)”, et il convient que ce dernier attende au moins 10,1 s pour que tous les appareillages de commande disposent d'une durée suffisante pour achever l'opération de réinitialisation des blocs de mémoire.

9.12 Défaillance système

Lorsque l'appareillage de commande détecte une défaillance système (voir IEC 62386-101, 4.11) et lorsque *“systemFailureLevel”* n'est pas la valeur MASK, *“targetLevel”* doit être calculé sur la base de *“systemFailureLevel”*. Le passage de *“actualLevel”* à *“targetLevel”* doit être immédiat et le rendement lumineux doit être ajusté le plus rapidement possible.

Si *“systemFailureLevel”* est la valeur MASK, l'appareillage de commande ne doit pas réagir à une défaillance système.

Au rétablissement de la tension libre du bus de terrain, l’appareillage de commande ne doit pas réagir.

“systemFailureLevel” peut être défini et faire l'objet d'une requête avec “SET SYSTEM FAILURE LEVEL (DTR0)” et “QUERY SYSTEM FAILURE LEVEL” respectivement.

Lorsque le rétablissement de l'alimentation du bus se produit après une défaillance système, les appareillages de commande alimentés par le bus doivent suivre la procédure de mise sous tension définie en 9.13 ci-dessous. Par conséquent, la variable *“systemFailureLevel”* n'est pas utilisée. Néanmoins, tous les appareillages de commande, y compris ceux alimentés par le bus, doivent maintenir le *“systemFailureLevel”* et être conformes aux exigences des spécifications de toutes les commandes qui y sont associées.

NOTE La mise en œuvre de *“systemFailureLevel”*, bien que cette variable ne soit normalement pas applicable pour les dispositifs alimentés par le bus, est effectuée pour éviter des conditions d'essai distinctes des appareillages de commande.

9.13 Mise sous tension

Après un cycle de mise sous tension externe (voir IEC 62386-101, 4.11.1), le dispositif doit conserver sa configuration la plus récente, avec les exceptions suivantes:

- L'état d'autorisation d'écriture des blocs de mémoire doit être désactivé pour tous les blocs de mémoire et l'octet de verrouillage doit être réglé sur 0xFF
- Toutes les minuteries actives doivent être arrêtées et annulées/réinitialisées
- *“powerCycleSeen”* doit être réglé sur TRUE
- *“actualLevel”* doit être réglé sur 0x00 en maintenant la lampe éteinte

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

- *"lampOn"* doit être réglé sur FALSE
- *"limitError"* doit être réglé sur FALSE
- *"targetlevel"* doit être réglé sur 0x00
- L'appareillage de commande peut commencer à préchauffer la lampe, mais celle-ci ne doit pas s'amorcer. Lors du préchauffage, "*actualLevel*" doit être maintenu à 0x00, contrairement à l'activité de démarrage normal.

Les dispositifs alimentés par le bus doivent activer immédiatement le niveau de mise sous tension. Pour les dispositifs à alimentation externe, le principe suivant s'applique:

En cas de réception d'une commande de contrôle de niveau autre que "GO TO SCENE (*sceneNumber*)" où la valeur du scénario équivaut à la valeur MASK et autre que DAPC(MASK), celle-ci doit être exécutée.

Lorsque "GO TO SCENE (*sceneNumber*)" où la valeur du scénario équivaut à la valeur MASK, est reçue, l'appareillage de commande doit ignorer la commande et continuer à fonctionner comme si aucune commande de contrôle de niveau n'avait été reçue.

Lorsque DAPC(MASK) est reçue, l'appareillage de commande doit interrompre toute activité de démarrage.

NOTE 1 Dans la mesure où *"actualLevel"* = 0, ceci maintient effectivement la lampe éteinte.

L'appareillage de commande doit activer le niveau de mise sous tension selon le Tableau 11 en calculant le *"targetLevel"* sur la base de *"powerOnLevel".* Si *"powerOnLevel"* équivaut à MASK, *"targetLevel"*doit être réglé sur *"lastLightLevel"."actualLevel"*doit être réglé sur *"targetLevel"* immédiatement et le rendement lumineux doit être ajusté le plus rapidement possible.

En cas de réception d'une commande de contrôle de niveau avant l'activation du niveau de mise sous tension, cette commande doit être exécutée immédiatement et l'appareillage de commande ne doit pas activer le niveau de mise sous tension.

Tableau 11 – Cadencement de la mise sous tension

Comportement lors de la mise sous tension	Durée minimale	Durée maximale
Lampe éteinte		540 ms
Zone grisée	> 540 ms	< 660 ms
Niveau de mise sous tension	660 ms	

NOTE 2 Il existe ainsi un intervalle au cours duquel un dispositif de commande peut transmettre une commande de contrôle de niveau qui sera respectée immédiatement, et DAPC(0x00) ou DAPC(MASK) peut donc être utilisée pour éviter tout transfert automatique sur *"powerOnLevel"*.

NOTE 3 Il est possible de détecter une défaillance système avant d'atteindre le niveau de mise sous tension. Lorsque "*systemFailureLevel*" n'est pas la valeur MASK, le *"targetLevel"* est recalculé sur la base de *"systemFailureLevel"*.

"powerOnLevel" peut être défini et faire l'objet d'une requête avec "SET POWER ON LEVEL (DTR0)" et "QUERY POWER ON LEVEL" respectivement.

Après réception de la première trame en avant à 16 bits au niveau de l'interface après mise sous tension, l'appareillage de commande doit répondre uniquement aux trames décrites dans l'IEC 62386-101.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

9.14 Attribution d'adresses courtes

9.14.1 Généralités

"shortAddress" doit être déduite de *data* ou *"DTR0"* selon la commande utilisée. Elle doit être définie à réception de PROGRAM SHORT ADDRESS (data)" ou "SET SHORT ADDRESS (DTR0)" comme suit:

- si *data* ou *"DTR0"* = MASK: MASK (l'adresse courte est effectivement supprimée)
- si *data* ou *"DTR0"* = 1xxxxxxxb ou xxxxxxx0b: aucun changement
- dans tous les autres cas (0AAAAAA1b): 00AAAAAAb.

9.14.2 Affectation d'adresses aléatoires

Un appareillage de commande doit mettre en œuvre un état d'initialisation qui active uniquement, outre les autres opérations identifiées dans la présente norme, un ensemble de commandes qui permettent à un contrôleur d'application de détecter et d'identifier de manière unique le ou les appareillages de commande disponibles sur le bus et d'attribuer des adresses courtes à ces dispositifs.

L'état d'initialisation est un état provisoire activé au moyen de la commande "INITIALISE (device)". Il doit s'interrompre automatiquement dans un délai de 15 minutes ± 1,5 minute après réception de la dernière commande "INITIALISE (device)". De plus, un cycle de mise sous tension ou la commande "TERMINATE" doit conduire l'appareillage de commande à quitter immédiatement l'état d'initialisation.

L'appareillage de commande doit comporter trois valeurs possibles pour *"initialisationState"*:

- DISABLED, dans un état autre que l'état d'initialisation
- ENABLED, dans l'état d'initialisation
- WITHDRAWN, dans l'état d'initialisation, effectivement identifié et retiré

Les commandes (spéciales) suivantes sont des commandes d'initialisation:

- "RANDOMISE", "COMPARE" et "WITHDRAW"
- "SEARCHADDRH (data)", "SEARCHADDRM (data)" et "SEARCHADDRL (data)"
- "PROGRAM SHORT ADDRESS (data)", "VERIFY SHORT ADDRESS (data)" et "QUERY SHORT ADDRESS"
- "IDENTIFY DEVICE"

NOTE "IDENTIFY DEVICE" n'est pas en soi une commande d'initialisation, mais elle est utilisée généralement lors de l'initialisation

9.14.3 Identification d'un dispositif

9.14.3.1 Généralités

Lors de l'identification, aucune variable ne doit être altérée sauf indication contraire explicite. Le cas échéant, les variables peuvent être ignorées provisoirement, de sorte qu'il n'y ait aucun effet secondaire une fois l'identification terminée.

Lorsque l'identification est active, le rendement lumineux peut se situer à tout niveau entre désactivé et 100%, "*minLevel*" et "*maxLevel*", ainsi que "*actualLevel*" étant effectivement ignorés provisoirement.

L'identification doit s'interrompre à réception de toute instruction autre que INITIALISE (device), RECALL MIN LEVEL, RECALL MAX LEVEL ou IDENTIFY DEVICE.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Après interruption de l'identification, le rendement lumineux doit être ajusté le plus rapidement possible afin de refléter “*actualLevel*” et la commande doit être exécutée (le cas échéant).

9.14.3.2 Méthode 1: instruction simple

L'identification peut être initiée par l'envoi de l'instruction “IDENTIFY DEVICE”. Ceci doit démarrer ou redémarrer une minuterie de 10 s ± 1 s. Alors que la minuterie est en fonctionnement, une procédure qui permet à un observateur d'identifier l'appareillage de commande sélectionné doit être exécutée. L'identification doit s'interrompre en cas d'expiration de la minuterie.

NOTE La procédure réelle est spécifique au fabricant.

Alors que l'identification est active, l'appareillage de commande doit, sans interrompre la procédure d'identification:

- Avec RECALL MIN LEVEL: définir “*actualLevel*” et “*targetLevel*” sur “*minLevel*”
- Avec RECALL MAX LEVEL:définir “*actualLevel*” et “*targetLevel*” sur “*maxLevel*”

Lorsqu'une identification est interrompue par un contrôleur d'application, la minuterie correspondante doit être annulée immédiatement.

Pour des exemples de pratiques d'utilisation des commandes, voir Annexe A.

9.14.3.3 Méthode 2: utilisation de “RECALL MAX LEVEL” et/ou “RECALL MIN LEVEL” (déconseillé)

Alors que *“initialisationState”* n'est pas DISABLED, l'appareillage de commande doit:

- Avec RECALL MIN LEVEL: définir “*actualLevel*” et “*targetLevel*” sur “*minLevel*”, puis ajuster le rendement lumineux le plus rapidement possible sur son niveau PHM. Si, toutefois, PHM n'est pas visiblement foncièrement différent de 100 %, la lampe doit alors en revanche être éteinte provisoirement.
- Avec RECALL MAX LEVEL: définir “*actualLevel*” et “*targetLevel*” sur “*maxLevel*”, puis ajuster le rendement lumineux le plus rapidement possible sur 100 %.

Lorsque le dispositif ne peut pas être lui-même identifié visuellement de cette manière, l'appareillage de commande doit répondre comme s'il avait reçu également “IDENTIFY DEVICE”, en lançant ou en redéclenchant la procédure d'identification.

NOTE Il est acceptable que le processus d'identification de l'appareillage de commande individuel dépende des deux commandes reçues en alternance.

L'identification doit être interrompue immédiatement lorsque l'une des conditions suivantes s'applique:

- le *“initialisationState”* passe à l'état DISABLED
- à réception de toute instruction autre que INITIALISE (device), RECALL MIN LEVEL, RECALL MAX LEVEL ou IDENTIFY DEVICE.

Pour des exemples de pratiques d'utilisation des commandes, voir Annexe A.

9.14.4 Affectation d’adresses directes

“SET SHORT ADDRESS (DTR0)” peut être utilisé pour programmer directement une adresse courte sur l'appareillage adressé.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

9.15 Comportement en état de défaillance

Si l'appareillage se trouve dans un état de défaillance où le fonctionnement prévu de la ou des lampes n'est pas possible (lampe grillée/et ou défaillance de l'appareillage de commande), il doit réagir aux commandes de niveau de la manière suivante:

L'appareillage de commande doit calculer *"targetLevel"* conformément aux commandes reçues, et contrôler la lampe dans la mesure où la pratique le permet. La panne pourrait modifier provisoirement la relation normale entre *"actualLevel"* et le rendement lumineux.

NOTE Par exemple, un appareillage de commande peut, lorsqu'il détecte une température excessivement élevée, se protéger contre le risque de dommage thermique par une limitation du rendement lumineux.

Lorsque l'état de défaillance est résolu, l'appareillage de commande doit rétablir la relation normale entre *"actualLevel"*et le rendement lumineux.

9.16 Information d'état

9.16.1 Généralités

Chaque appareillage de commande doit présenter son état sous la forme d'une combinaison de propriétés de dispositif comme indiqué dans le Tableau 12

Tableau 12 – État de l'appareillage de commande

Bit	Description	Valeur	Voir
0	*"controlGearFailure"* est TRUE?	"1" = "YES"	9.16.2
1	*"lampFailure"* est TRUE?	"1" = "YES"	9.16.3
2	*"lampOn"* est TRUE?	"1" = "YES"	9.16.4
3	*"limitError"* est TRUE?	"1" = "YES"	9.16.5
4	*"fadeRunning"* est TRUE?	"1" = "YES"	9.16.6
5	*"resetState"* est TRUE?	"1" = "YES"	9.16.7
6	*"shortAddress"* est MASK?	"1" = "YES"	9.16.8
7	*"powerCycleSeen"* est TRUE?	"1" = "YES"	9.16.9

L'état du dispositif peut faire l'objet d'une requête en utilisant "QUERY STATUS". Les bits doivent refléter la situation réelle sans retard sauf indication contraire explicite.

9.16.2 Bit 0: Défaillance de l'appareillage de commande (Control gear failure)

Une défaillance de l'appareillage de commande conformément à la présente norme correspond à une situation dans laquelle l'appareillage de commande ne peut pas fonctionner comme attendu.

NOTE Exemples: secteur sous tension, surchauffe, allumage intempestif des minuteries de chiens de garde, etc.

Lorsque la défaillance d'un appareillage de commande est détectée, *"controlGearFailure"* doit être réglé sur TRUE.

Lorsque la défaillance n'est plus détectée, et que le fonctionnement normal a repris, *"controlGearFailure"* doit être réglé sur FALSE.

La défaillance d'un appareillage de commande doit être détectée et indiquée au plus tard après un délai de 30 s.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

9.16.3 Bit 1: Lampe grillée (Lampe failure)

Une lampe grillée conformément à la présente norme correspond à une situation dans laquelle la lampe ne peut pas être utilisée comme attendu, du fait, par exemple, d'une connexion incorrecte de cette dernière ou de défauts internes.

Lorsqu'une lampe grillée est détectée, *"lampFailure"* doit être réglé sur TRUE. Une lampe grillée doit être détectée et indiquée au plus tard après un délai de 30 s, lorsque l'appareillage de commande n'est pas en attente (voir 9.2).

Il convient d'interpréter une lampe partiellement grillée également comme une lampe grillée.

Lorsque "*lampFailure*" est TRUE, l'appareillage de commande doit vérifier la lampe régulièrement afin de déterminer si l'état de cette dernière s'est amélioré. Cette vérification doit être effectuée au moins à chaque fois que "*targetLevel*" passe de 0x00 à une valeur supérieure. Après un démarrage réussi, *"lampFailure"* doit être réglé sur FALSE.

Pour le type de lampe "inconnu", ce bit peut être pris en charge. Pour le type de lampe "aucun", il peut y avoir prise en charge (par exemple, basée sur la mesure de la charge).

9.16.4 Bit 2: Lampe allumée (Lamp on)

"lampOn" doit être réglé sur FALSE lorsque la lampe est éteinte, lors du démarrage, ce qui signifie l'absence de rendement lumineux en cas de défaillance totale des lampes. Dans tous les autres cas, cet état doit être réglé sur TRUE.

9.16.5 Bit 3: Erreur limite (Limit error)

Lorsque le dernier niveau cible demandé a été modifié conformément aux limitations de *"minLevel"* ou *"maxLevel"*, ou lorsque *"targetLevel"* a été modifié en raison d'une modification de *"minLevel"* ou *"maxLevel",* "*limitError*" doit être réglé sur TRUE.

Lorsque le dernier niveau cible demandé par "DAPC (level)" équivaut à "MASK", "*limitError*" ne doit pas varier.

Dans tous les autres cas, "*limitError*" doit être réglé sur FALSE.

9.16.6 Bit 4: Modification de l'intensité lumineuse en cours (fade running)

"fadeRunning" doit être réglé sur FALSE sauf pendant la durée d'exécution de la minuterie de modification de l'intensité lumineuse. *"fadeRunning"* doit être réglé sur TRUE entre le début de la modification de l'intensité lumineuse (après le démarrage) et la fin de la durée associée, indépendamment du fait que *"targetLevel"* et *"actualLevel"*atteignent le même niveau.

9.16.7 Bit 5: Etat réinitialisé (Reset state)

"resetState" doit être réglé sur TRUE si toutes les variables NVM mentionnées dans le Tableau 14, sauf "*lastLightLevel*", sont réglées sur leur valeur réinitialisée. Les variables NVM qui comportent le marquage 'pas de modification' dans la colonne propre à la valeur réinitialisée ne doivent pas être prises en considération. Les variables NVM définies dans les parties 2xx mises en œuvre doivent être incluses.

Dans tous les autres cas, le bit doit être réglé sur FALSE.

9.16.8 Bit 6: Absence d'adresse courte (Missing short address)

Ce bit indique si une adresse courte a été attribuée à l'appareillage, en vérifiant *"shortAddress"*. Le bit doit être TRUE si *"shortAddress"* = MASK.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Dans tous les autres cas, le bit doit être réglé sur FALSE.

9.16.9 Bit 7: Observation du cycle de mise sous tension (Power cycle seen)

"powerCycleSeen" doit être réglé sur TRUE après exécution d'un cycle de mise sous tension externe (voir IEC 62386-101, 4.11).

"powerCycleSeen" doit être réglé sur FALSE une fois que l'une des commandes suivantes a été reçue:

"RESET", "DAPC (*level*)", "OFF", "UP", "DOWN", "STEP UP", "STEP DOWN", "RECALL MAX LEVEL", "RECALL MIN LEVEL", "GO TO LAST ACTIVE LEVEL", "STEP DOWN AND OFF", "ON AND STEP UP", "GO TO SCENE (*sceneNumber*)".

9.17 Mémoire non volatile (non-volatile memory)

Une mémoire non volatile physique prend typiquement en charge un nombre limité de cycles d'écriture. Dans la mesure où de nombreuses variables sont du type NVM, il est nécessaire d'accorder une certaine attention aux limites physiques.

Il convient qu'un appareillage de commande mémorise les variables NVM de sorte que leur contenu ne soit jamais perdu et que la durée de vie prévue du dispositif puisse être atteinte. Cela signifie qu'il peut ne pas être possible de saisir immédiatement physiquement chaque changement dans une variable. Il peut exister des situations dans lesquelles l'appareillage de commande n'est pas capable de saisir physiquement les variables dans la mémoire NVM, notamment en cas de changement très fréquent d'une variable NVM particulière.

Étant donné que le contrôleur d'application ne peut pas connaître le mécanisme interne de l'appareillage de commande pour la sauvegarde physique de variables rémanentes, l'instruction "SAVE PERSISTENT VARIABLES" est définie comme une instruction destinée à forcer l'appareillage de commande à saisir physiquement toutes les variables de type NVM dans la mémoire. Cette commande complète la saisie normale des variables NVM. Son utilisation normale consiste à s'assurer que des changements importants effectués par un contrôleur d'application ne peuvent pas être perdus, par exemple, après attribution de toutes les adresses courtes ou réglage d'autres données de configuration importantes (et stables). Il est clairement établi qu'elle n'est pas destinée à être utilisée après chaque changement de niveau. Généralement, cette commande est utilisée uniquement à de rares occasions pour une installation complète.

NOTE 1 La commande peut généralement être utilisée quelques milliers de fois avant d'endommager physiquement la mémoire NVM de l'appareillage de commande.

La sauvegarde physique des variables en réponse à l'instruction doit nécessiter au plus 300 ms. Au cours de l'exécution de l'opération de sauvegarde, le rendement lumineux peut fluctuer et l'appareillage de commande peut ou non répondre à toute commande. Toutefois, jusqu'à l'achèvement de l'opération, la valeur des variables concernées peut ne pas être définie. De plus, lorsque la lumière est éteinte à la réception de l'instruction, elle doit le rester; dans ce cas, aucun papillotement ne doit être visible.

Le rendement lumineux peut ne pas fluctuer au cours des opérations de sauvegarde à moins que ces dernières soient déclenchées par cette commande.

Un contrôleur d'application peut déclencher l'opération de sauvegarde au moyen de l'instruction"SAVE PERSISTENT VARIABLES" et il convient que ce dernier attende au moins 350 ms pour s'assurer que tous les appareillages de commande ont achevé l'opération.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

9.18 Types et caractéristiques de dispositifs

Les commandes dont le code de fonctionnement se situe dans la plage de 0xE0 à 0xFF sont réservées aux types ou aux caractéristiques de dispositifs spéciaux. Chaque type/caractéristique de dispositif redéfinit ces commandes, sauf pour la commande avec le code de fonctionnement 0xFF (“QUERY EXTENDED VERSION NUMBER”).

L'ensemble de commandes spécifiques au type/à la caractéristique de dispositif peut être sélectionné au moyen de l'instruction “ENABLE DEVICE TYPE (data)”.

Cette instruction doit sélectionner le type/la caractéristique de dispositif pour lesquels seule la prochaine commande d’application étendue suivante (se reporter à 11.6) est valide. La réception de cette instruction doit annuler toute sélection antérieure d’un type de dispositif.

L'activation du type/de la caractéristique de dispositif doit être annulée à l'exécution de la prochaine commande suivante adressée au même appareillage de commande, et cette commande doit être exécutée selon sa spécification, qu'il s'agisse ou non d'une commande d'application étendue.

Un appareillage de commande ne doit pas réagir à une commande qui appartient aux commandes d’application étendues d’un type/d'une caractéristique de dispositif non pris en charge par cet appareillage.

Les types de dispositif doivent être conformes aux spécifications des parties 2XX particulières de l'IEC 62386.

Un contrôleur d'application peut vérifier quels types de dispositif sont pris en charge par l'appareillage de commande. “QUERY DEVICE TYPE” consigne le type de dispositif pris en charge. Lorsque deux types/caractéristiques de dispositif ou plus sont pris en charge, “QUERY DEVICE TYPE” consigne la valeur MASK. Dans ce cas, le contrôleur d'application peut vérifier tous les types de dispositif pris en charge par la répétition de “QUERY NEXT DEVICE TYPE” jusqu'à réception de la valeur 254 comme réponse. L'émission de “QUERY DEVICE TYPE” assure automatiquement que les premiers type/caractéristique de dispositif sont consignés par “QUERY NEXT DEVICE TYPE”.

Afin de vérifier le numéro de version des types de dispositif pris en charge, le contrôleur d'application peut transmettre “ENABLE DEVICE TYPE (data) suivi de “QUERY EXTENDED VERSION NUMBER”. Cette opération consigne le numéro de version de cette mise en oeuvre de type/caractéristique de dispositif spécifique.

Il convient que les contrôleurs d'application soient capables d'identifier l'appareillage individuel et de mémoriser la relation entre l'adresse individuelle de l'appareillage et ses types de dispositif.

9.19 Utilisation de scénarii

Un appareillage de commande doit prendre en charge l'application de 16 scénarii. Les commandes suivantes doivent être prises en charge:

“GO TO SCENE (sceneNumber)”, “REMOVE FROM SCENE (sceneX)”, “QUERY SCENE LEVEL (sceneX)” et “SET SCENE (DTR0, sceneX)”.

Ces commandes comportent effectivement chacune 16 commandes, avec une commande pour chaque scénario. Ceci est réalisé par la sélection d'un bloc de 16 codes de fonctionnement consécutifs. On peut ainsi calculer facilement le nombre de scénarii à utiliser.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

À réception de l'une des commandes de scénario, *sceneNumber* doit être déduit du code de fonctionnement: *sceneNumber* = opcode – opcodeBase. Ceci identifie le scénario à utiliser. On peut trouver la opcodeBase dans le Tableau 13.

Tableau 13 – Scénarii

Commande	opcodeBase	Plage de code de fonctionnement
GO TO SCENE (sceneNumber)	0x10	[0x10,0x1F]
REMOVE FROM SCENE (sceneX)	0x50	[0x50,0x5F]
QUERY SCENE LEVEL (sceneX)	0xB0	[0xB0,0xBF]
SET SCENE (DTR0, sceneX)	0x40	[0x40,0x4F]

La variable *"sceneX"* s'applique également à 16 variables individuelles, où *X* équivaut à *sceneNumber* dans la plage [0,15].

À réception de la commande "GO TO SCENE (sceneNumber)", l'appareillage de commande doit réagir selon la valeur réelle de "*sceneX*", où X est déduit de sceneNumber. Si "*sceneX*" équivaut à MASK, "*targetLevel*" ne doit pas être affecté. Dans le cas contraire, l'appareillage de commande doit se comporter exactement comme si "DAPC (*level*)" avait été reçue avec un niveau équivalant à "*sceneX*".

NOTE L'utilisation de "DAPC (level)" implique que la transition a lieu en utilisant la durée de modification de l'intensité lumineuse définie.

10 Déclaration des variables (Declaration of variables)

Les valeurs par défaut, les valeurs réinitialisées, les valeurs de mise sous tension, le domaine de validité et le type de mémoire des variables définies doivent être conformes aux valeurs indiquées dans le Tableau 14.

Les variables déclarées dans cette section ne doivent pas pouvoir être saisies dans un bloc de mémoire.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 14 – Déclaration des variables

VARIABLE	VALEUR PAR DÉFAUT (valeur d'origine)	VALEUR REINITIALISEE	VALEUR DE MISE SOUS TENSION	DOMAINE DE VALIDITÉ	TYPE DE MÉMOIRE
"actualLevel"	[a]	0xFE	0x00	0, [*"minLevel"*, *"maxLevel"*]	RAM
"targetLevel"	[a]	0xFE	Voir 9.13 Mise sous tension	0, [*"minLevel"*, *"maxLevel"*]	RAM
"lastActiveLevel"	[a]	0xFE	*"maxLevel"*	[*"minLevel"*, *"maxLevel"*]	RAM
"lastLightLevel"	0xFE	0xFE[c]	pas de modification	0, [*"minLevel"*, *"maxLevel"*]	NVM
"powerOnLevel"	0xFE	0xFE	pas de modification	[0,0xFF]	NVM
"systemFailureLevel"	0xFE	0xFE	pas de modification	[0,0xFF]	NVM
"minLevel"	PHM	PHM	pas de modification	[PHM,*"maxLevel"*]	NVM
"maxLevel"	0xFE	0xFE	pas de modification	[*"minLevel"*,0xFE]	NVM
"fadeRate"	7	7	pas de modification	[1,0xF]	NVM
"fadeTime"	0	0	pas de modification	[0,0xF]	NVM
"extendedFadeTime Base"	0	0	pas de modification	[0,1111b]	NVM
"extendedFadeTime Multiplier"	0	0	pas de modification	[0,100b]	NVM
"shortAddress"	MASK (pas d'adresse)	pas de modification	pas de modification	[0,63], MASK	NVM
"searchAddress"	[a]	0xFF FF FF	0xFF FF FF	[0,0xFF FF FF]	RAM
"randomAddress"	0xFF FF FF	0xFF FF FF	pas de modification	[0,0xFF FF FF]	NVM
"operatingMode"	rodage en usine	pas de modification	pas de modification	0,[0x80,0xFF]	NVM
"initialisationState"	[a]	pas de modification	DISABLED	[ENABLED, DISABLED, WITHDRAWN]	RAM
"writeEnableState"	[a]	DISABLED	DISABLED	[ENABLED, DISABLED]	RAM
"controlGearFailure"	[a]	[b]	FALSE [d]	[TRUE, FALSE]	RAM
"lampFailure"	[a]	[b]	FALSE [d]	[TRUE, FALSE]	RAM
"lampOn"	[a]	[b]	FALSE	[TRUE, FALSE]	RAM
"limitError"	[a]	FALSE	FALSE [d]	[TRUE, FALSE]	RAM
"fadeRunning"	[a]	FALSE	FALSE	[TRUE, FALSE]	RAM
"resetState"	TRUE	TRUE	TRUE [d]	[TRUE, FALSE]	RAM
"powerCycleSeen"	[a]	FALSE	TRUE	[TRUE, FALSE]	RAM
"gearGroups"	0x00 00 (aucun groupe)	0x00 00 (aucun groupe)	pas de modification	[0,0xFF FF]	NVM
"sceneX" [e]	MASK	MASK	pas de modification	[0,0xFF]	NVM

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

VARIABLE	VALEUR PAR DÉFAUT (valeur d'origine)	VALEUR REINITIALISEE	VALEUR DE MISE SOUS TENSION	DOMAINE DE VALIDITÉ	TYPE DE MÉMOIRE
"DTR0"	[a]	pas de modification	0x00	[0,0xFF]	RAM
"DTR1"	[a]	pas de modification	0x00	[0,0xFF]	RAM
"DTR2"	[a]	pas de modification	0x00	[0,0xFF]	RAM
PHM	rodage en usine	pas de modification	pas de modification	[1,0xFE]	ROM

[a] Non applicable.

[b] La valeur pourrait varier suite à l'exécution de la commande RESET.

[c] Cette variable NVM est exclue pour "*resetState*".

[d] Il convient que la valeur reflète la situation réelle dès que possible.

[e] X se situe dans la plage 0x0 à 0xF, il existe effectivement une variable pour chacun des 16 scénarii.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11 Définition des commandes

11.1 Généralités

Les codes de fonctionnement non utilisés sont réservés à des besoins futurs.

11.2 Fiches de vue d'ensemble

Le Tableau 15 donne une vue d'ensemble des commandes normalisées. On peut trouver une vue d'ensemble des commandes spéciales dans le Tableau 16.

Tableau 15 – Commandes normalisées

Nom de la commande	Octet d'adresse		Octet de code de fonctionnement	Numéro de commande version 1	DTR0	DTR1	DTR2	Réponse	Send twice	Références	Référence de commande
	Voir 7.2.27.2.2	Bit sélecteur									
DAPC (level)	*Device*	0	*level*	-						9.4, 9.7.3, 9.8	11.3.1
OFF	*Device*	1	0x00	0						9.7.2	11.3.2
UP	*Device*	1	0x01	1						9.7.3	11.3.3
DOWN	*Device*	1	0x02	2						9.7.3	11.3.4
STEP UP	*Device*	1	0x03	3						9.7.2	11.3.5
STEP DOWN	*Device*	1	0x04	4						9.7.2	11.3.6
RECALL MAX LEVEL	*Device*	1	0x05	5						9.7.2, 9.14.2	11.3.7
RECALL MIN LEVEL	*Device*	1	0x06	6						9.7.2, 9.14.2	11.3.8
STEP DOWN AND OFF	*Device*	1	0x07	7						9.7.2	11.3.9
ON AND STEP UP	*Device*	1	0x08	8						9.7.2	11.3.10
ENABLE DAPC SEQUENCE	*Device*	1	0x09	9						9.8	11.3.11
GO TO LAST ACTIVE LEVEL	*Device*	1	0x0A							9.7.3	11.3.12
GO TO SCENE (sceneNumber)[a]	*Device*	1	*0x10 + sceneNumber*	16 – 31						9.7.3, 9.19	11.3.13

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Nom de la commande	Octet d'adresse		Octet de code de fonctionnement	Numéro de commande version 1	DTR0	DTR1	DTR2	Réponse	Send twice	Références	Référence de commande
	Voir 7.2.27.2.2	Bit sélecteur									
RESET	*Device*	1	0x20	32					✓	9.11.1, 10	11.4.2
STORE ACTUAL LEVEL IN DTR0	*Device*	1	0x21	33	✓				✓		11.4.3
SAVE PERSISTENT VARIABLES	*Device*	1	0x22						✓	9.17, 10	11.4.4
SET OPERATING MODE (DTR0)	*Device*	1	0x23		✓				✓	9.9.4	11.4.5
RESET MEMORY BANK (DTR0)	*Device*	1	0x24		✓				✓	9.11.2	11.4.6
IDENTIFY DEVICE	*Device*	1	0x25						✓	9.14.2	11.4.7
SET MAX LEVEL (DTR0)	*Device*	1	0x2A	42	✓				✓	9.6	11.4.7
SET MAX LEVEL (DTR0)	*Device*	1	0x2B	43	✓				✓	9.6	11.4.9
SET SYSTEM FAILURE LEVEL (DTR0)	*Device*	1	0x2C	44	✓				✓	9.12	11.4.10
SET POWER ON LEVEL (DTR0)	*Device*	1	0x2D	45	✓				✓	9.13	11.4.11
SET FADE TIME (DTR0)	*Device*	1	0x2E	46	✓				✓	9.5.2	11.4.12
SET FADE RATE (DTR0)	*Device*	1	0x2F	47	✓				✓	9.5.3	11.4.13
SET EXTENDED FADE TIME (DTR0)	*Device*	1	0x30		✓				✓	9.5.4	11.4.14
SET SCENE (DTR0, sceneX)[a]	*Device*	1	0x40 + *sceneNumber*	64 – 79	✓				✓	9.19	11.4.14
REMOVE FROM SCENE (sceneX)[a]	*Device*	1	0x50 + *sceneNumber*	80 – 95					✓	9.19	11.4.16
ADD TO GROUP (group)[a]	*Device*	1	0x60 + *groupe*	96 – 111					✓		11.4.17
REMOVE FROM GROUP (group)[a]	*Device*	1	0x70 + *groupe*	112 – 127					✓		11.4.18
SET SHORT ADDRESS (DTR0)	*Device*	1	0x80	128	✓				✓	9.14.4	11.4.19
ENABLE WRITE MEMORY	*Device*	1	0x81	129					✓	9.10	11.4.20
QUERY STATUS	*Device*	1	0x90	144				✓		9.16	11.5.2
QUERY CONTROL GEAR PRESENT	*Device*	1	0x91	145				✓			11.5.3

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Nom de la commande	Octet d'adresse		Octet de code de fonctionnement	Numéro de commande version 1	DTR0	DTR1	DTR2	Réponse	Send twice	Références	Référence de commande
	Voir 7.2.27.2.2	Bit sélecteur									
QUERY LAMP FAILURE	*Device*	1	0x92	146				✓			11.5.4
QUERY LAMP POWER ON	*Device*	1	0x93	147				✓			11.5.6
QUERY LIMIT ERROR	*Device*	1	0x94	148				✓			11.5.7
QUERY RESET STATE	*Device*	1	0x95	149				✓			11.5.8
QUERY MISSING SHORT ADDRESS	*Device*	1	0x96	150				✓		9.14.2	11.5.9
QUERY VERSION NUMBER	*Device*	1	0x97	151				✓			11.5.10
QUERY CONTENT DTR0	*Device*	1	0x98	152	✓			✓		9.10	11.5.11
QUERY DEVICE TYPE	*Device*	1	0x99	153				✓		9.18	11.5.12
QUERY PHYSICAL MINIMUM	*Device*	1	0x9A	154				✓			11.5.13
QUERY POWER FAILURE	*Device*	1	0x9B	155				✓			11.5.15
QUERY CONTENT DTR1	*Device*	1	0x9C	156		✓		✓		9.10	11.5.16
QUERY CONTENT DTR2	*Device*	1	0x9D	157			✓	✓			11.5.17
QUERY OPERATING MODE	*Device*	1	0x9E					✓		9.9.4	11.5.18
QUERY LIGHT SOURCE TYPE	*Device*	1	0x9F		✓	✓	✓	✓			11.5.19
QUERY ACTUAL LEVEL	*Device*	1	0xA0	160				✓			11.5.20
QUERY MAX LEVEL	*Device*	1	0xA1	161				✓			11.5.21
QUERY MIN LEVEL	*Device*	1	0xA2	162				✓			11.5.22
QUERY POWER ON LEVEL	*Device*	1	0xA3	163				✓		9.13	11.5.23
QUERY SYSTEM FAILURE LEVEL	*Device*	1	0xA4	164				✓		9.12	11.5.24
QUERY FADE TIME/FADE RATE	*Device*	1	0xA5	165				✓			11.5.25
QUERY MANUFACTURER SPECIFIC MODE	*Device*	1	0xA6					✓		9.9	11.5.27
QUERY NEXT DEVICE TYPE	Device	1	0xA7					✓		9.18	11.5.13
QUERY EXTENDED FADE TIME	Device	1	0xA8					✓		9.5.4	11.5.26
QUERY CONTROL GEAR FAILURE	Device	1	0xAA					✓		9.16.2	11.5.4

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Nom de la commande	Octet d'adresse		Octet de code de fonctionnement	Numéro de commande version 1	DTR0	DTR1	DTR2	Réponse	Send twice	Références	Référence de commande
	Voir 7.2.27.2.2	Bit sélecteur									
QUERY SCENE LEVEL (sceneX)a	*Device*	1	0xB0 + *sceneNumber*	176 – 191				✓		9.19	11.5.28
QUERY GROUPS 0-7	*Device*	1	0xC0	192				✓			11.5.29
QUERY GROUPS 8-15	*Device*	1	0xC1	193				✓			11.5.30
QUERY RANDOM ADDRESS (H)	*Device*	1	0xC2	194				✓			11.5.31
QUERY RANDOM ADDRESS (M)	*Device*	1	0xC3	195				✓			11.5.32
QUERY RANDOM ADDRESS (L)	*Device*	1	0xC4	196				✓			11.5.33
READ MEMORY LOCATION (DTR1, DTR0)	*Device*	1	0xC5	197	✓	✓		✓		9.10	11.5.34
Commandes d'application étendues	*Device*	1	0xE0 – 0xFE	224 – 254	?	?	?	?	?	9.18	11.6
QUERY EXTENDED VERSION NUMBER	*Device*	1	0xFF	255				✓			11.6.2

[a] Il existe une commande par scénario, et il existe donc effectivement 16 commandes pour les scénarii 0 à 15. Identique pour les 16 commandes de groupe.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 16 – Commandes spéciales

Nom de la commande	Octet d'adresse	Octet de code de fonctionnement	Numéro de commande version 1	DTR0	DTR1	DTR2	Réponse	Send twice	Références	Référence de commande
TERMINATE	0xA1	0x00	256						9.14.2	11.7.1
DTR0 (data)	0xA3	*data*	257	✓					9.10	11.7.3
INITIALISE (device)	0xA5	*device*	258					✓	9.14.2	11.7.4
RANDOMISE	0xA7	0x00	259					✓	9.14.2	11.7.5
COMPARE	0xA9	0x00	260				✓		9.14.2	11.7.6
WITHDRAW	0xAB	0x00	261						9.14.2	11.7.7
PING	0xAD	0x00								11.7.19
SEARCHADDRH (data)	0xB1	*data*	264						9.14.2	11.7.8
SEARCHADDRM (data)	0xB3	*data*	265						9.14.2	11.7.9
SEARCHADDRL (data)	0xB5	*data*	266						9.14.2	11.7.10
PROGRAM SHORT ADDRESS (data)	0xB7	*data*	267						9.14.2	11.7.11
VERIFY SHORT ADDRESS (data)	0xB9	*data*	268				✓		9.14.2	11.7.12
QUERY SHORT ADDRESS	0xBB	0x00	269				✓		9.14.2	11.7.13
ENABLE DEVICE TYPE (data)	0xC1	*data*	272						9.14.2	11.7.14
DTR1 (data)	0xC3	*data*	273		✓				9.10	11.7.15
DTR2 (data)	0xC5	*data*	274			✓				11.7.16
WRITE MEMORY LOCATION (DTR1, DTR0, data)	0xC7	*data*	275	✓	✓		✓		9.10	11.7.17
WRITE MEMORY LOCATION – NO REPLY (DTR1, DTR0, data)	0xC9	*data*		✓	✓				9.10	11.7.18

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.3 Instructions de niveau

11.3.1 DAPC (*level*)

À réception de “DAPC (level)” (contrôle direct de la puissance d'arc), *“targetLevel”* doit être calculé sur la base de *“level”*.

Le passage de *“actualLevel”* à *“targetLevel”* doit débuter en utilisant la durée de modification de l'intensité lumineuse applicable.

Se reporter à 9.4, 9.7.3 et 9.13 pour de plus amples informations.

11.3.2 OFF

“targetLevel” doit être réglé sur 0x00 et la ou les lampes doivent s'éteindre.

Le passage de *“actualLevel”* à *“targetLevel”* doit être immédiat et le rendement lumineux doit être ajusté le plus rapidement possible.

Se reporter à 9.7.2 pour de plus amples informations.

11.3.3 UP

Augmentation de la lumière en utilisant une modification de l'intensité lumineuse de 200 ms avec application de la vitesse correspondante définie. “*targetLevel*” doit être calculé sur la base de *“actualLevel”* et de la vitesse de modification de l'intensité lumineuse définie.

Afin de s'assurer qu'il y a une réaction à la commande, au moins un pas (“*targetLevel*” = “*targetLevel*”+1) doit être exécuté à réception de la première commande. Après ce premier pas, les pas suivants doivent être exécutés en utilisant la vitesse de modification de l'intensité lumineuse spécifiée en cours d'exécution de cette même modification. Chaque instruction “UP” reçue comme partie intégrante d'une itération doit provoquer le redémarrage du processus de modification de l'intensité lumineuse de 200 ms et un nouveau calcul de *“targetLevel”* sur la base de *“actualLevel”* et de la vitesse de modification de l'intensité lumineuse définie.

“actualLevel” ne doit pas être modifié s'il est réglé sur *“maxLevel”* ou 0x00.

Se reporter à 9.7.3 et 9.8.2 pour de plus amples informations.

11.3.4 DOWN

Affaiblissement de la lumière en utilisant une modification de l'intensité lumineuse de 200 ms avec application de la vitesse correspondante définie. “*targetLevel*” doit être calculé sur la base de *“actualLevel”* et de la vitesse de modification de l'intensité lumineuse définie.

Afin de s'assurer qu'il y a une réaction à la commande, au moins un pas (“*targetLevel*” = “*targetLevel*”-1) doit être exécuté à réception de la première commande. Après ce premier pas, les pas suivants doivent être exécutés en utilisant la vitesse de modification de l'intensité lumineuse spécifiée en cours d'exécution de cette même modification. Chaque instruction “DOWN” reçue comme partie intégrante d'une itération doit provoquer le redémarrage du processus de modification de l'intensité lumineuse de 200 ms et un nouveau calcul de *“targetLevel”* sur la base de *“actualLevel”* et de la vitesse de modification de l'intensité lumineuse définie.

“actualLevel” ne doit pas être modifié s'il est réglé sur *“minLevel”* ou 0x00.

Se reporter à 9.7.3 et 9.8.2 pour de plus amples informations.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.3.5 STEP UP

"targetlevel" doit être réglé sur:

- si *"targetLevel"* = 0: 0x00
- si *"minLevel"* ≤ *"targetLevel"* < *"maxLevel":"targetLevel"*+1
- si *"targetLevel"* = *"maxLevel":"maxLevel"*

Le passage de *"actualLevel"* à *"targetLevel"* doit être immédiat et le rendement lumineux doit être ajusté le plus rapidement possible.

Se reporter à 9.4 et 9.5.9 pour de plus amples informations.

11.3.6 STEP DOWN

"targetlevel" doit être réglé sur:

- si *"targetLevel"* = 0: 0x00
- si *"minLevel"* < *"targetLevel"* ≤ *"maxLevel":"targetLevel"*-1
- si *"targetLevel"* = *"minLevel":"minLevel"*

Le passage de *"actualLevel"* à *"targetLevel"* doit être immédiat et le rendement lumineux doit être ajusté le plus rapidement possible.

Se reporter à 9.4 et 9.5.9 pour de plus amples informations.

11.3.7 RECALL MAX LEVEL

Lorsque le *"initialisationState"* est DISABLED, *"targetLevel"* et *"actualLevel"* doivent être réglés sur *"maxLevel"*immédiatement et le rendement lumineux doit être ajusté le plus rapidement possible.

Se reporter à 9.7.2 pour de plus amples informations.

Lorsque le*"initialisationState"*n'est pas DISABLED, l'appareillage de commande doitrégler "*actualLevel*" et "*targetLevel*" sur "*maxLevel*", puis ajuster le rendement lumineux le plus rapidement possible sur 100%, en ignorant de façon provisoire "*maxLevel*" et "*actualLevel*".

Lorsque le dispositif ne peut pas être lui-même identifié visuellement de cette manière, l'appareillage de commande doit répondre comme s'il avait reçu également "IDENTIFY DEVICE", en lançant ou en redéclenchant la procédure d'identification.

NOTE Il est acceptable que le processus d'identification de l'appareillage de commande individuel dépende des deux commandes RECALL MAX LEVEL et RECALL MIN LEVEL reçues en alternance.

Lors de l'identification, aucune variable ne doit être altérée sauf indication contraire explicite. Le cas échéant, les variables peuvent être ignorées provisoirement, de sorte qu'il n'y ait aucun effet secondaire une fois l'identification terminée.

L'identification doit être interrompue immédiatement lorsque le *"initialisationState"* passe à DISABLED et à réception de toute instruction autre que INITIALISE (device),RECALL MIN LEVEL, RECALL MAX LEVEL ou IDENTIFY DEVICE.

Lorsque le *"initialisationState"*passe à DISABLED, l'identification doit s'interrompre immédiatement.

Se reporter à 9.14.3 pour de plus amples informations.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.3.8 RECALL MIN LEVEL

Lorsque le *"initialisationState"* est DISABLED, *"targetLevel"* et *"actualLevel"* doivent être réglés sur *"minLevel"*immédiatement et le rendement lumineux doit être ajusté le plus rapidement possible.

Se reporter à 9.7.2 pour de plus amples informations.

Lorsque le *"initialisationState"* n'est pas DISABLED, l'appareillage de commande doit régler "*actualLevel*" et "*targetLevel*" sur "*minLevel*", puis ajuster le rendement lumineux le plus rapidement possible sur son niveau PHM, en ignorant de façon provisoire "*minLevel*" et "*actualLevel*". Si, toutefois, PHM n'est pas visiblement foncièrement différent de 100%, la lampe doit alors en revanche être éteinte provisoirement.

Lorsque le dispositif ne peut pas être lui-même identifié visuellement de cette manière, l'appareillage de commande doit répondre comme s'il avait reçu également "IDENTIFY DEVICE", en lançant ou en redéclenchant la procédure d'identification.

Il est acceptable que le processus d'identification de l'appareillage de commande individuel dépende des deux commandes RECALL MAX LEVEL et RECALL MIN LEVEL reçues en alternance.

Lors de l'identification, aucune variable ne doit être altérée sauf indication contraire explicite. Le cas échéant, les variables peuvent être ignorées provisoirement, de sorte qu'il n'y ait aucun effet secondaire une fois l'identification terminée.

L'identification doit être interrompue immédiatement lorsque le *"initialisationState"* passe à DISABLED et à réception de toute instruction autre que INITIALISE (device),RECALL MIN LEVEL, RECALL MAX LEVEL ou IDENTIFY DEVICE.

Lorsque le *"initialisationState"*passe à DISABLED, l'identification doit s'interrompre immédiatement.

Se reporter à 9.14.3 pour de plus amples informations.

11.3.9 STEP DOWN AND OFF

"targetlevel" doit être réglé sur:

- si *"targetLevel"* = 0: 0x00
- si *"minLevel"* < *"targetLevel"* ≤ *"maxLevel":"targetLevel"*-1
- si *"targetLevel"* = *"minLevel"*: 0x00

Le passage de *"actualLevel"* à *"targetLevel"* doit être immédiat et le rendement lumineux doit être ajusté le plus rapidement possible.

Se reporter à 9.4 et 9.5.9 pour de plus amples informations.

11.3.10 ON AND STEP UP

"targetlevel" doit être réglé sur:

- si *"targetLevel"* = 0:*"minLevel"*
- si *"minLevel"* ≤ *"targetLevel"* < *"maxLevel":"targetLevel"*+1
- si *"targetLevel"* ≥ *"maxLevel":"maxLevel"*

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Le passage de *"actualLevel"* à *"targetLevel"* doit être immédiat et le rendement lumineux doit être ajusté le plus rapidement possible.

Se reporter à 9.4 et 9.5.9 pour de plus amples informations.

11.3.11 ENABLE DAPC SEQUENCE

Indique le début d'une itération de commandes "DAPC (level)".

Se reporter à 9.8.3 pour de plus amples informations.

11.3.12 GO TO LAST ACTIVE LEVEL

À réception de cette commande *"targetLevel"* doit être calculé sur la base de*"lastActiveLevel"*.

Le passage de *"actualLevel"* à *"targetLevel"* doit débuter en utilisant la durée de modification de l'intensité lumineuse définie.

Se reporter à 9.7.3 et 9.4 pour de plus amples informations.

11.3.13 GO TO SCENE (*sceneNumber*)

L'appareillage de commande doit réagir selon la valeur réelle de *"sceneX"* où *X* est déduit de *sceneNumber*:

- lorsque*"sceneX"* = *MASK,* la commande ne doit pas affecter *"targetLevel".*
- dans tous les autres cas*:* "DAPC (level)" interne, avec *level* équivalant à *"sceneX"* doit être exécutée.

NOTE L'utilisation de "DAPC (level)" implique que la transition a lieu en utilisant la durée de modification de l'intensité lumineuse définie.

Se reporter à 9.19 et 11.3.1 pour de plus amples informations.

11.4 Instructions de configuration

11.4.1 Généralités

Les instructions relatives à la configuration du dispositif permettent de modifier la configuration et/ou le mode de fonctionnement du dispositif de commande. Pour cette raison, une instruction relative à la configuration du dispositif ne doit pas être exécutée sauf si elle est reçue à deux reprises selon les exigences indiquées en 9.3 de l'IEC 62386-101:2014.

Sauf indication contraire explicite dans la description d'une instruction de configuration de dispositif particulière, le principe suivant s'applique:

- L'instruction doit être ignorée si les dispositions données en 9.7 de la présente norme l'exigent.
- L'appareillage de commande ne doit pas répondre à l'instruction

11.4.2 RESET

Toutes les variables doivent être réglées sur leurs valeurs réinitialisées. L'appareillage de commande doit démarrer pour réagir correctement aux commandes, au plus tard 300 ms après réception de l'instruction.

En cas de panne d'alimentation secteur au cours d'une réinitialisation, il n'est pas garanti que "RESET" soit achevée.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Se reporter à 9.11.1 et au Tableau 14 pour de plus amples informations.

11.4.3 STORE ACTUAL LEVEL IN DTR0

"actualLevel" doit être mémorisé dans *"DTR0"*.

11.4.4 SAVE PERSISTENT VARIABLES

L'appareillage de commande doit mémoriser physiquement toutes les variables identifiées dans le Tableau 14 comme étant une mémoire non volatile (NVM). Ceci doit inclure toutes les variables NVM d'application étendues définies dans les parties 2xx applicables.

L'appareillage de commande peut ne pas réagir aux commandes après réception de cette commande. L'appareillage de commande doit démarrer pour réagir correctement aux commandes, au plus tard 300 ms après réception de l'instruction.

Au cours du traitement de cette commande, le rendement lumineux peut fluctuer. Une fois le processus achevé, le niveau du rendement lumineux doit être celui prévu avant réception de cette commande, sur la base de *"targetLevel"* et de la transition active (éventuelle).

Il est recommandé d'utiliser cette commande généralement après la mise en service. En raison du nombre limité de cycles d'écriture de la mémoire rémanente et en raison du fait qu'il peut y avoir une réaction visible, il convient que les dispositifs de commande limitent l'utilisation de cette commande.

Étant donné qu'il peut y avoir des artéfacts visuels, il est recommandé d'utiliser cette commande uniquement au cours de l'état hors tension.

Se reporter au Tableau 14 et à 9.17 pour de plus amples informations.

11.4.5 SET OPERATING MODE (*DTR0*)

"operatingMode" doit être réglé sur *"DTR0"*.

Si *"DTR0"* ne correspond pas à un mode de fonctionnement mis en œuvre, la commande doit être ignorée.

Se reporter à 9.9 pour de plus amples informations.

11.4.6 RESET MEMORY BANK (*DTR0*)

La commande doit déclencher le processus de réglage du contenu de bloc de mémoire sur ses valeurs réinitialisées comme suit:

- si *"DTR0"* = 0: tous les blocs de mémoire mis en œuvre et non verrouillés, sauf le bloc de mémoire 0, doivent être réinitialisés
- dans tous les autres cas: le bloc de mémoire identifié par *"DTR0"* doit être réinitialisé à condition qu'il soit mis en œuvre et non verrouillé

Il est nécessaire de déverrouiller un bloc de mémoire afin de pouvoir réinitialiser tant les emplacements verrouillables que les emplacements non verrouillables.

L'appareillage de commande doit démarrer pour réagir correctement aux commandes, au plus tard 10 s après réception de l'instruction.

Se reporter à 9.11.2 pour de plus amples informations.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.4.7 IDENTIFY DEVICE

L'appareillage de commande doit lancer ou relancer une minuterie de 10 secondes ±1 s Alors que la minuterie est en fonctionnement, une procédure doit être exécutée qui permet à un observateur de différencier tout appareillage de commande qui exécute ce processus des dispositifs (du même type) qui ne l'exécutent pas. En cas d'expiration de la minuterie, l'identification doit s'interrompre.

Lors de l'identification, aucune variable ne doit être altérée sauf indication contraire explicite. Le cas échéant, les variables peuvent être ignorées provisoirement, de sorte qu'il n'y ait aucun effet secondaire une fois l'identification terminée.

Lorsque l'identification est active, le rendement lumineux peut se situer à tout niveau compris entre désactivé et 100 %, MIN, MAX et "*actualLevel*" étant effectivement ignorés provisoirement.

L'identification doit s'interrompre immédiatement à réception de toute instruction autre que INITIALISE (device), RECALL MIN LEVEL, RECALL MAX LEVEL ou IDENTIFY DEVICE.

Alors que l'identification est active, l'appareillage de commande doit, sans interrompre la procédure d'identification:

- Avec RECALL MIN LEVEL: définir "*actualLevel*" et "*targetLevel*" sur "*minLevel*"
- Avec RECALL MAX LEVEL:définir "*actualLevel*" et "*targetLevel*" sur "*maxLevel*"

Lorsqu'une identification est interrompue par un contrôleur d'application, la minuterie correspondante doit être annulée immédiatement.

Après interruption de l'identification, le rendement lumineux doit être ajusté le plus rapidement possible afin de refléter "*actualLevel*" et la commande doit être exécutée (le cas échéant).

L'identification peut être utilisée pendant la mise en service en ce sens qu'elle permet à l'installateur d'affecter, par exemple, le dispositif identifié particulier à un groupe de dispositifs particulier.

L'indication peut être réalisée, par exemple, par clignotement d'une diode électroluminescente (LED), par la production d'un son ou tout autre moyen visuel ou sonore. Le processus exact d'identification est spécifique au fabricant et il convient de le décrire dans le manuel.

NOTE Le contrôleur d'application peut également interrompre le processus d'identification à l'aide d'une commande "RESET".

Se reporter à 9.14.3 pour de plus amples informations.

11.4.8 SET MAX LEVEL (*DTR0*)

"maxLevel" doit être réglé sur:

- si *"minLevel"* ≥ *"DTR0"*: *"minLevel"*
- si *"DTR0"* = MASK: 0xFE
- dans tous les autres cas: *"DTR0"*

Si "actualLevel" > "maxLevel" suite au réglage d'un nouveau niveau max, "targetLevel" doit être calculé sur la base de *"maxLevel"*. Le passage de *"actualLevel"* à *"targetLevel"*doit débuter immédiatement et le rendement lumineux doit être ajusté le plus rapidement possible.

Se reporter à 9.7.2 pour de plus amples informations.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.4.9 SET MAX LEVEL (*DTR0*)

"minLevel" doit être réglé sur:

- si 0 ≤ *"DTR0"* ≤ PHM: PHM
- si *"DTR0"* ≥ *"maxLevel"* ou MASK: *"maxLevel"*
- dans tous les autres cas: *"DTR0"*

Si *"actualLevel"* > *0* et si, suite au réglage d'un nouveau niveau min, *"actualLevel"* <*"minLevel"*, *"targetLevel"* doit être calculé sur la base de *"minLevel"*. Le passage de *"actualLevel"* à *"targetLevel"*doit être immédiat et le rendement lumineux doit être ajusté le plus rapidement possible. Se reporter à 9.7.2 pour de plus amples informations.

11.4.10 SET SYSTEM FAILURE LEVEL (*DTR0*)

"systemFailureLevel" doit être réglé sur *"DTR0"*.

Se reporter à 9.12 pour de plus amples informations.

11.4.11 SET POWER ON LEVEL (*DTR0*)

"powerOnLevel" doit être réglé sur *"DTR0"*.

Se reporter à 9.13 pour de plus amples informations.

11.4.12 SET FADE TIME (*DTR0*)

"fadeTime" doit être réglé sur une valeur selon les phases suivantes:

- si *"DTR0"* > 15: 15
- dans tous les autres cas: *"DTR0"*

Si "*fadeTime"* n'est pas égale à 0, la durée de modification de l'intensité lumineuse doit être calculée sur la base de *"fadeTime"*. Si "*fadeTime"* est égale à 0, la durée étendue de modification de l'intensité lumineuse doit être utilisée.

Si une nouvelle durée de modification de l'intensité lumineuse est mémorisée pendant un processus de modification de l'intensité en cours, ce processus doit d'abord être terminé avant d'utiliser la nouvelle valeur pour la modification de l'intensité lumineuse suivante.

Se reporter à 9.5, 9.7.3, 11.4.14 et 11.7.19 pour de plus amples informations.

11.4.13 SET FADE RATE (*DTR0*)

"fadeRate" doit être réglé sur une valeur selon les phases suivantes:

- si *"DTR0"* > 15: 15
- si *"DTR0"* = 0: 1
- dans tous les autres cas: *"DTR0"*

La vitesse de modification de l'intensité lumineuse doit être calculée sur la base de *"fadeRate"*. Si une nouvelle vitesse de modification de l'intensité lumineuse est mémorisée pendant un processus de modification de l'intensité en cours, ce processus doit d'abord être terminé avant d'utiliser la nouvelle valeur pour la modification de l'intensité lumineuse suivante.

Se reporter à 9.5 et 9.7.3 pour de plus amples informations.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.4.14 SET EXTENDED FADE TIME (*DTR0*)

Les *"extendedFadeTimeBase"* et "*extendedFadeTimeMultiplier*" doivent être réglés sur une valeur selon les phases suivantes:

- Si "*DTR0"*>0x4F (0100 1111b):
  - "*extendedFadeTimeBase*" doit être réglée sur 0
  - "*extendedFadeTimeMultiplier*" doit être réglé sur 0

Sélection effective d'une modification de l'intensité lumineuse le plus rapidement possible.

- Pour tous les autres cas:
  - "*extendedFadeTimeBase*" doit être réglée sur AAAAb où *"DTR0"* = *xxxxAAAAb*
  - "*extendedFadeTimeMultiplier*" doit être réglé sur YYYb où *"DTR0"* = *xYYYxxxxb*
- La durée de modification de l'intensité lumineuse doit être calculée par multiplication de la valeur de base et du multiplicateur.

Si une nouvelle durée de modification de l'intensité lumineuse est mémorisée pendant un processus de modification de l'intensité en cours, ce processus doit d'abord être terminé avant d'utiliser la nouvelle valeur pour la modification de l'intensité lumineuse suivante.

Se reporter à 9.5.4 pour de plus amples informations.

11.4.15 SET SCENE (*DTR0, sceneX*)

Cette commande comporte effectivement 16 commandes, avec une commande pour chaque scénario. Ceci est réalisé par la sélection d'un bloc de 16 codes de fonctionnement consécutifs.

À réception de "SET SCENE (DTR0, sceneX)", le numéro de scénario doit être déduit du code de fonctionnement:*sceneNumber* = code de fonctionnement – 0x40. Ceci identifie le "*sceneX"* à utiliser.

"sceneX" doit être réglé sur *"DTR0"*.

Se reporter à 9.19 pour de plus amples informations.

11.4.16 REMOVE FROM SCENE (*sceneX*)

Cette commande comporte effectivement 16 commandes, avec une commande pour chaque scénario. Ceci est réalisé par la sélection d'un bloc de 16 codes de fonctionnement consécutifs.

À réception de "SET SCENE (DTR0, sceneX)", le numéro de scénario doit être déduit du code de fonctionnement: *sceneNumber* = code de fonctionnement – 0x50. Ceci identifie le "*sceneX"* à utiliser.

"sceneX" doit être réglé sur MASK. Ceci retire effectivement l'appareillage de commande du scénario dont il est membre.

Se reporter à 9.19 pour de plus amples informations.

11.4.17 ADD TO GROUP (*group*)

Cette commande comporte effectivement 16 commandes, avec une commande pour chaque groupe. Ceci est réalisé par la sélection d'un bloc de 16 codes de fonctionnement consécutifs.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

À réception de “ADD TO GROUP (*group*)”, *group* doit être déduit du code de fonctionnement: *group* = code de fonctionnement – 0x60. Ceci identifie le “*group”* à utiliser.

bit[*group*] de *“gearGroups”* doit être réglé sur TRUE. Ceci implique que l'appareillage de commande est membre de ce groupe.

11.4.18 REMOVE FROM GROUP (*group*)

Cette commande comporte effectivement 16 commandes, avec une commande pour chaque groupe. Ceci est réalisé par la sélection d'un bloc de 16 codes de fonctionnement consécutifs.

À réception de “REMOVE FROM GROUP (*group*)”, *group* doit être déduit du code de fonctionnement: *group* = code de fonctionnement – 0x70. Ceci identifie le “*group”* à utiliser.

bit[*group*] de *“gearGroups”* doit être réglé sur FALSE. Ceci implique que l'appareillage de commande n'est pas membre de ce groupe.

11.4.19 SET SHORT ADDRESS (*DTR0*)

“shortAddress” doit être réglé sur:

- si *“DTR0”* = MASK: MASK (l’adresse courte est effectivement supprimée)
- si *“DTR0”* = 1xxxxxxxb ou xxxxxxx0b: aucun changement
- dans tous les autres cas (0AAAAAA1b): 00AAAAAAb.

11.4.20 ENABLE WRITE MEMORY

“writeEnableState” doit être réglé sur ENABLED.

NOTE Il n'existe pas de commande qui désactive de manière explicite l'accès en écriture de la mémoire, dans la mesure où toute commande qui n'est pas directement impliquée dans l'écriture dans les blocs de mémoire règle automatiquement *“writeEnableState”* sur DISABLED.

Se reporter à 9.10.5 pour de plus amples informations.

11.5 Requêtes

11.5.1 Généralités

Les requêtes permettent de récupérer les valeurs de propriété d'un appareillage de commande. L'appareillage de commande adressé renvoie la valeur de propriété objet de la requête dans une trame en arrière.

Sauf indication contraire explicite dans la description d'une requête particulière, le principe suivant s'applique:

- La requête doit être ignorée si les dispositions données en 9.7 l'exigent.

Le cas échéant, la requête doit être ignorée si les valeurs de paramètre (dans *“DTR0”*, *“DTR1”* et *“DTR2”*) se situent en dehors du domaine de validité des variables de dispositif adressées, comme indiqué dans le Tableau 14.

11.5.2 QUERY STATUS

La réponse doit correspondre à l'état, qui est formé par une combinaison de propriétés d'appareillage de commande.

Se reporter à 9.16 pour de plus amples informations.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.5.3 QUERY CONTROL GEAR PRESENT

La réponse doit être YES.

NOTE La commande est ignorée si l'appareillage de commande n'est pas adressé, la réponse apportée étant effectivement NO.

11.5.4 QUERY CONTROL GEAR FAILURE

La réponse doit être YES si *"controlGearFailure"* est TRUE et NO dans le cas contraire.

11.5.5 QUERY LAMP FAILURE

La réponse doit être YES si *"LampFailure"* est TRUE et NO dans le cas contraire.

11.5.6 QUERY LAMP POWER ON

La réponse doit être YES si *"LampOn"* est TRUE et NO dans le cas contraire.

11.5.7 QUERY LIMIT ERROR

La réponse doit être YES si *"limitError"* est TRUE et NO dans le cas contraire.

11.5.8 QUERY RESET STATE

La réponse doit être YES si *"resetState"* est TRUE et NO dans le cas contraire.

11.5.9 QUERY MISSING SHORT ADDRESS

La réponse doit être YES si *"ShortAddress"* équivaut à MASK et NO dans le cas contraire.

NOTE Dans la mesure où l'appareillage de commande répond uniquement si aucune adresse courte n'est mémorisée, l'utilisation de la commande est utile uniquement en mode diffusion ou lorsque l'adressage de groupe est utilisé.

11.5.10 QUERY VERSION NUMBER

La réponse doit correspondre au contenu de l'emplacement 0x16 du bloc de mémoire 0.

Se reporter à l'Article 4 et au Tableau 9 pour de plus amples informations.

11.5.11 QUERY CONTENT DTR0

La réponse doit être *"DTR0"*.

11.5.12 QUERY DEVICE TYPE

La réponse doit être:

- si aucune partie 2xx n'est mise en œuvre: 254;
- lorsqu'un type/une caractéristique de dispositif est pris(e) en charge: le numéro de type/caractéristique de dispositif;
- lorsque deux types/caractéristiques de dispositif ou plus sont pris en charge: MASK.

Le codage des types de dispositif doit être conforme aux spécifications des parties 2XX particulières de l'IEC 62386.

Se reporter à 9.18 et 11.5.13 pour de plus amples informations.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.5.13 QUERY NEXT DEVICE TYPE

La réponse doit être:

- Lorsqu'elle est précédée directement par “QUERY DEVICE TYPE”, et lorsque deux types/caractéristiques de dispositif ou plus sont pris en charge: le premier numéro de type/caractéristique de dispositif le plus faible;
- Lorsqu'elle est précédée directement par “QUERY NEXT DEVICE TYPE”, et lorsque les types de dispositif n'ont pas tous été consignés, le numéro de type/caractéristique le plus faible suivant;
- Lorsqu'elle est précédée directement par “QUERY NEXT DEVICE TYPE”, et lorsque tous les types de dispositif ont été consignés: 254;
- dans tous les autres cas: NO.

La séquence des commandes doit être acceptée uniquement tant que celles-ci utilisent le même octet d'adresse. Les émetteurs à plusieurs maîtres doivent transmettre ce type de séquence sous forme de transaction. Le codage des types de dispositif doit être conforme aux spécifications des parties 2XX particulières de l'IEC 62386.

Se reporter à 9.18 et 11.5.12 pour de plus amples informations.

11.5.14 QUERY PHYSICAL MINIMUM

La réponse doit être PHM.

11.5.15 QUERY POWER FAILURE

La réponse doit être YES si *“powerCycleSeen”* est TRUE et NO dans le cas contraire.

11.5.16 QUERY CONTENT DTR1

La réponse doit être *“DTR1”*.

11.5.17 QUERY CONTENT DTR2

La réponse doit être *“DTR2”*.

11.5.18 QUERY OPERATING MODE

La réponse doit être *“operatingMode”*.

Se reporter à 9.99.9 pour de plus amples informations.

11.5.19 QUERY LIGHT SOURCE TYPE

La réponse doit correspondre au numéro du type de source de lumière donné dans le Tableau 17.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 17 – Codage du type de source de lumière

Type de source	Codage
Fluorescente basse pression	0
HID	2
Halogène basse tension	3
Lumière incandescente	4
LED	6
OLED	7
Autre que les types de source de lumière énumérés ci-dessus	252
Type de source de lumière inconnu [a]	253
Aucune source de lumière [b]	254
Plusieurs types de source de lumière	MASK
Réservé	1, 5, [8,251]
[a] Généralement utilisé en cas de conversion de signaux, par exemple 1 V à 10 V	
[b] Utilisé dans les cas où aucune source de lumière n'est connectée, par exemple, un relais	

Lorsque la réponse est MASK, le contenu de DTRO doit contenir une valeur qui représente le premier type de source de lumière, DTR1 doit représenter le deuxième type de source de lumière et DTR2 doit représenter le troisième type de source de lumière.

Lorsque précisément deux types de sources de lumière différents existent, DTR2 doit contenir 254, indiquant "aucune source de lumière".

Lorsqu'il existe plus de trois types de sources de lumière différents, DTR2 doit contenir 255.

11.5.20 QUERY ACTUAL LEVEL

La réponse doit être:

- si *"actualLevel"* = 0x00: 0x00 (voir également 9.13)
- Dans tous les autres cas:
  - lors du démarrage: MASK
  - aucun rendement lumineux (par exemple, en raison d'une défaillance totale des lampes, d'une défaillance de l'appareillage de commande) alors qu'un rendement lumineux est attendu: MASK.
  - dans tous les autres cas: *"actualLevel"*.

11.5.21 QUERY MAX LEVEL

La réponse doit être *"maxLevel"*.

11.5.22 QUERY MIN LEVEL

La réponse doit être *"minLevel"*.

11.5.23 QUERY POWER ON LEVEL

La réponse doit être *"powerOnLevel"*.

Se reporter à 9.12 pour de plus amples informations.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.5.24 QUERY SYSTEM FAILURE LEVEL

La réponse doit être *"systemFailureLevel"*.

Se reporter à 9.12 pour de plus amples informations.

11.5.25 QUERY FADE TIME/FADE RATE

La réponse doit être XXXX YYYYb, où XXXXb équivaut à *"fadeTime"* et YYYYb équivaut à *"fadeRate"*.

11.5.26 QUERY EXTENDED FADE TIME

La réponse doit être 0 XXX YYYYb, où XXXb équivaut à "*extendedFadeTimeMultiplier*" et YYYYb équivaut à "*extendedFadeTimeBase*".

11.5.27 QUERY MANUFACTURER SPECIFIC MODE

La réponse doit être YES si *"operatingMode"* se situe dans la plage [0x80,0xFF] et NO dans le cas contraire.

11.5.28 QUERY SCENE LEVEL (*sceneX*)

Cette commande comporte effectivement 16 commandes, avec une commande pour chaque scénario. Ceci est réalisé par la sélection d'un bloc de 16 codes de fonctionnement consécutifs.

À réception de "QUERY SCENE LEVEL (sceneX)", le numéro de scénario doit être déduit du code de fonctionnement: *sceneNumber* = code de fonctionnement – 0xB0. Ceci identifie le "*sceneX"* à utiliser.

La réponse doit être *"sceneX"*.

Se reporter à 9.19 pour de plus amples informations.

11.5.29 QUERY GROUPS 0-7

La réponse doit être *"gearGroups[7:0]"*.

Les membres des groupes 0 à 7 doivent être représentés sous la forme d'une valeur à 8 bits, avec un bit pour chaque groupe. "0" doit être interprété comme un non-membre, et "1" doit être interprété comme membre du groupe. Bit[X] doit représenter les membres du groupe X, où X se situe dans la plage [0,7].

11.5.30 QUERY GROUPS 8-15

La réponse doit être *"gearGroups[15:8]"*.

Les membres des groupes 8 à 15 doivent être représentés sous la forme d'une valeur à 8 bits, avec un bit pour chaque groupe. "0" doit être interprété comme un non-membre, et "1" doit être interprété comme membre du groupe. Bit[X] doit représenter les membres du groupe X+8, où X se situe dans la plage [0,7].

11.5.31 QUERY RANDOM ADDRESS (H)

La réponse doit être *"randomAddress[23:16]"*.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.5.32 QUERY RANDOM ADDRESS (M)

La réponse doit être *"randomAddress[15:8]"*.

11.5.33 QUERY RANDOM ADDRESS (L)

La réponse doit être *"randomAddress[7:0]"*.

11.5.34 READ MEMORY LOCATION (*DTR1, DTR0*)

La requête doit être ignorée si le bloc de mémoire adressé n'est pas mis en œuvre.

Lorsqu'elle est exécutée, la réponse doit correspondre au contenu de l'emplacement de mémoire identifié par *"DTR0"* dans le bloc de mémoire *"DTR1"*.

L'appareillage de commande doit répondre NO si l'emplacement de mémoire adressé n'est pas mis en œuvre.

NOTE 1 Ceci permet des temps morts dans la mise en œuvre du bloc de mémoire.

Lorsque l'emplacement adressé se situe sous l'emplacement 0xFF, l'appareillage de commande doit augmenter *"DTR0"* de un.

NOTE 2 Ceci permet une lecture à plusieurs octets efficace dans le cadre d'une transaction.

Se reporter à 9.10 pour de plus amples informations.

11.6 Commandes d'application étendues

11.6.1 Généralités

"ENABLE DEVICE TYPE (data)" doit être reçue avant une commande d'application étendue afin d'activer l'ensemble correct de commandes de type/caractéristique de dispositif. Pour d'autres exigences, voir la commande "ENABLE DEVICE TYPE (data)" et 11.7.14.

Si "ENABLE DEVICE TYPE (data)" n'est pas reçue avant une commande d'application étendue, cette dernière doit être ignorée.

La définition des commandes étendues fait partie intégrante des normes spécifiques à l'application.

Se reporter à 9.18 pour de plus amples informations.

11.6.2 QUERY EXTENDED VERSION NUMBER

La réponse doit être le numéro de version de la partie 2XX de la présente norme, relatives au type/à la caractéristique de dispositif correspondant(e), sous la forme d'un nombre à 8 bits.

La réponse doit être:

- lorsque le type/la caractéristique de dispositif activé(e) n'est pas mis(e) en œuvre: NO
- lorsque le type/la caractéristique de dispositif activé(e) est pris(e) en charge: le numéro de version appartenant au numéro de type/caractéristique de dispositif

Se reporter à 9.18 pour de plus amples informations.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.7 Commandes spéciales

11.7.1 Généralités

Toutes les commandes de mode spécial doivent être interprétées comme des instructions sauf indication contraire explicite.

11.7.2 TERMINATE

Les processus suivants doivent être interrompus immédiatement à réception de cette commande:

- Initialisation, "*initialisationState*" doit être réglé sur DISABLED.
- L'identification, qu'elle soit lancée comme partie intégrante de l'initialisation (en utilisant RECALL MAX LEVEL, RECALL MIN LEVEL) ou comme fonctionnement normalisé (IDENTIFY DEVICE), doit être interrompue.

