IEC TR 62453-52-150

Edition 1.0 2017-06

TECHNICAL REPORT

colour inside

Field device tool (FDT) interface specification – Part 52-150: Communication implementation for common language infrastructure – IEC 61784 CPF 15

IEC TR 62453-52-150:2017-06(en)

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 It also gives information on projects, replaced and withdrawn publications.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 20 000 terms and definitions in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

65 000 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.

IEC TR 62453-52-150

Edition 1.0 2017-06

TECHNICAL REPORT

colour inside

Field device tool (FDT) interface specification – Part 52-150: Communication implementation for common language infrastructure – IEC 61784 CPF 15

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 25.040.40; 35.100.05; 35.110

ISBN 978-2-8322-4336-7

CONTENTS

FOREWORD 8
INTRODUCTION 10
1 Scope 11
2 Normative references 11
3 Terms, definitions, symbols, abbreviated terms and conventions 12
3.1 Terms and definitions 12
3.2 Symbols and abbreviated terms 12
3.3 Conventions 12
3.3.1 Datatype names and references to datatypes 12
3.3.2 Vocabulary for requirements 12
3.3.3 Use of UML 12
4 Bus category 12
5 Access to instance and device data 12
5.1 General 12
5.2 IO signals provided by DTM 13
5.3 Data interfaces 13
5.3.1 Common data set 13
5.3.2 Mapping of Modbus datatypes to FDT datatypes 13
5.3.3 SemanticInfo 13
6 Protocol specific behaviour 14
6.1 Modbus data and addressing model 14
6.2 Modbus-related information of a Device DTM 15
6.3 Broadcasting 15
6.4 Unconfirmed private Modbus request 16
7 Protocol specific usage of general datatypes 16
8 Protocol specific common datatype: ModbusDeviceAddress 17
9 Network management datatypes 18
9.1 General 18
9.2 Configuration 19
9.3 Process Data Items 19
9.4 Parameterization 19
10 Communication datatypes 19
10.1 General 19
10.2 ModbusConnectRequest 19
10.3 ModbusConnectResponse 20
10.4 ModbusDisconnectRequest 20
10.5 ModbusDisconnectResponse 21
10.6 ModbusAbortMessage 21
10.7 ModbusReadCoilsRequest 22
10.8 ModbusReadCoilsResponse 23
10.9 ModbusReadDiscreteInputsRequest 24
10.10 ModbusReadDiscreteInputsResponse 24
10.11 ModbusReadHoldingRegistersRequest 25
10.12 ModbusReadHoldingRegistersResponse 26
10.13 ModbusReadInputRegistersRequest 27
10.14 ModbusReadInputRegistersResponse 28

10.15 ModbusWriteSingleCoilRequest 29
10.16 ModbusWriteSingleCoilResponse 30
10.17 ModbusWriteSingleRegisterRequest 30
10.18 ModbusWriteSingleRegisterResponse 31
10.19 ModbusReadExceptionStatusRequest 32
10.20 ModbusReadExceptionStatusResponse 32
10.21 ModbusDiagnosticsRequest 33
10.22 ModbusDiagnosticsResponse 34
10.23 ModbusGetCommEventCounterRequest 35
10.24 ModbusGetCommEventCounterResponse 35
10.25 ModbusGetCommEventLogRequest 36
10.26 ModbusGetCommEventLogResponse 37
10.27 IModbusWriteMultipleCoilsRequest 38
10.28 ModbusWriteMultipleCoilsResponse 39
10.29 ModbusWriteMultipleRegistersRequest 39
10.30 ModbusWriteMultipleRegistersResponse 40
10.31 ModbusReportSlaveIDRequest 41
10.32 ModbusReportSlaveIDResponse 41
10.33 ModbusReadFileRecordRequest 42
10.34 ModbusReadFileSubRequest 43
10.35 ModbusReadFileRecordResponse 44
10.36 ModbusReadFileSubResponse 45
10.37 ModbusWriteFileRecordRequest 45
10.38 ModbusWriteFileSubRequest 46
10.39 ModbusWriteFileRecordResponse 47
10.40 ModbusMaskWriteRegisterRequest 47
10.41 ModbusMaskWriteRegisterResponse 48
10.42 ModbusReadWriteRegistersRequest 49
10.43 ModbusReadWriteRegistersResponse 50
10.44 ModbusReadFiFoQueueRequest 51
10.45 ModbusReadFiFoQueueResponse 52
10.46 ModbusEncapsulatedInterfaceTransportRequest 53
10.47 ModbusEncapsulatedInterfaceTransportResponse 53
10.48 ModbusReadDeviceIdentificationRequest 54
10.49 ModbusReadDeviceIdentificationResponse 55
10.50 ModbusPrivateRequest 58
10.51 ModbusPrivateResponse 58
10.52 ModbusUnconfirmedPrivateRequest 59
10.53 ModbusUnconfirmedPrivateResponse 60
10.54 ModbusExceptionResponse 61
11 Datatypes for process data information 62
11.1 General 62
11.2 ModbusIOSignalInfo 62
11.3 Mapping of Modbus datatypes to FDT datatypes 63
12 Device identification 63
12.1 General 63
12.2 ModbusDeviceScanInfo datatype 63
12.3 ModbusDeviceIdentInfo datatype 64
12.4 Mapping of Information Source 66

Bibliography 68

Figure 1 – Part 52-150 of the IEC 62453 series 10
Figure 2 – Modbus data and addressing model 15
Figure 3 – ModbusDeviceAddress 17
Figure 4 – ModbusNetworkData 18
Figure 5 – ModbusConnectRequest 19
Figure 6 – ModbusConnectResponse 20
Figure 7 – ModbusDisconnectRequest 21
Figure 8 – ModbusDisconnectResponse 21
Figure 9 – ModbusAbortMessage 22
Figure 10 – ModbusReadCoilsRequest 22
Figure 11 – ModbusReadCoilsResponse 23
Figure 12 – ModbusReadDiscreteInputsRequest 24
Figure 13 – ModbusReadDiscreteInputsResponse 25
Figure 14 – ModbusReadHoldingRegistersRequest 26
Figure 15 – ModbusReadHoldingRegistersResponse 27
Figure 16 – ModbusReadInputRegistersRequest 28
Figure 17 – ModbusReadInputRegistersResponse 28
Figure 18 – ModbusWriteSingleCoilRequest 29
Figure 19 – ModbusWriteSingleCoilResponse 30
Figure 20 – ModbusWriteSingleRegisterRequest 31
Figure 21 – ModbusWriteSingleRegisterResponse 31
Figure 22 – ModbusReadExceptionStatusRequest 32
Figure 23 – ModbusReadExceptionStatusResponse 33
Figure 24 – ModbusDiagnosticsRequest 34
Figure 25 – ModbusDiagnosticsResponse 34
Figure 26 – ModbusGetCommEventCounterRequest 35
Figure 27 – ModbusGetCommEventCounterResponse 36
Figure 28 – ModbusGetCommEventLogRequest 37
Figure 29 – ModbusGetCommEventLogResponse 37
Figure 30 – ModbusWriteMultipleCoilsRequest 38
Figure 31 – ModbusWriteMultipleCoilsResponse 39
Figure 32 – ModbusWriteMultipleRegistersRequest 40
Figure 33 – ModbusWriteMultipleRegistersResponse 40
Figure 34 – ModbusReportSlaveIDRequest 41
Figure 35 – ModbusReportSlaveIDResponse 42
Figure 36 – ModbusReadFileRecordRequest 43
Figure 37 – ModbusReadFileSubRequest 43
Figure 38 – ModbusReadFileRecordResponse 44
Figure 39 – ModbusReadFileSubResponse 45
Figure 40 – ModbusWriteFileRecordRequest 46
Figure 41 – ModbusWriteFileSubRequest 46

Figure 42 – ModbusWriteFileRecordResponse 47
Figure 43 – ModbusMaskWriteRegisterRequest 48
Figure 44 – ModbusMaskWriteRegisterResponse 49
Figure 45 – ModbusReadWriteRegistersRequest 50
Figure 46 – ModbusReadWriteRegistersResponse 51
Figure 47 – ModbusReadFiFoQueueRequest 52
Figure 48 – ModbusReadFiFoQueueResponse 52
Figure 49 – ModbusEncapsulatedInterfaceTransportRequest 53
Figure 50 – ModbusEncapsulatedInterfaceTransportResponse 54
Figure 51 – ModbusReadDeviceIdentificationRequest 55
Figure 52 – ModbusReadDeviceIdentificationResponse 56
Figure 53 – ModbusIdentificationObject 56
Figure 54 – ModbusPrivateRequest 58
Figure 55 – ModbusPrivateResponse 59
Figure 56 – ModbusUnconfirmedPrivateRequest 60
Figure 57 – ModbusUnconfirmedPrivateResponse 60
Figure 58 – ModbusExceptionResponse 61
Figure 59 – ModbusIOSignalInfo 62
Figure 60 – ModbusDeviceScanInfo 64
Figure 61 – ModbusDeviceIdentInfo 65

Table 1 – Mapping of datatypes 13
Table 2 – Usage of general datatypes 14
Table 3 – Usage of broadcasts in transaction requests 16
Table 4 – Protocol specific usage of general datatypes 17
Table 5 – ModbusDeviceAddress 18
Table 6 – ModbusDeviceSerialAddress 18
Table 7 – ModbusDeviceTcpAddress 18
Table 8 – Modbus Network Data 19
Table 9 – ModbusConnectRequest datatype 20
Table 10 – ModbusConnectResponse datatype 20
Table 11 – ModbusDisconnectRequest datatype 21
Table 12 – ModbusDisconnectResponse datatype 21
Table 13 – ModbusAbortMessage datatype 22
Table 14 – ModbusReadCoilsRequest datatype 23
Table 15 – ModbusReadCoilsResponse datatype 23
Table 16 – ModbusReadDiscreteInputsRequest datatype 24
Table 17 – ModbusReadDiscreteInputsResponse datatype 25
Table 18 – ModbusReadHoldingRegistersRequest datatype 26
Table 19 – ModbusReadHoldingRegistersResponse datatype 27
Table 20 – ModbusReadInputRegistersRequest datatype 28
Table 21 – ModbusReadInputRegistersResponse datatype 29
Table 22 – ModbusWriteSingleCoilRequest datatype 29

Table 23 – ModbusWriteSingleCoilResponse datatype 30
Table 24 – ModbusWriteSingleRegisterRequest datatype 31
Table 25 – ModbusWriteSingleRegisterResponse datatype 32
Table 26 – ModbusReadExceptionStatusRequest datatype 32
Table 27 – ModbusReadExceptionStatusResponse datatype 33
Table 28 – ModbusDiagnosticsRequest datatype 34
Table 29 – ModbusDiagnosticsResponse datatype 35
Table 30 – ModbusGetCommEventCounterRequest datatype 35
Table 31 – ModbusGetCommEventCounterResponsedatatype 36
Table 32 – ModbusGetCommEventLogRequest datatype 37
Table 33 – ModbusGetCommEventLogResponse datatype 38
Table 34 – ModbusWriteMultipleCoilsRequest datatype 39
Table 35 – ModbusWriteMultipleCoilsResponse datatype 39
Table 36 – ModbusWriteMultipleRegistersRequest datatype 40
Table 37 – ModbusWriteMultipleRegistersResponse 41
Table 38 – ModbusReportSlaveIDRequest datatype 41
Table 39 – ModbusReportSlaveIDResponse 42
Table 40 – ModbusReadFileRecordRequest datatype 43
Table 41 – ModbusReadFileSubRequest datatype 44
Table 42 – ModbusReadFileRecordResponse 45
Table 43 – ModbusReadFileSubResponse 45
Table 44 – ModbusWriteFileRecordRequest datatype 46
Table 45 – ModbusWriteFileSubRequest datatype 47
Table 46 – ModbusWriteFileRecordResponse 47
Table 47 – ModbusMaskWriteRegisterRequest datatype 48
Table 48 – ModbusMaskWriteRegisterResponse 49
Table 49 – ModbusReadWriteRegistersRequest datatype 50
Table 50 – ModbusReadWriteRegistersResponse 51
Table 51 – ModbusReadFiFoQueueRequest datatype 52
Table 52 – ModbusReadFiFoQueueResponse 53
Table 53 – ModbusEncapsulatedInterfaceTransportRequest datatype 53
Table 54 – ModbusEncapsulatedInterfaceTransportResponse 54
Table 55 – ModbusReadDeviceIdentificationRequest datatype 55
Table 56 – ModbusReadDeviceIdentificationResponse 57
Table 57 – ModbusIdentificationObject 58
Table 58 – ModbusPrivateRequest datatype 58
Table 59 – ModbusPrivateResponse 59
Table 60 – ModbusUnconfirmedPrivateRequest datatype 60
Table 61 – ModbusUnconfirmedPrivateResponse 61
Table 62 – ModbusExceptionResponse 62
Table 63 – ModbusIOSignalInfo datatype 63
Table 64 – ModbusDeviceScanInfo datatype 64
Table 65 – ModbusDeviceIdentInfo datatype 65

Table 66 – Protocol specific mapping of scan information 66
Table 67 – Profile specific mapping of identification information 67

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

FIELD DEVICE TOOL (FDT) INTERFACE SPECIFICATION –

Part 52-150: Communication implementation for common language infrastructure – IEC 61784 CPF 15

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.

The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC TR 62453-52-150, which is a technical report, has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation.

Each part of the IEC 62453-52-xy series is intended to be read in conjunction with its corresponding part in the IEC 62453-3xy series. This document corresponds to IEC 63453-315.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
65E/440/DTR	65E/514/RVC

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

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

The list of all parts of the IEC 62453 series, under the general title *Field device tool (FDT) interface specification*, can be found on the IEC website.