La commande peut également interrompre d'autres processus identifiés dans les parties 2xx correspondantes.

Se reporter à 9.14.2 pour de plus amples informations.

11.7.3 DTR0 (*data*)

"DTR0" doit être réglé sur les *data* indiquées.

Se reporter à 9.10 pour de plus amples informations.

11.7.4 INITIALISE (*device*)

Cette instruction ne doit pas être exécutée sauf si elle est reçue à deux reprises selon les exigences indiquées en 9.3 de l'IEC 62386-101:2014.

Seuls les dispositifs correspondant au *device* donné doivent répondre à la commande, comme indiqué dans le Tableau 18:

Tableau 18 – Adressage de dispositif avec "INITIALISE"

Device	Dispositif(s) répondant(s)
0AAAAAA1b	Dispositif(s) avec *"shortAddress"* égale à 00AAAAAAb
11111111b	Les appareillages de commande sans *"shortAddress"* doivent réagir.
00000000b	Tous les appareillages doivent réagir.
Autres	Néant

La commande doit lancer ou prolonger l'état d'initialisation, en réglant *"initialisationState"* sur ENABLED, s'il était DISABLED et (re-)déclencher la minuterie. Aucune réponse ne doit être donnée.

Se reporter à 9.14.2 pour de plus amples informations.

11.7.5 RANDOMISE

Cette instruction ne doit pas être exécutée sauf si elle est reçue à deux reprises selon les exigences indiquées en 9.3 de l'IEC 62386-101:2014.

L'instruction doit être ignorée si *"initialisationState"* est DISABLED.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Lorsqu'elle est exécutée, l'instruction doit générer une valeur aléatoire pour *"randomAddress"*, dans la plage [0x000000,0xFFFFFE] qui doit pouvoir être utilisée dans un délai de 100 ms.

Lorsque plusieurs unités logiques existent, et que la réception de l'instruction s'effectue par adressage par diffusion, les adresses aléatoires générées internes au bus doivent être uniques, c'est-à-dire que chaque unité logique doit avoir une adresse aléatoire que l'on ne trouve dans aucune des autres unités logiques contenues dans le bus.

Aucune réponse ne doit être apportée à cette instruction.

Se reporter à 9.14.2 pour de plus amples informations.

11.7.6 COMPARE

La requête doit être ignorée à moins que *"initialisationState"* soit ENABLED.

Lorsqu'elle est exécutée, l'appareillage de commande doit répondre:

- si *"randomAddress"* ≤ *"searchAddress":*YES
- dans tous les autres cas: NO

Se reporter à 9.14.2 pour de plus amples informations.

11.7.7 WITHDRAW

L'instruction doit être ignorée à moins que les conditions suivantes s'appliquent:

- *"initialisationState"* équivaut à ENABLED, et
- *"randomAddress"* équivaut à *"searchAddress"*

Si l'instruction est exécutée, l'appareillage de commande doit modifier *"initialisationState"* en WITHDRAWN.

Avant de retirer un appareillage de commande, le contrôleur d'application peut lui attribuer une adresse courte, en utilisant "PROGRAM SHORT ADDRESS (data)".

NOTE La conséquence se traduit par l'exclusion de l'appareillage de commande des opérations "COMPARE" ultérieures, permettant ainsi au contrôleur d'application d'effectuer une opération de recherche (binaire) parmi tous les dispositifs jusqu'à ce que la requête "COMPARE" aboutisse à une absence de réponse (de tout appareillage de commande) sur le bus.

Se reporter à 9.14.2 pour de plus amples informations.

11.7.8 SEARCHADDRH (*data*)

L'instruction doit être ignorée si *"initialisationState"* équivaut à DISABLED.

Lorsqu'elle est exécutée, *"searchAddress[23:16]"* doit être réglé sur les *data* indiquées.

Se reporter à 9.14.2 pour de plus amples informations.

11.7.9 SEARCHADDRM (*data*)

L'instruction doit être ignorée si *"initialisationState"* équivaut à DISABLED.

Lorsqu'elle est exécutée, *"searchAddress[15:8]"* doit être réglé sur les *data* indiquées.

Se reporter à 9.14.2 pour de plus amples informations.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.7.10 SEARCHADDRL (*data*)

L'instruction doit être ignorée si *"initialisationState"* équivaut à DISABLED.

Lorsqu'elle est exécutée, *"searchAddress[7:0]"* doit être réglé sur les *data* indiquées.

Se reporter à 9.14.2 pour de plus amples informations.

11.7.11 PROGRAM SHORT ADDRESS (*data*)

L'instruction doit être ignorée à moins que les conditions suivantes s'appliquent:

- *"initialisationState"* équivaut à ENABLED ou WITHDRAWN, et
- *"randomAddress"* équivaut à *"searchAdress"*

Lorsqu'elle est exécutée, *"shortAddress"* doit être réglée comme suit:

- si *data* = MASK: MASK (l'adresse courte est effectivement supprimée)
- si *data* = 1xxxxxxxb ou xxxxxxx0b: aucun changement
- dans tous les autres cas (0AAAAAA1b): 00AAAAAAb.

Se reporter à 9.14.2 pour de plus amples informations.

11.7.12 VERIFY SHORT ADDRESS (*data*)

La requête doit être ignorée si *"initialisationState"* équivaut à DISABLED.

Lorsqu'elle est exécutée, la réponse doit être YES si *"shortAddress"* équivaut à 00AAAAAAb pour les *data* données par 0AAAAAA1b, et NO dans le cas contraire.

Se reporter à 9.14.2 pour de plus amples informations.

11.7.13 QUERY SHORT ADDRESS

La requête doit être ignorée si:

- *"initialisationState"* équivaut à DISABLED
- *"randomAddress"* n'équivaut pas à *"searchAdress"*

Lorsqu'elle est exécutée, la réponse doit être 0AAAAAA1b où "*shortAddress*" équivaut à 00AAAAAAb', ou MASK dans le cas où "*shortAddress*" est égale à MASK.

Se reporter à 9.14.2 pour de plus amples informations.

11.7.14 ENABLE DEVICE TYPE (*data*)

Cette instruction doit sélectionner le type/la caractéristique de dispositif pour lesquels la prochaine commande d'application étendue suivante (se reporter à 11.6) est valide. La réception de cette instruction doit annuler toute sélection antérieure d'un type de dispositif. La sélection est valide uniquement pour la prochaine commande d'application étendue suivante.

L'activation du type/de la caractéristique de dispositif doit être annulée à l'exécution de la prochaine commande suivante adressée au même appareillage de commande, et cette commande doit être exécutée selon sa spécification, qu'il s'agisse ou non d'une commande d'application étendue.

Le domaine valide de *data* doit être [0, 0xFD]. Si *data* est égal à MASK ou 254, la commande doit être ignorée.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Un appareillage de commande ne doit pas réagir à une commande qui appartient aux commandes d'application étendues d'un type/d'une caractéristique de dispositif différents des siens.

Tous les appareillages doivent être capables de répondre de façon appropriée à la plage de commandes normalisées.

Les types de dispositif doivent être conformes aux spécifications des parties 2XX particulières de l'IEC 62386.

Il convient que les appareillages de commande soient capables d'identifier des appareillages individuels et de mémoriser la relation entre l'adresse individuelle d'un appareillage et le type/la caractéristique de dispositif dans une mémoire rémanente.

11.7.15 DTR1 (*data*)

"DTR1" doit être réglé sur les *data* indiquées.

Se reporter à 9.10 pour de plus amples informations.

11.7.16 DTR2 (*data*)

"DTR2" doit être réglé sur les *data* indiquées.

11.7.17 WRITE MEMORY LOCATION (*DTR1, DTR0, data*)

L'instruction doit être ignorée lorsque les conditions suivantes s'appliquent:

- le bloc de mémoire adressé n'est pas mis en œuvre, ou
- *"writeEnableState"* est DISABLED.

NOTE 1 Cette opération est une opération de diffusion. L'adressage sélectif de l'appareillage de commande peut être réalisé par un réglage sélectif de la condition d'autorisation d'écriture.

Lorsque l'instruction est exécutée, l'appareillage de commande doit saisir les *data* dans l'emplacement de mémoire identifié par *"DTR0"* dans le bloc de mémoire *"DTR1"* et renvoyer *data* comme réponse.

NOTE 2 Une écriture simultanée dans plusieurs appareillages de commande entraînera vraisemblablement des erreurs de trames en raison de la collision des réponses.

NOTE 3 La valeur qui peut être lue à partir de l'emplacement de bloc de mémoire n'est pas nécessairement *data*.

Lorsque l'emplacement de bloc de mémoire sélectionné

- n'est pas mis en œuvre, ou
- se situe au-dessus du dernier emplacement de mémoire accessible, ou
- est verrouillé (voir 9.10.2), ou
- n'est pas inscriptible

la réponse à "WRITE MEMORY LOCATION (*DTR1, DTR0, data*)" doit être NO et aucun emplacement de mémoire ne doit être en mode écriture.

Lorsque l'emplacement adressé se situe sous l'emplacement 0xFF, l'appareillage de commande doit augmenter *"DTR0"* de un.

NOTE 3 Ceci permet une écriture à plusieurs octets efficace dans le cadre d'une transaction.

Se reporter à 9.10 pour de plus amples informations.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

11.7.18 WRITE MEMORY LOCATION – NO REPLY (*DTR1, DTR0, data*)

Cette instruction est identique à la commande "WRITE MEMORY LOCATION (*DTR1*, *DTR0*, *data*)" à l'exception du fait que l'appareillage de commande récepteur ne doit pas répondre à la commande.

Se reporter à 9.10 pour de plus amples informations.

11.7.19 PING

La commande ping est utilisée par des contrôleurs d'application à un seul maître (voir IEC 62386-103) afin d'indiquer leur présence. La commande ping doit être ignorée par l'appareillage de commande.

12 Procédures d'essai

12.1 Notes générales d'essai

Les exigences de 12.1 de l'IEC 62386-101:2014 s'appliquent également pour les essais d'appareillages de commande.

12.1.1 Abréviations

Les abréviations suivantes sont utilisées dans les essais:

- PHM Physical Minimum Level (niveau physique minimum)
- POL Power On Level (Niveau de mise sous tension)
- SFL System Failure Level (Niveau de défaillance du système)

12.1.2 Exécution des essais

Le paragraphe 12.2 a pour objectif de préparer le dispositif en essai (DUT ou device under test) pour les essais, en

- définissant les variables globales
- attribuant une adresse courte à chaque unité logique
- obtenant les informations qui concernent les unités logiques qu'il est nécessaire de soumettre à essai

Les essais décrits de 12.2 à 12.8 doivent toujours être effectués pour soumettre un dispositif à l'essai. Chaque séquence d'essai indique si elle doit être exécutée pour tous les dispositifs logiques en parallèle ou par dispositif logique sélectionné.

Les essais décrits en 12.9 doivent être effectués uniquement si le dispositif comporte plusieurs unités logiques.

Lorsqu'un dispositif alimenté par le bus contenant une alimentation de bus interne est soumis à l'essai selon la présente partie, un tel dispositif doit être traité comme un dispositif alimenté par le bus dans tous les essais. Il ne doit y avoir aucune alimentation externe qui maintienne effectivement l'alimentation de bus interne hors tension pendant les essais.

Lorsqu'un dispositif comporte une alimentation de bus, les essais définis dans l'IEC 62386-101 doivent être réalisés.

Avant de réaliser un essai, la tension nominale *GLOBAL_internalVoltage* et le courant nominal *GLOBAL_Ibus* doivent être rétablis.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.1.3 Transmission des données

12.1.3.1 Établie sur la catégorie d'essai

Le mode d'adressage dépend de la méthode selon laquelle l'essai doit être réalisé, pour tous les dispositifs logiques en parallèle ou par dispositif logique. Par conséquent, le mode d'adressage suivant doit être utilisé:

- diffusion, si l'essai doit être exécuté pour toutes les unités logiques en parallèle
- adresse courte du dispositif logique en essai, si l'essai doit être exécuté pour chaque unité logique sélectionnée

12.1.3.2 Établie sur le mode d'adressage

Sauf mention contraire, chaque commande doit être envoyée en utilisant le mode d'adressage décrit en 12.1.3.1. Lorsqu'une commande est à envoyer à une adresse différente, l'adresse doit être donnée sous la forme d'un octet, comme:

COMMAND, send to *address*

où COMMAND est l'une des commandes définies dans la présente norme et où l'adresse peut être:

- une adresse courte, donnée sous forme d'octet (par exemple, l'adresse courte 1 est donnée sous la forme 00000011b)
- une adresse de groupe, donnée sous forme d'octet (par exemple, l'adresse courte 2 est donnée sous la forme 00000010b)
- une adresse de diffusion, donnée sous la forme “diffusion”
- une diffusion non adressée, donnée sous la forme “diffusion non adressée”

12.1.3.3 Établie sur le type de commande

Sauf mention contraire, les commandes de configuration doivent être envoyées deux fois. Lorsqu'il est nécessaire d'envoyer une commande une seule fois, cette dernière est notée sous la forme:

COMMAND, send once

Exemple de méthode d'envoi d'une commande RESET une seule fois:

RESET, send once

12.1.4 Configuration d'essai

Avant de commencer un essai, le DUT doit être connecté au secteur et à l'interface du bus, ainsi qu'à une lampe de service.

L'alimentation doit être réglée sur les valeurs définies en 12.2 par GLOBAL_VBusHigh, GLOBAL_VBusLow, GLOBAL_Ibus.

Sauf mention contraire, l'appareil d'essai doit utiliser le temps de chute, le temps de montée, le temps de demi-bit, le double demi-temps et le temps d'établissement (entre toute trame et une trame en avant) donnés dans les variables globales. De plus, l'alimentation doit être ajustée sur les valeurs définies par les variables globales.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.1.5 Résultat des essais

Chaque message de sortie des essais réalisés sur une unité logique doit être précédé de LogicalUnit suivi de l'adresse courte de l'unité logique en essai. Le message de sortie doit être le suivant:

errornumber LogicalUnit 1: chaîne

reportnumber LogicalUnit 1: chaîne

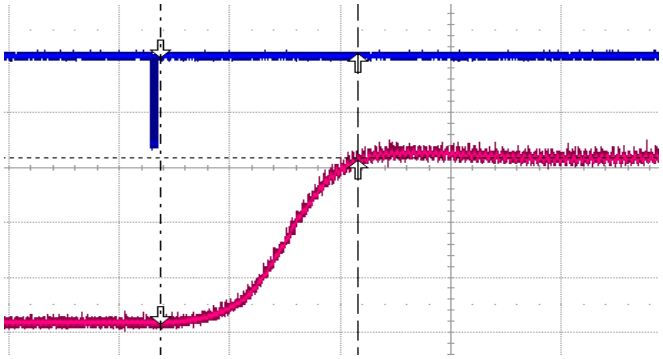
warningnumber LogicalUnit 1: chaîne

haltnumber LogicalUnit 1: chaîne

12.1.6 Mesure de la durée de modification de l'intensité lumineuse basés sur le rendement lumineux

Les mesures du rendement lumineux doivent être effectués au moyen d'un capteur de luminosité relié à un oscilloscope.

Afin de mesurer la durée de modification de l'intensité lumineuse sur la base du rendement lumineux, il est nécessaire qu'un oscilloscope capture tant l'interface du bus que le rendement lumineux. Le point de début des mesures correspond à la fin de la commande qui a initié la modification de l'intensité lumineuse. Le point de fin des mesures correspond au moment où la lumière commence à se stabiliser (préalablement à un dépassement ou à un sous-dépassement). La Figure 6 indique les points de début et de fin des mesures lorsque la modification de l'intensité lumineuse passe de MIN LEVEL à MAX LEVEL.



IEC

Figure 6 – Modification de l'intensité lumineuse de MIN LEVEL à MAX LEVEL

La Figure 7 montre comment les mesures doivent être effectués lorsque la modification de l'intensité lumineuse passe au mode hors tension. Le point de départ des mesures correspond au moment qui précède la fin de la commande qui a déclenché la modification de l'intensité lumineuse, et le point d'arrêt des mesures correspond au moment où la lampe est éteinte.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

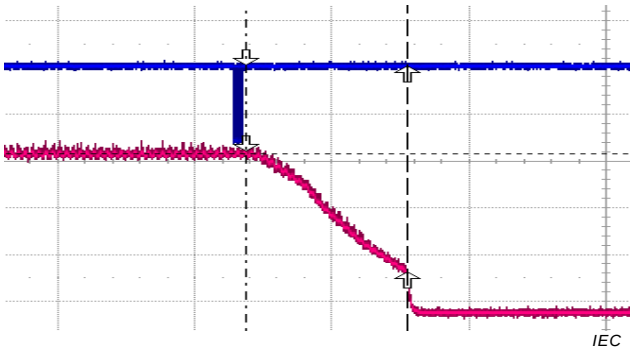


Figure 7 – Modification de l'intensité lumineuse de MAX LEVEL à la mise hors tension

12.1.7 Description du programme d'essai pour les durées rapides de modification de l'intensité lumineuse sur un gradateur à modulation de largeur d'impulsion (PWM ou pulse width modulation)

Lorsque l'on utilise une source de lumière LED avec un appareillage de commande qui applique la modulation de largeur d'impulsion pour la modification de l'intensité lumineuse, le rendement lumineux mesuré reflète directement le signal à modulation de largeur d'impulsion. Un processus normal de modification de l'intensité lumineuse ressemble au processus illustré à la Figure 8, ce qui rend impossible toute détermination précise du début et de la fin de la modification.

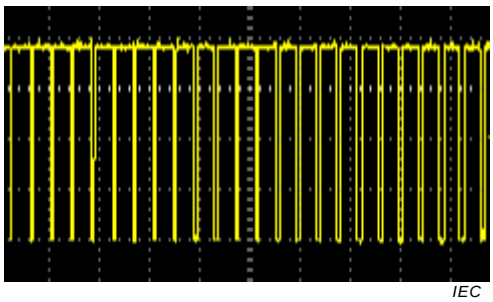


Figure 8 – Modification normale de l'intensité lumineuse pour un gradateur à modulation de largeur d'impulsion

Afin d'obtenir un indicateur visible au début et à la fin d'un processus de modification de l'intensité lumineuse, il est nécessaire que la modification commence par une ligne apériodique, par exemple, typiquement à la puissance de sortie maximale et s'arrête également par une ligne apériodique, par exemple habituellement à l'état hors tension.

Dans la mesure où la courbe normale de modification de l'intensité lumineuse n'est pas linéaire, le signal à modulation de largeur d'impulsion se révèle véritablement non symétrique pour des valeurs inférieures à 170 et n'est pas détecté par un oscilloscope lorsque la mesure s'effectue sur une plage de plusieurs 100 ms afin de vérifier par essai des durées rapides de modification de l'intensité lumineuse plus élevées.

Sur cette base, un processus de modification de l'intensité lumineuse compris entre 254 et 0, combiné à un MIN LEVEL configuré de 170 donne un signal à modulation de largeur d'impulsion qui indique clairement les points de début et de fin de la modification de l'intensité lumineuse comme l'illustre la Figure 9.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

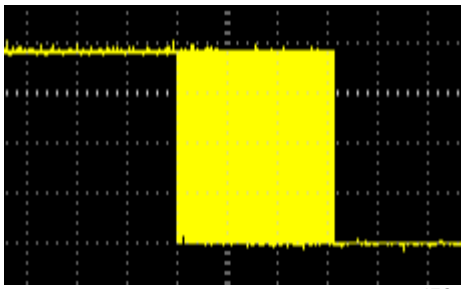


Figure 9 – Modification de l'intensité lumineuse de MAX LEVEL à la mise hors tension pour un gradateur à modulation de largeur d'impulsion

12.1.8 Notation d'essai

Il convient d'interpréter le tiret ("-") indiqué dans les tableaux pour "command" comme signifiant "send nothing".

12.1.9 Limitation d'exécution des essais

Les procédures d'essai actuelles peuvent être exécutées sur un DUT comportant 63 unités logiques au maximum. L'adresse courte 63 est réservée à des fins d'essai.

12.1.10 Résultats d'essai

Un DUT doit être déclaré comme conforme à la norme IEC 62386 uniquement si tous les essais sont satisfaits sans aucune erreur pour toutes les unités logiques.

12.1.11 Traitement des exceptions

À chaque occurrence d'un incident fortuit dans le cadre d'une procédure d'essai, qui rend absurde toute poursuite de la procédure, la procédure d'essai actuelle – ou la série de procédures d'essai – doit être abandonnée (interrompue) à ce point.

12.1.12 Réponse fortuite

À chaque envoi d'une commande dans le cadre d'une procédure d'essai, on peut obtenir la série de résultats potentiels suivante:

- Trame en arrière
- Pas de réponse
- Toute violation (Cadencement des bits, séquence de trames, taille des trames)

Selon la commande, la réponse est tenue de suivre certaines contraintes:

- La réponse à apporter à une requête de valeur est tenue de comporter une trame en arrière valide contenant une valeur comprise dans un certain domaine de validité.
- La réponse à apporter à une requête Oui/Non est tenue de comporter “No Answer” ou une trame en arrière valide contenant 255.
- Les autres commandes n'ont pas réponse.

En cas de résultat fortuit, une erreur générale doit être consignée suivie d'un traitement des exceptions (voir 12.1.11).

Souvent, ces incidents d'indiquent pas un dysfonctionnement par rapport à l'objet de la procédure d'essai actuelle, mais un problème de communication en général.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Le Tableau 19 montre toutes les commandes et leurs résultats fortuits.

Tableau 19 – Résultat fortuit

Nom de la commande	Fortuit		
	Violation	Valeur	Pas de réponse
QUERY STATUS	✓		✓
QUERY CONTROL GEAR PRESENT	✓	[0, 254]	
QUERY LAMP FAILURE	✓	[0, 254]	
QUERY LAMP POWER ON	✓	[0, 254]	
QUERY LIMIT ERROR	✓	[0, 254]	
QUERY RESET STATE	✓	[0, 254]	
QUERY MISSING SHORT ADDRESS	✓	[0, 254]	
QUERY VERSION NUMBER	✓	[0,7],[9,255]	✓
QUERY CONTENT DTR0	✓		✓
QUERY DEVICE TYPE	✓		✓
QUERY PHYSICAL MINIMUM	✓	0, 255	✓
QUERY POWER FAILURE	✓	[0, 254]	
QUERY CONTENT DTR1	✓		✓
QUERY CONTENT DTR2	✓		✓
QUERY OPERATING MODE	✓		✓
QUERY LIGHT SOURCE TYPE	✓	1, 5, [8, 251]	✓
QUERY ACTUAL LEVEL	✓		✓
QUERY MAX LEVEL	✓	0	✓
QUERY MIN LEVEL	✓	0	✓
QUERY POWER ON LEVEL	✓		✓
QUERY SYSTEM FAILURE LEVEL	✓		✓
QUERY FADE TIME/FADE RATE	✓	xxxx 0000b	✓
QUERY MANUFACTURER SPECIFIC MODE	✓	[0, 254]	
QUERY NEXT DEVICE TYPE	✓		
QUERY EXTENDED FADE TIME	✓	[80, 255]	✓
QUERY CONTROL GEAR FAILURE	✓	[0, 254]	
QUERY SCENE LEVEL (sceneX)	✓		✓
QUERY GROUPS 0-7	✓		✓
QUERY GROUPS 8-15	✓		✓
QUERY RANDOM ADDRESS (H)	✓		✓
QUERY RANDOM ADDRESS (M)	✓		✓
QUERY RANDOM ADDRESS (L)	✓		✓
READ MEMORY LOCATION (DTR1, DTR0)	✓		
QUERY EXTENDED VERSION NUMBER	✓		
COMPARE	✓	[0, 254]	

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Nom de la commande	Fortuit		
	Violation	Valeur	Pas de réponse
VERIFY SHORT ADDRESS (data)	✓	[0, 254]	
QUERY SHORT ADDRESS	✓	0xxx xxx0 b, [128, 254]	
WRITE MEMORY LOCATION (DTR1, DTR0, data)	✓		
WRITE MEMORY LOCATION – NO REPLY (DTR1, DTR0, data)	✓	[0,255]	
Toute autre commande	✓	[0,255]	

Lorsqu'une procédure d'essai est tenue d'effectuer une vérification par essai plus particulièrement avec ce type de résultat fortuit, par exemple la vérification de l'absence de réaction du DUT suite à l'utilisation d'une adresse différente de celle de configuration normale de ce même dispositif, elle est également tenue d'indiquer quelle(s) erreur(s) est (sont) à exclure de cette exception générale applicable à cette commande particulière.

12.2 Préambule

12.2.1 Préambule d'essai

Le préambule d'essai définit les paramètres globaux, vérifie les valeurs par défaut lorsque le dispositif est sorti d'usine, attribue à chaque unité logique une adresse courte égale à son indice. Pour chaque unité logique, l'information suivante est mémorisée:

- deviceType (une matrice des types de dispositif pris en charge)
- lightSource (une matrice des sources de lumière prises en charge)
- extendedVersionNumber (une matrice des numéros de version étendue)
- runTests (indique si les essais doivent être effectués pour l'unité logique concernée)

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
// Définir les paramètres globaux
GLOBAL_VbusHigh = 16 // en V – Haute tension par défaut pour les essais
GLOBAL_VbusLow = 0 // in V – Basse tension par défaut pour les essais
GLOBAL_Ibus = 250 // en mA – Courant par défaut pour les essais
GLOBAL_fallTime = 3 // en µs -Temps de descente par défaut
GLOBAL_riseTime = 3 // en µs -Temps de montée par défaut
GLOBAL_halfBitTime = 417 // en µs – Temps de demi-bit par défaut
GLOBAL_doubleHalfBitTime = 833 // en µs – Double temps de demi-bit par défaut
GLOBAL_settlingTime = 15 // en ms – Temps d'établissement par défaut, entre toute trame et une trame en avant
GLOBAL_busPowered = UserInput (Le DUT est-il alimenté par un bus?, YesNo)
GLOBAL_internalBPS = UserInput (Le dispositif comporte-t-il une alimentation de bus intégrée?, YesNo)
if (GLOBAL_internalBPS == Yes)
    if (GLOBAL_busPowered == Yes)
        GLOBAL_internalBPS = No
        UserInput (Ce DUT ne doit être connecté à aucune alimentation externe pour tous les essais, OK)
    else
        GLOBAL_internalVoltage = UserInput (Saisir la tension en circuit ouvert de l'alimentation de bus interne, value [V])
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        GLOBAL_internalCurrent = UserInput (Saisir le courant maximal spécifié de l'alimentation de bus interne, value [mA])
        GLOBAL_VbusHigh = GLOBAL_internalVoltage
        GLOBAL_Ibus = 250 – GLOBAL_internalCurrent
    endif
endif
UserInput (Régler l'alimentation de manière à avoir une tension GLOBAL_VbusHigh V de bus élevée et GLOBAL_Ibus mA, et connecter le DUT, OK)
answer =QUERY CONTROL GEAR PRESENT, send to broadcast
if (answer!= YES)
    halt1 DUT non trouvé
endif
GLOBAL_safeLampConnection = UserInput (Peut-on déconnecter et connecter une lampe en toute sécurité avec application de l'alimentation externe au DUT?, YesNo)
GLOBAL_startupTimeLimit = UserInput (Saisir la limite de temps de démarrage par défaut (saisir la limite maximale pour toutes les lampes), 3 s au minimum, value [s])
GLOBAL_startupTimeLimit = Max (3, GLOBAL_startupTimeLimit)
 // Vérifier par essai les valeurs par défaut en usine – cette partie est facultative
operatingMode = -1
PHM = -1
factoryNewDevice = UserInput (Le DUT est-il sorti d'usine?, YesNo)
if (factoryNewDevice == Yes)
    (operatingMode; PHM) = CheckFactoryDefault102 ()
else
    report1 La vérification des variables par défaut en usine n'est pas effectuée pour ce DUT, étant donné qu'il n'est pas sorti d'usine.
    operatingMode = QUERY OPERATING MODE
endif
// Demander à l'utilisateur quel mode de fonctionnement appliquer pour les essais ultérieurs
if (operatingMode != 0)
    keepOperatingMode = UserInput (Utiliser le mode de fonctionnement actuel ('No' conduit obligatoirement au mode de fonctionnement 0)?, YesNo)
    if (keepOperatingMode == Yes)
        keepOperatingMode = UserInput (Les instructions définies dans la présente norme sont-elles toutes mises en œuvre dans l'ensemble des modes spécifiques au fabricant et le bloc de mémoire 0 est-il identique pour ces modes?, YesNo)
    endif
    if (keepOperatingMode == No) // Forcer le DUT à adopter le mode normal
        DTR0 (0)
        SET OPERATING MODE
    endif
endif
// Abandonner les essais lorsque le dispositif comporte 64 unités logiques
numberOfLogicalUnits = GetNumberOfLogicalUnits ()
if (numberOfLogicalUnits == 64)
    halt2 Le bus comporte 64 unités logiques. L'adresse courte 63 est utilisée pour les essais, par conséquent l'essai de ce dispositif est abandonné.
else
    // Attribuer une adresse courte à chaque unité logique, l'adresse courte doit être égale à l'indice de l'unité logique
    GLOBAL_numberShortAddresses = AddressPreamble ()
    if (GLOBAL_numberShortAddresses == 0)
        halt3 Aucune unité trouvée.
    else if (GLOBAL_numberShortAddresses>= 64)
        halt4 Nombre trop important d'unités trouvées
    else
        if (GLOBAL_numberShortAddresses != numberOfLogicalUnits)
            error1 Le nombre attribué d'adresses courtes diffère du nombre d'unités logiques disponibles dans le bus. Attendu: numberOfLogicalUnits. Réel: GLOBAL_numberShortAddresses.
        endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        // Obtenir les informations par unité logique et les stocker en qualité de paramètres globaux
        for (logicalUnitAddress = 0; logicalUnitAddress < GLOBAL_numberShortAddresses; logicalUnitAddress++)
            (GLOBAL_logicalUnit[logicalUnitAddress].deviceType[])                    =
            GetSupportedDeviceTypes (logicalUnitAddress)
            (GLOBAL_logicalUnit[logicalUnitAddress].extendedVersionNumber[])         =
            GetExtendedVersionNumber (logicalUnitAddress;
             GLOBAL_logicalUnit[logicalUnitAddress].deviceType[])
            (GLOBAL_logicalUnit[logicalUnitAddress].lightSource[])                   =
            GetSupportedLightSources (logicalUnitAddress)
        endfor
        // Vérifier par essai les valeurs par défaut en usine des variables différentes par unité logique
        if (factoryNewDevice == Yes)
            for (logicalUnitAddress = 0; logicalUnitAddress<GLOBAL_numberShortAddresses; logicalUnitAddress++)
                CheckFactoryDefault102PerLogicalUnit (logicalUnitAddress; operatingMode; PHM)
                CheckFactoryDefault2xxPerLogicalUnit (logicalUnitAddress; GLOBAL_logicalUnit[logicalUnitAddress].deviceType[])
            endfor
        endif
        GLOBAL_currentUnderTestLogicalUnit = 0 // Définir une variable à utiliser pour les essais ultérieurs, afin de déterminer quelle unité logique est en essai
        // Lorsque le bus dispose de plusieurs unités logiques, demander à l'utilisateur si les essais doivent être effectués pour toutes les unités logiques ou pour des unités spécifiques
        if (GLOBAL_numberShortAddresses!= 1)
            answer = UserInput (Les essais doivent-ils être effectués pour toutes les unités logiques?, YesNo)
            if (answer == Yes)
                for (i = 0; i <GLOBAL_numberShortAddresses; i++)
                    GLOBAL_logicalUnit[i].runTests = true
                endfor
            else
                for (i = 0; i < GLOBAL_numberShortAddresses; i++)
                    answer = UserInput (Les essais doivent-ils être effectués pour une unité logique avec l'indice i ?, YesNo)
                    if (answer == Yes)
                        GLOBAL_logicalUnit[i].runTests = true
                    else
                        GLOBAL_logicalUnit[i].runTests = false
                    endif
                endfor
            endif
        else
            GLOBAL_logicalUnit[0].runTests = true // Les essais doivent être effectués pour la seule unité logique disponible du bus
        endif
    endif
endif
GLOBAL_lightSourceType = UserInput (Saisir le type de source de lumière utilisé pour les essais et sa puissance (W) (ou la configuration en l'absence de source de lumière), value)
GLOBAL_outputCapDelay = 0
GLOBAL_outputCapDelay = UserInput (Saisir le temps de décharge du condensateur de sortie qui permet de déconnecter la lampe en toute sécurité, 0 si absent), value [s])
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.2.1.1 CheckFactoryDefault102

La sous-séquence d'essai vérifie les 102 variables par défaut en usine. Le mode de fonctionnement et le niveau minimum sont deux exceptions dans la mesure où le mode de fonctionnement et la PHM peuvent différer par unité logique. Selon les réponses de QUERY OPERATING MODE et QUERY PHYSICAL MINIMUM, le mode de fonctionnement et minLevel sont vérifiés dans cette sous-séquence, ou après l'attribution d'une adresse courte à chaque dispositif logique (CheckFactoryDefault102PerLogicalUnit() subsequence).

La séquence doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

(*operatingMode*; *PHM*) = CheckFactoryDefault102 ()

```
// Vérifier le mode de fonctionnement du DUT
operatingMode = -1
PHM = -1
answer = QUERY OPERATING MODE, accept Violation
if (answer n'est pas une trame en arrière valide)
    report1 Un dispositif physique comprend plusieurs unités logiques avec des modes de fonctionnement par défaut différents.
    answer = UserInput (Les instructions définies dans la présente norme sont-elles toutes mises en œuvre dans l'ensemble des modes spécifiques au fabricant et le bloc de mémoire 0 est-il identique pour ces modes?, YesNo)
    if (answer == No)
        warning1 Le mode de fonctionnement par défaut pour tous les dispositifs logiques ne peut pas être vérifié. Le DUT est forcé à adopter le mode de fonctionnement 0x00.
        DTR0 (0)
        SET OPERATING MODE
        operatingMode = 0
    else
        report2 Il est nécessaire de soumettre à essai le mode de fonctionnement par défaut après l'attribution d'une adresse courte à chaque dispositif logique.
    endif
else
    if (answer == 0)
        report3 Le DUT est en mode de fonctionnement 0x00.
        operatingMode = answer
    else if (0x01 <= answer AND answer<= 0x7F)
        error1 Le DUT est en mode de fonctionnement réservé. Réel: answer. Attendu: 0, [0x80,0xFF]. Le DUT est forcé à adopter le mode de fonctionnement 0x00.
        DTR0 (0)
        SET OPERATING MODE
        operatingMode = 0
    else
        report4 Le DUT est en mode spécifique au fabricant, mode de fonctionnement answer.
        operatingMode = answer
    endif
endif
// Vérifier le niveau minimum physique et le niveau minimum du DUT
answer = QUERY PHYSICAL MINIMUM, accept Violation, Value
if (answer n'est pas une trame en arrière valide)
    report5 Un dispositif physique comprend plusieurs unités logiques avec des PHM différentes.
else
    if (answer == 0 OR answer == 255)
        halt1 Valeur de rodage en usine erronée pour PHM. Réel: answer. Attendu: [0x01,0xFE].
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    endif
    PHM = answer
endif
if (PHM == -1)
    iStart = 0
else
    iStart = 1
endif
// Vérifier la valeur par défaut des 102 variables
for (i = iStart; i<= 28; i++)
    answer = query[i], accept Violation, Value
    if (answer n'est pas une trame en arrière valide)
        error2 Plusieurs unités logiques ont renvoyé des valeurs par défaut différentes pour variable[i].
    else
        if (answer != expectedAnswer[i])
            error3 Valeur par défaut erronée pour variable[i]. Réel: answer. Attendu: expectedAnswer[i].
        endif
    endif
    if (i == 6)
        randomAddress = answer
    endif
endfor
// Vérifier la variable initialisationState
answer = QUERY SHORT ADDRESS
if (answer != NO)
    error 4 Au moins une unité logique a un état d'initialisation par défaut incorrect. Réel: ENABLED ou WITHDRAWN. Attendu: DISABLED.
endif
answer = COMPARE
if (answer != NO)
    error 5 Au moins une unité logique a un état d'initialisation par défaut incorrect. Réel: ENABLED. Attendu: DISABLED
endif
// Vérifier la variable ShortAddress
INITIALISE (0)
answer = QUERY SHORT ADDRESS, accept Violation, Value
if (answer n'est pas une trame en arrière valide)
    error6 Plusieurs unités logiques ont renvoyé des valeurs par défaut différentes pour ShortAddress.
else
    if (answer != 255)
        error7 Valeur par défaut erronée pour shortAddress. Réponse: answer. Attendu: 255.
    endif
endif
// Vérifier la variable searchAddress
if (randomAddress == 0xFF FF FF)
    answer = COMPARE
    if (answer ==NO)
        error8 Valeur par défaut erronée pour searchAddress dans la mesure où la commande COMPARE n'a pas envoyé de réponse.
    endif
else
    warning 2 Valeur par défaut pour la variable searchAddress non vérifiée.
endif
TERMINATE
// Vérifier par essai la valeur par défaut pour la variable lastLightLevel
DTR0 (255)
SET POWER ON LEVEL
PowerCycleAndWaitForDecoder (5)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

WaitForPowerOnPhaseToFinish ()
answer = QUERY ACTUAL LEVEL
if (*answer* != 0xFE)
    error9 Valeur par défaut erronée pour lastLightLevel. Réponse: *answer*. Attendu: 0xFE.
endif
// Vérifier par essai la valeur par défaut pour la variable lastActiveLevel
OFF
GO TO LAST ACTIVE LEVEL
WaitForLampOnAddressed (broadcast)
answer = QUERY ACTUAL LEVEL
if (*answer* != 0xFE)
    error10 Valeur par défaut erronée pour lastLActiveLevel. Réponse: *answer*. Attendu: 0xFE.
endif
return (*operatingMode*; *PHM*)

Tableau 20 – Paramètres pour la séquence d'essai CheckFactoryDefault102

Phase d'essai i	query	variable	expectedAnswer
0	QUERY MIN LEVEL	minLevel	PHM
1	QUERY POWER ON LEVEL	powerOnLevel	0xFE
2	QUERY SYSTEM FAILURE LEVEL	systemFailureLevel	0xFE
3	QUERY MAX LEVEL	maxLevel	0xFE
4	QUERY FADE TIME/FADE RATE	fadeRate/fadeTime	0x07
5	QUERY EXTENDED FADE TIME	extendedFadeTimeBase/Multiplier	0
6	**GetRandomAddress** ()	randomAddress	0xFFFFFF
7	QUERY GROUP 0-7	gearGroups0-7	0x00
8	QUERY GROUP 8-15	gearGroups8-15	0x00
9	QUERY SCENE LEVEL 0	scene0	0xFF
10	QUERY SCENE LEVEL 1	scene1	0xFF
11	QUERY SCENE LEVEL 2	scene2	0xFF
12	QUERY SCENE LEVEL 3	scene3	0xFF
13	QUERY SCENE LEVEL 4	scene4	0xFF
14	QUERY SCENE LEVEL 5	scene5	0xFF
15	QUERY SCENE LEVEL 6	scene6	0xFF
16	QUERY SCENE LEVEL 7	scene7	0xFF
17	QUERY SCENE LEVEL 8	scene8	0xFF
18	QUERY SCENE LEVEL 9	scene9	0xFF
19	QUERY SCENE LEVEL 10	scene10	0xFF
20	QUERY SCENE LEVEL 11	scene11	0xFF
21	QUERY SCENE LEVEL 12	scene12	0xFF
22	QUERY SCENE LEVEL 13	scene13	0xFF
23	QUERY SCENE LEVEL 14	scene14	0xFF
24	QUERY SCENE LEVEL 15	scene15	0xFF
25	QUERY STATUS	statusByte	11100100b
26	QUERY CONTENT DTR0	DTR0	0x00
27	QUERY CONTENT DTR1	DTR1	0x00
28	QUERY CONTENT DTR2	DTR2	0x00

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.2.1.2 AddressPreamble

La sous-séquence d'essai supprime toutes les adresses courtes, puis découvre les unités logiques disponibles dans un bus et attribue à chacune d'elle une adresse courte égale à leur indice. La sous-séquence renvoie le nombre d'unités logiques trouvées.

La sous-séquence doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
numAssignedShortAddresses = AddressPreamble ()

searchCompleted = false
numAssignedShortAddresses = 0
assignedAddresses[63] = false
highestAssigned = -1
// Supprimer toutes les adresses courtes, puis détecter toutes les unités et leur attribuer des adresses courtes
DTR0 (255)
SET SHORT ADDRESS
INITIALISE (0)
RANDOMISE
wait 100 ms // après interruption de la commande RANDOMISE
while (!searchCompleted)
    // Vérifier si toute unité quelle qu'elle soit est toujours non adressée
    SetSearchAddress (0xFFFFFF)
    answer = COMPARE
    if (answer == NO)
        searchCompleted = true
    endif
    if (!searchCompleted)
        if (numAssignedShortAddresses< 63)
            searchAddress = 0xFFFFFF
            for (i = 23; i>= 0; i--)
                mask = (1 <<i)
                searchAddress = searchAddress& (~mask)
                SetSearchAddress (searchAddress)
                answer = COMPARE
                if (answer == NO)
                    // Aucune unité dans l'espace d'adresse aléatoire demandé => inverser le masque
                    searchAddress = searchAddress | mask
                else
                    // Au moins une unité est présente => conserver le masque
                endif
            endfor
            // Dernier bit atteint => définir une searchAddress valide
            SetSearchAddress (searchAddress)
            answer = COMPARE
            if (answer == YES)
                // Unité unique valide trouvée => programmer une adresse courte, où celle-ci est l'indice de l'unité logique
                PROGRAM SHORT ADDRESS ((63 << 1) + 1)
                address = GetIndexOfLogicalUnit (111111b) // adresse courte 63
                if (address< 63)
                    if (assignedAddresses[address] == true)
                        halt 1 Indice double fortuit trouvé. Réel: address.
                    else
                        PROGRAM SHORT ADDRESS ((address<< 1) + 1)
                        WITHDRAW
                        numAssignedShortAddresses++
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                        assignedAddresses[address] = true
                        if (address>highestAssigned)
                            highestAssigned = address
                        endif
                    endif
                else
                    halt 2 Indice élevé fortuit trouvé dans le bloc de mémoire 0. Réel:
                    address. Attendu: <63.
                endif
            else
                halt 3 Aucune unité trouvée à la dernière adresse de recherche.
            endif
        endif
    endif
    INITIALISE (0)
endwhile
TERMINATE
if (numAssignedShortAddresses -1!= highestAssigned)
    for (i = 0; i <highestAssigned; i++)
        if (assignedAddresses[i] ==true)
            report 1 Adresse attribuée: i.
        else
            report 2 Adresse non attribuée: i.
        endif
    endfor
    halt 4 Espace fortuit détecté dans les adresses courtes attribuées.
endif
returnnumAssignedShortAddresses
```

12.2.1.3 CheckFactoryDefault102PerLogicalUnit

La sous-séquence d'essai vérifie les valeurs par défaut du mode de fonctionnement, de la PHM et du niveau minimum, pour chaque unité logique, dans le cas où elles n'ont pas été vérifiées par essai au préalable.

La sous-séquence doit être exécutée pour l'unité logique avec l'adresse courte donnée par la variable d'adresse.

Description de l'essai:

CheckFactoryDefault102PerLogicalUnit (*address*; *operatingMode*; *PHM*)

```
if (operatingMode == -1)
    answer = QUERY OPERATING MODE, send to ((address<< 1) + 1)
    if (answer == 0)
        report1 L'unité logique address est en mode de fonctionnement 0x00.
    else if (0x01 <= answer AND answer<= 0x7F)
        error1 Unité logique address: L'unité logique est en mode de fonctionnement
        réservé. Réel: answer. Attendu: 0, [0x80,0xFF].
        report2 Afin de réaliser les essais, l'unité logique address est réglée sur le mode de
        fonctionnement 0x00.
        DTR (0)
        SET OPERATING MODE, send to ((address<< 1) + 1)
    else
        report3 LogicalUnit address: L'unité logique est en mode spécifique au fabricant,
        mode de fonctionnement answer.
    endif
endif
if (PHM == -1)
    answer = QUERY PHYSICAL MINIMUM, send to ((address<< 1) + 1), accept Value
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    if (answer == 0 OR answer == 255)
        halt1 LogicalUnit address: Valeur de rodage en usine erronée pour PHM. Réponse:
        answer. Attendu: [0x01,0xFE].
    endif
    PHM = answer
    answer = QUERY MIN LEVEL, send to ((address<< 1) + 1)
    if (answer != PHM)
        error2 LogicalUnit address: Valeur par défaut erronée pour minLevel. Réponse:
        answer. Attendu: PHM.
    endif
endif
return
```

12.2.1.4 CheckFactoryDefault2xxPerLogicalUnit

La sous-séquence d'essai vérifie toutes les variables par défaut en usine 2xx, pour chaque type de dispositif pris en charge par l'unité logique. Pour toutes les unités logiques qui prennent en charge un type de dispositif supérieur à 8, ou ayant un numéro de version étendue supérieur à 2, il convient d'exécuter l'essai défini dans la toute dernière norme 2xx.

La sous-séquence doit être exécutée pour l'unité logique avec l'adresse courte donnée par la variable d'adresse.

Description de l'essai:

CheckFactoryDefault2xxPerLogicalUnit (*address*; *deviceType[]*)

```
if (deviceType[0] != -1)
    foreach (device in deviceType)
        ENABLE DEVICE TYPE (device)
        answer = QUERY EXTENDED VERSION NUMBER, send to ((address<< 1) + 1)
        if (answer> 2 OR device>= 9)
            version = 201 + device
            UserInput (Pour l'unité logique address avec le type de dispositif device,
            exécuter à présent l'essai par défaut en usine défini dans la toute dernière
            norme IEC 62386-version,OK)
        else
            switch (device)
                case 0:
                    report1 Vérifier la conformité avec l'IEC 62386-201 Ed1
                    CheckFactoryDefault201 (address)
                    break
                case 1:
                    report2 Vérifier la conformité avec l'IEC 62386-202 Ed1
                    CheckFactoryDefault202 (address)
                    break
                case 2:
                    report3 Vérifier la conformité avec l'IEC 62386-203 Ed1
                    CheckFactoryDefault203 (address)
                    break
                case 3:
                    report4 Vérifier la conformité avec l'IEC 62386-204 Ed1
                    CheckFactoryDefault204 (address)
                    break
                case 4:
                    report5 Vérifier la conformité avec l'IEC 62386-205 Ed1
                    CheckFactoryDefault205 (address)
                    break
                case 5:
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                    report6 Vérifier la conformité avec l'IEC 62386-206 Ed1
                    CheckFactoryDefault206 (address)
                    break
                case 6:
                    report7 Vérifier la conformité avec l'IEC 62386-207 Ed1
                    CheckFactoryDefault207 (address)
                    break
                case 7:
                    report8 Vérifier la conformité avec l'IEC 62386-208 Ed1
                    CheckFactoryDefault208 (address)
                    break
                case 8:
                    report9 Vérifier la conformité avec l'IEC 62386-209 Ed1
                    CheckFactoryDefault209 (address)
                    break
            endswitch
        endif
    endfor
endif
return
```

12.2.1.4.1 CheckFactoryDefault201

Cette sous-séquence vérifie les valeurs par défaut en usine des variables définies dans la norme 201. La sous-séquence doit être exécutée pour l'unité logique avec l'adresse courte donnée par la variable d'adresse.

Description de l'essai:

CheckFactoryDefault201 (*address*)

```
for (i = 0; i< 2; i++)
    ENABLE DEVICE TYPE 0
    answer = query[i], send to ((address<< 1) + 1)
    if (answer != expectedAnswer[i])
        error1 LogicalUnit address: Valeur par défaut erronée pour variable[i]. Réponse:
        answer. Attendu: expectedAnswer[i].
    endif
endfor
return
```

Tableau 21 – Paramètres pour la séquence d'essai CheckFactoryDefault201

Phase d'essai i	query	variable	expectedAnswer
0	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	1
1	QUERY DEVICE TYPE	deviceType (Type de dispositif)	0

12.2.1.4.2 CheckFactoryDefault202

Cette sous-séquence vérifie les valeurs par défaut en usine des variables définies dans la norme 202. La sous-séquence doit être exécutée pour l'unité logique avec l'adresse courte donnée par la variable d'adresse.

Description de l'essai:

CheckFactoryDefault202 (*address*)
ENABLE DEVICE TYPE 1

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

emergencyMinLevel = QUERY EMERGENCY MIN LEVEL, send to ((*address*<< 1) + 1)
ENABLE DEVICE TYPE 1
emergencyMaxLevel = QUERY EMERGENCY MAX LEVEL, send to ((*address*<< 1) + 1)
if (*emergencyMinLevel* == 0)
    error1 LogicalUnit *address*: Valeur par défaut erronée pour emergencyMinLevel. Réponse: 0. Attendu: [1,*emergencyMaxLevel*] ou MASK.
endif
if (*emergencyMaxLevel* == 0)
    error2 LogicalUnit *address*: Valeur par défaut erronée pour emergencyMaxLevel. Réponse: 0. Attendu: [*emergencyMinLevel*,254] ou MASK.
endif
if (*emergencyMinLevel*>*emergencyMaxLevel*)
    error3 LogicalUnit *address*: emergencyMinLevel (*emergencyMinLevel*) supérieur à emergencyMaxLevel (*emergencyMaxLevel*).
endif
ENABLE DEVICE TYPE 1
answer = QUERY FEATURES, send to ((*address*<< 1) + 1)
autoTestCapability = (*answer*>> 3) & 0x01
for (*i* = 0; *i*< 14; *i*++)
    command[*i*]
    ENABLE DEVICE TYPE 1
    answer = *query*[*i*], send to ((*address*<< 1) + 1)
    if (*answer* != *expectedAnswer*[*i*,*autoTestCapability*])
        error4 LogicalUnit *address*: Valeur par défaut erronée pour *variable*[*i*]. Réponse: *answer*. Attendu: *expectedAnswer*[*i*,*autoTestCapability*].
    endif
endfor
return

Tableau 22 – Paramètres pour la séquence d'essai CheckFactoryDefault202

Phase d'essai i	command	query	variable	expectedAnswer	
				autoTestCapability = 0	autoTestCapability = 1
0	-	QUERY EMERGENCY LEVEL	emergencyLevel	*emergencyMaxLevel*	*emergencyMaxLevel*
1	DTR0 (7)	QUERY TEST TIMING	prolongTime	0	0
2	DTR0 (0)	QUERY TEST TIMING	functionTestDelayTimeHighByte	255	0 ou 2.
3	DTR0 (1)	QUERY TEST TIMING	functionTestDelayTimeLowByte	255	0 ou 160.
4	DTR0 (2)	QUERY TEST TIMING	durationTestDelayTimeHighByte	255	0 ou 136.
5	DTR0 (3)	QUERY TEST TIMING	durationTestDelayTimeLowByte	255	0 ou 128.
6	DTR0 (4)	QUERY TEST TIMING	functionTestInterval	0	7
7	DTR0 (5)	QUERY TEST TIMING	durationTestInterval	0	52
8	DTR0 (6)	QUERY TEST TIMING	testExecutionTimeout	7	7
9	-	QUERY DURATION TEST RESULT	durationTestResult	0	0
10	-	QUERY LAMP EMERGENCY TIME	lampEmergencyTime	0	0
11	-	QUERY LAMP TOTAL OPERATION TIME	lampTotalOperationTime	0	0

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12	-	QUERY DEVICE TYPE	deviceType (Type de dispositif)	1	1
13	-	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	1	1

12.2.1.4.3 CheckFactoryDefault203

Cette sous-séquence vérifie les valeurs par défaut en usine des variables définies dans la norme 203. La sous-séquence doit être exécutée pour l'unité logique avec l'adresse courte donnée par la variable d'adresse.

Description de l'essai:

CheckFactoryDefault203 (*address*)
for (*i* = 0; *i*< 7; *i*++)
    ENABLE DEVICE TYPE 2
    answer = *query*[*i*], send to ((*address*<< 1) + 1)
    if (*answer* != *expectedAnswer*[*i*])
        error1 LogicalUnit *address*: Valeur par défaut erronée pour *variable*[*i*]. Réponse: *answer*. Attendu: *expectedAnswer*[*i*].
    endif
endfor
return

Tableau 23 – Paramètres pour la séquence d'essai CheckFactoryDefault203

Phase d'essai i	query	variable	expectedAnswer
0	QUERY DEVICE TYPE	deviceType (Type de dispositif)	2
1	QUERY HID STATUS	hidStatus	0
2	QUERY ACTUAL HID FAILURE	actualHidFailure	0X000XXXb
3	QUERY STORED HID FAILURE	storedHidFailure	0X000XXXb
4	QUERY THERMAL OVERLOAD TIME HB	thermalOverloadTimeHighByte	0
5	QUERY THERMAL OVERLOAD TIME LB	thermalOverloadTimeLowByte	0
6	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	1

12.2.1.4.4 CheckFactoryDefault204

Cette sous-séquence vérifie les valeurs par défaut en usine des variables définies dans la norme 204. La sous-séquence doit être exécutée pour l'unité logique avec l'adresse courte donnée par la variable d'adresse.

Description de l'essai:

CheckFactoryDefault204 (*address*)

for (*i* = 0; *i*< 2; *i*++)
    ENABLE DEVICE TYPE 3
    answer = *query*[*i*], send to ((*address*<< 1) + 1)
    if (*answer* != *expectedAnswer*[*i*])
        error1 LogicalUnit *address*: Valeur par défaut erronée pour *variable*[*i*]. Réponse: *answer*. Attendu: *expectedAnswer*[*i*].
    endif

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

endfor
return

Tableau 24 – Paramètres pour la séquence d'essai CheckFactoryDefault204

Phase d'essai i	query	variable	expectedAnswer
0	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	1
1	QUERY DEVICE TYPE	deviceType (Type de dispositif)	3

12.2.1.4.5 CheckFactoryDefault205

Cette sous-séquence vérifie les valeurs par défaut en usine des variables définies dans la norme 205. La sous-séquence doit être exécutée pour l'unité logique avec l'adresse courte donnée par la variable d'adresse.

Description de l'essai:

CheckFactoryDefault205 (*address*)

for (*i* = 0; *i*< 6; *i*++)
    ENABLE DEVICE TYPE 4
    answer = *query*[*i*], send to ((*address*<< 1) + 1)
    if (*answer* != *expectedAnswer*[*i*])
        error1 LogicalUnit *address*: Valeur par défaut erronée pour *variable*[*i*]. Réponse: *answer*. Attendu: *expectedAnswer*[*i*].
    endif
endfor
return

Tableau 25 – Paramètres pour la séquence d'essai CheckFactoryDefault205

Phase d'essai i	query	variable	expectedAnswer
0	QUERY DIMMING CURVE	dimmingCurve	0
1	QUERY DIMMER STATUS	dimmerStatus	000000XXb
2	QUERY FAILURE STATUS	failureStatusByte1	XXX0XXXXb
3	QUERY CONTENT DTR1	failureStatusByte2	000XXXXXb
4	QUERY DEVICE TYPE	deviceType (Type de dispositif)	4
5	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	1

12.2.1.4.6 CheckFactoryDefault206

Cette sous-séquence vérifie les valeurs par défaut en usine des variables définies dans la norme 206. La sous-séquence doit être exécutée pour l'unité logique avec l'adresse courte donnée par la variable d'adresse.

Description de l'essai:

CheckFactoryDefault206 (*address*)

for (*i* = 0; *i*< 6; *i*++)
    ENABLE DEVICE TYPE 5
    answer = *query*[*i*], send to ((*address*<< 1) + 1)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    if (answer != expectedAnswer[i])
        error1 LogicalUnit address: Valeur par défaut erronée pour variable[i]. Réponse:
        answer. Attendu: expectedAnswer[i].
    endif
endfor
return
```

Tableau 26 – Paramètres pour la séquence d'essai CheckFactoryDefault206

Phase d'essai i	query	variable	expectedAnswer
0	QUERY DIMMING CURVE	dimmingCurve	0
1	QUERY FAILURE STATUS	failureStatus	0
2	QUERY CONVERTERSTATUS	convertorStatus	0
3	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	1
4	QUERY DEVICE TYPE	deviceType (Type de dispositif)	5
5	QUERY PHYSICAL MINIMUM	physicalMinLevel	1

12.2.1.4.7 CheckFactoryDefault207

Cette sous-séquence vérifie les valeurs par défaut en usine des variables définies dans la norme 207. La sous-séquence doit être exécutée pour l'unité logique avec l'adresse courte donnée par la variable d'adresse.

Description de l'essai:

CheckFactoryDefault207 (*address*)

```
ENABLE DEVICE TYPE 6
minFastFadeTime = QUERY MIN FAST FADE TIME, send to ((address<< 1) + 1)
if (minFastFadeTime == 0 OR minFastFadeTime> 27)
    error1 LogicalUnit address: Valeur par défaut erronée pour minFastFadeTime. Réponse:
    answer. Attendu: [1,27].
endif
for (i = 0; i< 5; i++)
    ENABLE DEVICE TYPE 6
    answer = query[i], send to ((address<< 1) + 1)
    if (answer != expectedAnswer[i])
        error2 LogicalUnit address: Valeur par défaut erronée pour variable[i]. Réponse:
        answer. Attendu: expectedAnswer[i].
    endif
endfor
return
```

Tableau 27 – Paramètres pour la séquence d'essai CheckFactoryDefault207

Phase d'essai i	query	variable	expectedAnswer
0	QUERY FAST FADE TIME	fastFadeTime	0
1	QUERY OPERATING MODE	operatingMode	0000XXXXb
2	QUERY DIMMING CURVE	dimmingCurve	0
3	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	1
4	QUERY DEVICE TYPE	deviceType (Type de dispositif)	6

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.2.1.4.8 CheckFactoryDefault208

Cette sous-séquence vérifie les valeurs par défaut en usine des variables définies dans la norme 208. La sous-séquence doit être exécutée pour l'unité logique avec l'adresse courte donnée par la variable d'adresse.

Description de l'essai:

CheckFactoryDefault208 (*address*)

```
for (i = 0; i< 11; i++)
    ENABLE DEVICE TYPE 7
    answer = query[i], send to ((address<< 1) + 1)
    if (answer != expectedAnswer[i])
        error1 LogicalUnit address: Valeur par défaut erronée pour variable[i]. Réponse:
        answer. Attendu: expectedAnswer[i].
    endif
endfor
return
```

Tableau 28 – Paramètres pour la séquence d'essai CheckFactoryDefault208

Phase d'essai i	query	variable	expectedAnswer
0	QUERY PHYSICAL MINIMUM	physicalMinLevel	254
1	QUERY MIN LEVEL	minLevel	254
2	QUERY MAX LEVEL	maxLevel	254
3	QUERY UP SWITCH-ON THRESHOLD	upSwitchOnThreshold	1
4	QUERY UP SWITCH-OFF THRESHOLD	upSwitchOffThreshold	255
5	QUERY DOWN SWITCH-ON THRESHOLD	downSwitchOnThreshold	255
6	QUERY DOWN SWITCH-OFF THRESHOLD	downSwitchOffThreshold	0
7	QUERY ERROR HOLD-OFF TIME	errorHoldOffTime	0
8	QUERY SWITCH STATUS	switchStatus	X0000XXXb
9	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	1
10	QUERY DEVICE TYPE	deviceType (Type de dispositif)	7

12.2.1.4.9 CheckFactoryDefault209

Cette sous-séquence vérifie les valeurs par défaut en usine des variables définies dans la norme 209. La sous-séquence doit être exécutée pour l'unité logique avec l'adresse courte donnée par la variable d'adresse.

Description de l'essai:

CheckFactoryDefault209 (*address*)

```
for (i = 0; i< 78; i++)
    command1[i], send to ((address<< 1) + 1)
    command2[i]
    ENABLE DEVICE TYPE 8
    answer = query[i], send to ((address<< 1) + 1)
    if (answer != expectedAnswer[i])
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

error1 LogicalUnit *address*: Valeur par défaut erronée pour *variable*[*i*]. Réponse: *answer*. Attendu: *expectedAnswer*[*i*].

endif
endfor
return

Tableau 29 – Paramètres pour la séquence d'essai CheckFactoryDefault209

Phase d'essai i	command1	command2	query	variable	expectedAnswer
0	-	DTR0 (192)	QUERY COLOUR VALUE	Temporary x-coordinate_MSB	255
1	-	-	QUERY CONTENT DTR0	Temporary x-coordinate_LSB	255
2	-	DTR0 (193)	QUERY COLOUR VALUE	Temporary y-coordinate_MSB	255
3	-	-	QUERY CONTENT DTR0	Temporary y-coordinate_LSB	255
4	-	DTR0 (194)	QUERY COLOUR VALUE	Temporary colour temperature Tc_MSB	255
5	-	-	QUERY CONTENT DTR0	Temporary colour temperature Tc_LSB	255
6	-	DTR0 (195)	QUERY COLOUR VALUE	Temporary Primary N dimlevel 0_MSB	255
7	-	-	QUERY CONTENT DTR0	Temporary Primary N dimlevel 0_LSB	255
8	-	DTR0 (196)	QUERY COLOUR VALUE	Temporary Primary N dimlevel 1_MSB	255
9	-	-	QUERY CONTENT DTR0	Temporary Primary N dimlevel 1_LSB	255
10	-	DTR0 (197)	QUERY COLOUR VALUE	Temporary Primary N dimlevel 2_MSB	255
11	-	-	QUERY CONTENT DTR0	Temporary Primary N dimlevel 2_LSB	255
12	-	DTR0 (198)	QUERY COLOUR VALUE	Temporary Primary N dimlevel 3_MSB	255
13	-	-	QUERY CONTENT DTR0	Temporary Primary N dimlevel 3_LSB	255
14	-	DTR0 (199)	QUERY COLOUR VALUE	Temporary Primary N dimlevel 4_MSB	255
15	-	-	QUERY CONTENT DTR0	Temporary Primary N dimlevel 4_LSB	255
16	-	DTR0 (200)	QUERY COLOUR VALUE	Temporary Primary N dimlevel 5_MSB	255
17	-	-	QUERY CONTENT DTR0	Temporary Primary N dimlevel 5_LSB	255
18	-	DTR0 (201)	QUERY COLOUR VALUE	Temporary Red dimlevel	255
19	-	DTR0 (202)	QUERY COLOUR VALUE	Temporary Green dimlevel	255
20	-	DTR0 (203)	QUERY COLOUR VALUE	Temporary Blue dimlevel	255
21	-	DTR0 (204)	QUERY COLOUR VALUE	Temporary White dimlevel	255
22	-	DTR0 (205)	QUERY COLOUR VALUE	Temporary Amber dimlevel	255

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Phase d'essai	command1	command2	query	variable	expectedAnswer
23	-	DTR0 (206)	QUERY COLOUR VALUE	Temporary FreeColour dimlevel	255
24	-	DTR0 (207)	QUERY COLOUR VALUE	Temporary RGBWAF control	255
25	-	DTR0 (224)	QUERY COLOUR VALUE	Report x-coordinate_MSB	255
26	-	-	QUERY CONTENT DTR0	Report x-coordinate_LSB	255
27	-	DTR0 (225)	QUERY COLOUR VALUE	Report y-coordinate_MSB	255
28	-	-	QUERY CONTENT DTR0	Report y-coordinate_LSB	255
29	-	DTR0 (226)	QUERY COLOUR VALUE	Report colour temperature Tc_MSB	255
30	-	-	QUERY CONTENT DTR0	Report colour temperature Tc_LSB	255
31	-	DTR0 (227)	QUERY COLOUR VALUE	Report Primary 0 dimlevel 0_MSB	255
32	-	-	QUERY CONTENT DTR0	Report Primary 0 dimlevel 0_LSB	255
33	-	DTR0 (228)	QUERY COLOUR VALUE	Report Primary 0 dimlevel 1_MSB	255
34	-	-	QUERY CONTENT DTR0	Report Primary 0 dimlevel 1_LSB	255
35	-	DTR0 (229)	QUERY COLOUR VALUE	Report Primary 0 dimlevel 2_MSB	255
36	-	-	QUERY CONTENT DTR0	Report Primary 0 dimlevel 2_LSB	255
37	-	DTR0 (230)	QUERY COLOUR VALUE	Report Primary 0 dimlevel 3_MSB	255
38	-	-	QUERY CONTENT DTR0	Report Primary 0 dimlevel 3_LSB	255
39	-	DTR0 (231)	QUERY COLOUR VALUE	Report Primary 0 dimlevel 4_MSB	255
40	-	-	QUERY CONTENT DTR0	Report Primary 0 dimlevel 4_LSB	255
41	-	DTR0 (232)	QUERY COLOUR VALUE	Report Primary 0 dimlevel 5_MSB	255
42	-	-	QUERY CONTENT DTR0	Report Primary 0 dimlevel 5_LSB	255
43	-	DTR0 (233)	QUERY COLOUR VALUE	Report Red dimlevel	255
44	-	DTR0 (234)	QUERY COLOUR VALUE	Report Green dimlevel	255
45	-	DTR0 (235)	QUERY COLOUR VALUE	Report Blue dimlevel	255
46	-	DTR0 (236)	QUERY COLOUR VALUE	Report White dimlevel	255
47	-	DTR0 (237)	QUERY COLOUR VALUE	Report Amber dimlevel	255
48	-	DTR0 (238)	QUERY COLOUR VALUE	Report FreeColour dimlevel	255
49	-	DTR0 (239)	QUERY COLOUR VALUE	Report RGBWAF control	255
50	-	DTR0 (15)	QUERY COLOUR VALUE	RGBWAF control	255

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Phase d'essai	command1	command2	query	variable	expectedAnswer
51	-	DTR0 (1)	QUERY ASSIGNED COLOUR	Assigned colour channel 0	1
52	-	DTR0 (2)	QUERY ASSIGNED COLOUR	Assigned colour channel 1	2
53	-	DTR0 (3)	QUERY ASSIGNED COLOUR	Assigned colour channel 2	3
54	-	DTR0 (4)	QUERY ASSIGNED COLOUR	Assigned colour channel 3	4
55	-	DTR0 (5)	QUERY ASSIGNED COLOUR	Assigned colour channel 4	5
56	-	DTR0 (6)	QUERY ASSIGNED COLOUR	Assigned colour channel 5	6
57	-	DTR0 (208)	QUERY COLOUR VALUE	Temporary colour type	255
58	-	DTR0 (240)	QUERY COLOUR VALUE	Report colour type	255
59	QUERY SCENE LEVEL 0	DTR0 (240)	QUERY COLOUR VALUE	Scene 0 colour type	255
60	QUERY SCENE LEVEL 1	DTR0 (240)	QUERY COLOUR VALUE	Scene 1 colour type	255
61	QUERY SCENE LEVEL 2	DTR0 (240)	QUERY COLOUR VALUE	Scene 2 colour type	255
62	QUERY SCENE LEVEL 3	DTR0 (240)	QUERY COLOUR VALUE	Scene 3 colour type	255
63	QUERY SCENE LEVEL 4	DTR0 (240)	QUERY COLOUR VALUE	Scene 4 colour type	255
64	QUERY SCENE LEVEL 5	DTR0 (240)	QUERY COLOUR VALUE	Scene 5 colour type	255
65	QUERY SCENE LEVEL 6	DTR0 (240)	QUERY COLOUR VALUE	Scene 6 colour type	255
66	QUERY SCENE LEVEL 7	DTR0 (240)	QUERY COLOUR VALUE	Scene 7 colour type	255
67	QUERY SCENE LEVEL 8	DTR0 (240)	QUERY COLOUR VALUE	Scene 8 colour type	255
68	QUERY SCENE LEVEL 9	DTR0 (240)	QUERY COLOUR VALUE	Scene 9 colour type	255
69	QUERY SCENE LEVEL 10	DTR0 (240)	QUERY COLOUR VALUE	Scene 10 colour type	255
70	QUERY SCENE LEVEL 11	DTR0 (240)	QUERY COLOUR VALUE	Scene 11 colour type	255
71	QUERY SCENE LEVEL 12	DTR0 (240)	QUERY COLOUR VALUE	Scene 12 colour type	255
72	QUERY SCENE LEVEL 13	DTR0 (240)	QUERY COLOUR VALUE	Scene 13 colour type	255
73	QUERY SCENE LEVEL 14	DTR0 (240)	QUERY COLOUR VALUE	Scene 14 colour type	255
74	QUERY SCENE LEVEL 15	DTR0 (240)	QUERY COLOUR VALUE	Scene 15 colour type	255
75	-	-	QUERY GEAR FEATURES/STATUS	gear features / status	XX000001b
76	-	-	QUERY DEVICE TYPE	deviceType (Type de dispositif)	8
77	-	-	QUERY EXTENDED VERSION NUMBER	extendedVersionNumber	2

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.3 Paramètres fonctionnels physiques

12.3.1 Polarity test (Essai de polarité)

La séquence d'essai vérifie si le DUT est insensible à la polarité eu égard aux connexions de l'interface du bus. La séquence d'essai s'applique aux DUT sans ou avec une alimentation de bus intégrée inactive.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
if (GLOBAL_internalBPS == No)
    answer = QUERY CONTROL GEAR PRESENT
    if (answer == YES)
        report1 Communication possible à la polarité actuelle.
    else
        error1 Aucune communication à la polarité actuelle.
    endif
    Change (Permuter les fils de données à l'interface de bus du DUT)
    wait 100 ms
    answer = QUERY CONTROL GEAR PRESENT
    if (answer == YES)
        report2 Communication possible à la polarité inversée.
    else
        error2 Aucune communication à la polarité inversée.
        Change (Permuter les fils de données à l'interface de bus du DUT)
        wait 100 ms
    endif
else
    report3 Essai de polarité non exécuté en raison d'une alimentation interne.
endif
```

12.3.2 Maximum and minimum system voltage (Tension du système maximale et minimale)

La séquence d'essai vérifie si l'interface est capable de résister aux tensions assignées maximale et minimale.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
if (GLOBAL_Ibus == 0)
    report1 Essai non exécuté étant donné que le dispositif en essai ne permet pas la
    présence d'alimentations externes supplémentaires.
else
    Apply (Courant de GLOBAL_Ibus mA + 10 mA sur l'interface du bus)
    for (i = 0; i<2; i++)
        Vbus = voltage[i]
        Apply (Déconnecter l'interface)
        Apply (Tension de Vbus V sur l'interface du bus)
        Apply (Reconnecter l'interface)
        // la tension peut changer
        wait 1 min
        Apply (Tension de GLOBAL_VbusHigh V sur l'interface du bus)
        DTR0 (13)
        for (j = 0; j< 12; j++)
            DTR0 (value[j])
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            answer = QUERY CONTENT DTR0
            if (answer != value[j])
                error1 Fonctionnement défaillant après application de la tension assignée de Vbus V à l'interface du bus pendant 1 min. Réel: answer. Attendu: value[j].
            endif
        endfor
    endfor
endif
```

Tableau 30 – Paramètres pour la séquence d'essai 'Maximum and minimum system voltage'

Phase d'essai i	0	1
voltage [V]	22,5	-6,5

Phase d'essai j	0	1	2	3	4	5	6	7	8	9	10	11
value	0	1	2	4	8	16	32	64	85	128	170	255

12.3.3 Overvoltage protection test (Essai de protection contre la surtension)

Vérifier la protection de l'interface contre la surtension pour la tension externe maximale assignée du système.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
overvoltageProtection = UserInput (La protection contre la surtension est-elle prise en charge par le DUT?, YesNo)
if (overvoltageProtection == Yes)
    maximumVoltage = UserInput (Saisir la tension externe maximale assignée prise en charge par le DUT, value [V])
    maximumFrequency = UserInput (Saisir la fréquence externe maximale assignée prise en charge par le DUT, value [Hz])
    answer = QUERY CONTROL GEAR PRESENT
    if (answer != YES)
        error1 Aucune communication possible.
    else
        if (GLOBAL_busPowered == Yes)
            Disconnect (Interface du bus du DUT de l'appareil d'essai)
        else
            Switch_off (alimentation externe)
            Disconnect (Alimentation externe et interface du bus du DUT de l'appareil d'essai)
        endif
        Apply (Surtension de maximumVoltage V avec une fréquence de maximumFrequency Hz sur l'interface du bus)
        wait 1 min
        Remove (Surtension de l'interface du bus)
        if (GLOBAL_busPowered == Yes)
            Connect (Interface du bus du DUT à l'appareil d'essai)
        else
            Connect (Alimentation externe et interface du bus du DUT à l'appareil d'essai)
            Switch_on (alimentation externe)
        endif
        start_timer (timer)
        do
            answer = QUERY CONTROL GEAR PRESENT, acceptNo Answer
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            timestamp = get_timer (timer)
            if (answer == YES)
                report1 Protection contre la surtension prise en charge par le DUT.
                break
            endif
        while (timestamp<= 1 min)
        if (answer == NO)
            error2 Aucune communication au bout de 1 min après application de
            maximumVoltage V / maximumFrequency Hz sur l'interface du bus.
        endif
    endif
else
    report2 Protection contre la surtension non prise en charge par le DUT.
endif
```

Il est recommandé de répéter cet essai à la température de fonctionnement maximale et minimale.

12.3.4 Current rating test (Essai de courant assigné)

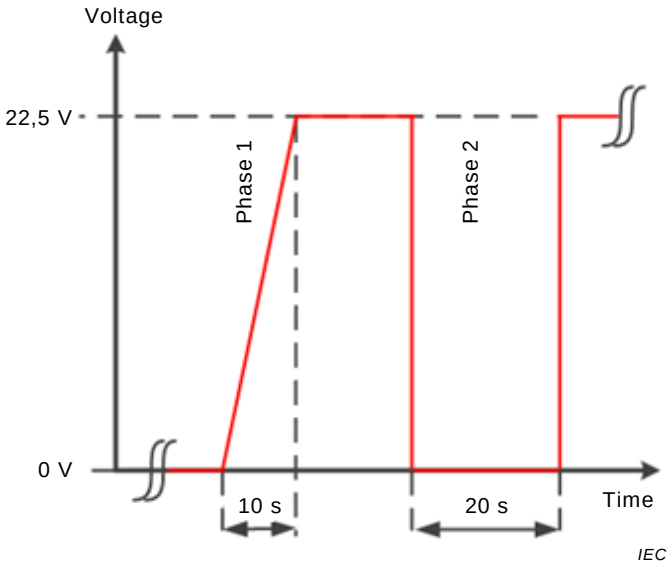
La séquence d'essai vérifie la consommation de courant avec le bus en état de repos.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
if (GLOBAL_internalBPS == Yes)
    report1 L'essai n'est pas applicable.
else
    currentLimit = 2
    if (GLOBAL_busPowered)
        currentLimit = UserInput (Saisir la consommation de courant indiquée sur l'étiquette
        ou dans la documentation, value [mA])
    endif
    Apply (Variation de tension linéaire entre 0 V et 22,5 V dans un délai de 10  s par
    rapport aux bornes du bus tel qu'illustré à la Phase 1 de la Figure 10)
    QUERY CONTENT DTR0
    // La chute de tension doit être appliquée directement après l'interruption valide de la
    trame en avant afin de décharger le condensateur interne du récepteur
    Apply (Chute de tension immédiate entre 22,5 V et 0 V – voir Figure 10)
    Apply (Tension de 0 V pendant 20 s – voir Phase 2 de la Figure 10)
    Apply (Variation de tension immédiate entre 0 V et 22,5 V à la fin de la Phase 2 de la
    Figure 10)
    current1 = Measure (Consommation de courant maximale en mA aux bornes du bus au
    cours de la Phase 1)
    current2 = Measure (Consommation de courant en mA aux bornes du bus lors de la
    variation de tension immédiate à la fin de la Phase 2)
    if (current1<= currentLimit)
        report2 La consommation de courant maximale mesurée au cours de la Phase1 est
        current1 mA. Attendu: <= currentLimit mA.
    else
        error1 Consommation de courant maximale erronée au cours de la Phase1. Réel:
        current1 mA. Attendu: <= currentLimit mA.
    endif
    if (current2<= currentLimit)
        report3 La consommation de courant maximale mesurée à la fin de la Phase 2 est
        current2 mA. Attendu: <= currentLimit mA.
    else
        error2 Consommation de courant maximale erronée à la fin de la Phase 2. Réel:
        current2 mA. Attendu: <= currentLimit mA.
    endif
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe



Légende

Anglais	Français
Voltage	Tension
Time	Temps

Figure 10 – Essai de courant assigné

Il est recommandé de répéter cet essai à la température de fonctionnement maximale et minimale.

12.3.5 Transmitter voltages (Tensions de l'émetteur)

La séquence d'essai vérifie si

- le dispositif réagit à différents réglages de tension et de courant;
- à une basse tension lors de l'état actif de l'émetteur;
- à une haute tension dans une trame en arrière.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
// 250 mA si admis, courant interne en cas d'alimentation interne unique. Le courant maximal admis est fourni.
Apply (Courant de GLOBAL_Ibus mA sur l'interface du bus)
//Effectuer un essai à la tension minimale et au courant maximal
if (GLOBAL_internalBPS)
    Vbus = 12
    Apply (Bloquer la tension du bus sur Vbus V sur l'interface du bus)
else
    Vbus = 10
    Apply (Tension de Vbus V sur l'interface du bus)
endif
CheckTxVoltages(Vbus; GLOBAL_Ibus)
if (GLOBAL_Ibus> 0)
    //Effectuer un essai à une tension de 20,5 V et au courant maximal. GLOBAL_Ibus = 0 en cas d'alimentation interne unique
    Apply (Tension de 20,5 V sur l'interface du bus)
    CheckTxVoltages (20,5; GLOBAL_Ibus)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
endif
if (GLOBAL_internalBPS)
    // Effectuer un essai à la tension d'alimentation interne du bus et au courant maximal si admis
    Apply (Tension de GLOBAL_internalVoltage V sur l'interface du bus)
    CheckTxVoltages(GLOBAL_internalVoltage; GLOBAL_Ibus)
    //Effectuer un essai en utilisant uniquement l'alimentation interne du bus
    if (GLOBAL_Ibus> 0)
        // Couper l'alimentation d'essai, courant minimal
        Apply (Courant de 0 mA sur l'interface du bus)
        CheckTxVoltages (GLOBAL_internalVoltage; 0)
    endif
else
    // Effectuer un essai pour un courant de 8 mA et différentes tensions
    Apply (Courant de 8 mA sur l'interface du bus)
    Apply (Tension de 10 V sur l'interface du bus)
    CheckTxVoltages(10; 8)
    Apply (Tension de 20,5 V sur l'interface du bus)
    CheckTxVoltages(20,5; 8)
endif
```

Il est recommandé de répéter cet essai à la température de fonctionnement maximale et minimale.