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

INTRODUCTION

This part of IEC 62453 is an interface specification for developers of Field Device Tool (FDT) components for function control and data access within a client/server architecture. The specification is a result of an analysis and design process to develop standard interfaces to facilitate the development of servers and clients by multiple vendors that need to interoperate seamlessly.

With the integration of fieldbuses into control systems, there are a few other tasks which need to be performed. In addition to fieldbus- and device-specific tools, there is a need to integrate these tools into higher-level system-wide planning or engineering tools. In particular, for use in extensive and heterogeneous control systems, typically in the area of the process industry, the unambiguous definition of engineering interfaces that are easy to use for all those involved is of great importance.

A device-specific software component, called Device Type Manager (DTM), is supplied by the field device manufacturer with its device. The DTM is integrated into engineering tools via the FDT interfaces defined in this specification. The approach to integration is in general open for all kind of fieldbusses and thus meets the requirements for integrating different kinds of devices into heterogeneous control systems.

Figure 1 shows how this part of the IEC 62453-52-xy series is aligned in the structure of the IEC 62453 series.

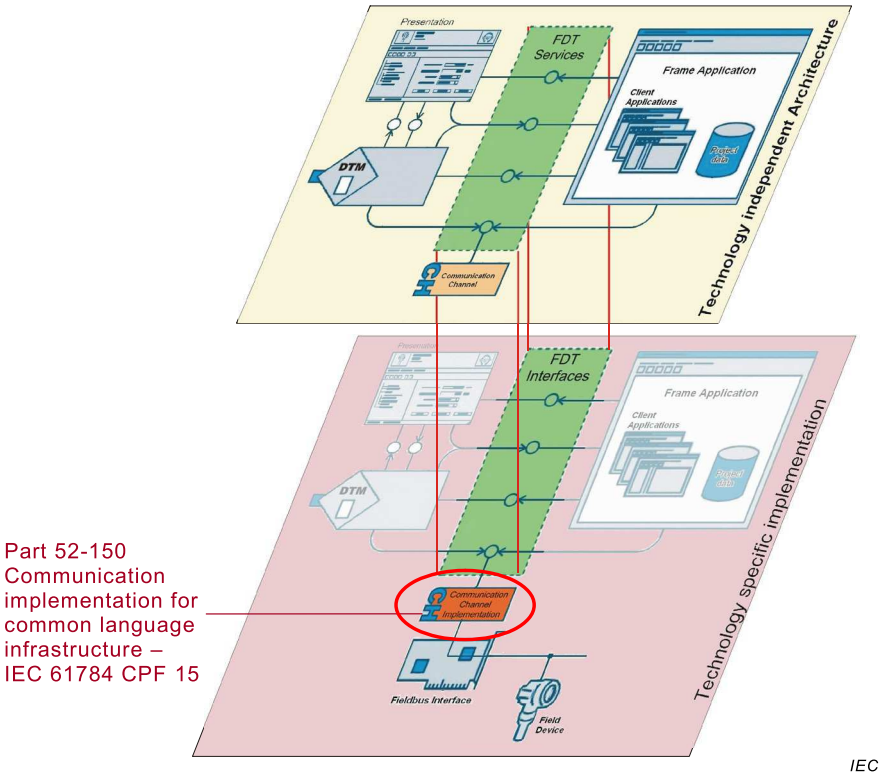


Figure 1 – Part 52-150 of the IEC 62453 series

FIELD DEVICE TOOL (FDT) INTERFACE SPECIFICATION –

Part 52-150: Communication implementation for common language infrastructure – IEC 61784 CPF 15

1 Scope

This part of the IEC 62453-52-xy series, which is a Technical Report, provides information for integrating the Modbus®[1] technology into the CLI-based implementation of FDT interface specification (IEC TR 62453-42).

This part of IEC 62453 specifies the implementation of communication and other services based on IEC 62453-315.

This document neither contains the FDT specification nor modifies it.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61131-3:2013, *Programmable controllers – Part 3: Programming languages*

IEC 61158-5-15:2010, *Industrial communication networks – Fieldbus specifications – Part 5-15: Application layer service definition – Type 15 elements*

IEC 61784-1:2014, *Industrial communication networks – Profiles – Part 1: Fieldbus profiles*

IEC 62453-1:2016, *Field device tool (FDT) interface specification – Part 1: Overview and guidance*

IEC 62453-2:2016, *Field device tool (FDT) interface specification – Part 2: Concepts and detailed description*

IEC TR 62453-42:2016, *Field device tool (FDT) interface specification – Part 42: Object model integration profile – Common language infrastructure*

IEC 62453-315:2009, *Field device tool (FDT) interface specification – Part 315: Communication profile integration – IEC 61784 CPF 15*
IEC 62453-315:2009/AMD1:2016

---

[1] Modbus is the trademark of Schneider Automation Inc. It is registered in the United States of America. This information is given for the convenience of users of this document and does not constitute an endorsement by IEC of the trademark holder or any of its products. Compliance to this profile does not require use of the trademark Modbus. Use of the trademark Modbus requires permission from Schneider Automation Inc.

3 Terms, definitions, symbols, abbreviated terms and conventions

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62453-1, IEC 62453-2, IEC TR 62453-42 and IEC 62453-315 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.2 Symbols and abbreviated terms

For the purposes of this document, the symbols and abbreviations given in IEC 62453-1, IEC 62453-2, IEC 62453-315, IEC TR 62453-42 and the following apply.

IO Input/Output

3.3 Conventions

3.3.1 Datatype names and references to datatypes

The conventions for naming and referencing of datatypes are explained in IEC 62453-2:2016, Clause A.1.

3.3.2 Vocabulary for requirements

The following expressions are used when specifying requirements.

Usage of “shall” or “mandatory”	No exceptions allowed.
Usage of “should” or “recommended”	Strong recommendation. It may make sense in special exceptional cases to differ from the described behaviour.
Usage of “can” or “optional”	Function or behaviour may be provided, depending on defined conditions.

3.3.3 Use of UML

Figures in this document are using UML notation as defined in Annex A of IEC 62453-1:2016.

4 Bus category

IEC 61784 CPF 15 protocol is identified in the attribute busCategory of the BusCategory element by the identifiers, as specified in IEC 62453-315.

5 Access to instance and device data

5.1 General

The minimum set of provided data shall be:

- All process values available for the device shall be modeled as ProcessData including the ranges and scaling if applicable;
- All network configuration related parameters shall be exposed in NetworkData (see Clause 9).

5.2 IO signals provided by DTM

A DTM shall provide IO signal information for the device using the IProcessData interface. The IO signals describe datatype and address parameters of process data as detailed in 11.2.

5.3 Data interfaces

5.3.1 Common data set

For Modbus no minimum set of parameters or common data set is defined which shall be provided by a DTM. Exposure of device parameters is at the vendor's discretion. If a DTM provides process values, the process variables shall be modelled as process data objects.

5.3.2 Mapping of Modbus datatypes to FDT datatypes

Modbus uses datatypes as specified in [2][2] for the transmission on the fieldbus. The FDT interfaces IDeviceData and IInstanceData use .NET datatypes, while PLC applications use datatypes defined in IEC 61131-3. This subclause defines the mapping of parameter datatypes, whereas mapping of process datatypes is defined in 11.3.

The mapping of parameter datatypes is described in Table 1.

Table 1 – Mapping of datatypes

Modbus datatype	FDT datatype	IEC 61131 datatype
Discrete Inputs	BitArray	ARRAY [] OF BOOL
Coil	bool	BOOL
Coils	BitArray	ARRAY [] OF BOOL
Input Registers	ushort[]	ARRAY [] OF WORD
Holding Register	ushort	WORD
Holding Registers	ushort[]	ARRAY [] OF WORD

The FDT data types do not change any byte or bit order of the data. The data interpretation, e.g. if a float value is transferred in a holding register, is under the responsibility of the DTM respectively the user of the data. The user of the data shall know how the data is represented by the hardware device.

5.3.3 SemanticInfo

The usage of the SemanticInfo datatype is shown in Table 2. The identifier in SemanticId shall be unique and always reference the same element. This means the semantic information shall be the same whenever the same data is referenced. By using this attribute e.g. a Frame Application is able to get the information regarding the meaning and usage of a single data structure.

---

2 Figures in square backets refer to the Bibliography.

Table 2 – Usage of general datatypes

Attribute	Description for use in Modbus
SemanticInfo.ParameterReadAddress / SemanticInfo.ParameterWriteAddress	The value of ParameterReadAddress and ParameterWriteAdress is a string conforming to a pattern as follows: FunctionCode.StartAddress.BitOffset.BitLength where FunctionCode = Modbus function code to access the data StartAddress = starting address BitOffset = start bit within the starting address BitLength = length in bits All values are unsigned integers.
SemanticInfo.ApplicationDomain	The value of ApplicationDomain is as follows: MODBUS
SemanticInfo.SemanticId	The value of SemanticId is vendor specific.

6 Protocol specific behaviour

6.1 Modbus data and addressing model

The Modbus data model is very simple and described in [2]. Figure 2 shows an extract of the data model description.

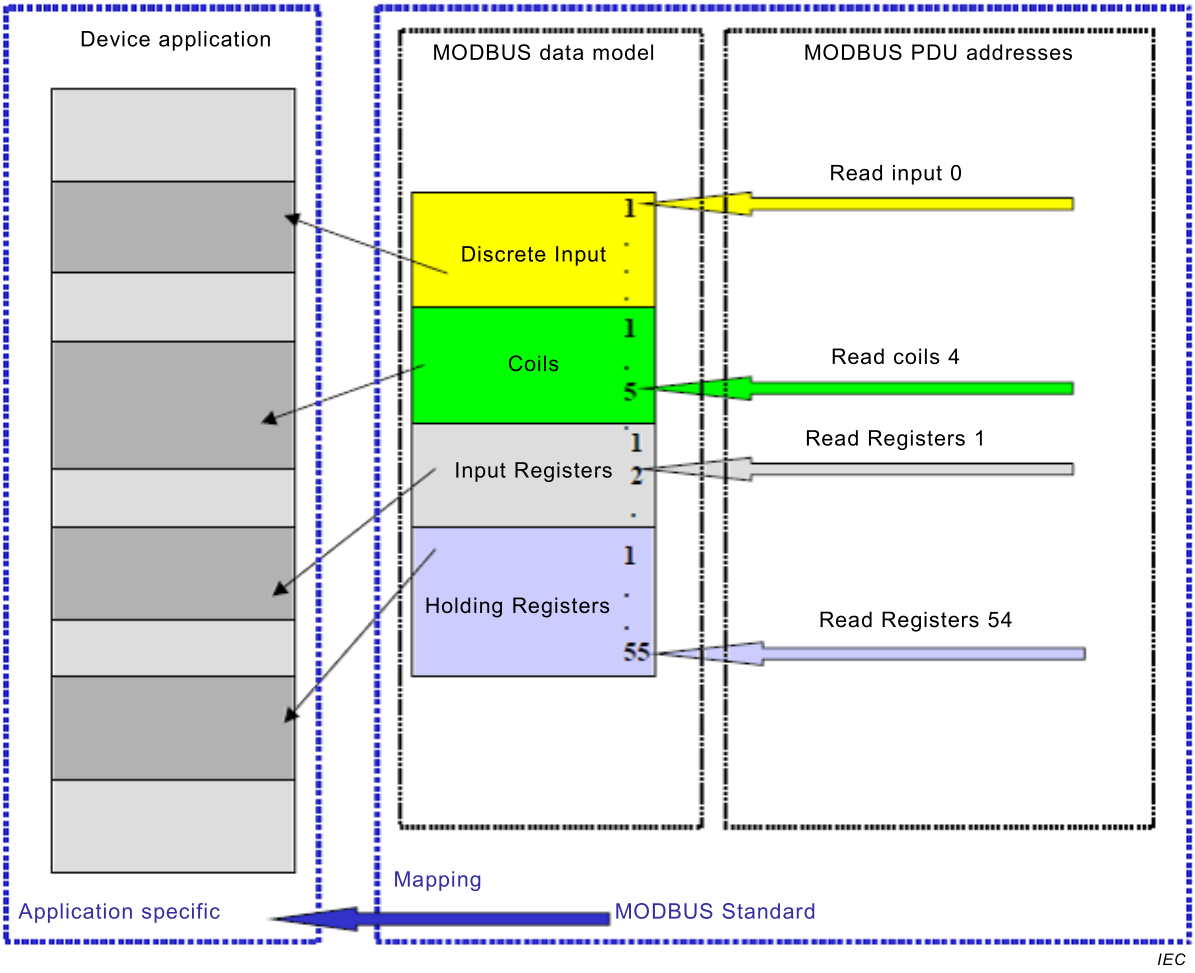


Figure 2 – Modbus data and addressing model

6.2 Modbus-related information of a Device DTM

The information used by a Modbus client (IO scanner) to set up the Modbus network properly and allow cyclic communication between control system and Modbus server devices is provided by a DTM in Process data items.

A DTM of a Modbus device shall deliver process data items related information to get integrated into an FDT-based engineering system.

This specification makes no assumptions whether a modular Modbus device is modeled in a Device DTM, Composite DTM or Gateway DTM. All types of DTMs shall provide all mandatory information defined in the following subclauses.

6.3 Broadcasting

In broadcast mode a DTM can send a Modbus request to all devices connected to the bus. This mode is only supported for devices which are connected via Modbus Serial Line. The connection can either be a direct connection or a connection via a gateway. The broadcast mode shall be initiated by a ConnectRequest with the slave address of the target device set to 0 (SlaveAddress=0).

Because in broadcast mode no response will be returned by the device, the broadcast mode shall be only used with the transaction requests listed in Table 3.