12.3.5.1 CheckTxVoltages

Cette sous-séquence vérifie la tension d'un signal envoyé par l'émetteur.

Description de l'essai:

CheckTxVoltages (*Vbus*; *Ibus*)

```
for (i = 0; i < 4; i++)
    DTR0 (value[i])
    current = Ibus + GLOBAL_internalCurrent
    answer = QUERY CONTENT DTR0, accept Pas de réponse
    if (answer == NO)
        error1 Aucune réponse reçue avec Vbus V et current mA pour QUERY CONTENT DTR0.
    else
        // Une fois que la tension du bus a franchi une basse tension de 4,5 V ou une tension élevée de 10 V, ce niveau doit être franchi une fois dans la direction opposée à la fin de la période de basse tension ou de tension élevée
        levelOkLow = UserInput (Les périodes actives de réponse à basse tension se situent-elles dans l'intervalle [-4,5 V; 4,5 V]?, YesNo)
        levelOkHigh = UserInput (Le niveau de réponse à tension élevée se situe-t-il dans l'intervalle [10 V; 22,5 V]?, YesNo)
        if (levelOkLow == No)
            error2 La période active à basse tension se situe en dehors de l'intervalle -4,5 V < Vlow < 4,5 V avec Vbus V et current mA dans la trame en arrière value[i].
        endif
        if (levelOkHigh == No)
            error3 La période de tension élevée se situe en dehors de l'intervalle 10 V < Vhigh < 22,5 V avec Vbus V et current mA dans la trame en arrière value[i].
        endif
    endif
endfor
return
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 31 – Paramètres pour la séquence d'essai 'Transmitter voltages'

Phase d'essai i	value
0	255
1	170
2	85
3	0

12.3.6 Transmitter rising and falling edges (Fronts montant et descendant de l'émetteur)

La séquence d'essai évalue l'exactitude des premier et dernier fronts montant et descendant dans une trame en arrière à des réglages de tension et de courant différents.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
//Effectuer un essai à une tension de 12 V et au courant maximal
Apply (Courant de GLOBAL_Ibus mA sur l'interface du bus)
Vbus = 12
if (GLOBAL_internalBPS)
    Apply (Bloquer la tension du bus sur Vbus V sur l'interface du bus)
else
    Apply (Tension de Vbus V sur l'interface du bus)
endif
CheckMaximumTxRiseFallTimes (12; GLOBAL_Ibus)
// Effectuer un essai à une tension de 10 V et un courant de 250 mA si possible
if (!GLOBAL_internalBPS)
    Apply (Tension de 10 V sur l'interface du bus)
    CheckMaximumTxRiseFallTimes (10; GLOBAL_Ibus)
endif
//Effectuer un essai  à la tension maximale si possible
if (GLOBAL_Ibus> 0)
    Apply (Tension de 20,5 V sur l'interface du bus)
    CheckMaximumTxRiseFallTimes (20,5; GLOBAL_Ibus)
    CheckMinimumTxRiseFallTimes (20,5; GLOBAL_Ibus)
endif
if (GLOBAL_internalBPS)
    // Effectuer un essai à la tension d'alimentation interne du bus et au courant maximal
    Apply (Tension de GLOBAL_internalVoltage V sur l'interface du bus)
    CheckMaximumTxRiseFallTimes (GLOBAL_internalVoltage; GLOBAL_Ibus])
    // Effectuer un essai avec uniquement l'alimentation interne du bus si non traité par la
    phase précédente
    if (GLOBAL_Ibus> 0)
        // Couper l'alimentation d'essai
        Apply (Courant de 0 mA sur l'interface du bus)
        CheckMaximumTxRiseFallTimes (GLOBAL_internalVoltage; 0)
    else
        CheckMinimumTxRiseFallTimes (GLOBAL_internalVoltage; 0)
    endif
else
    // Effectuer un essai pour un courant de 8 mA et différentes tensions
    Apply (Courant de 8 mA sur l'interface du bus)
    Apply (Tension de 10 V sur l'interface du bus)
    CheckMaximumTxRiseFallTimes (10; 8)
    Apply (Tension de 12 V sur l'interface du bus)
    CheckMaximumTxRiseFallTimes(12; 8)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    Apply (Tension de 20,5 V sur l'interface du bus)
    CheckMaximumTxRiseFallTimes (20,5; 8)
endif
```

Il est recommandé de répéter cet essai à la température de fonctionnement maximale et minimale.

12.3.6.1 CheckMinimumTxRiseFallTimes

Cette sous-séquence vérifie les temps de montée et de descente minimum d'un signal envoyé par l'émetteur.

Description de l'essai:

CheckMinimumTxRiseFallTimes (*Vbus*; *Ibus*)

```
for (i = 0; i < 2; i++)
    DTR0 (95)
    current = Ibus + GLOBAL_internalCurrent
    answer = QUERY CONTENT DTR0, accept Pas de réponse
    if (answer == NO)
        error1 Aucune réponse reçue avec Vbus V et current mA pour QUERY CONTENT DTR0.
    else
        fallTimeRelative = Measure (Temps compris entre 10% et 90% de l'écart de tension du signal pour le front descendant edge[i] dans la trame en arrière en µs)
        riseTimeRelative = Measure (Temps compris entre 10% et 90% de l'écart de tension du signal pour le front ascendant edge[i] dans la trame en arrière en µs)
        if (fallTimeRelative< 3)
            error2 Temps de chute erroné avec Vbus V et current mA dans le front descendant edge[i] de la trame en arrière. Réel: fallTimeRelative µs. Attendu: >= 3 µs.
        endif
        if (riseTimeRelative< 3)
            error3 Temps de montée erroné avec Vbus V et current mA dans le front ascendant edge[i] de la trame en arrière. Réel: riseTimeRelative µs. Attendu: >= 3 µs.
        endif
    endif
endfor
return
```

Tableau 32 – Paramètres pour la séquence d'essai 'Transmitter rising and falling edges'

Phase d'essai i	edge
0	premier
1	dernier

12.3.6.2 CheckMaximumTxRiseFallTimes

Cette sous-séquence vérifie les temps de montée et de descente maximums d'un signal envoyé par l'émetteur.

Description de l'essai:

CheckMaximumTxRiseFallTimes (*Vbus*; *Ibus*)

```
for (i = 0; i < 2; i++)
    DTR0 (95)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    current = Ibus + GLOBAL_internalCurrent
    answer = QUERY CONTENT DTR0, accept Pas de réponse
    if (answer == NO)
        error4 Aucune réponse reçue avec Vbus V et current mA pour QUERY CONTENT DTR0.
    else
        voltage = Measure (Dernière tension élevée du signal avant le front edge[i] en V)
        if (voltage< 12)
            fallTimeAbsolute = Measure (Temps compris entre (Vbus – 0,5) V et 4,5 V du front descendant edge[i] dans la trame en arrière en µs)
            riseTimeAbsolute = Measure (Temps compris entre 4,5 V et (Vbus – 0,5) V du front ascendant edge[i] dans la trame en arrière en µs)
        else
            fallTimeAbsolute = Measure (Temps compris entre 11,5 V et 4,5 V du front descendant edge[i] dans la trame en arrière en µs)
            riseTimeAbsolute = Measure (Temps compris entre 4,5 V et 11,5 V du front ascendant edge[i] dans la trame en arrière en µs)
        endif
        if (fallTimeAbsolute> 25)
            error 5 Temps de chute erroné avec Vbus V et current mA dans le front descendant edge[i] de la trame en arrière. Réel: fallTimeAbsolute µs. Attendu: <= 25 µs.
        endif
        if (riseTimeAbsolute> 25)
            error6 Temps de montée erroné avec Vbus V et current mA dans le front ascendant edge[i] de la trame en arrière. Réel: riseTimeAbsolute µs. Attendu: <= 25 µs.
        endif
    endif
endfor
return
```

Tableau 33 – Paramètres pour la séquence d'essai 'Transmitter rising and falling edges'

Phase d'essai i	edge
0	premier
1	dernier

12.3.7 Transmitter bit timing (Cadencement des bits de l'émetteur)

Cette séquence d'essai vérifie que le cadencement du temps de demi-bit et du double demi-temps est donné en termes de limites.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
Apply (Courant de GLOBAL_IbusmA sur l'interface du bus)
if (GLOBAL_internalBPS)
    Vbus = 12
    Apply (Bloquer la tension du bus sur Vbus V sur l'interface du bus)
else
    Vbus = 10
    Apply (Tension de Vbus V sur l'interface du bus)
endif
// Vérifier par essai le courant maximal et la tension minimale
CheckTxBitTiming (Vbus; GLOBAL_Ibus)
if (GLOBAL_Ibus> 0)
    // Effectuer un essai à une tension de 20,5 V et un courant maximal si possible
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    Apply (Tension de 20,5 V sur l'interface du bus)
    CheckTxBitTiming (20,5; GLOBAL_Ibus)
endif
if (GLOBAL_internalBPS)
    // Effectuer un essai à la tension d'alimentation interne du bus et au courant maximal le cas échéant
    Apply (Tension de GLOBAL_internalVoltage V sur l'interface du bus)
    CheckTxBitTiming (GLOBAL_internalVoltage; GLOBAL_Ibus)
    // Effectuer un essai avec uniquement l'alimentation interne du bus si non traité par la phase précédente
    if (GLOBAL_Ibus> 0)
        // Couper l'alimentation d'essai
        Apply (Courant de 0 mA sur l'interface du bus)
        CheckTxBitTiming (GLOBAL_internalVoltage; 0)
    endif
else
    // Effectuer un essai pour un courant équivalant à 8 mA et différentes tensions
    Apply (Courant de 8 mA sur l'interface du bus)
    Apply (Tension de 10 V sur l'interface du bus)
    CheckTxBitTiming (10; 8)
    Apply (Tension de 20,5 V sur l'interface du bus)
    CheckTxBitTiming (20,5; 8)
endif
```

Il est recommandé de répéter cet essai à la température de fonctionnement maximale et minimale.

12.3.7.1 CheckTxBitTiming

Cette sous-séquence vérifie les cadencements de bits d'un signal envoyé par l'émetteur.

Description de l'essai:

CheckTxBitTiming (*Vbus*; *Ibus*)

```
for (i = 0; i < 24; i++)
    DTR0 (value[i])
    current = Ibus + GLOBAL_internalCurrent
    answer = QUERY CONTENT DTR0, accept Pas de réponse
    if (answer == NO)
        error1 Aucune réponse reçue avec Vbus V et current mA pour QUERY CONTENT DTR0.
    else
        // Note: les mesures à niveau élevé s'appliquent uniquement après le bit de départ et avant la condition d'arrêt
        timeTe = Measure (Durée de la period[i] de la trame en arrière à 8 V en µs)
        if (TeNo[i] == 1)
            if (timeTe< 366,7 OR timeTe> 466,7)
                error2 Cadencement de demi-bit incorrect à la period[i] et avec la value[i]. Réel: timeTe µs. Attendu: 366,7 µs <= temps de demi-bit <= 466,7 µs.
            else
                report1 Cadencement de demi-bit incorrect à la period[i] et avec la value[i]. Réel: timeTe µs.
            endif
        endif
        if (TeNo[i] == 2)
            if (timeTe< 733,3 OR timeTe> 933,3)
                error3 Cadencement de double demi-bit incorrect à la period[i] et avec la value[i]. Réel: timeTe µs. Attendu: 733,3 µs <= temps de double demi-bit <= 933,3 µs.
            else
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                report2 Cadencement de double demi-bit à la period[i] et avec la value[i].
                Réel: timeTe µs.
            endif
        endif
    endif
endfor
return
```

Tableau 34 – Paramètres pour la séquence d'essai 'Transmitter bit timing'

Phase d'essai i	period	value	TeNo
0	Première période cadencement faible	0	1
1	Première période cadencement élevé	0	2
2	Deuxième période cadencement faible	0	1
3	Deuxième période cadencement élevé	0	1
4	Dernière période cadencement faible	0	1
5	Dernière période cadencement élevé	0	1
6	Première période cadencement faible	85	1
7	Première période cadencement élevé	85	1
8	Deuxième période cadencement faible	85	1
9	Deuxième période cadencement élevé	85	2
10	Dernière période cadencement faible	85	2
11	Dernière période cadencement élevé	85	2
12	Première période cadencement faible	170	1
13	Première période cadencement élevé	170	1
14	Deuxième période cadencement faible	170	1
15	Deuxième période cadencement élevé	170	2
16	Dernière période cadencement faible	170	1
17	Dernière période cadencement élevé	170	2
18	Première période cadencement faible	255	1
19	Première période cadencement élevé	255	1
20	Deuxième période cadencement élevé	255	1
21	Deuxième période cadencement élevé	255	1
22	Dernière période cadencement faible	255	1
23	Dernière période cadencement élevé	255	1

12.3.8 Transmitter frame timing (Cadencement des trames de l'émetteur)

La séquence d'essai vérifie que les temps de réponse se situent dans des limites définies.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
minTime = 100
maxTime = 0
for (i = 0; i < 12; i++)
    DTR0 (value[i])
    for (j = 0; j < 10; j++)
        answer = QUERY CONTENT DTR0
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        answerTime = Measure Temps d'établissement entre la trame en avant et la trame en
        arrière de QUERY CONTENT DTR0 en ms)
        // Vérifier par essai le temps d'établissement des trames en avant et en arrière de
        l'émetteur selon le Tableau 17 de l'IEC 62386-101 Ed 2.0
        if (answerTime< 5,5 OR answerTime> 10,5)
            error1 Temps de réponse incorrect à la phase d'essai (i,j) = (i,j). Réel:
            answerTime ms. Attendu: 5,5 ms <= temps d'établissement <= 10,5 ms.
        endif
        if (answerTime<minTime)
            minTime = answerTime
        endif
        if (answerTime>maxTime)
            maxTime = answerTime
        endif
    endfor
endfor
report1 Le temps d'établissement minimum mesuré est minTime ms.
report2 Le temps d'établissement maximum mesuré est maxTime ms.
```

Tableau 35 – Paramètres pour la séquence d'essai 'Receiver frame timing'

Phase d'essai i	0	1	2	3	4	5	6	7	8	9	10	11
value	0	1	2	4	8	16	32	64	85	128	170	255

Il est recommandé de répéter cet essai à la température de fonctionnement maximale et minimale.

12.3.9 Receiver start-up behavior (Comportement au démarrage du récepteur)

La séquence d'essai vérifie si

- les coupures d'alimentation de bus d'une durée de 40 ms sont ignorées par l'appareillage de commande; essai effectué quatre fois
- le comportement au démarrage après un cycle de mise sous tension externe est correct; essai effectué quatre fois. En l'absence d'alimentation interne du bus, quatre durées différentes sont utilisées.
- le comportement au démarrage après une panne d'alimentation de bus est correct

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
for (i = 0; i < 4; i++)
    // coupure d'alimentation de bus d'une durée de 40 ms
    wait 7 s
    Apply (Tension de 0 V sur l'interface du bus)
    wait 40 ms
    if (GLOBAL_internalBPS)
        Apply (Bloquer la tension à 12 V sur l'interface du bus)
    else
        Apply (Tension de 10 V sur l'interface du bus)
    endif
    wait 2,4 ms// condition d'arrêt
    answer = QUERY CONTROL GEAR PRESENT
    if (answer != YES)
        error1 Aucune communication après une coupure d'alimentation de bus d'une durée
        de 40 ms à la phase d'essai i = i.
    endif
    // Démarrage du cycle de mise sous tension externe
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    if (!GLOBAL_internalBPS)
        Apply (Tension de 0 V sur l'interface du bus)
    endif
    base = PowerCycleAndWaitForBusPower (60)
    start_timer (timer)
    if (GLOBAL_internalBPS)
        Apply (Bloquer la tension à 12 V sur l'interface du bus)
    else
        waitdelayTime[i] ms
        Apply (Tension de 10 V sur l'interface du bus et alimentation en courant de 8 mA)
    endif
    value = base + get_timer (timer) // Déterminer le temps en ms entre le cycle de mise
    sous tension et le rétablissement de l'alimentation de bus
    if (GLOBAL_busPowered)
        waitTime = 1200// Temps de lancement maximum
    else
        // Vérifier la note e, Tableau 6 de l'IEC 62386-101 Ed 2.0
        if (value< 350)
            waitTime = 450 – value
        else
            waitTime = 100
        endif
    endif
    waitwaitTime ms// Il convient à présent que le dispositif soit prêt, vérifier tous les cas de
    figure
    answer = QUERY CONTROL GEAR PRESENT
    if (answer != YES)
        error2 Aucune communication après waitTime ms, une fois l'alimentation de bus
        effective au terme du cycle de mise sous tension externe à la phase d'essai i = i.
    endif
    // Démarrage suite à panne d'alimentation de bus
    wait 1200 ms
    Apply (Tension de 0 V sur l'interface du bus)
    waitbusPowerDown[i] ms
    if (GLOBAL_internalBPS)
        Apply (Bloquer la tension à 12 V sur l'interface du bus)
    else
        Apply (Tension de 10 V sur l'interface du bus)
    endif
    if (GLOBAL_busPowered)
        waitTime = 1200
    else
        waitTime = 100
    endif
    waitwaitTime ms
    answer = QUERY CONTROL GEAR PRESENT
    if (answer != YES)
        error3 Aucune communication après waitTime ms suite à la période de mise hors
        tension du bus de busPowerDown[i] ms à la phase d'essai i = i.
    endif
endfor
```

Tableau 36 – Paramètres pour la séquence d'essai 'Receiver start-up behavior'

Phase d'essai i	0	1	2	3
delayTime [ms]	50	250	340	500
busPowerDown [ms]	100	500	1000	2000

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Il est recommandé de répéter cet essai à la température de fonctionnement maximale et minimale.

12.3.10 Receiver threshold (Seuil du récepteur)

La séquence d'essai vérifie si le seuil du récepteur se situe dans la plage attendue.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
for (Vbus = 9,5; Vbus<= 10; Vbus = Vbus + 0,5)
    for (i = 0; i < 20; i++)
        DTR0 (55)
        Apply (Tension de Vbus V sur l'interface du bus)
        Apply (DTR0 (255) avec une basse tension de 6,5 V)
        Apply (Tension de GLOBAL_VbusHighV sur l'interface du bus)
        answer = QUERY CONTENT DTR0, accept Pas de réponse
        if (answer != 255)
            if (Vbus < 10)
                warning1 DTR0 (255) non exécuté correctement pour une tension élevée
                du bus de Vbus V et une basse tension du bus de 6,5 V. Boucle: i Réel:
                answer. Attendu: 255.
            else
                error1 DTR0 (255) non exécutée correctement pour une tension élevée du
                bus de Vbus V et une basse tension du bus de 6,5 V. Boucle: i Réel:
                answer. Attendu: 255.
            endif
        endif
    endfor
endfor
```

Il est recommandé de répéter cet essai à la température de fonctionnement maximale et minimale.

12.3.11 Receiver bit timing (Cadencement des bits du récepteur)

La séquence d'essai vérifie la conformité de cadencement des bits du décodeur récepteur:

- pour différents cadencements de demi-bit
- pour les violations de cadencement de demi-bit et de double demi-bit
- pour différentes tensions basses et élevées du bus

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
Vbus = GLOBAL_VbusHigh
for (i = 0; i <4; i++)
    // Octet de commande envoyé avec cadencement nominal; combinaisons de limites dans
    le 2nd octet.
    for (m = 0; m < 5; m++)
        lowTime = TeLowTime[m]
        for (n = 0; n< 5; n++)
            highTime = TeHighTime[n]
            for (j = 0; j< 10; j++)
                DTR0 (0)
                // Toutes les autres commandes doivent être exécutées avec un
                cadencement nominal
                Apply (command[i] avec cadencements de bits donnés dans le Tableau)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                    answer = QUERY CONTENT DTR0
                    if (answer != expectation[i])
                        error1 command[i] non correctement exécutée à un temps élevé de demi-bit highTime µs, et un temps réduit de demi-bit lowTime µs. Réel: answer. Attendu: expectation[i].
                    endif
                endfor
            endfor
        endfor
endfor
for (i = 4; i < 11; i++)
    // phase 4: aucune violation
    // phase 5: violation de demi-bit d'une durée de 750 µs, bit élevé 5
    // phase: 6 violation de demi-bit d'une durée de 750 µs, bit faible 2
    // phase: 7 violation de double demi-bit d'une durée de 1250 µs, bits faibles 4 et 3
    // phase: 8 violation de double demi-bit d'une durée de 1250 µs, bits faibles 8 et 7
    // phase: 9 violation de double demi-bit d'une durée de 1200 µs, bits faibles 4 et 3
    // phase 10: violation de double demi-bit d'une durée de 1200 µs, bits faibles 8 et 7
    for (l = 0; l< 2; l++)
        if (GLOBAL_internalBPS)
            if (l == 1)
                Vbus = 12
            endif
        else
            Vbus = busVoltage[l]
        endif
        for (j = 0; j< 10; j++)
            DTR0 (0)
            Apply (command[i] avec cadencements de bits et tensions donnés dans le Tableau)
            answer = QUERY CONTENT DTR0
            if (answer != expectation[i])
                error2 command[i] non correctement traitée pour la tension de bus de Vbus V à la phase i. Réel: answer. Attendu: expectation[i].
            endif
        endfor
    endfor
endfor
```

Tableau 37 – Paramètres pour la séquence d'essai 'Receiver bit timing'

Phase d'essai m	**0**	**1**	**2**	**3**	**4**
TeLowTime [µs]	334	375	416	458	500

Phase d'essai n	**0**	**1**	**2**	**3**	**4**
TeHighTime [µs]	334	375	416	458	500

Phase d'essai l	**0**	**1**
busVoltage [V]	10	20,5

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Phase d'essai i	0		1		2		3		4		5		6		7		8		9		10	
command	DTR0 (240)		DTR0 (15)		DTR0 (85)		DTR0 (255)		DTR0 (15)		DTR0 (15)		DTR0 (15)		DTR0 (15)		DTR0 (15)		DTR0 (15)		DTR0 (15)	
possible value	240		15		85		255		15		0		0		0		0		0		0	
voltage / time	tension du bus [V]	temps [µs] à 8 V	tension du bus [V]	temps [µs] à 8 V	tension du bus [V]	temps [µs] à 8 V	tension du bus [V]	temps [µs] à 8 V	tension du bus [V]	temps [µs] à 8 V	tension du bus [V]	temps [µs] à 8 V	tension du bus [V]	temps [µs] à 8 V	tension du bus [V]	temps [µs] à 8 V	tension du bus [V]	temps [µs] à 8 V	tension du bus [V]	temps [µs] à 8 V	tension du bus [V]	temps [µs] à 8 V
startbit	0	416	0	416	0	416	0	416	0	334	0	334	0	334	0	334	0	334	0	334	0	334
	VBus	416	VBus	416	VBus	416	VBus	416	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500
bit 15	0	416	0	416	0	416	0	416	0	334	0	334	0	334	0	334	0	334	0	334	0	334
	VBus	416	VBus	416	VBus	416	VBus	416	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500
bit 14	VBus	416	VBus	416	VBus	416	VBus	416	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334
	0	416	0	416	0	416	0	416	0	500	0	500	0	500	0	500	0	500	0	500	0	500
bit 13	0	416	0	416	0	416	0	416	0	500	0	500	0	500	0	500	0	500	0	500	0	500
	VBus	416	VBus	416	VBus	416	VBus	416	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334
bit 12	VBus	416	VBus	416	VBus	416	VBus	416	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500
	0	416	0	416	0	416	0	416	0	334	0	334	0	334	0	334	0	334	0	334	0	334
bit 11	VBus	416	VBus	416	VBus	416	VBus	416	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500
	0	416	0	416	0	416	0	416	0	334	0	334	0	334	0	334	0	334	0	334	0	334
bit 10	VBus	416	VBus	416	VBus	416	VBus	416	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334
	0	416	0	416	0	416	0	416	0	334	0	334	0	334	0	334	0	334	0	334	0	334
bit 9	0	416	0	416	0	416	0	416	0	500	0	500	0	500	0	500	0	500	0	500	0	500
	VBus	416	VBus	416	VBus	416	VBus	416	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500
bit 8	0	416	0	416	0	416	0	416	0	500	0	500	0	500	0	500	0	500	0	500	0	500
	VBus	416	VBus	416	VBus	416	VBus	416	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	600
bit 7	0	lowTime	VBus	highTime	VBus	highTime	0	highTime	VBus	334	VBus	334	VBus	334	VBus	334	VBus	750	VBus	334	VBus	600
	VBus	highTime	0	lowTime	0	lowTime	VBus	lowTime	0	500	0	500	0	500	0	500	0	500	0	500	0	500

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Phase d'essai i	0		1		2		3		4		5		6		7		8		9		10	
bit 6	0	lowTime	VBus	highTime	0	highTime	0	highTime	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500
	VBus	highTime	0	lowTime	VBus	lowTime	VBus	lowTime	0	500	0	500	0	334	0	500	0	500	0	500	0	500
bit 5	0	lowTime	VBus	highTime	VBus	highTime	0	highTime	VBus	334	VBus	750	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334
	VBus	highTime	0	lowTime	0	lowTime	VBus	lowTime	0	334	0	334	0	334	0	334	0	500	0	500	0	334
bit 4	0	lowTime	VBus	highTime	0	highTime	0	highTime	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334
	VBus	highTime	0	lowTime	VBus	lowTime	VBus	lowTime	0	500	0	500	0	500	0	500	0	500	0	600	0	500
bit 3	VBus	highTime	0	lowTime	VBus	lowTime	0	lowTime	0	500	0	500	0	500	0	750	0	500	0	600	0	500
	0	lowTime	VBus	highTime	0	highTime	VBus	highTime	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334
bit 2	VBus	highTime	0	lowTime	0	lowTime	0	lowTime	0	500	0	500	0	750	0	500	0	500	0	500	0	500
	0	lowTime	VBus	highTime	VBus	highTime	VBus	highTime	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500
bit 1	VBus	highTime	0	lowTime	VBus	lowTime	0	lowTime	0	334	0	334	0	334	0	334	0	334	0	334	0	334
	0	lowTime	VBus	highTime	0	highTime	VBus	highTime	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334	VBus	334
bit 0	VBus	highTime	0	lowTime	0	lowTime	0	lowTime	0	334	0	334	0	334	0	334	0	334	0	334	0	334
	0	lowTime	VBus	highTime	VBus	highTime	VBus	highTime	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500	VBus	500

Il est recommandé de répéter cet essai à la température de fonctionnement maximale et minimale.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

12.3.12 Extended receiver bit timing (Cadencement des bits étendus du récepteur)

Toutes les longueurs de phases (demi-bits et doubles demi-bits) sont réglées sur la même valeur. Une phase est réglée sur une valeur d'essai spéciale, qui génère une forme d'onde toujours valide ou occasionne une violation du cadencement des bits. L'essai est répété pour différentes tensions du bus au repos.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
waveForm[28]  = {417, 417, 417, 833, 833, 833, 417, 417, 417, 417,
                 833, 417, 417, 833, 417, 417, 417, 417, 417, 417,
                 833, 417, 417, 417, 417, 417, 417, 417}
                 // cadencement nominal pour la commande DTR0(15)
for (i =0; i<=1; i++)
    for (j =0; j<=8; j++)
        for (k =0; k <=27; k ++) // k sélectionne la position de phase à modifier
            // assembler la trame d'essai
            expected = expect[j]
            for (x= 0; x<= 27; x++)
                if(x== k)
                    // insérer la longueur de phase modifiée à la position de phase sélectionnée
                    if(phase[x] == H)
                        // si un demi-bit commence au milieu d'un bit logique, il ne doit pas être étendu, dans la mesure où il résulterait en un double demi-bit valide, et non en une violation du cadencement des bits
                        if(expect[j] == accept OR bitstart[x] == Y)
                            waveForm[x] = modHalf[j]
                        else
                            waveForm[x] = half[j]
                            expected = accepter
                        endif
                    else
                        waveForm[x] = modDouble[j]
                    endif
                else
                    // utiliser une longueur de phase valide à toutes les autres positions de phases
                    if(phase[x] == H)
                        waveForm[x] = half[j]
                    else
                        waveForm[x] = double[j]
                    endif
                endif
            endfor
            // envoyer la trame d'essai
            for (x = 0; x<10; x++)
                DTR0 (0)
                // Toutes les autres commandes doivent être exécutées avec un cadencement nominal
                if (i == 0)
                    // tension minimale
                    if (GLOBAL_internalBPS)
                        Apply (Bloquer la tension à 12 V sur l'interface du bus)
                        busVoltage = 12
                    else
                        Apply (Tension de 10 V sur l'interface du bus)
                        busVoltage = 10
                    endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                    else
                        // Tension maximale
                        if(GLOBAL_Ibus == 0)
                            Apply (Tension de GLOBAL_VbusHigh V sur l'interface du bus)
                            busVoltage = GLOBAL_VbusHigh
                        else
                            Apply (Tension de 20,5 V sur l'interface du bus)
                            busVoltage = 20,5
                        endif
                    endif
                    Apply(waveForm[])
                    Apply (Tension de GLOBAL_VbusHigh sur l'interface du bus)
                    answer = QUERY CONTENT DTR0
                    if (expected == accept)
                        if(answer != 15)
                            error 1 Commande d'essai DTR0(15) non correctement exécutée
                            avec un temps de demi-bit half[j] µs et un double temps de demi-
                            bit double[j] µs, et un temps de demi-bit modifié modHalf[j] µs,
                            respectivement double temps de demi-bit modDouble[j] µs à une
                            phase de signal k. Tension du bus: busVoltage. Réel:answer.
                            Attendu: 15.
                        endif
                    else
                        if(answer != 0)
                            error 2 Commande d'essai DTR0(15) non ignorée ou exécutée de
                            façon erronée avec un temps de demi-bit half[j] µs et un double
                            temps de demi-bit double[j] µs, et un temps de demi-bit modifié
                            modHalf[j] µs, respectivement double temps de demi-bit
                            modDouble[j] µs à une phase de signal k. Tension du bus:
                            busVoltage. Réel: answer. Attendu: 0.
                        endif
                    endif
                endfor
            endfor
        endfor
    endfor
endfor
```

Tableau 38 – Paramètres pour la séquence d'essai 'Extended receiver bit timing'

Phase d'essai j	half[µs]	double[µs]	modHalf[µs]	modDouble[µs]	expect
0	417	833	500	1 000	accept
1	417	833	334	667	accept
2	334	667	500	1 000	accept
3	500	1 000	334	667	accept
4	334	1 000	500	667	accept
5	500	667	334	1 000	accept
6	417	833	750	1 200	ignore
7	334	667	750	1 200	ignore
8	500	1000	750	1 200	ignore

Phase x	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
phase	H	H	H	D	D	D	H	H	H	H	D	H	H	D	H	H	H	H	H	H	D	H	H	H	H	H	H	H
bitstart	Y	N	Y	N	N	N	N	Y	N	Y	N	N	Y	N	N	Y	N	Y	N	Y	N	N	Y	N	Y	N	Y	N

Il est recommandé de répéter cet essai à la température de fonctionnement maximale et minimale.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.3.13 Receiver forward frame violation (Violation de la trame en avant du récepteur)

La séquence d'essai vérifie si le récepteur est capable de se rétablir après la réception d'une trame en avant non normalisée.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
for (i = 0; i < 5; i++)
    for (j = 0; j< 10; j++)
        DTR0 (value[i])
        // forme d'onde envoyée directement après le dernier front ascendant de la commande DTR0
        answer = waveForm[i]
        if (answer != value[i])
            error1text[i]. Boucle: j.Réel: answer. Attendu: value[i].
        endif
    endfor
endfor
```

Tableau 39 – Paramètres pour la séquence d'essai 'Receiver frame violation and recovering after frame size violation'

Phase d'essai i	value	waveform	text
0	7	2400 µs + 110100011111100000b + 2400 µs + 11111111110011000b	DTR0 (240) avec violation de taille de trame a modifié le contenu de DTR0
1	10	2400 µs + 1010b + 2400 µs + 11111111110011000b	Quelques bits (violation de taille de trame) ont modifié le contenu de DTR0
2	0	2400 µs + 11010001100010101011010b + 2400 µs + 11111111110011000b	Trame de 20 bits contenant DTR0 (15) dans les 16 premiers bits non ignorée
3	0	2400 µs + 110100011000101010110101010b + 2400 µs + 11111111110011000b	Trame de 24 bits contenant DTR0 (15) dans les 16 premiers bits non ignorée
4	0	2400 µs + 1101000110001010110101010101010b + 2400 µs + 11111111110011000b	Trame de 32 bits contenant DTR0 (15) dans les 16 premiers bits non ignorée

12.3.14 Receiver settling timing (Cadencement de l'établissement du récepteur)

La séquence d'essai vérifie si les

- trames avant-avant (FF-FF) avec des temps d'établissement valides sont acceptées;
- trames avant-avant (FF-FF) avec des temps d'établissement non valides sont rejetées;
- trames arrière-avant (BF-FF) avec des temps d'établissement valides sont acceptées;
- trames arrière-avant (BF-FF) avec des temps d'établissement non valides sont rejetées.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
// Essais de trames FF-FF
for (i = 0; i < 4; i++)
    for (j = 0; j< 12; j++)
        DTR0 (13)
        DTR1 (13)
        DTR0 (value[j])
        Wait settlingTime[i] ms // temps d'établissement entre FF-FF
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            DTR1 (value[j])
            answer0 = QUERY CONTENT DTR0
            answer1 = QUERY CONTENT DTR1
            if (i< 2)
                if (answer0 != value[j])
                    error1 Valeur fortuite de DTR0 pour le temps d'établissement FF-FF réglé
                    sur settlingTime[i] ms. Réel: answer0. Attendu: value[j].
                endif
                if (answer1 != value[j])
                    error2 Valeur fortuite de DTR1 pour le temps d'établissement FF-FF réglé
                    sur settlingTime[i] ms. Réel: answer1. Attendu: value[j].
                endif
            else
                if (answer0 != 13)
                    error3 Valeur fortuite de DTR0 pour le temps d'établissement FF-FF réglé
                    sur settlingTime[i] ms. Réel: answer0. Attendu: 13.
                endif
                if (answer1 != 13)
                    error4 Valeur fortuite de DTR1 pour le temps d'établissement FF-FF réglé
                    sur settlingTime[i] ms. Réel: answer1. Attendu: 13.
                endif
            endif
        endfor
    endfor
    // Essais de trames BF-FF
    for (i = 0; i < 4; i++)
        for (j = 0; j< 12; j++)
            DTR1 (13)
            answer0 = QUERY CONTENT DTR0
            wait settlingTime[i] ms // temps d'établissement entre BF-FF
            DTR1 (value[j])
            answer1 = QUERY CONTENT DTR1
            if (i< 2)
                if (answer1 != value[j])
                    error5 DTR1 non acceptée pour le temps d'établissement BF-FF réglé sur
                    settlingTime[i] ms. Réel: answer1. Attendu: value[j].
                endif
            else
                if (answer1 != 13)
                    error6 DTR1 non ignorée pour le temps d'établissement BF-FF réglé sur
                    settlingTime[i] ms. Réel: answer1. Attendu: 13.
                endif
            endif
        endfor
    endfor
```

Tableau 40 – Paramètres pour la séquence d'essai 'Receiver frame timing'

Phase d'essai i	0	1	2	3
settlingTime [ms]	3	2,4	1,4	1,2

Phase d'essai j	0	1	2	3	4	5	6	7	8	9	10	11
value	0	1	2	4	8	16	32	64	85	128	170	255

Il est recommandé de répéter cet essai à la température de fonctionnement maximale et minimale.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.3.15 Receiver frame timing FF-FF send twice (Cadencement des trames du récepteur FF-FF 'send twice')

La séquence d'essai vérifie si les

- trames 'send twice' avec un temps d'établissement correspondant maximum compris entre les trames en avant sont correctement reçues
- les commandes 'send twice' avec une commande intermédiaire pour les temps d'établissement minimum sont ignorées

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
for (value = 0; value< 16; value++)
    // Réception correcte pour le temps d'établissement 'send twice' maximum
    DTR0 (value)
    SET SCENE (value)
    DTR0 (value + 1)
    SET SCENE (value), send once
    wait 94 ms // temps d'établissement
    SET SCENE (value), send once
    answer = QUERY SCENE LEVEL (value)
    if (answer != value + 1)
        error1 (value) SET SCENE Send twice au cours du temps d'établissement de 94 ms
        entre les trames en avant non acceptée. Réel: answer. Attendu: value + 1.
    endif
    // Ignorer la valeur send twice pour un temps d'établissement send twice trop long
    DTR0 (value)
    SET SCENE (value)
    DTR0 (value + 1)
    SET SCENE (value), send once
    wait 105 ms // temps d'établissement
    SET SCENE (value), send once
    answer = QUERY SCENE LEVEL (value)
    if (answer != value)
        error2 (value) SET SCENE Send twice au cours du temps d'établissement de 105
        ms entre les trames en avant non ignorée. Réel: answer. Attendu: value.
    endif
endfor
// Ignorer la commande 'send twice' pour la commande intermédiaire avec des temps
d'établissement minimum
for (value = 0; value< 16; value++)
    DTR0 (value)
    DTR1 (255)
    SET SCENE (value)
    DTR0 (value + 1)
    SET SCENE (value), send once
    wait 13,5 ms // temps d'établissement
    DTR1 (value)
    wait 13,5 ms // temps d'établissement
    SET SCENE (value), send once
    answer = QUERY SCENE LEVEL (value)
    if (answer != value)
        error3 Commande Send twice non ignorée pour la commande intermédiaire à la
        phase d'essai = value. Réel: answer. Attendu: value.
    endif
    answer = QUERY CONTENT DTR1
    if (answer != value)
        error4 (value) DTR1 de la commande intermédiaire non correctement exécutée à la
        phase d'essai = value. Réel: answer. Attendu: value.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    endif
endfor
// Ignorer la commande 'send twice' pour la commande intermédiaire avec des temps d'établissement minimums, accepter la 2e commande send twice
for (value = 0; value< 16; value++)
    DTR0 (value)
    DTR1 (255)
    SET SCENE (value)
    DTR0 (value + 1)
    SET SCENE (value), send once
    wait 13,5 ms // temps d'établissement
    DTR1 (value)
    wait 13,5 ms // temps d'établissement
    SET SCENE (value), send once
    wait 80 ms // temps d'établissement
    SET SCENE (value), send once
    answer = QUERY SCENE LEVEL (value)
    if (answer != value + 1)
        error5 Seconde commande Send twice ignorée pour la commande intermédiaire à la phase d'essai = value. Réel: answer. Attendu: value+ 1.
    endif
    answer = QUERY CONTENT DTR1
    if (answer != value)
        error6 (value) DTR1 de la commande intermédiaire non correctement exécutée à la phase d'essai = value. Réel: answer. Attendu: value.
    endif
endfor
```

Il est recommandé de répéter cet essai à la température de fonctionnement maximale et minimale.

12.4 Instructions de configuration

12.4.1 RESET

Dans cette séquence d'essai, tous les paramètres du dispositif en essai, programmables par l'utilisateur, sont réglés sur des valeurs non réinitialisées. Après l'envoi d'une commande RESET ou après nouveau réglage des paramètres du DUT programmables par l'utilisateur sur leurs valeurs réinitialisées, les paramètres doivent être vérifiés par rapport à ces mêmes valeurs. Le resetState et l'état du DUT sont vérifiés également après chaque changement des paramètres.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
answer = QUERY STATUS
if (answer != XX100XXXb)
    error1 Réponse erronée à QUERY STATUS après la commande RESET. Réel: answer. Attendu: XX100XXXb.
endif
PHM = QUERY PHYSICAL MINIMUM
for (i = 0; i<40; i++)
    for (j = 0; j< 2; j++)
        if (i == 2)
            DTR0 (PHM + 1)
        else
            DTR0 (1)
        endif
        command1[i]
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        answer = QUERY RESET STATE
        if (answer != reset[i])
            error2 Réponse erronée à QUERY RESET STATE à la phase d'essai (i,j) = (i,j).
            Réel: answer. Attendu: reset[i].
        endif
        answer = QUERY STATUS
        if (answer != status[i])
            error3 Réponse erronée à QUERY STATUS à la phase d'essai (i,j) = (i,j). Réel:
            answer. Attendu: status[i].
        endif
        if (j == 0)
            RESET
            wait 300 ms
        else
            if (i == 5)
                DTR0 (0)
            else
                DTR0 (value[i])
            endif
            command2[i]
        endif
        answer = query[i]
        if (answer != value[i])
            error4 Pas de RESET de errorText[i] à la phase d'essai (i,j) = (i,j). Réel:
            answer. Attendu: value[i].
        endif
        answer = QUERY RESET STATE
        if (answer != YES)
            error5 Réponse erronée à QUERY RESET STATE à la phase d'essai (i,j) = (i,j).
            Réel: answer. Attendu: YES.
        endif
        answer = QUERY STATUS
        if (answer != XX100XXXb)
            error6 Réponse erronée à QUERY RESET STATE à la phase d'essai (i,j) = (i,j).
            Réel: answer. Attendu: XX100XXXb.
        endif
    endfor
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 41 – Paramètres pour la séquence d'essai 'RESET'

Phase d'essai	command1	command2	query	value	reset		status		errorText
					PHM != 254	PHM = 254	PHM != 254	PHM = 254	
0	SET POWER ON LEVEL	SET POWER ON LEVEL	QUERY POWER ON LEVEL	0xFE	NO	NO	XX000XXXb	XX000XXXb	powerOnLevel
1	SET SYSTEM FAILURE LEVEL	SET SYSTEM FAILURE LEVEL	QUERY SYSTEM FAILURE LEVEL	0xFE	NO	NO	XX000XXXb	XX000XXXb	systemFailureLevel
2	SET MIN LEVEL	SET MIN LEVEL	QUERY MIN LEVEL	*PHM*	NO	YES	XX000XXXb	XX100XXXb	minLevel
3	SET MAX LEVEL	SET MAX LEVEL	QUERY MAX LEVEL	0xFE	NO	YES	XX001XXXb	XX100XXXb	maxLevel
4	SET FADE RATE	SET FADE RATE	QUERY FADE TIME/FADE RATE	0x07	NO	NO	XX000XXXb	XX000XXXb	fadeRate/fadeTime
5	SET FADE TIME	SET FADE TIME	QUERY FADE TIME/FADE RATE	0x07	NO	NO	XX000XXXb	XX000XXXb	fadeRate/fadeTime
6	ADD TO GROUP 0	REMOVE FROM GROUP 0	QUERY GROUPS 0-7	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups0-7
7	ADD TO GROUP 1	REMOVE FROM GROUP 1	QUERY GROUPS 0-7	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups0-7
8	ADD TO GROUP 2	REMOVE FROM GROUP 2	QUERY GROUPS 0-7	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups0-7
9	ADD TO GROUP 3	REMOVE FROM GROUP 3	QUERY GROUPS 0-7	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups0-7
10	ADD TO GROUP 4	REMOVE FROM GROUP 4	QUERY GROUPS 0-7	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups0-7
11	ADD TO GROUP 5	REMOVE FROM GROUP 5	QUERY GROUPS 0-7	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups0-7
12	ADD TO GROUP 6	REMOVE FROM GROUP 6	QUERY GROUPS 0-7	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups0-7
13	ADD TO GROUP 7	REMOVE FROM GROUP 7	QUERY GROUPS 0-7	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups0-7
14	ADD TO GROUP 8	REMOVE FROM GROUP 8	QUERY GROUPS 8-15	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups8-15
15	ADD TO GROUP 9	REMOVE FROM GROUP 9	QUERY GROUPS 8-15	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups8-15
16	ADD TO GROUP 10	REMOVE FROM GROUP 10	QUERY GROUPS 8-15	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups8-15
17	ADD TO GROUP 11	REMOVE FROM GROUP 11	QUERY GROUPS 8-15	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups8-15
18	ADD TO GROUP 12	REMOVE FROM GROUP 12	QUERY GROUPS 8-15	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups8-15
19	ADD TO GROUP 13	REMOVE FROM GROUP 13	QUERY GROUPS 8-15	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups8-15

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printed.

Phase d'essai	command1	command2	query	value	reset		status		errorText
					PHM != 254	PHM = 254	PHM != 254	PHM = 254	
20	ADD TO GROUP 14	REMOVE FROM GROUP 14	QUERY GROUPS 8-15	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups8-15
21	ADD TO GROUP 15	REMOVE FROM GROUP 15	QUERY GROUPS 8-15	0x00	NO	NO	XX000XXXb	XX000XXXb	gearGroups8-15
22	SET SCENE 0	SET SCENE 0	QUERY SCENE LEVEL 0	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene0
23	SET SCENE 1	SET SCENE 1	QUERY SCENE LEVEL 1	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene1
24	SET SCENE 2	SET SCENE 2	QUERY SCENE LEVEL 2	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene2
25	SET SCENE 3	SET SCENE 3	QUERY SCENE LEVEL 3	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene3
26	SET SCENE 4	SET SCENE 4	QUERY SCENE LEVEL 4	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene4
27	SET SCENE 5	SET SCENE 5	QUERY SCENE LEVEL 5	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene5
28	SET SCENE 6	SET SCENE 6	QUERY SCENE LEVEL 6	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene6
29	SET SCENE 7	SET SCENE 7	QUERY SCENE LEVEL 7	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene7
30	SET SCENE 8	SET SCENE 8	QUERY SCENE LEVEL 8	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene8
31	SET SCENE 9	SET SCENE 9	QUERY SCENE LEVEL 9	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene9
32	SET SCENE 10	SET SCENE 10	QUERY SCENE LEVEL 10	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene10
33	SET SCENE 11	SET SCENE 11	QUERY SCENE LEVEL 11	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene11
34	SET SCENE 12	SET SCENE 12	QUERY SCENE LEVEL 12	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene12
35	SET SCENE 13	SET SCENE 13	QUERY SCENE LEVEL 13	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene13
36	SET SCENE 14	SET SCENE 14	QUERY SCENE LEVEL 14	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene14
37	SET SCENE 15	SET SCENE 15	QUERY SCENE LEVEL 15	0xFF	NO	NO	XX000XXXb	XX000XXXb	scene15
38	SET EXTENDED FADE TIME	SET EXTENDED FADE TIME	QUERY EXTENDED FADE TIME	0x00	NO	NO	XX000XXXb	XX000XXXb	extendedFadeTimeBase/Multiplier
39	DAPC (*PHM*)	DAPC (254)	QUERY ACTUAL LEVEL	254	YES	YES	XX100XXXb	XX100XXXb	lastLightLevel

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.4.2 RESET: timeout / command in-between (RESET: temporisation / commande intermédiaire)

La commande RESET doit être exécutée uniquement si elle est reçue deux fois.

Cette séquence d'essai vérifie le comportement du DUT dans les conditions suivantes:

- une seule commande RESET est envoyée au lieu de deux commandes identiques
- la commande RESET est envoyée deux fois avec un temps d'établissement de 105 ms plus long que le temps d'établissement défini
- la commande RESET est envoyée avec une trame intermédiaire, trame qui se compose de quelques bits, et non une commande
- la commande RESET est envoyée avec une commande intermédiaire, commande qui est envoyée par diffusion
- la commande RESET est envoyée avec une commande intermédiaire, commande qui est envoyée à une certaine adresse de groupe
- la commande RESET est envoyée avec une commande intermédiaire, commande qui est envoyée à une certaine adresse courte
- la commande RESET est envoyée avec une commande intermédiaire, puis elle est renvoyée une nouvelle fois

Dans les cinq premiers cas, il convient de ne pas exécuter la commande RESET. Dans le dernier cas, il convient d'exécuter la commande RESET. Lorsqu'elle est indiquée, il convient d'accepter la commande intermédiaire

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
// Vérifier commande RESET send once
ADD TO GROUP 0
RESET, send once
wait 400 ms //100 ms pour commande send-twice "virtuelle" + 300 ms nécessaire pour RESET
answer = QUERY GROUPS 0-7
if (answer != 0x01)
    error1 RESET sent once exécutée. Réel: answer. Attendu: 0x01.
endif
// Vérifier commande send RESET avec temporisation
ADD TO GROUP 0
RESET, send once
wait 105 ms // temps d'établissement
RESET, send once
wait 300 ms
answer = QUERY GROUPS 0-7
if (answer != 0x01)
    error2 RESET avec temporisation exécutée. Réel: answer. Attendu: 0x01.
endif
// Vérifier commande send RESET avec une trame intermédiaire
ADD TO GROUP 0
// Les 3 phases suivantes doivent être envoyées dans un délai de 75 ms, à compter du dernier bit de montée de la première commande "RESET, send once" jusqu'au premier bit de descente de la seconde commande "RESET, send once"
RESET, send once
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
idle 13 ms + 110010 + idle 13 ms // temps d'établissement: repos d'une durée de 13 ms suivi d'une trame, suivie d'une période de 13 ms
RESET, send once
wait 300 ms
answer = QUERY GROUPS 0-7
if (answer != 0x01)
    error3 RESET avec quelques bits intermédiaires exécutée. Réel: answer. Attendu: 0x01.
endif
// Vérifier commande send RESET avec commande de diffusion intermédiaire
ADD TO GROUP 0
RECALL MAX LEVEL
// Les 3 phases suivantes doivent être envoyées dans un délai de 75 ms, à compter du dernier bit de montée de la première commande "RESET, send once" jusqu'au premier bit de descente de la seconde commande "RESET, send once"
RESET, send once
RECALL MIN LEVEL
RESET, send once
wait 300 ms
answer = QUERY GROUPS 0-7
if (answer != 0x01)
    error4 RESET avec commande intermédiaire exécutée. Réel: answer. Attendu: 0x01.
endif
answer = QUERY ACTUAL LEVEL
if (answer != PHM)
    error5 Commande intermédiaire RESET non exécutée. Réel: answer. Attendu: PHM.
endif
// Vérifier commande send RESET avec commande de groupe intermédiaire
ADD TO GROUP 0
RECALL MAX LEVEL
// Les 3 phases suivantes doivent être envoyées dans un délai de 75 ms, à compter du dernier bit de montée de la première commande "RESET, send once" jusqu'au premier bit de descente de la seconde commande "RESET, send once"
RESET, send once
RECALL MIN LEVEL, send to 10000001b // gearGroup 0
RESET, send once
wait 300 ms
answer = QUERY GROUPS 0-7
if (answer != 0x01)
    error6 RESET avec commande intermédiaire exécutée. Réel: answer. Attendu: 0x01.
endif
answer = QUERY ACTUAL LEVEL
if (answer != PHM)
    error7 Commande intermédiaire RESET non exécutée. Réel: answer. Attendu: PHM.
endif
// Vérifier commande send RESET avec commande courte intermédiaire
ADD TO GROUP 0
RECALL MAX LEVEL
oldAddress = GLOBAL_currentUnderTestLogicalUnit
newAddress = 63
SetShortAddress (oldAddress; newAddress)
// Les 3 phases suivantes doivent être envoyées dans un délai de 75 ms, à compter du dernier bit de montée de la première commande "RESET, send once" jusqu'au premier bit de descente de la seconde commande "RESET, send once"
RESET, broadcast, send once
RECALL MIN LEVEL, send to ((newAddress<< 1) + 1)
RESET, broadcast, send once
wait 300 ms
answer = QUERY GROUPS 0-7, send to ((newAddress<< 1) + 1)
if (answer != 0x01)
    error8 RESET avec commande intermédiaire exécutée. Réel: answer. Attendu: 0x01.
endif
answer = QUERY ACTUAL LEVEL, send to ((newAddress<< 1) + 1)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
if (answer != PHM)
    error9 Commande intermédiaire RESET non exécutée. Réel: answer. Attendu: PHM.
endif
SetShortAddress (newAddress; oldAddress)
// Vérifier par essai la commande RESET envoyée avec la commande intermédiaire par diffusion, puis de nouveau une nouvelle commande RESET envoyée une seule fois
ADD TO GROUP 0
DTR0 (0)
//Les 4 phases suivantes doivent être envoyées dans un délai de 75 ms, à compter du dernier bit de montée de la première commande "RESET, send once" jusqu'au premier bit de descente de la troisième commande "RESET, send once"
RESET, send once
DTR0 (1)
RESET, send once
RESET, send once
wait 300 ms
answer = QUERY GROUPS 0-7
if (answer != 0x00)
    error10 Commande RESET non exécutée. Réel: answer. Attendu: 0x00
endif
answer = QUERY CONTENT DTR0
if (answer != 1)
    error11 Commande intermédiaire RESET non exécutée. Réel: answer. Attendu: 1.
endif
```

12.4.3 Send-twice timeout (Temporisation de commande 'send-twice')

Toute instruction de configuration doit être exécutée uniquement si elle est reçue deux fois.

Dans cette séquence d'essai, on essaie de modifier tous les paramètres du DUT programmables par l'utilisateur, au moyen des instructions de configuration envoyées comme suit:

- une seule commande est envoyée au lieu de deux commandes identiques, par conséquent, il convient de ne pas modifier le paramètre.
- la commande est envoyée deux fois avec un temps d'établissement de 105 ms plus long que le temps d'établissement défini, par conséquent, il convient de ne pas modifier le paramètre.
- la commande est envoyée trois fois avec un temps d'établissement entre les deux premières commandes de 105 ms, et un temps d'établissement entre les deux commandes suivantes de 50 ms. Par conséquent, il convient d'ignorer la première commande, et il convient d'interpréter les deux commandes suivantes comme une commande send-twice. Par conséquent, il convient de modifier le paramètre.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
PHM = QUERY PHYSICAL MINIMUM
oldAddress = GLOBAL_currentUnderTestLogicalUnit
newAddress = 63
for (i = 0; i < 75; i++)
    RESET
    wait 300 ms
    for (j = 0; j< 3; j++)
        DTR0 (10)
        command1[i]
        if (j == 0) // Vérifier commande Send une seule fois
            command2[i], send once
        else if (j == 1) // Vérifier commande Send avec temporisation
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            command2[i], send once
            wait 105 ms // temps d'établissement
            command2[i], send once
        else //Vérifier par essai la commande Send avec temporisation suivie d'une nouvelle commande
            command2[i], send once
            wait 105 ms // temps d'établissement
            command2[i], send once
            wait 50 ms // temps d'établissement
            command2[i], send once
        endif
        answer = query[i]
        if (answer != value[i])
            error1 Mauvais réglage de errorText[i] à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: value[i].
        endif
        if (i != 74)
            answer = QUERY RESET STATE
        else
            answer = QUERY RESET STATE, send to (address[j] << 1 + 1)
        endif
        if (answer != reset[i])
            error2 Réponse erronée à QUERY RESET STATE à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: reset[i].
        endif
        if (i != 74)
            answer = QUERY STATUS
        else
            answer = QUERY STATUS, send to (address[j] << 1 + 1)
        endif
        if (answer != status[i])
            error3 Réponse erronée à QUERY STATUS à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: status[i].
        endif
    endfor
    if (i == 69 OR i == 70)
        TERMINATE
    endif
endfor
SetShortAddress (newAddress; oldAddress)
```

Tableau 42 – Paramètres pour la séquence d'essai 'Send twice timeout'

Phase d'essai j	address
0	oldAddress
1	oldAddress
2	newAddress

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Phase d'essai i	command1	command2	query	value			reset			status			errorText
				j != 2	j = 2		j != 2	j = 2		j != 2	j = 2		
					PHM != 254	PHM = 254		PHM != 254	PHM = 254		PHM != 254	PHM = 254	
0	-	ADD TO GROUP 0	QUERY GROUPS 0-7	0x00	1	1	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups0-7
1	ADD TO GROUP 0	REMOVE FROM GROUP 0	QUERY GROUPS 0-7	1	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups0-7
2	-	ADD TO GROUP 1	QUERY GROUPS 0-7	0x00	2	2	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups0-7
3	ADD TO GROUP 1	REMOVE FROM GROUP 1	QUERY GROUPS 0-7	2	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups0-7
4	-	ADD TO GROUP 2	QUERY GROUPS 0-7	0x00	4	4	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups0-7
5	ADD TO GROUP 2	REMOVE FROM GROUP 2	QUERY GROUPS 0-7	4	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups0-7
6	-	ADD TO GROUP 3	QUERY GROUPS 0-7	0x00	8	8	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups0-7
7	ADD TO GROUP 3	REMOVE FROM GROUP 3	QUERY GROUPS 0-7	8	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups0-7
8	-	ADD TO GROUP 4	QUERY GROUPS 0-7	0x00	16	16	YES	NO	NO	0X100100b	0X000100bb	0X000100b	gearGroups0-7
9	ADD TO GROUP 4	REMOVE FROM GROUP 4	QUERY GROUPS 0-7	16	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups0-7
10	-	ADD TO GROUP 5	QUERY GROUPS 0-7	0x00	32	32	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups0-7
11	ADD TO GROUP 5	REMOVE FROM GROUP 5	QUERY GROUPS 0-7	32	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups0-7
12	-	ADD TO GROUP 6	QUERY GROUPS 0-7	0x00	64	64	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups0-7
13	ADD TO GROUP 6	REMOVE FROM GROUP 6	QUERY GROUPS 0-7	64	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups0-7
14	-	ADD TO GROUP 7	QUERY GROUPS 0-7	0x00	128	128	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups0-7

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Phase d'essai i	command1	command2	query	value			reset			status			errorText
				j != 2	j = 2		j != 2	j = 2		j != 2	j = 2		
					PHM != 254	PHM = 254		PHM != 254	PHM = 254		PHM != 254	PHM = 254	
15	ADD TO GROUP 7	REMOVE FROM GROUP 7	QUERY GROUPS 0-7	128	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups0-7
16	-	ADD TO GROUP 8	QUERY GROUPS 8-15	0x00	1	1	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups8-15
17	ADD TO GROUP 8	REMOVE FROM GROUP 8	QUERY GROUPS 8-15	1	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups8-15
18	-	ADD TO GROUP 9	QUERY GROUPS 8-15	0x00	2	2	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups8-15
19	ADD TO GROUP 9	REMOVE FROM GROUP 9	QUERY GROUPS 8-15	2	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups8-15
20	-	ADD TO GROUP 10	QUERY GROUPS 8-15	0x00	4	4	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups8-15
21	ADD TO GROUP 10	REMOVE FROM GROUP 10	QUERY GROUPS 8-15	4	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups8-15
22	-	ADD TO GROUP 11	QUERY GROUPS 8-15	0x00	8	8	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups8-15
23	ADD TO GROUP 11	REMOVE FROM GROUP 11	QUERY GROUPS 8-15	8	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups8-15
24	-	ADD TO GROUP 12	QUERY GROUPS 8-15	0x00	16	16	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups8-15
25	ADD TO GROUP 12	REMOVE FROM GROUP 12	QUERY GROUPS 8-15	16	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups8-15
26	-	ADD TO GROUP 13	QUERY GROUPS 8-15	0x00	32	32	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups8-15
27	ADD TO GROUP 13	REMOVE FROM GROUP 13	QUERY GROUPS 8-15	32	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups8-15
28	-	ADD TO GROUP 14	QUERY GROUPS 8-15	0x00	64	64	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups8-15
29	ADD TO GROUP 14	REMOVE FROM GROUP 14	QUERY GROUPS 8-15	64	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups8-15

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Phase d'essai i	command1	command2	query	value			reset			status			errorText
				j != 2	j = 2		j != 2	j = 2		j != 2	j = 2		
					PHM != 254	PHM = 254		PHM != 254	PHM = 254		PHM != 254	PHM = 254	
30	-	ADD TO GROUP 15	QUERY GROUPS 8-15	0x00	128	128	YES	NO	NO	0X100100b	0X000100b	0X000100b	gearGroups8-15
31	ADD TO GROUP 15	REMOVE FROM GROUP 15	QUERY GROUPS 8-15	128	0x00	0x00	NO	YES	YES	0X000100b	0X100100b	0X100100b	gearGroups8-15
32	-	SET SCENE 0	QUERY SCENE LEVEL 0	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene0
33	SET SCENE 0	REMOVE FROM SCENE 0	QUERY SCENE LEVEL 0	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene0
34	-	SET SCENE 1	QUERY SCENE LEVEL 1	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene1
35	SET SCENE 1	REMOVE FROM SCENE 1	QUERY SCENE LEVEL 1	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene1
36	-	SET SCENE 2	QUERY SCENE LEVEL 2	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene2
37	SET SCENE 2	REMOVE FROM SCENE 2	QUERY SCENE LEVEL 2	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene2
38	-	SET SCENE 3	QUERY SCENE LEVEL 3	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene3
39	SET SCENE 3	REMOVE FROM SCENE 3	QUERY SCENE LEVEL 3	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene3
40	-	SET SCENE 4	QUERY SCENE LEVEL 4	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene4
41	SET SCENE 4	REMOVE FROM SCENE 4	QUERY SCENE LEVEL 4	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene4
42	-	SET SCENE 5	QUERY SCENE LEVEL 5	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene5
43	SET SCENE 5	REMOVE FROM SCENE 5	QUERY SCENE LEVEL 5	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene5
44	-	SET SCENE 6	QUERY SCENE LEVEL 6	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene6

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Phase d'essai i	command1	command2	query	value			reset			status			errorText
				j != 2	j = 2		j != 2	j = 2		j != 2	j = 2		
					PHM != 254	PHM = 254		PHM != 254	PHM = 254		PHM != 254	PHM = 254	
45	SET SCENE 6	REMOVE FROM SCENE 6	QUERY SCENE LEVEL 6	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene4
46	-	SET SCENE 7	QUERY SCENE LEVEL 7	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene7
47	SET SCENE 7	REMOVE FROM SCENE 7	QUERY SCENE LEVEL 7	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene7
48	-	SET SCENE 8	QUERY SCENE LEVEL 8	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene8
49	SET SCENE 8	REMOVE FROM SCENE 8	QUERY SCENE LEVEL 8	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene8
50	-	SET SCENE 9	QUERY SCENE LEVEL 9	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene9
51	SET SCENE 9	REMOVE FROM SCENE 9	QUERY SCENE LEVEL 9	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene9
52	-	SET SCENE 10	QUERY SCENE LEVEL 10	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene10
53	SET SCENE 10	REMOVE FROM SCENE 10	QUERY SCENE LEVEL 10	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene10
54	-	SET SCENE 11	QUERY SCENE LEVEL 11	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene11
55	SET SCENE 11	REMOVE FROM SCENE 11	QUERY SCENE LEVEL 11	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene11
56	-	SET SCENE 12	QUERY SCENE LEVEL 12	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene12
57	SET SCENE 12	REMOVE FROM SCENE 12	QUERY SCENE LEVEL 12	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene12
58	-	SET SCENE 13	QUERY SCENE LEVEL 13	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene13
59	SET SCENE 13	REMOVE FROM SCENE 113	QUERY SCENE LEVEL 13	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene13

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Phase d'essai i	command1	command2	query	value			reset			status			errorText
				j != 2	j = 2		j != 2	j = 2		j != 2	j = 2		
					PHM != 254	PHM = 254		PHM != 254	PHM = 254		PHM != 254	PHM = 254	
60	-	SET SCENE 14	QUERY SCENE LEVEL 14	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene14
61	SET SCENE 14	REMOVE FROM SCENE 14	QUERY SCENE LEVEL 14	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene14
62	-	SET SCENE 15	QUERY SCENE LEVEL 15	0xFF	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	scene15
63	SET SCENE 15	REMOVE FROM SCENE 15	QUERY SCENE LEVEL 15	10	0xFF	0xFF	NO	YES	YES	0X000100b	0X100100b	0X100100b	scene15
64	-	SET POWER ON LEVEL	QUERY POWER ON LEVEL	0xFE	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	powerOnLevel
65	-	SET SYSTEM FAILURE LEVEL	QUERY SYSTEM FAILURE LEVEL	0xFE	10	10	YES	NO	NO	0X100100b	0X000100b	0X000100b	systemFailureLevel
66	-	SET FADE RATE	QUERY FADE TIME/FADE RATE	0x07	0x0A	0x0A	YES	NO	NO	0X100100b	0X000100b	0X000100b	fadeRate/fadeTime
67	-	SET FADE TIME	QUERY FADE TIME/FADE RATE	0x07	0xA7	0xA7	YES	NO	NO	0X100100b	0X000100b	0X000100b	fadeRate/fadeTime
68	DTR0 (18)	SET EXTENDED FADE TIME	QUERY EXTENDED FADE TIME	0	18	18	YES	NO	NO	0X100100b	0X000100b	0X000100b	extendedFadeTime
69	-	INITIALISE (*oldAddress*<<1+1)	QUERY SHORT ADDRESS	NO	*oldAddress*	*oldAddress*	YES	YES	YES	0X100100b	0X100100b	0X100100b	initialisationState
70	INITIALISE (*oldAddress*<<1+1)	RANDOMISE	**GetRandomAddress** ()	0xFF FF FF	!= 0xFF FF FF	!= 0xFF FF FF	YES	NO	NO	0X100100b	0X000100b	0X000100b	randomAddress
71	DTR0 (0)	STORE ACTUAL LEVEL IN DTR0	QUERY DTR0	0	254	254	YES	YES	YES	0X100100b	0X100100b	0X100100b	actualLevel
72	DTR0 (*PHM* + 1)	SET MIN LEVEL	QUERY MIN LEVEL	*PHM*	*PHM* + 1	*PHM*	YES	NO	YES	0X100100b	0X000100b	0X100100b	minLevel

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Phase d'essai i	command1	command2	query	value			reset			status			errorText
				j != 2	j = 2		j != 2	j = 2		j != 2	j = 2		
					PHM != 254	PHM = 254		PHM != 254	PHM = 254		PHM != 254	PHM = 254	
73	DTR0 (*PHM* + 1)	SET MAX LEVEL	QUERY MAX LEVEL	0xFE	*PHM* + 1	0xFE	YES	NO	YES	0X100100b	0X001100b	0X100100b	maxLevel
74	DTR0 (*newAddress*<<1+1)	SET SHORT ADDRESS	QUERY CONTROL GEAR PRESENT send to (*address*[*j*] << 1 + 1)	YES	YES	YES	YES	YES	YES	0X100100b	0X100100b	0X100100b	shortAddress

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.4.4 Commands in-between (Commandes intermédiaires)

Toute instruction de configuration doit être exécutée uniquement si elle est reçue deux fois.

Dans cette séquence d'essai, on essaie de modifier tous les paramètres du DUT programmables par l'utilisateur, au moyen des instructions de configuration envoyées comme suit:

- l'instruction de configuration est envoyée avec une trame intermédiaire, trame qui se compose de quelques bits, et non une commande
- l'instruction de configuration est envoyée avec une commande intermédiaire, commande qui est envoyée par diffusion
- l'instruction de configuration est envoyée avec une commande intermédiaire, commande qui est envoyée à une certaine adresse de groupe
- l'instruction de configuration est envoyée avec une commande intermédiaire, commande qui est envoyée à une certaine adresse courte
- l'instruction de configuration est envoyée avec une commande intermédiaire, puis elle est renvoyée une nouvelle fois

Dans les quatre premiers cas, il convient de ne pas exécuter la commande de configuration. Dans le dernier cas, il convient d'accepter l'instruction de configuration. Lorsqu'elle est indiquée, il convient d'accepter la commande intermédiaire

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
PHM = QUERY PHYSICAL MINIMUM
oldAddress = GLOBAL_currentUnderTestLogicalUnit
for (i = 0; i<74; i++)
    // Vérifier par essai le rejet de l'instruction de configuration
    for (j = 0; j<5; j++)
        RESET
        wait 300 ms
        DTR0 (1)
        command1[i]
        // Les phases suivantes doivent être envoyées dans un délai de 75 ms, à compter du
        dernier bit de montée de la première commande "command2[i], send once" jusqu'au
        premier bit de descente de la dernière commande  "command2[i], send once"
        command2[i], send once
        if (j == 0)
            idle 13 ms + 110010 + idle 13 ms // Repos d'une durée de 13 ms suivi d'une
            trame, suivie d'une période de 13 ms – Vérifier par essai la commande Send
            avec une trame intermédiaire
        else if (j == 1)
            RECALL MIN LEVEL, send to BROADCAST // Vérifier par essai la commande
            Send avec commande de diffusion intermédiaire
        else if (j == 2)
            RECALL MIN LEVEL, send to 10000001b // Vérifier par essai la commande
            Send avec commande de groupe intermédiaire – gearGroup 0
        else if (j == 3)
            RECALL MIN LEVEL, send to ((GLOBAL_currentUnderTestLogicalUnit<< 1) +
            1)  // Vérifier par essai la commande Send avec commande courte intermédiaire
        else
            RECALL MIN LEVEL, send to ((63<< 1) + 1)// Vérifier par essai la commande
            Send avec commande courte intermédiaire
        endif
        command2[i], send once
        answer = query[i]
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        if (answer != value1[i])
            error1 Mauvais réglage de errorText[i] à la phase (i,j) = (i,j). Réel: answer.
            Attendu: value1[i].
        endif
        answer = QUERY ACTUAL LEVEL
        if (j == 1 OR j == 3 OR (i == 1 AND j ==2))
            if (answer != PHM)
                error2 Commande intermédiaire non exécutée à la phase (i,j) = (i,j). Réel:
                answer. Attendu: PHM.
            endif
        else
            if (answer != 254)
                error3 Commande intermédiaire exécutée à la phase (i,j) = (i,j). Réel:
                answer. Attendu: 254.
            endif
        endif
    endfor
    // Vérifier par essai l'acceptation de l'instruction de configuration
    RESET
    wait 300 ms
    if (i == 69)
        DTR0 (254)
    else
        DTR0 (1)
    endif
    DTR1 (0)
    command1[i]
    // Les 4 phases suivantes doivent être envoyées dans un délai de 75 ms, à compter du
    dernier bit de montée de la première commande "command2[i], send once" jusqu'au
    premier bit de descente de la dernière commande  "command2[i], send once"
    command2[i], send once
    DTR1 (1)
    command2[i], send once
    command2[i], send once
    wait 100 ms
    answer = query[i]
    if (answer != value2[i])
        error4 Mauvais réglage de errorText[i] à la  phase i = i. Réel: answer. Attendu:
        value2[i].
    endif
    answer = QUERY CONTENT DTR1
    if (answer != 1)
        error5 Valeur erronée de DTR1 à la phase i = i. Réel: answer. Attendu: 1.
    endif
    if (i == 72 OR i == 73)
        TERMINATE
    endif
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 43 – Paramètres pour la séquence d'essai 'Commands in-between'

Phase d'essai i	command1	command2	query	value1	value2	errorText
0	-	ADD TO GROUP 0	QUERY GROUPS 0-7	0x00	1	gearGroups0-7
1	ADD TO GROUP 0	REMOVE FROM GROUP 0	QUERY GROUPS 0-7	1	0x00	gearGroups0-7
2	-	ADD TO GROUP 1	QUERY GROUPS 0-7	0x00	2	gearGroups0-7
3	ADD TO GROUP 1	REMOVE FROM GROUP 1	QUERY GROUPS 0-7	2	0x00	gearGroups0-7
4	-	ADD TO GROUP 2	QUERY GROUPS 0-7	0x00	4	gearGroups0-7
5	ADD TO GROUP 2	REMOVE FROM GROUP 2	QUERY GROUPS 0-7	4	0x00	gearGroups0-7
6	-	ADD TO GROUP 3	QUERY GROUPS 0-7	0x00	8	gearGroups0-7
7	ADD TO GROUP 3	REMOVE FROM GROUP 3	QUERY GROUPS 0-7	8	0x00	gearGroups0-7
8	-	ADD TO GROUP 4	QUERY GROUPS 0-7	0x00	16	gearGroups0-7
9	ADD TO GROUP 4	REMOVE FROM GROUP 4	QUERY GROUPS 0-7	16	0x00	gearGroups0-7
10	-	ADD TO GROUP 5	QUERY GROUPS 0-7	0x00	32	gearGroups0-7
11	ADD TO GROUP 5	REMOVE FROM GROUP 5	QUERY GROUPS 0-7	32	0x00	gearGroups0-7
12	-	ADD TO GROUP 6	QUERY GROUPS 0-7	0x00	64	gearGroups0-7
13	ADD TO GROUP 6	REMOVE FROM GROUP 6	QUERY GROUPS 0-7	64	0x00	gearGroups0-7
14	-	ADD TO GROUP 7	QUERY GROUPS 0-7	0x00	128	gearGroups0-7
15	ADD TO GROUP 7	REMOVE FROM GROUP 7	QUERY GROUPS 0-7	128	0x00	gearGroups0-7
16	-	ADD TO GROUP 8	QUERY GROUPS 8-15	0x00	1	gearGroups8-15
17	ADD TO GROUP 8	REMOVE FROM GROUP 8	QUERY GROUPS 8-15	1	0x00	gearGroups8-15
18	-	ADD TO GROUP 9	QUERY GROUPS 8-15	0x00	2	gearGroups8-15
19	ADD TO GROUP 9	REMOVE FROM GROUP 9	QUERY GROUPS 8-15	2	0x00	gearGroups8-15
20	-	ADD TO GROUP 10	QUERY GROUPS 8-15	0x00	4	gearGroups8-15
21	ADD TO GROUP 10	REMOVE FROM GROUP 10	QUERY GROUPS 8-15	4	0x00	gearGroups8-15
22	-	ADD TO GROUP 11	QUERY GROUPS 8-15	0x00	8	gearGroups8-15
23	ADD TO GROUP 11	REMOVE FROM GROUP 11	QUERY GROUPS 8-15	8	0x00	gearGroups8-15

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Phase d'essai i	command1	command2	query	value1	value2	errorText
24	-	ADD TO GROUP 12	QUERY GROUPS 8-15	0x00	16	gearGroups8-15
25	ADD TO GROUP 12	REMOVE FROM GROUP 12	QUERY GROUPS 8-15	16	0x00	gearGroups8-15
26	-	ADD TO GROUP 13	QUERY GROUPS 8-15	0x00	32	gearGroups8-15
27	ADD TO GROUP 13	REMOVE FROM GROUP 13	QUERY GROUPS 8-15	32	0x00	gearGroups8-15
28	-	ADD TO GROUP 14	QUERY GROUPS 8-15	0x00	64	gearGroups8-15
29	ADD TO GROUP 14	REMOVE FROM GROUP 14	QUERY GROUPS 8-15	64	0x00	gearGroups8-15
30	-	ADD TO GROUP 15	QUERY GROUPS 8-15	0x00	128	gearGroups8-15
31	ADD TO GROUP 15	REMOVE FROM GROUP 15	QUERY GROUPS 8-15	128	0x00	gearGroups8-15
32	-	SET SCENE 0	QUERY SCENE LEVEL 0	0xFF	1	scene0
33	SET SCENE 0	REMOVE FROM SCENE 0	QUERY SCENE LEVEL 0	1	0xFF	scene0
34	-	SET SCENE 1	QUERY SCENE LEVEL 1	0xFF	1	scene1
35	SET SCENE 1	REMOVE FROM SCENE 1	QUERY SCENE LEVEL 1	1	0xFF	scene1
36	-	SET SCENE 2	QUERY SCENE LEVEL 2	0xFF	1	scene2
37	SET SCENE 2	REMOVE FROM SCENE 2	QUERY SCENE LEVEL 2	1	0xFF	scene2
38	-	SET SCENE 3	QUERY SCENE LEVEL 3	0xFF	1	scene3
39	SET SCENE 3	REMOVE FROM SCENE 3	QUERY SCENE LEVEL 3	1	0xFF	scene3
40	-	SET SCENE 4	QUERY SCENE LEVEL 4	0xFF	1	scene4
41	SET SCENE 4	REMOVE FROM SCENE 4	QUERY SCENE LEVEL 4	1	0xFF	scene4
42	-	SET SCENE 5	QUERY SCENE LEVEL 5	0xFF	1	scene5
43	SET SCENE 5	REMOVE FROM SCENE 5	QUERY SCENE LEVEL 5	1	0xFF	scene5
44	-	SET SCENE 6	QUERY SCENE LEVEL 6	0xFF	1	scene6
45	SET SCENE 6	REMOVE FROM SCENE 6	QUERY SCENE LEVEL 6	1	0xFF	scene6
46	-	SET SCENE 7	QUERY SCENE LEVEL 7	0xFF	1	scene7
47	SET SCENE 7	REMOVE FROM SCENE 7	QUERY SCENE LEVEL 7	1	0xFF	scene7

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Phase d'essai i	command1	command2	query	value1	value2	errorText
48	-	SET SCENE 8	QUERY SCENE LEVEL 8	0xFF	1	scene8
49	SET SCENE 8	REMOVE FROM SCENE 8	QUERY SCENE LEVEL 8	1	0xFF	scene8
50	-	SET SCENE 9	QUERY SCENE LEVEL 9	0xFF	1	scene9
51	SET SCENE 9	REMOVE FROM SCENE 9	QUERY SCENE LEVEL 9	1	0xFF	scene9
52	-	SET SCENE 10	QUERY SCENE LEVEL 10	0xFF	1	scene10
53	SET SCENE 10	REMOVE FROM SCENE 10	QUERY SCENE LEVEL 10	1	0xFF	scene10
54	-	SET SCENE 11	QUERY SCENE LEVEL 11	0xFF	1	scene11
55	SET SCENE 11	REMOVE FROM SCENE 11	QUERY SCENE LEVEL 11	1	0xFF	scene11
56	-	SET SCENE 12	QUERY SCENE LEVEL 12	0xFF	1	scene12
57	SET SCENE 12	REMOVE FROM SCENE 12	QUERY SCENE LEVEL 12	1	0xFF	scene12
58	-	SET SCENE 13	QUERY SCENE LEVEL 13	0xFF	1	scene13
59	SET SCENE 13	REMOVE FROM SCENE 13	QUERY SCENE LEVEL 13	1	0xFF	scene13
60	-	SET SCENE 14	QUERY SCENE LEVEL 14	0xFF	1	scene14
61	SET SCENE 14	REMOVE FROM SCENE 14	QUERY SCENE LEVEL 14	1	0xFF	scene14
62	-	SET SCENE 15	QUERY SCENE LEVEL 15	0xFF	1	scene15
63	SET SCENE 15	REMOVE FROM SCENE 15	QUERY SCENE LEVEL 15	1	0xFF	scene15
64	-	SET POWER ON LEVEL	QUERY POWER ON LEVEL	0xFE	1	powerOnLevel
65	-	SET SYSTEM FAILURE LEVEL	QUERY SYSTEM FAILURE LEVEL	0xFE	1	systemFailureLevel
66	-	SET FADE RATE	QUERY FADE TIME/FADE RATE	0x07	0x01	fadeRate/fadeTime
67	-	SET FADE TIME	QUERY FADE TIME/FADE RATE	0x07	0x17	fadeRate/fadeTime

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Phase d'essai i	command1	command2	query	value1	value2	errorText
68	-	SET EXTENDED FADE TIME	QUERY EXTENDED FADE TIME	0	1	extendedFadeTime
69	-	SET MIN LEVEL	QUERY MIN LEVEL	*PHM*	254	minLevel
70	-	SET MAX LEVEL	QUERY MAX LEVEL	0xFE	*PHM*	maxLevel
71	-	STORE ACTUAL LEVEL IN DTR0	QUERY CONTENT DTR0	1	0xFE	actualLevel
72	-	INITIALISE ((*oldAddress*<< 1) + 1)	QUERY SHORT ADDRESS	NO	(*oldAddress*<< 1) + 1	initialisationState
73	INITIALISE (*oldAddress*<< 1 + 1)	RANDOMISE	**GetRandomAddress** ()	0xFF FF FF	! 0xFF FF FF	randomAddress

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

12.4.5 STORE ACTUAL LEVEL IN DTR0

La séquence d'essai doit servir à soumettre à l'essai la commande 'STORE ACTUAL LEVEL IN DTR0' à cinq états différents du dispositif en essai: niveau MAX, niveau OFF, niveau MIN, lors du démarrage et en cas de défaillance totale des lampes.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
DTR0 (255)
// Vérifier par essai si niveau max mémorisé
STORE ACTUAL LEVEL IN DTR0
answer = QUERY CONTENT DTR0
if (answer != 254)
    error1 MAX LEVEL non mémorisé dans DTR0. Réel: answer. Attendu: 254.
endif
// Vérifier par essai si niveau hors tension mémorisé
OFF
STORE ACTUAL LEVEL IN DTR0
answer = QUERY CONTENT DTR0
if (answer != 0)
    error2 0 (OFF) non mémorisé dans DTR0. Réel: answer. Attendu: 0.
endif
// Vérifier par essai si niveau min mémorisé
RECALL MIN LEVEL
WaitForLampOn ()
STORE ACTUAL LEVEL IN DTR0
answer = QUERY CONTENT DTR0
if (answer != PHM)
    error3 MIN LEVEL non mémorisé dans DTR0. Réel: answer. Attendu: PHM.
endif
// Vérifier par essai si le niveau réel lors du démarrage est mémorisé (lors du démarrage,
niveau réel = 0)
PowerCycleAndWaitForDecoder (5)
STORE ACTUAL LEVEL IN DTR0
answer = QUERY CONTENT DTR0
if (answer != 0)
    error4 0 (démarrage) non mémorisé dans DTR0. Réel: answer. Attendu: 0.
endif
// Vérifier par essai si le niveau réel lors de la défaillance de la ou des lampes est mémorisé
(lors de la défaillance de la ou des lampes, niveau réel = dernier niveau cible)
WaitForPowerOnPhaseToFinish ()
DisconnectLamps (0)
delay = 30 s
foreach (lightSourceType in
GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[])
    if (lightSourceType == 2) // Cette unité logique a une source de lumière HID
        delay = delay +GLOBAL_startupTimeLimit
        break
    endif
endfor
waitdelay//  La défaillance de la ou des lampes a été détectée
STORE ACTUAL LEVEL IN DTR0
answer = QUERY CONTENT DTR0
if (answer != 254)
    error5 254 (niveau réel lors de la défaillance de la ou des lampes) non mémorisé dans
    DTR0. Réel: answer. Attendu: 254.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
endif
ConnectLamps ()
```

12.4.6 SAVE PERSISTENT VARIABLES

Il est recommandé au fabricant de vérifier le bon comportement de la commande SAVE PERSISTENT VARIABLES.

12.4.7 SET OPERATING MODE

La séquence d'essai vérifie si les modes réservés (0x01 à 0x7F) le sont en tentant de régler le DUT sur l'un de ces modes, et vérifie également s'il existe des modes spécifiques au fabricant (0x80 à 0xFF) et si tel est le cas, il convient que le DUT continue à réagir selon la spécification.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
initialOperatingMode = QUERY OPERATING MODE
for (i = 1; i< 0x80; i++)
    DTR0 (0)
    SET OPERATING MODE
    DTR0 (i)
    SET OPERATING MODE
    answer = QUERY OPERATING MODE
    if (answer != 0)
        error 1 SET OPERATING MODE exécuté avec DTR0 réglé sur le mode de
        fonctionnement réservé  i. Réel: answer. Attendu: 0.
    endif
    answer = QUERY MANUFACTURER SPECIFIC MODE
    if (answer == NO)
        error2 QUERY MANUFACTURER SPECIFIC MODE en réponse lorsque le mode de
        fonctionnement est réglé sur le mode 0, et DTR0 réglé sur i. Réel: answer. Attendu:
        NO.
    endif
endfor
for (i = 0x80; i<= 0xFF; i++)
    DTR0 (0)
    SET OPERATING MODE
    DTR0 (i)
    SET OPERATING MODE
    answer = QUERY OPERATING MODE
    if (answer != 0)
        answer = QUERY MANUFACTURER SPECIFIC MODE
        if (answer == NO)
            error3 QUERY MANUFACTURER SPECIFIC MODE en réponse lorsque le
            mode de fonctionnement est réglé sur le mode 0, et DTR0 réglé sur i. Réel:
            answer. Attendu: NO.
        endif
    else if (answer == i)
        report1 Mode spécifique au fabricant i mis en oeuvre dans le DUT.
        answer = QUERY MANUFACTURER SPECIFIC MODE
        if (answer!= YES)
            error4 QUERY MANUFACTURER SPECIFIC MODE ne répond pas lorsque le
            DUT est en mode spécifique au fabricant i. Réel: answer. Attendu: YES.
        endif
    else //valeur différente de 0 et i reçue
        error5 Mode de fonctionnement réglé sur un mode de fonctionnement complètement
        différent de celui admis. Réel: answer. Attendu: 0 ou i.
    endif
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

DTR0 (*initialOperatingMode*)
SET OPERATING MODE

12.4.8 SET MAX LEVEL

La séquence d'essai vérifie si MAX LEVEL est réglé correctement et si ACTUAL LEVEL varie en conséquence, lorsque MIN LEVEL est réglé sur PHM + 1. Les valeurs d'essai utilisées sont:

- valeur d'essai <= MIN LEVEL: 0, PHM, PHM + 1
- MIN LEVEL < valeur d'essai <= MAX LEVEL: (PHM + 254) >> 1, 253, 254
- valeur d'essai > MAX LEVEL: 255.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
DTR0 (PHM + 1)
SET MIN LEVEL
for (i = 0; i < 7; i++)
    RECALL MAX LEVEL
    DTR0 (value[i])
    SET MAX LEVEL
    answer = QUERY MAX LEVEL
    if (answer != max[i])
        error1 MAX LEVEL erroné mémorisé à la phase d'essai i = i. Réel: answer. Attendu:
        max[i].
    endif
    answer = QUERY ACTUAL LEVEL
    if (answer != level[i])
        error2 ACTUAL LEVEL erroné à la phase d'essai i = i. Réel: answer. Attendu:
        level[i].
    endif
endfor
```

Tableau 44 – Paramètres pour la séquence d'essai SET MAX LEVEL

Phase d'essai i	value	max		level	
		PHM < 253	PHM >= 253	PHM < 253	PHM >= 253
0	0	*PHM* + 1	254	*PHM* + 1	254
1	*PHM*	*PHM* + 1	254	*PHM* + 1	254
2	*PHM* + 1	*PHM* + 1	254	*PHM* + 1	254
3	(*PHM* + 254) >> 1	(*PHM* + 254) >> 1	254	*PHM* + 1	254
4	253	253	254	(*PHM* + 254) >> 1	254
5	254	254	254	253	254
6	255	254	254	254	254

12.4.9 SET MIN LEVEL

La séquence d'essai vérifie si MIN LEVEL est réglé correctement et si ACTUAL LEVEL varie en conséquence, lorsque MAX LEVEL est réglé sur 253. Les valeurs d'essai utilisées sont:

- valeur d'essai <= PHM: 0, PHM >> 1, PHM

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

- PHM < valeur d'essai <= MAX LEVEL: (PHM + 254) >> 1, 253
- valeur d'essai > MAX LEVEL: 254, 255.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
DTR0 (253)
SET MAX LEVEL
RECALL MIN LEVEL
for (i = 0; i < 7; i++)
    DTR0 (value[i])
    SET MIN LEVEL
    answer = QUERY MIN LEVEL
    if (answer != min[i])
        error1 MIN LEVEL erroné mémorisé à la phase d'essai i = i. Réel: answer. Attendu:
        min[i].
    endif
    answer = QUERY ACTUAL LEVEL
    if (answer != level[i])
        error2 ACTUAL LEVEL erroné à la phase d'essai i = i. Réel: answer. Attendu:
        level[i].
    endif
endfor
```

Tableau 45 – Paramètres pour la séquence d'essai SET MIN LEVEL

Phase d'essai i	value	min		level	
		PHM < 254	PHM = 254	PHM < 254	PHM = 254
0	0	*PHM*	254	*PHM*	254
1	*PHM*>> 1	*PHM*	254	*PHM*	254
2	*PHM*	*PHM*	254	*PHM*	254
3	(*PHM* + 254) >> 1	(*PHM* + 254) >> 1	254	(*PHM* + 254) >> 1	254
4	253	253	254	253	254
5	254	253	254	253	254
6	255	253	254	253	254

12.4.10 SET SYSTEM FAILURE LEVEL

La séquence d'essai vérifie si le SYSTEM FAILURE LEVEL est réglé correctement sur différentes valeurs d'essai. La détection et le fonctionnement corrects du DUT en cas de défaillance système sont également vérifiés. Il est prévu de régler le SYSTEM FAILURE LEVEL sur la valeur donnée; il convient que seul le niveau réel change entre les MIN LEVEL et MAX LEVEL. Les valeurs d'essai utilisées sont: 0, 1, PHM, PHM, (PHM + 254) >> 1, 254, 255.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
for (i = 0; i< 6; i++) //  Boucle par la valeur donnée dans le tableau ci-dessous
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
DTR0 (value[i])
SET SYSTEM FAILURE LEVEL
answer = QUERY SYSTEM FAILURE LEVEL
if (answer != system[i])
    error1 SYSTEM FAILURE LEVEL erroné mémorisé à la phase d'essai i = i. Réel:
    answer. Attendu: system[i].
endif
for (j = 0; j< 2; j++) // Vérifier le délai de détection de SFL
    RECALL MIN LEVEL
    WaitForLampOn ()
    Apply (Tension de 0 V sur l'interface du bus)
    if (j == 0) // Il n'est pas nécessaire de détecter une défaillance système
        if (GLOBAL_busPowered)
            wait 40 ms
        else
            wait 450 ms
        endif
    else// Il est nécessaire de détecter une défaillance système
        wait 550 ms
    endif
    Apply (Tension de GLOBAL_VbusHigh V sur l'interface du bus)
    if (GLOBAL_busPowered)
        wait 1200 ms
        if (j == 1)
            WaitForLampOn ()
        endif
    else
        wait 100 ms
    endif
    answer = QUERY ACTUAL LEVEL
    if (answer != level[GLOBAL_busPowered,i,j])
        error2 ACTUAL LEVEL erroné à la phase d'essai (i,j) = (i,j). Réel: answer.
        Attendu: level[GLOBAL_busPowered,i,j].
    endif
    RECALL MAX LEVEL
    wait 700 ms
endfor
endfor
```

Tableau 46 – Paramètres pour la séquence d'essai SET SYSTEM FAILURE LEVEL

Phase d'essai i	value	system	level		
			j = 0 (no SFL)	j = 1 (SFL)	
				GLOBAL_busPowered =false(SFL)	GLOBAL_busPowered =true(POL)
0	0	0	*PHM*	0	254
1	1	1	*PHM*	*PHM*	254
2	(*PHM* + 254) >> 1	(*PHM* + 254) >> 1	*PHM*	(*PHM* + 254) >> 1	254
3	*PHM*	*PHM*	*PHM*	*PHM*	254
4	254	254	*PHM*	254	254
5	255	255	*PHM*	*PHM*	254

12.4.11 SET POWER ON LEVEL

La séquence d'essai vérifie si le POWER ON LEVEL est réglé correctement sur différentes valeurs d'essai. La détection et le fonctionnement corrects du DUT en cas de mise sous tension sont également vérifiés. L'interface du bus et le comportement lumineux sont vérifiés après la mise sous tension. Il est prévu de régler le POWER ON LEVEL sur la valeur donnée;

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

il convient que seul le niveau de luminosité change entre les MIN LEVEL et MAX LEVEL. Les valeurs d'essai utilisées sont: 0, 1, PHM, PHM + 1, (PHM + 254) >> 1, 253, 254, 255.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
DTR0 (PHM + 1)
SET MIN LEVEL
DTR0 (253)
SET MAX LEVEL
lightSource = vrai
if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
    lightSource = false// Cette unité logique n'a pas de source de lumière
endif
for (i = 0; i < 8; i++)
    RECALL MIN LEVEL
    DTR0 (value[i])
    SET POWER ON LEVEL
    answer = QUERY POWER ON LEVEL
    if (answer != value[i])
        error1 POWER ON LEVEL erroné mémorisé à la phase d'essai i = i. Réel: answer.
        Attendu: value[i].
    else
        exitLoop = faux
        if (lightSource)
            UserInput (Prévoir la vérification de l'interface du bus et le du comportement
            lumineux jusqu'à ce que la lampe s'allume après mise sous tension de
            l'alimentation externe, OK)
            Start (Mesure de la luminosité)
        endif
        start_timer (timer)
        timestamp = PowerCycleAndWaitForBusPower (5)
        powerCycleDelay = 5000
        if (GLOBAL_busPowered)
            powerCycleDelay = 550
        endif
        do
            queryTime = get_timer (timer) // Obtenir le temps d'envoi de la requête en ms
            answer = QUERY ACTUAL LEVEL, accept Pas de réponse
            finalTime = queryTime – powerCycleDelay – timestamp
            if (answer == NO)
                if (GLOBAL_busPowered)
                    if (queryTime>= powerCycleDelay + timestamp + 1200)) //
                    PowerCycle + WaitForBusPower + WaitForDecoder
                        error2 Pas de réponse de Query Actual Level (finalTime) en ms
                        après mise sous tension à la phase d'essai i = i.
                        exitLoop = vrai
                    endif
                else
                    if (GLOBAL_internalBPS AND timestamp> 350)
                        if (queryTime>= powerCycleDelay + timestamp + 100)) //
                        PowerCycle + WaitForBusPower + WaitForDecoder
                            error3 Pas de réponse de Query Actual Level (finalTime) en
                            ms après mise sous tension à la phase d'essai i = i.
                            exitLoop = vrai
                        endif
                    else
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                    if (queryTime>= powerCycleDelay + 450)) // PowerCycle + WaitForDecoder
                        error4 Pas de réponse de Query Actual Level (queryTime – powerCycleDelay) en ms après mise sous tension à la phase d'essai i = i.
                        exitLoop = vrai
                    endif
                endif
            endif
        else
            if (!GLOBAL_busPowered AND (finalTime<660)) // Attendre l'activation de POL
                if (finalTime<= 540)// Il n'est pas admis d'allumer la lampe
                    if (i == 0)
                        if (answer != 0)
                            error5 Sur la base du niveau réel consigné, la lampe n'est pas restée éteinte à la phase d'essai i = i.
                            exitLoop = vrai
                        endif
                    else
                        if (answer != 0 AND answer != 255)
                            error6 Sur la base du niveau réel consigné, la lampe s'est allumée à finalTime après mise sous tension ms à la phase d'essai i = i.
                            exitLoop = vrai
                        endif
                    endif
                else // Zone grise – la lampe peut s'allumer
                    if (i == 0)
                        if (answer != 0)
                            error7 Sur la base du niveau réel consigné, la lampe n'est pas restée éteinte à la phase d'essai i = i.
                            exitLoop = vrai
                        endif
                    else
                        if (answer == level[i])
                            exitLoop = vrai
                        else
                            if (answer != 0 AND answer != 255)
                                error8 Sur la base du niveau réel consigné, la lampe s'est allumée à finalTime ms après mise sous tension à la phase d'essai i = i. Réel: answer, Attendu: 0, 255 ou level[i].
                                exitLoop = vrai
                            endif
                        endif
                    endif
                endif
            else// POL activé
                if (i == 0)
                    if (answer != 0) // Il n'est pas nécessaire de lancer la phase de démarrage
                        error9 Sur la base du niveau réel consigné, la lampe n'est pas restée éteinte à la phase d'essai i = i.
                    endif
                    exitLoop = vrai
                else
                    if (answer == level[i])
                        exitLoop = vrai
                    else
                        if (answer != 255)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                                        error10 Lampe allumée à un niveau incorrect à la phase d'essai i = i. Réel: answer. Attendu: level[i] ou 255.
                                        exitLoop = vrai
                                    endif
                                endif
                            endif
                        endif
                    endif
                    if (finalTime>= GLOBAL_startupTimeLimit)
                        error11 Le démarrage a duré plus longtemps que le délai de démarrage prédéfini = GLOBAL_startupTimeLimit s à la phase d'essai i = i.
                        exitLoop = vrai
                    endif
                while (!exitLoop)
                if (i != 0 AND answer == level[i])
                    report1 Sur la base du niveau réel consigné, la lampe s'est allumée à finalTime ms après mise sous tension à la phase d'essai i = i.
                endif
                if (lightSource)
                    Stop (Mesure de luminosité)
                    if (i == 0)
                        lampTurnedOn = UserInput (La lampe s'est-elle allumée?, YesNo)
                        if (lampTurnedOn == Yes)
                            error12 Sur la base du rendement lumineux observé, la lampe s'est allumée après mise sous tension à la phase d'essai i = 0.
                        endif
                    else
                        if (GLOBAL_busPowered)
                            lightTime = Measure (Temps nécessaire à l'unité logique pour allumer la ou les lampe(s) entre le moment de la mise sous tension de l'alimentation de bus et l'allumage de la ou des lampes en ms, sur la base des mesures de la luminosité)
                        else
                            lightTime = Measure (Temps nécessaire à l'unité logique pour allumer la ou les lampes entre le moment de la mise sous tension de l'alimentation externe et l'allumage de la ou des lampes en ms, sur la base des mesures de la luminosité)
                        endif
                        if (!GLOBAL_busPowered AND lightTime<= 540 ms)
                            error13 Sur la base du rendement lumineux mesuré, la lampe s'est allumée à lightTime ms après mise sous tension à la phase d'essai i = i.
                        else
                            report12 Sur la base du rendement lumineux mesuré, la lampe s'est allumée à lightTime ms après mise sous tension à la phase d'essai i = i.
                        endif
                        // Vérifier par essai s'il existe une différence entre le moment réel où la lampe s'allume et le moment consigné, en prenant en compte un écart intermédiaire maximal de 40 ms
                        if (finalTime>lightTime + 40)
                            error14 Sur la base de l'interface contrôlée et du rendement lumineux mesuré, la lampe s'est allumée plus tôt que le moment indiqué via l'interface à la phase d'essai i = i.
                        else if (finalTime<lightTime – 40)
                            error15 Sur la base de l'interface contrôlée et du rendement lumineux mesuré, la lampe s'est allumée plus tard que le moment indiqué via l'interface à la phase d'essai i = i.
                        endif
                    endif
                endif
            endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

endfor

Tableau 47 – Paramètres pour la séquence d'essai SET POWER ON LEVEL

Phase d'essai i	value	level	
		PHM < 253	PHM >= 253
0	0	0	0
1	1	*PHM* + 1	254
2	*PHM*	*PHM* + 1	254
3	*PHM* + 1	*PHM* + 1	254
4	(*PHM* + 254) >> 1	(*PHM* + 254) >> 1	254
5	253	253	254
6	254	253	254
7	255	*PHM* + 1	254

12.4.12 SET FADE TIME

La séquence d'essai vérifie si le FADE TIME est réglé correctement sur différentes valeurs d'essai. Les réponses correctes à QUERY RESET STATE et QUERY STATUS sont également vérifiées par essai.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

for (*i* = 0; *i* < 8; *i*++)
RESET
wait 300 ms
DTR0 (*value*[*i*])
SET FADE TIME
answer = QUERY FADE TIME/FADE RATE
if (*answer* != *fadeTime*[*i*])
error1 FADE TIME erroné mémorisé à la phase d'essai i = *i*. Réel: *answer*. Attendu: *fadeTime*[*i*].
endif
answer = QUERY RESET STATE
if (*answer* != *reset*[*i*])
error2 Réponse erronée à QUERY RESET STATE et *text*[*i*] FADE TIME à la phase d'essai = *i*. Réel: *answer*. Attendu: *reset*[*i*].
endif
answer = QUERY STATUS
if (*answer* != *status*[*i*])
error3 Réponse erronée à QUERY STATUS et *text*[*i*] FADE TIME à la phase d'essai i = *i*. Réel: *answer*. Attendu: *status*[*i*].
endif
endfor

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 48 – Paramètres pour la séquence d'essai SET FADE TIME

Phase d'essai i	value	fadeTime	text	reset	status
0	0	0x07	inchangé	YES	XX1XXXXXb
1	1	0x17	valide	NO	XX0XXXXXb
2	5	0x57	valide	NO	XX0XXXXXb
3	14	0xE7	valide	NO	XX0XXXXXb
4	15	0xF7	valide	NO	XX0XXXXXb
5	16	0xF7	non valide	NO	XX0XXXXXb
6	128	0xF7	non valide	NO	XX0XXXXXb
7	255	0xF7	non valide	NO	XX0XXXXXb

12.4.13 SET FADE RATE

La séquence d'essai vérifie si le FADE RATE est réglé correctement sur différentes valeurs d'essai. Les réponses correctes à QUERY RESET STATE et QUERY STATUS sont également vérifiées par essai.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

for (*i* = 0; *i* < 9; *i*++)
    RESET
    wait 300 ms
    DTR0 (*value*[*i*])
    SET FADE RATE
    answer = QUERY FADE TIME/FADE RATE
    if (*answer* != *fadeRate*[*i*])
        error1 FADE RATE erroné mémorisé à la phase d'essai i = *i*. Réel: *answer*. Attendu: *fadeRate*[*i*].
    endif
    answer = QUERY RESET STATE
    if (*answer* != *reset*[*i*])
        error2 Réponse erronée à QUERY RESET STATE et *text*[*i*] FADE RATE à la phase d'essai i = *i*. Réel: *answer*. Attendu: *reset*[*i*].
    endif
    answer = QUERY STATUS
    if (*answer* != *status*[*i*])
        error3 Réponse erronée à QUERY STATUS et *text*[*i*] FADE RATE à la phase d'essai = *i*. Réel: *answer*. Attendu: *status*[*i*].
    endif
endfor

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 49 – Paramètres pour la séquence d'essai SET FADE RATE

Phase d'essai i	value	fadeRate	text	reset	status
0	7	0x07	inchangé	YES	XX1XXXXXb
1	0	0x01	non valide	NO	XX0XXXXXb
2	1	0x01	valide	NO	XX0XXXXXb
3	5	0x05	valide	NO	XX0XXXXXb
4	14	0x0E	valide	NO	XX0XXXXXb
5	15	0x0F	valide	NO	XX0XXXXXb
6	16	0x0F	non valide	NO	XX0XXXXXb
7	128	0x0F	non valide	NO	XX0XXXXXb
8	255	0x0F	non valide	NO	XX0XXXXXb

12.4.14 SET SCENE / REMOVE FROM SCENE

La séquence d'essai vérifie si la mémorisation et le retrait des scénarii sont effectués correctement. Au départ, chaque valeur d'essai (0, 1, 128, 253, 254, 255, PHM) est mémorisée dans chaque registre de scénario du DUT au moyen de SET SCENE, puis la valeur est retirée au moyen de REMOVE FROM SCENE. Les réponses correctes à QUERY RESET STATE et QUERY STATUS sont également vérifiées par essai.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
for (*i* = 0; *i* < 16; *i*++)
    for (*j* = 0; *j*< 7; *j*++)
        DTR0 (*value*[*j*])
        SET SCENE *i*
        answer = QUERY SCENE LEVEL *i*
        if (*answer* != *scene*[*j*])
            error1 SCENE LEVEL *i* erroné mémorisé à la phase d'essai (i,j) = (*i*,*j*). Réel: *answer*. Attendu: *scene*[*j*].
        endif
        answer = QUERY RESET STATE
        if (*answer* != *reset*[*j*])
            error2 Réponse erronée à QUERY RESET STATE et SCENE *i* programmé à la phase d'essai (i,j) = (*i*,*j*). Réel: *answer*. Attendu: *reset*[*j*].
        endif
        answer = QUERY STATUS
        if (*answer* != *status*[*j*])
            error3 Réponse erronée à QUERY STATUS et SCENE *i* programmé à la phase d'essai (i,j) = (*i*,*j*). Réel: *answer*. Attendu: *status*[*j*].
        endif
    endfor
    REMOVE FROM SCENE *i*
    answer = QUERY SCENE LEVEL *i*
    if (*answer* != 255)
        error4 SCENE LEVEL *i* non retiré à la phase d'essai i = *i*. Réel: *answer*. Attendu: 255.
    endif
    answer = QUERY RESET STATE
    if (*answer* != YES)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        error5 Réponse erronée à QUERY RESET STATE et SCENE i retiré à la phase
        d'essai i = i. Réel: answer. Attendu: YES.
    endif
    answer = QUERY STATUS
    if (answer != XX1XXXXXb)
        error6 Réponse erronée à QUERY STATUS et SCENE i retiré à la phase d'essai i =
        i. Réel: answer. Attendu: XX1XXXXXb.
    endif
endfor
```

Tableau 50 – Paramètres pour la séquence d'essai SET SCENE / REMOVE FROM SCENE

Phase d'essai j	value	scene	reset	status
0	0	0	NO	XX0XXXXXb
1	1	1	NO	XX0XXXXXb
2	128	128	NO	XX0XXXXXb
3	253	253	NO	XX0XXXXXb
4	254	254	NO	XX0XXXXXb
5	255	255	YES	XX1XXXXXb
6	*PHM*	*PHM*	NO	XX0XXXXXb

12.4.15 ADD TO GROUP / REMOVE FROM GROUP

La séquence d'essai vérifie si l'ajout à un groupe et le retrait d'un groupe d'un DUT sont effectués correctement. Au départ, le DUT est ajouté à un groupe au moyen de la commande ADD TO GROUP, puis il est retiré du groupe au moyen de la commande REMOVE FROM GROUP. L'essai vérifie également l'adressage du groupe, par l'envoi d'une requête au groupe X après ajout, puis retrait du DUT de ce groupe X particulier.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
for (i = 0; i < 16; i++)
    ADD TO GROUP i
    answer = QUERY GROUPS 0-7
    if (answer != groups0-7[i])
        error1 Réponse erronée à QUERY GROUPS 0-7 et ajout au GROUP i. Réel:
        answer. Attendu: groups0-7[i].
    endif
    answer = QUERY GROUPS 8-15
    if (answer != groups8-15[i])
        error2 Réponse erronée à QUERY GROUPS 8-15 et ajout au GROUP i. Réel:
        answer. Attendu: groups8-15[i].
    endif
    groupAddress = (i<< 1) + 10000001b // gearGroups i
    answer = QUERY PHYSICAL MINIMUM, send to groupAddress
    if (answer != PHM)
        error3 Réponse erronée à QUERY PHYSICAL MINIMUM et ajout au GROUP i. Réel:
        answer. Attendu: PHM.
    endif
    REMOVE FROM GROUP i
    answer = QUERY GROUPS 0-7
    if (answer != 0)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        error4 Réponse erronée à QUERY GROUPS 0-7 et retrait du GROUP i. Réel: answer. Attendu: 0.
    endif
    answer = QUERY GROUPS 8-15
    if (answer != 0)
        error5 Réponse erronée à QUERY GROUPS 8-15 et retrait du GROUP i. Réel: answer. Attendu: 0.
    endif
    answer = QUERY PHYSICAL MINIMUM, send to groupAddress
    if (answer != NO)
        error6 Réponse erronée à QUERY PHYSICAL MINIMUM et retrait du GROUP i. Réel: answer. Attendu: NO.
    endif
endfor
```

Tableau 51 – Paramètres pour la séquence d'essai ADD TO GROUP' / 'REMOVE FROM GROUP

Phase d'essai i	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
groups0-7	1	2	4	8	16	32	64	128	0	0	0	0	0	0	0	0
groups8-15	0	0	0	0	0	0	0	0	1	2	4	8	16	32	64	128

12.4.16 SET SHORT ADDRESS

La séquence d'essai vérifie si la mémorisation de l'adresse courte est correctement programmée, en utilisant l'adresse courte programmée dans la phase précédente. QUERY MISSING SHORT ADDRESS et le bit d'adresse courte de la réponse à QUERY STATUS sont également vérifiés par essai.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
oldAddress = GLOBAL_currentUnderTestLogicalUnit
lastAssignedAddress = oldAddress
if (GLOBAL_numberShortAddresses< 62)
    numberNotAssignedAddresses = 62 – GLOBAL_numberShortAddresses + 1
    intermediateAddress = GLOBAL_numberShortAddresses + (oldAddress % numberNotAssignedAddresses)
    iEnd = 7
else
    iEnd = 6
endif
for (i = 0; i<iEnd; i++)
    DTR0 (value[i])
    SET SHORT ADDRESS, send to address1[i]
    answer = QUERY MISSING SHORT ADDRESS, send to address2[i]
    if (answer != test1[i])
        error1 Réponse erronée à QUERY MISSING SHORT ADDRESS à la phase d'essai i = i. Réel: answer. Attendu: test1[i].
    endif
    answer = QUERY STATUS, send to address2[i]
    if (answer != test2[i])
        error2 Réponse erronée à QUERY STATUS à la phase d'essai i = i. Réel: answer. Attendu: test2[i].
    endif
    lastAssignedAddress = address2[i]
endfor
SetShortAddress (lastAssignedAddress; oldAddress)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 52 – Paramètres pour la séquence d'essai SET SHORT ADDRESS

Phase d'essai i	value	description	address1	address2	test1	test2
0	01111111b	adresse courte 63	*oldAddress*<<1+1	01111111b	NO	X0XXXXXXb
1	11111111b	supprimer adresse courte	01111111b	diffusion non adressée	YES	X1XXXXXXb
2	*oldAddress*<<1+1	*oldAddress*	diffusion non adressée	*oldAddress*<<1+1	NO	X0XXXXXXb
3	10000001b	pas de modification	*oldAddress*<<1+1	*oldAddress*<<1+1	NO	X0XXXXXXb
4	00000000b	pas de modification	*oldAddress*<<1+1	*oldAddress*<<1+1	NO	X0XXXXXXb
5	10000000b	pas de modification	*oldAddress*<<1+1	*oldAddress*<<1+1	NO	X0XXXXXXb
6	*intermediateAddress*<<1+1	adresse courte	*oldAddress*<<1+1	*intermediateAddress*<<1+1	NO	X0XXXXXXb

12.4.17 SET EXTENDED FADE TIME

La séquence d'essai vérifie si le EXTENDED FADE TIME est réglé correctement sur différentes valeurs d'essai. Les réponses correctes à QUERY RESET STATE et QUERY STATUS sont également vérifiées par essai.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

for (*i* = 0; *i* < 10; *i*++)
    RESET
    wait 300 ms
    DTR0 (*value*[*i*])
    SET EXTENDED FADE TIME
    answer = QUERY EXTENDED FADE TIME
    if (*answer* != *extendedFadeTime*[*i*])
        error1 EXTENDED FADE TIME erroné mémorisé à la phase d'essai i = *i*. Réel: *answer*. Attendu: *extendedFadeTime*[*i*].
    endif
    answer = QUERY RESET STATE
    if (*answer* != *reset*[*i*])
        error2 Réponse erronée à QUERY RESET STATE et *text*[*i*] EXTENDED FADE TIME à la phase d'essai i = *i*. Réel: *answer*. Attendu: *reset*[*i*].
    endif
    answer = QUERY STATUS
    if (*answer* != *status*[*i*])
        error3 Réponse erronée à QUERY STATUS et *text*[*i*] EXTENDED FADE TIME à la phase d'essai = *i*. Réel: *answer*. Attendu: *status*[*i*].
    endif
endfor

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 53 – Paramètres pour la séquence d'essai SET EXTENDED FADE TIME

Phase d'essai i	value	extendedFadeTime	text	reset	status
0	00000000b	00000000b	valide	YES	XX1XXXXXb
1	00000001b	00000001b	valide	NO	XX0XXXXXb
2	10111111b	00000000b	non valide	YES	XX1XXXXXb
3	00001111b	00001111b	valide	NO	XX0XXXXXb
4	01010000b	00000000b	non valide	YES	XX1XXXXXb
5	00010000b	00010000b	valide	NO	XX0XXXXXb
6	01100101b	00000000b	non valide	YES	XX1XXXXXb
7	01000000b	01000000b	valide	NO	XX0XXXXXb
8	01110001b	00000000b	non valide	YES	XX1XXXXXb
9	01001111b	01001111b	valide	NO	XX0XXXXXb

12.4.18 Reset/Power-on values (Valeurs de réinitialisation/Mise sous tension)

La séquence d'essai vérifie les valeurs de réinitialisation et de mise sous tension des 102 variables. Il est supposé que les valeurs de réinitialisation et de mise sous tension des variables 2xx sont vérifiées par essai dans la norme IEC 62386-2xx.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
operatingMode = QUERY OPERATING MODE
PHM = QUERY PHYSICAL MINIMUM
shortAddress = GLOBAL_currentUnderTestLogicalUnit
// Modifier la valeur de 102 variables
INITIALISE (shortAddress << 1 + 1)
RANDOMISE
wait 100 ms
TERMINATE
randomAddress = GetRandomAddress ()
for (i = 4; i < 32; i++)
    command[i]
endfor
// Effectuer un RESET
RESET
wait 300 ms
// Vérifier les variables ROM après réinitialisation
i = 0
deviceType[] = GetSupportedDeviceTypes (shortAddress)
foreach (device in deviceType)
    if (device != GLOBAL_logicalUnit[shortAddress].deviceType[i])
        error1 LogicalUnit shortAddress: deviceType erroné après RESET. Réel: device.
        Attendu: GLOBAL_logicalUnit[shortAddress].deviceType[i].
    endif
    i++
endfor
i = 0
extendedVersionNumber[] = GetExtendedVersionNumber (shortAddress; deviceType[])
foreach (version in extendedVersionNumber)
    if (version != GLOBAL_logicalUnit[shortAddress].extendedVersionNumber[i])
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            error2 LogicalUnit shortAddress: extendedVersionNumber erroné après RESET. Réel: version. Attendu: GLOBAL_logicalUnit[shortAddress].extendedVersionNumber[i].
        endif
        i++
    endfor
    i = 0
    lightSource[] = GetSupportedLightSources (shortAddress)
    foreach (light in lightSource)
        if (light != GLOBAL_logicalUnit[shortAddress].lightSource[i])
            error3 LogicalUnit shortAddress: lightSource erronée après RESET. Réel: light. Attendu: GLOBAL_logicalUnit[shortAddress].lightSource[i].
        endif
        i++
    endfor
    // Vérifier la valeur réinitialisée des 102 variables
    for (i = 0; i < 32; i++)
        answer = query[i]
        if (answer != reset[i])
            error4 Valeur réinitialisée erronée pour variable[i]. Réponse: answer. Attendu: reset[i].
        endif
    endfor
    // Modifier la valeur de 102 variables
    INITIALISE (shortAddress<< 1 + 1)
    RANDOMISE
    wait 100 ms
    TERMINATE
    randomAddress = GetRandomAddress ()
    for (i = 4; i < 32; i++)
        command[i]
    endfor
    // Exécuter un cycle de mise sous tension
    wait 1 s
    PowerCycleAndWaitForDecoder (60)
    // Vérifier les variables ROM après le cycle de mise sous tension
    i = 0
    deviceType[] = GetSupportedDeviceTypes (shortAddress)
    foreach (device in deviceType)
        if (device != GLOBAL_logicalUnit[shortAddress].deviceType[i])
            error5 LogicalUnit shortAddress: deviceType erroné après le cycle de mise sous tension. Réel: device. Attendu: GLOBAL_logicalUnit[shortAddress].deviceType[i].
        endif
        i++
    endfor
    i = 0
    extendedVersionNumber[] = GetExtendedVersionNumber (shortAddress; deviceType[])
    foreach (version in extendedVersionNumber)
        if (version != GLOBAL_logicalUnit[shortAddress].extendedVersionNumber[i])
            error6 LogicalUnit shortAddress: extendedVersionNumber erroné après le cycle de mise sous tension. Réel: version. Attendu: GLOBAL_logicalUnit[shortAddress].extendedVersionNumber[i].
        endif
        i++
    endfor
    i = 0
    lightSource[] = GetSupportedLightSources (shortAddress)
    foreach (light in lightSource)
        if (light != GLOBAL_logicalUnit[shortAddress].lightSource[i])
            error7 LogicalUnit shortAddress: lightSource erronée après le cycle de mise sous tension. Réel: light. Attendu: GLOBAL_logicalUnit[shortAddress].lightSource[i].
        endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    i++
endfor
// Vérifier la valeur de mise sous tension des 102 variables
for (i = 0; i < 32; i++)
    answer = query[i]
    if (answer != powerOn[i])
        error8 Valeur de mise sous tension erronée pour variable[i] à la phase d'essai i = i.
        Réponse: answer. Attendu: powerOn[i].
    endif
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 54 – Paramètres pour la séquence d'essai 'Reset/Power-on values'

Phase d'essai i	command	query	variable	reset	powerOn		
					PHM = 1	1 < PHM < 254	PHM = 254
0	-	QUERY OPERATING MODE	operatingMode	*operatingMode*	*operatingMode*	*operatingMode*	*operatingMode*
1	-	QUERY CONTROL GEAR PRESENT	shortAddress	YES	YES	YES	YES
2	-	**GetRandomAddress** ()	randomAddress	0xFF FF FF	*randomAddress*	*randomAddress*	*randomAddress*
3	-	**GetVersionNumber** ()	versionNumber	2.0	2.0	2.0	2.0
4	DTR0 (*PHM* + 1) SET MIN LEVEL	QUERY MIN LEVEL	minLevel	*PHM*	*PHM* + 1	*PHM* + 1	254
5	DTR0 (*PHM* + 1) SET MAX LEVEL	QUERY MAX LEVEL	maxLevel	254	*PHM* + 1	*PHM* + 1	254
6	DTR0 (1) SET POWER ON LEVEL	QUERY POWER ON LEVEL	powerOnLevel	0xFE	1	1	1
7	DTR0 (1) SET SYSTEM FAILURE LEVEL	QUERY SYSTEM FAILURE LEVEL	systemFailureLevel	0xFE	1	1	1
8	DTR0 (15) SET FADE RATE SET FADE TIME	QUERY FADE TIME/FADE RATE	fadeRate/fadeTime	0x07	0xFF	0xFF	0xFF
9	DTR0 (43) SET EXTENDED FADE TIME	QUERY EXTENDED FADE TIME	extendedFadeTimeBase/ Multiplier	0	43	43	43
10	ADD TO GROUP 0 ADD TO GROUP 1 ADD TO GROUP 2 ADD TO GROUP 3 ADD TO GROUP 4 ADD TO GROUP 5 ADD TO GROUP 6 ADD TO GROUP 7	QUERY GROUP 0-7	gearGroups0-7	0x00	0xFF	0xFF	0xFF

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printed.

Phase d'essai i	command	query	variable	reset	powerOn		
					PHM = 1	1 < PHM < 254	PHM = 254
11	ADD TO GROUP 8 ADD TO GROUP 9 ADD TO GROUP 10 ADD TO GROUP 11 ADD TO GROUP 12 ADD TO GROUP 13 ADD TO GROUP 14 ADD TO GROUP 15	QUERY GROUP 8-15	gearGroups8-15	0x00	0xFF	0xFF	0xFF
12	DTR0 (0) SET SCENE 0	QUERY SCENE LEVEL 0	scene0	0xFF	0	0	0
13	DTR0 (1) SET SCENE 1	QUERY SCENE LEVEL 1	scene1	0xFF	1	1	1
14	DTR0 (2) SET SCENE 2	QUERY SCENE LEVEL 2	scene2	0xFF	2	2	2
15	DTR0 (3) SET SCENE 3	QUERY SCENE LEVEL 3	scene3	0xFF	3	3	3
16	DTR0 (4) SET SCENE 4	QUERY SCENE LEVEL 4	scene4	0xFF	4	4	4
17	DTR0 (5) SET SCENE 5	QUERY SCENE LEVEL 5	scene5	0xFF	5	5	5
18	DTR0 (6) SET SCENE 6	QUERY SCENE LEVEL 6	scene6	0xFF	6	6	6
19	DTR0 (7) SET SCENE 7	QUERY SCENE LEVEL 7	scene7	0xFF	7	7	7
20	DTR0 (8) SET SCENE 8	QUERY SCENE LEVEL 8	scene8	0xFF	8	8	8

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Phase d'essai i	command	query	variable	reset	powerOn		
					PHM = 1	1 < PHM < 254	PHM = 254
21	DTR0 (9) SET SCENE 9	QUERY SCENE LEVEL 9	scene9	0xFF	9	9	9
22	DTR0 (10) SET SCENE 10	QUERY SCENE LEVEL 10	scene10	0xFF	10	10	10
23	DTR0 (11) SET SCENE 11	QUERY SCENE LEVEL 11	scene11	0xFF	11	11	11
24	DTR0 (12) SET SCENE 12	QUERY SCENE LEVEL 12	scene12	0xFF	12	12	12
25	DTR0 (13) SET SCENE 13	QUERY SCENE LEVEL 13	scene13	0xFF	13	13	13
26	DTR0 (14) SET SCENE 14	QUERY SCENE LEVEL 14	scene14	0xFF	14	14	14
27	DTR0 (15) SET SCENE 15	QUERY SCENE LEVEL 15	scene15	0xFF	15	15	15
28	DTR0 (0xAA)	QUERY CONTENT DTR0	DTR0	0xAA	0x00	0x00	0x00
29	DTR1 (0xAB)	QUERY CONTENT DTR1	DTR1	0xAB	0x00	0x00	0x00
30	DTR2 (0xAC)	QUERY CONTENT DTR2	DTR2	0xAC	0x00	0x00	0x00
31	DAPC (1)	QUERY STATUS	statusByte	00100100b	10000100b	10001100b	10001100b

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

12.4.19 DTR0 / DTR1 / DTR2

La séquence d'essai vérifie le bon fonctionnement des registres DTR, par une lecture à partir de ces derniers et une écriture dans ces derniers. Il est nécessaire qu'ils soient corrects avant d'effectuer les essais suivants. Ils n'influencent pas (il convient qu'ils n'influencent pas) du tout les valeurs par défaut d'usine des variables NVM

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

for (*i* = 0; *i* < 9; *i*++)
DTR0 (*data0*[*i*])
DTR1 (*data1*[*i*])
DTR2 (*data2*[*i*])
answer = QUERY CONTENT DTR0
if (*answer* != *data0*[*i*])
error1 Valeur erronée de DTR0 mémorisée à la phase d'essai i = *i*. Réel: *answer*. Attendu: *data0*[*i*].
endif
answer = QUERY CONTENT DTR1
if (*answer* != *data1*[*i*])
error2 Valeur erronée de DTR1 mémorisée à la phase d'essai i = *i*. Réel: *answer*. Attendu: *data1*[*i*].
endif
answer = QUERY CONTENT DTR2
if (*answer* != *data2*[*i*])
error3 Valeur erronée de DTR2 mémorisée à la phase d'essai i = *i*. Actual: *answer*. Attendu: *data2*[*i*].
endif
endfor

Tableau 55 – Paramètres pour la séquence d'essai DTR0 / DTR1 / DTR2

Phase d'essai i	data0	data1	data2
0	00000001b	11111111b	10000000b
1	00000010b	00000001b	11111111b
2	00000100b	00000010b	00000001b
3	00001000b	00000100b	00000010b
4	00010000b	00001000b	00000100b
5	00100000b	00010000b	00001000b
6	01000000b	00100000b	00010000b
7	10000000b	01000000b	00100000b
8	11111111b	10000000b	01000000b

12.5 Blocs de mémoire

12.5.1 READ MEMORY LOCATION on Memory Bank 0 (READ MEMORY LOCATION sur bloc de mémoire 0)

La séquence d'essai vérifie le bon fonctionnement de la commande READ MEMORY LOCATION et si le bloc de mémoire 0 est mis en œuvre selon la spécification.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
DTR0 (0)
DTR1 (0)
answer = READ MEMORY LOCATION
if (answer == NO)
    error1 Aucune réponse reçue lors de la lecture de la taille du bloc de mémoire 0. Réel: NO. Attendu: pas NO.
else// Lire le bloc de mémoire 0
    // Lire l'emplacement du bloc de mémoire 0x00, qui peut différer par unité logique
    DTR1 (0)
    DTR2 (128)
    for (address = 0; address<GLOBAL_numberShortAddresses; address++)
        DTR0 (0)
        laml[address] = READ MEMORY LOCATION, send to ((address<< 1) + 1)
        if (answer == NO)
            error2 LogicalUnit address: Aucune réponse reçue lors de la lecture de l'emplacement du bloc de mémoire 0. Réel: NO. Attendu: pas NO.
        else
            if (laml[address] < 0x1A) // Vérifier que tous les emplacements obligatoires de blocs de mémoire sont mis en œuvre
                error3 LogicalUnit address: Les emplacements obligatoires de blocs de mémoire ne sont pas tous mis en œuvre. Réel: laml[address]. Attendu: réponse >= 0x1A.
            endif
            if (laml[address] >= 0x1B AND laml[address] <= 0x7F) // Vérifier qu'aucun emplacement de bloc de mémoire réservé [0x1B,0x7F] n'est fourni comme dernier emplacement de mémoire accessible
                error4 LogicalUnit address: Emplacement de bloc de mémoire réservé laml[address] renvoyé comme dernier emplacement de bloc de mémoire. Réel: laml[address]. Attendu: 0x1A ou [0x80,0xFE].
            endif
            if (laml[address] == 0xFF) // Vérifier que l'emplacement du bloc de mémoire réservé 0xFF n'est pas fourni comme dernier emplacement de mémoire accessible
                error5 LogicalUnit address: Emplacement de bloc de mémoire 0xFF réservé renvoyé comme dernier emplacement de bloc de mémoire. Réel: laml[address]. Attendu: 0x1A ou [0x80,0xFE].
            endif
        endif
        answer = QUERY CONTENT DTR0, send to ((address<< 1) + 1) // Vérifier que DTR0 est augmenté après lecture d'un emplacement de bloc de mémoire valide
        if (answer != 1)
            error6 LogicalUnit address: DTR0 non augmenté après lecture d'un emplacement de bloc de mémoire valide. Réel: answer. Attendu: 1.
        endif
        answer = QUERY CONTENT DTR1, send to ((address<< 1) + 1) // Vérifier que DTR1 n'est pas modifié après lecture d'un emplacement de bloc de mémoire
        if (answer != 0)
            error7 LogicalUnit address: DTR1 modifié après lecture d'un emplacement de bloc de mémoire valide. Réel: answer. Attendu: 0.
            DTR1 (0)
        endif
        answer = QUERY CONTENT DTR2, send to ((address<< 1) + 1) // Vérifier que DTR2 n'est pas modifié après lecture d'un emplacement de bloc de mémoire
        if (answer != 128)
            error8 LogicalUnit address: DTR2 modifié après lecture d'un emplacement de bloc de mémoire valide. Réel: answer. Attendu: 128.
            DTR2 (128)
        endif
    endfor
    // Lire l'emplacement de bloc de mémoire 0x01, qui ne doit pas être mis en oeuvre sur les unités logiques
    DTR0 (1)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
DTR2 (64)
answer = READ MEMORY LOCATION // Vérifier que l'emplacement du bloc de mémoire 0x01 réservé n'est pas mis en œuvre
if (answer != NO)
    error9 Réponse reçue lorsque la lecture est réservée – emplacement du bloc de mémoire 0x01 non mis en œuvre. Réel: answer. Attendu: NO.
endif
answer = QUERY CONTENT DTR0 // Vérifier que DTR0 est augmenté après lecture d'un emplacement de bloc de mémoire non mis en œuvre
if (answer != 2)
    error10 DTR0 non augmenté après lecture d'un emplacement de bloc de mémoire non mis en œuvre. Réel: answer. Attendu: 2.
endif
answer = QUERY CONTENT DTR1 // Vérifier que DTR1 n'est pas modifié après lecture d'un emplacement de bloc de mémoire
if (answer != 0)
    error11 DTR1 modifié après lecture d'un emplacement de bloc de mémoire non mis en œuvre. Réel: answer. Attendu: 0.
    DTR1 (0)
endif
answer = QUERY CONTENT DTR2 // Vérifier que DTR2 n'est pas modifié après lecture d'un emplacement de bloc de mémoire
if (answer != 64)
    error12 DTR2 modifié après lecture d'un emplacement de bloc de mémoire non mis en œuvre. Réel: answer. Attendu: 64.
endif
// La lecture du contenu doit correspondre aux emplacements de blocs de mémoire mis en œuvre
// Lire l'emplacement du bloc de mémoire 0x02, qui peut différer par unité logique
for (address = 0; address<GLOBAL_numberShortAddresses; address++)
    DTR0 (2)
    answer = READ MEMORY LOCATION, send to ((address<< 1) + 1)
    if (answer == NO)
        error13 LogicalUnit address: Une erreur s'est produite lors de la lecture de l'emplacement de bloc de mémoire valide 0x02.
    else
        if (answer<= 199)
            report1 LogicalUnit address: Dernier bloc de mémoire accessible = answer.
        else
            error14 LogicalUnit address: Dernier bloc de mémoire accessible erroné consigné. Réel: answer. Attendu: [0, 199].
        endif
    endif
    answer = QUERY CONTENT DTR0, send to ((address<< 1) + 1) // Vérifier que DTR0 est augmenté après lecture d'un emplacement de bloc de mémoire valide
    if (answer != 3)
        error15 LogicalUnit address: DTR0 non augmenté après lecture d'un emplacement de bloc de mémoire valide. Réel: answer. Attendu: 3.
    endif
endfor
// Lire les emplacements de blocs de mémoire 0x03 – 0x19, qui doivent être communs à toutes les unités logiques
loc0x19 = 0
DTR0 (3)
for (i = 0; i < 11; i++)
    multibyte = ReadMemBankMultibyteLocation (nrBytes[i])
    if (multibyte != -1)
        // multioctet doit être affichée comme valeur décimale
        report2text[i] = multibyte
        // Vérifier la plage admise pour chaque emplacement de bloc de mémoire
        if (address[i] == 0x19)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                loc0x19 = multibyte
            endif
            if (address[i] == 0x15)
                if (multibyte == 0xFF)
                    error16 Pour ce DUT, la norme 101 doit être mise en oeuvre.
                else if (multibyte<00001000b)
                    error17text[i] doit être au moins 2.0 (00001000b).
                endif
            else if (address[i] == 0x16)
                if (multibyte == 0xFF)
                    error18 Pour ce DUT, la norme 102 doit être mise en œuvre.
                else if (multibyte != 00001000b)
                    error19text[i] doit être 2.0 (00001000b).
                endif
            else if (address[i] == 0x17)
                if (multibyte == 0xFF)
                    report3 Pour ce DUT, la norme 103 doit être mise en œuvre.
                else if (multibyte<00001000b)
                    error20text[i] doit être au moins 2.0 (00001000b).
                endif
            else if (address[i] == 0x18 AND multibyte> 64)
                error21text[i] doit être compris dans la plage [0,64].
            else if (address[i] == 0x19 AND (multibyte< 1 OR multibyte> 64))
                error22text[i] doit être compris dans la plage [1,64].
            endif
            answer = QUERY CONTENT DTR0 // Vérifier que DTR0 est augmenté après
            lecture d'un emplacement de bloc de mémoire valide
            if (answer != dtrValue[i])
                error23 DTR0 non augmenté après lecture d'un emplacement de bloc de
                mémoire valide. Réel: answer. Attendu: dtrValue[i].
                DTR0 (dtrValue[i])
            endif
        else
            error24 Une erreur s'est produite lors de la lecture de l'address[i] valide de
            l'emplacement de bloc de mémoire.
            DTR0 (dtrValue[i])
        endif
    endfor
    // Lire l'emplacement du bloc de mémoire 0x1A, dont il convient qu'il diffère par unité
    logique
    if (loc0x19 == 0)
        error25 L'emplacement 0x1A ne peut pas être vérifié dans la mesure où une erreur
        s'est produite lors de la lecture de l'emplacement 0x19.
    else
        for (address = 0; address<GLOBAL_numberShortAddresses; address++)
            DTR0 (0x1A)
            answer = READ MEMORY LOCATION, send to ((address<< 1) + 1)
            if (answer != NO)
                if (answer> (loc0x19 – 1))
                    error26 LogicalUnit address: L'indice de cet appareillage de
                    commande logique doit se situer dans la plage [0, loc0x19 – 1].
                else
                    report4 LogicalUnit address: Indice de cet appareillage de commande
                    logique= answer.
                endif
            else
                error27 LogicalUnit address: Une erreur s'est produite lors de la lecture de
                l'emplacement de bloc de mémoire valide 0x1A.
            endif
            answer = QUERY CONTENT DTR0, send to ((address<< 1) + 1) // Vérifier que
            DTR0 est augmenté après lecture d'un emplacement de bloc de mémoire valide
            if (answer != 0x1B)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            error28 LogicalUnit address: DTR0 non augmenté après lecture de
            l'emplacement de bloc de mémoire 0x1A. Réel: answer. Attendu: 0x1B.
        endif
    endfor
endif
// Vérifier que les emplacements de blocs de mémoire réservés 0x1B-0x7F ne sont mis
en oeuvre dans aucune des unités logiques
DTR0 (0x1B)
for (i = 0x1B; i<= 0x7F; i++)
    answer = READ MEMORY LOCATION
    if (answer != NO)
        error29 Réponse reçue lors de la lecture de l'emplacement du bloc de mémoire
        i non mis en oeuvre. Réel: answer. Attendu: NO.
    endif
    answer = QUERY CONTENT DTR0 // Vérifier que DTR0 est augmenté après lecture
    d'un emplacement de bloc de mémoire non mis en œuvre
    if (answer != i + 1)
        error30 DTR0 non augmenté après lecture de l'emplacement de bloc de
        mémoire i. non mis en œuvre. Réel: answer. Attendu: i + 1.
        DTR0 (i + 1)
    endif
endfor
for (address = 0; address<GLOBAL_numberShortAddresses; address++)
    // Lorsqu'elles sont disponibles, lire les informations supplémentaires concernant les
    appareillages de commande, par unité logique
    DTR0 (0x80)
    additionalData = 0
    for (i = 0x80; i<= 254; i++)
        answer = READ MEMORY LOCATION, send to ((address<< 1) + 1)
        if (answer != NO)
            additionalData = additionalData + 1
            report5 LogicalUnit address: Les informations supplémentaires concernant
            les appareillages de commande à l'emplacement i correspondent à answer.
            if (i>laml[address])
                error 31 LogicalUnit address: Informations supplémentaires
                concernant les appareillages de commande identifiées à
                l'emplacement i. Le dernier emplacement de mémoire accessible
                correspond à laml[address].
            endif
        endif
        answer = QUERY CONTENT DTR0, send to ((address<< 1) + 1) // Vérifier que
        DTR0 est augmenté après lecture d'un emplacement de bloc de mémoire valide
        if (answer != i + 1)
            error32 LogicalUnit address: DTR0 non augmenté après lecture d'un
            emplacement de bloc de mémoire valide i. Réel: answer. Attendu: i + 1.
            DTR0 (i + 1)
        endif
    endfor
    if (additionalData== 0 AND laml[address] >= 0x80)
        error33 LogicalUnit address: Aucune réponse reçue lors de la lecture de
        données supplémentaires, des données supplémentaires sont toutefois
        attendues.
    endif
endfor
// Lire le dernier emplacement de bloc de mémoire
DTR0 (0xFF)
answer = READ MEMORY LOCATION
if (answer != NO)
    error34 Réponse reçue lors de la lecture de l'emplacement de mémoire 0xFF. Réel:
    answer. Attendu: NO.
endif
answer = QUERY CONTENT DTR0
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    if (answer != 255)
        error35 DTR0 modifié après lecture de l'emplacement de mémoire 0xFF. Réel: answer. Attendu: 255.
    endif
endif
```

Tableau 56 – Paramètres pour la séquence d'essai READ MEMORY LOCATION sur le bloc de mémoire 0

Phase d'essai i	address	nrBytes	dtrValue	text
0	0x03	6	9	GTIN (décimale)
1	0x09	1	10	Version du microprogramme (principale)
2	0x0A	1	11	Version du microprogramme (secondaire)
3	0x0B	8	19	Numéro d'identification (décimal)
4	0x13	1	20	Version du matériel (principale)
5	0x14	1	21	Version du matériel (secondaire)
6	0x15	1	22	numéro de version 101
7	0x16	1	23	numéro de version 102
8	0x17	1	24	numéro de version 103
9	0x18	1	25	Nombre de dispositifs de commande logiques dans le bus
10	0x19	1	26	Nombre d'appareillages de commande logiques dans le bus

12.5.2 READ MEMORY LOCATION on Memory Bank 1 (READ MEMORY LOCATION sur bloc de mémoire 0)

La séquence d'essai vérifie le bon fonctionnement de la commande READ MEMORY LOCATION et si le bloc de mémoire 1 est mis en œuvre selon la spécification.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
DTR0 (0)
DTR1 (1)
laml= READ MEMORY LOCATION
if (laml!= NO)
    report1 Le bloc de mémoire 1 est mis en œuvre et le dernier emplacement de bloc de mémoire accessible est laml.
    if (laml< 0x10) // Vérifier que tous les emplacements obligatoires de blocs de mémoire sont mis en œuvre
        error1 Les emplacements obligatoires de blocs de mémoire ne sont pas tous mis en œuvre. Réel: laml. Attendu: réponse >= 0x10.
    endif
    if (laml == 0xFF) // Vérifier que l'emplacement du bloc de mémoire réservé 0xFF n'est pas fourni comme dernier emplacement de mémoire accessible
        error2 Emplacement du bloc de mémoire 0xFF réservé. Réel: laml. Attendu: [0x10,0xFE].
    endif
    answer = QUERY CONTENT DTR0 // Vérifier que DTR0 est augmenté après lecture d'un emplacement de bloc de mémoire valide
    if (answer != 1)
        error3 DTR0 non augmenté après lecture d'un emplacement de bloc de mémoire valide. Réel: answer. Attendu: 1.
    endif
    answer = QUERY CONTENT DTR1 // Vérifier que DTR1 n'est pas modifié après lecture d'un emplacement de bloc de mémoire
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
if (answer != 1)
    error4 DTR1 modifié après lecture d'un emplacement de bloc de mémoire valide. Réel: answer. Attendu: 1.
endif
DTR0 (1)
DTR1 (1)
answer = READ MEMORY LOCATION // Lire l'emplacement de l'octet indicateur 0x01
report2 Octet indicateur (emplacement de bloc de mémoire 1) = answer
answer = QUERY CONTENT DTR0 //  Vérifier que DTR0 est augmenté après lecture de l'emplacement de bloc de mémoire spécifique au fabricant
if (answer != 2)
    error5 DTR0 non augmenté après lecture de l'emplacement de bloc de mémoire spécifique au fabricant. Réel: answer. Attendu: 2.
endif
answer = QUERY CONTENT DTR1 // Vérifier que DTR1 n'est pas modifié après lecture d'un emplacement de bloc de mémoire
if (answer != 1)
    error6 DTR1 modifié après lecture de l'emplacement de bloc de mémoire spécifique au fabricant. Réel: answer. Attendu: 1.
    DTR1 (1)
endif
// La lecture du contenu doit correspondre aux emplacements de blocs de mémoire mis en œuvre
DTR0 (2)
for (i = 0; i < 3; i++)
    if (address[i] + nrBytes[i] – 1 <= laml)
        multibyte = ReadMemBankMultibyteLocation (nrBytes[i])
        if (multibyte != -1)
            report3text[i] = multibyte
        else
            error7 Une erreur s'est produite lors de la lecture de l'emplacement de bloc de mémoire valide (text[i]).
        endif
    else
        error8 Les emplacements obligatoires de blocs de mémoire ne sont pas tous mis en œuvre.
    endif
endfor
// Lire les emplacements au-dessus du dernier emplacement de bloc de mémoire accessible
DTR0 (laml + 1)
for (i = laml + 1; i<= 0xFE; i++)
    answer = READ MEMORY LOCATION
    if (answer != NO)
        error9 Réponse reçue lors de la lecture de l'emplacement du bloc de mémoire i. Réel: answer. Attendu: NO.
    endif
    answer = QUERY CONTENT DTR0
    if (answer != i + 1)
        error10 DTR0 non mis en œuvre après lecture des emplacements au-dessus du dernier emplacement de bloc de mémoire accessible. Réel: answer. Attendu: i + 1.
    endif
endfor
// Lire le dernier emplacement de bloc de mémoire
DTR0 (0xFF)
answer = READ MEMORY LOCATION
if (answer != NO)
    error11 Réponse reçue lors de la lecture de l'emplacement de mémoire 0xFF. Réel: answer. Attendu: NO.
endif
answer = QUERY CONTENT DTR0
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    if (answer != 255)
        error12 DTR0 modifié après lecture de l'emplacement de mémoire 0xFF. Réel:
        answer. Attendu: 255.
    endif
else
    report4 Le bloc de mémoire 1 n'est pas mis en œuvre.
    // Vérifier que le bloc de mémoire 1 n'est effectivement pas mis en œuvre
    for (i = 1; i<= 255; i++)
        DTR0 (i)
        answer = READ MEMORY LOCATION
        if (answer != NO)
            error13 Réponse reçue lors de la lecture de l'emplacement du bloc de mémoire
            1 non mis en œuvre, emplacement i. Réel: answer. Attendu: NO.
        endif
        answer = QUERY CONTENT DTR0
        if (answer != i)
            error14 DTR0 modifié après lecture de l'emplacement  du bloc de mémoire 1,
            emplacement i. Réel: answer. Attendu: i.
        endif
        answer = QUERY CONTENT DTR1 // Vérifier que DTR1 n'est pas modifié après
        lecture d'un emplacement de bloc de mémoire
        if (answer != 1)
            error 15 DTR1 modifié après lecture de l'emplacement du bloc de mémoire 1,
            emplacement i.. Réel: answer. Attendu: 1.
            DTR1 (1)
        endif
    endfor
endif
```

Tableau 57 – Paramètres pour la séquence d'essai READ MEMORY LOCATION sur le bloc de mémoire 1

Phase d'essai i	address	nrBytes	text
0	2	1	Octet de verrouillage du bloc de mémoire 1
1	3	6	GTIN fabricant d'origine (décimale)
2	9	8	Numéro d'identification fabricant d'origine (décimale)

12.5.3 READ MEMORY LOCATION on other Memory Banks (READ MEMORY LOCATION sur d'autres blocs de mémoire)

La séquence d'essai vérifie le bon fonctionnement de la commande READ MEMORY LOCATION et si tous les blocs de mémoire autres que 0 et 1 sont mis en œuvre selon la spécification.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
DTR0 (2)
DTR1 (0)
lamb = READ MEMORY LOCATION
if (lamb< 2)
    report1 Aucun bloc de mémoire autre que les blocs 0 ou 1 n'est mis en œuvre.
else
    if (lamb<= 199)
        report2 Le dernier bloc de mémoire accessible est lamb.
    else
        error1 Dernier bloc de mémoire accessible erroné consigné. Réel: lamb. Attendu:
        [2, 199].
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        lamb = 199
    endif
    // Déterminer un bloc de mémoire mis en œuvre entre MB 2 et MB lamb
    for (i = 2; i<= lamb; i++)
        DTR0 (0)
        DTR1 (i)
        laml = READ MEMORY LOCATION
        if (laml == NO)
            report3 Le bloc de mémoire i n'est pas mis en œuvre.
        else
            report4 Le bloc de mémoire i est mis en oeuvre.
            if (laml< 3 OR laml == 0xFF)
                error2 Emplacement de mémoire erroné pour le bloc de mémoire i. Réel:
                laml. Attendu: [0x03,0xFE].
            endif
            answer = QUERY CONTENT DTR0 // Vérifier que DTR0 est augmenté après
            lecture d'un emplacement de bloc de mémoire valide
            if (answer != 1)
                error3 DTR0 non augmenté après lecture d'un emplacement 0 du bloc de
                mémoire i. Réel: answer. Attendu: 1.
            endif
            // Vérifier l'emplacement 0x02
            DTR0 (2)
            answer = READ MEMORY LOCATION
            if (answer == NO)
                error4 Aucune réponse reçue lors de la lecture de l'emplacement 0x02 du
                bloc de mémoire i. Réel: NO. Attendu: pas NO.
            endif
            // Vérifier qu'au moins un emplacement entre 0x03 et laml est mis en œuvre.
            numberOfAnswers = 0
            DTR0 (3)
            for (j = 3; j<= laml; j++)
                answer = READ MEMORY LOCATION
                if (answer != NO)
                    numberOfAnswers++
                endif
                answer = QUERY CONTENT DTR0
                if (answer != j + 1)
                    error5 DTR0 non augmenté après lecture de l'emplacement j du bloc
                    de mémoire i. Réel: answer. Attendu: j + 1.
                endif
            endfor
            if (numberOfAnswers == 0)
                error6 Au moins un emplacement du bloc de mémoire i doit être mis en
                œuvre dans la plage [0x03, laml].
            endif
            // Lire les emplacements au-dessus du dernier emplacement de bloc de
            mémoire accessible
            DTR0 (laml + 1)
            for (j = laml + 1; j<= 0xFE; j++)
                answer = READ MEMORY LOCATION
                if (answer != NO)
                    error7 Réponse reçue lors de la lecture de l'emplacement de bloc de
                    mémoire j non mis en œuvre du bloc de mémoire i. Réel: answer.
                    Attendu: NO.
                endif
                answer = QUERY CONTENT DTR0
                if (answer != j + 1)
                    error8 DTR0 non augmenté après lecture du dernier emplacement de
                    mémoire accessible j du bloc de mémoire i. Réel: answer. Attendu: j +
                    1.
                endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                endfor
                // Lire le dernier emplacement de bloc de mémoire
                DTR0 (0xFF)
                answer = READ MEMORY LOCATION
                if (answer != NO)
                    error9 Réponse reçue lors de la lecture de l'emplacement 0xFF du bloc de mémoire i. Réel: answer. Attendu: NO.
                endif
                answer = QUERY CONTENT DTR0
                if (answer != 255)
                    error10 DTR0 modifié après lecture de l'emplacement 0xFF du bloc de mémoire i. Réel: answer. Attendu: 255.
                endif
            endif
        endfor
        // Vérifier que les blocs de mémoire compris entre lamb +1 et 199 ne sont pas mis en œuvre – aucune réponse attendue lors de la lecture de MB
        DTR0 (0)
        for (i = lamb + 1; i< 200; i++)
            DTR1 (i)
            answer = READ MEMORY LOCATION
            if (answer != NO)
                error11 Réponse reçue lors de la lecture au-dessus du dernier bloc de mémoire accessible: bloc de mémoire i. Réel: answer. Attendu: NO.
            endif
            answer = QUERY CONTENT DTR0
            if (answer != 0)
                error12 DTR0 modifié après lecture du bloc de mémoire non mis en oeuvre i. Réel: answer. Attendu: 0.
                DTR0 (0)
            endif
        endfor
        // Vérifier que les blocs de mémoire compris entre 200 et 255 sont réservés – aucune réponse attendue lors de la lecture de MB
        DTR0 (0)
        for (i = 200; i < 256; i++)
            DTR1 (i)
            answer = READ MEMORY LOCATION
            if (answer != NO)
                error13 Réponse reçue lors de la lecture du bloc de mémoire i. Réel: answer. Attendu: NO.
            endif
            answer = QUERY CONTENT DTR0
            if (answer != 0)
                error14 DTR0 modifié après lecture du bloc de mémoire i réservé. Réel: answer. Attendu: 0.
                DTR0 (0)
            endif
        endfor
endif
```