Table 3 – Usage of broadcasts in transaction requests

Broadcast Transaction Request	Restrictions
ModbusWriteSingleRequest	None
ModbusWriteSingleRegisterRequest	None
ModbusDiagnosticsRequest	This transaction request shall be used in broadcast mode only with the following sub-functions: 0x01: Restart Communication Option 0x03: Change ASCII Input Delimiter 0x04: Force Listen Only Mode 0x0A: Clear Counters and Diagnostic Register 0x14: Clear Overrun Counter and Flag
ModbusWriteMultipleCoilsRequest	None
ModbusWriteMultipleRegisterRequest	None
ModbusWriteFileRecordRequest	None
ModbusMaskWriteRegisterRequest	None
ModbusPrivateRequest	Shall be only used with private services if no response is required from the device.

Although in broadcast mode no response will be returned by the target devices, a transaction response which corresponds to the transaction request, shall be generated. This transaction response shall be generated in order to inform the DTM that the broadcast request was sent on the bus. If a Modbus Communication DTM is used to establish the communication, it shall provide this generated transaction response. If no Modbus Communication DTM is used to establish the communication, the Modbus Gateway DTM, which provides the link to the higher communication level different from Modbus, shall provide this transaction response.

6.4 Unconfirmed private Modbus request

This transaction request can be used to send any unconfirmed private Modbus request. Although no response will be returned by the target device, a transaction response, which corresponds to the transaction request, shall be generated. This transaction response shall be generated in order to inform the DTM that the unconfirmed request was sent on the bus. If a Modbus Communication DTM is used to establish the communication, it shall provide this generated transaction response. If no Modbus Communication DTM is used to establish the communication, the Modbus Gateway DTM, which provides the link to the higher communication level different from Modbus, shall provide this transaction response.

7 Protocol specific usage of general datatypes

Table 4 shows how general datatypes are used with IEC 61784 CPF 15 devices.

Table 4 – Protocol specific usage of general datatypes

Attribute	Description for use
ProtocolId	See Clause 4
PhysicalLayer	Not applicable
ApplicationDomain / SemanticId	See 5.3.3
Address	See Clause 8
ManufacturerId	Modbus Vendor Name
DeviceTypeId	Modbus Product Code
HardwareRevision	Not applicable
SoftwareRevision	Modbus MajorMinorRevision
ProtocolIdentificationProfile	Not applicable

8 Protocol specific common datatype: ModbusDeviceAddress

The only protocol-specific common datatype is ModbusDeviceAddress. The protocol specific device address relates to network management and communication.

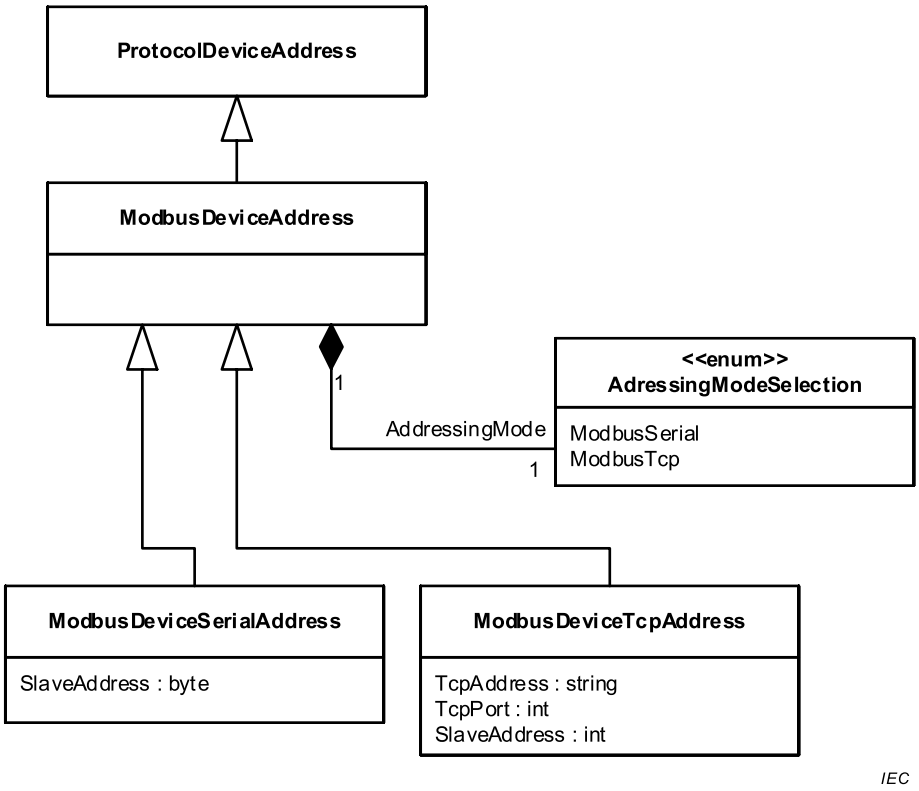


Figure 3 – ModbusDeviceAddress

Table 5, Table 6 and Table 7 show how address information is used with the different Modbus protocols.

Table 5 – ModbusDeviceAddress

Member Name	Type	Description
AddressingModeSelection	enum	Specifies whether a Modbus Serial or a Modbus TCP address is used

Table 6 – ModbusDeviceSerialAddress

Member Name	Type	Description
SlaveAddress	byte	Address of the Modbus Serial device

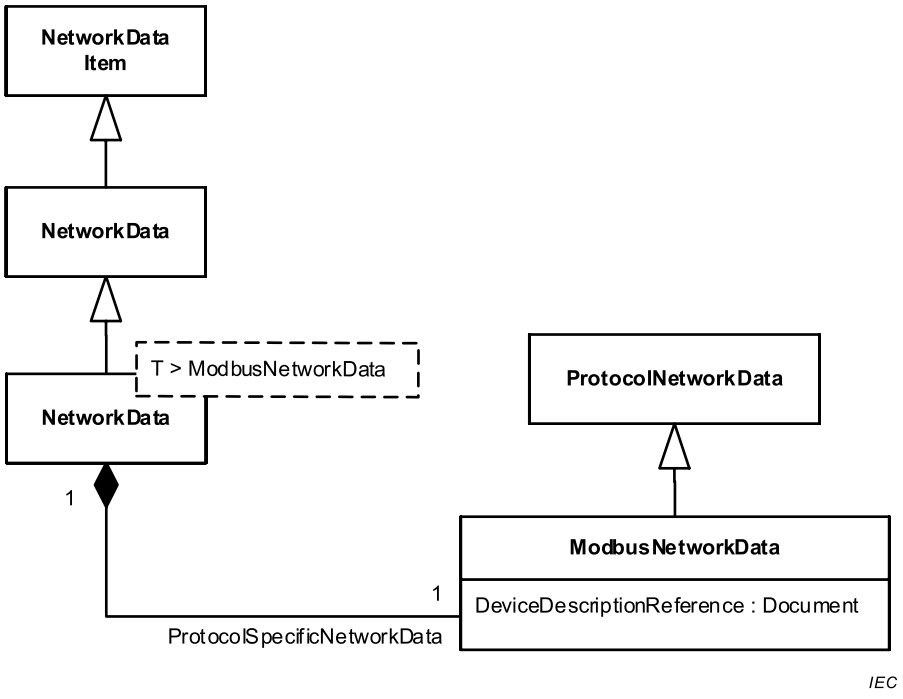
Table 7 – ModbusDeviceTcpAddress

Member Name	Type	Description
TcpAddress	string	String representation of the IP address of a Modbus TCP device
TcpPort	int	Port of the Modbus TCP connection
SlaveAddress	int	Slave address of a (virtual) Modbus device behind a Modbus TCP/ Modbus Serial Line gateway

9 Network management datatypes

9.1 General

The data needed for management of the network are exposed by the Device DTM in the INetworkData interface (see Figure 4).



Used in:
INetworkData.GetNetworkDataInfo()

Figure 4 – ModbusNetworkData

The properties of ModbusNetworkData are described in Table 8.

Table 8 – Modbus Network Data

Member Name	Type	Description
DeviceDescriptionReference	Document	Path to file which contains the Modbus device description if available

9.2 Configuration

Modbus networks do not require a special configuration. The focus for Modbus DTMs is on the process data items and parameterization of devices. See 9.4 and 11.2.

9.3 Process Data Items

For a detailed description about Process Data Items, please refer to Clause 11.

9.4 Parameterization

For the parameterization of a Modbus device the DTM shall use the communication services and communication datatypes described in Clause 10.

Because Modbus does not define a specific or common way how to parameterize a device, the parameterization is vendor specific.

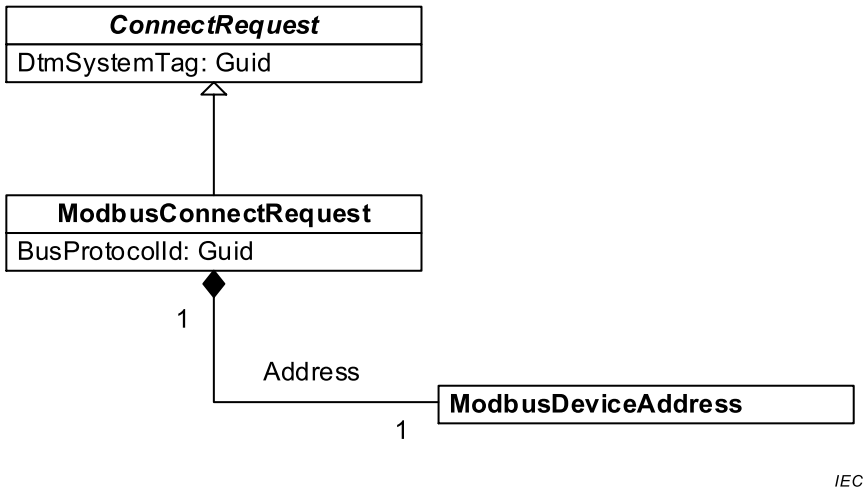
10 Communication datatypes

10.1 General

The datatypes contain the address information and the communication data required to execute the respective request or to transport the response information.

10.2 ModbusConnectRequest

This is the Modbus specific implementation of the abstract class ConnectRequest (see Figure 5).



Used in:
ICommunication.BeginConnect()

Figure 5 – ModbusConnectRequest

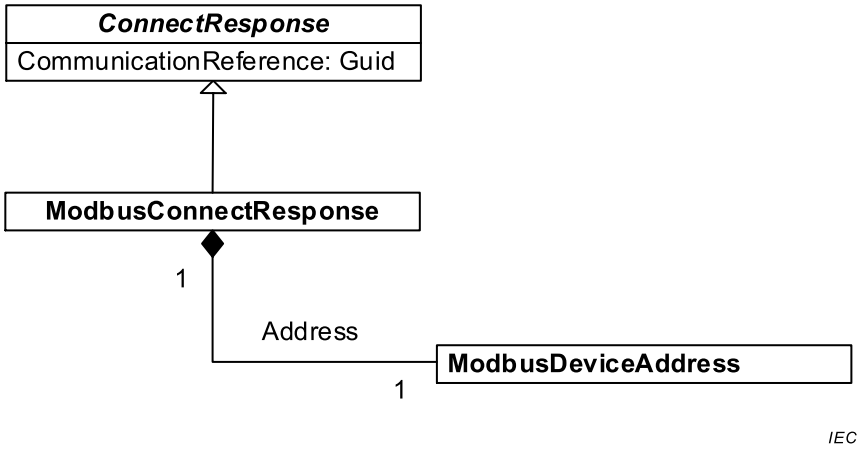
The properties of the ModbusConnectRequest datatype are described in Table 9.

Table 9 – ModbusConnectRequest datatype

Property	Description
Address	Address information of the Modbus device
BusProtocolId	Protocol identifier of the used protocol (Serial or TCP) of the connect request
DtmSystemTag	Unique identification of the DTM in the frame application

10.3 ModbusConnectResponse

This is the Modbus specific implementation of the abstract class ConnectResponse (see Figure 6).



Used in:
ICommunication.EndConnect()

Figure 6 – ModbusConnectResponse

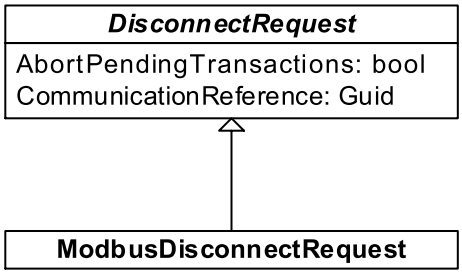
The properties of the ModbusConnectResponse datatype are described in Table 10.

Table 10 – ModbusConnectResponse datatype

Property	Description
Address	Address information of the Modbus device
CommunicationReference	Identifier for a communication link to a device

10.4 ModbusDisconnectRequest

This is the Modbus specific implementation of the abstract class DisconnectRequest (see Figure 7).



Used in:
ICommunication.BeginDisconnect()

Figure 7 – ModbusDisconnectRequest

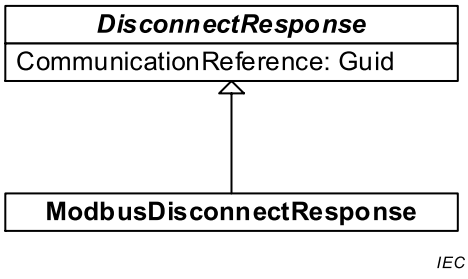
The properties of the ModbusDisconnectRequest datatype are described in Table 11.

Table 11 – ModbusDisconnectRequest datatype

Property	Description
AbortPendingTransactions	Indicates whether pending transactions shall be aborted.
CommunicationReference	Identifier for a communication link to a device.

10.5 ModbusDisconnectResponse

This is the Modbus specific implementation of the abstract class DisconnectResponse (see Figure 8).



Used in:
ICommunication.EndDisconnect()

Figure 8 – ModbusDisconnectResponse

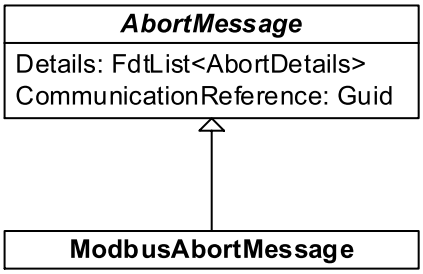
The properties of the ModbusDisconnectRequest datatype are described in Table 12.

Table 12 – ModbusDisconnectResponse datatype

Property	Description
CommunicationReference	Identifier for a communication link to a device.

10.6 ModbusAbortMessage

This is the Modbus specific implementation of the abstract AbortMessage class (see Figure 9).



Used in:
ICommunication.EndDisconnect()

Figure 9 – ModbusAbortMessage

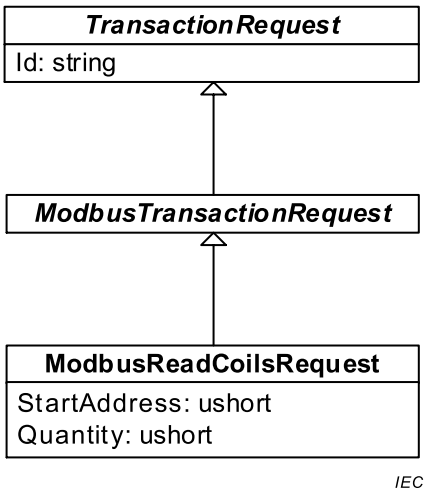
The properties of the ModbusAbortMessage datatype are described in Table 13.

Table 13 – ModbusAbortMessage datatype

Property	Description
CommunicationReference	Identifier for a communication link to a device.
Details	Details about the cause and source of the abort.

10.7 ModbusReadCoilsRequest

This subclause describes the request for the Modbus service Read Coils (see Figure 10).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 10 – ModbusReadCoilsRequest

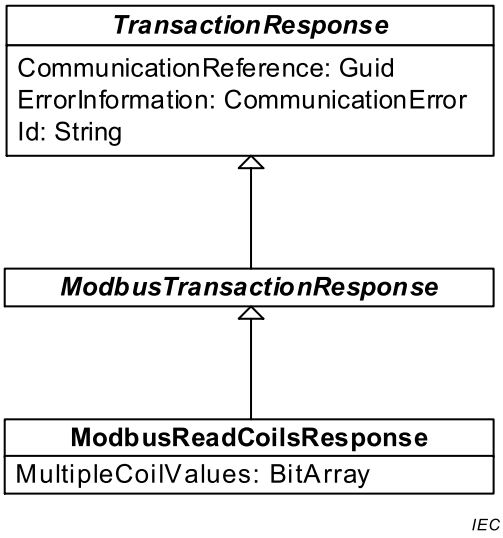
The properties of the ModbusReadCoilsRequest datatype are described in Table 14.

Table 14 – ModbusReadCoilsRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request.	
Quantity	Number of coils to be read	Quantity of coils
StartAddress	Address of the first coil to be read	Address of first coil

10.8 ModbusReadCoilsResponse

This subclause describes the response for the Modbus service Read Coils (see Figure 11).



Used in:
ICommunication.EndCommunicationRequest()

Figure 11 – ModbusReadCoilsResponse

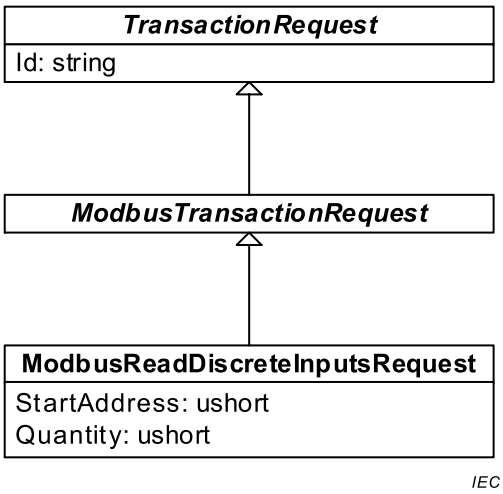
The properties of the ModbusReadCoilsResponse datatype are described in Table 15.

Table 15 – ModbusReadCoilsResponse datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	
MultipleCoilValues	Bit-array with each coil state coded in one character: - “0” = FALSE or “OFF” - “1” = TRUE or “ON”	Data

10.9 ModbusReadDiscreteInputsRequest

This subclause describes the request for the Modbus service Read Discrete Inputs (see Figure 12).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 12 – ModbusReadDiscreteInputsRequest

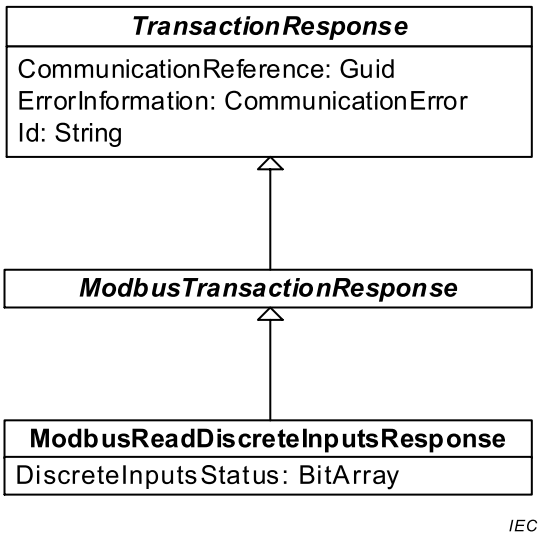
The properties of the ModbusReadDiscreteInputsRequest datatype are described in Table 16.

Table 16 – ModbusReadDiscreteInputsRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request	
Quantity	Number of discrete inputs to be read	Quantity of discretes
StartAddress	Address of the first discrete input to be read	Address of first discrete

10.10 ModbusReadDiscreteInputsResponse

This subclause describes the response for the Modbus service Read Discrete Inputs (see Figure 13).



Used in:
ICommunication.EndCommunicationRequest()

Figure 13 – ModbusReadDiscreteInputsResponse

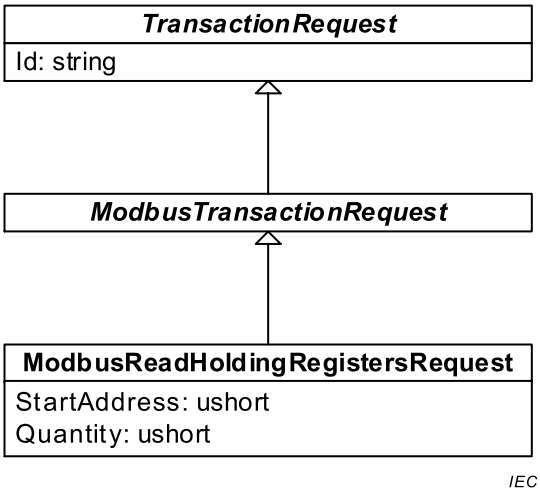
The properties of the ModbusDiscreteInputsResponse datatype are described in Table 17.

Table 17 – ModbusReadDiscreteInputsResponse datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
DiscreteInputsStatus	Bit-array with each coil state coded in one character: “0” = FALSE or “OFF” “1” = TRUE or “ON”	Data
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	

10.11 ModbusReadHoldingRegistersRequest

This subclause describes the request for the Modbus service Read Holding Registers (see Figure 14).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 14 – ModbusReadHoldingRegistersRequest

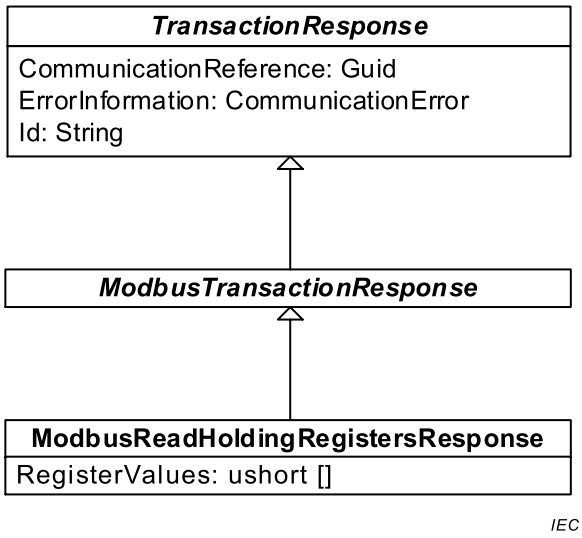
The properties of the ModbusReadHoldingRegistersRequest datatype are described in Table 18.

Table 18 – ModbusReadHoldingRegistersRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request.	
Quantity	Number of holding registers to be read	Quantity of holding registers to read
StartAddress	Address of the first holding register to be read	Address of first holding register to read

10.12 ModbusReadHoldingRegistersResponse

This subclause describes the response for the Modbus service Read Holding Registers (see Figure 15).



Used in:

ICommunication.EndCommunicationRequest()

Figure 15 – ModbusReadHoldingRegistersResponse

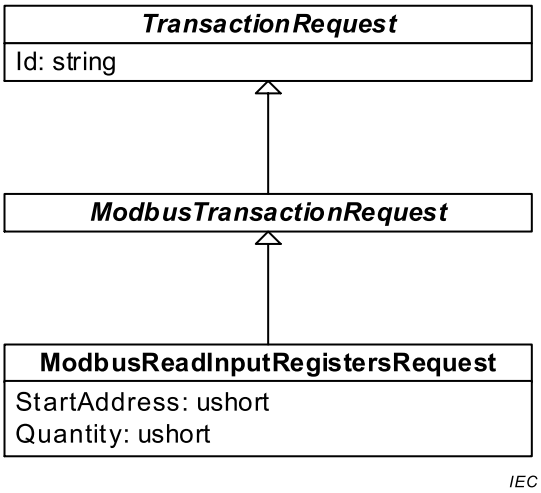
The properties of the ModbusReadHoldingRegistersResponse datatype are described in Table 19.

Table 19 – ModbusReadHoldingRegistersResponse datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	
RegisterValues	Read holding register values.	Data

10.13 ModbusReadInputRegistersRequest

This subclause describes the request for the Modbus service Read Input Registers (see Figure 16).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 16 – ModbusReadInputRegistersRequest

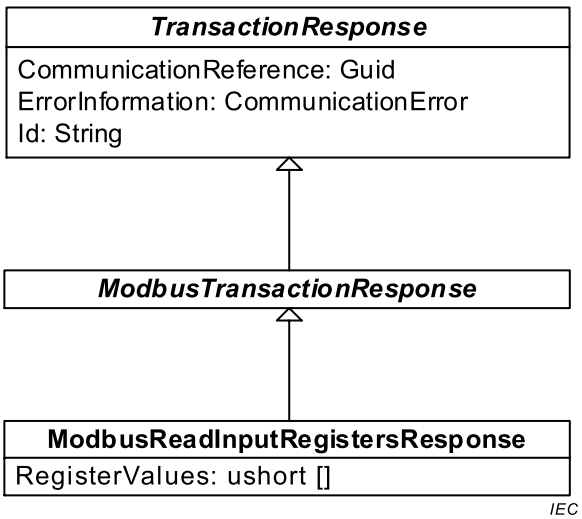
The properties of the ModbusReadInputRegistersRequest datatype are described in Table 20.

Table 20 – ModbusReadInputRegistersRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request	
Quantity	Number of input registers to be read	Quantity of input registers
StartAddress	Address of the first input register to be read	Address of first input register

10.14 ModbusReadInputRegistersResponse

This subclause describes the response for the Modbus service Read Input Registers (see Figure 17).



Used in:
ICommunication.EndCommunicationRequest()

Figure 17 – ModbusReadInputRegistersResponse

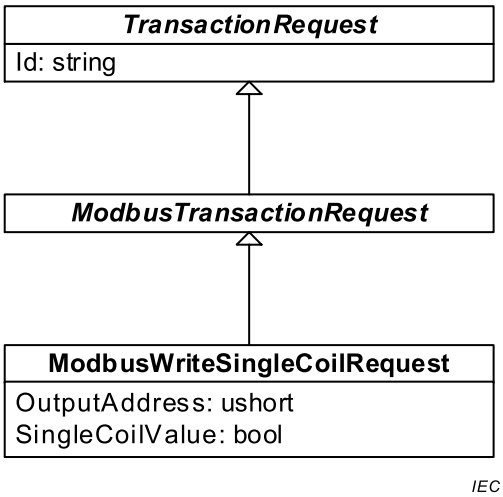
The properties of the ModbusReadInputRegistersResponse datatype are described in Table 21.

Table 21 – ModbusReadInputRegistersResponse datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	
RegisterValues	Read input register values.	Data

10.15 ModbusWriteSingleCoilRequest

This subclause describes the request for the Modbus service Write Single Coil (see Figure 18).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 18 – ModbusWriteSingleCoilRequest

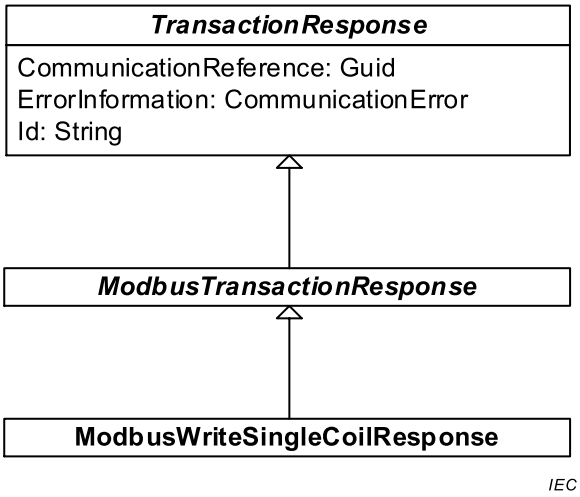
The properties of the ModbusWriteSingleCoilRequest datatype are described in Table 22.

Table 22 – ModbusWriteSingleCoilRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request.	
OutputAddress	Address of the coil to be forced	Address of first coil
SingleCoilValue	Coil state to be forced, with: “0”=FALSE or “OFF” “1”=TRUE or “ON”	Data single coil

10.16 ModbusWriteSingleCoilResponse

This subclause describes the response for the Modbus service Write Single Coil (see Figure 19).