12.5.4 Écriture dans le bloc de mémoire

La séquence d'essai vérifie le bon fonctionnement des commandes WRITE MEMORY LOCATION et WRITE MEMORY LOCATION – NO REPLY. Avant de réaliser l'essai, un bloc de mémoire mis en oeuvre s'avère nécessaire.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
(memoryBankNr; memoryBankLoc) = FindImplementedMemoryBank ()
if (memoryBankNr != 0)
    report1 Le bloc de mémoire memoryBankNr est mis en œuvre et sera utilisé pour les essais.
    DTR0 (memoryBankNr)
    RESET MEMORY BANK
    wait 11 s
    DTR0 (3)
    DTR1 (memoryBankNr)
    loc0x03 = READ MEMORY LOCATION
    if (memoryBankNr == 1)
        if (memoryBankLoc<= 253)
            iArray = {0,1,2,3,4,5,6,7,8,9,10,11}
        else
            iArray = {0,1,2,3,4,5,6,7,8,9}
        endif
    else
        if (memoryBankLoc<= 253)
            iArray = {0,1,2,3,4,5,6,7,10,11}
        else
            iArray = {0,1,2,3,4,5,6,7}
        endif
    endif
    foreach (i dans iArray)
        DTR0 (2) // Sélectionner l'emplacement de bloc de mémoire
        DTR1 (memoryBankNr) // Sélectionner le bloc de mémoire
        if (i != 1 AND i != 3)
            ENABLE WRITE MEMORY // ENABLE WRITE MEMORY pour certains pas
        endif
        command1[i] // WRITE MEMORY LOCATION – NO REPLY pour certains pas
        command2[i] // DTR0 pour certains pas
        answer = command3[i] // WRITE MEMORY LOCATION avec ou sans réponse
        if (answer != writeValue[i])
            error1 Ecriture dans l'emplacement de bloc de mémoire valide text1[i] à la phase d'essai i = i. Réel: answer. Attendu: writeValue[i].
        endif
        answer = QUERY CONTENT DTR0 // Vérifier si DTR0 est modifié après écriture d'un emplacement de bloc de mémoire valide dans des conditions différentes
        if (answer != dtrValue[i])
            error2 DTR0 text2[i] à la phase d'essai = i. Réel: answer. Attendu: dtrValue[i].
        endif
        answer = QUERY CONTENT DTR1 // Vérifier que DTR1 n'est pas modifié après écriture d'un emplacement de bloc de mémoire
        if (answer != memoryBankNr)
            error3 DTR1 modifié à la phase d'essai = i. Réel: answer. Attendu: memoryBankNr.
        endif
        DTR0 (address[i])
        DTR1 (memoryBankNr)
        answer = READ MEMORY LOCATION // Vérifier par lecture si l'emplacement a été correctement écrit – cette opération désactive également l'état writeEnableState
        if (answer != readValue[i])
            error4 Contenu erroné de l'emplacement de bloc de mémoire à la phase d'essai i = i. Réel: answer. Attendu: readValue[i].
        endif
    endfor
else
    report2 Aucun bloc de mémoire autre que le bloc de mémoire 0 n'est mis en œuvre.
    DTR1 (0) // Sélectionner le bloc de mémoire 0
    // Lire et mémoriser toutes les valeurs saisies dans le bloc de mémoire 0
    for (j = 0; j< 256; j++)
        DTR0 (j)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        valueOnLocation[j] = READ MEMORY LOCATION
    endfor
    // Essayer d'écrire le bloc de mémoire 0
    for (j = 0; j< 2; j++)
        for (k = 0; k< 256; k++)
            ENABLE WRITE MEMORY
            DTR0 (k)
            if (valueOnLocation[k] == NO)
                value = 255
            else
                value = ~valueOnLocation[k]
            endif
            if (j == 0)
                answer = WRITE MEMORY LOCATION (value)
                if (answer != NO)
                    error5 Ecriture d'un emplacement de bloc de mémoire ROM confirmé
                    à la phase d'essai (j,k) = (j,k). Réel: answer. Attendu: NO.
                endif
            else
                WRITE MEMORY LOCATION – NO REPLY (value)
            endif
            answer = QUERY CONTENT DTR0 // Vérifier DTR0
            if (k == 255)
                if (answer != 255)
                    error6 DTR0 modifié à la phase d'essai (j,k) = (j,k). Réel: answer.
                    Attendu: 255.
                endif
            else
                if (answer != k + 1)
                    error7 DTR0 non augmenté à la phase d'essai (j,k) = (j,k). Réel:
                    answer. Attendu: k + 1.
                endif
            endif
            answer = QUERY CONTENT DTR1 // Vérifier que DTR1 n'est pas modifié après
            la tentative d'écriture d'un emplacement de bloc de mémoire
            if (answer != 0)
                error8 DTR1 modifié à la phase d'essai (j,k) = (j,k). Réel: answer. Attendu:
                0.
                DTR1 (0)
            endif
            DTR0 (k)
            answer = READ MEMORY LOCATION // Vérifier par lecture si l'emplacement a
            été écrit – cette opération désactive également l'état writeEnableState
            if (answer != valueOnLocation[k])
                error9 Contenu erroné de l'emplacement de bloc de mémoire à la phase
                d'essai (j,k) = (j,k). Réel: answer. Attendu: valueOnLocation[k].
                ENABLE WRITE MEMORY
                DTR0 (k)
                WRITE MEMORY LOCATION – NO REPLY (valueOnLocation[k])
            endif
        endfor
    endfor
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 58 – Paramètres pour la séquence d'essai 'Memory Bank writing'

Phase d'essai i	command1	command2	command3	writeValue	text1	dtrValue	text2	address	readValue	test step description
0	-	-	WRITE MEMORY LOCATION (0x00)	0x00	non confirmé	3	non augmenté	2	0x00	Vérifier l'écriture d'un emplacement valide lorsque writeEnableState = activé
1	-	-	WRITE MEMORY LOCATION (0x01)	NO	confirmé	2	augmenté	2	0x00	Vérifier l'écriture d'un emplacement valide lorsque writeEnableState = désactivé
2	-	-	WRITE MEMORY LOCATION – NO REPLY (0x02)	NO	confirmé	3	non augmenté	2	0x02	Vérifier l'écriture d'un emplacement valide lorsque writeEnableState = activé
3	-	-	WRITE MEMORY LOCATION – NO REPLY (0x03)	NO	confirmé	2	augmenté	2	0x02	Vérifier l'écriture d'un emplacement valide lorsque writeEnableState = désactivé
4	WRITE MEMORY LOCATION – NO REPLY (0x55)	DTR0 (255)	WRITE MEMORY LOCATION (0x04)	NO	confirmé	255	augmenté	255	NO	Vérifier l'écriture lorsque writeEnableState = activé AND l'emplacement n'est pas mis en oeuvre (loc0xFF-don't increment DTR0)
5	WRITE MEMORY LOCATION – NO REPLY (0x55)	DTR0 (255)	WRITE MEMORY LOCATION – NO REPLY (0x05)	NO	confirmé	255	augmenté	255	NO	
6	WRITE MEMORY LOCATION – NO REPLY (0x55)	DTR0 (0)	WRITE MEMORY LOCATION (0x06)	NO	confirmé	1	non augmenté	0	*memoryBankLoc*	Vérifier l'écriture lorsque writeEnableState = activé AND l'emplacement

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Phase d'essai i	command1	command2	command3	writeValue	text1	dtrValue	text2	address	readValue	test step description
7	WRITE MEMORY LOCATION – NO REPLY (0x55)	DTR0 (0)	WRITE MEMORY LOCATION – NO REPLY (0x07)	NO	confirmé	1	non augmenté	0	*memoryBankLoc*	n'est pas inscriptible (0x00)
8	WRITE MEMORY LOCATION – NO REPLY (0x00)	DTR0 (3)	WRITE MEMORY LOCATION (0x08)	NO	confirmé	4	non augmenté	3	*loc0x03*	Vérifier l'écriture lorsque writeEnableState = activé AND l'emplacement est verrouillable et MB est verrouillé en écriture
9	WRITE MEMORY LOCATION – NO REPLY (0x00)	DTR0 (3)	WRITE MEMORY LOCATION – NO REPLY (0x09)	NO	confirmé	4	non augmenté	3	*loc0x03*	
10	WRITE MEMORY LOCATION – NO REPLY (0x55)	DTR0 (*memoryBankLoc*+1)	WRITE MEMORY LOCATION (0x0A)	NO	confirmé	*memoryBankLoc* +2	non augmenté	*memoryBankLoc* +1	NO	Vérifier l'écriture lorsque writeEnableState = activé AND l'emplacement est autre que laml
11	WRITE MEMORY LOCATION – NO REPLY (0x55)	DTR0 (*memoryBankLoc*+1)	WRITE MEMORY LOCATION – NO REPLY (0x0B)	NO	confirmé	*memoryBankLoc* +2	non augmenté	*memoryBankLoc* +1	NO	

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printed.

12.5.5 ENABLE WRITE MEMORY: writeEnableState

La séquence d'essai vérifie le bon fonctionnement de la commande ENABLE WRITE MEMORY, ainsi que la mise en œuvre correcte de la variable writeEnableState. Avant de réaliser l'essai, un bloc de mémoire mis en œuvre s'avère nécessaire.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
(memBankNr; memoryBankLoc) = FindImplementedMemoryBank ()
if (memBankNr == 0)
    report1 Aucun bloc de mémoire autre que le bloc de mémoire 0 n'est mis en œuvre.
else
    report2 Le bloc de mémoire memBankNr est mis en œuvre et sera utilisé pour les
    essais.
    for (i = 0; i<15; i++)
        STEP UP // il convient que la commande désactive l'état writeEnableState
        command1[i]
        command2[i]
        ENABLE WRITE MEMORY
        if (i>= 8)
            answer = command3[i]
            if (answer != value1[i])
                error1 Valeur erronée à la phase d'essai i = i. Réel: answer. Attendu:
                value1[i].
            endif
        endif
        command4[i]
        answer = WRITE MEMORY LOCATION (i)
        if (answer != value2[i])
            error2 Valeur erronée pour writeEnableState à la phase d'essai i = i. text[i].
        endif
    endfor
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 59 – Paramètres pour la séquence d'essai ENABLE WRITE MEMORY: writeEnableState

Phase d'essai i	command1	command2	command3	value1	command4	value2	text
0	DTR0 (2)	DTR1 (*memBankNr*)	-	-	-	0	Réel: DISABLED. Attendu: ENABLED.
1	DTR0 (0)	DTR1 (*memBankNr*)	-	-	DTR0 (2)	1	Réel: DISABLED. Attendu: ENABLED.
2	DTR0 (2)	DTR1 (0)	-	-	DTR1 (*memBankNr*)	2	Réel: DISABLED. Attendu: ENABLED.
3	DTR0 (2)	DTR1 (*memBankNr*)	-	-	DTR2 (0)	3	Réel: DISABLED. Attendu: ENABLED.
4	DTR0 (2)	DTR1 (*memBankNr*)	-	-	ENABLE WRITE MEMORY	4	Réel: DISABLED. Attendu: ENABLED.
5	DTR0 (2)	DTR1 (*memBankNr*)	-	-	OFF	NO	Réel: ENABLED. Attendu: DISABLED.
6	DTR0 (2)	DTR1 (*memBankNr*)	-	-	RESET attendre 300 ms	NO	Réel: ENABLED. Attendu: DISABLED.
7	DTR0 (2)	DTR1 (*memBankNr*)	-	-	**PowerCycleAndWaitForDecoder** (5) DTR1 (*memBankNr*) DTR0 (2)	NO	Réel: ENABLED. Attendu: DISABLED.
8	DTR0 (2)	DTR1 (*memBankNr*)	QUERY CONTENT DTR0	2	-	8	Réel: DISABLED. Attendu: ENABLED.
9	DTR0 (2)	DTR1 (*memBankNr*)	QUERY CONTENT DTR1	*memBankNr*	-	9	Réel: DISABLED. Attendu: ENABLED.
10	DTR0 (2)	DTR1 (*memBankNr*)	QUERY CONTENT DTR2	0	-	10	Réel: DISABLED. Attendu: ENABLED.
11	DTR0 (2)	DTR1 (*memBankNr*)	READ MEMORY LOCATION	10	-	NO	Réel: ENABLED. Attendu: DISABLED.
12	DTR0 (2)	DTR1 (*memBankNr*)	WRITE MEMORY LOCATION (80)	80	DTR0 (2)	12	Réel: DISABLED. Attendu: ENABLED.
13	DTR0 (2)	DTR1 (*memBankNr*)	WRITE MEMORY LOCATION – NO REPLY (90)	NO	DTR0 (2)	13	Réel: DISABLED. Attendu: ENABLED.
14	DTR0 (2)	DTR1 (*memBankNr*)	WRITE MEMORY LOCATION (100)	100	DTR0 (*memoryBankLoc* + 1)	NO	Réel: ENABLED. Attendu: DISABLED.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printed.

12.5.6 ENABLE WRITE MEMORY: timeout / command in-between (ENABLE WRITE MEMORY: temporisation / commande intermédiaire)

La séquence d'essai vérifie le bon fonctionnement de la commande ENABLE WRITE MEMORY. Avant de réaliser l'essai, un bloc de mémoire mis en œuvre s'avère nécessaire. La commande doit être exécutée uniquement si elle est reçue deux fois.

Cette séquence d'essai vérifie le comportement du DUT dans les conditions suivantes:

- une seule commande est envoyée au lieu de deux commandes identiques
- la commande est envoyée deux fois avec un temps d'établissement de 105 ms plus long que le temps d'établissement défini
- la commande est envoyée avec une trame intermédiaire, trame qui se compose de quelques bits, et non une commande
- la commande est envoyée avec une autre commande intermédiaire, commande qui est envoyée par diffusion
- la commande est envoyée avec une autre commande intermédiaire, commande qui est envoyée à une certaine adresse de groupe
- la commande est envoyée avec une autre commande intermédiaire, commande qui est envoyée à une certaine adresse courte

Dans tous ces cas, il convient de ne pas exécuter la commande. Lorsqu'elle est indiquée, il convient d'accepter la commande intermédiaire

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
(memBankNr; memoryBankLoc) = FindImplementedMemoryBank ()
if (memBankNr == 0)
    report1 Aucun bloc de mémoire autre que le bloc de mémoire 0 n'est mis en œuvre.
else
    report2 Le bloc de mémoire memBankNr est mis en œuvre et sera utilisé pour les
    essais.
    PHM = QUERY PHYSICAL MINIMUM
    for (i = 0; i < 3; i++)
        RESET
        wait 300 ms
        DTR0 (2)
        DTR1 (memBankNr)
        if (i == 0) // Vérifier par essai la commande Send une seule fois
            ENABLE WRITE MEMORY, send once
        else if (i == 1) // Vérifier par essai la commande Send avec temporisation
            ENABLE WRITE MEMORY, send once
            wait 105 ms // temps d'établissement
            ENABLE WRITE MEMORY, send once
        else //Vérifier par essai la commande Send avec temporisation suivie d'une nouvelle
        commande
            ENABLE WRITE MEMORY, send once
            wait 105 ms // temps d'établissement
            ENABLE WRITE MEMORY, send once
            wait 50 ms // temps d'établissement
            ENABLE WRITE MEMORY, send once
        endif
        answer = WRITE MEMORY LOCATION (0x01)
        if (answer != value[i])
            error1 writeEnableState text[i] à la phase d'essai i = i. Réel: answer. Attendu:
            value[i].
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            endif
        endfor
        for (i = 0; i<5; i++)
            RESET
            wait 300 ms
            DTR0 (2)
            DTR1 (memBankNr)
            // Les phases suivantes doivent être envoyées dans un délai de 75 ms, à compter du dernier bit de montée de la première commande "ENABLE WRITE MEMORY, send once" jusqu'au premier bit de descente de la seconde commande "ENABLE WRITE MEMORY, send once"
            ENABLE WRITE MEMORY, send once
            if (i == 0)
                idle 13 ms + 110010 + idle 13 ms // temps d'établissement: repos d'une durée de 13 ms et envoyer une trame, suivie d'une période de 13 ms – Vérifier par essai la commande Send avec une trame intermédiaire
            else if (i == 1)
                RECALL MIN LEVEL, send to BROADCAST // Vérifier par essai la commande Send avec commande de diffusion intermédiaire
            else if (i == 2)
                RECALL MIN LEVEL, send to 10000001b // Vérifier par essai la commande Send avec commande de groupe intermédiaire – gearGroup 0
            else if (i == 3)
                RECALL MIN LEVEL, send to ((GLOBAL_currentUnderTestLogicalUnit<< 1) + 1) //Vérifier par essai la commande Send avec commande courte intermédiaire
            else
                RECALL MIN LEVEL, send to ((63<< 1) + 1) // Vérifier par essai la commande Send avec commande courte intermédiaire
            endif
            ENABLE WRITE MEMORY, send once
            answer = WRITE MEMORY LOCATION (i)
            if (answer != NO)
                error2 writeEnableState activé à la phase d'essai i = i. Réel: answer. Attendu: NO.
            endif
            answer = QUERY ACTUAL LEVEL
            if (i == 1 OR i == 3)
                if (answer != PHM)
                    error3 Commande intermédiaire non exécutée. Réel: answer. Attendu: PHM.
                endif
            else
                if (answer != 254)
                    error4Commande intermédiaire exécutée. Réel: answer. Attendu: 254.
                endif
            endif
        endfor
endif
```

Tableau 60 – Paramètres pour la séquence d'essai ENABLE WRITE MEMORY: temporisation / commande intermédiaire

Phase d'essai i	value	text
0	NO	activé
1	NO	activé
2	0x01	non activé

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.5.7 RESET: timeout / command in-between (RESET: temporisation / commande intermédiaire)

La séquence d'essai vérifie le bon fonctionnement de la commande RESET MEMORY BANK. Avant de réaliser l'essai, un bloc de mémoire mis en œuvre s'avère nécessaire. La commande doit être exécutée uniquement si elle est reçue deux fois.

Cette séquence d'essai vérifie le comportement du DUT dans les conditions suivantes:

- une seule commande est envoyée au lieu de deux commandes identiques
- la commande est envoyée deux fois avec un temps d'établissement de 105 ms plus long que le temps d'établissement défini
- la commande est envoyée avec une trame intermédiaire, trame qui se compose de quelques bits, et non une commande
- la commande est envoyée avec une autre commande intermédiaire, commande qui est envoyée par diffusion
- la commande est envoyée avec une autre commande intermédiaire, commande qui est envoyée à une certaine adresse de groupe
- la commande est envoyée avec une autre commande intermédiaire, commande qui est envoyée à une certaine adresse courte

Dans tous ces cas, il convient de ne pas exécuter la commande. Lorsqu'elle est indiquée, il convient d'accepter la commande intermédiaire

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
(memBankNr; memoryBankLoc) = FindImplementedMemoryBank ()
if (memBankNr == 0)
    report1 Aucun bloc de mémoire autre que le bloc de mémoire 0 n'est mis en œuvre.
else
    report2 Le bloc de mémoire memBankNr est mis en œuvre et sera utilisé pour les
    essais.
    PHM = QUERY PHYSICAL MINIMUM
    // Vérifier le comportement de temporisation
    for (i = 0; i < 3; i++)
        RESET
        wait 300 ms
        DTR0 (2)
        DTR1 (memBankNr)
        ENABLE WRITE MEMORY
        answer = WRITE MEMORY LOCATION (0x55)
        if (answer != 0x55)
            error1 Valeur erronée saisie à la phase d'essai i = i. Réel: answer. Attendu:
            0x55.
        endif
        DTR0 (memBankNr)
        if (i == 0) // Vérifier par essai la commande Send une seule fois
            RESET MEMORY BANK, send once
        else if (i == 1) // Vérifier par essai la commande Send avec temporisation
            RESET MEMORY BANK, send once
            wait 105 ms // temps d'établissement
            RESET MEMORY BANK, send once
        else //Vérifier par essai la commande Send avec temporisation suivie d'une nouvelle
        commande
            RESET MEMORY BANK, send once
            wait 105 ms // temps d'établissement
            RESET MEMORY BANK, send once
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            wait 50 ms // temps d'établissement
            RESET MEMORY BANK, send once
        endif
        wait10,1 s
        DTR0 (2)
        answer = READ MEMORY LOCATION
        if (answer != value[i])
            error2 Bloc de mémoire memBanktext[i] à la phase d'essai i = i. Réel: answer. Attendu: value[i].
        endif
    endfor
    // Vérifier le comportement lorsqu'une commande est envoyée par l'intermédiaire de sendf twice
    for (i = 0; i<5; i++)
        RESET
        wait 300 ms
        DTR0 (2)
        DTR1 (memBankNr)
        ENABLE WRITE MEMORY
        answer = WRITE MEMORY LOCATION (i)
        if (answer != i)
            error3 Valeur erronée saisie à la phase d'essai i = i. Réel: answer. Attendu: i.
        endif
        DTR0 (memBankNr)
        // Les phases suivantes doivent être envoyées dans un délai de 75 ms, à compter du dernier bit de montée de la première commande "RESET MEMORY BANK, send once" jusqu'au premier bit de descente de la seconde commande "RESET MEMORY BANK, send once"
        RESET MEMORY BANK, send once
        if (i == 0)
            idle 13 ms + 110010 + idle 13 ms // temps d'établissement: repos d'une durée de 13 ms suivi d'une trame, suivie d'une période de 13 ms – Vérifier par essai la commande Send avec une trame intermédiaire
        else if (i == 1)
            RECALL MIN LEVEL, send to BROADCAST // Vérifier par essai la commande Send avec commande de diffusion intermédiaire
        else if (i == 2)
            RECALL MIN LEVEL, send to 10000001b // Vérifier par essai la commande Send avec commande de groupe intermédiaire – gearGroups0
        else if (i == 3)
            RECALL MIN LEVEL, send to ((GLOBAL_currentUnderTestLogicalUnit<< 1) + 1) //Vérifier par essai la commande Send avec commande courte intermédiaire
        else
            RECALL MIN LEVEL, send to ((63<< 1) + 1)// Vérifier par essai la commande Send avec commande courte intermédiaire
        endif
        RESET MEMORY BANK, send once
        wait 10,1 s
        DTR0 (2)
        answer = READ MEMORY LOCATION
        if (answer != i)
            error4 Bloc de mémoire memBankNr réinitialisé à la phase d'essai i = i. Réel: answer. Attendu: i.
        endif
        answer = QUERY ACTUAL LEVEL
        if (i == 1 OR i == 3)
            if (answer != PHM)
                error5 Commande intermédiaire non exécutée. Réel: answer. Attendu: PHM.
            endif
        else
            if (answer != 254)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                error6 Commande intermédiaire exécutée. Réel: answer. Attendu: 254.
            endif
        endif
    endfor
endif
```

Tableau 61 – Paramètres pour la séquence d'essai RESET MEMORY BANK: temporisation / commande intermédiaire

Phase d'essai i	value	text
0	0x55	réinitialisé
1	0x55	réinitialisé
2	0xFF	non réinitialisé

12.5.8 RESET MEMORY BANK

La séquence d'essai vérifie le bon fonctionnement de la RESET MEMORY BANK. Avant de réaliser l'essai, un bloc de mémoire mis en œuvre s'avère nécessaire.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
(memBankNr[]; memBankLoc[]) = FindAllImplementedMemoryBanks ()
if (memBankNr[0] == 0)
    report1 Aucun bloc de mémoire autre que le bloc de mémoire 0 n'est mis en œuvre.
else
    for (i = 0; i < 4; i++)
        // Modifier l'octet de verrouillage de tous les blocs de mémoire mis en œuvre
        ENABLE WRITE MEMORY
        foreach (memBank in memBankNr)
            DTR0 (2)
            DTR1 (memBank)
            if (i<= 1)
                WRITE MEMORY LOCATION – NO REPLY (i)
            else
                WRITE MEMORY LOCATION – NO REPLY (0x55)
            endif
        endfor
        // Réinitialiser le bloc de mémoire
        DTR0 (dtr[i])
        RESET MEMORY BANK
        wait 10,1 s
        // Vérifier si la réinitialisation du bloc de mémoire sélectionné a été exécutée
        foreach (memBank in memBankNr)
            DTR0 (2)
            DTR1 (memBank)
            answer = READ MEMORY LOCATION
            if (i<= 1)
                if (answer != i)
                    error1 Bloc de mémoire memBank réinitialisé avec bloc de mémoire
                    verrouillé en écriture à la phase d'essai i = i. Réel: answer. Attendu: i.
                endif
            else if (i == 2)
                if (memBank == memBankNr[0] AND answer != 0xFF)
                    error2 Bloc de mémoire memBank sélectionné non réinitialisé à la
                    phase d'essai i = i. Réel: answer. Attendu: 0xFF.
                else if (memBank != memBankNr[0] AND answer != 0x55)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                    error3 Bloc de mémoire memBank non sélectionné réinitialisé à la
                    phase d'essai i = i. Réel: answer. Attendu: 0x55.
                endif
            else
                if (answer != 0xFF)
                    error4 Bloc de mémoire memBank non réinitialisé à la phase d'essai i
                    = i. Réel: answer. Attendu: 0xFF.
                endif
            endif
        endfor
    endfor
endif
```

Tableau 62 – Paramètres pour la séquence d'essai 'RESET MEMORY BANK'

Phase d'essai i	dtr	test description
0	*memBankNr*[0]	pas de réinitialisation (bloc de mémoire verrouillé)
1	0	pas de réinitialisation (bloc de mémoire verrouillé)
2	*memBankNr*[0]	réinitialiser le premier bloc de mémoire; les autres blocs de mémoire restent inchangés
3	0	réinitialiser tous les blocs de mémoire, tous les blocs réinitialisés

12.6 Instructions de niveau

12.6.1 Level instructions: Basic behaviour (Instructions de niveau: Comportement de base)

Cette séquence d'essai vérifie le comportement de base des instructions de niveau.

La première partie de l'essai vérifie le comportement des instructions suivantes: DAPC, OFF, UP, DOWN, STEP UP, STEP DOWN, RECALL MAX LEVEL, RECALL MIN LEVEL, STEP DOWN AND OFF, ON AND STEP UP. Ces commandes sont envoyées avec le DUT réglé à quatre niveaux connus différents (OFF, MIN LEVEL, point milieu entre la plage de gradation maximale, et MAX LEVEL) et avec des valeurs différentes pour les niveaux MIN et MAX. Les commandes QUERY ACTUAL LEVEL et QUERY STATUS servent à vérifier le bon fonctionnement.

La seconde partie de l'essai vérifie si le bit de modification de l'intensité lumineuse est réglé et réinitialisé par la commande DAPC.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
mid = (PHM + 254) >> 1
for (i = 0; i < 2; i++)
    if (i == 1)
        DTR0 (PHM + 1)
        SET MIN LEVEL
        DTR0 (253)
        SET MAX LEVEL
    endif
    min = QUERY MIN LEVEL
    max = QUERY MAX LEVEL
    for (j = 0; j< 42; j++)
        DAPC (dapcLevel[j])
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            WaitForLampLevel (min(dapcLevel[j],max))
            command[j]
            if (j == 2 OR j == 26 OR j == 30 OR j == 38)
                WaitForLampOn ()
            endif
            answer = QUERY ACTUAL LEVEL
            if (answer != level[i,j])
                error1 ACTUAL LEVEL erroné à la phase d'essai (i,j) = (i,j). Réel: answer.
                Attendu: level[i,j].
            endif
            answer = QUERY STATUS
            if (answer != status[i,j])
                error2 Etat de lampe erroné à la phase d'essai (i,j) = (i,j). Réel: answer.
                Attendu: level[i,j].
            endif
        endfor
    endfor
    if (PHM == 254)
        report1 L'appareillage de commande n'est pas gradable.
    else
        RECALL MAX LEVEL
        DTR0 (4)
        SET FADE TIME
        DAPC (1)
        answer = QUERY STATUS
        if (answer != XXX1XXXXb)
            error3 Bit . de QUERY STATUS non réglé. Réel: answer. Attendu: XXX1XXXXb.
        endif
        DAPC (255)
        answer = QUERY STATUS
        if (answer != XXX0XXXXb)
            error4 Bit fadeRunning de QUERY STATUS non supprimé. Réel: answer. Attendu:
            XXX0XXXXb.
        endif
    endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 63 – Paramètres pour la séquence d'essai 'Level instructions: Basic behaviour'

Phase d'essai j	dapcLevel	command	level						status
			i = 0			i = 1			
			PHM <= 252	PHM = 253	PHM = 254	PHM <= 250	PHM = 251	PHM => 252	
0	254	DAPC (0)	0	0	0	0	0	0	XXX0X0XXb
1	0	DAPC (255)	0	0	0	0	0	0	XXX0X0XXb
2	0	DAPC (1)	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
3	*min*	DAPC (*min*)	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
4	*min*	DAPC (255)	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
5	*min*	DAPC (*mid*)	*mid*	*mid*	*mid*	*mid*	*mid*	*mid*	XXX0X1XXb
6	*mid*	DAPC (*max*)	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
7	*max*	DAPC (254)	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
8	*max*	DAPC (255)	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
9	*max*	OFF	0	0	0	0	0	0	XXX0X0XXb
10	0	UP attendre 300 ms	0	0	0	0	0	0	XXX0X0XXb
11	*min*	UP attendre 300 ms	>*min*	>*min*	*min*	>*min*	>*min*	*min*	XXX0X1XXb
12	*mid*	UP attendre 300 ms	>*mid*	>*mid*	*min*	>*mid*	>*mid*	*min*	XXX0X1XXb
13	*max*	UP attendre 300 ms	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
14	0	DOWN attendre 300 ms	0	0	0	0	0	0	XXX0X0XXb
15	*min*	DOWN attendre 300 ms	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
16	*mid*	DOWN attendre 300 ms	<*mid*	<*mid*	*min*	<*mid*	<*mid*	*min*	XXX0X1XXb
17	*max*	DOWN attendre 300 ms	<*max*	<*max*	*max*	<*max*	<*max*	*max*	XXX0X1XXb
18	0	STEP UP	0	0	0	0	0	0	XXX0X0XXb

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Phase d'essai j	dapcLevel	command	level						status
			i = 0			i = 1			
			PHM <= 252	PHM = 253	PHM = 254	PHM <= 250	PHM = 251	PHM => 252	
19	*min*	STEP UP	*min* + 1	*min* + 1	*min*	*min* + 1	*min* + 1	*min*	XXX0X1XXb
20	*mid*	STEP UP	*mid* + 1	*max*	*max*	*mid* + 1	*max*	*max*	XXX0X1XXb
21	*max*	STEP UP	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
22	0	STEP DOWN	0	0	0	0	0	0	XXX0X0XXb
23	*min*	STEP DOWN	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
24	*mid*	STEP DOWN	*mid* – 1	*mid* – 1	*max*	*mid* – 1	*mid* – 1	*max*	XXX0X1XXb
25	*max*	STEP DOWN	*max* – 1	*max* – 1	*max*	*max* – 1	*max* – 1	*max*	XXX0X1XXb
26	0	RECALL MAX LEVEL	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
27	*min*	RECALL MAX LEVEL	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
28	*mid*	RECALL MAX LEVEL	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
29	*max*	RECALL MAX LEVEL	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb
30	0	RECALL MIN LEVEL	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
31	*min*	RECALL MIN LEVEL	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
32	*mid*	RECALL MIN LEVEL	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
33	*max*	RECALL MIN LEVEL	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
34	0	STEP DOWN AND OFF	0	0	0	0	0	0	XXX0X0XXb
35	*min*	STEP DOWN AND OFF	0	0	0	0	0	0	XXX0X0XXb
36	*mid*	STEP DOWN AND OFF	*mid* – 1	*mid* – 1	*min*	*mid* – 1	*mid* – 1	*min*	XXX0X1XXb
37	*max*	STEP DOWN AND OFF	*max* – 1	*max* – 1	*max*	*max* – 1	*max* – 1	*max*	XXX0X1XXb
38	0	ON AND STEP UP	*min*	*min*	*min*	*min*	*min*	*min*	XXX0X1XXb
39	*min*	ON AND STEP UP	*min* + 1	*min* + 1	*min*	*min* + 1	*min* + 1	*min*	XXX0X1XXb
40	*mid*	ON AND STEP UP	*mid* + 1	*max*	*max*	*mid* + 1	*max*	*max*	XXX0X1XXb
41	*max*	ON AND STEP UP	*max*	*max*	*max*	*max*	*max*	*max*	XXX0X1XXb

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

12.6.2 FADE TIME: possible values (FADE TIME: valeurs possibles)

La séquence d'essai vérifie le traitement correct de toutes les valeurs FADE TIME potentielles. La commande DAPC est utilisée pour la gradation de MAX LEVEL à MIN LEVEL et de MIN LEVEL à MAX LEVEL. À chaque phase d'essai, la durée de modification du processus de modification de l'intensité lumineuse est mesurée et comparée avec les prévisions. La durée du processus de modification de l'intensité lumineuse est basée sur le bit fadeRunning (bit 4) dans la réponse de QUERY STATUS. La commande QUERY ACTUAL LEVEL sert à vérifier le niveau cible.

Note concernant la réalisation de l'essai: Il convient d'envoyer les commandes DAPC et QUERY STATUS le plus rapidement possible l'une après l'autre (une requête peut être envoyée 2,4 ms après réception d'une réponse)

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report1 L'appareillage de commande n'est pas gradable.
else
    for (i = 1; i < 16; i++)
        DTR0 (i)
        SET FADE TIME
        timeLimit = tMAX[i] + 0,1 s
        for (j = 0; j< 2; j++)
            command[j]
            DAPC (level[j])
            start_timer (timer) //  Lancement de la minuterie après l'interruption de la commande DAPC
            do
                answer = QUERY STATUS
                timestamp = get_timer (timer) – 10 ms // Soustraire 10 ms qui est la longueur approchée de la trame en arrière afin d'obtenir le moment de départ de cette dernière
            while (answer == XXX1XXXXb AND timestamp<timeLimit)
            if (timestamp>= timeLimit)
                error1 Modification de l'intensité lumineuse non interrompue après timeLimit s.
            else
                if (timestamp<tMIN[i] OR timestamp>tMAX[i])
                    error2 FADE TIME hors de la plage à la phase d'essai (i,j) = (i,j). Réel: timestamp. Attendu: tMIN[i] <= time <= tMAX[i].
                endif
            endif
            answer = QUERY ACTUAL LEVEL
            if (answer != value[j])
                error3 ACTUAL LEVEL erroné après la fin du processus de modification de l'intensité lumineuse à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: value[j].
            endif
        endfor
    endfor
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 64 – Paramètres pour la séquence d'essai 'FADE TIME: possible values'

Phase d'essai i	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
tMIN [s]	0,6	0,9	1,3	1,8	2,5	3,6	5,1	7,2	10,2	14,4	20,4	28,8	40,7	57,6	81,5
tMAX [s]	0,8	1,1	1,6	2,2	3,1	4,4	6,2	8,8	12,4	17,4	24,9	35,2	49,8	70,4	99,6

Phase d'essai j	0	1
command	RECALL MAX LEVEL	RECALL MIN LEVEL
level	1	254
value	*PHM*	254

12.6.3 FADE TIME: transitions

La séquence d'essai vérifie si le processus de modification de l'intensité lumineuse entre les niveaux off, min, middle et max (arrêt, minimum, moyen et maximum) est exécuté correctement avec trois durées de modification de l'intensité lumineuse différentes. L'essai vérifie également le comportement du processus de modification de l'intensité lumineuse lors du démarrage (phases d'essai j=12) et la défaillance totale des lampes (phases d'essai j=14. À chaque phase d'essai, la durée du processus de modification de l'intensité lumineuse est mesurée et comparée avec les prévisions. La durée du processus de modification de l'intensité lumineuse est basée sur le bit fadeRunning (bit 4) dans la réponse de QUERY STATUS. La commande QUERY ACTUAL LEVEL sert à vérifier le niveau cible.

Sur la base des spécifications, aux phases d'essai j={0,2,5,15}, il convient qu'aucune modification de l'intensité lumineuse ne se produise dans la mesure où les niveaux cible et réel sont équivalents. Vérifier si les transitions de niveau pour une durée de modification de l'intensité lumineuse donnée sont exécutées selon la spécification, y compris le comportement des octets d'état.

Transitions de-à indiquées par la phase d'essai j

delà	0	min	mid	max
0	j=15	j=10	j=12	j=14
min	j=11	j=2	j=7	j=3
mid	j=13	j=6	j=5	j=8
max	j=9	j=1	j=4	j=0

Note concernant la réalisation de l'essai: // Il convient d'envoyer les commandes DAPC et QUERY STATUS le plus rapidement possible l'une après l'autre (une requête peut être envoyée 2,4 ms après réception d'une réponse)

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (*PHM* == 254)
    report1 L'appareillage de commande n'est pas gradable.
else
    mid = (*PHM* + 254) >> 1
    delay = 30 s +*GLOBAL_startupTimeLimit*
    lightSource = vrai

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
   lightSource = false// Cette unité logique n'a pas de source de lumière
endif
for (i = 0; i < 3; i++)
      DTR0 (fade[i])
      SET FADE TIME
      RECALL MAX LEVEL
      WaitForLampLevel (254)
      for (j = 0; j< 16; j++)
            DTR0 (254)
            SET POWER ON LEVEL
            if (j == 15) // Mettre les lampes hors tension avec la commande OFF
                  OFF
            else if (j == 14) // Déconnecter toutes les lampes pour obtenir une défaillance totale des lampes
                  DisconnectLamps (0)
            endif
            DAPC (level[j])
            start_timer (timer) // Lancement de la minuterie après l'interruption de la commande DAPC
            // Vérifier si le processus de modification de l'intensité lumineuse a été lancé
            switch(j)
                  case 0:
                  case 2:
                  case 5:
                  case 15:
                        // Vérifier le bit fadeRunning lorsque targetLevel == actualLevel
                        answer = QUERY STATUS
                        if (answer != XXX0XXXXb)
                              error1 Modification de l'intensité lumineuse lancée à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: XXX0XXXXb.
                        endif
                        break
                  case 10:
                  case 12:
                  case 14:
                        // retarder et réinitialiser la minuterie au moment réel du lancement de la modification de l'intensité lumineuse
                        expected = XXXXX0XXb // La modification de l'intensité lumineuse est lancée après allumage de la ou des lampes – vérifier le bit lampOn
                        if (j == 14 AND lightSource)
                              expected = XXXXXX0Xb // La modification de l'intensité lumineuse est lancée après détection de la défaillance des lampes
                        endif
                        start_timer (timer2)
                        do
                              answer = QUERY STATUS
                              start_timer (timer) // Lancement de la minuterie après interruption de la réponse
                        while ((answer== expected) AND (get_timer (timer2) <delay))
                  default:
                        // Vérifier le bit fadeRunning lorsque targetLevel != actualLevel
                        do
                              answer = QUERY STATUS
                              fadeTime = get_timer (timer) – 10 ms // Soustraire 10 ms qui est la longueur approchée de la trame en arrière afin d'obtenir le moment de départ de cette dernière
                        while (answer == XXX1XXXXb AND fadeTime<timeLimit[i]) // Vérifier le bit fadeRunning
                        if (fadeTime>= timeLimit[i])
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                        error2 Modification de l'intensité lumineuse non interrompue
                        après timeLimit[i] s.
                    else
                        if (fadeTime <tMIN[i] OR fadeTime>tMAX[i])
                            error3 FADE TIME hors de la plage à la phase d'essai (i,j) =
                            (i,j). Réel: fadeTime. Attendu: tMIN[i] <= time <= tMAX[i].
                        endif
                    endif
                    break
                endswitch
                // Reconnecter toutes les lampes afin de supprimer la défaillance totale des
                lampes
                if (j == 14)
                    ConnectLamps ()
                    WaitForLampOn ()
                endif
                // Vérifier le niveau réel
                answer = QUERY ACTUAL LEVEL
                if (answer != value[j])
                    error4 ACTUAL LEVEL erroné après la fin du processus de modification
                    de l'intensité lumineuse à la phase d'essai (i,j) = (i,j). Réel: answer.
                    Attendu: value[j].
                    DTR0 (0)
                    SET FADE TIME
                    DAPC (value[j]) // Régler le niveau sur le niveau attendu afin de s'assurer
                    que le pas suivant commence à partir du niveau correct
                    DTR0 (fade[i])
                    SET FADE TIME
                endif
            endfor
        endfor
    endif
```

Tableau 65 – Paramètres pour la séquence d'essai 'FADE TIME: transitions'

Phase d'essai i	fade	tMin [s]	tMax [s]	timeLimit [s]
0	1	0,6	0,8	0,9
1	4	1,8	2,2	2,3
2	9	10,2	12,4	12,5

Phase d'essai j	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
level	254	1	1	254	*mid*	*mid*	1	*mid*	254	0	1	0	*mid*	0	254	0
value	254	*PHM*	*PHM*	254	*mid*	*mid*	*PHM*	*mid*	254	0	*PHM*	0	*mid*	0	254	0

12.6.4 FADE TIME: fading to 0 (FADE TIME: processus de modification de l'intensité lumineuse pour atteindre le niveau 0)

La séquence d'essai vérifie le comportement du DUT lors du processus de modification de l'intensité lumineuse jusqu'à la position arrêt. Le même processus de modification de l'intensité lumineuse est lancé deux fois, la première fois pour vérifier si les bits fadeRunning et lampOn dans la réponse de QUERY STATUS sont réglés et supprimés simultanément, et la seconde fois pour vérifier si la lampe s'éteint lorsque la modification de l'intensité lumineuse est achevée. L'essai vérifie également si, au cours du processus de modification de l'intensité lumineuse, les pas sont réalisés au moment attendu.

Note concernant la réalisation de l'essai: Il convient d'envoyer les commandes DAPC et QUERY STATUS, ainsi que les commandes DAPC et QUERY ACTUAL LEVEL, le plus

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

rapidement possible l'une après l'autre (une requête peut être envoyée 2,4 ms après réception d'une réponse)

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM> 250)
    report1 Cet essai ne peut pas être effectué. Un DUT avec PHM inférieur ou égal à 250 est exigé.
else
    DTR0 (PHM + 1)
    SET MIN LEVEL
    timeLimit = 36 s
    // Lancer le processus de modification de l'intensité lumineuse pour atteindre le niveau 0 et vérifier les bits fadeRunning et lampOn
    DAPC (PHM + 4)
    DTR0 (12)
    SET FADE TIME //Définir une durée de modification de l'intensité lumineuse de 32 s
    i = 0
    DAPC (0)
    start_timer (timer) // Lancement de la minuterie après l'interruption de la commande DAPC
    do
        status[i] = QUERY STATUS
        fadeRunningBitTime[i] = get_timer (timer) – 10 ms // Soustraire 10 ms qui est la longueur approchée de la trame en arrière afin d'obtenir le moment de départ de cette dernière
        i++
    while (status[i – 1] == XXX1XXXXb AND fadeRunningBitTime[i – 1] <timeLimit)
    statusLength = i
    if (fadeRunningBitTime[i – 1] >= timeLimit)
        error1 Modification de l'intensité lumineuse non interrompue après timeLimit s.
    else
        // Vérifier si les bits fadeRunning et lampOn sont réglés/supprimés simultanément
        for (i = 0; i<statusLength; i++)
            fadeRunningBit = (status[i]>> 4) & 0x01
            lampOnBit = (status[i]>> 2) & 0x01
            if (fadeRunningBit != lampOnBit)
                error2 bits fadeRunning et lampOn non réglés/supprimés simultanément après fadeRunningBitTime[i] [s] du processus de modification de l'intensité lumineuse. Octet d'état: status[i].
            endif
        endfor
        // Lancer le même processus de modification de l'intensité lumineuse et vérifier le niveau réel
        DTR0 (0)
        SET FADE TIME
        DAPC (PHM + 4)
        WaitForLampLevel (PHM + 4)
        DTR0 (12)
        SET FADE TIME
        i = 0
        DAPC (0)
        start_timer (timer) // Lancement de la minuterie après l'interruption de la commande DAPC
        do
            level[i] = QUERY ACTUAL LEVEL
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            fadeRunningLevelTime[i] = get_timer (timer) – 10 ms // Soustraire 10 ms qui est la longueur approchée de la trame en arrière afin d'obtenir le moment de départ de cette dernière
            i++
        while (level[i-1] != 0 AND fadeRunningLevelTime[i – 1] <timeLimit)
        levelLength = i
        if (fadeRunningLevelTime[i – 1] >= timeLimit)
            error3 Modification de l'intensité lumineuse non interrompue après timeLimit s.
        else
            // Vérifier si le moment de réinitialisation du bit de modification de l'intensité lumineuse chevauche le moment où la lampe s'éteint
            fadeRunningTimestamp = fadeRunningBitTime[statusLength – 2]
            fadeStoppedTimestamp = fadeRunningBitTime[statusLength – 1]
            lampOnTimestamp = fadeRunningLevelTime[levelLength – 2]
            lampOffTimestamp = fadeRunningLevelTime[levelLength – 1]
            minLimit = Max (fadeRunningTimestamp,lampOnTimestamp)
            maxLimit = Min (fadeStoppedTimestamp,lampOffTimestamp)
            if (minLimit > maxLimit)
                error4 La lampe ne s'est pas éteinte lorsque la modification de l'intensité lumineuse a été interrompue.
            endif
            // Vérifier si le niveau réel est monotonique et vérifier le moment de réalisation du pas de modification de l'intensité lumineuse
            j = 0
            for (i = 1; i < levelLength; i++)
                if (level[i] >level[i – 1])
                    error5 Le niveau réel ne baisse pas de manière monotonique.
                else
                    if (level[i] != level[i – 1]) // un pas a été réalisé
                        if (j> 3)
                            error6 Le DUT a réalisé plus de pas de niveaux de luminosité que le nombre de pas attendu.
                            break
                        endif
                        if (level[i] != value[j])
                            error7 Niveau de luminosité modifié erroné. Réel: level[i]. Attendu: value[j].
                        endif
                        if (fadeRunningLevelTime[i] <tMIN[j] OR fadeRunningLevelTime[i] >tMAX[j])
                            error8 Moment inapproprié du niveau de luminosité. Réel: fadeRunningLevelTime[i]. Attendu: tMIN[j] <= temps <= tMAX[j].
                        endif
                        j++
                    endif
                endif
            endfor
        endif
    endif
endif
```

Tableau 66 – Paramètres pour la séquence d'essai 'FADE TIME: fading to 0'

Phase d'essai j	value	tMin [s]	tMax [s]
0	*PHM* + 3	4,8	5,8
1	*PHM* + 2	14,4	17,6
2	*PHM* + 1	23,9	29,2
3	0	28,8	35,2

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.6.5 FADE TIME: small steps fading (FADE TIME: processus de modification de l'intensité lumineuse par pas réduits)

La séquence d'essai vérifie si les transitions de niveau vers des pas réduits pour une durée de modification de l'intensité lumineuse donnée sont exécutées selon la spécification. Le processus de modification de l'intensité lumineuse est lancé deux fois à chaque phase d'essai, une première fois pour contrôler le niveau réel de l'interface, et une seconde fois pour contrôler l'octet d'état. Il convient de contrôler l'interface du bus de façon continue de manière à pouvoir effectuer les mesures. Sur la base des informations acquises, les vérifications suivantes sont effectuées:

- tant que le bit fadeRunning est réglé, le bit lampOn l'est également; uniquement dans le cas d'une modification de l'intensité lumineuse pour atteindre le niveau 0 ou à partir de ce niveau
- la modification de l'intensité lumineuse prend 4 s – sur la base de l'octet d'état
- le moment de réalisation des pas réels de modification de l'intensité lumineuse – sur la base du niveau réel

Concernant la réalisation de l'essai: Il convient d'envoyer les commandes DAPC et QUERY STATUS, ainsi que les commandes DAPC et QUERY ACTUAL LEVEL, le plus rapidement possible l'une après l'autre (une requête peut être envoyée 2,4 ms après réception d'une réponse)

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
DTR0 (PHM + 1)
SET MIN LEVEL
min = QUERY MIN LEVEL
mid = (min + 254) >> 1
switch (PHM)
    case 254:
    case 253:
        mStart = 6
        break
    case 252:
        mStart = 3
        break
    case 251:
        mStart = 2
        break
    case 250:
        mStart = 1
        break
    default:
        mStart = 0
        break
endswitch
for (m = mStart; m< 8; m++)
    // Lancer le processus de modification de l'intensité lumineuse et mémoriser l'octet d'état
    DTR0 (0)
    SET FADE TIME
    DAPC (fromLevel[m])
    WaitForLampLevel (fromLevel[m])
    DTR0 (6)
    SET FADE TIME
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
i = 0
DAPC (toLevel[m])
start_timer (timer) // Lancement de la minuterie après l'interruption de la commande DAPC
if (m == 5 OR m == 7)
    start_timer (timer2)
    do
        answer = QUERY STATUS
        start_timer (timer) // Lancement de la minuterie après interruption de la réponse
    while (answer == XXXX X0XXb) AND (get_timer (timer2) <GLOBAL_startupTimeLimit)) // Poursuivre le processus de requête jusqu'à ce que la ou les lampes s'allument – vérifier le bit lampOn
endif
do
    status[i] = QUERY STATUS
    statusTimestamp[i] = get_timer (timer) – 10 ms // Soustraire 10 ms qui est la longueur approchée de la trame en arrière afin d'obtenir le moment de départ de cette dernière
    i++
while (status[i – 1] == XXX1 XXXXb AND statusTimestamp[i – 1] < 4,5 s)
statusLength = i
if (statusTimestamp[i – 1] >= 4,5 s)
    error1 Modification de l'intensité lumineuse non interrompue après 4,5 s.
else
    // Vérifier que la modification de l'intensité lumineuse prend 4 s – sur la base de l'octet d'état
    if (statusTimestamp[i – 1] < 3,6 s OR statusTimestamp[i – 1] > 4,4 s)
        error2 Durée de modification de l'intensité lumineuse inappropriée à la phase d'essai m = m. Réel: statusTimestamp[i – 1] s. Attendu: 3,6 s < durée de modification de l'intensité lumineuse < 4,4 s.
    endif
    // Vérifier que tant que le bit fadeRunning est réglé, le bit lampOn l'est également; uniquement dans le cas d'une modification de l'intensité lumineuse pour atteindre le niveau 0 ou à partir de ce niveau
    if (fromLevel[m] == 0 OR toLevel[m] == 0)
        if (fromLevel[m] == 0)
            iEnd = statusLength – 1 // exclure la dernière réponse; il convient que la dernière réponse attendue soit XXX0 X1XXb
        else
            iEnd = statusLength
        endif
        for (i = 0; i<iEnd; i++)
            fadeRunningBit = (status[i]>> 4) & 0x01
            lampOnBit = (status[i]>> 2) & 0x01
            if (fadeRunningBit != lampOnBit) // si (le bit 2 et le bit 4 ne sont pas simultanément réglés sur TRUE)
                error3 Les bits fadeRunning et lampOn ne sont pas réglés ou supprimés simultanément. Octet d'état: status[i].
            endif
        endfor
    endif
endif
// Lancer le processus de modification de l'intensité lumineuse entre les mêmes niveaux que précédemment et mémoriser le niveau réel consigné
DTR0 (0)
SET FADE TIME
DAPC (fromLevel[m])
WaitForLampLevel (fromLevel[m])
DTR0 (6)
SET FADE TIME //Définir une durée de modification de l'intensité lumineuse de 4 s
i = 0
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        DAPC (toLevel[m])
        start_timer (timer) // Lancement de la minuterie après l'interruption de la commande DAPC
        if (m == 5 OR m == 7)
            WaitForLampOn ()
        endif
        do
            actualLevel[i] = QUERY ACTUAL LEVEL
            actualLevelTimestamp[i] = get_timer (timer) – 10 ms // Soustraire 10 ms qui est la longueur approchée de la trame en arrière afin d'obtenir le moment de départ de cette dernière
            i++
        while (actualLevel[i – 1] != toLevel[m] AND actualLevelTimestamp[i – 1] < 4,5 s)
        actualLevelLength = i
        if (actualLevelTimestamp[i – 1] >= 4,5 s)
            error4 Modification de l'intensité lumineuse non interrompue après 4,5 s.
        else
            // Vérifier le moment de réalisation des pas de modification de l'intensité lumineuse – sur la base du niveau réel
            if (m != 7)
                step = 1
                for (i = 1; i<actualLevelLength; i++)
                    if (actualLevel[i – 1] != actualLevel[i])
                        if (step<= nrSteps[m])
                            if (step == 1)
                                minLimit = t1Min[m]
                                maxLimit = t1Max[m]
                            else
                                minLimit = t2Min[m]
                                maxLimit = t2Max[m]
                            endif
                            if (actualLevelTimestamp[i] <minLimit OR actualLevelTimestamp[i] >maxLimit)
                                error5 Moment inapproprié de modification du niveau de luminosité pour le pas = step à la phase d'essai m = m. Réel: actualLevelTimestamp[i] s. Attendu: minLimit s <= temps <= maxLimit s.
                            endif
                            step++
                        else
                            error6 Le DUT a réalisé plus de pas que le nombre de pas attendu.
                            break
                        endif
                    endif
                endfor
            endif
        endif
    endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 67 – Paramètres pour la séquence d'essai ' small steps fading'

Phase d'essai m	fromLevel	toLevel	nrSteps	t1Min	t1Max	t2Min	t2Max
0	*mid*	*mid* – 2	2	0,9	1,1	2,7	3,3
1	*mid*	*mid* + 2	2	0,9	1,1	2,7	3,3
2	*mid*	*mid* – 1	1	1,8	2,2	-	-
3	*mid*	*mid* + 1	1	1,8	2,2	-	-
4	*min* + 1	0	2	1,8	2,2	3,6	4,4
5	0	*min* + 1	1	1,8	2,2	-	-
6	*Min*	0	1	3,6	4,4	-	-
7	0	*Min*	0	-	-	-	-

12.6.6 FADE TIME: extended fade time (FADE TIME: durée étendue de modification de l'intensité lumineuse)

La séquence d'essai vérifie le traitement correct de quelques valeurs EXTENDED FADE TIME potentielles. La commande DAPC sert à la gradation de

- MAX LEVEL à MIN LEVEL (phase d'essai j = 0)
- MIN LEVEL à MAX LEVEL (phase d'essai j = 1)
- MAX LEVEL à un niveau moyen (phase d'essai j = 2)
- un niveau moyen à MAX LEVEL (phase d'essai j = 3)

À chaque phase d'essai, la durée du processus de modification de l'intensité lumineuse est mesurée et comparée avec les prévisions. La durée du processus de modification de l'intensité lumineuse est basée sur le bit fadeRunning (bit 4) dans la réponse de QUERY STATUS. La commande QUERY ACTUAL LEVEL sert à vérifier le niveau cible.

Concernant la réalisation de l'essai: Il convient d'envoyer les commandes DAPC et QUERY STATUS le plus rapidement possible l'une après l'autre (une requête peut être envoyée 2,4 ms après réception d'une réponse)

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report1 L'appareillage de commande n'est pas gradable.
else
    mid = (PHM + 254) >> 1
    // Vérifier l'utilisation de la durée étendue de modification de l'intensité lumineuse
    for (i = 0; i < 4; i++)
        for (j = 0; j< 4; j++)
            fadeTime = 200 s
            for (k = 0; k<kEnd[i]; k++)
                DTR0 (0)
                SET EXTENDED FADE TIME
                command[j] // Régler le niveau de lancement du processus de modification
                de l'intensité lumineuse
                DTR0 (dtrValue[i])
                SET EXTENDED FADE TIME
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                DAPC (level[j]) // Lancer le processus de modification de l'intensité lumineuse
                start_timer (timer) // Lancement de la minuterie après l'interruption de la commande DAPC
                waitk ms // Décaler le moment de l'envoi de QUERY STATUS de manière à déterminer le moment de réinitialisation du bit de modification de l'intensité lumineuse
                do
                    answer = QUERY STATUS
                    timestamp = get_timer (timer) – 10 ms // Soustraire 10 ms qui est la longueur approchée de la trame en arrière afin d'obtenir le moment de départ de cette dernière
                while (answer == XXX1XXXXb AND timestamp<timeLimit[i])
                if (k == 0 AND timestamp>= timeLimit[i])
                    error1 Modification de l'intensité lumineuse non interrompue après timeLimit[i] s.
                    break
                endif
                if (timestamp<fadeTime)
                    fadeTime = timestamp
                endif
            endfor
            if (fadeTime != 200)
                if (fadeTime<tMin[i] OR fadeTime>tMax[i])
                    error2 EXTENDED FADE TIME non utilisée ou FADE TIME hors de la plage à la phase d'essai (i,j) = (i,j). Réel: fadeTime s. Attendu: tMin[i] <= temps <= tMax[i].
                endif
            endif
            answer = QUERY ACTUAL LEVEL
            if (answer != value[j])
                error3 ACTUAL LEVEL erroné après la fin du processus de modification de l'intensité lumineuse à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: value[j].
            endif
        endfor
    endfor
    // Vérifier si le processus de modification lumineuse est exécuté le plus rapidement possible
    DTR0 (0)
    SET EXTENDED FADE TIME
    RECALL MAX LEVEL
    i = 0
    DAPC (1)
    start_timer(timer) // Lancement de la minuterie après l'interruption de la commande DAPC
    do
        answer[i] = QUERY STATUS
        i++
    while (get_timer(timer) < 1s)
    foreach (i in answer)
        if (i == XXX1XXXXb)
            error4 bit fadeRunning réglé lors d'une transition qu'il convient d'avoir effectué immédiatement.
        endif
    endfor
    RECALL MAX LEVEL
    DAPC (1)
    answer = QUERY ACTUAL LEVEL
    if (answer != PHM)
        error5 Le niveau cible diffère du niveau réel, lorsque la transition vers le niveau cible était à effectuer immédiatement. Réponse: answer. Attendu: PHM.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    endif
endif
```

Tableau 68 – Paramètres pour la séquence d'essai 'FADE TIME: extended fade time'

Phase d'essai i	dtrValue	tMin [s]	tMax [s]	kEnd	timeLimit
0	00010001b	0,19	0,21	40	0,25
1	00101111b	15,2	16,8	1	17
2	00110011b	38	42	1	43
3	01000010b	171	189	1	190

Phase d'essai j	command	level	value
0	RECALL MAX LEVEL	1	*PHM*
1	RECALL MIN LEVEL	254	254
2	RECALL MAX LEVEL	*mid*	*mid*
3	DAPC (*mid*)	254	254

12.6.7 FADE RATE: possible values (FADE RATE: valeurs possibles)

La séquence d'essai vérifie le traitement correct de toutes les valeurs FADE RATE potentielles. Dans la première partie de l'essai, une commande DOWN est envoyée. Dans la seconde partie de l'essai, la commande DOWN est répétée un certain nombre de fois n(j). Pour les deux cas, le nombre de pas de modification de l'intensité lumineuse du DUT et la durée du processus de modification de l'intensité lumineuse de 200 ms font l'objet d'une requête. L'essai est répété avec la commande UP.

Pour la seconde partie de l'essai, le nombre de commandes à envoyer dépend du PHM du DUT et du FADE RATE choisi. Pour chaque FADE RATE (sans tenir compte du PHM), les pas maximum et minimum qui peuvent être réalisés dans un délai de 100 ms sont donnés par sMin1 et sMin2, respectivement. Ayant défini les sMin1 et sMin2 pour chaque FADE RATE, ainsi que le PHM du DUT, on calcule le nombre de fois où une commande peut être envoyée et les pas maximum et minimum attendus, de manière à pouvoir observer une différence.

Note concernant la réalisation de l'essai: Il convient d'envoyer les commandes command2[i] et QUERY STATUS le plus rapidement possible l'une après l'autre (une requête peut être envoyée 2,4 ms après réception d'une réponse).

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report1 L'appareillage de commande n'est pas gradable.
else
    (n[]; sMin2[]; sMax2[]) = CalculateFadeRate (PHM)
    for (i = 0; i < 2; i++)
        for (j = 1; j< 16; j++)
            // Vérifier par essai le comportement lors de l'envoi d'une commande
            if (sMax1[j] <= (254 – PHM))
                DTR0 (j)
                SET FADE RATE
                fadeTime = 300 ms
                for (k = 0; k<40; k++)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                command1[i]
                wait 770 ms
                command2[i]
                start_timer (timer) // Lancement de la minuterie après l'interruption de la command2[i]
                waitk ms // Décaler le moment de l'envoi de QUERY STATUS de manière à déterminer le moment de réinitialisation du bit de modification de l'intensité lumineuse
                do
                    answer = QUERY STATUS
                    timestamp = get_timer (timer) – 10 ms // Soustraire 10 ms qui est la longueur approchée de la trame en arrière afin d'obtenir le moment de départ de cette dernière
                while (answer == XXX1XXXXb AND timestamp< 250 ms)
                if (k == 0 AND timestamp>= 250 ms)
                    error1 Modification de l'intensité lumineuse non interrompue après 250 ms.
                    break
                endif
                if (timestamp<fadeTime)
                    fadeTime = timestamp
                endif
            endfor
            if (k == 40)
                if (fadeTime< 180 ms OR fadeTime> 220 ms)
                    error2 Durée de modification de l'intensité lumineuse erronée initiée par la command2[i] avec FADE RATE j. Réel: fadeTime ms. Attendu: 180 ms <= temps <= 220 ms.
                endif
            endif
            answer = QUERY ACTUAL LEVEL
            if (i == 0)
                s = 254 – answer
            else
                s = answer – PHM
            endif
            if (sMin1[j] >s OR s>sMax1[j])
                error3 Nombre erroné de pas avec la command2[i] et FADE RATE j. Réel: s. Attendu: sMin1[j] <= s <= sMax1[j].
            endif
        endif
        // Vérifier par essai le comportement lors de l'envoi de plusieurs commandes
        DTR0 (j)
        SET FADE RATE
        fadeTime = 300 ms
        for (k = 0; k<40; k++)
            command1[i]
            wait 770 ms
            counter = n[j]
            // Il est nécessaire d'envoyer toutes les command2[i] à chaque intervalle de 100 ms. Après la dernière commande2[i], commencer les envois le plus rapidement possible après chaque QUERY STATUS l'un après l'autre (la requête peut être envoyée 2,4 ms après réception de BF)
            while (counter != 0)
                wait 90 ms // S'assurer qu'un intervalle de 90 ms est compris entre les deux trames en avant – intervalles de 100 ms entre la réception des commandes=demi-durée et vitesse de modification de l'intensité lumineuse
                command2[i]
                counter--
            endwhile
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                start_timer (timer) // Lancement de la minuterie après l'interruption de la dernière command2[i]
                wait (k * 1) ms
                do
                    answer = QUERY STATUS
                    timestamp = get_timer (timer) – 10 ms // Soustraire 10 ms qui est la longueur approchée de la trame en arrière afin d'obtenir le moment de départ de cette dernière
                while (answer == XXX1XXXXb AND timestamp< 250 ms)
                if (k == 0 AND timestamp>= 250 ms)
                    error4 Modification de l'intensité lumineuse non interrompue après 250 ms.
                    break
                endif
                if (timestamp<fadeTime)
                    fadeTime = timestamp
                endif
            endfor
            if (k == 40)
                if (fadeTime< 180 ms OR fadeTime> 220 ms)
                    error5 Durée de modification de l'intensité lumineuse erronée initiée par la command2[i] avec FADE RATE j. Réel: fadeTime ms. Attendu: 180 ms <= temps <= 220 ms.
                endif
            endif
            answer = QUERY ACTUAL LEVEL
            if (i == 0)
                s = 254 – answer
            else
                s = answer – PHM
            endif
            if (sMin2[j] >s OR s>sMax2[j])
                error6 Nombre erroné de pas avec la command2[i] et FADE RATE j. Réel: s. Attendu: sMin2[j] <= s <= sMax2[j].
            endif
        endfor
    endfor
endif
```

Tableau 69 – Paramètres pour la séquence d'essai 'FADE RATE: possible values'

Phase d'essai i	command1	command2
0	RECALL MAX LEVEL	DOWN
1	RECALL MIN LEVEL	UP

Phase d'essai j	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
sMin1	65	46	33	23	17	12	9	6	5	3	3	2	2	1	1
sMax1	80	57	41	29	21	15	11	8	6	5	4	3	3	2	2

12.6.7.1 CalculateFadeRate

La sous-séquence d'essai calcule, sur la base du PHM de l'unité logique, le nombre de commandes qui peuvent être envoyées pour une certaine modification de l'intensité lumineuse, ainsi que le nombre minimum et maximum attendu de pas à réaliser.

Description de l'essai:

(*n[]*; *sMin[]*; *sMax[]*) = CalculateFadeRate (*PHM*)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
maxSteps = 254 – PHM
for (fade = 1; fade< 16; fade++)
    for (steps = 1; steps< 256; steps++)
        // Calculer le nombre de pas à réaliser lors de l'envoi des commandes 'steps' avec la vitesse de modification de l'intensité lumineuse 'fade'
        tmps = (steps + 1) * steps100ms[fade]
        tmpmin = RoundDown (0,9 * tmps) + 1
        tmpmax = RoundUp (1,1 * tmps) + 1
        if (tmpmax>maxSteps)
            // Quitter la boucle 'steps' dans la mesure où un nombre de pas plus important que les maxSteps ne peut être réalisé
            if (steps == 1)
                // Calculer les pas minimum et maximum à réaliser dans le cas où une seule commande peut être envoyée
                n[fade] = 1
                sMin[fade] = Min (tmpmin, maxSteps)
                sMax[fade] = Min (tmpmax, maxSteps)
            endif
            break
        endif
        // Mémoriser le nombre minimum et maximum de pas à réaliser lors de l'envoi de n commandes
        n[fade] = steps
        sMin[fade] = tmpmin
        sMax[fade] = tmpmax
    endfor
endfor
return (n[], sMin[], sMax[])
```

Tableau 70 – Paramètres pour la séquence d'essai 'FADE RATE: possible values'

Phase d'essai Modification de l'intensité lumineuse	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
steps100ms	35,8	25,3	17,9	12,7	8,94	6,33	4,47	3,16	2,24	1,58	1,12	0,79	0,56	0,4	0,28

12.6.8 FADE RATE: transitions

La séquence d'essai vérifie si le processus de modification de l'intensité lumineuse au moyen des commandes UP et DOWN s'effectue correctement dans la situation suivante:

- lancer une modification de l'intensité lumineuse entre des niveaux identiques (de 254 à 254, de PHM à PHM). Il convient de ne lancer aucun processus de modification de l'intensité lumineuse dans la mesure où les niveaux réel et cible sont équivalents.
- lancer une modification de l'intensité lumineuse entre deux niveaux consécutifs (de 253 à 254, de PHM+1 à PHM). Un processus de modification de l'intensité lumineuse d'une durée de 200 ms doit être lancé.