Used in:
ICommunication.EndCommunicationRequest()

Figure 19 – ModbusWriteSingleCoilResponse

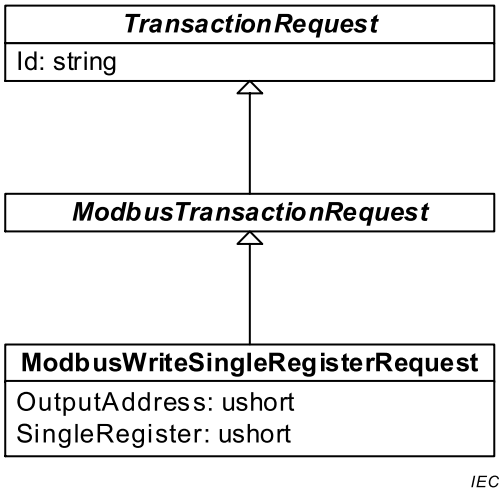
The properties of the ModbusWriteSingleCoilResponse datatype are described in Table 23.

Table 23 – ModbusWriteSingleCoilResponse datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	

10.17 ModbusWriteSingleRegisterRequest

This subclause describes the request for the Modbus service Write Single Register (see Figure 20).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 20 – ModbusWriteSingleRegisterRequest

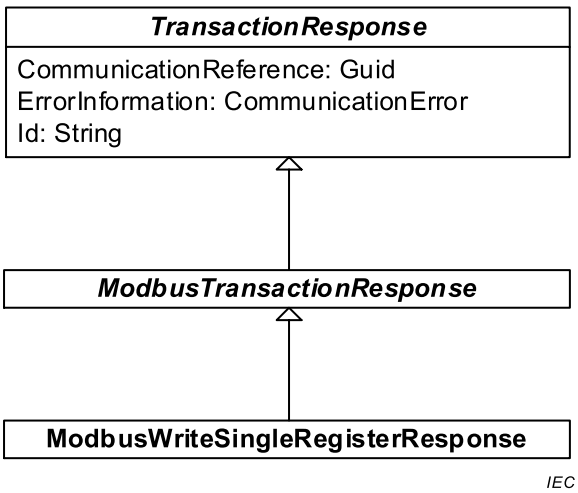
The properties of the ModbusWriteSingleRegisterRequest datatype are described in Table 24.

Table 24 – ModbusWriteSingleRegisterRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request	
OutputAddress	Address of the holding register to be written	Address of first holding register to write
SingleRegister	Value to be written to the register	Data

10.18 ModbusWriteSingleRegisterResponse

This subclause describes the response for the Modbus service Write Single Register (see Figure 21).



Used in:
ICommunication.EndCommunicationRequest()

Figure 21 – ModbusWriteSingleRegisterResponse

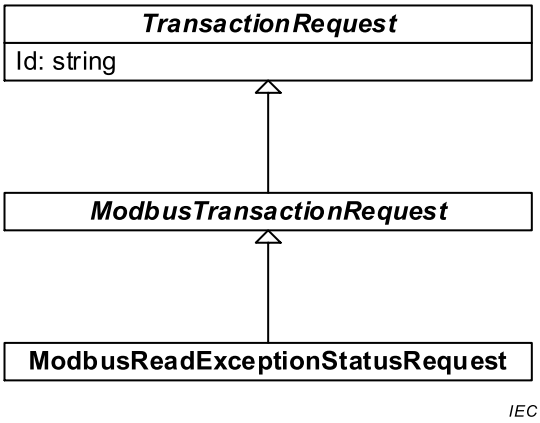
The properties of the ModbusWriteSingleRegisterResponse datatype are described in Table 25.

Table 25 – ModbusWriteSingleRegisterResponse datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	

10.19 ModbusReadExceptionStatusRequest

This subclause describes the request for the Modbus service Read Exception Status (see Figure 22).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 22 – ModbusReadExceptionStatusRequest

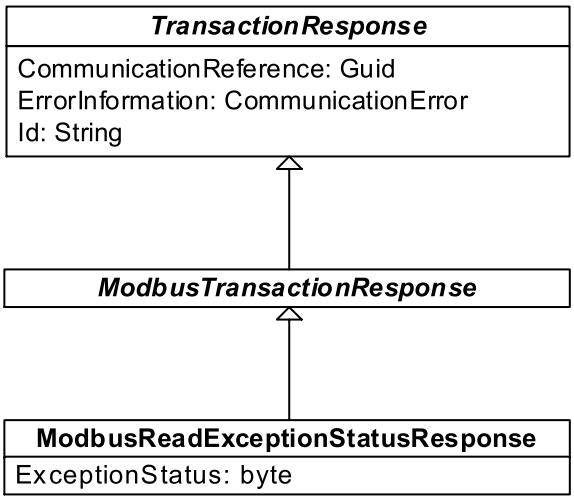
The properties of the ModbusReadExceptionStatusRequest datatype are described in Table 26.

Table 26 – ModbusReadExceptionStatusRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request.	

10.20 ModbusReadExceptionStatusResponse

This subclause describes the response for the Modbus service Read Exception Status (see Figure 23).



Used in:
ICommunication.EndCommunicationRequest()

Figure 23 – ModbusReadExceptionStatusResponse

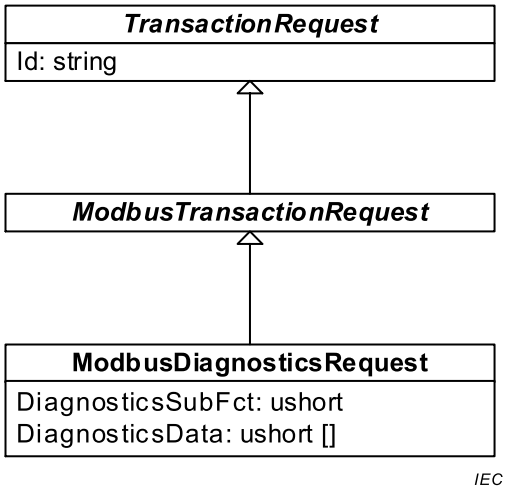
The properties of the ModbusReadExceptionStatusResponse datatype are described in Table 27.

Table 27 – ModbusReadExceptionStatusResponse datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
ExceptionStatus	Exception status of Modbus Serial Line device.	Output data
Id	[Optional] Identifier for a single Transaction Request.	

10.21 ModbusDiagnosticsRequest

This subclause describes the request for the Modbus service Diagnostics (see Figure 24).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 24 – ModbusDiagnosticsRequest

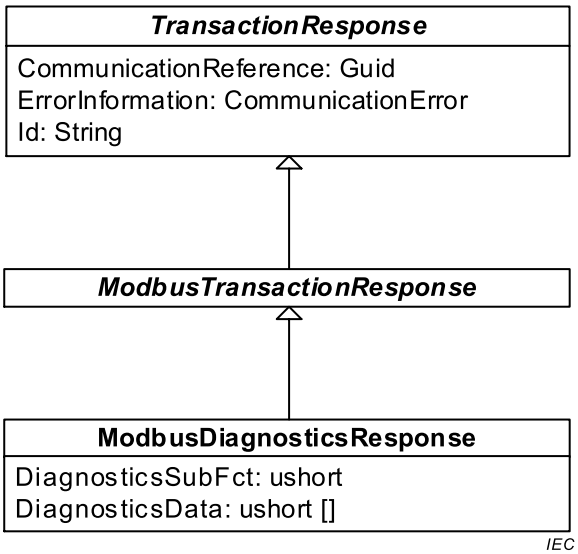
The properties of the ModbusDiagnosticsRequest datatype are described in Table 28.

Table 28 – ModbusDiagnosticsRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
DiagnosticsData	Required data, depending on the sub-function type	Data
DiagnosticsSubFct	Sub-function code	Sub-function
Id	[Optional] Identifier for a single Transaction Request	

10.22 ModbusDiagnosticsResponse

This subclause describes the response for the Modbus service Diagnostics (see Figure 25).



Used in:
ICommunication.EndCommunicationRequest()

Figure 25 – ModbusDiagnosticsResponse

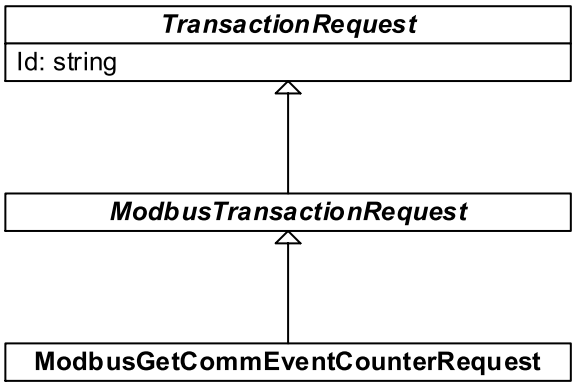
The properties of the ModbusDiagnosticsResponse datatype are described in Table 29.

Table 29 – ModbusDiagnosticsResponse datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
DiagnosticsData	Required data, depending on the sub-function type.	Data
DiagnosticsSubFct	Sub-function code	Sub-function
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	

10.23 ModbusGetCommEventCounterRequest

This subclause describes the request for the Modbus service Get Comm Event Counter (see Figure 26).



Used in:

ICommunication.BeginCommunicationRequest()

Figure 26 – ModbusGetCommEventCounterRequest

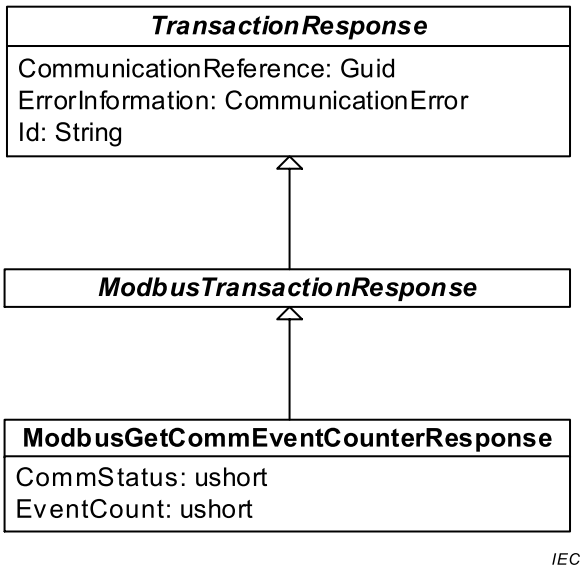
The properties of the ModbusGetCommEventCounterRequest datatype are described in Table 30.

Table 30 – ModbusGetCommEventCounterRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request.	

10.24 ModbusGetCommEventCounterResponse

This subclause describes the response for the Modbus service Get Comm Event Counter (see Figure 27).



Used in:
ICommunication.EndCommunicationRequest()

Figure 27 – ModbusGetCommEventCounterResponse

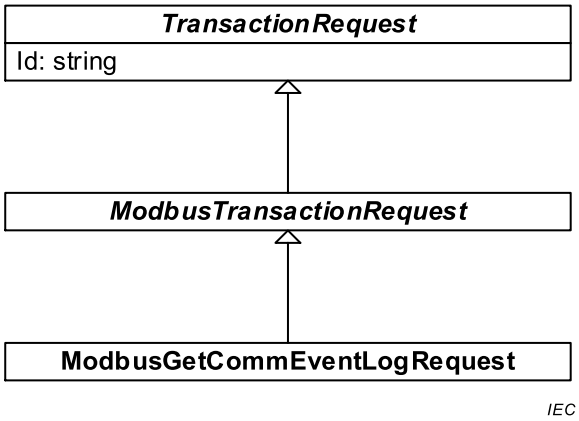
The properties of the ModbusGetCommEventCounterResponse datatype are described in Table 31.

Table 31 – ModbusGetCommEventCounterResponsedatatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
CommStatus	Two-byte status information. The status information will be 0xFFFF if a previously-issued program command is still being processed by the remote device (busy condition), otherwise it will be 0x0000.	Status
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
EventCount	Number of events counted by the device.	Event Count
Id	[Optional] Identifier for a single Transaction Request.	

10.25 ModbusGetCommEventLogRequest

This subclause describes the request for the Modbus service Get Comm Event Log (see Figure 28).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 28 – ModbusGetCommEventLogRequest

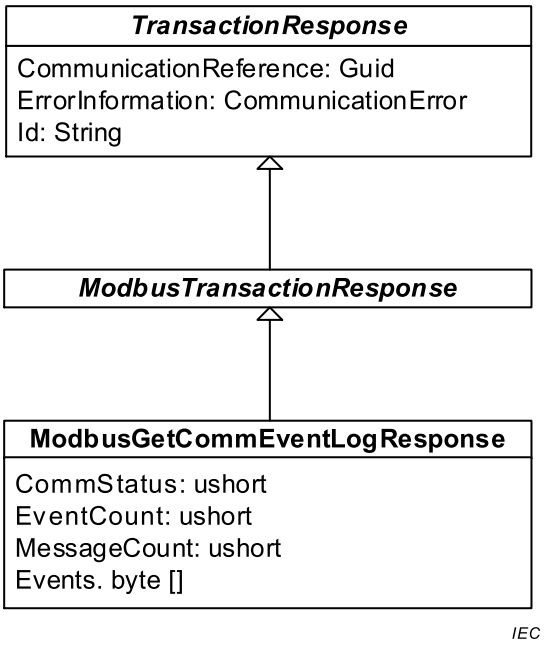
The properties of the ModbusGetCommEventLogRequest datatype are described in Table 32.

Table 32 – ModbusGetCommEventLogRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request.	

10.26 ModbusGetCommEventLogResponse

This subclause describes the response for the Modbus service Get Comm Event Log (see Figure 29).



Used in:
ICommunication.EndCommunicationRequest()

Figure 29 – ModbusGetCommEventLogResponse

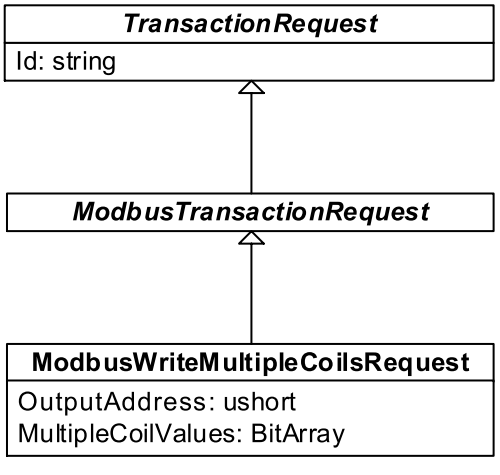
The properties of the ModbusGetCommEventLogResponse datatype are described in Table 33.

Table 33 – ModbusGetCommEventLogResponse datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
CommStatus	Two-byte status information. The status information will be 0xFFFF if a previously-issued program command is still being processed by the remote device (busy condition), otherwise it will be 0x0000.	Status
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Events	Each byte corresponds to the status of one MODBUS send or receive operation for the remote device.	Events
EventCount	Number of events counted by the device.	Event Count
Id	[Optional] Identifier for a single Transaction Request.	
MessageCount	Quantity of messages processed by the remote device since its last restart, clear counters operation, or power-up.	Message Count

10.27 IModbusWriteMultipleCoilsRequest

This subclause describes the request for the Modbus service Write Multiple Coils (see Figure 30).



Used in:

ICommunication.BeginCommunicationRequest()

Figure 30 – ModbusWriteMultipleCoilsRequest

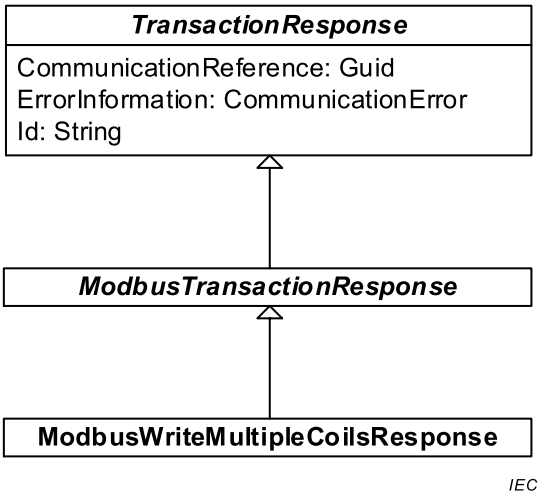
The properties of the ModbusWriteMultipleCoilsRequest datatype are described in Table 34.

Table 34 – ModbusWriteMultipleCoilsRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request.	
MultipleCoilValues	Bit-array with each coil state coded in one bit, where the first bit in the array represents the first coil to be written: "0"=FALSE or "OFF" "1"=TRUE or "ON"	Data
OutputAddress	Address of the first coil to be forced.	Address of first coil

10.28 ModbusWriteMultipleCoilsResponse

This subclause describes the response for the Modbus service Write Multiple Coils (see Figure 31).



Used in:
ICommunication.EndCommunicationRequest()

Figure 31 – ModbusWriteMultipleCoilsResponse

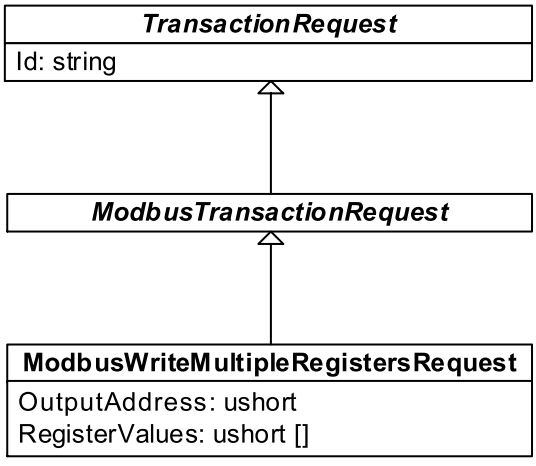
The properties of the ModbusWriteMultipleCoilsResponse datatype are described in Table 35.

Table 35 – ModbusWriteMultipleCoilsResponse datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	

10.29 ModbusWriteMultipleRegistersRequest

This subclause describes the request for the Modbus service Write Multiple Registers (see Figure 32).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 32 – ModbusWriteMultipleRegistersRequest

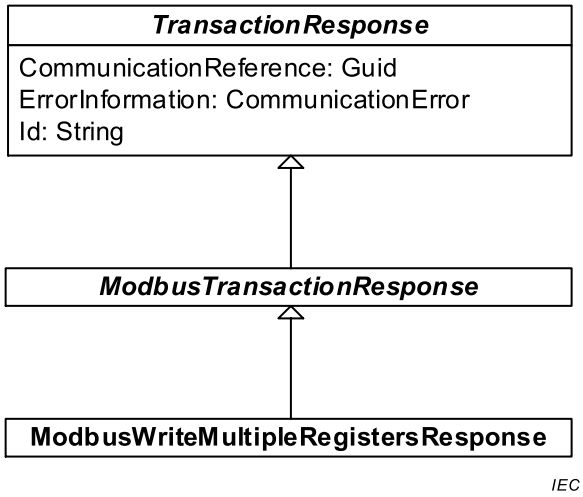
The properties of the ModbusWriteMultipleRegistersRequest datatype are described in Table 36.

Table 36 – ModbusWriteMultipleRegistersRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request.	
OutputAddress	Address of the first coil to be forced.	Address of first coil
RegisterValues	Register values to be written.	Data

10.30 ModbusWriteMultipleRegistersResponse

This subclause describes the response for the Modbus service Write Multiple Registers (see Figure 33).



Used in:
ICommunication.EndCommunicationRequest()

Figure 33 – ModbusWriteMultipleRegistersResponse

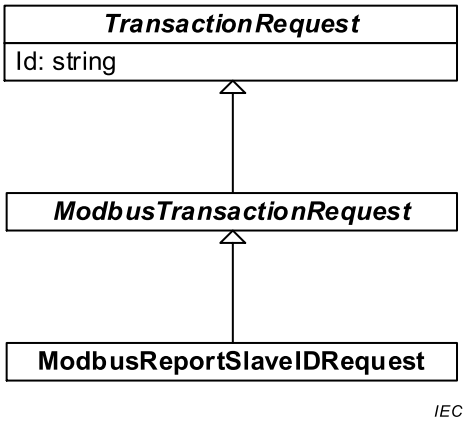
The properties of the ModbusWriteMultipleRegistersResponse datatype are described in Table 37.

Table 37 – ModbusWriteMultipleRegistersResponse

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	

10.31 ModbusReportSlaveIDRequest

This subclause describes the request for the Modbus service Report Slave ID (see Figure 34).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 34 – ModbusReportSlaveIDRequest

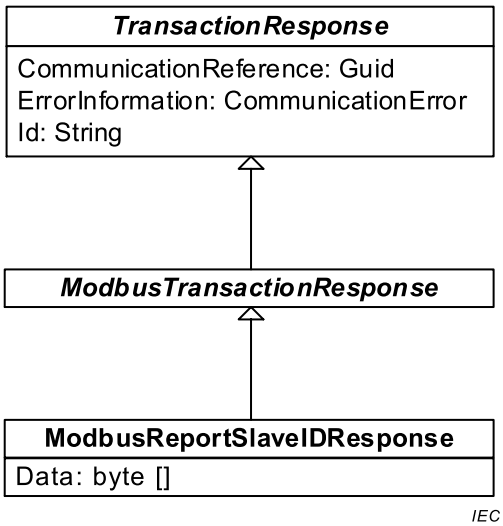
The properties of the ModbusReportSlaveIDRequest datatype are described in Table 38.

Table 38 – ModbusReportSlaveIDRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request.	

10.32 ModbusReportSlaveIDResponse

This subclause describes the response for the Modbus service Report Slave ID (see Figure 35).



Used in:
ICommunication.EndCommunicationRequest()

Figure 35 – ModbusReportSlaveIDResponse

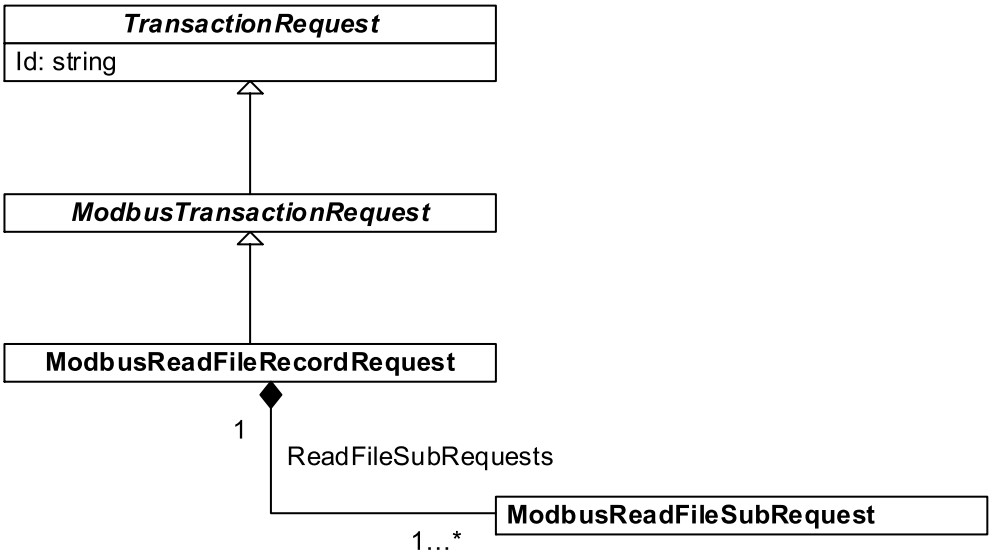
The properties of the ModbusReportSlaveIDResponse datatype are described in Table 39.

Table 39 – ModbusReportSlaveIDResponse

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
Data	This attribute contains the: – Slave ID; – the Run Indicator Status (0x00 or 0xFF); – and the additional device specific data; in the same format and order as defined in the MODBUS Application Protocol Specification.	Slave ID, Run Indicator Status Additional data
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	

10.33 ModbusReadFileRecordRequest

This subclause describes the request for the Modbus service Read File Record (see Figure 36).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 36 – ModbusReadFileRecordRequest

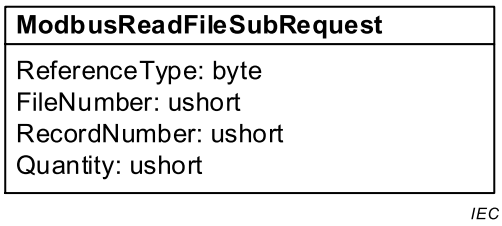
The properties of the ModbusReadFileRecordRequest datatype are described in Table 40.

Table 40 – ModbusReadFileRecordRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request.	
ModbusReadFileSubRequest	Sub-request equivalent to the Read File Record sub-request element defined in IEC 61158-5-15.	

10.34 ModbusReadFileSubRequest

This subclause describes the sub-request for the Modbus service Read File Record (see Figure 37).



Used in
ICommunication.BeginCommunicationRequest()

Figure 37 – ModbusReadFileSubRequest

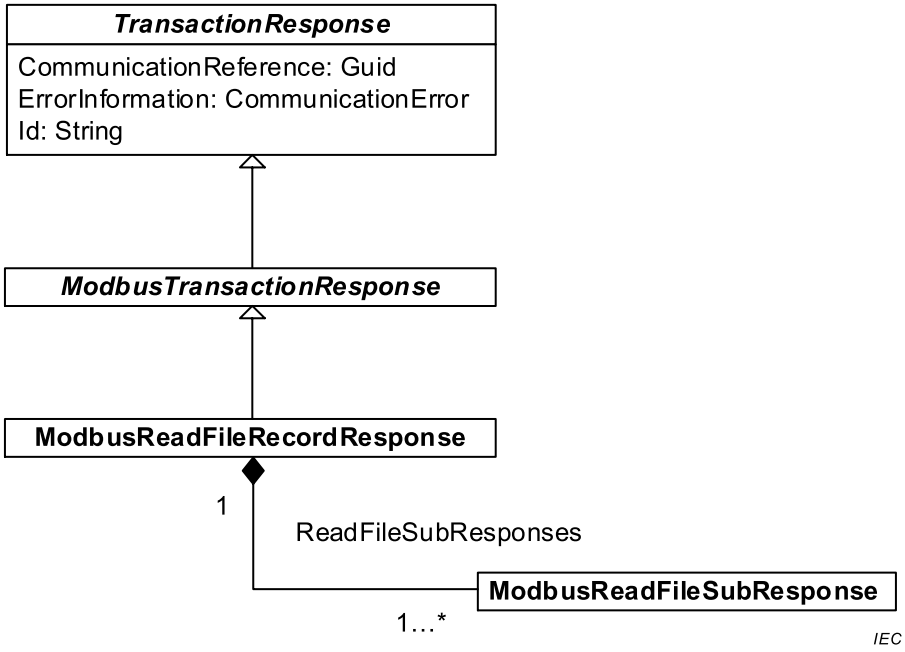
The properties of the ModbusReadFileSubRequest datatype are described in Table 41.

Table 41 – ModbusReadFileSubRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
FileNumber	File number	File number
Id	[Optional] Identifier for a single Transaction Request.	
Quantity	Length of the record to be read as quantity of registers	Record length
RecordNumber	Starting record number within the file.	Record number
ReferenceType	Reference type	Reference type

10.35 ModbusReadFileRecordResponse

This subclause describes the response for the Modbus service Read File Record (see Figure 38).