La commande QUERY ACTUAL LEVEL sert à vérifier le niveau cible.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    report1 L'appareillage de commande n'est pas gradable.
else
    DTR0 (2)
    SET FADE RATE
    // Vérifier qu'aucune modification de l'intensité lumineuse n'est lancée
    for (i = 0; i < 2; i++)
        command1[i]
        command2[i]
        answer = QUERY STATUS
        if (answer != XXX0XXXXb)
            error1 Modification de l'intensité lumineuse lancée à la phase d'essai i = i. RéeL: answer. Attendu: XXX0XXXXb.
        endif
        answer = QUERY ACTUAL LEVEL
        if (answer != level[i])
            error2ACTUAL LEVEL erroné à la phase d'essai i = i. Réel: answer. Attendu: level[i].
        endif
    endfor
    // Vérifier qu'un processus de modification de l'intensité lumineuse d'une durée de 200 ms est lancé
    for (i = 2; i < 4; i++)
        fadeTime = 300 ms
        for (j = 0; j<40; j++)
            command1[i]
            command2[i]
            start_timer (timer) // Lancement de la minuterie après l'interruption de la command2[j]
            waitj ms // Décaler le moment de l'envoi de QUERY STATUS de manière à déterminer le moment de réinitialisation du bit de modification de l'intensité lumineuse
            do
                answer = QUERY STATUS
                timestamp = get_timer (timer) – 10 ms // Soustraire 10 ms qui est la longueur approchée de la trame en arrière afin d'obtenir le moment de départ de cette dernière
            while (answer == XXX1XXXXb AND timestamp< 250 ms)
            if (j == 0 AND timestamp>= 250 ms)
                error3 Modification de l'intensité lumineuse non interrompue après 250 ms à la phase d'essai i = i.
                break
            endif
            if (timestamp<fadeTime)
                fadeTime = timestamp
            endif
        endfor
        if (j == 40)
            if (fadeTime< 180 ms OR fadeTime> 220 ms)
                error4 Moment inapproprié d'interruption de la modification de l'intensité lumineuse à la phase d'essai  i = i. Réel: fadeTime ms. Attendu: 180 ms <= temps <= 220 ms.
            endif
        endif
        answer = QUERY ACTUAL LEVEL
        if (answer != level[i])
            error5 ACTUAL LEVEL erroné à la phase d'essai i = i. Réel: answer. Attendu: level[i].
        endif
    endfor
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 71 – Paramètres pour la séquence d'essai 'FADE RATE: transitions'

Phase d'essai i	command1	command2	level
0	RECALL MAX LEVEL	UP	254
1	RECALL MIN LEVEL	DOWN	*PHM*
2	DAPC (253)	UP	254
3	DAPC (*PHM* + 1)	DOWN	*PHM*

12.6.9 FADE RATE: extended fade time (FADE RATE: durée étendue de modification de l'intensité lumineuse)

La séquence d'essai vérifie si lors du processus de modification de l'intensité lumineuse avec une vitesse donnée, la durée de modification de l'intensité lumineuse et la durée étendue de modification de l'intensité lumineuse restent inchangées.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report1 L'appareillage de commande n'est pas gradable.
else
    for (i = 0; i < 2; i++)
        // Régler les variables du processus de modification de l'intensité lumineuse
        DTR0 (5)
        SET FADE TIME
        SET FADE RATE
        DTR0 (00101101b)
        SET EXTENDED FADE TIME
        //Il est nécessaire d'envoyer les commandes suivantes le plus rapidement possible
        l'une après l'autre (les requêtes peuvent être envoyées 2,4 ms après réception de
        BF)
        command[i]
        answer = QUERY FADE TIME/FADE RATE
        if ((answer& 0x0F) != 5)
            error1 fadeRate modifiée lors d'un processus de modification de l'intensité
            lumineuse lancé par la command[i]. Réel: (answer& 0x0F). Attendu: 5.
        endif
        if ((answer>> 4) != 5)
            error2 fadeTime modifiée lors d'un processus de modification de l'intensité
            lumineuse lancé par la command[i]. Réel: (answer>> 4). Attendu: 5.
        endif
        answer = QUERY EXTENDED FADE TIME
        if ((answer& 0x0F) != 13)
            error3 extendedFadeTimeBase modifiée lors d'un processus de modification de
            l'intensité lumineuse lancé par la command[i]. Réel: (answer& 0x0F). Attendu:
            13.
        endif
        if ((answer>> 4) != 2)
            error4 extendedFadeTimeMultiplier modifiée lors d'un processus de
            modification de l'intensité lumineuse lancé par la command[i]. Réel: (answer>>
            4). Attendu: 2.
        endif
        wait 200 ms
        // Vérifier si les valeurs initiales ne sont pas modifiées
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            answer = QUERY FADE TIME/FADE RATE
            if ((answer& 0x0F) != 5)
                error5 fadeRate modifiée après la fin du processus de modification de
                l'intensité lumineuse avec la command[i]. Réel: (answer& 0x0F). Attendu: 5.
            endif
            if ((answer>> 4) != 5)
                error6 fadeTime modifiée après la fin du processus de modification de
                l'intensité lumineuse avec la command[i]. Réel: (answer>> 4). Attendu: 5.
            endif
            answer = QUERY EXTENDED FADE TIME
            if ((answer& 0x0F) != 13)
                error7 extendedFadeTimeBase modifiée après la fin du processus de
                modification de l'intensité lumineuse avec la command[i]. Réel: (answer&
                0x0F). Attendu: 13.
            endif
            if ((answer>> 4) != 2)
                error8 extendedFadeTimeMultiplier modifiée après la fin du processus de
                modification de l'intensité lumineuse avec lacommand[i]. Réel: (answer>> 4).
                Attendu: 2.
            endif
        endfor
    endif
```

Tableau 72 – Paramètres pour la séquence d'essai 'FADE RATE: extended fade time'

Phase d'essai i	command
0	UP
1	DOWN

12.6.10 FADE TIME/FADE RATE: stop fading by setting MIN/MAX levels (FADE TIME/FADE RATE: interrompre le processus de modification de l'intensité lumineuse par le réglage des niveaux MIN/MAX

La séquence d'essai vérifie si le processus de modification de l'intensité lumineuse est interrompu selon la spécification à réception des commandes "SET MAX LEVEL" et "SET MIN LEVEL". Le DUT est réglé sur un niveau de référence, puis une modification de l'intensité lumineuse est lancée. Lors du processus de modification de l'intensité lumineuse, les niveaux MIN et MAX sont réglés. Le niveau réel atteint par le DUT, ainsi que le réglage des niveaux max et min sont vérifiés lors du processus de modification de l'intensité lumineuse comme suit:

- de MAX LEVEL à MIN LEVEL et de MIN LEVEL à MAX LEVEL en utilisant la durée du processus de modification de l'intensité lumineuse
- de MAX LEVEL à MIN LEVEL et de MIN LEVEL à MAX LEVEL en utilisant la durée étendue de modification de l'intensité lumineuse
- de MAX LEVEL à descendant et de MIN LEVEL à ascendant en utilisant la vitesse de modification de l'intensité lumineuse

La plage attendue des niveaux réels est calculée au début de l'essai. Aux phases d'essais k=0 et k=1, la modification de l'intensité lumineuse est lancée au moyen des commandes DAPC et GO TO SCENE, et après un délai de 1 s (un quart de la durée du processus de modification de l'intensité lumineuse), les niveaux min/max sont réglés. À la phase d'essai k=3, une commande DAPC lance la modification de l'intensité lumineuse, puis après un délai de 1 s la commande GO TO LAST ACTIVE LEVEL est envoyée, commande qui lance une nouvelle modification de l'intensité lumineuse vers la cible définie par la commande DAPC. Une seconde plus tard, les niveaux min/max sont définis. En cas de modification de l'intensité lumineuse avec la vitesse correspondante, cette même modification est interrompue après 100 ms (à mi-durée du processus de modification de l'intensité lumineuse).

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

PHM = QUERY PHYSICAL MINIMUM
if (*PHM*>= 253)
    report1 L'appareillage de commande n'est pas suffisamment gradable.
else
    // Déterminer le niveau attendu après une durée équivalant à 1/4 de la durée du processus de modification de l'intensité lumineuse du niveau max au niveau min, avec la durée du processus de modification de l'intensité lumineuse et la durée étendue de modification de l'intensité lumineuse
    FT_Max2Min = ((254 – (*PHM* + 1)) >> 2) *// Niveau attendu après une durée équivalant à 1/4 de la durée du processus de modification de l'intensité lumineuse du niveau max au niveau min*
    FT_Max2Min_min10p = 254 – *FT_Max2Min* * 1,1 *// Niveau minimum attendu avec la durée du processus de modification de l'intensité lumineuse*
    FT_Max2Min_min5p = 254 – *FT_Max2Min* * 1,05 *// Niveau minimum attendu avec la durée étendue de modification de l'intensité lumineuse*
    FT_Max2Min_max5p = 254 – *FT_Max2Min* * 0,95 *// Niveau maximum attendu avec la durée étendue de modification de l'intensité lumineuse*
    FT_Max2Min_max10p = 254 – FT_Max2Min * 0,9 *// Niveau maximum attendu avec la durée du processus de modification de l'intensité lumineuse*
    // Déterminer le niveau attendu après une durée équivalant à 1/4 de la nouvelle durée du processus de modification de l'intensité lumineuse du point précédent au niveau min, avec la durée du processus de modification de l'intensité lumineuse et la durée étendue de modification de l'intensité lumineuse
    FT_Max2Min_2Min_min10p = *FT_Max2Min_min10p* – ((*FT_Max2Min_min10p* – (*PHM* + 1)) >> 2) * 1,1 *// Niveau minimum attendu avec la durée du processus de modification de l'intensité lumineuse*
    FT_Max2Min_2Min_min5p = *FT_Max2Min_min5p* – ((*FT_Max2Min_min5p* – (*PHM* + 1)) >> 2) * 1,05 *// Niveau minimum attendu avec la durée étendue de modification de l'intensité lumineuse*
    FT_Max2Min_2Min_max5p = *FT_Max2Min_max5p* – ((*FT_Max2Min_max5p* – (*PHM* + 1)) >> 2) * 0,95 *// Niveau maximum attendu avec la durée étendue de modification de l'intensité lumineuse*
    FT_Max2Min_2Min_max10p = *FT_Max2Min_max10p* – ((*FT_Max2Min_max10p* – (*PHM* + 1)) >> 2) * 0,9 *// Niveau maximum attendu avec la durée du processus de modification de l'intensité lumineuse*
    // Déterminer le niveau attendu après une durée équivalant à 1/4 de la durée du processus de modification de l'intensité lumineuse du niveau min au niveau max, avec la durée du processus de modification de l'intensité lumineuse et la durée étendue de modification de l'intensité lumineuse
    FT_Min2Max = ((254 – (*PHM* + 1)) >> 2) *// Niveau attendu après une durée équivalant à 1/4 de la durée du processus de modification de l'intensité lumineuse du niveau min au niveau max*
    FT_Min2Max_min10p = (*PHM* + 1) + *FT_Min2Max* * 0,9 *// Niveau minimum attendu avec la durée du processus de modification de l'intensité lumineuse*
    FT_Min2Max_min5p = (*PHM* + 1) + *FT_Min2Max* * 0,95 *// Niveau minimum attendu avec la durée étendue de modification de l'intensité lumineuse*
    FT_Min2Max_max5p = (*PHM* + 1) + *FT_Min2Max* * 1,05 *// Niveau maximum attendu avec la durée étendue de modification de l'intensité lumineuse*
    FT_Min2Max_max10p = (*PHM* + 1) + *FT_Min2Max* * 1,1 *// Niveau maximum attendu avec la durée du processus de modification de l'intensité lumineuse*
    // Déterminer le niveau attendu après une durée équivalant à 1/4 de la nouvelle durée du processus de modification de l'intensité lumineuse du point précédent au niveau max, avec la durée du processus de modification de l'intensité lumineuse et la durée étendue de modification de l'intensité lumineuse
    FT_Min2Max_2Max_min10p = *FT_Min2Max_min10p* + ((254 – *FT_Min2Max_min10p*) >> 2) * 0,9 *// Niveau minimum attendu avec la durée du processus de modification de l'intensité lumineuse*

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
FT_Min2Max_2Max_min5p = FT_Min2Max_min5p + ((254 – FT_Min2Max_min5p) >> 2) * 0,95 // Niveau minimum attendu avec la durée étendue de modification de l'intensité lumineuse
FT_Min2Max_2Max_max5p = FT_Min2Max_max5p + ((254 – FT_Min2Max_max5p) >> 2) * 1,05 // Niveau maximum attendu avec la durée étendue de modification de l'intensité lumineuse
FT_Min2Max_2Max_max10p = FT_Min2Max_max10p + ((254 – FT_Min2Max_max10p) >> 2) * 1,1 // Niveau maximum attendu avec la durée du processus de modification de l'intensité lumineuse
FR_Min = 22 // Nombre minimum de pas à réaliser avec une vitesse de modification de l'intensité lumineuse de 2 dans un intervalle de 100 ms
FR_Max = 28 // Nombre maximum de pas à réaliser par le DUT avec une vitesse de modification de l'intensité lumineuse de 2 dans un intervalle de 100 ms
for (i = 0; i < 3; i++)
    for (j = 0; j< 6; j++)
        for (k = 0; k< 3; k++)
            RESET
            wait 300 ms
            DTR0 (PHM + 1)
            SET MIN LEVEL
            DTR0 (value1[i])
            command1[i]
            command2[j]
            if (i< 2)
                if (k == 0)
                    command3[j]
                else if (k == 1)
                    DTR0 (1)
                    SET SCENE 5
                    DTR0 (254)
                    SET SCENE 7
                    command4[j]
                else
                    command3[j]
                    wait 1 s
                    GO TO LAST ACTIVE LEVEL
                endif
                wait 1 s
                DTR0 (value2[j])
            else
                DTR0 (value2[j])
                command5[j]
                wait90 ms
            endif
            command6[j]
            answer = QUERY STATUS
            if (answer != XXX0XXXXb)
                error1 Modification de l'intensité lumineuse non interrompue à la phase d'essai (i,j,k) = (i,j,k). Réel: answer. Attendu: XXX0XXXXb.
            endif
            answer = QUERY ACTUAL LEVEL
            if (answer != level[i,j,k])
                error2 Niveau réel erroné après envoi de la commande command6[j] à la phase d'essai (i,j,k) = (i,j,k). Réel: answer. Attendu: level[i,j,k].
            endif
            answer = command7
            if (answer != value2[j])
                error3 command6[j] non exécutée à la phase d'essai (i,j,k) = (i,j,k). Réel: answer. Attendu: value2[j].
            endif
            if (i == 2)
                k = 2 // Ne pas répéter l'essai pour UP/DOWN
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                endif
            endfor
        endfor
    endfor
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 73 – Paramètres pour la séquence d'essai 'FADE TIME/FADE RATE: stop fading by setting MIN/MAX levels'

Phase d'essai i			0	1	2
value1			6	0010 0011	2
command1			SET FADE TIME	SET EXTENDED FADE TIME	SET FADE RATE
level	k != 2	j <= 1	**Max** (**RoundDown** (*FT_Max2Min_min10p*),*minLevel*[*j*]) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max10p*),*minLevel*[*j*])	**Max** (**RoundDown** (*FT_Max2Min_min5p*),*minLevel*[*j*]) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max5p*),*minLevel*[*j*])	**Max** (254 – *FR_Max*,*minLevel*[*j*]) <= answer <= **Max** (254 – *FR_Min*,*minLevel*[*j*])
		j = 2	253	253	253
		j = 3	*PHM* + 2	*PHM* + 2	*PHM* + 2
		j >= 4	**Min** (**RoundDown** (*FT_Min2Max_min10p*),*maxLevel*[*j*]) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max10p*),*maxLevel*[*j*])	**Min** (**RoundDown** (*FT_Min2Max_min5p*),*maxLevel*[*j*]) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max5p*),*maxLevel*[*j*])	**Min** (*PHM* + 1 + *FR_Min*,*maxLevel*[*j*]) <= answer <= **Min** (*PHM* + 1 + *FR_Max*,*maxLevel*[*j*])
	k = 2	j <= 2	**Max** (**RoundDown** (*FT_Max2Min_2Min_min10p*),*minLevel*[*j*]) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max10p*),*minLevel*[*j*])	**Max** (**RoundDown** (*FT_Max2Min_2Min_min5p*),*minLevel*[*j*]) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max5p*),*minLevel*[*j*])	-
		j >= 3	**Min** (**RoundDown** (*FT_Min2Max_2Max_min10p*),*maxLevel*[*j*]) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max10p*),*maxLevel*[*j*])	**Min** (**RoundDown** (*FT_Min2Max_2Max_min5p*),*maxLevel*[*j*]) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max5p*),*maxLevel*[*j*])	-

IEC 62386-102:2014 © IEC 2014

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

Phase d'essai j	command2	command3	command4	command5	value2	command6	minLevel	maxLevel	command7	test description
0	RECALL MAX LEVEL	DAPC (1)	GO TO SCENE 5	DOWN	*PHM* + 1	SET MIN LEVEL	*PHM* + 1	254	QUERY MIN LEVEL	lancer une modification de l'intensité lumineuse de MAX LEVEL à MIN LEVEL/descendante
1	RECALL MAX LEVEL	DAPC (1)	GO TO SCENE 5	DOWN	*PHM* + 2	SET MIN LEVEL	*PHM* + 2	254	QUERY MIN LEVEL	
2	RECALL MAX LEVEL	DAPC (1)	GO TO SCENE 5	DOWN	253	SET MIN LEVEL	253	254	QUERY MIN LEVEL	
3	RECALL MIN LEVEL	DAPC (254)	GO TO SCENE 7	UP	*PHM* + 2	SET MAX LEVEL	*PHM* + 1	*PHM* + 2	QUERY MAX LEVEL	lancer une modification de l'intensité lumineuse de MIN LEVEL à MAX LEVEL/ascendante
4	RECALL MIN LEVEL	DAPC (254)	GO TO SCENE 7	UP	253	SET MAX LEVEL	*PHM* + 1	253	QUERY MAX LEVEL	
5	RECALL MIN LEVEL	DAPC (254)	GO TO SCENE 7	UP	254	SET MAX LEVEL	*PHM* + 1	254	QUERY MAX LEVEL	

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.6.11 FADE TIME/FADE RATE: stop fading (FADE TIME/FADE RATE: interrompre le processus de modification de l'intensité lumineuse)

La séquence d'essai vérifie si le processus de modification de l'intensité lumineuse est interrompu selon la spécification à réception des commandes DAPC(255), SAVE PERSISTENT VARIABLES et IDENTIFY DEVICE. Le DUT est réglé sur un niveau de référence, puis une modification de l'intensité lumineuse est lancée. Le niveau réel atteint par le DUT est vérifié après le processus de modification de l'intensité lumineuse comme suit:

- de MAX LEVEL à MIN LEVEL et de MIN LEVEL à MAX LEVEL en utilisant la durée du processus de modification de l'intensité lumineuse
- de MAX LEVEL à MIN LEVEL et de MIN LEVEL à MAX LEVEL en utilisant la durée étendue de modification de l'intensité lumineuse
- de MAX LEVEL à descendant et de MIN LEVEL à ascendant en utilisant la vitesse de modification de l'intensité lumineuse

La plage attendue des niveaux réels est calculée au début de l'essai. Aux phases d'essais k=0 et k=1, la modification de l'intensité lumineuse est lancée au moyen des commandes DAPC et GO TO SCENE, et après un délai de 1 s (un quart de la durée du processus de modification de l'intensité lumineuse), cette même modification est interrompue. À la phase d'essai k=3, une commande DAPC lance la modification de l'intensité lumineuse, puis après un délai de 1 s la commande GO TO LAST ACTIVE LEVEL est envoyée, commande qui lance une nouvelle modification de l'intensité lumineuse vers la cible définie par la commande DAPC. Une seconde plus tard, la modification de l'intensité lumineuse est interrompue. En cas de modification de l'intensité lumineuse avec la vitesse correspondante, cette même modification est interrompue après 100 ms (à mi-durée du processus de modification de l'intensité lumineuse).

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

PHM = QUERY PHYSICAL MINIMUM
if (*PHM*>= 253)
    report1 L'appareillage de commande n'est pas suffisamment gradable.
else
    minLevel = *PHM* + 1
    // Déterminer le niveau attendu après une durée équivalant à 1/4 de la durée du processus de modification de l'intensité lumineuse du niveau max au niveau min, avec la durée du processus de modification de l'intensité lumineuse et la durée étendue de modification de l'intensité lumineuse
    FT_Max2Min = ((254 – (*minLevel*)) >> 2) *// Niveau attendu après une durée équivalant à 1/4 de la durée du processus de modification de l'intensité lumineuse du niveau max au niveau min*
    FT_Max2Min_min10p = 254 – *FT_Max2Min* * 1,1 *// Niveau minimum attendu avec la durée du processus de modification de l'intensité lumineuse*
    FT_Max2Min_min5p = 254 – *FT_Max2Min* * 1,05 *// Niveau minimum attendu avec la durée étendue de modification de l'intensité lumineuse*
    FT_Max2Min_max5p = 254 – *FT_Max2Min* * 0,95 *// Niveau maximum attendu avec la durée étendue de modification de l'intensité lumineuse*
    FT_Max2Min_max10p = 254 – *FT_Max2Min* * 0,9 *// Niveau maximum attendu avec la durée du processus de modification de l'intensité lumineuse*
    // Déterminer le niveau attendu après une durée équivalant à 1/4 de la nouvelle durée du processus de modification de l'intensité lumineuse du point précédent au niveau min, avec la durée du processus de modification de l'intensité lumineuse et la durée étendue de modification de l'intensité lumineuse
    FT_Max2Min_2Min_min10p = *FT_Max2Min_min10p* – ((*FT_Max2Min_min10p* – *minLevel*) >> 2) * 1,1 *// Niveau minimum attendu avec la durée du processus de modification de l'intensité lumineuse*

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
FT_Max2Min_2Min_min5p = FT_Max2Min_min5p – ((FT_Max2Min_min5p – minLevel) >> 2) * 1,05 // Niveau minimum attendu avec la durée étendue de modification de l'intensité lumineuse
FT_Max2Min_2Min_max5p = FT_Max2Min_max5p – ((FT_Max2Min_max5p – minLevel) >> 2) * 0,95 // Niveau maximum attendu avec la durée étendue de modification de l'intensité lumineuse
FT_Max2Min_2Min_max10p = FT_Max2Min_max10p – ((FT_Max2Min_max10p – minLevel) >> 2) * 0,9 // Niveau maximum attendu avec la durée du processus de modification de l'intensité lumineuse
// Déterminer le niveau attendu après une durée équivalant à 1/4 de la durée du processus de modification de l'intensité lumineuse du niveau min au niveau max, avec la durée du processus de modification de l'intensité lumineuse et la durée étendue de modification de l'intensité lumineuse
FT_Min2Max = ((254 – minLevel) >> 2) // Niveau attendu après une durée équivalant à 1/4 de la durée du processus de modification de l'intensité lumineuse du niveau min au niveau max
FT_Min2Max_min10p = minLevel + FT_Min2Max * 0,9 // Niveau minimum attendu avec la durée du processus de modification de l'intensité lumineuse
FT_Min2Max_min5p = minLevel + FT_Min2Max * 0,95 // Niveau minimum attendu avec la durée étendue de modification de l'intensité lumineuse
FT_Min2Max_max5p = minLevel + FT_Min2Max * 1,05 // Niveau maximum attendu avec la durée étendue de modification de l'intensité lumineuse
FT_Min2Max_max10p = minLevel + FT_Min2Max * 1,1 // Niveau maximum attendu avec la durée du processus de modification de l'intensité lumineuse
// Déterminer le niveau attendu après une durée équivalant à 1/4 de la nouvelle durée du processus de modification de l'intensité lumineuse du point précédent au niveau max, avec la durée du processus de modification de l'intensité lumineuse et la durée étendue de modification de l'intensité lumineuse
FT_Min2Max_2Max_min10p = FT_Min2Max_min10p + ((254 – FT_Min2Max_min10p) >> 2) * 0,9 // Niveau minimum attendu avec la durée du processus de modification de l'intensité lumineuse
FT_Min2Max_2Max_min5p = FT_Min2Max_min5p + ((254 – FT_Min2Max_min5p) >> 2) * 0,95 // Niveau minimum attendu avec la durée étendue de modification de l'intensité lumineuse
FT_Min2Max_2Max_max5p = FT_Min2Max_max5p + ((254 – FT_Min2Max_max5p) >> 2) * 1,05 // Niveau maximum attendu avec la durée étendue de modification de l'intensité lumineuse
FT_Min2Max_2Max_max10p = FT_Min2Max_max10p + ((254 – FT_Min2Max_max10p) >> 2) * 1,1 // Niveau maximum attendu avec la durée du processus de modification de l'intensité lumineuse
FR_Min = 22 // Nombre minimum de pas à réaliser avec une vitesse de modification de l'intensité lumineuse de 2 dans un intervalle de 100 ms
FR_Max = 28 // Nombre maximum de pas à réaliser avec une vitesse de modification de l'intensité lumineuse de 2 dans un intervalle de 100 ms
for (i = 0; i < 3; i++)
    for (j = 0; j< 6; j++)
        for (k = 0; k< 3; k++)
            RESET
            wait 300 ms
            DTR0 (minLevel)
            SET MIN LEVEL
            command2[j]
            DTR0 (value[i])
            command1[i]
            if (i< 2)
                if (k == 0)
                    command3[j]
                else if (k == 1)
                    DTR0 (1)
                    SET SCENE 4
                    DTR0 (254)
                    SET SCENE 15
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                        command4[j]
                    else
                        command3[j]
                        wait 1 s
                        GO TO LAST ACTIVE LEVEL
                    endif
                    wait 1 s
                else
                    command5[j]
                    wait90 ms
                endif
                command6[j]
                answer = QUERY STATUS
                if (answer != XXX0XXXXb)
                    error1 Modification de l'intensité lumineuse non interrompue à la phase d'essai (i,j,k) = (i,j,k). Réel: answer. Attendu: XXX0XXXXb.
                endif
                answer = QUERY ACTUAL LEVEL
                if (answer != level[i,j,k])
                    error2 Niveau réel erroné à la phase d'essai (i,j,k) = (i,j,k). Réel: answer. Attendu: level[i,j,k].
                endif
                if (i == 2)
                    k = 2 // Ne pas répéter l'essai pour UP/DOWN
                endif
            endfor
        endfor
    endfor
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 74 – Paramètres pour la séquence d'essai 'FADE TIME/FADE RATE: stop fading'

Phase d'essai i			0	1	2
value1			6	00100011b	2
command1			SET FADE TIME	SET EXTENDED FADE TIME	SET FADE RATE
level	k != 2	j <= 2	**Max** (**RoundDown** (*FT_Max2Min_min10p*),*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max10p*),*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_min5p*),*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max5p*),*minLevel*)	**Max** (254 – *FR_Max*,*minLevel*) <= answer <= **Max** (254 – *FR_Min*,*minLevel*)
		j >= 3	**Min** (**RoundDown** (*FT_Min2Max_min10p*),254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max10p*),254)	**Min** (**RoundDown** (*FT_Min2Max_min5p*),254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max5p*),254)	**Min** (*minLevel* + *FR_Min*,254) <= answer <= **Min** (*minLevel* + *FR_Max*,254)
	k = 2	j <= 2	**Max** (**RoundDown** (*FT_Max2Min_2Min_min10p*),*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max10p*),*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_2Min_min5p*),*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max5p*),*minLevel*)	-
		j >= 3	**Min** (**RoundDown** (*FT_Min2Max_2Max_min10p*),254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max10p*),254)	**Min** (**RoundDown** (*FT_Min2Max_2Max_min5p*),254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max5p*),254)	-

Phase d'essai j	command2	command3	command4	command5	command6
0	RECALL MAX LEVEL	DAPC (1)	GO TO SCENE 4	DOWN	DAPC (255)
1	RECALL MAX LEVEL	DAPC (1)	GO TO SCENE 4	DOWN	SAVE PERSISTENT VARIABLES attendre 300 ms
2	RECALL MAX LEVEL	DAPC (1)	GO TO SCENE 4	DOWN	IDENTIFY DEVICE attendre 11 s
3	RECALL MIN LEVEL	DAPC (254)	GO TO SCENE 15	UP	DAPC (255)
4	RECALL MIN LEVEL	DAPC (254)	GO TO SCENE 15	UP	SAVE PERSISTENT VARIABLES attendre 300 ms
5	RECALL MIN LEVEL	DAPC (254)	GO TO SCENE 15	UP	IDENTIFY DEVICE attendre 11 s

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

12.6.12 FADE TIME/FADE RATE: stop fading when a command is sent, check timing (FADE TIME/FADE RATE: interrompre le processus de modification de l'intensité lumineuse lors de l'envoi d'une commande, vérifier le cadencement)

La séquence d'essai vérifie si le processus de modification de l'intensité lumineuse est interrompu à réception d'une commande absolue ou relative.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

PHM = QUERY PHYSICAL MINIMUM
if (*PHM*>= 246)
    report1 L'appareillage de commande n'est pas suffisamment gradable.
else
    minLevel = *PHM* + 1
    // Déterminer le niveau attendu après une durée équivalant à 1/4 de la durée du processus de modification de l'intensité lumineuse du niveau max au niveau min, avec la durée du processus de modification de l'intensité lumineuse et la durée étendue de modification de l'intensité lumineuse
    FT_Max2Min = ((254 – (*minLevel*)) >> 2) *// Niveau attendu après une durée équivalant à 1/4 de la durée du processus de modification de l'intensité lumineuse du niveau max au niveau min*
    FT_Max2Min_min10p = 254 – *FT_Max2Min* * 1,1 *// Niveau minimum attendu avec la durée du processus de modification de l'intensité lumineuse*
    FT_Max2Min_min5p = 254 – *FT_Max2Min* * 1,05 *// Niveau minimum attendu avec la durée étendue de modification de l'intensité lumineuse*
    FT_Max2Min_max5p = 254 – *FT_Max2Min* * 0,95 *// Niveau maximum attendu avec la durée étendue de modification de l'intensité lumineuse*
    FT_Max2Min_max10p = 254 – *FT_Max2Min* * 0,9 *// Niveau maximum attendu avec la durée du processus de modification de l'intensité lumineuse*
    // Déterminer le niveau attendu après une durée équivalant à 1/4 de la nouvelle durée du processus de modification de l'intensité lumineuse du point précédent au niveau min, avec la durée du processus de modification de l'intensité lumineuse et la durée étendue de modification de l'intensité lumineuse
    FT_Max2Min_2Min_min10p = *FT_Max2Min_min10p* – ((*FT_Max2Min_min10p* – *minLevel*) >> 2) * 1,1 *// Niveau minimum attendu avec la durée du processus de modification de l'intensité lumineuse*
    FT_Max2Min_2Min_min5p = *FT_Max2Min_min5p* – ((*FT_Max2Min_min5p* – *minLevel*) >> 2) * 1,05 *// Niveau minimum attendu avec la durée étendue de modification de l'intensité lumineuse*
    FT_Max2Min_2Min_max5p = *FT_Max2Min_max5p* – ((*FT_Max2Min_max5p* – *minLevel*) >> 2) * 0,95 *// Niveau maximum attendu avec la durée étendue de modification de l'intensité lumineuse*
    FT_Max2Min_2Min_max10p = *FT_Max2Min_max10p* – ((*FT_Max2Min_max10p* – *minLevel*) >> 2) * 0,9 *// Niveau maximum attendu avec la durée du processus de modification de l'intensité lumineuse*
    // Déterminer le niveau attendu après une durée équivalant à 1/4 de la durée du processus de modification de l'intensité lumineuse du niveau min au niveau max, avec la durée du processus de modification de l'intensité lumineuse et la durée étendue de modification de l'intensité lumineuse
    FT_Min2Max = ((254 – *minLevel*) >> 2) *// Niveau attendu après une durée équivalant à 1/4 de la durée du processus de modification de l'intensité lumineuse du niveau min au niveau max*
    FT_Min2Max_min10p = *minLevel* + *FT_Min2Max* * 0,9 *// Niveau minimum attendu avec la durée du processus de modification de l'intensité lumineuse*
    FT_Min2Max_min5p = *minLevel* + *FT_Min2Max* * 0,95 *// Niveau minimum attendu avec la durée étendue de modification de l'intensité lumineuse*
    FT_Min2Max_max5p = *minLevel* + *FT_Min2Max* * 1,05 *// Niveau maximum attendu avec la durée étendue de modification de l'intensité lumineuse*

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
FT_Min2Max_max10p = minLevel + FT_Min2Max * 1,1 // Niveau maximum attendu avec la durée du processus de modification de l'intensité lumineuse
// Déterminer le niveau attendu après une durée équivalant à 1/4 de la nouvelle durée du processus de modification de l'intensité lumineuse du point précédent au niveau max, avec la durée du processus de modification de l'intensité lumineuse et la durée étendue de modification de l'intensité lumineuse
FT_Min2Max_2Max_min10p = FT_Min2Max_min10p + ((254 – FT_Min2Max_min10p) >> 2) * 0,9 // Niveau minimum attendu avec la durée du processus de modification de l'intensité lumineuse
FT_Min2Max_2Max_min5p = FT_Min2Max_min5p + ((254 – FT_Min2Max_min5p) >> 2) * 0,95 // Niveau minimum attendu avec la durée étendue de modification de l'intensité lumineuse
FT_Min2Max_2Max_max5p = FT_Min2Max_max5p + ((254 – FT_Min2Max_max5p) >> 2) * 1,05 // Niveau maximum attendu avec la durée étendue de modification de l'intensité lumineuse
FT_Min2Max_2Max_max10p = FT_Min2Max_max10p + ((254 – FT_Min2Max_max10p) >> 2) * 1,1 // Niveau maximum attendu avec la durée du processus de modification de l'intensité lumineuse
// Déterminer le nombre de pas à réaliser avec une vitesse de modification de l'intensité lumineuse de 2 dans un intervalle de 100 ms
FR_Min = 22 // Nombre minimum de pas
FR_Min = 28 // Nombre maximum de pas
FR_Max2Min_min10p = Max (254 – FR_Max,minLevel)
FR_Max2Min_max10p = Max (254 – FR_Min,minLevel)
FR_Min2Max_min10p = Min (minLevel + FR_Min,254)
FR_Min2Max_max10p = Min (minLevel + FR_Max,254)
for (i = 0; i < 3; i++)
    if (i< 2)
        jstart = 0
        jend = 5
        delay = 1000 ms // Attendre pendant une durée équivalant à 1/4 de la durée du processus de modification de l'intensité lumineuse
    else
        jstart = 6
        jend = 7
        delay = 90 ms //Attendre pendant une durée équivalant à la moitié de la durée du processus de modification de l'intensité lumineuse – prévoir un intervalle de 100 ms entre la réception des commandes
    endif
    for (j = jstart; j<= jend; j++)
        for (k = 0; k< 8; k++)
            RESET
            wait 300 ms
            WaitForLampLevel (254)
            DTR0 (minLevel)
            SET MIN LEVEL
            DTR0 (value[i])
            command1[i]
            command2[j]
            DTR0 (1)
            SET SCENE 3
            DTR0 (254)
            SET SCENE 10
            command3[j]
            waitdelay ms // temps d'établissement
            command4[k]
            answer = QUERY STATUS
            if (answer != XXX0 XXXXb)
                error1 Modification de l'intensité lumineuse non interrompue à la phase d'essai (i,j,k) = (i,j,k). Réel: answer. Attendu: XXX0 XXXXb.
            endif
            answer = QUERY ACTUAL LEVEL
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                    if (answer != level[i,j,k])
                        error2 Niveau réel erroné à la phase d'essai (i,j,k) = (i,j,k). Réel:
                        answer. Attendu: level[i,j,k].
                    endif
                endfor
            endfor
        endfor
    endif
```

Tableau 75 – Paramètres pour la séquence d'essai 'FADE TIME/FADE RATE: stop fading when a command is sent, check timing'

Phase d'essai i	value	command1	description
0	6	SET FADE TIME	modification de l'intensité lumineuse d'une durée de 4 s
1	00100011b	SET EXTENDED FADE TIME	modification de l'intensité lumineuse d'une durée de 4 s
2	2	SET FADE RATE	modification de l'intensité lumineuse de 25 pas/100 ms

Phase d'essai j	command2	command3
0	RECALL MAX LEVEL	DAPC (1)
1	RECALL MAX LEVEL	GO TO SCENE 3
2	RECALL MIN LEVEL	DAPC (254)
3	RECALL MIN LEVEL	GO TO SCENE 10
4	RECALL MAX LEVEL	DAPC(1) attendre 1 s GO TO LAST ACTIVE LEVEL
5	RECALL MIN LEVEL	DAPC(254) attendre 1 s GO TO LAST ACTIVE LEVEL
6	RECALL MAX LEVEL	DOWN
7	RECALL MIN LEVEL	UP

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Phase d'essai k			0	1	2	3	4	5	6	7
command4			OFF	RECALL MIN LEVEL	RECALL MAX LEVEL	RESET attendre 300 ms	STEP UP	STEP DOWN	ON AND STEP UP	STEP DOWN AND OFF
level	**i = 0**	**j = {0,1}**	0	*minLevel*	254	254	**Max** (**RoundDown** (*FT_Max2Min_min10p*) + 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max10p*) + 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_min10p*) – 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max10p*) – 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_min10p*) + 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max10p*) + 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_min10p*) – 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max10p*) – 1,*minLevel*)
		j = {2,3}	0	*minLevel*	254	254	**Min** (**RoundDown** (*FT_Min2Max_min10p*) + 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max10p*) + 1,254)	**Min** (**RoundDown** (*FT_Min2Max_min10p*) – 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max10p*) – 1,254)	**Min** (**RoundDown** (*FT_Min2Max_min10p*) + 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max10p*) + 1,254)	**Min** (**RoundDown** (*FT_Min2Max_min10p*) – 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max10p*) – 1,254)
		j = 4	0	*minLevel*	254	254	**Max** (**RoundDown** (*FT_Max2Min_2Min_min10p*) + 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max10p*) + 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_2Min_min10p*) – 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max10p*) – 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_2Min_min10p*) + 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max10p*) + 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_2Min_min10p*) – 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max10p*) – 1,*minLevel*)
		j = 5	0	*minLevel*	254	254	**Min** (**RoundDown** (*FT_Min2Max_2Max_min10p*) + 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max10p*) + 1,254)	**Min** (**RoundDown** (*FT_Min2Max_2Max_min10p*) – 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max10p*) – 1,254)	**Min** (**RoundDown** (*FT_Min2Max_2Max_min10p*) + 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max10p*) + 1,254)	**Min** (**RoundDown** (*FT_Min2Max_2Max_min10p*) – 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max10p*) – 1,254)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printed.

Phase d'essai k			0	1	2	3	4	5	6	7
command4			OFF	RECALL MIN LEVEL	RECALL MAX LEVEL	RESET attendre 300 ms	STEP UP	STEP DOWN	ON AND STEP UP	STEP DOWN AND OFF
	i = 1	**j = {0,1}**	0	*minLevel*	254	254	**Max** (**RoundDown** (*FT_Max2Min_min5p*) + 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max5p*) + 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_min5p*) – 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max5p*) – 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_min5p*) + 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max5p*) + 1,*minLevel*)	**Max** (**RoundDown**(*FT_Max2Min_min5p*) – 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_max5p*) – 1,*minLevel*)
		j = {2,3}	0	*minLevel*	254	254	**Min** (**RoundDown** (*FT_Min2Max_min5p*) + 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max5p*) + 1,254)	**Min** (**RoundDown** (*FT_Min2Max_min5p*) – 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max5p*) – 1,254)	**Min** (**RoundDown** (*FT_Min2Max_min5p*) + 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max5p*) + 1,254)	**Min** (**RoundDown** (*FT_Min2Max_min5p*) – 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_max5p*) – 1,254)
		j = 4	0	*minLevel*	254	254	**Max** (**RoundDown** (*FT_Max2Min_2Min_min5p*) + 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max5p*) + 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_2Min_min5p*) – 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max5p*) – 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_2Min_min5p*) + 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max5p*) + 1,*minLevel*)	**Max** (**RoundDown** (*FT_Max2Min_2Min_min 5p*) – 1,*minLevel*) <= answer <= **Max** (**RoundUp** (*FT_Max2Min_2Min_max 5p*) – 1,*minLevel*)
		j = 5	0	*minLevel*	254	254	**Min** (**RoundDown** (*FT_Min2Max_2Max_min5p*) + 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max5p*) + 1,254)	**Min** (**RoundDown** (*FT_Min2Max_2Max_min5p*) – 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max5p*) – 1,254)	**Min** (**RoundDown** (*FT_Min2Max_2Max_min5p*) + 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_max5p*) + 1,254)	**Min** (**RoundDown** (*FT_Min2Max_2Max_min 5p*) – 1,254) <= answer <= **Min** (**RoundUp** (*FT_Min2Max_2Max_ma x5p*) – 1,254)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Phase d'essai k			0	1	2	3	4	5	6	7
command4			OFF	RECALL MIN LEVEL	RECALL MAX LEVEL	RESET attendre 300 ms	STEP UP	STEP DOWN	ON AND STEP UP	STEP DOWN AND OFF
	i = 2	j = 6	0	*minLevel*	254	254	**Max** (*FR_Max2Min_min10p* + 1,*minLevel*) <= answer <= **Max** (*FR_Max2Min_max10p* + 1,*minLevel*)	**Max** (*FR_Max2Min_min10p* – 1,*minLevel*) <= answer <= **Max** (*FR_Max2Min_max10p* – 1,*minLevel*)	**Max** (*FR_Max2Min_min10p* + 1,*minLevel*) <= answer <= **Max** (*FR_Max2Min_max10p* + 1,*minLevel*)	**Max** (*FR_Max2Min_min10p* – 1,*minLevel*) <= answer <= **Max** (*FR_Max2Min_max10p* – 1,*minLevel*)
		j = 7	0	*minLevel*	254	254	**Min** (*FR_Min2Max_min10p* + 1,254) <= answer <= **Min** (*FR_Min2Max_max10p* + 1,254)	**Min** (*FR_Min2Max_min10p* – 1,254) <= answer <= **Min** (*FR_Min2Max_max10p* – 1,254)	**Min** (*FR_Min2Max_min10p* + 1,254) <= answer <= **Min** (*FR_Min2Max_max10p* + 1,254)	**Min** (*FR_Min2Max_min10p* – 1,254) <= answer <= **Min** (*FR_Min2Max_max10p* – 1,254)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.6.13 FADE TIME/FADE RATE: stop fading during startup (FADE TIME/FADE RATE: interrompre le processus de modification de l'intensité lumineuse lors du démarrage)

La séquence d'essai vérifie si le processus de modification de l'intensité lumineuse est interrompu selon la spécification lors du démarrage.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM>= 253)
    report1 Essai non utile pour les dispositifs avec PHM >= 253. PHM réel = PHM.
else
    DTR0 (15)
    SET FADE TIME // Régler la durée la plus longue de modification de l'intensité lumineuse (2,8 pas/s --> 1 pas/360 ms)
    SET FADE RATE
    DTR0 (PHM + 1)
    for (i = 0; i < 10; i++)
        OFF
        wait 1 s
        // Il est nécessaire d'envoyer les deux commandes suivantes (DAPC(254) et command) avec le temps d'établissement minimum admis
        DAPC (254)
        command[i]
        answer = QUERY STATUS
        if (answer != XXX0XXXXb)
            error1 Modification de l'intensité lumineuse non interrompue à la phase d'essai i = i. Réel: answer. Attendu: XXX0XXXXb.
        endif
        if (i != 8)
            WaitForLampOn ()
        endif
        answer = QUERY ACTUAL LEVEL
        if (answer != level[i])
            error2 Niveau réel erroné à la phase d'essai i = i. Réel: answer. Attendu: level[i].
        endif
    endfor
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 76 – Paramètres pour la séquence d'essai 'FADE TIME/FADE RATE: stop fading during startup'

Phase d'essai i	command	level
0	SET MIN LEVEL DTR0 (254)	*PHM* + 1
1	SET MAX LEVEL	*PHM* + 1
2	DAPC (255)	*PHM* + 1
3	SAVE PERSISTENT VARIABLES attendre 300 ms	*PHM* + 1
4	UP attendre 220 ms	*PHM* + 2
5	DOWN attendre 220 ms	*PHM* + 1
6	STEP UP	*PHM* + 2
7	STEP DOWN	*PHM* + 1
8	STEP DOWN AND OFF	0
9	ON AND STEP UP	*PHM* + 2

12.6.14 Level instructions: combined instructions (Instructions de niveau: instructions combinées)

La séquence d'essai vérifie le bon fonctionnement du DUT lors de l'envoi de plusieurs séquences d'instructions de contrôle de niveau, avec ou sans processus de modification de l'intensité lumineuse.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM>= 253)
    report1 L'appareillage de commande n'est pas suffisamment gradable.
else
    minLevel = PHM + 1
    DTR0 (minLevel)
    SET MIN LEVEL
    DTR0 (2)
    SET FADE RATE
    for (i = 0; i < 12; i++)
        command1[i]
        wait 700 ms
        command2[i]
        command3[i]
        wait 600 ms
        answer = QUERY ACTUAL LEVEL
        if (value1Min[i] >answer OR answer> value1Max[i])
            error1 Niveau réel erroné à la phase d'essai i = i. Réel: answer. Attendu:
            value1Min[i] <= niveau <= value1Max[i].
        endif
    endfor
    for (i = 0; i < 12; i++)
        command1[i]
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            wait 700 ms
            command2[i]
            command3[i]
            wait 90 ms
            command3[i]
            wait 450 ms
            answer = QUERY ACTUAL LEVEL
            if (value2Min[i] >answer OR answer> value2Max[i])
                error2 Niveau réel erroné à la phase d'essai i = i. Réel: answer. Attendu:
                value2Min[i] <= level <= value2Max[i].
            endif
        endfor
    endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 77 – Paramètres pour la séquence d'essai 'Level instructions: combined instructions'

Phase d'essai	command1	command2	command3	value1Min	value1Max	value2Min	value2Max
0	DAPC (254)	DAPC (*minLevel*)	UP	**Max** (*minLevel*, **Min** (*minLevel* + 45, 254))	**Min** (**Max** (*minLevel*, *minLevel* + 56), 254)	**Max** (*minLevel*, **Min** (*minLevel* + 69, 254))	**Min** (**Max** (*minLevel*, *minLevel* + 83), 254)
1	DAPC (254)	DAPC (*minLevel*)	STEP UP	**Min** (*minLevel* + 1, 254)	**Min** (*minLevel* + 1, 254)	**Min** (*minLevel* + 2, 254)	**Min** (*minLevel* + 2, 254)
2	DAPC (254)	DAPC (*minLevel*)	ON AND STEP UP	**Min** (*minLevel* + 1, 254)	**Min** (*minLevel* + 1, 254)	**Min** (*minLevel* + 2, 254)	**Min** (*minLevel* + 2, 254)
3	DAPC (254)	RECALL MIN LEVEL	UP	**Max** (*minLevel*, **Min** (*minLevel* + 45, 254))	**Max** (*minLevel*, **Min** (*minLevel* + 56, 254))	**Max** (*minLevel*, **Min** (*minLevel* + 69, 254))	**Max** (*minLevel*, **Min** (*minLevel* + 83, 254))
4	DAPC (254)	RECALL MIN LEVEL	STEP UP	**Min** (*minLevel* + 1, 254)	**Min** (*minLevel* + 1, 254)	**Min** (*minLevel* + 2, 254)	**Min** (*minLevel* + 2, 254)
5	DAPC (254)	RECALL MIN LEVEL	ON AND STEP UP	**Min** (*minLevel* + 1, 254)	**Min** (*minLevel* + 1, 254)	**Min** (*minLevel* + 2, 254)	**Min** (*minLevel* + 2, 254)
6	DAPC (*minLevel*)	DAPC (254)	DOWN	**Max** (*minLevel*, **Min** (254 – 56, 254))	**Max** (*minLevel*, **Min** (254 – 45, 254))	**Max** (*minLevel*, **Min** (254 – 83, 254))	**Max** (*minLevel*, **Min** (254 – 69, 254))
7	DAPC (*minLevel*)	DAPC (254)	STEP DOWN	**Max** (*minLevel*, (254 – 1))	**Max** (*minLevel*, (254 – 1))	**Max** (*minLevel*, (254 – 2))	**Max** (*minLevel*, (254 – 2))
8	DAPC (*minLevel*)	DAPC (254)	STEP DOWN AND OFF	**Max** (*minLevel*, (254 – 1))	**Max** (*minLevel*, (254 – 1))	**Max** (*minLevel*, (254 – 2))	**Max** (*minLevel*, (254 – 2))
9	DAPC (*minLevel*)	RECALL MAX LEVEL	DOWN	**Max** (*minLevel*, **Min** (254 – 56, 254))	**Max** (*minLevel*, **Min** (254 – 45, 254))	**Max** (*minLevel*, **Min** (254 – 83, 254))	**Max** (*minLevel*, **Min** (254 – 69, 254))
10	DAPC (*minLevel*)	RECALL MAX LEVEL	STEP DOWN	**Max** (*minLevel*, (254 – 1))	**Max** (*minLevel*, (254 – 1))	**Max** (*minLevel*, (254 – 2))	**Max** (*minLevel*, (254 – 2))
11	DAPC (*minLevel*)	RECALL MAX LEVEL	STEP DOWN AND OFF	**Max** (*minLevel*, (254 – 1))	**Max** (*minLevel*, (254 – 1))	**Max** (*minLevel*, (254 – 2))	**Max** (*minLevel*, (254 – 2))

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

12.6.15 Power On Level – System Failure Level combined (Niveau de mise sous tension – Niveau de défaillance système combinés)

La séquence d'essai vérifie si le niveau de mise sous tension et les niveaux de défaillance système du DUT sont réglés selon la spécification après application d'un cycle de mise sous tension et d'une défaillance système.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
PHM = QUERY PHYSICAL MINIMUM
if (PHM>= 253)
    report1 L'appareillage de commande n'est pas suffisamment gradable.
else
    capable = false
    if (!GLOBAL_busPowered)
        capable = DetectSFLbeforePOL ()
    endif
    lightSource = vrai
    if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
        lightSource = false// Cette unité logique n'a pas de source de lumière
    endif
    RESET
    wait 300 ms
    // Déterminer une vitesse de modification de l'intensité lumineuse à utiliser dans l'essai
    minSteps = {0, 65, 46, 33, 23, 17, 12, 9, 6, 5, 3, 3, 2, 2, 1, 1} // arrondis vers le bas
    maxSteps = {0, 80, 57, 41, 29, 21, 15, 11, 8, 6, 5, 4, 3, 3, 2, 2} // arrondis vers le haut
    maxStepsToMake = 254 – PHM
    for (fr = 1; fr< 16; fr++)
        if (maxStepsToMake>maxSteps[fr])
            fadeRate = fr + 1 // essayer de ne pas atteindre 254/PHM avec une commande
            UP/DOWN
            break
        endif
    endfor
    DTR0 (PHM)
    SET SCENE 3
    midPoint = (PHM + 254) >> 1
    DTR0 (fadeRate)
    SET FADE RATE
    if (lightSource)
        UserInput (Il est nécessaire d'effectuer tous les mesures de luminosité avec une
        luminosité stabilisée, OK)
        // Obtenir les niveaux de luminosité attendus
        WaitForLampLevel (254)
        light254 = Measure (Rendement lumineux)
        DAPC (midPoint)
        lightMid = Measure (Rendement lumineux)
        RECALL MIN LEVEL
        lightPHM = Measure (Rendement lumineux)
        UP
        lightUP = Measure (Rendement lumineux)
        RECALL MAX LEVEL
        DOWN
        lightDOWN = Measure (Rendement lumineux)
        OFF
        lightOff = Measure (Rendement lumineux)
    endif
    for (i = 0; i < 2; i++)
        for (j = 0; j< 7; j++)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
for (m = 0; m< 3; m++) // [0] aucune durée de modification de l'intensité lumineuse; [1] durée de modification de l'intensité lumineuse != 0; [2] vitesse de modification de l'intensité lumineuse
    if (i == 0) // [0] régler POL et SFL, puis aller vers une cible (régler POL et SFL avant l'envoi de la command2);
        DTR0 (powerOn[j])
        SET POWER ON LEVEL
        DTR0 (systemFailure[j])
        SET SYSTEM FAILURE LEVEL
    else// [1] aller vers une cible, puis régler POL et SFL (régler POL et SFL après l'envoi de la command2)
        DTR0 (254)
        SET POWER ON LEVEL
        SET SYSTEM FAILURE LEVEL
    endif
    DTR0 (fade[m])
    if (m<= 1)
        SET FADE TIME
        kStart = 0
        kEnd = 4
    else
        SET FADE RATE
        kStart = 4
        kEnd = 6
    endif
    for (k = kStart; k< kEnd; k++)
        command1[k]
        WaitForLampOn ()
        command2[k]
        if (i == 1)
            DTR0 (powerOn[j])
            SET POWER ON LEVEL
            DTR0 (systemFailure[j])
            SET SYSTEM FAILURE LEVEL
        endif
        if (GLOBAL_busPowered)
            Disconnect (Interface)
            wait 5 s
            if (lightSource)
                UserInput (Préparer la vérification du comportement lumineux après rétablissement de la tension libre du bus, OK)
                Connect (Interface)
                Start (Mesure de luminosité)
            else
                Connect (Interface)
            endif
            wait 1,5 s
            if (expectedLevel[j] == 0)
                wait 10 s
            else
                WaitForPowerOnPhaseToFinish ()
            endif
            if (lightSource)
                Stop (Mesure de luminosité)
                lightOutput = Measure (Rendement lumineux final)
                if (expectedLight[j] * 0,9 >lightOutput OR lightOutput>expectedLight[j] * 1,1)
                    error1 Niveau de rendement lumineux erroné avec une défaillance système à la phase d'essai (i,j,k)=(i,j,k). Réel: lightOutput. Attendu: expectedLight[j] * 0,9 <= lightOutput <= expectedLight[j] * 1,1.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            endif
            oneSwitch = UserInput (Modification immédiate du rendement lumineux de la position hors tension à la valeur finale?, YesNo)
            if (oneSwitch)
                report2 Le rendement lumineux a adopté directement l'état POL.
            else
                error2 Le rendement lumineux n'a pas adopté directement l'état POL.
            endif
        endif
        answer = QUERY ACTUAL LEVEL
        errorString = -1
        if ( (j == 1 OR j == 3 OR j == 6) AND (k == 4 OR k == 5) )
            if (k == 4 AND (answer<PHM + minSteps[fadeRate] OR answer>PHM + maxSteps[fadeRate]))
                errorString = "PHM + minSteps[fadeRate] <= actualLevel <= PHM + maxSteps[fadeRate]"
            else (k == 5 AND (answer< 254 – maxSteps[fadeRate] OR answer> 254 – minSteps[fadeRate]))
                errorString = "254 – maxSteps[fadeRate] <= actualLevel <= 254 – minSteps[fadeRate]"
            endif
        else
            if (answer != expectedLevel[j])
                errorString = expectedLevel[j]
            endif
        endif
        if (errorString != -1)
            error3 Niveau réel incorrect au rétablissement de la tension libre du bus à la phase d'essai (i,j,k)=(i,j,k). Réel: answer. Attendu: errorString.
        endif
    else
        Switch_off (alimentation secteur)
        wait 5 s //Attendre avant de déconnecter l'interface afin de s'assurer que le DUT n'adoptera pas d'abord l'état SFL dans le cas où son alimentation est plus importante
        Disconnect (Interface)
        wait 1 s
        if (lightSource)
            UserInput (Préparer la vérification du comportement lumineux après mise sous tension de l'alimentation secteur, OK)
            Switch_on (alimentation secteur)
            Start (Mesure de luminosité)
            wait 10 s
            if (expectedLevel[j] != 0)
                UserInput (Attendre que la lumière s'allume et se stabilise, OK)
            endif
            Stop (Mesure de luminosité)
            lightOutput = Measure (Rendement lumineux final)
            if (expectedLight[j] * 0,9 >lightOutput OR lightOutput>expectedLight[j] * 1,1)
                error4 Niveau de rendement lumineux erroné avec une défaillance système à la phase d'essai (i,j,k)=(i,j,k). Réel: lightOutput. Attendu: expectedLight[j] * 0,9 <= lightOutput <= expectedLight[j] * 1,1.
            endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        oneSwitch = UserInput (Modification immédiate du rendement lumineux de la position hors tension à la valeur finale?, YesNo)
        if (oneSwitch)
            report3 Le rendement lumineux a adopté directement l'état SFL.
        else
            if (capable)
                error5 Le rendement lumineux a tout d'abord adopté l'état POL, puis l'état SFL, alors que le DUT est capable de détecter SFL avant de passer à l'état POL.
            else
                report4 Le rendement lumineux a tout d'abord adopté l'état POL, puis l'état SFL, dans la mesure où le DUT n'est pas capable de détecter SFL avant de passer à l'état POL.
            endif
        endif
        UserInput (Préparer la vérification du comportement lumineux après rétablissement de la tension libre du bus, OK)
        Connect (Interface)
        Start (Mesure de luminosité)
        wait 1,5 s
        lightChange = UserInput (Le rendement lumineux a-t-il changé au rétablissement de la tension libre du bus?, YesNo)
        if (lightChange)
            error6 Le rendement lumineux a changé au rétablissement de la tension libre du bus à la phase d'essai (i,j,k)=(i,j,k).
        endif
        Stop (Mesure de luminosité)
        lightOutput = Measure (Rendement lumineux final)
        if (expectedLight[j] * 0,9 >lightOutput OR lightOutput>expectedLight[j] * 1,1)
            error7 Niveau de rendement lumineux incorrect à la restoration de la tension libre du bus à la phase d'essai (i,j,k)=(i,j,k). Réel: lightOutput. Attendu: expectedLight[j] * 0,9 <= lightOutput <= expectedLight[j] * 1,1.
        endif
    else
        Switch_on (alimentation secteur)
        wait 10 s
        Connect (Interface)
        wait 1,5 s
    endif
    answer = QUERY ACTUAL LEVEL
    errorString = -1
    if ( (j == 1) AND (k == 4 OR k == 5) )
        if (k == 4 AND (answer<PHM + minSteps[fadeRate] OR answer>PHM + maxSteps[fadeRate]))
            errorString = "PHM + minSteps[fadeRate] <= actualLevel <= PHM + maxSteps[fadeRate]"
        elseif (k == 5 AND (answer< 254 – maxSteps[fadeRate] OR answer> 254 – minSteps[fadeRate]))
            errorString = "254 – maxSteps[fadeRate] <= actualLevel <= 254 – minSteps[fadeRate]"
        endif
    else
        if (answer != expectedLevel[j])
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                                    errorString = expectedLevel[j]
                                endif
                            endif
                            if (errorString != -1)
                                error8 Niveau réel incorrect au rétablissement de la tension
                                libre du bus à la phase d'essai (i,j,k)=(i,j,k). Réel: answer.
                                Attendu: errorString.
                            endif
                        endif
                    endfor
                endfor
            endfor
        endfor
    endif
```

Tableau 78 – Paramètres pour la séquence d'essai "PowerOnLevel and SystemFailureLevel"

Phase d'essai j	powerOn	systemFailure	expectedLevel		expectedLight	
			busPowered = false	busPowered = true	busPowered = false	busPowered = true
0	*midPoint*	255	*midPoint*	*midPoint*	*lightMid*	*lightMid*
1	255	255	*lastLightLevel*[*k*]	*lastLightLevel*[*k*]	*lastLightOutput*[*k*]	*lastLightOutput*[*k*]
2	*PHM*	*midPoint*	*midPoint*	*PHM*	*lightMid*	*lightPHM*
3	255	*midPoint*	*midPoint*	*lastLightLevel*[*k*]	*lightMid*	*lastLightOutput*[*k*]
4	0	255	0	0	*lightOff*	*lightOff*
5	*PHM*	0	0	*PHM*	*lightOff*	*lightPHM*
6	255	0	0	*lastLightLevel*[*k*]	*lightOff*	*lastLightOutput*[*k*]

Phase d'essai m	fade
0	0
1	8
2	*fadeRate*

Phase d'essai k	command1	command2	lastLightLevel	lastLightOutput
0	RECALL MAX LEVEL	DAPC (0)	0	*lightOff*
1	RECALL MAX LEVEL	DAPC (*PHM*)	*PHM*	*lightPHM*
2	RECALL MIN LEVEL	DAPC (254)	254	*light254*
3	RECALL MAX LEVEL	GO TO SCENE 3	*PHM*	*lightPHM*
4	RECALL MIN LEVEL	UP	*PHM* + *maxSteps*[*fadeRate*]	*lightUp*
5	RECALL MAX LEVEL	DOWN	254 – *minSteps*[*fadeRate*]	*lightDown*

12.6.15.1 DetectSFLbeforePOL

Cette sous-séquence vérifie si le DUT est capable ou non de détecter le niveau de défaillance du système avant de passer au niveau de mise sous tension.

Description de l'essai:

capability= DetectSFLbeforePOL ()

capability = false

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
RESET
wait 300 ms
DTR0 (253)
SET POWER ON LEVEL
DTR0 (0)
SET SYSTEM FAILURE LEVEL
Switch_off (alimentation secteur)
wait 5 s
Apply (Tension de 0 V sur l'interface du bus)
wait 1 s
Switch_on (alimentation secteur)
wait 660 ms
Apply (Tension de GLOBAL_VbusHigh V sur l'interface du bus)
do
    answer = QUERY ACTUAL LEVEL, accept Pas de réponse
while (answer == NO OR answer == 255)
if (answer == 0)
    report1 Le DUT est capable de détecter une SYSTEM FAILURE avant de passer au POWER ON LEVEL.
    capability = true
else if (answer == 253)
    report2 Le DUT n'est pas capable de détecter une SYSTEM FAILURE avant de passer au POWER ON LEVEL.
    capability = false
else
    halt1Le DUT a renvoyé un niveau réel inattendu. L'essai est abandonné.
endif
returncapability
```

12.6.16 ENABLE DAPC SEQUENCE

La séquence d'essai vérifie la courbe de gradation par rapport aux tâches de modification de l'intensité lumineuse avec une séquence de commandes de contrôle direct de la puissance d'arc. La commande ENABLE DAPC SEQUENCE est envoyée au début de la séquence. Il est nécessaire que la courbe de gradation soit strictement monotonique. La mesure est effectué avec un photomètre relié à un oscilloscope à mémoire numérique. L'essai vérifie également si la minuterie déclenchée par la commande ENABLE DAPC SEQUENCE est mise en oeuvre selon la spécification.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report1 L'appareillage de commande n'est pas gradable.
else
    lightSource = vrai
    if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
       lightSource = false// Cette unité logique n'a pas de source de lumière
    endif
    if (lightSource)
        // Lancer la séquence DAPC et vérifier si la courbe de gradation est strictement monotonique
        UserInput (Préparer la vérification du comportement lumineux, OK)
        ENABLE DAPC SEQUENCE
        for (i = 0; i < 14; i++)
            if (level[i] >= PHM)
                DAPC(level[i])
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                wait 170 ms
            endif
        endfor
        monotonicCurve = UserInput (La courbe de gradation est-elle strictement monotonique?, YesNo)
        if (monotonicCurve != Yes)
            error1 Courbe de gradation non strictement monotonique.
        endif
    endif
    // Vérifier le point effectif d'expiration de la minuterie
    fadeTime = 300 ms
    for (i = 0; i<40; i++)
        RECALL MAX LEVEL
        ENABLE DAPC SEQUENCE
        DAPC (1)
        start_timer (timer) // Lancement de la minuterie après l'interruption de la commande DAPC
        waiti ms // Décaler le moment de l'envoi de QUERY STATUS de manière à déterminer le moment de réinitialisation du bit de modification de l'intensité lumineuse
        do
            answer = QUERY STATUS
            timestamp = get_timer (timer) – 10 ms // Soustraire 10 ms qui est la longueur approchée de la trame en arrière afin d'obtenir le moment de départ de cette dernière
        while (answer == XXX1XXXXb AND timestamp< 250 ms)
        if (i == 0 AND timestamp>= 250 ms)
            error2 DAPC SEQUENCE non interrompue après 250 ms.
            break
        endif
        if (timestamp<fadeTime)
            fadeTime = timestamp
        endif
    endfor
    if (i == 40)
        if (fadeTime< 180 ms OR fadeTime> 220 ms)
            error3 Moment inapproprié d'arrêt de DAPC SEQUENCE. Réel: fadeTime ms. Attendu: 180 ms <= temps <= 220 ms.
        endif
    endif
    // Vérifier le point de poursuite/interruption de la séquence
    for (j = 0; j< 2; j++)
        ENABLE DAPC SEQUENCE
        DAPC (254)
        waitdelay[j] ms // Le temps de retard doit être interprété comme le temps d'établissement
        DAPC (1)
        answer = QUERY STATUS
        if (answer != status[j])
            error4 DAPC SEQUENCE text[j] à la phase d'essai j = j. Réel: answer. Attendu: status[j].
        endif
        wait 220 ms
    endfor
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 79 – Paramètres pour la séquence d'essai "ENABLE DAPC SEQUENCE"

Phase d'essai i	0	1	2	3	4	5	6	7	8	9	10	11	12	13
level	254	250	246	241	235	229	221	210	195	170	145	85	60	1

Phase d'essai j	delay	status	text
0	170	XXX1XXXXb	annulé trop tôt
1	230	XXX0XXXXb	non annulé

12.6.17 GO TO LAST ACTIVE LEVEL

La séquence d'essai vérifie le bon fonctionnement de la commande GO TO LAST ACTIVE LEVEL lorsqu'elle est envoyée avec ou sans processus de modification de l'intensité lumineuse. QUERY STATUS sert à vérifier l'état du bit fadeRunning et QUERY ACTUAL LEVEL sert à vérifier le niveau cible.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM>= 253)
    report1 L'appareillage de commande n'est pas suffisamment gradable.
else
    DTR0 (0)
    SET POWER ON LEVEL
    SET SYSTEM FAILURE LEVEL
    for (i = 0; i < 3; i++)
        if (i == 1)
            DTR0 (33) // Régler une modification de l'intensité lumineuse d'une durée de 2 s avec la durée étendue de modification de l'intensité lumineuse
            SET EXTENDED FADE TIME
        else if (i == 2) // Régler une modification de l'intensité lumineuse d'une durée de 2 s avec la durée de modification de l'intensité lumineuse
            DTR0 (4)
            SET FADE TIME
        endif
        for (j = 0; j< 5; j++)
            command[j]
            wait 1 s
            action[j]
            GO TO LAST ACTIVE LEVEL
            WaitForPowerOnPhaseToFinish ()
            if (i>= 1 AND j> 0) // Vérifier si la modification de l'intensité lumineuse a été lancée
                answer = QUERY STATUS
                if (answer != XXX1XXXXb)
                    error1 Modification de l'intensité lumineuse non lancée à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: XXX1XXXXb.
                endif
                wait 2,3 s
            endif
            answer = QUERY STATUS // Vérifier si la modification de l'intensité lumineuse est terminée
            if (answer != XXX0XXXXb)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                    if (i == 0 OR ((i>= 1 AND j == 0))
                        error2 Modification de l'intensité lumineuse lancée à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: XXX0XXXXb.
                    else
                        error3 Modification de l'intensité lumineuse non interrompue à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: XXX0XXXXb.
                    endif
                endif
                answer = QUERY ACTUAL LEVEL
                if (answer != level[j])
                    error4 Niveau réel erroné à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: level[j].
                endif
            endfor
        endfor
    endif
```

Tableau 80 – Paramètres pour la séquence d'essai 'GO TO LAST ACTIVE LEVEL'

Phase d'essai j	command	action	level	description
0	RECALL MIN LEVEL	-	*PHM*	changer le niveau de MIN LEVEL à MAX LEVEL
1	DAPC(254)	-	254	avec i=0, changer le niveau de MAX LEVEL à MIN LEVEL avec i=1, changer le niveau de mi-parcours entre milieu et 254 à 254
2	RECALL MIN LEVEL	**PowerCycleAndWaitForDecoder** (5)	254	changer le niveau de la position arrêt à 254
3	OFF	-	254	changer le niveau de OFF (0) à MAX LEVEL
4	RECALL MAX LEVEL	**Apply** (Tension de 0 V sur l'interface du bus) attendre 1 s **Apply** (Tension de *GLOBAL_VbusHigh* V sur l'interface du bus) attendre 1,2 s	254	changer le niveau de SYSTEM FAILURE LEVEL (0) au niveau existant avant que la lampe ne s'éteigne (MAX LEVEL)

12.6.18 GO TO SCENE

La séquence d'essai vérifie le bon fonctionnement de la commande GO TO SCENE pour chaque scénario. Dans la première partie de l'essai, les scénarii avec des valeurs différentes font l'objet d'un rappel, avec et sans modification de l'intensité lumineuse.

La seconde partie de la séquence d'essai vérifie si la modification de l'intensité lumineuse est interrompue par la commande GO TO SCENE, avec programmation du scénario en tant que valeur 255.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM>= 252)
    report1 L'appareillage de commande n'est pas suffisamment gradable.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
else
    middle = (254 + PHM) >> 1
    DTR0 (PHM + 1)
    SET MIN LEVEL
    DTR0 (253)
    SET MAX LEVEL
    for (i = 0; i< 16; i++) // Pour chaque scénario
        for (k = 0; k< 3; k++) // Régler différentes modifications de l'intensité lumineuse
            if (k == 0)
                DTR0 (0) // Définir Pas de processus de modification de l'intensité lumineuse
                SET FADE TIME
                SET EXTENDED FADE TIME
            else if (k == 1)
                DTR0 (33) // Régler une modification de l'intensité lumineuse d'une durée de 2 s avec la durée étendue de modification de l'intensité lumineuse
                SET EXTENDED FADE TIME
            else if (k == 2)
                DTR0 (4) // Régler une modification de l'intensité lumineuse d'une durée de 2 s avec la durée de modification de l'intensité lumineuse
                SET FADE TIME
            endif
            RECALL MAX LEVEL
            for (j = 0; j< 10; j++) // Définir différentes valeurs pour les scénarii
                DTR0 (value[j])
                SET SCENE i
                GO TO SCENE i
                if (j == 2)
                    do
                        answer = QUERY STATUS
                    while (answer == XXXXX0XXb) //Attendre que le bit lampOn bit soit réglé
                endif
                if (k>= 1)
                    answer = QUERY STATUS
                    if (answer != status[j])
                        error1 text1[j] à la phase d'essai (i,j,k) = (i,j,k). Réel: answer. Attendu: status[j].
                    endif
                    wait 2,2 s
                endif
                answer = QUERY STATUS
                if (answer != XXX0XXXXb)
                    if (k == 0)
                        error2 Modification de l'intensité lumineuse lancée à la phase d'essai (i,j,k) = (i,j,k). Réel: answer. Attendu: XXX0XXXXb.
                    else if (k>= 1 AND value[j] != 255)
                        error3 text2[j] à la phase d'essai (i,j,k) = (i,j,k). Réel: answer. Attendu: XXX0XXXXb.
                    endif
                    WaitForFadeToFinish (5000) // Prévoir 5 s pour terminer le processus de modification de l'intensité lumineuse
                endif
                answer = QUERY ACTUAL LEVEL
                if (answer != level[j])
                    error4 Niveau réel erroné à la phase d'essai (i,j,k) = (i,j,k). Réel: answer. Attendu: level[j].
                endif
            endfor
        endfor
    endfor
    // Vérifier le comportement du DUT lorsqu'il est réglé sur un scénario avec la valeur 255
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        DTR0 (4)
        SET FADE TIME
        for (i = 0; i < 16; i++)
            DTR0 (255)
            SET SCENE i
            RECALL MAX LEVEL
            DAPC(1)
            wait 1 s
            GO TO SCENE i
            answer = QUERY STATUS
            if (answer != XXX1XXXXb)
                error5 GO TO SCENE avec la valeur MASK acceptée, et modification de
                l'intensité lumineuse en cours interrompue à l'étape d'essai i. Réel: answer.
                Attendu: XXX1XXXXb.
            endif
        endfor
    endif
```

Tableau 81 – Paramètres pour la séquence d'essai 'GO TO SCENE'

Phase d'essai j	value	level	status	text1	text2
0	0	0	XXX1XXXXb	Modification de l'intensité lumineuse non commencée	Modification de l'intensité lumineuse non interrompue
1	255	0	XXX0XXXXb	Commande non ignorée et modification de l'intensité lumineuse commencée	-
2	*middle*	*middle*	XXX1XXXXb	Modification de l'intensité lumineuse non commencée	Modification de l'intensité lumineuse non interrompue
3	1	*PHM* + 1	XXX1XXXXb	Modification de l'intensité lumineuse non commencée	Modification de l'intensité lumineuse non interrompue
4	255	*PHM* + 1	XXX0XXXXb	Commande non ignorée et modification de l'intensité lumineuse commencée	-
5	253	253	XXX1XXXXb	Modification de l'intensité lumineuse non commencée	Modification de l'intensité lumineuse non interrompue
6	254	253	XXX0XXXXb	Modification de l'intensité lumineuse lancée	-
7	255	253	XXX0XXXXb	Commande non ignorée et modification de l'intensité lumineuse lancée	-
8	*PHM*	*PHM* + 1	XXX1XXXXb	Modification de l'intensité lumineuse non lancée	Modification de l'intensité lumineuse non interrompue
9	255	*PHM* + 1	XXX0XXXXb	Commande non ignorée et modification de l'intensité lumineuse lancée	-

12.6.19 Power on: level control commands (Mise sous tension: commande de contrôle de niveau)

La séquence d'essai vérifie le comportement du DUT immédiatement après connexion de l'alimentation secteur, par l'envoi de commandes comme suit:

- une commande est envoyée 450 ms après la connexion de l'alimentation secteur
- la même commande est envoyée pendant une durée de 540 ms à partir du moment de connexion de l'alimentation secteur