Used in:
ICommunication.EndCommunicationRequest()

Figure 38 – ModbusReadFileRecordResponse

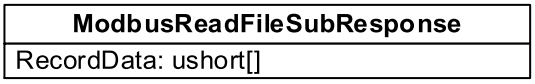
The properties of the ModbusReadFileRecordResponse datatype are described in Table 42.

Table 42 – ModbusReadFileRecordResponse

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	
ReadFileSubResponse	Sub-response equivalent to the Read File Record sub-response element defined in IEC 61158-5-15.	

10.36 ModbusReadFileSubResponse

This subclause describes the sub-response for the Modbus service Read File Record (see Figure 39).



Used in:
ICommunication.EndCommunicationRequest()

Figure 39 – ModbusReadFileSubResponse

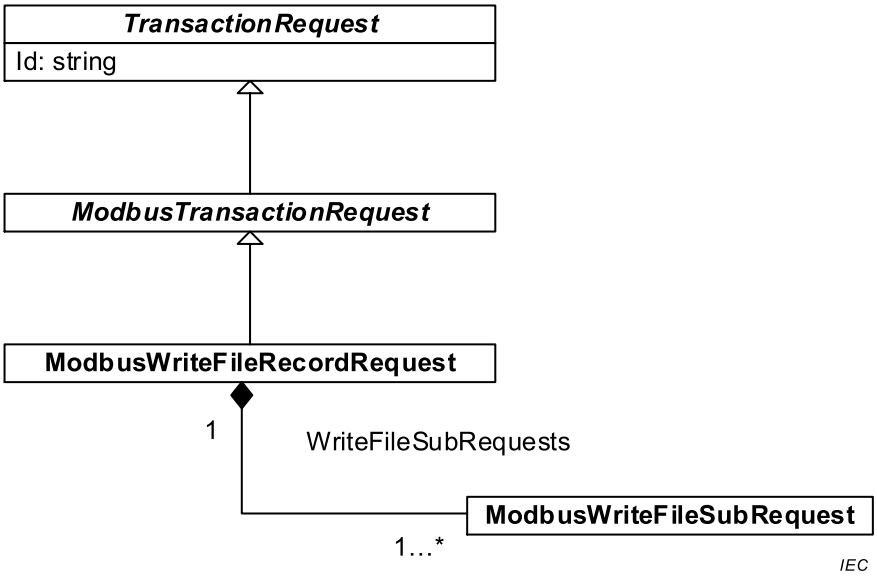
The properties of the ModbusReadFileSubResponse datatype are described in Table 43.

Table 43 – ModbusReadFileSubResponse

Property	Description	Equivalent IEC 61158-5-15 service parameter
RecordData	Record data	Record data array

10.37 ModbusWriteFileRecordRequest

This subclause describes the request for the Modbus service Write File Record (see Figure 40).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 40 – ModbusWriteFileRecordRequest

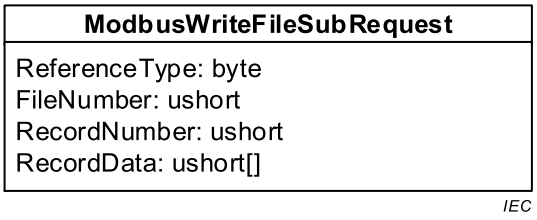
The properties of the ModbusWriteFileRecordRequest datatype are described in Table 44.

Table 44 – ModbusWriteFileRecordRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request.	
ModbusWriteFileSubRequest	Reference type	Sub-request equivalent to the Write File Record sub-request element defined in IEC 61158-5-15

10.38 ModbusWriteFileSubRequest

This subclause describes the sub-request for the Modbus service Write File Record (see Figure 41).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 41 – ModbusWriteFileSubRequest

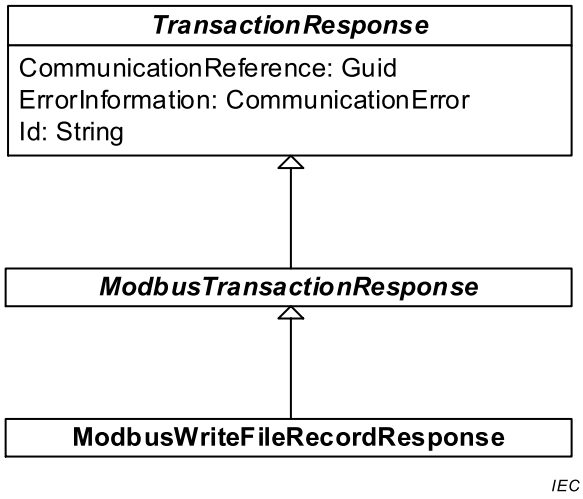
The properties of the ModbusWriteFileSubRequest datatype are described in Table 45.

Table 45 – ModbusWriteFileSubRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
FileNumber	File number	File number
RecordData	Record data	Record data array
RecordNumber	Starting record number within the file	Record number
ReferenceType	Reference type	Reference type

10.39 ModbusWriteFileRecordResponse

This subclause describes the response for the Modbus service Write File Record (see Figure 42).



Used in:
ICommunication.EndCommunicationRequest()

Figure 42 – ModbusWriteFileRecordResponse

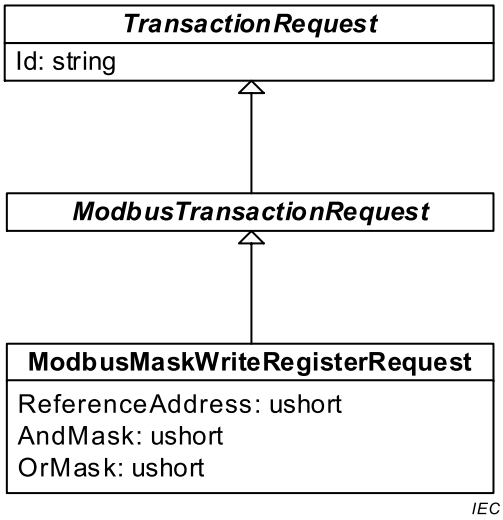
The properties of the ModbusWriteFileRecordResponse datatype are described in Table 46.

Table 46 – ModbusWriteFileRecordResponse

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	

10.40 ModbusMaskWriteRegisterRequest

This subclause describes the request for the Modbus service Mask Write Register (see Figure 43).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 43 – ModbusMaskWriteRegisterRequest

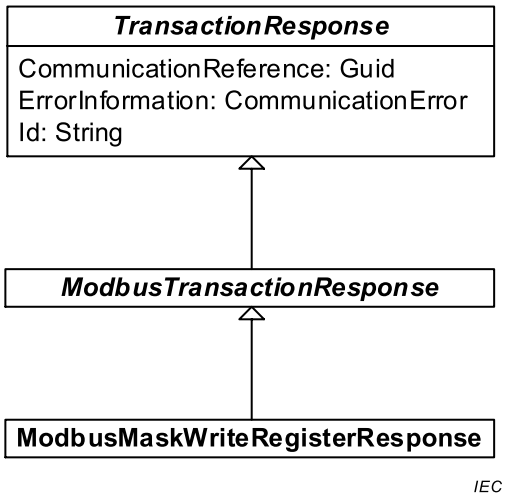
The properties of the ModbusMaskWriteRegisterRequest datatype are described in Table 47.

Table 47 – ModbusMaskWriteRegisterRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
AndMask	AND mask	AND Mask
Id	[Optional] Identifier for a single Transaction Request.	
OrMask	OR mask	OR Mask
ReferenceAddress	Address of the holding register the mask shall be applied to.	Address of first holding register to write

10.41 ModbusMaskWriteRegisterResponse

This subclause describes the response for the Modbus service Mask Write Register (see Figure 44).



Used in:
ICommunication.EndCommunicationRequest()

Figure 44 – ModbusMaskWriteRegisterResponse

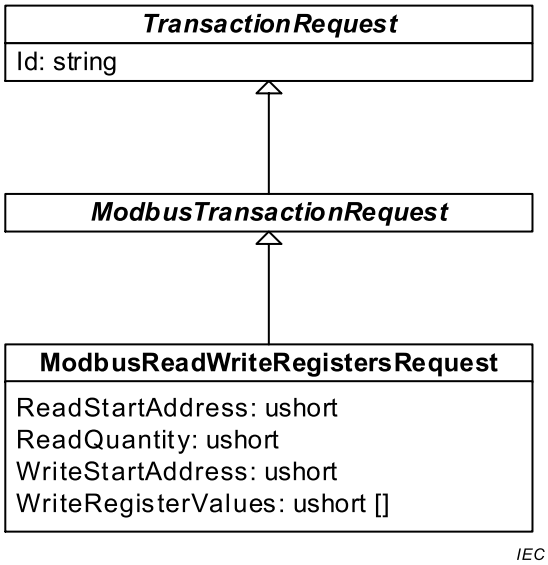
The properties of the ModbusMaskWriteRegisterResponse datatype are described in Table 48.

Table 48 – ModbusMaskWriteRegisterResponse

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	

10.42 ModbusReadWriteRegistersRequest

This subclause describes the request for the Modbus service Read/Write Multiple Registers (see Figure 45).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 45 – ModbusReadWriteRegistersRequest

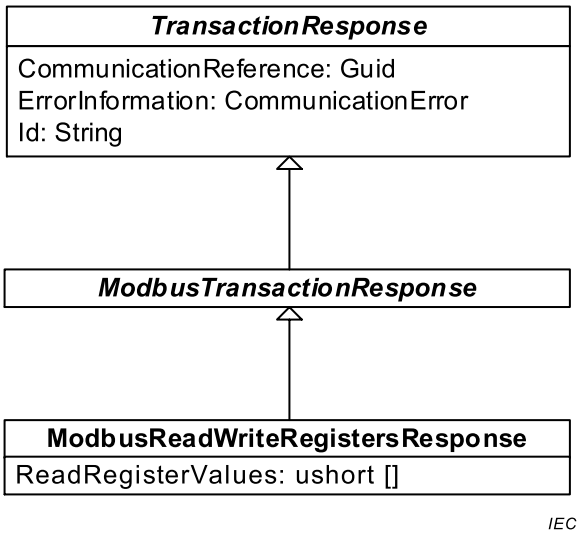
The properties of the ModbusReadWriteRegistersRequest datatype are described in Table 49.

Table 49 – ModbusReadWriteRegistersRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request	
ReadQuantity	Number of holding registers to be read	Quantity of holding registers to read
ReadStartAddress	Address of the first holding register to be read	Address of first holding register to read
WriteRegisterValues	Register values to be written	Data
WriteStartAddress	Address of the first holding register to be written	Address of first holding register to write

10.43 ModbusReadWriteRegistersResponse

This subclause describes the response for the Modbus service Read/Write Multiple Registers (see Figure 46).



Used in:
ICommunication.EndCommunicationRequest()

Figure 46 – ModbusReadWriteRegistersResponse

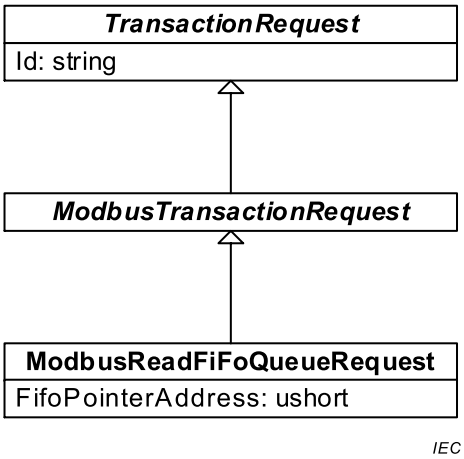
The properties of the ModbusReadWriteRegistersResponse datatype are described in Table 50.

Table 50 – ModbusReadWriteRegistersResponse

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	
ReadRegisterValues	Read holding register values.	Data

10.44 ModbusReadFiFoQueueRequest

This subclause describes the request for the Modbus service Read FiFo Queue (see Figure 47).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 47 – ModbusReadFiFoQueueRequest

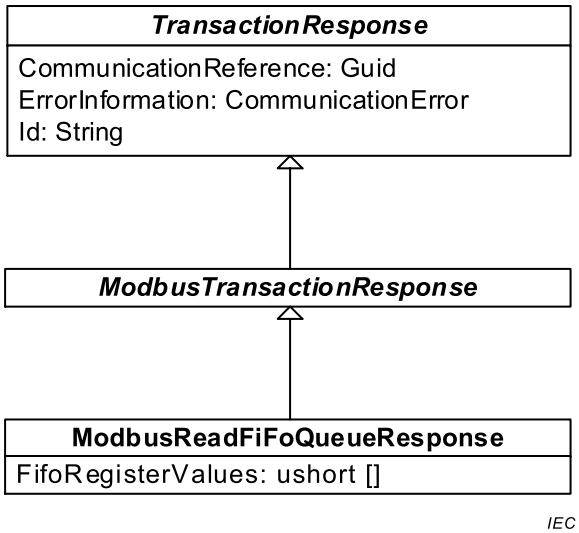
The properties of the ModbusReadFiFoQueueRequest datatype are described in Table 51.

Table 51 – ModbusReadFiFoQueueRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request.	
FifoPointerAddress	Address of the first register to be read in a First-In-First-Out (FIFO) queue of registers.	Address of FIFO queue

10.45 ModbusReadFiFoQueueResponse

This subclause describes the response for the Modbus service Read FIFO Queue (see Figure 48).