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Un capteur de luminosité permet également de vérifier le rendement lumineux.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
if (!GLOBAL_busPowered)
    lightSource = vrai
    if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
       lightSource = false // Cette unité logique n'a pas de source de lumière
    endif
    RESET
    wait 300 ms
    PHM = QUERY PHYSICAL MINIMUM
    mid = (PHM + 254) >> 1
    DTR0 (254)
    SET SCENE 0
    DTR0 (255)
    SET SCENE 1
    DTR0 (mid)
    SET POWER ON LEVEL
    for (i = 0; i < 2; i++)
        for (j = 0; j< 15; j++)
            command1[j]
            WaitForLampOn ()
            if (lightSource)
                UserInput (Préparer la vérification du comportement lumineux après mise
                sous tension de l'alimentation secteur, OK)
                Start (Observation de luminosité)
            endif
            timestamp = PowerCycleAndWaitForBusPower (5)
            if (timestamp > 420)
                report1 Rétablissement de l'alimentation interne du bus trop lente pour cet
                essai.
                j = 15
                i = 2
            else
                if (i == 0)
                    wait(520 – timestamp) ms // Récepteur prêt au plus tard à 520 ms
                    command2[j] // Envoyer la commande une seule fois
                else
                    start_timer(timer)
                    do
                        command2[j]
                    while (get_timer(timer) < 540 ms) // Poursuivre l'envoi de la même
                    commande pendant une durée de 540 ms
                endif
                if (lightSource)
                    if (expectedLevel[j] == 0)
                        wait 5 s
                        Stop (Observation de luminosité)
                        lampOn = UserInput (La lampe s'est-elle allumée?, YesNo)
                        if (lampOn == Yes)
                            error1 Sur la base du rendement lumineux, la lampe s'est
                            allumée après réception de la commande command2[j] à la
                            phase d'essai (i,j) = (i,j).
                        endif
                    else
                        WaitForPowerOnPhaseToFinish ()
                        Stop (Observation de luminosité)
                        lampOn = UserInput (La lampe s'est-elle allumée?, YesNo)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                        if (lampOn == Yes)
                            flickering = UserInput (Présentait-elle un papillotement?, YesNo)
                            if (flickering == Yes)
                                error2 Papillotement de la lampe au moment de son passage au niveau cible à la phase d'essai (i,j) = (i,j).
                            endif
                        else
                            error3 Sur la base du rendement lumineux, la lampe ne s'est pas allumée après réception de la commande command2[j] à la phase d'essai (i,j) = (i,j).
                        endif
                    endif
                else
                    if (expectedLevel[j] == 0)
                        wait 5 s
                    else
                        WaitForPowerOnPhaseToFinish ()
                    endif
                endif
                answer = QUERY ACTUAL LEVEL
                if (answer != expectedLevel[j])
                    error4 Niveau réel erroné après réception de la commande command2[j] à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: expectedLevel[j].
                endif
            endif
        endfor
    endfor
endif
```

Tableau 82 – Paramètres pour la séquence d'essai 'Power on: level control commands'

Phase d'essai j	command1	command2	expectedLevel	
			i = 0	i = 1
0	RECALL MIN LEVEL	DAPC (0)	0	0
1	RECALL MIN LEVEL	DAPC (254)	254	254
2	RECALL MIN LEVEL	DAPC (255)	0	0
3	RECALL MIN LEVEL	OFF	0	0
4	RECALL MIN LEVEL	UP	0	0
5	RECALL MIN LEVEL	DOWN	0	0
6	RECALL MIN LEVEL	STEP UP	0	0
7	RECALL MIN LEVEL	STEP DOWN	0	0
8	RECALL MIN LEVEL	RECALL MAX LEVEL	254	254
9	RECALL MAX LEVEL	RECALL MIN LEVEL	*PHM*	*PHM*
10	RECALL MIN LEVEL	STEP DOWN AND OFF	0	0
11	RECALL MAX LEVEL	ON AND STEP UP	*PHM*	>= *PHM*
12	RECALL MAX LEVEL	GO TO LAST ACTIVE LEVEL	254	254
13	RECALL MIN LEVEL	GO TO SCENE 0	254	254
14	RECALL MAX LEVEL	GO TO SCENE 1	*mid*	*mid*

12.6.20 Logarithmic dimming curve (courbe de gradation logarithmique)

La séquence d'essai vérifie le rendement lumineux à des niveaux de puissance d'arc définis. La mesure est effectué au moyen d'un capteur de luminosité.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report1 L'appareillage de commande n'est pas gradable.
else
    lightSource = vrai
    if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
       lightSource = false // Cette unité logique n'a pas de source de lumière
    endif
    if (lightSource)
        UserInput (Il est nécessaire d'effectuer toutes les mesures de luminosité avec une
        luminosité stabilisée, OK)
        light254 = Measure (Rendement lumineux)
        for (i = 0; i < 10; i++)
            if (level[i] >= PHM)
                DAPC (level[i])
                lightAtLevel = Measure (Rendement lumineux)
                value = (lightAtLevel / light254) * 100
                if (minimum[i] >value OR value>maximum[i])
                    error1 Valeur i en dehors des limites de tolérance. Réel: value.
                    Attendu: minimum[i] <= valeur <= maximum[i].
                endif
            endif
        endfor
    else
        report2 L'appareillage de commande ne comporte pas de source de lumière.
    endif
endif
```

Tableau 83 – Paramètres pour la séquence d'essai 'Logarithmic dimming curve'

Phase d'essai i	level	minimum	nominal	maximum
0	243	63,53	74,05	86,14
1	229	40,00	50,53	71,00
2	216	27,28	35,43	52,09
3	195	15,00	19,97	30,00
4	170	7,00	10,09	15,00
5	145	3,93	5,10	7,50
6	126	2,00	3,04	4,50
7	85	0,50	0,99	2,00
8	60	0,25	0,50	1,00
9	1	0,05	0,10	0,20

12.6.21 Courbe de gradation DAPC (contrôle direct de la puissance d'arc)

La séquence d'essai doit servir à vérifier la courbe de gradation lors des tâches de modification de l'intensité lumineuse avec la commande DAPC. L'unité logique est programmée avec une durée de modification de l'intensité lumineuse de 4 s. Elle est contrainte d'effectuer une gradation au minLevel, puis au maxLevel. Il est nécessaire que la courbe de gradation soit strictement monotonique. La mesure est effectué avec un photomètre relié à un oscilloscope à mémoire numérique.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report1 L'appareillage de commande n'est pas gradable.
else
    lightSource = vrai
    if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
       lightSource = false // Cette unité logique n'a pas de source de lumière
    endif
    if (lightSource)
        for (i = 0; i < 2; i++)
            DTR0 (value[i])
            command[i] //Régler une modification de l'intensité lumineuse d'une durée de 4
            s
            UserInput (Préparer la vérification du comportement lumineux, OK)
            DAPC (PHM)
            wait 5 s
            monotonicCurve = UserInput (La courbe de gradation est-elle strictement
            monotonique?, YesNo)
            if (monotonicCurve != Yes)
                error1 Courbe de gradation non strictement monotonique à la phase
                d'essai i = i.
            endif
            UserInput (Préparer la vérification du comportement lumineux, OK)
            DAPC (254)
            wait 5 s
            monotonicCurve = UserInput (La courbe de gradation est-elle strictement
            monotonique?, YesNo)
            if (monotonicCurve != Yes)
                error2 Courbe de gradation non strictement monotonique à la phase
                d'essai i = i.
            endif
        endfor
    else
        report2 L'appareillage de commande ne comporte pas de source de lumière.
    endif
endif
```

Tableau 84 – Paramètres pour la séquence d'essai 'Dimming curve: DAPC' (contrôle direct de la puissance d'arc)

Phase d'essai i	value	command
0	00100011b	SET EXTENDED FADE TIME
1	6	SET FADE TIME

12.6.22 Courbe de gradation: UP / DOWN

La séquence d'essai doit servir à vérifier la courbe de gradation lors des tâches de modification de l'intensité lumineuse avec les commandes UP et DOWN. Il est nécessaire que la courbe de gradation soit strictement monotonique. La mesure est effectué avec un photomètre relié à un oscilloscope à mémoire numérique.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report1 L'appareillage de commande n'est pas gradable.
else
    lightSource = vrai
    if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
       lightSource = false // Cette unité logique n'a pas de source de lumière
    endif
    if (lightSource)
        UserInput (Préparer la vérification du comportement lumineux, OK)
        for (i = 0; i < 61; i++)
            DOWN
            wait 90 ms // S'assurer que la durée du temps d'établissement est de 90 ms de
            manière à avoir des intervalles de 100 ms entre la réception des
            commandes=demi-durée et vitesse de modification de l'intensité lumineuse
        endfor
        monotonicCurve = UserInput (La courbe de gradation est-elle strictement
        monotonique?, YesNo)
        if (monotonicCurve != Yes)
            error1 Courbe de gradation non strictement monotonique.
        endif
        UserInput (Préparer la vérification du comportement lumineux, OK)
        for (i = 0; i < 61; i++)
            UP
            wait 90 ms // S'assurer que la durée du temps d'établissement est de 90 ms de
            manière à avoir des intervalles de 100 ms entre la réception des
            commandes=demi-durée et vitesse de modification de l'intensité lumineuse
        endfor
        monotonicCurve = UserInput (La courbe de gradation est-elle strictement
        monotonique?, YesNo)
        if (monotonicCurve != Yes)
            error2 Courbe de gradation non strictement monotonique.
        endif
    else
        report2 L'appareillage de commande ne comporte pas de source de lumière.
    endif
endif
```

12.6.23 Courbe de gradation: STEP UP / STEP DOWN

La séquence d'essai doit servir à vérifier la courbe de gradation lors des tâches de modification de l'intensité lumineuse avec les commandes STEP UP et STEP DOWN. Il est nécessaire que la courbe de gradation soit strictement monotonique. La mesure est effectué avec un photomètre relié à un oscilloscope à mémoire numérique.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (PHM == 254)
    report1 L'appareillage de commande n'est pas gradable.
else
    lightSource = vrai
    if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        lightSource = false // Cette unité logique n'a pas de source de lumière
    endif
    if (lightSource)
        iEnd = 254 – PHM
        UserInput (Préparer la vérification du comportement lumineux, OK)
        for (i = 0; i<iEnd; i++)
            STEP DOWN
            wait 50 ms
        endfor
        monotonicCurve = UserInput (La courbe de gradation est-elle strictement
        monotonique?, YesNo)
        if (monotonicCurve != Yes)
            error1 Courbe de gradation non strictement monotonique.
        endif
        UserInput (Préparer la vérification du comportement lumineux, OK)
        for (i = 0; i<iEnd; i++)
            STEP UP
            wait 50 ms
        monotonicCurve = UserInput (La courbe de gradation est-elle strictement
        monotonique?, YesNo)
        if (monotonicCurve != Yes)
            error2 Courbe de gradation non strictement monotonique.
        endif
    else
        report2 L'appareillage de commande ne comporte pas de source de lumière.
    endif
endif
```

12.6.24 FADE TIME/EXTENDED FADE TIME: light output behaviour (FADE TIME/EXTENDED FADE TIME: comportement de rendement lumineux)

La séquence d'essai doit servir à vérifier si le moment où la lampe est hors tension (sur la base du rendement lumineux) est reporté dans le niveau réel consigné (donné sur l'interface du bus). Cette vérification est effectuée alors qu'il est nécessaire que le DUT réalise une gradation du niveau maximum à la position arrêt, en utilisant une FADE TIME ou une EXTENDED FADE TIME.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
lightSource = vrai
if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
    lightSource = false // Cette unité logique n'a pas de source de lumière
endif
if (lightSource)
    RESET
    wait 300 ms
    for (i = 0; i < 2; i++)
        RECALL MAX LEVEL
        WaitForLampOn ()
        DTR0 (value[i])
        command[i] // Régler une modification de l'intensité lumineuse d'une durée de 4 s
        Start (Contrôle du comportement du rendement lumineux et de l'interface, OK)
        DAPC (0)
        start_timer (timer) // Lancement de la minuterie après l'interruption de la commande
        DAPC
        do
            answer = QUERY ACTUAL LEVEL
            timestamp = get_timer (timer)
        while (answer != 0 AND timestamp< 5 s)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        if (timestamp>= 5 s)
            error1 Sur la base du niveau réel, la lumière ne s'est pas éteinte après une
            durée de 5 s du processus de modification de l'intensité lumineuse.
        endif
        Stop (Contrôle du comportement du rendement lumineux et de l'interface, OK)
        lampOff = UserInput (La lumière est-elle éteinte?, YesNo)
        if (lampOff != Yes)
            error2 La lumière ne s'est pas éteinte près une durée de 5 s du processus de
            modification de l'intensité lumineuse.
        else
            // Vérifier que le niveau réel consigné reflète l'instant de mise sous/hors tension
            de la lampe
            answer = UserInput (Sur la base du contrôle du rendement lumineux et de
            l'interface, la lampe est-elle hors tension lors de l'interruption de l'envoi des
            commandes?, YesNo)
            if (answer == No)
                error3 La mise hors tension de la lampe et le niveau réel consigné ne sont
                pas synchronisés.
            endif
        endif
    endfor
else
    report1 L'appareillage de commande ne comporte pas de source de lumière.
endif
```

Tableau 85 – Paramètres pour la séquence d'essai 'FADE TIME/EXTENDED FADE TIME: light output behaviour'

Phase d'essai i	value	command
0	00100011b	SET EXTENDED FADE TIME
1	6	SET FADE TIME

12.6.25 EXTENDED FADE TIME: light output behaviour (EXTENDED FADE TIME: comportement de rendement lumineux)

La séquence d'essai doit servir à vérifier si le rendement lumineux dans la transition entre niveau max et position d'arrêt est effectif

- sans modification de l'intensité lumineuse ou avec une durée étendue de modification de l'intensité lumineuse inférieure à la durée que le dispositif est physiquement capable de prendre en charge. Le rendement lumineux doit être ajusté le plus rapidement possible;
- avec une durée étendue de modification de l'intensité lumineuse supérieure à la durée que le dispositif est physiquement capable de prendre en charge. Le rendement lumineux doit être ajusté tel qu'indiqué par la modification de l'intensité lumineuse définie.

L'essai vérifie également si le moment où la lampe est hors tension (sur la base du rendement lumineux) est reporté dans le niveau réel consigné (donné sur l'interface du bus).

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
lightSource = vrai
if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
    lightSource = false // Cette unité logique n'a pas de source de lumière
endif
if (lightSource)
    RESET
    wait 300 ms
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
// Sans lancer de modification de l'intensité lumineuse, vérifier le temps nécessaire au dispositif pour mettre la lampe hors tension
Start (Contrôler le comportement du rendement lumineux et de l'interface, et préparer le mesure du temps nécessaire pour mettre la lampe hors tension, OK)
DAPC (0)
start_timer (timer) // Lancement de la minuterie après l'interruption de la commande DAPC
do
    answer = QUERY ACTUAL LEVEL
    timestamp = get_timer (timer)
while (answer != 0 AND timestamp< 1 s)
if (timestamp>= 1 s)
    error1 Sur la base du niveau réel, la lumière ne s'est pas éteinte après une durée de 1 s.
endif
Stop (Contrôle du comportement du rendement lumineux et de l'interface, OK)
lampOff = UserInput (La lumière est-elle éteinte?, YesNo)
if (lampOff != Yes)
    error2 La lumière ne s'est pas éteinte après une durée de 1 s du processus de modification de l'intensité lumineuse.
else
    lampOffNoFade = UserInput (Saisir la durée nécessaire entre l'arrêt de la commande DAPC et l'extinction de la lumière, value[ms])
    if (lampOffNoFade< 100 ms)
        report 1 Essai non utile pour un dispositif qui peut réaliser une gradation en moins de 100 ms sans modification de l'intensité lumineuse.
    else
        if (lampOffNoFade>600 ms)
            error3 Sur la base du rendement lumineux mesuré, la lumière ne s'est pas éteinte comme attendu. Réel lampOffNoFade ms. Attendu: <= 600 ms.
        endif
        // Déterminer les limites inférieure et supérieure du processus de modification de l'intensité lumineuse en utilisant la durée étendue de modification de l'intensité lumineuse
        fadeLimit[0] = Max (0, (RoundDown (lampOffNoFade / 100)) – 1)
        fadeLimit[1] = fadeLimit[0] + 1
        level[0] = lampOffNoFade
        level[1] = fadeLimit[1] * 100
        // Lancer le processus de modification en utilisant la durée étendue de modification de l'intensité lumineuse
        for (i = 0; i < 2; i++)
            RECALL MAX LEVEL
            WaitForLampOn ()
            DTR0 (16 + fadeLimit[i])
            SET EXTENDED FADE TIME
            Start (Contrôle du comportement du rendement lumineux et de l'interface, OK)
            DAPC (0)
            start_timer (timer) // Lancement de la minuterie après l'interruption de la commande DAPC
            do
                answer = QUERY ACTUAL LEVEL
                timestamp = get_timer (timer)
            while (answer != 0 AND timestamp< 1 s)
            if (timestamp>= 1 s)
                error4 Sur la base du niveau réel, la lumière ne s'est pas éteinte après une durée de 1 s du processus de modification de l'intensité lumineuse.
            endif
            Stop (Contrôle du comportement du rendement lumineux et de l'interface, OK)
            lampOff = UserInput (La lumière est-elle éteinte?, YesNo)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                    if (lampOff != Yes)
                        error5 La lumière ne s'est pas éteinte après une durée de 1 s du processus de modification de l'intensité lumineuse.
                    else
                        fadingTime = UserInput (Saisir la durée nécessaire entre l'arrêt de la commande DAPC et l'extinction de la lumière, value[ms])
                        if(i == 0 AND (fadingTime<level[i] – 10 ms OR fadingTime>level[i] + 10 ms))
                            error6 Sur la base du rendement lumineux mesuré, la lumière ne s'est pas éteinte comme attendu. Réel fadingTimems. Attendu: (level[i]- 10) ms <= temps <= (level[i]+ 10) ms.
                        endif
                        if(i == 1 AND (fadingTime<level[i] * 0,95 OR fadingTime>level[i] * 1,05))
                            error7 Sur la base du rendement lumineux mesuré, la lumière ne s'est pas éteinte comme attendu. Réel fadingTime ms. Attendu: (level[i] *0,95) ms <= temps <= (level[i] * 1,05) ms.
                        endif
                        // Vérifier que le niveau réel consigné reflète l'instant de mise sous/hors tension de la lampe
                        answer = UserInput (Sur la base du contrôle du rendement lumineux et de l'interface, la lampe est-elle hors tension lors de l'interruption de l'envoi des commandes?, YesNo)
                        if (answer == No)
                            error8 La mise hors tension de la lampe et le niveau réel consigné ne sont pas synchronisés.
                        endif
                    endif
                endfor
            endif
        endif
    else
        report2 L'appareillage de commande ne comporte pas de source de lumière.
    endif
```

12.6.26 Comportement lors d'une modification de l'intensité lumineuse

La séquence d'essai vérifie si un changement de fadeTime, extendedFadeTimeBase, extendedFadeTimeMultiplier ou fadeRate lors d'une modification de l'intensité lumineuse en cours n'affecte pas cette dernière, et vérifie par ailleurs que la modification de l'intensité lumineuse suivante utilisera les valeurs recalculées. L'essai peut être effectué sur une unité logique gradable.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
PHM = QUERY PHYSICAL MINIMUM
if (PHM>= 247)
    report1 L'appareillage de commande n'est pas suffisamment gradable.
else
    RESET
    wait 300 ms
    for (i = 0; i < 4; i++)
        RECALL MAX LEVEL
        DTR0 (value1[i])
        command1[i] // Définir un réglage de la modification de l'intensité lumineuse
        command2[i] // Lancer la modification de l'intensité lumineuse
        start_timer (timer) // Lancement de la minuterie après l'interruption de la commande DAPC
        waitdelay[i] ms
        DTR0 (value2[i])
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        command1[i] // Changer le réglage de la modification de l'intensité lumineuse
        do// Vérifier le moment où la modification de l'intensité lumineuse s'achève
            answer = QUERY STATUS
            timestamp = get_timer (timer) // Obtenir le temps en ms
        while (answer == XXX1XXXXb AND timestamp<fade1Limit[i])
        if (timestamp>= fade1Limit[i])
            error1 Modification de l'intensité lumineuse non interrompue après fade1Limit[i]
            ms à la phase d'essai i = i.
        else
            if (i< 3)
                if (timestamp<fade1Min[i] OR timestamp>fade1Max[i])
                    error2 FADE TIME modifiée à la phase d'essai i = i. Réel: timestamp
                    ms. Attendu: fade1Min[i] ms <= temps <= fade1Max[i] ms.
                endif
            else
                answer = QUERY ACTUAL LEVEL
                s = 254 – answer
                if (s<fade1Min[i] OR s>fade1Max[i])
                    error3 FADE RATE modifiée à la phase d'essai i = i. Nombre réel de
                    pas réalisés: s. Attendu: fade1Min[i] <= s <= fade1Max[i].
                endif
            endif
        endif
        RECALL MAX LEVEL
        command2[i] // Lancer une nouvelle modification de l'intensité lumineuse
        start_timer (timer) // Lancement de la minuterie après l'interruption de la commande
        DAPC
        do// Vérifier le moment où la modification de l'intensité lumineuse s'achève
            answer = QUERY STATUS
            timestamp = get_timer (timer) // Obtenir le temps en ms
        while (answer == XXX1XXXXb AND timestamp<fade2Limit[i])
        if (timestamp>= fade2Limit[i])
            error4 Modification de l'intensité lumineuse non interrompue après fade2Limit[i]
            à la phase d'essai i = i.
        else
            if (i< 3)
                if (timestamp<fade2Min[i] OR timestamp>fade2Max[i])
                    error5 FADE TIME incorrecte appliquée à la phase d'essai i = i. Réel:
                    timestamp ms. Attendu: fade2Min[i] ms <= temps <= fade2Max[i] ms.
                endif
            else
                answer = QUERY ACTUAL LEVEL
                s = 254 – answer
                if (s<fade2Min[i] OR s>fade2Max[i])
                    error6 FADE RATE incorrecte appliquée à la phase d'essai i = i.
                    Nombre réel de pas réalisés: s. Attendu: fade2Min[i] <= s <=
                    fade2Max[i].
                endif
            endif
        endif
    endfor
endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 86 – Paramètres pour la séquence d'essai 'Behaviour during a fade'

Phase d'essai i	0	1	2	3
value1	00100000b	00100000b	2	13
value2	00100011b	00110000b	6	8
command1	SET EXTENDED FADE TIME	SET EXTENDED FADE TIME	SET FADE TIME	SET FADE RATE
command2	DAPC (1)	DAPC (1)	DAPC (1)	DOWN
delay	500	500	500	100
fade1Min	950 ms	950 ms	950 ms	1
fade1Max	1050 ms	1050 ms	1100 ms	2
fade1Limit	1200 ms	1200 ms	1200 ms	250 ms
fade2Min	3800 ms	9500 ms	3600 ms	5
fade2Max	4200 ms	10500 ms	4400 ms	7
fade2Limit	4300 ms	10600 ms	4500 ms	250 ms
test stepdescription	modifier la base de durée étendue de modification de l'intensité lumineuse	modifier le multiplicateur de durée étendue de modification de l'intensité lumineuse	modifier la durée de modification de l'intensité lumineuse	modifier la vitesse de modification de l'intensité lumineuse

12.7 Commandes spéciales

12.7.1 INITIALISE – minuterie

La séquence d'essai vérifie les paramètres suivants:

- les valeurs réinitialisées et de mise sous tension pour la variable initialisationState
- initialisationState est DISABLED par la commande RESET
- le bon fonctionnement de la minuterie de 15 min (démarrage, arrêt et prolongement de la minuterie)
- activation de initialisationState avec la lampe hors tension

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
responsiveDevice = GLOBAL_currentUnderTestLogicalUnit<< 1 + 1
// Vérifier par essai la valeur de réinitialisation pour la variable initialisationState
TERMINATE
RESET
wait 300 ms
INITIALISE (responsiveDevice) // initialisationState = ENABLED
RESET
wait 300 ms
RANDOMISE
wait 100 ms
answer = GetRandomAddress ()
if (answer == 0xFF FF FF)
    error1 initialisationState désactivé par la commande RESET. Exécution de la commande
    RANDOMISE attendue après la commande RESET.
endif
TERMINATE
INITIALISE (responsiveDevice)
WITHDRAW // initialisationState = WITHDRAWN
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
RESET
wait 300 ms
RANDOMISE
wait 100 ms
answer = GetRandomAddress ()
if (answer == 0xFF FF FF)
    error2 initialisationState désactivé par la commande RESET. Exécution de la commande RANDOMISE attendue après la commande RESET.
endif
// Vérifier par essai la valeur de mise sous tension pour la variable initialisationState
TERMINATE
INITIALISE (responsiveDevice)
PowerCycleAndWaitForDecoder (5)
RANDOMISE
wait 100 ms
answer = GetRandomAddress ()
if (answer != 0xFF FF FF)
    error3 Valeur de mise sous tension erronée pour initialisationState. Aucune exécution de la commande RANDOMISE attendue après le cycle de mise sous tension.
endif
TERMINATE
// Vérifier que initialisationState est activé par la commande INITIALISE, et que la minuterie s'arrête après 15 min
INITIALISE (responsiveDevice)
start_timer (timer)
answer = QUERY SHORT ADDRESS
if (answer != responsiveDevice)
    error4 initialisationState non activé. Réel: answer. Attendu: responsiveDevice.
endif
do
    time = get_timer (timer)
    answer = QUERY SHORT ADDRESS
    if (answer != responsiveDevice)
        break
    endif
while (time< 17 min)
if (time< (15 – 1,5))
    error5 Expiration trop précoce de la minuterie d'initialisation. Réel: time min. Attendu: 13,5 min < minuterie < 16,5 min.
else if (time> (15 + 1,5))
    error6 Expiration trop tardive de la minuterie d'initialisation. Réel: time min. Attendu: 13,5 min < minuterie < 16,5 min.
endif
TERMINATE
// Vérifier que la minuterie se prolonge
INITIALISE (responsiveDevice)
start_timer (timer)
wait 5 min
INITIALISE (responsiveDevice)
do
    time = get_timer (timer)
    answer = QUERY SHORT ADDRESS
    if (answer != responsiveDevice)
        break
    endif
while (time< 22 min)
if (time< ((15 + 5) – 1,5))
    error7 Expiration trop précoce de la minuterie d'initialisation redéclenchée. Réel: time min. Attendu: 18,5 min < minuterie < 21,5 min.
else if (time> ((15 + 5) + 1,5))
    error8 Expiration trop tardive de la minuterie d'initialisation redéclenchée. Réel: time min. Attendu: 18,5 min < minuterie < 21,5 min.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
endif
TERMINATE
// Vérifier que initialisationState est activé avec la lampe hors tension
RESET
wait 300 ms
OFF
INITIALISE (responsiveDevice)
answer = QUERY SHORT ADDRESS
if (answer != responsiveDevice)
    error9 initialisationState non activé avec la lampe hors tension. Réel: answer. Attendu:
    responsiveDevice.
endif
TERMINATE
```

12.7.2 TERMINATE

La séquence d'essai vérifie si la commande TERMINATE désactive l'initialisationState.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
PowerCycleAndWaitForDecoder (5)
RESET
wait 300 ms
responsiveDevice = GLOBAL_currentUnderTestLogicalUnit<< 1 + 1
INITIALISE (responsiveDevice)
answer = QUERY SHORT ADDRESS
if (answer != responsiveDevice)
    error1 initialisationState non activé. Réel: answer. Attendu: responsiveDevice.
endif
TERMINATE
answer = QUERY SHORT ADDRESS
if (answer != NO)
    error2 initialisationState non désactivé. Réel: answer. Attendu: NO.
endif
```

12.7.3 INITIALISE – device addressing (INITIALISE – adressage de dispositif)

La séquence d'essai vérifie le schéma d'adressage du dispositif défini dans la norme, dans deux cas: lorsque le DUT n'a pas d'adresse courte et lorsqu'une adresse courte est attribuée au DUT.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
oldAddress = GLOBAL_currentUnderTestLogicalUnit
newAddress = 63
for (i = 0; i < 2; i++)
    SetShortAddress (fromAddress[i]; toAddress[i])
    for (j = 0; j<5; j++)
        INITIALISE (device[j])
        answer = QUERY SHORT ADDRESS
        if (answer != shortAddress[i,j])
            error1 Réponse erronée de l'unité logique à la phase d'essai (i,j) = (i,j). Réel:
            answer. Attendu: shortAddress[i,j].
        endif
        TERMINATE
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    endfor
endfor
SetShortAddress (newAddress; oldAddress)
```

Tableau 87 – Paramètres pour la séquence d'essai "INITIALISE – device addressing"

Phase d'essai i	fromAddress	toAddress
0	*oldAddress*	MASK
1	MASK	*newAddress*

Phase d'essai j	device	*GLOBAL_numberShortAddresses*	shortAddress		test step description
			i = 0 (no shortAddress)	i = 1 (shortAddress = newAddress)	
0	0	1	MASK	*newAddress*<<1+1	Réponse de toutes les unités logiques
		>1	trame en arrière non valide	trame en arrière non valide	
1	255		MASK	NO	Seules les unités logiques sans shortAddress répondent
2	*newAddress* <<1+1		NO	*newAddress*<<1+1	Seules les unités logiques avec shortAddress = *newAddress* répondent
3	01111110b		NO	NO	Aucune unité logique ne répond
4	11111110b		NO	NO	Aucune unité logique ne répond

12.7.4 RANDOMISE

La séquence d'essai vérifie le bon fonctionnement de la commande RANDOMISE lorsque initialisationState a l'une des valeurs suivantes: désactivé, activé ou supprimé.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
TERMINATE
RANDOMISE
wait 100 ms
randomAddress = GetRandomAddress ()
if (randomAddress != 0xFF FF FF)
    error1 Commande exécutée lorsque initialisationState est désactivé. Réel:
    randomAddress. Attendu: 0xFF FF FF.
endif
RESET
wait 300 ms
responsiveDevice = GLOBAL_currentUnderTestLogicalUnit<< 1 + 1
INITIALISE (responsiveDevice)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
RANDOMISE
wait 100 ms
randomAddress1 = GetRandomAddress ()
if (randomAddress1 == 0xFFFFFF)
    error2 Commande non exécutée lorsque initialisationState est activé. L'adresse aléatoire générée est 0xFF FF FF.
endif
SetSearchAddress (randomAddress1)
WITHDRAW
RANDOMISE
wait 100 ms
randomAddress2 = GetRandomAddress ()
if (randomAddress2 == randomAddress1)
    error3 Commande non exécutée lorsque initialisationState est supprimé. Aucune nouvelle adresse aléatoire générée.
endif
TERMINATE
```

12.7.5 COMPARE

La séquence d'essai vérifie le bon fonctionnement de la commande COMPARE lorsque initialisationState est soit désactivé, soit activé. L'essai vérifie également le moment où il convient que le DUT envoie une réponse à la commande COMPARE, selon les randomAddress et searchAddress mémorisées dans le DUT.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
TERMINATE
responsiveDevice = GLOBAL_currentUnderTestLogicalUnit<< 1 + 1
answer = COMPARE
if (answer != NO)
    error1 Commande exécutée lorsque initialisationState est désactivé et randomAddress = searchAddress = 0xFF FF FF. Réel: answer. Attendu: NO.
endif
INITIALISE (responsiveDevice)
answer = COMPARE
if (answer!= YES)
    error2 Commande non exécutée lorsque initialisationState est activé et randomAddress = searchAddress = 0xFF FF FF. Réel: answer. Attendu: YES.
endif
randomAddress = GetLimitedRandomAddress (responsiveDevice)
if (randomAddress == 0xFF FF FF)
    error3 Générateur aléatoire inapproprié. À des fins d'essai, chaque octet de l'adresse aléatoire doit se situer dans la plage [0x01, 0xFE].
else
    INITIALISE (responsiveDevice)
    for (i = 0; i < 7; i++)
        SetSearchAddress (data[i])
        answer = COMPARE
        if (answer != value[i])
            error4 errorText[i] à la phase d'essai i = i. Réel: answer. Attendu: value[i].
        endif
    endfor
    TERMINATE
    answer = COMPARE
    if (answer != NO)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

error5 Commande exécutée lorsque initialisationState est désactivé et randomAddress = searchAddress et différent de 0xFF FF FF. Réel: *answer*. Attendu: NO.

endif

endif

Tableau 88 – Paramètres pour la séquence d'essai 'COMPARE'

Phase d'essai i	data	value	errorText
0	*randomAddress* + 0x01 00 00	YES	Commande non exécutée avec RANDOM ADDRESS < SEARCH ADDRESS
1	*randomAddress* + 0x00 01 00	YES	Commande non exécutée avec RANDOM ADDRESS < SEARCH ADDRESS
2	*randomAddress* + 0x00 00 01	YES	Commande non exécutée avec RANDOM ADDRESS < SEARCH ADDRESS
3	*randomAddress* – 0x01 00 00	NO	Commande exécutée avec RANDOM ADDRESS > SEARCH ADDRESS
4	*randomAddress* – 0x00 01 00	NO	Commande exécutée avec RANDOM ADDRESS > SEARCH ADDRESS
5	*randomAddress* – 0x00 00 01	NO	Commande exécutée avec RANDOM ADDRESS > SEARCH ADDRESS
6	*randomAddress*	YES	Commande non exécutée avec RANDOM ADDRESS = SEARCH ADDRESS

12.7.6 WITHDRAW

La séquence d'essai vérifie le bon fonctionnement de la commande WITHDRAW. L'essai vérifie également qu'il convient que la commande INITIALISE ne relance pas le processus de comparaison et ne prolonge pas la minuterie d'initialisation.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

RESET
wait 300 ms
responsiveDevice = *GLOBAL_currentUnderTestLogicalUnit*<< 1 + 1
randomAddress = **GetLimitedRandomAddress** (*responsiveDevice*)
if (*randomAddress* == 0xFF FF FF)
    error1 Générateur aléatoire inapproprié. À des fins d'essai, chaque octet de l'adresse aléatoire doit se situer dans la plage [0x01, 0xFE].
else
    for (*i* = 0; *i* < 7; *i*++)
        TERMINATE
        INITIALISE (*responsiveDevice*)
        SetSearchAddress (*data*[*i*])
        WITHDRAW
        SetSearchAddress (*randomAddress*)
        answer = COMPARE
        if (*answer* != *value*[*i*])
            error2 *errorText*[*i*] à la phase d'essai = *i*. Réel: *answer*. Attendu: *value*[*i*].
        endif
    endfor
    INITIALISE (*responsiveDevice*)
    answer = COMPARE
    if (*answer* != NO)
        error3 INITIALISE réinitialise initialisationState sur ENABLED. Réel: *answer*. Attendu: NO.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    endif
    TERMINATE
endif
// Vérifier que la minuterie initialisationState est redéclenchée lorsque initialisationState = état WITHDRAWN
RESET
wait 300 ms
INITIALISE (responsiveDevice)
start_timer (timer)
wait 5 min
WITHDRAW
INITIALISE (responsiveDevice)
do
    time = get_timer (timer)
    answer = QUERY SHORT ADDRESS
    if (answer != responsiveDevice)
        break
    endif
while (time< 22 min)
if (time< ((15 + 5) – 1,5) OR time> ((15 + 5) + 1,5))
    error4 Pas de redéclenchement de la minuterie d'initialisation lorsque initialisationState est supprimé. Réel: time min. Attendu: 18,5 min < minuterie < 21,5 min.
endif
TERMINATE
```

Tableau 89 – Paramètres pour la séquence d'essai 'WITHDRAW'

Phase d'essai	data	value	errorText	initialisationState after WITHDRAW
0	*randomAddress* + 0x01 00 00	YES	Commande exécutée avec RANDOM ADDRESS < SEARCH ADDRESS	ENABLED
1	*randomAddress* + 0x00 01 00	YES	Commande exécutée avec RANDOM ADDRESS < SEARCH ADDRESS	ENABLED
2	*randomAddress* + 0x00 00 01	YES	Commande exécutée avec RANDOM ADDRESS < SEARCH ADDRESS	ENABLED
3	*randomAddress* – 0x01 00 00	YES	Commande exécutée avec RANDOM ADDRESS > SEARCH ADDRESS	ENABLED
4	*randomAddress* – 0x00 01 00	YES	Commande exécutée avec RANDOM ADDRESS > SEARCH ADDRESS	ENABLED
5	*randomAddress* – 0x00 00 01	YES	Commande exécutée avec RANDOM ADDRESS > SEARCH ADDRESS	ENABLED
6	*randomAddress*	NO	Commande non exécutée avec RANDOM ADDRESS = SEARCH ADDRESS	WITHDRAWN

12.7.7 SEARCHADDRH / SEARCHADDRM / SEARCHADDRL

La séquence d'essai vérifie tout d'abord les valeurs de réinitialisation et de mise sous tension pour la variable searchAddress. Ensuite, on vérifie le bon fonctionnement des commandes SEARCHADDRH, SEARCHADDRM, SEARCHADDRL lorsque initialisationState est désactivé, activé ou supprimé.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
// Vérifier par essai la valeur de réinitialisation pour la variable searchAddress
responsiveDevice = GLOBAL_currentUnderTestLogicalUnit<< 1 + 1
RESET
wait 300 ms
INITIALISE (responsiveDevice)
SetSearchAddress (0x01 01 01)
answer = QUERY SHORT ADDRESS
if (answer != NO)
    error1 Valeur de réinitialisation erronée pour randomAddress. Aucune réponse attendue de QUERY SHORT ADDRESS après réglage de searchAddress. Réel: answer. Attendu: NO
endif
RESET
wait 300 ms
answer = QUERY SHORT ADDRESS
if (answer != responsiveDevice)
    error2 Valeur de réinitialisation erronée pour searchAddress. Réponse attendue de QUERY SHORT ADDRESS après réinitialisation des variables. Réel: answer. Attendu: responsiveDevice
endif
TERMINATE
// Vérifier par essai la valeur de mise sous tension pour la variable searchAddress
SetSearchAddress (0x01 01 01)
PowerCycleAndWaitForDecoder (5)
INITIALISE (responsiveDevice)
answer = QUERY SHORT ADDRESS
if (answer != responsiveDevice)
    error3 Valeur de mise sous tension erronée pour searchAddress. Réponse attendue de QUERY SHORT ADDRESS après le cycle de mise sous tension. Réel: answer. Attendu: responsiveDevice
endif
// Vérifier par essai si la variable searchAddress est réglée correctement
RESET
wait 300 ms
randomAddress = GetLimitedRandomAddress (responsiveDevice)
if (randomAddress == 0xFF FF FF)
    error4 Générateur aléatoire inapproprié. À des fins d'essai, chaque octet de l'adresse aléatoire doit se situer dans la plage [0x01, 0xFE].
else
    answer = COMPARE
    if (answer != NO)
        error5 Commande COMPARE exécutée lorsque initialisationState est désactivé. Réel: answer. Attendu: NO.
    endif
    INITIALISE (responsiveDevice)
    SetSearchAddress (randomAddress + 0x00 01 00)
    answer = COMPARE
    if (answer!= YES)
        error6 searchAddress non réglée lorsque initialisationState est activé. Réel: answer. Attendu: YES.
    endif
    SetSearchAddress (randomAddress)
    WITHDRAW
    SetSearchAddress (randomAddress + 0x01 00 00)
    TERMINATE
    INITIALISE (responsiveDevice)
    answer = COMPARE
    if (answer!= YES)
        error7 searchAddress non réglée lorsque initialisationState est supprimé. Réel: answer. Attendu: YES.
    endif
    TERMINATE
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
endif
```

12.7.8 PROGRAM SHORT ADDRESS

La séquence d'essai vérifie le bon fonctionnement de la commande PROGRAM SHORT ADDRESS lorsque initialisationState est désactivé, activé ou supprimé. L'essai vérifie également si la commande est acceptée ou non lorsque différents formats (valides et non valides) de l'adresse à mémoriser sont donnés.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
TERMINATE
oldAddress = GLOBAL_currentUnderTestLogicalUnit
newAddress = 63
PROGRAM SHORT ADDRESS ((newAddress<< 1) + 1)
answer = QUERY CONTROL GEAR PRESENT, send to ((newAddress<< 1) + 1)
if (answer != NO)
    error1 Commande exécutée lorsque initialisationState est désactivé. Réel: answer.
    Attendu: NO.
    SetShortAddress (newAddress; oldAddress)
endif
randomAddress = GetLimitedRandomAddress ((oldAddress<< 1) + 1)
if (randomAddress == 0xFF FF FF)
    error2 Générateur aléatoire inapproprié. À des fins d'essai, chaque octet de l'adresse
    aléatoire doit se situer dans la plage [0x01, 0xFE].
else
    INITIALISE ((oldAddress<< 1) + 1)
    for (i = 0; i < 7; i++)
        SetSearchAddress (data[i])
        PROGRAM SHORT ADDRESS ((newAddress<< 1) + 1)
        answer = QUERY CONTROL GEAR PRESENT, sent to ((newAddress<< 1) + 1)
        if (answer != value[i])
            error3 errorText1[i] à la phase d'essai i = i. Réel: answer. Attendu: value[i].
            if (i != 6)
                SetShortAddress (newAddress; oldAddress)
            else
                SetShortAddress (oldAddress; newAddress)
            endif
        endif
    endfor
    SetSearchAddress (randomAddress)
    for (j = 0; j<6; j++)
        PROGRAM SHORT ADDRESS (address[j])
        answer = QUERY CONTROL GEAR PRESENT, send to queryAddress[j]
        if (answer!= YES)
            halt 1 errorText2[j] de la commande PROGRAM SHORT ADDRESS à la phase
            d'essai j = j. Réel: answer. Attendu: YES.
        endif
    endfor
    // Vérifier par essai toutes les adresses courtes disponibles
    for (j = GLOBAL_numberShortAddresses; j< 64; j++)
        shortAddressToSet =j <<1 +1
        PROGRAM SHORT ADDRESS (shortAddressToSet)
        answer = QUERY SHORT ADDRESS, send to shortAddressToSet
        if (answer != shortAddressToSet)
            halt 2 commande PROGRAM SHORT ADDRESS à la phase d'essai j = j
            (échec). Réel: answer. Attendu: shortAddressToSet.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        endif
    endfor
    WITHDRAW
    PROGRAM SHORT ADDRESS ((oldAddress<< 1) + 1)
    answer = QUERY CONTROL GEAR PRESENT, send to ((oldAddress<< 1) + 1)
    if (answer!= YES)
        error4 Commande non exécutée lorsque initialisationState est supprimé. Réel:
        answer. Attendu: YES.
        SetShortAddress (63; oldAddress)
    endif
    TERMINATE
endif
```

Tableau 90 – Paramètres pour la séquence d'essai 'PROGRAM SHORT ADDRESS'

Phase d'essai	data	value	errorText1
0	*randomAddress* + 0x01 00 00	NO	Commande exécutée avec RANDOM ADDRESS < SEARCH ADDRESS
1	*randomAddress* + 0x00 01 00	NO	Commande exécutée avec RANDOM ADDRESS < SEARCH ADDRESS
2	*randomAddress* + 0x00 00 01	NO	Commande exécutée avec RANDOM ADDRESS < SEARCH ADDRESS
3	*randomAddress* – 0x01 00 00	NO	Commande exécutée avec RANDOM ADDRESS > SEARCH ADDRESS
4	*randomAddress* – 0x00 01 00	NO	Commande exécutée avec RANDOM ADDRESS > SEARCH ADDRESS
5	*randomAddress* – 0x00 00 01	NO	Commande exécutée avec RANDOM ADDRESS > SEARCH ADDRESS
6	*randomAddress*	YES	Commande non exécutée avec RANDOM ADDRESS = SEARCH ADDRESS

Phase d'essai	address	description	queryAddress	errorText2
0	*oldAddress*<<1+1	adresse initiale	*oldAddress*<<1+1	non exécutée
1	01111111b	adresse courte 63	01111111b	non exécutée
2	10000001b	pas de modification	01111111b	exécutée
3	00000000b	pas de modification	01111111b	exécutée
4	10000000b	pas de modification	01111111b	exécutée
5	11111111b	supprimer adresse courte	diffusion non adressée	non exécutée

12.7.9 VERIFY SHORT ADDRESS

La séquence d'essai vérifie le bon fonctionnement de la commande VERIFY SHORT ADDRESS lorsque initialisationState est désactivé, activé ou supprimé. L'essai vérifie également si le DUT envoie une réponse lorsque différents formats (valides et non valides) de l'adresse à vérifier sont donnés.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
TERMINATE
oldAddress = GLOBAL_currentUnderTestLogicalUnit
answer = VERIFY SHORT ADDRESS ((oldAddress<< 1) + 1)
if (answer != NO)
    error1 Commande exécutée lorsque initialisationState est désactivé. Réel: answer.
    Attendu: NO.
endif
for (i = 0; i < 8; i++)
    INITIALISE (address[i])
    DTR0 (setAddress[i])
    SET SHORT ADDRESS, send to address[i])
    answer = VERIFY SHORT ADDRESS (data[i])
    if (answer != value[i])
        error2 errorText[i] lorsque initialisationState est activé à l'étape d'essai i = i. Réel:
        answer. Attendu: value[i].
    endif
    WITHDRAW
    answer = VERIFY SHORT ADDRESS (data[i])
    if (answer != value[i])
        error3 errorText[i] lorsque initialisationState est supprimé à l'étape d'essai i = i.
        Réel: answer. Attendu: value[i].
    endif
    TERMINATE
endfor
SetShortAddress (255; oldAddress)
```

Tableau 91 – Paramètres pour la séquence d'essai 'VERIFY SHORT ADDRESS'

Phase d'essai i	address	setAddress	data	value	errorText
0	*oldAddress*<<1 + 1	*oldAddress*<< 1 + 1	*oldAddress*<< 1 + 1	YES	Commande non exécutée
1	*oldAddress*<<1 + 1	*oldAddress*<< 1 + 1	*oldAddress*<< 1 + 3	NO	Commande exécutée
2	*oldAddress*<< 1 + 1	01111111b	01111111b	YES	Commande non exécutée
3	01111111b	01111111b	01111101b	NO	Commande exécutée
4	01111111b	01111111b	01111110b	NO	Commande exécutée
5	01111111b	01111111b	11111111b	NO	Commande exécutée
6	01111111b	01111111b	11111110b	NO	Commande exécutée
7	01111111b	11111111b	11111111b	NO	Commande exécutée

12.7.10 QUERY SHORT ADDRESS

La séquence d'essai vérifie le bon fonctionnement de la commande QUERY SHORT ADDRESS. Au départ, le format correct de l'adresse courte renvoyée par la commande fait l'objet d'une vérification, puis le comportement du DUT lorsque l'initialisationState est désactivé, activé ou supprimé, est vérifié par essai.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
oldAddress = GLOBAL_currentUnderTestLogicalUnit
// Vérifier le format de réponse de QUERY SHORT ADDRESS, attendu: 11111111b ou
0AAAAAA1b
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
INITIALISE ((oldAddress<< 1) + 1)
for (i = 0; i<3; i++)
    DTR0 (validAddress[i])
    SET SHORT ADDRESS, send to address[i]
    answer = QUERY SHORT ADDRESS, accept Value
    if (answer != addressFormat[i])
        error1 Format erroné de l'adresse courte renvoyée à la phase d'essai i = i. Réel:
        answer. Format attendu: addressFormat[i].
    endif
endfor
TERMINATE
// Vérifier le comportement du DUT lorsque initialisationState = désactivé
answer = QUERY SHORT ADDRESS
if (answer != NO)
    error2 Commande exécutée lorsque initialisationState est désactivé. Réel: answer.
    Attendu: NO.
endif
randomAddress = GetLimitedRandomAddress (01111111b)
if (randomAddress == 0xFF FF FF)
    error3 Générateur aléatoire inapproprié. À des fins d'essai, chaque octet de l'adresse
    aléatoire doit se situer dans la plage [0x01, 0xFE].
    SetShortAddress (63; oldAddress)
else
    // Vérifier le comportement du DUT avec initialisationState = activé et différentes valeurs
    pour randomAddress et searchAddress
    INITIALISE (01111111b)
    for (j = 0; j< 7; j++)
        SetSearchAddress (data[j])
        answer = QUERY SHORT ADDRESS
        if (answer != value[j])
            error4 errorText[j] lorsque initialisationState est activé à la phase d'essai j = j.
            Réel: answer. Attendu: value[j].
        endif
    endfor
    WITHDRAW
    // Vérifier le comportement du DUT avec initialisationState = supprimé et différentes
    valeurs pour randomAddress et searchAddress
    for (j = 0; j< 7; j++)
        SetSearchAddress (data[j])
        answer = QUERY SHORT ADDRESS
        if (answer != value[j])
            error5 errorText[j] lorsque initialisationState est supprimé à la phase d'essai j =
            j. Réel: answer. Attendu: value[j].
        endif
    endfor
    TERMINATE
    // Vérifier la réponse de QUERY SHORT ADDRESS lorsqu'aucune adresse courte n'est
    attribuée au DUT
    DTR0 (255)
    SET SHORT ADDRESS, send to 01111111b // Supprimer l'adresse courte
    INITIALISE (255)
    SetSearchAddress (randomAddress)
    answer = QUERY SHORT ADDRESS
    if (answer != 255)
        error6 Réponse erronée lorsqu'aucune adresse n'est attribuée et initialisationState
        est activé. Réel: answer. Attendu: 255.
    endif
    WITHDRAW
    answer = QUERY SHORT ADDRESS
    if (answer != 255)
        error7 Réponse erronée lorsqu'aucune adresse n'est attribuée et initialisationState
        est supprimé. Réel: answer. Attendu: 255.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    endif
    TERMINATE
    SetShortAddress (255; oldAddress)
endif
```

Tableau 92 – Paramètres pour la séquence d'essai 'QUERY SHORT ADDRESS'

Phase d'essai i	validAddress	address	addressFormat
0	(*oldAddress*<< 1) + 1	(*oldAddress* << 1) + 1	(*oldAddress* << 1) + 1
1	11111111b	(*oldAddress*<< 1) + 1	11111111b
2	01111111b	diffusion non adressée	01111111b

Phase d'essai j	data	value	errorText
0	*randomAddress* + 0x01 00 00	NO	Commande exécutée avec RANDOM ADDRESS < SEARCH ADDRESS
1	*randomAddress* + 0x00 01 00	NO	Commande exécutée avec RANDOM ADDRESS < SEARCH ADDRESS
2	*randomAddress* + 0x00 00 01	NO	Commande exécutée avec RANDOM ADDRESS < SEARCH ADDRESS
3	*randomAddress* – 0x01 00 00	NO	Commande exécutée avec RANDOM ADDRESS > SEARCH ADDRESS
4	*randomAddress* – 0x00 01 00	NO	Commande exécutée avec RANDOM ADDRESS > SEARCH ADDRESS
5	*randomAddress* – 0x00 00 01	NO	Commande exécutée avec RANDOM ADDRESS > SEARCH ADDRESS
6	*randomAddress*	01111111b	Commande non exécutée avec RANDOM ADDRESS = SEARCH ADDRESS

12.7.11 IDENTIFY DEVICE

La séquence d'essai vérifie le bon fonctionnement de la commande IDENTIFY DEVICE. La minuterie de la procédure d'identification est également vérifiée si la procédure est lancée, terminée, prolongée ou abandonnée selon la spécification.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
responsiveDevice = GLOBAL_currentUnderTestLogicalUnit<< 1 + 1
// Vérifier par essai si la procédure d'identification est lancée et terminée dans un délai de 10 s ± 1 s
UserInput (Après acceptation de ce message, vérifier si l'unité logique lance une procédure d'identification et mesurer la durée de cette procédure (en s), OK)
IDENTIFY DEVICE
wait 12 s
started = UserInput (La procédure d'identification a-t-elle été lancée?, YesNo)
if (started != Yes)
    error1 Procédure d'identification non lancée par la commande IDENTIFY DEVICE.
else
    stopped = UserInput (La procédure d'identification s'est-elle interrompue?,  YesNo)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    if (stopped == Yes)
        stoppedTime = UserInput (Saisir la durée de la procédure d'identification, value [s])
        if (stoppedTime< 9)
            error2 La procédure d'identification s'est interrompue avant 9 s.
        else if (stoppedTime> 11)
            error3 Procédure d'identification non interrompue après 11 s.
        endif
    else
        error4 Procédure d'identification non interrompue après 11 s.
        UserInput (Attendre l'arrêt de la procédure d'identification, OK)
    endif
endif
// Vérifier si la minuterie de la procédure d'identification est prolongée
UserInput (Après acceptation de ce message, vérifier si l'unité logique lance une procédure
d'identification de 15 s, ± 1 s, OK)
IDENTIFY DEVICE
wait 5 s
IDENTIFY DEVICE
wait 12 s
started = UserInput (L'unité logique a-t-elle lancé une procédure d'identification de 15 s ± 1
s?, YesNo)
if (started != Yes)
    error5 Procédure d'identification non relancée à réception d'une seconde commande
    IDENTIFY DEVICE.
endif
PHM = QUERY PHYSICAL MINIMUM
mid = (254 + PHM) >> 1
// Vérifier par essai si la minuterie de la procédure d'identification n'est pas interrompue
for (i = 0; i < 6; i++)
    command1[i]
    if (i == 3)
        WaitForLampOn ()
    endif
    UserInput (Après acceptation de ce message, vérifier si l'unité logique lance une
    procédure d'identification de 10 s ± 1 s, OK)
    IDENTIFY DEVICE
    wait 5 s
    if (i< 4)
        command2[i]
    else
        answer = command2[i]
        if (answer != value1[i])
            error6 commande text1[i] non exécutée.
        endif
    endif
    wait 12 s
    started = UserInput (La procédure d'identification a-t-elle duré pendant 10 s ± 1 s?,
    YesNo)
    if (started != Yes)
        error7 Procédure d'identification interrompue à réception de text1[i].
    endif
    answer = QUERY ACTUAL LEVEL
    if (answer != level1[i])
        error8 Niveau réel erroné après réception de text1[i] lors de la procédure
        d'identification.
    endif
    if (i == 3)
        answer = query1[i]
        if (answer != value1[i])
            error9 commande text1[i] non exécutée.
        endif
        TERMINATE
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    endif
endfor
// Vérifier si la procédure d'identification est abandonnée
DTR0 (1)
for (j = 0; j< 6; j++)
    command3[j]
    if (j == 3)
        WaitForLampOn ()
    endif
    UserInput (Après acceptation de ce message, l'unité logique lancera une procédure d'identification. Vérifier si la procédure d'identification est interrompue après 4 s, OK)
    IDENTIFY DEVICE
    wait 4 s
    command4[j]
    stopped = UserInput (L'unité logique a-t-elle lancé une procédure d'identification de 4 s?, YesNo)
    if (stopped == NO)
        error10 Procédure d'identification non interrompue par la commande text2[j].
        wait 8 s
    endif
    answer = QUERY ACTUAL LEVEL
    if (answer != level2[j])
        error11 Niveau réel erroné après réception de text2[j] lors de la procédure d'identification.
    endif
    if (j>= 2)
        answer = query2[j]
        if (answer != value2[j])
            error12 commande text2[j] non exécutée.
        endif
        if (j == 2)
            TERMINATE
        endif
    endif
endfor
```

Tableau 93 – Paramètres pour la séquence d'essai 'IDENTIFY DEVICE'

Phase d'essai	command1	command2	level1	text1	query1	value1
0	RECALL MIN LEVEL	RECALL MAX LEVEL	254	RECALL MAX LEVEL	-	-
1	RECALL MAX LEVEL	RECALL MIN LEVEL	PHM	RECALL MIN LEVEL	-	-
2	OFF	PING	0	PING	-	-
3	RECALL MIN LEVEL	INITIALISE (*responsiveDevice*)	PHM	INITIALISE	VERIFY SHORT ADDRESS (*responsiveDevice*)	YES
4	DAPC (*mid*)	COMPARE	*mid*	COMPARE	-	YES
5	DAPC (*mid*)	QUERY STATUS	*mid*	QUERY STATUS	-	0010XX00b

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Phase d'essai j	command3	command4	level2	text2	query2	value2
0	RECALL MIN LEVEL	TERMINATE	*PHM*	TERMINATE	-	-
1	DAPC (*mid*)	DAPC (*mid*)	*mid*	DAPC (contrôle direct de la puissance d'arc)	-	-
2	OFF INITIALISE (*responsiveDevice*)	WITHDRAW	0	WITHDRAW	COMPARE	NO
3	DAPC (*mid*)	SET POWER ON LEVEL	*mid*	SET POWER ON LEVEL	QUERY POWER ON LEVEL	1
4	RECALL MAX LEVEL	RESET **attendre** 300 ms	254	RESET	QUERY POWER ON LEVEL	254
5	OFF	DTR0 (2)	0	DTR0	QUERY CONTENT DTR0	2

12.7.12 IDENTIFY DEVICE THROUGH RECALL MIN/MAX LEVEL

La séquence d'essai vérifie le bon fonctionnement des commandes RECALL MAX LEVEL et RECALL MIN LEVEL pour l'identification d'un dispositif.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
responsiveDevice = GLOBAL_currentUnderTestLogicalUnit<< 1 + 1
PHM = QUERY PHYSICAL MINIMUM
mid = (PHM + 254) >> 1
UserInput (Après acceptation de ce message, vérifier si l'unité logique lance une procédure d'identification de 10 s ± 1 s, OK)
INITIALISE (responsiveDevice)
RECALL MAX LEVEL
wait12 s
startedAsIdentifyDevice = UserInput (L'unité logique a-t-elle lancé une procédure d'identification de 10 s ± 1 s?, YesNo)
if (startedAsIdentifyDevice == Yes)
    report1 L'unité logique répond à RECALL MAX LEVEL comme si elle avait reçu IDENTIFY DEVICE.
    TERMINATE
    UserInput (Après acceptation de ce message, vérifier si l'unité logique lance une procédure d'identification de 10 s ± 1 s, OK)
    RECALL MAX LEVEL
    INITIALISE (responsiveDevice)
    RECALL MIN LEVEL
    wait12 s
    identification = UserInput (L'unité logique a-t-elle lancé une procédure d'identification de 10 s ± 1 s?, YesNo)
    if (identification != Yes)
        error1 L'unité logique n'a pas répondu à RECALL MIN LEVEL comme si elle avait reçu IDENTIFY DEVICE.
    endif
    TERMINATE
    // RECALL MAX déclenche IDENTIFY DEVICE, fonctionne pendant 10 s
    extraTime=10
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
else
    report2 L'unité logique répond à RECALL MAX LEVEL, mais la réponse est différente de
    celle apportée à IDENTIFY DEVICE.
    extraTime=0
endif
// Ajouter le temps de répétition dans le cas où RECALL MAX déclenche IDENTIFY DEVICE
identificationTime = 10 +extraTime
for (k= 0; k< 2; k++)
    RECALL MAX LEVEL
    WaitForLampOn ()
    if (k== 1)
        DTR0 (mid)
        SET MIN LEVEL
        SET MAX LEVEL
    else
        DTR0 (mid – 1)
        SET MIN LEVEL
        DTR0 (mid + 1)
        SET MAX LEVEL
    endif
    minLevel=QUERY MIN LEVEL
    maxLevel = QUERY MAX LEVEL
    INITIALISE (responsiveDevice)
    // Vérifier par essai si l'unité logique lance une procédure d'identification
    UserInput (Après acceptation de ce message, vérifier si l'unité logique lance une
    procédure d'identification de identificationTimes ± 1 s, OK)
    for (m = 0; m< 10; m++)
        RECALL MIN LEVEL
        wait480 ms
        RECALL MAX LEVEL
        wait480 ms
    endfor
    RECALL MIN LEVEL
    waitextraTime+ 2 s
    identification = UserInput (L'unité logique a-t-elle lancé une procédure d'identification de
    identificationTimes ± 1 s?, YesNo)
    if (identification != Yes)
        error2 L'unité logique n'a pas lancé de procédure d'identification de
        identificationTimes ± 1 s à la phase d'essai k = k.
    endif
    TERMINATE
    answer = QUERY MIN LEVEL
    if (answer != minLevel)
        error3 Niveau min erroné réglé après achèvement du processus d'initialisation.
        Réel: answer. Attendu: minLevel.
    endif
    answer = QUERY MAX LEVEL
    if (answer != maxLevel)
        error4 Niveau max erroné réglé après achèvement du processus d'initialisation.
        Réel: answer. Attendu: maxLevel.
    endif
    answer = QUERY ACTUAL LEVEL
    if (answer !=minLevel)
        error5 Niveau réel erroné après achèvement du processus d'initialisation. Réel:
        answer. Attendu: minLevel.
    endif
    RECALL MAX LEVEL
    WaitForLampOn ()
    // Vérifier par essai si la procédure d'identification est abandonnée une fois la minuterie
    d'initialisation écoulée
    INITIALISE (responsiveDevice)
    wait 10 min
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
UserInput (Après acceptation de ce message, vérifier si l'unité logique lance une procédure d'identification de 5 min ± 1,5 min, OK)
start_timer (timer)
do
    RECALL MAX LEVEL
    wait 500 ms
    RECALL MIN LEVEL
    wait 500 ms
while (get_timer (timer) <7 min)
identification = UserInput (La procédure d'identification a-t-elle duré pendant 5 min ± 1,5 min?, YesNo)
if (identification == No)
    error6 Procédure d'identification non interrompue après écoulement de la minuterie déclenchée par la commande INITIALISE.
endif
TERMINATE // Vérifier par essai si la minuterie de la procédure d'identification n'est pas interrompue
for (i = 0; i < 6; i++)
    INITIALISE (responsiveDevice)
    UserInput (Après acceptation de ce message, vérifier si l'unité logique lance une procédure d'identification de identificationTime s ± 1 s, OK)
    for (m = 0; m< 5; m++)
        RECALL MIN LEVEL
        wait 480 ms
        RECALL MAX LEVEL
        wait 480 ms
    endfor
    if (i< 4)
        command1[i]
    else
        answer = command1[i]
        if (answer != value1[i])
            error7 commande text1[i] non exécutée.
        endif
    endif
    for (m = 0; m< 5; m++)
        RECALL MIN LEVEL
        wait 480 ms
        RECALL MAX LEVEL
        wait 480 ms
    endfor
    RECALL MIN LEVEL
    waitextraTime + 2 s
    identification = UserInput (La procédure d'identification a-t-elle duré pendant identificationTimes ± 1 s?, YesNo)
    if (identification == No)
        error8 Procédure d'identification interrompue à réception de la commande text1[i].
    endif
    if (i == 3)
        answer = query1[i]
        if (answer != value1[i])
            error9 commande text1[i] non exécutée.
        endif
    endif
    TERMINATE
    answer = QUERY ACTUAL LEVEL
    if (answer != minLevel)
        error10 Niveau réel erroné après réception de text1[i] lors de la procédure d'identification.
    endif
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    // Vérifier par essai si la procédure d'identification est abandonnée à réception d'une commande
    DTR0 (1)
    RECALL MIN LEVEL
    for (j = 0; j< 6; j++)
        INITIALISE (responsiveDevice)
        UserInput (Après acceptation de ce message, vérifier si l'unité logique lance une procédure d'identification de 5 s, OK)
        for (m = 0; m< 5; m++)
            RECALL MIN LEVEL
            wait 480 ms
            RECALL MAX LEVEL
            wait 480 ms
        endfor
        RECALL MIN LEVEL
        command2[j]
        identification = UserInput (L'unité logique a-t-elle lancé une procédure d'identification de 5 s?, YesNo)
        if (identification != Yes)
            error11 Procédure d'identification non interrompue par la commande text2[j].
        endif
        if (j>= 2)
            answer = query2[j]
            if (answer != value2[j])
                error12 commande text2[j] non exécutée.
            endif
        endif
        TERMINATE
        answer = QUERY ACTUAL LEVEL
        if (answer != level[j])
            error13 Niveau réel erroné après réception de text2[j] lors de la procédure d'identification.
        endif
    endfor
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 94 – Paramètres pour la séquence d'essai 'IDENTIFY DEVICE THROUGH RECALL MIN/MAX LEVEL'

Phase d'essai i	command1	text1	query1	value1
0	RECALL MAX LEVEL	RECALL MAX LEVEL	-	-
1	RECALL MIN LEVEL	RECALL MIN LEVEL	-	-
2	PING	PING	-	-
3	INITIALISE (*responsiveDevice*)	INITIALISE	VERIFY SHORT ADDRESS (*responsiveDevice*)	YES
4	COMPARE	COMPARE	-	YES
5	QUERY STATUS	QUERY STATUS	-	0000XX00b

Phase d'essai j	command2	level	text2	query2	value2
0	TERMINATE	*minLevel*	TERMINATE	-	-
1	DAPC (*mid*)	*mid*	DAPC (contrôle direct de la puissance d'arc)	-	-
2	WITHDRAW	*minLevel*	WITHDRAW	COMPARE	NO
3	SET POWER ON LEVEL	*minLevel*	SET POWER ON LEVEL	QUERY POWER ON LEVEL	1
4	DTR0 (2)	*minLevel*	DTR0	QUERY CONTENT DTR0	2
5	RESET **wait** 300 ms	254	RESET	QUERY POWER ON LEVEL	254

12.8 Queries and reserved commands (Requêtes et commandes réservées)

12.8.1 QUERY STATUS – lampFailure/lampOn

La séquence d'essai vérifie si les bits lampFailure et lampOn dans la réponse de QUERY STATUS sont réglés correctement lors d'une défaillance partielle ou totale des lampes. L'essai vérifie également que les réponses aux commandes QUERY LAMP POWER ON et QUERY LAMP FAILURE sont conformes aux valeurs des bits lampOn et lampFailure. QUERY ACTUAL LEVEL permet de vérifier le niveau de luminosité réglé par le DUT.

Sur la base du nombre de lampes connectées au DUT, l'essai est effectué une ou deux fois. Lorsqu'une seule lampe est connectée au DUT, l'essai est effectué une seule fois pour vérifier le comportement lors de la défaillance totale des lampes. Lorsque deux lampes ou plus sont connectées au DUT, l'essai est effectué deux fois, une première fois pour vérifier le comportement lors de la défaillance totale des lampes et une seconde fois pour vérifier le comportement lors de la défaillance partielle des lampes.

Lorsque la ou les lampes ne peuvent être déconnectées ou connectées en toute sécurité avec application de l'alimentation secteur au DUT, il convient d'effectuer cette déconnexion et cette reconnexion uniquement après coupure de l'alimentation secteur.

Note concernant la réalisation de l'essai: Il convient d'envoyer les commandes DAPC et QUERY STATUS le plus rapidement possible l'une après l'autre (une requête peut être envoyée 2,4 ms après réception d'une réponse)

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
// Demander à l'utilisateur le nombre de lampes connectées au DUT
numberLamps = UserInput (Fournir le nombre de lampes connectées au DUT?, value)
if (numberLamps == 1)
    imax = 1 // Essai à effectuer une seule fois
else
    imax = 2 // Essai à effectuer deux fois
endif
delay = 30 s +GLOBAL_startupTimeLimit
delayLimit = 33 s +GLOBAL_startupTimeLimit
lightSource = vrai
if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
    lightSource = false // Cette unité logique n'a pas de source de lumière
endif
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
if (lightSource)
    //Vérifier par essai si les bits sont réglés correctement lorsqu'aucune modification de
    l'intensité lumineuse n'est lancée
    for (i = 0; i<imax; i++)
        for (j = 0; j<4; j++)
            RECALL MAX LEVEL
            if(j== 3)
                WaitForLampOn ()
            endif
            DisconnectLamps (i) // Déconnecter les lampes afin de générer leur
            défaillance
            start_timer (timer)
            do
                answer = QUERY LAMP FAILURE
                timestamp = get_timer (timer) – 10 ms // Soustraire 10 ms qui est la
                longueur approchée de la trame en arrière afin d'obtenir le moment de
                départ de cette dernière
            while (answer == NO AND timestamp<delayLimit)
            if (timestamp>= delayLimit)
                error1 Défaillance des lampes non détectée après delayLimit s à la phase
                d'essai (i,j) = (i,j).
            endif
            command[j]
            answer = QUERY LAMP FAILURE
            if (answer!= YES)
                error2 lampFailure non détecté à la phase d'essai (i,j) = (i,j). Réel: answer.
                Attendu: YES.
            endif
            lampOn = NO
            status = XXXXX01Xb
            statusText = "lampFailure bit"
            actualLevel = MASK
            if (i == 1) // défaillance partielle des lampes
                lampOperational = UserInput (Au moins une des lampes est-elle toujours
                opérationnelle?, YesNo)
                if (lampOperational == true)
                    lampOn = YES
                    status = XXXXX11Xb
                    statusText = "lampFailure and lampOn bits"
                    actualLevel = level[j]
                endif
            endif
            answer = QUERY LAMP POWER ON
            if (answer != lampOn)
                error3 lampOn non réglé correctement à la phase d'essai (i,j) = (i,j). Réel:
                answer. Attendu: lampOn.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                endif
                answer = QUERY STATUS
                if (answer != status)
                    error4 statusText dans QUERY STATUS non réglé correctement à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: status.
                endif
                answer = QUERY ACTUAL LEVEL
                if (answer != actualLevel)
                    error5 Niveau réel erroné à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: actualLevel.
                endif
                ConnectLamps () // Connectlamps afin de supprimer la défaillance des lampes
                if(j!= 2)
                    WaitForLampOn ()
                endif
                answer = QUERY LAMP FAILURE
                if (answer!= lampFailureBit[j])
                    error6 lampFailure non réglé correctement avec toutes les lampes connectées à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: lampFailureBit[j].
                endif
                answer= QUERY LAMP POWER ON
                if(answer!= lampOnBit[j])
                    error7 lampOn non réglé correctement avec toutes les lampes connectées à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: lampOnBit[j].
                endif
                answer= QUERY STATUS
                if(answer!= statusByte[j])
                    error8 bits lampFailure et lampOn dans QUERY STATUS non réglés correctement avec toutes les lampes connectées à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: statusByte[j].
                endif
                answer = QUERY ACTUAL LEVEL
                if (answer != level[j])
                    error9 Niveau réel erroné avec toutes les lampes connectées à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: level[j].
                endif
            endfor
        endfor
    endif
    // Vérifier par essai si les bits sont réglés correctement lorsqu'une modification de l'intensité lumineuse est lancée
    DTR0 (4)
    SET FADE TIME
    DTR0 (0)
    SET POWER ON LEVEL
    kMax = 2
    if (lightSource)
        kMax = 3
    endif
    for (k = 0; k<kMax; k++)
        action[k]
        count = 0
        DAPC (254)
        start_timer (timer2)
        do
            answer[count] = QUERY STATUS
            start_timer (timer) // Lancement de la minuterie après l'interruption de la trame en arrière
        while (answer[count++] == status[k] AND get_timer (timer2) <GLOBAL_startupTimeLimit)
        do
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        answer[count] = QUERY STATUS
        timestamp = get_timer (timer) – 10 ms // Soustraire 10 ms qui est la longueur approchée de la trame en arrière afin d'obtenir le moment de départ de cette dernière
    while (answer[count++] == XXX1XXXXb AND timestamp < 2,5 s)
    if (timestamp>= 2,5 s)
        error10 Modification de l'intensité lumineuse non interrompue après 2,5 ms à la phase d'essai k = k.
    else
        for (i = 0; i<count – 1; i++)
            bit4 = (answer[i] >> 4) & 0x01
            bit = (answer[i] >>shiftBit[k]) & 0x01
            if (bit != bit4) // si (bit1 et bit4), ou (bit2 et bit 4) non réglés simultanément
                error11 Les bits de fadeRunning et de text[k] ne sont pas réglés simultanément à la phase d'essai k = k.
                break
            endif
        endfor
    endif
endfor
ConnectLamps ()
```

Tableau 95 – Paramètres pour la séquence d'essai 'QUERY STATUS – lampFailure/lampOn'

Phase d'essai j	command	lampFailureBit	lampOnBit	statusByte	level
0	RECALL MIN LEVEL	NO	YES	XXXXX10Xb	*PHM*
1	RESET **wait** (300 ms +*delay*)	NO	YES	XXXXX10Xb	254
2	OFF	YES	NO	XXXXX01Xb	255
3	**PowerCycleAndWaitForDecoder** (5) **wait***delay*	NO	YES	XXXXX10Xb	254

Phase d'essai k	action	status	shiftBit	text	test step description
0	OFF	XXXXX0XXb	2	lampOn	modification de l'intensité lumineuse de 0 à 254 avec toutes les lampes connectées
1	**PowerCycleAndWaitForDecoder**(5)	XXXXX0XXb	2	lampOn	modification de l'intensité lumineuse de niveau min (lancement) à 254 avec toutes les lampes connectées
2	**DisconnectLamps** (0) **PowerCycleAndWaitForDecoder**(5)	XXXXXX0Xb	1	lampFailure	modification de l'intensité lumineuse de niveau min (lancement) à 254 avec toutes les lampes déconnectées

12.8.2 QUERY STATUS – lampOn

La séquence d'essai vérifie si le bit lampOn dans la réponse de QUERY STATUS est réglé correctement. La lampe de l'unité logique est tout d'abord éteinte via des commandes ou le cycle de mise sous tension, puis la lampe est allumée. L'essai vérifie également que la réponse à la commande QUERY LAMP POWER ON est conforme à la valeur du bit lampOn,

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

avant et après allumage de la lampe. QUERY ACTUAL LEVEL permet de vérifier le niveau de luminosité réglé par l'unité logique.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
DTR0 (0)
SET POWER ON LEVEL
SET SCENE 5
DTR0 (254)
SET SCENE 12
for (i = 0; i < 6; i++)
    // Mettre la lampe hors tension et effectuer l'essai lorsque la lampe est hors tension
    command1[i]
    answer = QUERY STATUS
    if (answer != XXXXX0XXb)
        error1 Bit lampOn dans QUERY STATUS non supprimé avec la lampe hors tension
        à la phase d'essai i = i. Réel: answer. Attendu: XXXXX0XXb.
    endif
    answer = QUERY LAMP POWER ON
    if (answer != NO)
        error2 Bit lampOn non supprimé avec la lampe hors tension à la phase d'essai i = i.
        Réel: answer. Attendu: NO.
    endif
    answer = QUERY ACTUAL LEVEL
    if (answer != 0)
        error3 Niveau réel erroné avec la lampe hors tension à la phase d'essai i = i. Réel:
        answer. Attendu: 0.
    endif
    // Mettre la lampe sous tension et effectuer l'essai lorsque la lampe est sous tension
    command2[i]
    WaitForLampOn ()
    answer = QUERY STATUS
    if (answer != XXXXX1XXb)
        error4 Bit lampOn dans QUERY STATUS non réglé avec la lampe sous tension à la
        phase d'essai i = i. Réel: answer. Attendu: XXXXX1XXb.
    endif
    answer = QUERY LAMP POWER ON
    if (answer!= YES)
        error5 Bit lampOn non réglé avec la lampe sous tension à la phase d'essai i = i.
        Réel: answer. Attendu: YES.
    endif
    answer = QUERY ACTUAL LEVEL
    if (answer != level[i])
        error6 Niveau réel erroné avec la lampe sous tension à la phase d'essai i = i. Réel:
        answer. Attendu: level[i].
    endif
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 96 – Paramètres pour la séquence d'essai 'QUERY STATUS – lampOn'

Phase d'essai i	command1	command2	level
0	DAPC (0)	DAPC (1)	*PHM*
1	OFF	DAPC (254)	254
2	RECALL MIN LEVEL STEP DOWN AND OFF	RECALL MIN LEVEL	*PHM*
3	**PowerCycleAndWaitForDecoder** (5)	RECALL MAX LEVEL	254
4	GO TO SCENE 5	GO TO SCENE 12	254
5	OFF	ON AND STEP UP	*PHM*

12.8.3 QUERY STATUS – limitError/lampOn

La séquence d'essai vérifie si les bits limitError et lampOn dans la réponse de QUERY STATUS sont réglés correctement après modification du niveau cible suite à une modification des niveaux min ou max et suite à une instruction de niveau. Chaque phase d'essai suppose une mise en œuvre correcte de la phase précédente.

L'essai vérifie également que la réponse aux commandes QUERY LAMP POWER ON et QUERY LIMIT ERROR est conforme à la valeur des bits lampOn et limitError. QUERY ACTUAL LEVEL permet de vérifier le niveau de luminosité réglé par l'unité logique.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
PHM = QUERY PHYSICAL MINIMUM
for (i = 0; i < 31; i++)
    command[i]
    if (i == 30)
        PowerCycleAndWaitForDecoder (5)
        WaitForPowerOnPhaseToFinish ()
    endif
    if (i != 3 AND i != 4 AND i != 5 AND i != 8)
        WaitForLampOn ()
    endif
    answer = QUERY STATUS
    if (answer != status[i])
        error5 Réglage erroné des bits lampOn et/ou limitError dans QUERY STATUS à la
        phase d'essai i = i. Réel: answer. Attendu: status[i].
    endif
    answer = QUERY LAMP POWER ON
    if (answer != powerOn[i])
        error6 bit lampOn non réglé correctement à la phase d'essai i = i. Réel: answer.
        Attendu: powerOn[i].
    endif
    answer = QUERY LIMIT ERROR
    if (answer != limit[i])
        error7 bit limitError non réglé correctement à la phase d'essai i = i. Réel: answer.
        Attendu: limit[i].
    endif
    answer = QUERY ACTUAL LEVEL
    if (answer != level[i])
        error8 Niveau réel erroné à la phase d'essai i = i. Réel: answer. Attendu: level[i].
    endif
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 97 – Paramètres pour la séquence d'essai 'QUERY STATUS – limitError/lampOn'

Phase d'essai i	command	status		powerOn	limit		level	
		PHM < 254	PHM = 254		PHM < 254	PHM = 254	PHM < 254	PHM = 254
0	RECALL MIN LEVEL DTR0 (*PHM* + 1) SET MIN LEVEL	0X001100b	0X000100b	YES	YES	NO	*PHM* + 1	254
1	RECALL MIN LEVEL	0X000100b	0X000100b	YES	NO	NO	*PHM* + 1	254
2	STEP DOWN	0X001100b	0X001100b	YES	YES	YES	*PHM* + 1	254
3	STEP DOWN AND OFF	0X000000b	0X000000b	NO	NO	NO	0	0
4	DAPC (255)	0X000000b	0X000000b	NO	NO	NO	0	0
5	UP	0X000000b	0X000000b	NO	NO	NO	0	0
6	ON AND STEP UP	0X000100b	0X000100b	YES	NO	NO	*PHM* + 1	254
7	DTR0 (1) SET SCENE 0 GO TO SCENE 0	0X001100b	0X001100b	YES	YES	YES	*PHM* + 1	254
8	OFF	0X000000b	0X000000b	NO	NO	NO	0	0
9	DAPC(1)	0X001100b	0X001100b	YES	YES	YES	*PHM* + 1	254
10	DAPC (255)	0X001100b	0X001100b	YES	YES	YES	*PHM* + 1	254
11	DTR0 (255) SET SCENE 10 GO TO SCENE 10	0X001100b	0X001100b	YES	YES	YES	*PHM* + 1	254
12	RECALL MAX LEVEL	0X000100b	0X000100b	YES	NO	NO	254	254
13	DTR0 (253) SET MAX LEVEL	0X001100b	0X000100b	YES	YES	NO	253	254
14	DTR0 (*PHM* + 1) SET SCENE 1 GO TO SCENE 1	0X000100b	0X001100b	YES	NO	YES	*PHM* + 1	254
15	DOWN	0X001100b	0X001100b	YES	YES	YES	*PHM* + 1	254
16	DTR0 (253) SET SCENE 2 GO TO SCENE 2	0X000100b	0X001100b	YES	NO	YES	253	254
17	STEP UP	0X001100b	0X001100b	YES	YES	YES	253	254

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Phase d'essai i	command	status		powerOn	limit		level	
		PHM < 254	PHM = 254		PHM < 254	PHM = 254	PHM < 254	PHM = 254
18	RECALL MAX LEVEL	0X000100b	0X000100b	YES	NO	NO	253	254
19	DAPC (254)	0X001100b	0X000100b	YES	YES	NO	253	254
20	RECALL MAX LEVEL	0X000100b	0X000100b	YES	NO	NO	253	254
21	UP	0X001100b	0X001100b	YES	YES	YES	253	254
22	RECALL MAX LEVEL	0X000100b	0X000100b	YES	NO	NO	253	254
23	DTR0 (*PHM* + 1) SET MIN LEVEL	0X000100b	0X000100b	YES	NO	NO	253	254
24	DTR0 (254) SET SCENE 0 GO TO SCENE 0	0X001100b	0X000100b	YES	YES	NO	253	254
25	DTR0 (254) SET MAX LEVEL	0X000100b	0X000100b	YES	NO	NO	253	254
26	DAPC (*PHM* + 1)	0X000100b	0X000100b	YES	NO	NO	*PHM* + 1	254
27	OFF DTR0 (*PHM* + 2) SET MIN LEVEL GO TO LAST ACTIVE LEVEL	0X001100b	0X000100b	YES	YES	NO	*PHM* + 2	254
28	DAPC (254)	0X000100b	0X000100b	YES	NO	NO	254	254
29	OFF DTR0 (253) SET MAX LEVEL GO TO LAST ACTIVE LEVEL	0X001100b	0X000100b	YES	YES	NO	253	254
30	-	1X001100b	1X000100b	YES	YES	NO	253	254

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.8.4 QUERY STATUS – powerCycleSeen

La séquence d'essai vérifie si le bit powerCycleSeen dans la réponse de QUERY STATUS est réglé correctement. L'essai vérifie également que la réponse à la commande QUERY POWER FAILURE est conforme à la valeur du bit powerCycleSeen. Il convient de régler le bit powerCycleSeen immédiatement après le cycle de mise sous tension, et une instruction indiquant qu'il convient de supprimer le bit est reçue.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
DTR0 (1)
SET SCENE 4
SET SCENE 9
for (i = 0; i < 26; i++)
    PowerCycleAndWaitForDecoder (5)
    wait 1 s
    answer = QUERY STATUS
    if (answer != 1XXXXXXXb)
        error1 bit powerCycleSeen dans QUERY STATUS non réglé après un cycle de mise
        sous tension externe à la phase d'essai i = i. Réel: answer. Attendu: 1XXXXXXXb.
    endif
    answer = QUERY POWER FAILURE
    if (answer!= YES)
        error2 bit powerCycleSeen non détecté après un cycle de mise sous tension externe
        à la phase d'essai i = i. Réel: answer. Attendu: YES.
    endif
    command[i]
    answer = QUERY STATUS
    if (answer != status[i])
        error3 bit powerCycleSeen dans QUERY STATUS non réglé correctement après
        réception de la command[i] à la phase d'essai i = i. Réel: answer. Attendu: status[i].
    endif
    answer = QUERY POWER FAILURE
    if (answer != powerFailure[i])
        error4 bit powerCycleSeen non réglé correctement après réception de la
        command[i] à la phase d'essai i = i. Réel: answer. Attendu: powerFailure[i].
    endif
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 98 – Paramètres pour la séquence d'essai 'QUERY STATUS -powerCycleSeen'

Phase d'essai i	command	status	powerFailure
0	RESET attendre 300 ms	0XXXXXXXb	NO
1	DAPC (1)	0XXXXXXXb	NO
2	OFF	0XXXXXXXb	NO
3	UP	0XXXXXXXb	NO
4	DOWN	0XXXXXXXb	NO
5	STEP UP	0XXXXXXXb	NO
6	STEP DOWN	0XXXXXXXb	NO
7	RECALL MAX LEVEL	0XXXXXXXb	NO
8	RECALL MIN LEVEL	0XXXXXXXb	NO
9	GO TO LAST ACTIVE LEVEL	0XXXXXXXb	NO
10	STEP DOWN AND OFF	0XXXXXXXb	NO
11	ON AND STEP UP	0XXXXXXXb	NO
12	GO TO SCENE 0	0XXXXXXXb	NO
13	GO TO SCENE 4	0XXXXXXXb	NO
14	GO TO SCENE 9	0XXXXXXXb	NO
15	GO TO SCENE 15	0XXXXXXXb	NO
16	DTR0 (1)	1XXXXXXXb	YES
17	SET MIN LEVEL	1XXXXXXXb	YES
18	SET FADE TIME	1XXXXXXXb	YES
19	SET SCENE 2	1XXXXXXXb	YES
20	ADD TO GROUP 11	1XXXXXXXb	YES
21	READ MEMORY BANK	1XXXXXXXb	YES
22	ENABLE DAPC SEQUENCE	1XXXXXXXb	YES
23	TERMINATE	1XXXXXXXb	YES
24	INITIALISE (0)	1XXXXXXXb	YES
25	PING	1XXXXXXXb	YES

12.8.5 QUERY CONTROL GEAR PRESENT

La séquence d'essai vérifie le bon fonctionnement de la commande QUERY CONTROL GEAR PRESENT. La commande est envoyée à l'adresse courte de l'unité logique en essai et à une adresse courte différente.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
answer = QUERY CONTROL GEAR PRESENT
if (answer == NO)
    error1 Aucun DUT n'est présent à l'interface du bus.
else
    oldAddress = GLOBAL_currentUnderTestLogicalUnit
    newAddress = 63
    SetShortAddress (oldAddress; newAddress)
    for (i = 0; i < 2; i++)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        answer = QUERY CONTROL GEAR PRESENT, send to ((address[i] << 1) + 1)
        if (answer != expected[i])
            error2 Réponse erronée lorsque text[i] a été envoyé à la commande. Réel:
            answer. Attendu: expected[i].
        endif
    endfor
    SetShortAddress (newAddress; oldAddress)
endif
```

Tableau 99 – Paramètres pour la séquence d'essai 'QUERY CONTROL GEAR PRESENT'

Phase d'essai i	address	expected	test step description
0	*newAddress*	YES	à l'adresse courte du dispositif
1	*oldAddress*	NO	à une adresse courte différente

12.8.6 QUERY VERSION NUMBER

La séquence d'essai vérifie le numéro de version de la norme, mise en œuvre par le DUT.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
// Obtenir la version en utilisant QUERY VERSION NUMBER
answer = GetVersionNumber ()
if (answer == 2,0)
    report1 Le numéro de version équivaut à answer.
else if (answer == 2)
    warning1 Le numéro de version équivaut à answer, mais il n'est pas au bon format.
    Attendu: 2.0.
else if (answer< 2)
    warning2 Le DUT n'est pas conforme avec la toute dernière version de la norme. Le
    numéro de version équivaut à answer.
else
    error1 Numéro de version incorrect. Réel: answer. Attendu: 0, 1, ou 2.0.
endif
// Comparer le numéro de version donné dans le bloc de mémoire 0 avec la réponse à Query
Version Number
DTR0 (0x16)
DTR1 (0)
answerMB = READ MEMORY LOCATION
answerQVN = QUERY VERSION NUMBER, accept Value
if (answerMB != answerQVN)
    error2 Le numéro de version indiqué dans le bloc de mémoire 0 ne correspond pas à la
    réponse de QUERY VERSION NUMBER. Numéro de version donné dans le bloc de
    mémoire 0: answerMB. Réponse à Query Version Number: answerQVN.
endif
```

12.8.7 PING

La séquence d'essai vérifie si le dispositif répond à une commande PING, envoyée une ou deux fois.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
RESET
wait 300 ms
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
for (i = 0; i < 2; i++)
    if (i == 0)
        answer = PING, send once
    else
        answer = PING, send twice
    endif
    if (answer != NO)
        error1 Réponse après réception d'une commande PING à la phase i = i.
    endif
    answer = QUERY RESET STATE
    if (answer != YES)
        error2 DUT non à l'état réinitialisé après réception d'une commande PING à la
        phase i = i.
        RESET
        wait 300 ms
    endif
endfor
```

12.8.8 Broadcast unaddressed (Diffusion non adressée)

La séquence d'essai vérifie le comportement d'une unité logique à une commande "diffusion non adressée".

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
RESET
wait 300 ms
oldAddress = GLOBAL_currentUnderTestLogicalUnit
PHM = QUERY PHYSICAL MINIMUM, send to ((oldAddress<< 1) + 1)
SetShortAddress (oldAddress; 255)
answer = QUERY MISSING SHORT ADDRESS, send to broadcast unaddressed
if (answer!= YES)
    error1 Adresse courte  non supprimée.
endif
for (i = 0; i < 2; i++)
    for (j = 0; j< 13; j++)
        DTR0 (data[j])
        command[j], send to broadcast unaddressed
        answer = query[j], send to address[i]
        if (answer != value[i,j])
            if (i == 0)
                error2 command[j] diffusion non adressée non exécutée bien qu'aucune
                adresse courte n'ait été attribuée. Réel: answer. Attendu: value[i,j].
            else
                error3 command[j] diffusion non adressée exécutée bien qu'une adresse
                courte soit attribuée. Réel: answer. Attendu: value[i,j].
            endif
        endif
    endfor
    // Attribuer une adresse courte
    if (i == 0)
        RESET
        wait 300 ms
        SetShortAddress (255; oldAddress)
        answer = QUERY CONTROL GEAR PRESENT, send to ((oldAddress<< 1) + 1)
        if (answer!= YES)
            error4 Adresse courte non attribuée.
        endif
    endif
endfor
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 100 – Paramètres pour la séquence d'essai 'Broadcast unaddressed'

Phase d'essai i	address
0	diffusion non adressée
1	(*oldAddress*<< 1) + 1

Phase d'essai j	data	command	query	value	
				i = 0	i = 1
0	0	RECALL MIN LEVEL	QUERY ACTUAL LEVEL	*PHM*	254
1	0	RECALL MAX LEVEL	QUERY ACTUAL LEVEL	254	254
2	0	DAPC (1)	QUERY ACTUAL LEVEL	*PHM*	254
3	0	DAPC (254)	QUERY ACTUAL LEVEL	254	254
4	170	SET POWER ON LEVEL	QUERY POWER ON LEVEL	170	254
5	4	SET FADE TIME	QUERY FADE TIME/FADE RATE	0x47	0x07
6	150	SET SCENE 0	QUERY SCENE LEVEL 0	150	255
7	200	SET SCENE 10	QUERY SCENE LEVEL 10	200	255
8	0	ADD TO GROUP 1	QUERY GROUPS 0-7	00000010b	0
9	0	ADD TO GROUP 15	QUERY GROUPS 8-15	10000000b	0
10	0	-	QUERY CONTROL GEAR PRESENT	YES	YES
11	10	-	QUERY CONTENT DTR0	10	10
12	0	-	QUERY RESET STATE	NO	YES

12.8.9 Reserved commands: standard commands (Commandes réservées: commandes normalisées)

La séquence d'essai vérifie si le dispositif répond à l'une des commandes normalisées réservées.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

RESET
wait 300 ms
for (*i* = 0; *i* < 6; *i*++)
  for (*j* = 0; *j*<*counterMax*[*i*]; *j*++)
    opcode = *offset*[*i*] + *j*
    answer = Send twice broadcast command with opcode *opcode*, **accept** Violation, Value
    if (*answer* != NO)
      error1 Réponse après réception d'une commande normalisée réservée avec le opcode *opcode*.
    endif
    answer = QUERY RESET STATE
    if (*answer* != YES)
      error2 DUT non à l'état réinitialisé après réception d'une commande normalisée réservée avec le opcode *opcode*.
      RESET
      wait 300 ms
    endif
  endfor
endfor

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 101 – Paramètres pour la séquence d'essai 'Reserved commands: standard commands'

Phase d'essai i	offset	counterMax	test step description
0	11	5	Commandes 11 à 15
1	38	4	Commandes 38 à 41
2	49	15	Commandes 49 à 63
3	130	14	Commandes 130 à 143
4	170	6	Commandes 170 à 175
5	198	26	Commandes 198 à 223

12.8.10 Reserved commands: special commands (Commandes réservées: commandes spéciales)

La séquence d'essai vérifie si le dispositif répond à l'une des commandes spéciales réservées, alors que l'initialisationState est soit DISABLED, soit ENABLED.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
RESET
wait 300 ms
for (m = 0; m< 2; m++)
    if (m == 1)
        INITIALISE (0)
    endif
    for (i = 0; i < 13; i++)
        for (j = 0; j<counterMax[i]; j++)
            address = offset[i] + 2 * j
            for (k = 0; k< 10; k++)
                opcode = opcodeByte[k]
                answer = Send twice to address command with opcode opcode, accept
                Violation, Value
                if (answer != NO)
                    error1 Réponse après réception d'une commande réservée à
                    l'adresse address et avec le opcode  opcodeà la phase d'essai m = m.
                endif
                answer = QUERY RESET STATE
                if (answer != YES)
                    error2 DUT non à l'état réinitialisé après réception d'une commande
                    réservée à l'adresse address et avec le opcode  opcode à la phase
                    d'essai m = m.
                    RESET
                    wait 300 ms
                endif
            endfor
        endfor
    endfor
endfor
TERMINATE
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Tableau 102 – Paramètres pour la séquence d'essai 'Reserved commands: special commands'

Phase d'essai i	offset	counterMax	test step description
0	175	1	Octet d'adresse 10101111b
1	189	2	Octet d'adresse 101111X1b
2	203	1	Octet d'adresse 11001011b
3	205	2	Octet d'adresse 110011X1b
4	209	8	Octet d'adresse 1101XXX1b
5	225	8	Octet d'adresse 1110XXX1b
6	241	4	Octet d'adresse 11110XX1b
7	249	2	Octet d'adresse 111110X1b
8	160	16	Octet d'adresse 101XXXX0b
9	192	16	Octet d'adresse 110XXXX0b
10	224	8	Octet d'adresse 1110XXX0b
11	240	4	Octet d'adresse 11110XX0b
12	248	2	Octet d'adresse 111110X0b

Phase d'essai k	0	1	2	3	4	5	6	7	8	9
opcodeByte	0	1	3	5	9	17	33	65	129	255

12.8.11 Commandes d'application étendues

La séquence d'essai vérifie si le dispositif répond à l'une des commandes d'application étendues sans qu'elle soit précédée de la commande (de données) ENABLE DEVICE TYPE.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

RESET
wait 300 ms
for (*i* = 0; *i* < 31; *i*++)
    opcode = 224 + *i*
    answer = Send twice broadcastcommand with opcode *opcode*, **accept** Violation, Value
    if (*answer* != NO)
        error1 Réponse après réception d'une commande d'application étendue avec le opcode *opcode*.
    endif
    answer = QUERY RESET STATE
    if (*answer* != YES)
        error2 DUT non à l'état réinitialisé après réception d'une commande d'application étendue avec le opcode *opcode*.
        RESET
        wait 300 ms
    endif
endfor

12.8.12 Types de dispositif non pris en charge

La séquence d'essai vérifie si le dispositif répond aux commandes d'application étendues des types de dispositif non pris en charge.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
RESET
wait 300 ms
for (i = 0; i < 255; i++)
    ENABLE DEVICE TYPE (i)
    answer = QUERY EXTENDED VERSION NUMBER
    if (answer != NO)
        report1 Le type de dispositif i est pris en charge.
    else
        for (j = 0; j< 31; j++)
            opcode = 224 + j
            ENABLE DEVICE TYPE (i)
            answer = Send twice broadcastcommand with opcode opcode, accept
            Violation, Value
            if (answer != NO)
                error1 Réponse après réception d'une commande d'application étendue
                avec le opcode opcode.
            endif
            answer = QUERY RESET STATE
            if (answer != YES)
                error2 DUT non à l'état réinitialisé après réception d'une commande
                d'application étendue avec le opcode opcode.
                RESET
                wait 300 ms
            endif
        endfor
    endif
endfor
```

12.8.13 Fonctionnalité supprimée

La séquence d'essai vérifie que l'ancienne fonctionnalité de commande avec l'adresse = 10111101b et le opcode = 00000000b (commande PHYSICAL SELECTION) n'est pas disponible pour la norme actuelle.

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
lightSource = vrai
if (GLOBAL_logicalUnit[GLOBAL_currentUnderTestLogicalUnit].lightSource[0] == 254)
    lightSource = false // Cette unité logique n'a pas de source de lumière
endif
if (GLOBAL_safeLampConnection == Yes AND lightSource)
    RESET
    wait 300 ms
    oldAddress = GLOBAL_currentUnderTestLogicalUnit
    address = 10111101b
    opcode = 00000000b
    DTR0 (255)
    SET SHORT ADDRESS
    INITIALISE (255)
    answer = QUERY SHORT ADDRESS
    if (answer!= YES)
        error1 Pas de réponse de QUERY SHORT ADDRESS.
    endif
    RANDOMISE
    wait100 ms
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    answer = QUERY SHORT ADDRESS
    if (answer != NO)
        halt1 L'adresse aléatoire est égale à l'adresse de recherche après la commande RANDOMISE.
    endif
    Envoyer commande avec l'adresse = address et le opcode  = opcode
    answer = QUERY SHORT ADDRESS
    if (answer != NO)
        halt2 Réponse inattendue après envoi de l'ancienne commande PHYSICAL SELECTION.
    endif
    DisconnectLamps (0)
    start_timer (timer)
    do
        answer = QUERY STATUS, send to broadcast unaddressed
        timestamp = get_timer (timer)
        while (answer == XXXXXX0Xb AND timestamp< 33 s) //Poursuivre le processus de requête jusqu'à détection de la défaillance des lampes – vérifier le bit lampFailure
    if (timestamp > 33)
        error2  Bit de défaillance des lampes non réglé après un intervalle de 33 s. Temps maximum: 30 s.
    endif
    answer = QUERY SHORT ADDRESS
    if (answer != NO)
        error3 Réponse reçue de QUERY SHORT ADDRESS lorsque la ou les lampes sont déconnectées et l'ancienne commande PHYSICAL SELECTION est envoyée.
    endif
    PROGRAM SHORT ADDRESS (63)
    answer = QUERY CONTROL GEAR PRESENT, send to 01111111b
    if (answer == YES)
        error4 Programmation réussie de l'adresse courte du fait de l'ancienne sélection physique.
        DTR0 (255)
        SET SHORT ADDRESS, send to 01111111b
    endif
    ConnectLamps ()
    Envoyer commande avec l'adresse = address et le opcode  = opcode
    answer = QUERY SHORT ADDRESS
    if (answer != NO)
        error5 Réponse inattendue après envoi de l'ancienne commande PHYSICAL SELECTION.
    endif
    TERMINATE
    SetShortAddress (255; oldAddress)
else
    if (lightSource)
        report1 La séquence d'essai n'est pas applicable.
    else
        warning1 La séquence d'essai ne peut pas être exécutée, la déconnexion et la reconnexion de la lampe ne peuvent pas être effectuées en toute sécurité.
    endif
endif
```

12.9 Contamination croisée

12.9.1 DTR0

La séquence d'essai vérifie que le changement du registre DTR0 d'une unité logique n'affecte pas la valeur des registres des autres unités logiques. Le registre DTR0 doit être soumis à essai par l'intermédiaire des blocs de mémoire. DTR0 doit être augmenté après chaque lecture d'un emplacement de bloc de mémoire.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
if (GLOBAL_numberShortAddresses == 1)
    report1 Un seul dispositif logique est mis en œuvre.
else
    DTR0 (10)
    DTR1 (0)
    answer = READ MEMORY LOCATION
    for (address = 0; address<GLOBAL_numberShortAddresses; address++)
        for(k = 0; k < address; k++)
            READ MEMORY LOCATION, send to ((address<< 1) + 1)
        endfor
    endfor
    for (address = 0; address<GLOBAL_numberShortAddresses; address++)
        answer = QUERY CONTENT DTR0, send to ((address<< 1) + 1)
        expectedValue = 10 + 1 +address
        if(answer != expectedValue)
            error1 LogicalUnit address: Valeur erronée de DTR0. Réel: answer. Attendu:
            expectedValue.
        endif
    endfor
endif
```

12.9.2 Variables NVM

La séquence d'essai vérifie que la modification de certaines variables d'une unité logique n'affecte pas les valeurs des variables des autres unités logiques.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
if (GLOBAL_numberShortAddresses == 1)
    report1 Un seul dispositif logique est mis en œuvre.
else
    RESET
    wait 300 ms
    // Modifier les variables des unités logiques
    for (address = 0; address<GLOBAL_numberShortAddresses; address++)
        PHM = QUERY PHYSICAL MINIMUM, send to ((address<< 1) + 1)
        DTR0 (address)
        SET SCENE 3, send to ((address<< 1) + 1)
        SET SCENE 8, send to ((address<< 1) + 1)
        SET SCENE 14, send to ((address<< 1) + 1)
        SET POWER ON LEVEL, send to ((address<< 1) + 1)
        SET SYSTEM FAILURE LEVEL, send to ((address<< 1) + 1)
        DTR0 (address % 16)
        SET FADE TIME, send to ((address<< 1) + 1)
        SET EXTENDED FADE TIME, send to ((address<< 1) + 1)
        DTR0 ((address % 15) + 1)
        SET FADE RATE, send to ((address<< 1) + 1)
        ADD TO GROUP (address % 16), send to ((address<< 1) + 1)
        DTR0 (PHM + (address % (255 -PHM)))
        SET MIN LEVEL, send to ((address<< 1) + 1)
        SET MAX LEVEL, send to ((address<< 1) + 1)
    endfor
    // Vérifier la modification des variables
    for (address = 0; address<GLOBAL_numberShortAddresses; address++)
        PHM = QUERY PHYSICAL MINIMUM, send to ((address<< 1) + 1)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

expected = *PHM* + (*address* % (255 -*PHM*))
answer = QUERY ACTUAL LEVEL, send to ((*address*<< 1) + 1)
if (*answer* != *expected*)
    error1 LogicalUnit *address*: Valeur erronée pour actualLevel. Réel:*answer*. Attendu: *expected*.
endif
answer = QUERY MIN LEVEL, send to ((*address*<< 1) + 1)
if (*answer* != *expected*)
    error2 LogicalUnit *address*: Valeur erronée pour minLevel. Réel:*answer*. Attendu: *expected*.
endif
answer = QUERY MAX LEVEL, send to ((*address*<< 1) + 1)
if (*answer* != *expected*)
    error3 LogicalUnit *address*: Valeur erronée pour maxLevel. Réel:*answer*. Attendu: *expected*.
endif
answer = QUERY SCENE LEVEL 3, send to ((*address*<< 1) + 1)
if (*answer* != *address*)
    error4 LogicalUnit *address*: Valeur erronée pour scene3. Réel:*answer*. Attendu: *address*.
endif
answer = QUERY SCENE LEVEL 8, send to ((*address*<< 1) + 1)
if (*answer* != *address*)
    error5 LogicalUnit *address*: Valeur erronée pour scene8. Réel:*answer*. Attendu: *address*.
endif
answer = QUERY SCENE LEVEL 14, send to ((*address*<< 1) + 1)
if (*answer* != *address*)
    error6 LogicalUnit *address*: Valeur erronée pour scene14. Réel:*answer*. Attendu: *address*.
endif
answer = QUERY POWER ON LEVEL, send to ((*address*<< 1) + 1)
if (*answer* != *address*)
    error7 LogicalUnit *address*: Valeur erronée pour powerOnLevel. Réel:*answer*. Attendu: *address*.
endif
answer = QUERY SYSTEM FAILURE LEVEL, send to ((*address*<< 1) + 1)
if (*answer* != *address*)
    error8 LogicalUnit *address*: Valeur erronée pour systemFailureLevel. Réel:*answer*. Attendu: *address*.
endif
answer = QUERY FADE TIME/FADE RATE, send to ((*address*<< 1) + 1)
expected = (*address*%16) << 4 + ((*address* % 15) + 1)
if (*answer* != *expected*)
    error9 LogicalUnit *address*: Valeur erronée pour fadeRate/fadeTime. Réel:*answer*. Attendu: *expected*.
endif
answer = QUERY EXTENDED FADE TIME, send to ((*address*<< 1) + 1)
if (*answer* != (*address*%16))
    error10 LogicalUnit *address*: Valeur erronée pour extendedFadeTime. Réel:*answer*. Attendu: (*address*%16).
endif
group = *address*%16
if (*group*<= 7)
    group0-7 = 1 <<*group*
    group8-15 = 0
else
    group0-7 = 0
    group8-15 = 1 <<(*group*– 8)
endif
answer = QUERY GROUPS 0-7, send to ((*address*<< 1) + 1)
if (*answer* != *group0-7*)

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            error11 LogicalUnit address: Valeur erronée pour gearGroups0-7. Réel:answer.
            Attendu: group0-7.
        endif
        answer = QUERY GROUPS 8-15, send to ((address<< 1) + 1)
        if (answer != group8-15)
            error12 LogicalUnit address: Valeur erronée pour gearGroups8-15.
            Réel:answer. Attendu: group8-15.
        endif
    endfor
endif
```

12.9.3 Génération d'adresses aléatoires

La séquence d'essai vérifie que:

- toutes les unités logiques génèrent une adresse aléatoire unique, lorsque la commande RANDOMISE est envoyée en utilisant la diffusion comme mode d'adressage
- seule l'unité logique adressée génère une adresse aléatoire, lorsque la commande RANDOMISE est envoyée en utilisant l'adresse courte de l'unité logique sélectionnée

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
if (GLOBAL_numberShortAddresses == 1)
    report1 Un seul dispositif logique est mis en œuvre.
else
    RESET
    wait 300 ms
    // Toutes les unités logiques doivent générer une adresse aléatoire unique
    INITIALISE (0)
    RANDOMISE
    wait 100 ms
    for (address = 0; address<GLOBAL_numberShortAddresses; address++)
        randomAddress[address] = GetRandomAddress (address)
    endfor
    for (i = 0; i<GLOBAL_numberShortAddresses; i++)
        if (randomAddress[i] == 0xFFFFFF)
            error1 LogicalUnit i: Adresse aléatoire erronée générée. Réel: 0xFFFFFF.
            Attendu: pas 0xFFFFFF.
        endif
        for (j = i + 1; j<GLOBAL_numberShortAddresses; j++)
            if (randomAddress[i] == randomAddress[j])
                error2 Les LogicalUnit i et LogicalUnit j ont généré la même adresse
                aléatoire randomAddress[i].
            endif
        endfor
    endfor
    RESET
    wait 300 ms
    TERMINATE
    // Il convient que seule une unité logique génère une adresse aléatoire
    for (address = 0; address<GLOBAL_numberShortAddresses; address++)
        answer = QUERY RESET STATE, send to ((address<< 1) + 1)
        if (answer!= YES)
            error3 LogicalUnit address: n'est pas à l'état réinitialisé. Réel: N0. Attendu:
            YES.
        endif
        INITIALISE (address <<1 +1)
        RANDOMISE
        wait 100 ms
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        TERMINATE
        answer = QUERY RESET STATE, send to ((address<< 1) + 1)
        if (answer != NO)
            error4 LogicalUnit address: est toujours à l'état réinitialisé. Réel: YES. Attendu: NO.
        endif
    endfor
endif
```

12.9.4 Addressing 1 (Adressage 1)

La séquence d'essai vérifie la réponse envoyée par toutes les unités logiques lors des requêtes de diffusion. L'essai met hors tension les lampes de la moitié des unités logiques. La réponse attendue est YES pour une requête YES-NO, et une trame en arrière non valide pour une requête à 8 bits.

La séquence d'essai doit être exécutée pour toutes les unités logiques en parallèle.

Description de l'essai:

```
if (GLOBAL_numberShortAddresses == 1)
    report1 Un seul dispositif logique est mis en œuvre.
else
    RESET
    wait 300 ms
    WaitForLampOnAddressed (broadcast)
    // Toutes les lampes des unités logiques sont sous tension
    answer = QUERY LAMP POWER ON
    if (answer!= YES)
        error1 Réponse erronée de toutes les unités logiques lors d'une requête YES-NO avec toutes les lampes sous tension. Réel: answer. Attendu: YES.
    endif
    answer = QUERY STATUS
    if (answer != 00100100b)
        error2 Réponse erronée de toutes les unités logiques lors d'une requête à 8 bits avec toutes les lampes sous tension. Réel: answer. Attendu: 00100100b.
    endif
    // Toutes les lampes d'une unité logique sont hors tension, les autres lampes sont sous tension
    for (address = 0; address<GLOBAL_numberShortAddresses; address++)
        RECALL MAX LEVEL
        WaitForLampOnAddressed (broadcast)
        OFF, send to ((address<< 1) + 1)
        for (i = 0; i<GLOBAL_numberShortAddresses; i++)
            answer = QUERY LAMP POWER ON, send to ((i<< 1) + 1)
            if (i == address)
                if (answer != NO)
                    error3 Réponse erronée de l'unité logique address lors d'une requête YES-NO avec les lampes de LogicalUnit address hors tension. Réel: answer. Attendu: NO.
                endif
            else
                if (answer!= YES)
                    error4 Réponse erronée de l'unité logique i lors d'une requête YES-NO avec les lampes de LogicalUnit address hors tension. Réel: answer. Attendu: YES.
                endif
            endif
        endfor
        answer = QUERY LAMP POWER ON
        if (answer!= YES)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
            error5 Réponse erronée de toutes les unités logiques lors d'une requête YES-NO avec les lampes de LogicalUnit address hors tension. Réel: answer. Attendu: YES.
        endif
        answer = QUERY STATUS, accept Violation
        if (answer est une trame en arrière valide)
            error6 Réponse erronée de toutes les unités logiques lors d'une requête à 8 bits avec les lampes de LogicalUnit address hors tension. Réel: answer. Attendu: trame en arrière non valide
        endif
    endfor
    // Toutes les lampes des unités logiques sont hors tension
    OFF
    answer = QUERY LAMP POWER ON
    if (answer != NO)
        error7 Réponse erronée de toutes les unités logiques lors d'une requête YES-NO avec toutes les lampes hors tension. Réel: answer. Attendu: NO.
    endif
    answer = QUERY STATUS, accept Violation
    if (answer != 00100000b)
        error8 Réponse erronée de toutes les unités logiques lors d'une requête à 8 bits avec toutes les lampes hors tension. Réel: answer. Attendu: 00100000b.
    endif
endif
```

12.9.5 Addressing 2 (Adressage 2)

La séquence d'essai vérifie la réponse envoyée par toutes les unités logiques lors des requêtes envoyées par adressage par diffusion et groupement L'essai vérifie le comportement des unités logiques lorsqu'elles sont toutes ajoutées à un groupe, puis lorsque la moitié d'entre elles figure dans un groupe et l'autre moitié dans un groupe différent. L'essai règle les lampes des unités logiques comme suit:

- toutes les lampes sont sous tension
- la première moitié des lampes du groupe est hors tension, et le reste des lampes est sous tension, avec toutes les unités logiques dans un groupe; lampes du Group0 hors tension et lampes du Group1 sous tension, avec les unités logiques réparties en deux groupes
- la première moitié des lampes du groupe est sous tension, et le reste des lampes est hors tension, avec toutes les unités logiques dans un groupe; lampes du Group0 sous tension et lampes du Group1 hors tension, avec les unités logiques réparties en deux groupes
- toutes les lampes sont hors tension

L'essai doit être exécuté pour toutes les unités logiques en parallèle.

Description de l'essai:

```
if (GLOBAL_numberShortAddresses == 1)
    report1 Un seul dispositif logique est mis en œuvre.
else
    RESET
    wait 300 ms
    for (i = 0; i < 2; i++)
        if (i == 0)
            ADD TO GROUP 1
        else
            for (address = 0; address< (GLOBAL_numberShortAddresses>> 1); address++)
                REMOVE FROM GROUP 1, send to ((address<< 1) + 1)
                ADD TO GROUP 0, send to ((address<< 1) + 1)
            endfor
        endif
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
for (j = 0; j< 4; j++)
    switch (j)
        case 0: // Toutes les lampes sont sous tension
            RECALL MAX LEVEL
            WaitForLampOnAddressed (broadcast)
            break
        case 1:
            if (i == 0) // Première moitié du groupe – lampes hors tension, reste du groupe – lampes sous tension
                for (address = 0; address< (GLOBAL_numberShortAddresses>> 1); address++)
                    OFF, send to ((address<< 1) + 1)
                endfor
            else// Group0 – lampes hors tension, Group1 – lampes sous tension
                OFF, send to 10000001b //gearGroups0
            endif
            break
        case 2:
            if (i == 0) // Première moitié du groupe – lampes sous tension, reste du groupe – lampes hors tension
                for (address = 0; address< (GLOBAL_numberShortAddresses>> 1); address++)
                    RECALL MAX LEVEL, send to ((address<< 1) + 1)
                    WaitForLampOnAddressed ((address<< 1) + 1)
                endfor
                for (address = (GLOBAL_numberShortAddresses>> 1); address<GLOBAL_numberShortAddresses; address++)
                    OFF, send to ((address<< 1) + 1)
                endfor
            else// Group0 – lampes sous tension, Group1 – lampes hors tension
                RECALL MAX LEVEL, send to 10000001b //gearGroups0
                OFF, send to 10000011b //gearGroups1
                WaitForLampOnAddressed (10000001b)
            endif
            break
        case 3: // Toutes les lampes sont hors tension
            if (i == 0)
                OFF
            else
                OFF, send to 10000001b //gearGroups0
            endif
            break
    endswitch
    answer = QUERY LAMP POWER ON
    if (answer != lampOnBroadcast[j])
        error1 Réponse erronée de toutes les unités logiques lors d'une requête YES-NO à la phase d'essai (i,j) = (i,j).. Réel: answer. Attendu: lampOnBroadcast[j].
    endif
    answer = QUERY STATUS, accept Violation
    if (answer != statusBroadcast[j])
        error2 Réponse erronée de toutes les unités logiques lors d'une requête à 8 bits à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu: statusBroadcast[j].
    endif
    answer = QUERY LAMP POWER ON, send to 10000011b //gearGroups1
    if (answer != lampOnG1[i,j])
        error3 Réponse erronée de toutes les unités logiques du gearGroups1 lors d'une requête YES-NO. Réel: answer. Attendu: lampOnG1[i,j].
    endif
    answer = QUERY STATUS, send to 10000011b //gearGroups1
    if (answer != statusG1[i,j])
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                error4 Réponse erronée de toutes les unités logiques du gearGroups1 lors
                d'une requête à 8 bits à la phase d'essai (i,j) = (i,j). Réel: answer. Attendu:
                statusG1[i,j].
            endif
            if (i == 1)
                answer = QUERY LAMP POWER ON, send to 10000001b //gearGroups0
                if (answer != lampOnG0[j])
                    error5 Réponse erronée de toutes les unités logiques du gearGroups0
                    lors d'une requête YES-NO. Réel: answer. Attendu: lampOnG0[j].
                endif
                answer = QUERY STATUS, send to 10000001b //gearGroups0
                if (answer != statusG0[j])
                    error6 Réponse erronée de toutes les unités logiques du gearGroups0
                    lors d'une requête à 8 bits à la phase d'essai (i,j) = (i,j). Réel: answer.
                    Attendu: statusG0[j].
                endif
            endif
        endfor
    endfor
endif
```

Tableau 103 – Paramètres pour la séquence d'essai 'Addressing 2'

Phase d'essai j		0	1	2	3
lampOnBroadcast		YES	YES	YES	NO
statusBroadcast		00000100b	trame en arrière non valide	trame en arrière non valide	00000000b
i = 0	**lampOnG1**	YES	YES	YES	NO
	statusG1	00000100b	trame en arrière non valide	trame en arrière non valide	00000000b
i = 1	**lampOnG1**	YES	YES	NO	NO
	statusG1	00000100b	00000100b	00000000b	00000000b
	lampOnG0	YES	NO	YES	NO
	statusG0	00000100b	00000000b	00000100b	00000000b

12.9.6 Addressing 3 (Adressage 3)

La séquence d'essai vérifie le comportement d'une unité logique lors d'une requête "diffusion non adressée".

La séquence d'essai doit être exécutée pour chaque unité logique sélectionnée.

Description de l'essai:

```
if (GLOBAL_numberShortAddresses == 1)
    report1 Un seul dispositif logique est mis en œuvre.
else
    RESET
    wait 300 ms
    oldAddress = GLOBAL_currentUnderTestLogicalUnit
    SetShortAddress (oldAddress; 255)
    INITIALISE (0)
    RANDOMISE
    wait 100 ms
    answer = QUERY RANDOM ADDRESS(H), send to broadcast unaddressed, accept
    Violation
    if (answer n'est pas une trame en arrière valide)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
        error1 Plusieurs unités logiques ont répondu à la commande "diffusion non adressée".
    endif
    answer = QUERY RANDOM ADDRESS(M), send to broadcast unaddressed, accept Violation
    if (answer n'est pas une trame en arrière valide)
        error2 Plusieurs unités logiques ont répondu à la commande "diffusion non adressée".
    endif
    answer = QUERY RANDOM ADDRESS(L), send to broadcast unaddressed, accept Violation
    if (answer n'est pas une trame en arrière valide)
        error3 Plusieurs unités logiques ont répondu à la commande "diffusion non adressée".
    endif
    SetShortAddress (255; oldAddress)
    TERMNATE
endif
```

12.10 Sous-séquences générales

12.10.1 GetVersionNumber

La sous-séquence d'essai renvoie le numéro de version de l'appareillage de commande.

Description de l'essai:

```
versionNumber = GetVersionNumber ()

versionNumber = -1
answer = QUERY VERSION NUMBER, accept Value
if (answer> 3)
    minor = answer& 0x03
    major = answer>> 2
    versionNumber = major + minor / 10
else
    versionNumber = answer
endif
return versionNumber
```

12.10.2 GetExtendedVersionNumber

La sous-séquence d'essai renvoie une matrice avec le numéro de version des parties 2xx de la présente norme pour chaque type de dispositif pris en charge de l'unité logique en essai.

Description de l'essai:

```
extendedVersionNumber[] = GetExtendedVersionNumber (address; deviceType[])

extendedVersionNumber[0] = -1
if (deviceType[0] != -1)
    i = 0
    foreach (device in deviceType)
        ENABLE DEVICE TYPE (device)
        answer = QUERY EXTENDED VERSION NUMBER, send to ((address<< 1) + 1)
        if (answer> 3)
            minor = answer& 0x03
            major = answer>> 2
            answer = major + minor / 10
        else
            if (device>= 10)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                error1 LogicalUnit address: Numéro de version/format incorrects consignés pour device. Attendu: >=2.0 Réel: answer
            endif
        endif
        extendedVersionNumber[i] = answer
        i++
    endfor
endif
return extendedVersionNumber[]
```

12.10.3 GetSupportedDeviceTypes

La sous-séquence d'essai vérifie le bon fonctionnement de la commande QUERY DEVICE TYPE et renvoie une matrice avec tous les types de dispositif pris en charge de l'unité logique en essai.

Description de l'essai:

```
deviceType[] = GetSupportedDeviceTypes (address)

answer = QUERY DEVICE TYPE, send to ((address<< 1) + 1)
i = 0
deviceType[0] = -1
if (answer == 254)
    report1 LogicalUnit address: Aucune partie 2xx n'est prise en charge.
else if (answer == 255)
    do
        answer = QUERY NEXT DEVICE TYPE, send to ((address<< 1) + 1)
        switch (answer)
            case NO:
            case 255:
                error1 LogicalUnit address: Réponse erronée à QUERY NEXT DEVICE TYPE. Réel: answer. Attendu: [0 254].
                i = 256
                break
            case 254:
                break
            default:
                deviceType[i] = answer
                i++
                break
        endswitch
    while (answer != 254 AND i< 255)
    if (i == 255)
        error2 LogicalUnit address: Plus de 254 types de dispositif consignés.
    endif
else
    deviceType[0] = answer
endif
return deviceType[]
```

12.10.4 GetSupportedLightSources

La sous-séquence d'essai vérifie le bon fonctionnement de la commande QUERY LIGHT SOURCE TYPE et renvoie une matrice avec tous les types de source de lumière pris en charge de l'unité logique en essai.

Description de l'essai:

```
lightSource[] = GetSupportedLightSources (address)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
lightSource[0] = -1
lightSource[1] = -1
lightSource[2] = -1
answer = QUERY LIGHT SOURCE TYPE, send to ((address<< 1) + 1)
if (answer == 255)
    answer = QUERY CONTENT DTR0, send to ((address<< 1) + 1)
    switch (answer)
        case 0:
        case 2:
        case 3:
        case 4:
        case 6
        case 7:
        case 252:
        case 253:
            lightSource[0] = answer
            break
        default:
            error1 LogicalUnit address: Source de lumière 1 incorrecte consignée. Réel:
            answer. Attendu: 0, 2, 3, 4, 6, 7, 252 ou 253.
            break
    endswitch
    answer = QUERY CONTENT DTR1, send to ((address<< 1) + 1)
    switch (answer)
        case 0:
        case 2:
        case 3:
        case 4:
        case 6
        case 7:
        case 252:
        case 253:
            lightSource[1] = answer
            break
        default:
            error 2 LogicalUnit address: Source de lumière 2 incorrecte consignée. Réel:
            answer. Attendu: 0, 2, 3, 4, 6, 7, 252 ou 253.
            break
    endswitch
    answer = QUERY CONTENT DTR2, send to ((address<< 1) + 1)
    switch (answer)
        case 0:
        case 2:
        case 3:
        case 4:
        case 6
        case 7:
        case 252:
        case253:
            lightSource[2] = answer
            break
        case254:
            report1 LogicalUnit address: Exactement deux types de source de lumière
            indiqués.
            break
        case255:
            report 2 LogicalUnit address: Le troisième type de source de lumière indique
            plusieurs types de source de lumière.
            break
        default:
            error3 LogicalUnit address: Source de lumière incorrecte consignée. Réel:
            answer. Attendu: 0, 2, 3, 4, 6, 7, 252, 253 ou 255.
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
                break
        endswitch
        endif
else
        lightSource[0] = answer
endif
return lightSource[]
```

12.10.5 WaitForPowerOnPhaseToFinish

La sous-séquence d'essai attend que les lampes s'allument après un cycle de mise sous tension. Si les lampes ne s'allument pas dans un délai donné, la sous-séquence génère une erreur et interrompt la vérification du niveau réel.

Description de l'essai:

WaitForPowerOnPhaseToFinish ()

```
start_timer (timer)
do
        answer = QUERY ACTUAL LEVEL, accept Pas de réponse
        if (get_timer (timer) >= GLOBAL_startupTimeLimit)
                error1 Le démarrage dure plus longtemps que le délai de démarrage préréglé =
                GLOBAL_startupTimeLimit s. Boucle arrêtée.
                break
        endif
while (answer == NO OR answer == 0 OR answer == 255)
return
```

12.10.6 WaitForLampOn

La sous-séquence d'essai attend que les lampes s'allument après qu'elles ont été hors tension. Si les lampes ne s'allument pas dans un délai donné, la sous-séquence génère une erreur et interrompt la vérification du niveau réel.

Description de l'essai:

WaitForLampOn ()

```
start_timer (timer)
error = false
do
        answer = QUERY ACTUAL LEVEL
        if (get_timer (timer) >= GLOBAL_startupTimeLimit)
                error1 L'allumage de la lampe dure plus longtemps que le délai de démarrage
                préréglé = GLOBAL_startupTimeLimit s. Boucle arrêtée.
                break
        endif
        if (!errorAND answer == 0)
                error2 Niveau réel 0 consigné tout en attendant que la lampe s'allume.
                error = true
        endif
while (answer == 255 OR answer == 0)
return
```

12.10.7 WaitForLampOnAddressed

La sous-séquence d'essai attend que les lampes s'allument après qu'elles ont été hors tension. Si les lampes ne s'allument pas dans un délai donné, la sous-séquence génère une

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

erreur et interrompt la vérification du niveau réel. La fonction prévoit que toutes les lampes passent au niveau 254.

Description de l'essai:

WaitForLampOnAddressed (*address*)

```
start_timer (timer)
do
    answer = QUERY ACTUAL LEVEL, sent to address, accept Violation
    if (get_timer (timer) >= GLOBAL_startupTimeLimit)
        error1 L'allumage des lampes dure plus longtemps que le délai de démarrage
        préréglé = GLOBAL_startupTimeLimit s. Boucle arrêtée.
        break
    endif
while (answer != 254)
return
```

12.10.8 WaitForLampLevel

La sous-séquence d'essai attend que le niveau réel atteigne un "niveau" souhaité. Si le niveau souhaité n'est pas atteint dans un délai donné, la sous-séquence génère une erreur et interrompt la vérification du niveau réel.

Description de l'essai:

WaitForLampLevel (*level*)

```
start_timer (timer)
do
    answer = QUERY ACTUAL LEVEL
    if (get_timer (timer) >= GLOBAL_startupTimeLimit)
        error1 Passer au niveau bas level dure plus longtemps que le délai de démarrage
        préréglé = GLOBAL_startupTimeLimit s. Boucle arrêtée.
        break
    endif
while (answer != level)
return
```

12.10.9 WaitForFadeToFinish

La sous-séquence d'essai attend la fin d'une modification de l'intensité lumineuse. Si le processus de modification de l'intensité lumineuse dure plus longtemps qu'un délai 'timeLimit' donné, la sous-séquence génère une erreur et interrompt la vérification du bit de modification de l'intensité lumineuse.

Description de l'essai:

WaitForFadeToFinish (*timeLimit*)

```
start_timer (timer)
do
    answer = QUERY STATUS
    if (get_timer (timer) >= timeLimit)
        error1 La modification de l'intensité lumineuse ne s'est pas arrêtée après timeLimit
        ms. boucle arrêtée.
        break
    endif
while (answer != XXX0XXXXb)
return
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.10.10 SetShortAddress

La sous-séquence d'essai définit une nouvelle adresse courte (toAddress) au moyen de SET SHORT ADDRESS, et avec le mode d'adressage suivant:

- adresse courte d'une unité logique: si une adresse courte est déjà attribuée à l'unité logique (fromAddress)
- diffusion non adressée: si aucune adresse courte n'est attribuée à l'unité logique

Description de l'essai:

SetShortAddress (*fromAddress*; *toAddress*)

```
if (toAddress == 255)
    dtrValue = 255
elseif (toAddress<= 63)
    dtrValue = (toAddress<< 1) + 1
else
    halt 1 Argument toAddress non valide dans la sous-séquence SetShortAddress. Réel: toAddress.
endif
DTR0 (dtrValue)
if (fromAddress != 255)
    if (fromAddress<= 63)
        answer =QUERY CONTROL GEAR PRESENT, send to (fromAddress<< 1) + 1
        if (answer== YES)
            SET SHORT ADDRESS, send to (fromAddress<< 1) + 1
        else
            halt 2 Argument fromAddress non valide dans la sous-séquence SetShortAddress. Réel: fromAddress.
        endif
    else
        halt 3 Argument fromAddress non valide dans la sous-séquence SetShortAddress. Réel: fromAddress.
    endif
else
    answer =QUERY CONTROL GEAR PRESENT, send to broadcast unaddressed
    if (answer== YES)
        SET SHORT ADDRESS, send to broadcast unaddressed
    else
        halt 4 Argument fromAddress non valide dans la sous-séquence SetShortAddress. Réel: fromAddress.
    endif
endif
return
```

12.10.11 GetRandomAddress

La sous-séquence d'essai renvoie l'adresse aléatoire.

Description de l'essai:

```
randomAddress = GetRandomAddress ()

answerH = QUERY RANDOM ADDRESS (H)
answerM = QUERY RANDOM ADDRESS (M)
answerL = QUERY RANDOM ADDRESS (L)
randomAddress = answerH<< 16 + answerM<< 8 + answerL
return randomAddress
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.10.12 GetLimitedRandomAddress

La sous-séquence d'essai essaie à 50 reprises de déterminer une adresse aléatoire dont chaque octet généré est différent de 0x00 et 0xFF.

Description de l'essai:

randomAddress = GetLimitedRandomAddress (*logicalUnit*)

```
randomAddress = 0xFF FF FF
TERMINATE
INITIALISE (logicalUnit)
for (i = 0; i < 50; i++)
    RANDOMISE
    wait 100 ms
    randomH = QUERY RANDOM ADDRESS (H), send to logicalUnit
    randomM = QUERY RANDOM ADDRESS (M), send to logicalUnit
    randomL = QUERY RANDOM ADDRESS (L),send to logicalUnit
    if ((randomH!= 0x00) AND (randomH!= 0xFF) AND (randomM!= 0x00) AND (randomM!=
    0xFF) AND (randomL!= 0x00) AND (randomL!= 0xFF))
        randomAddress = answerH << 16 + answerM<< 8 + answerL
        break
    endif
endfor
TERMINATE
return randomAddress
```

12.10.13 SetSearchAddress

La sous-séquence d'essai définit l'adresse de recherche sur 'data'.

Description de l'essai:

SetSearchAddress (*data*)

```
SEARCHADDRH (data>> 16)
SEARCHADDRM ((data>> 8) & (0x00 FF))
SEARCHADDRL (data& 0x00 00 FF)
return
```

12.10.14 ReadMemBankMultibyteLocation

La sous-séquence d'essai renvoie le contenu des emplacements de blocs de mémoire 'nrBytes'. En présence d'un espace, la valeur -1 est renvoyée.

Description de l'essai:

multibyte = ReadMemBankMultibyteLocation (*nrBytes*)

```
multibyte = 0
for (i = 0; i<nrBytes; i++)
    answer = READ MEMORY LOCATION
    if (answer == NO)
        multibyte = -1
        break
    endif
    multibyte = multibyte + answer * 256^(nrBytes – 1 – i)
endfor
return multibyte
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

12.10.15FindImplementedMemoryBank

La sous-séquence d'essai renvoie le numéro du premier bloc de mémoire mis en œuvre supérieur au bloc 0 et à l'adresse du dernier emplacement de mémoire accessible de ce bloc de mémoire, pour l'unité logique sélectionnée.

Description de l'essai:

(*memoryBankNr*; *memoryBankLoc*) = FindImplementedMemoryBank ()

```
memoryBankNr = 0
memoryBankLoc = 0
DTR0 (2)
DTR1 (0)
lastMemBank = READ MEMORY LOCATION
for (i = 1; i<= lastMemBank; i++)
    DTR0 (0)
    DTR1 (i)
    answer = READ MEMORY LOCATION
    if (answer != NO)
        memoryBankNr = i
        memoryBankLoc = answer
        break
    endif
endfor
return (memoryBankNr; memoryBankLoc)
```

12.10.16FindAllImplementedMemoryBanks

La sous-séquence d'essai renvoie tous les blocs de mémoire mis en œuvre et l'adresse du dernier emplacement de mémoire accessible de chaque bloc de mémoire mis en œuvre supérieur au bloc 0, pour l'unité logique sélectionnée.

Description de l'essai:

(*memoryBankNr[]*; *memoryBankLoc[]*) = FindAllImplementedMemoryBanks ()

```
memoryBankNr[0] = 0
memoryBankLoc[0] = 0
count = 0
DTR0 (2)
DTR1 (0)
lastMemBank= READ MEMORY LOCATION
for (i = 1; i<= lastMemBank; i++)
    DTR0 (0)
    DTR1 (i)
    answer = READ MEMORY LOCATION
    if (answer != NO)
        memoryBankNr[count] = i
        memoryBankLoc[count] = answer
        count++
    endif
endfor
return (memoryBankNr[]; memoryBankLoc[])
```

12.10.17GetNumberOfLogicalUnits

La sous-séquence d'essai renvoie le nombre d'appareillages de commande logiques présents dans le bus.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Description de l'essai:

numberLogicalUnits = GetNumberOfLogicalUnits ()

DTR1 (0)
DTR0 (0x19)
answer = READ MEMORY LOCATION
return *answer*

12.10.18 GetIndexOfLogicalUnit

La sous-séquence d'essai renvoie l'indice de l'appareillage de commande logique.

Description de l'essai:

indexNumberLogicalUnit = GetIndexOfLogicalUnit (*address*)

DTR1 (0)
DTR0 (0x1A)
answer = READ MEMORY LOCATION, send to ((*address*<< 1) + 1)
return *answer*

12.10.19 ConnectLamps

La sous-séquence d'essai doit être utilisée pour connecter toutes les lampes.

Description de l'essai:

ConnectLamps ()

```
if (GLOBAL_safeLampConnection == No)
    maxLevel = QUERY MAX LEVEL
    answer = QUERY ACTUAL LEVEL
    if (answer != 0)
        DTR0 (answer)
        SET MAX LEVEL
        OFF
    endif
    wait GLOBAL_outputCapDelay
    Connect (Toutes les lampes)
    if (answer != 0)
        RECALL MAX LEVEL
        DTR0 (maxLevel)
        SET MAX LEVEL
    endif
else
    Connect (Toutes les lampes)
endif
wait 30 s // 30 s max pour pallier la défaillance des lampes et régler les autres bits d'état
return
```

12.10.20 DisconnectLamps

La sous-séquence d'essai doit être utilisée pour déconnecter une ou toutes les lampes.

Description de l'essai:

DisconnectLamps (*numberLamps*)

```
if (GLOBAL_safeLampConnection == No)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
    maxLevel = QUERY MAX LEVEL
    answer = QUERY ACTUAL LEVEL
    if (answer != 0)
        DTR0 (answer)
        SET MAX LEVEL
        OFF
    endif
    if (numberLamps == 0)
        Disconnect (Toutes les lampes)
    else
        Disconnect (Une lampe)
    endif
    if (answer != 0)
        RECALL MAX LEVEL
        DTR0 (maxLevel)
        SET MAX LEVEL
    endif
else
    if (numberLamps == 0)
        Disconnect (Toutes les lampes)
    else
        Disconnect (Une lampe)
    endif
endif
return
```

12.10.21PowerCycle

La sous-séquence d'essai exécute un cycle de mise sous tension externe pour les dispositifs alimentés par le bus et les dispositifs externes alimentés par le bus. La durée de coupure de l'alimentation est donnée en s.

Description de l'essai:

```
PowerCycle (delay)

if (GLOBAL_busPowered)
    if (delay == 5)
        delay = 0,550 // durée de 5 s par défaut pour les dispositifs à alimentation externe,
        passer à une durée de 550 ms
    endif
    Disconnect (interface)
    waitdelay s
    Connect (interface)
else
    Switch_off (alimentation externe)
    waitdelay s
    Switch_on (alimentation externe)
endif
return
```

12.10.22PowerCycleAndWaitForBusPower

La sous-séquence d'essai exécute un PowerCycle et attend que l'alimentation de bus soit rétablie. La durée de coupure de l'alimentation est donnée en s. La sous-séquence renvoie le temps (en ms) entre la fin du PowerCycle et la disponibilité de l'alimentation de bus.

Description de l'essai:

```
time = PowerCycleAndWaitForBusPower (delay)
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

```
if (GLOBAL_internalBPS)
    // Couper l'alimentation d'essai
    Apply (Courant de 0 mA sur l'interface du bus)
endif
PowerCycle (delay)
start_timer (timer)
if (GLOBAL_internalBPS)
    do
        voltage = Measure (Tension de l'interface du bus en V)
        timestamp = get_timer (timer) // Obtenir le temps en secondes
        if (timestamp> 7)
            halt1 Alimentation interne du bus non disponible après 7 s.
        endif
    while (voltage< 12)
    if (timestamp> 5)
        error1 Alimentation interne du bus non disponible après 5 s.
    endif
    // Rétablir l'alimentation d'essai
    Apply (Courant de GLOBAL_Ibus mA sur l'interface du bus)
endif
return (get_timer (timer))
```

12.10.23 PowerCycleAndWaitForDecoder

La sous-séquence d'essai exécute un PowerCycleAndWaitForBusPower et attend que le décodeur soit prêt. La durée de coupure de l'alimentation est donnée en s. La sous-séquence fonctionne tant pour les dispositifs alimentés par le bus que pour les dispositifs externes alimentés par le bus.

Description de l'essai:

PowerCycleAndWaitForDecoder (*delay*)

```
timestamp = PowerCycleAndWaitForBusPower (delay)
if (GLOBAL_busPowered)
    waitTime = 1200
else
    // Vérifier la note e, Tableau 6 de l'IEC 62386-101 Ed 2.0
    if (timestamp< 350)
        waitTime = 450 – timestamp
    else
        waitTime = 100
    endif
endif
wait waitTime ms
return
```

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Annexe A
(informative)

Exemples d'algorithmes

A.1 Affectation d'adresses aléatoires

Les appareillages sont raccordés à un appareillage utilisant l'affectation d'adresses aléatoires pour la configuration du système.

a) Lancer l'algorithme avec la commande "INITIALISE (device)" qui active les commandes d'adressage pendant une période de 15 min.

b) Envoyer la commande "RANDOMISE"; tous les appareillages de commande choisissent une *randomAddress* de sorte que $0 \leq$ *randomAddress* $\leq +2^{24}-2$.

c) Le dispositif de commande recherche l'appareillage de commande avec l'adresse aléatoire la plus courte à l'aide d'un algorithme qui utilise les commandes "SEARCHADDRH (*data)*", "SEARCHADDRM (*data)*", "SEARCHADDRL (*data)*" et la commande "COMPARE". L'appareillage de commande avec l'adresse aléatoire la plus courte est identifié. À ce stade, il est nécessaire que le dispositif de commande soit capable de traiter des cadencements différents dans les trames en arrière provenant d'appareillages de commande différents. Il est également probable que les appareillages de commande ont généré la même *randomAddress*, auquel cas il convient de relancer la répartition aléatoire pour l'appareillage restant.

d) L'adresse courte est programmée pour l'appareillage de commande identifié à l'aide de "PROGRAM SHORT ADDRESS (*data)*".

e) VERIFY SHORT ADDRESS (*data)*" peut être utilisée pour vérifier la programmation correcte.

f) L'appareillage de commande concerné peut être identifié au moyen de "IDENTIFY DEVICE", ou utiliser une séquence alternative de "RECALL MAX LEVEL" et "RECALL MIN LEVEL" avec l'adresse courte programmée afin de consigner la position locale de l'appareillage de commande respectif.

g) Si nécessaire, l'adresse courte peut être modifiée en revenant à l'étape d).

h) L'appareillage de commande identifié doit être retiré du processus de recherche au moyen de "WITHDRAW".

i) Répéter la procédure à partir de l'étape c) jusqu'à ce que plus aucun autre appareillage de commande ne puisse être identifié. Utiliser "INITIALISE (device)" pour prolonger la minuterie de 15 minutes, si nécessaire.

j) Interrompre le processus avec "TERMINATE".

Dans le cas où deux appareillages de commande ou plus ont la même adresse courte, relancer la procédure d'adressage uniquement pour les appareillages concernés avec la commande "INITIALISE (*device)*" (en utilisant l'adresse courte dans le deuxième octet), puis procéder aux étapes b) à j).

A.2 Un seul appareillage raccordé au dispositif de commande

Un seul appareillage est raccordé à un dispositif de commande qui utilise l'algorithme suivant pour la programmation d'une adresse courte.

a) Transmettre la nouvelle adresse courte (0AAA AAA1b) à l'aide de la "DTR0 (*data)*".

b) Vérifier le contenu du DTR0 à l'aide de la commande "QUERY CONTENT DTR0".

c) Envoyer la commande "SET SHORT ADDRESS *(DTR0)*" à deux reprises conformément aux exigences indiquées en 9.3 de l'IEC 62386-101:2014.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

A.3 Utilisation des commandes d'application étendues

Il est nécessaire qu'un dispositif de commande qui utilise des commandes d'application étendues détecte les commandes d'application étendues qui sont prises en charge par les différents appareillages. L'algorithme suivant peut être utilisé:

a) Processus d'initialisation et affectation d'adresses.

b) Demander le type/la caractéristique de dispositif de chaque appareillage de commande présent dans le système. Si la réponse reçue est «MASK», le dispositif prend en charge deux types de dispositif ou plus. Dans ce cas, la procédure suivante peut être utilisée pour obtenir une liste des types de dispositif auxquels appartiennent les appareillages:

   1) Envoyer la commande "QUERY EXTENDED VERSION NUMBER" précédée de la commande "ENABLE DEVICE TYPE (*data*)" avec *data* égal à "0". S'il y a une réponse, l'appareillage de commande appartient au type de dispositif 0.

   2) Répéter l'étape a) avec tous les autres types de dispositif pris en charge par le dispositif de commande.

c) Le dispositif de commande doit envoyer la commande "ENABLE DEVICE TYPE (*data*)" avant chaque commande d'application étendue.

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Annexe B
(normative)

Gradateur à haute résolution

Un gradateur à haute résolution n'est pas obligatoire. Toutefois, s'il est mis en œuvre, il doit l'être selon la présente annexe.

Le *"actualLevel"* doit consigner le niveau de puissance d'arc le plus proche, après arrondi d'une valeur interne comme on peut le voir à la Figure B.1.

Le rendement lumineux doit toujours correspondre à un point discret sur la courbe de gradation sélectionnée, sauf lorsque:

- une modification de l'intensité lumineuse est en cours (via une courbe à haute résolution théorique ou interne)
- une modification de l'intensité lumineuse est interrompue avant que la durée correspondante ne se soit écoulée
- Une autre courbe de gradation est sélectionnée
- Un niveau de puissance d'arc a été programmé avec une autre courbe de gradation (généralement, les scénarii, y compris les niveaux de mise sous tension et de défaillance système, mémorisent le niveau ainsi que la courbe de gradation correspondante, afin de permettre une représentation sur d'autres courbes et un retour sans perte)

Lorsque le rendement lumineux se situe "entre" deux points discrets sur la courbe de gradation sélectionnée:

- *"actualLevel"* est réglé sur le point le plus proche de ces deux points
- Une nouvelle modification de l'intensité lumineuse commence à partir du rendement lumineux réel (qui peut ne pas correspondre à un point discret sur la courbe de gradation sélectionnée) et s'achève au rendement lumineux cible (qui peut ne pas correspondre à un point discret sur la courbe de gradation sélectionnée), c'est-à-dire lorsqu'un préréglage est utilisé, alors qu'il a été réglé en utilisant une autre courbe de gradation)
- La modification de l'intensité lumineuse doit toujours suivre la courbe à haute résolution théorique ou interne sans effectuer de commutations sur un point discret de la courbe de gradation sélectionnée
- il y a certaines conséquences sur les essais effectués
  - Après interruption d'une modification de l'intensité lumineuse, ou commutation de la courbe de gradation, un premier pas pourrait être inférieur ou supérieur à un pas plein sur la courbe de gradation active
  - Un essai effectué avec des niveaux à partir de deux courbes de gradation ou plus simultanément se révèle être complexe, et il vaut peut-être mieux l'éviter

Comportement qui peut être observé:

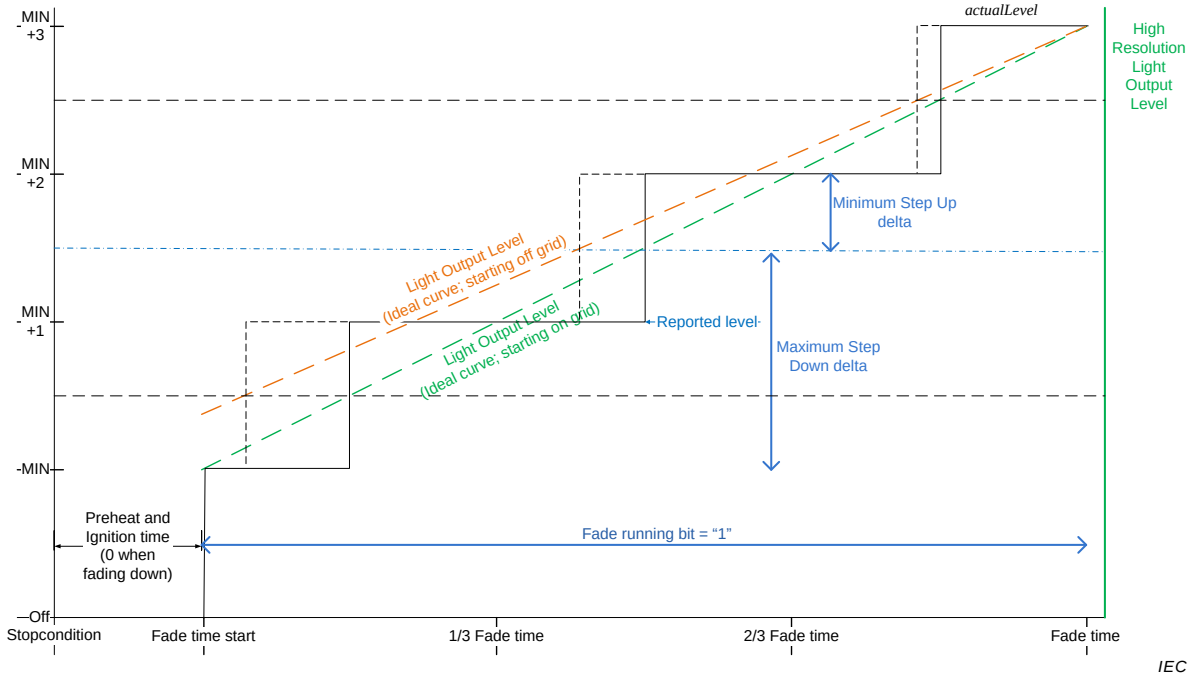
- en théorie, une modification minimale de l'intensité lumineuse est possible alors que *"actualLevel"* n'est pas modifié;
- la commande directe de puissance d'arc (Direct Arc Power Command ou DAPC) par rapport au niveau réel pourrait modifier l'intensité lumineuse entre le point du gradateur à haute résolution et le point discret (inférieur à un demi-pas de gradation);
- un STEP UP ou STEP DOWN peut dans le cas le plus défavorable produire un delta de "demi-pas" ou de "un pas et demi"; par exemple, gradateur HighRes qui se termine à stepsize+0,49 stepsize: la réponse à un pas ascendant est 0,51 stepsize, tandis que la réponse à un pas descendant est 1,49 stepsize pour se terminer à un pas discret;

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

- l'état "fade running" est réglé sur "1" au début de la durée de modification de l'intensité lumineuse et se poursuit jusqu'à l'écoulement de FadeTime, même lorsqu'"Actual Level" est déjà au niveau final;
- le niveau réel représente toujours le point discret le plus proche sur la courbe de gradation.

Cas spéciaux:

- Lorsqu'une modification de l'intensité lumineuse débute à partir de l'état “Lamp off”, le premier pas de la position hors tension à “Min Level” doit être exécuté au début de la durée de modification de l'intensité lumineuse. Le pas compris entre la position hors tension et le niveau min ne fait pas partie intégrante de la durée de modification de l'intensité lumineuse.
- Lorsqu'une modification de l'intensité lumineuse débute à l'état “Lamp off”, le dernier pas de “Min Level” à la position hors tension doit être exécuté au début de la durée de modification de l'intensité lumineuse + FadeTime (durée de modification de l'intensité lumineuse). Le pas compris entre le niveau min et la position hors tension ne fait pas partie intégrante de la durée de modification de l'intensité lumineuse.



Légende

Anglais	Français
Off	Arrêt (lampe éteinte)
Fade time start	Début de durée de modification de l’intensité lumineuse
Fade time	Durée de modification de l’intensité lumineuse
Preheat and ignition time (0 when fading down)	Temps de préchauffage et d’amorçage (0 lorsque processus de modification descendante de l’intensité lumineuse)
Fade running bit	Bit d’exécution de la modification de l’intensité lumineuse
Light output level	Niveau de rendement lumineux
Ideal curve	Courbe théorique
Starting on grid	Point de départ en réseau
Starting off grid	Point de départ hors réseau

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Anglais	Français
Reported level	Niveau consigné
Maximum step down delta	Delta de pas descendant maximum
Maximum step up delta	Delta de pas ascendant maximum
High resolution light output level	Niveau de rendement lumineux à haute résolution

Figure B.1 – Comportement des niveaux dans le cas de points de départ hors réseau

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Bibliographie

IEC 60598-1, *Luminaires – Partie 1: Exigences générales et essais*

IEC 60669-2-1, *Interrupteurs pour installations électriques fixes domestiques et analogues – Partie 2-1, Prescriptions particulières – Interrupteurs électroniques*

IEC 60921, *Ballasts pour lampes tubulaires à fluorescence – Exigences de performances*

IEC 60923, *Appareillages de lampes – Ballasts pour lampes à décharge (à l'exclusion des lampes tubulaires à fluorescence) – Exigences de performance*

IEC 60925, *Ballasts électroniques alimentés en courant continu pour lampes tubulaires à fluorescence – Prescriptions de performances*

IEC 61547, *Équipements pour l'éclairage à usage général – Exigences concernant l'immunité CEM*

IEC 62386-102:2009, *Interface d'éclairage adressable numérique – Partie 102: Exigences générales – Appareillages de commande*

CISPR 15, *Limites et méthodes de mesure des perturbations radioélectriques produites par les appareils électriques d'éclairage et les appareils analogues*

GS1 General Specification, Version 14: Jan-2014, [cité 2014-07-15] . Disponible à l'addresse: http://www.google.ch/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=2&ved=0CCIQFjAB&url=http%3A%2F%2Fwww.gs1.at%2Findex.php%3Foption%3Dcom_phocadownload%26view%3Dcategory%26download%3D289%3Ags1-general-specifications-v14-en%26id%3D9%3Ags1-spezifikationen-a-richtlinien%26Itemid%3D304&ei=znm2U4PqFoP20gXXmIHgAQ&usg=AFQjCNHoqaUjWXvLbyJfVJoGxgOAl63mCw

———————

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when print

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

3, rue de Varembé
PO Box 131
CH-1211 Geneva 20
Switzerland

Tel: + 41 22 919 02 11
Fax: + 41 22 919 03 00
info@iec.ch
www.iec.ch

Copyrighted material licensed to BR Demo by Thomson Reuters (Scientific), Inc., subscriptions.techstreet.com, downloaded on Nov-27-2014 by James Madison. No further reproduction or distribution is permitted. Uncontrolled when printe