Used in:
ICommunication.EndCommunicationRequest()

Figure 48 – ModbusReadFiFoQueueResponse

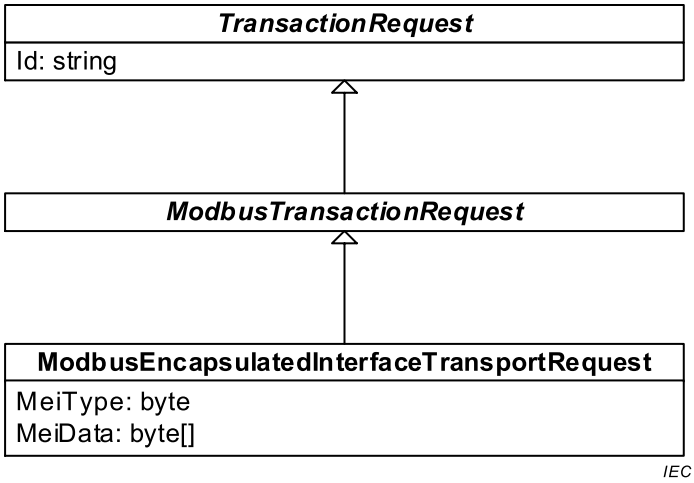
The properties of the ModbusReadFiFoQueueResponse datatype are described in Table 52.

Table 52 – ModbusReadFiFoQueueResponse

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	
FifoRegisterValues	Register values read from the FIFO queue Data.	

10.46 ModbusEncapsulatedInterfaceTransportRequest

This subclause describes the request for the Modbus service Encapsulated Interface Transport (see Figure 49).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 49 – ModbusEncapsulatedInterfaceTransportRequest

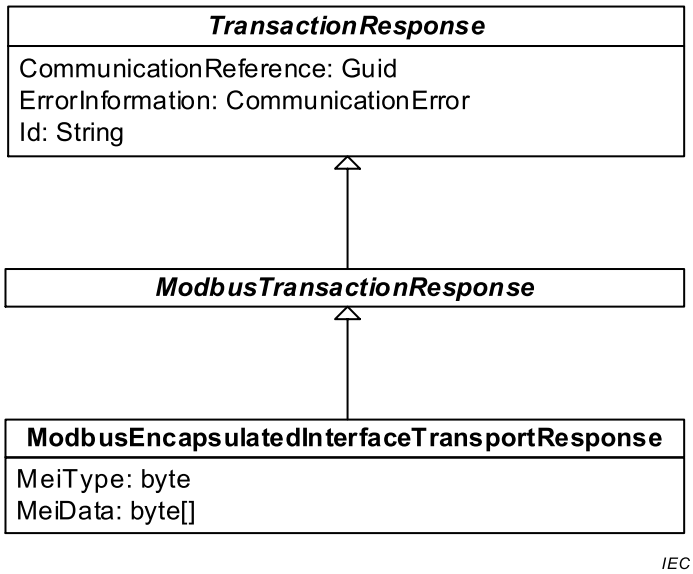
The properties of the ModbusEncapsulatedInterfaceTransportRequest datatype are described in Table 53.

Table 53 – ModbusEncapsulatedInterfaceTransportRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request.	
MeiData	Modbus encapsulated interface type specific data.	MEI type specific data
MeiType	Modbus encapsulated interface type (MEI type).	MEI type

10.47 ModbusEncapsulatedInterfaceTransportResponse

This subclause describes the response for the Modbus service Encapsulated Interface Transport (see Figure 50).



Used in:
ICommunication.EndCommunicationRequest()

Figure 50 – ModbusEncapsulatedInterfaceTransportResponse

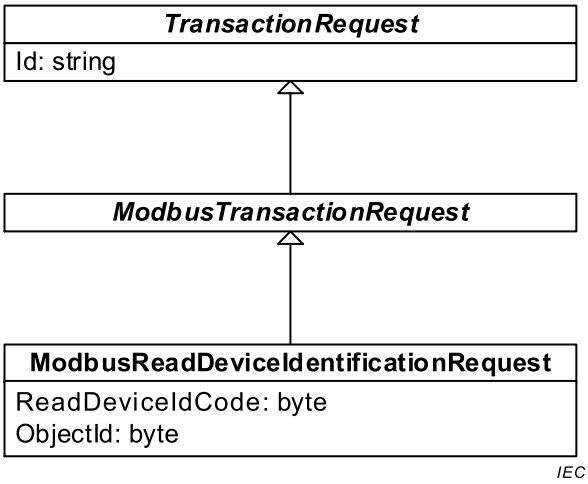
The properties of the ModbusEncapsulatedInterfaceTransportResponse datatype are described in Table 54.

Table 54 – ModbusEncapsulatedInterfaceTransportResponse

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	
MeiData	Modbus encapsulated interface type specific data.	MEI type specific data
MeiType	Modbus encapsulated interface type (MEI type).	MEI type

10.48 ModbusReadDeviceIdentificationRequest

This subclause describes the request for the Modbus service Read Device Identification (see Figure 51).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 51 – ModbusReadDeviceIdentificationRequest

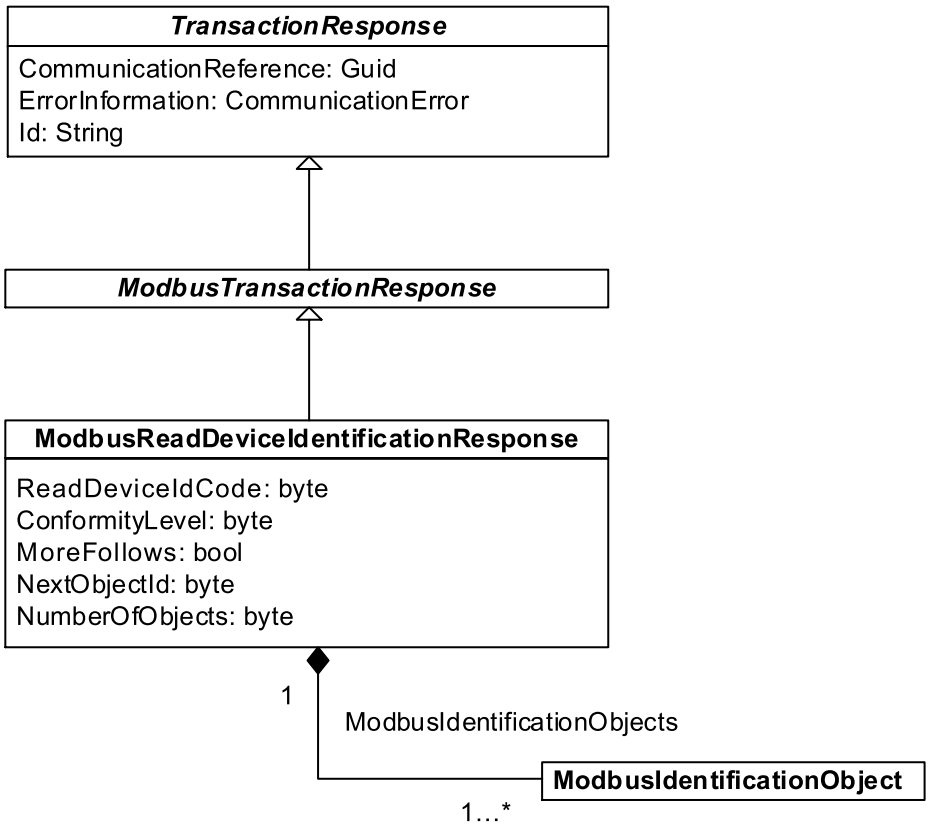
The properties of the ModbusReadDeviceIdentificationRequest datatype are described in Table 55.

Table 55 – ModbusReadDeviceIdentificationRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request.	
ReadDeviceIDCode	The parameter " Read Device ID code " allows to define four access types: 01: request to get the basic device identification (stream access) 02: request to get the regular device identification (stream access) 03: request to get the extended device identification (stream access) 04: request to get one specific identification object (individual access)	Read device ID code
ObjectId	Identification of the first object to obtain.	Requested object ID

10.49 ModbusReadDeviceIdentificationResponse

This subclause describes the response for the Modbus service Read Device Identification (see Figure 52 and Figure 53).



Used in:
ICommunication.EndCommunicationRequest()

Figure 52 – ModbusReadDeviceIdentificationResponse

The properties of the ModbusReadDeviceIdentificationResponse datatype are described in Table 56.

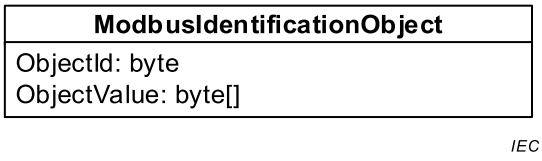


Figure 53 – ModbusIdentificationObject

The properties of the ModbusIdentificationObject datatype are described in Table 57.

Table 56 – ModbusReadDeviceIdentificationResponse

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ConformityLevel	Identification conformity level of the device and type of supported access 01: basic identification (stream access only) 02: regular identification (stream access only) 03: extended identification (stream access only) 81: basic identification (stream access and individual access) 82: regular identification (stream access and individual access) 83: extended identification (stream access and individual access)	Conformity level
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	
ModbusIdentificationObject	Identification objects of the Read Device Identification service response provided by the Encapsulated Interface defined in IEC 61158-5-15	
MoreFollows	In case of readDeviceIdCode 01, 02 or 03 (stream access), if the identification data does not fit into a single response and several request/response transactions may be required: “0”: no more objects are available; “1”: other identification objects are available and further Modbus transactions are required. In case of ReadDevId code 04 (individual access), this field shall be set to “0”.	More-available flag
NextObjectid	“0”, if no more identification objects are available (moreFollows=”0”) Identification of the next object to be obtained, if more identification objects are available (moreFollows=”1”)	Next object ID
NumberOfObjects	Number of identification objects returned in this response (for an individual access, numberOfObjects=”1”)	Number of objects
ReadDeviceIdCode	The parameter " Read Device ID code " allows to define four access types: 01: request to get the basic device identification (stream access); 02: request to get the regular device identification (stream access); 03: request to get the extended device identification (stream access); 04: request to get one specific identification object (individual access).	Read device ID code
ModbusIdentificationObject	Identification conformity level of the device and type of supported access 01: basic identification (stream access only) 02: regular identification (stream access only) 03: extended identification (stream access only)	Conformity level

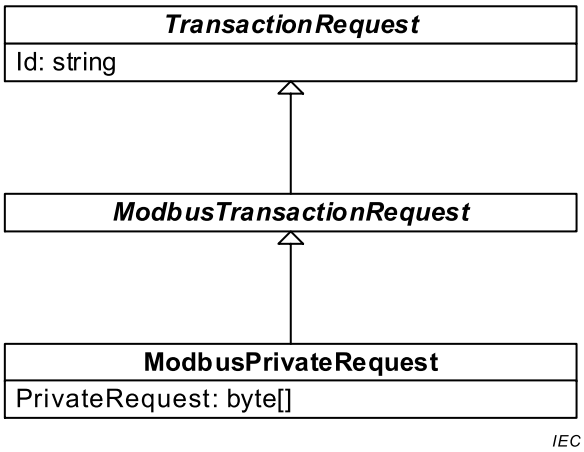
Property	Description	Equivalent IEC 61158-5-15 service parameter
	81: basic identification (stream access and individual access) 82: regular identification (stream access and individual access) 83: extended identification (stream access and individual access)	

Table 57 – ModbusIdentificationObject

Property	Description	Equivalent IEC 61158-5-15 service parameter
ObjectId	Identification of the returned object	Returned object ID
ObjectValue	Object value	Object value

10.50 ModbusPrivateRequest

This subclause describes the request for a private Modbus service (see Figure 54).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 54 – ModbusPrivateRequest

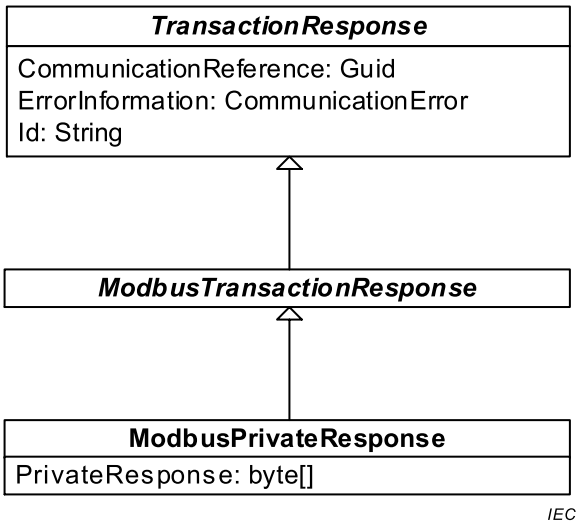
The properties of the ModbusPrivateRequest datatype are described in Table 58.

Table 58 – ModbusPrivateRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request.	
PrivateRequest	Sequence of hexadecimal digits representing the private Modbus request.	

10.51 ModbusPrivateResponse

This subclause describes the response for a private Modbus service (see Figure 55).



Used in:
ICommunication.EndCommunicationRequest()

Figure 55 – ModbusPrivateResponse

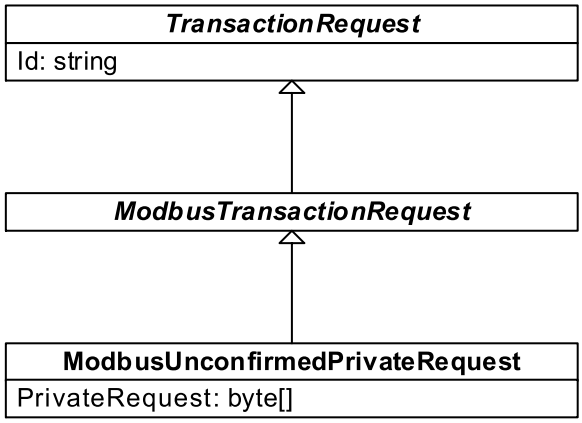
The properties of the ModbusPrivateResponse datatype are described in Table 59.

Table 59 – ModbusPrivateResponse

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	
PrivateResponse	Sequence of hexadecimal digits representing the private Modbus response	

10.52 ModbusUnconfirmedPrivateRequest

This subclause describes the request for an unconfirmed private Modbus service (see Figure 56).



Used in:
ICommunication.BeginCommunicationRequest()

Figure 56 – ModbusUnconfirmedPrivateRequest

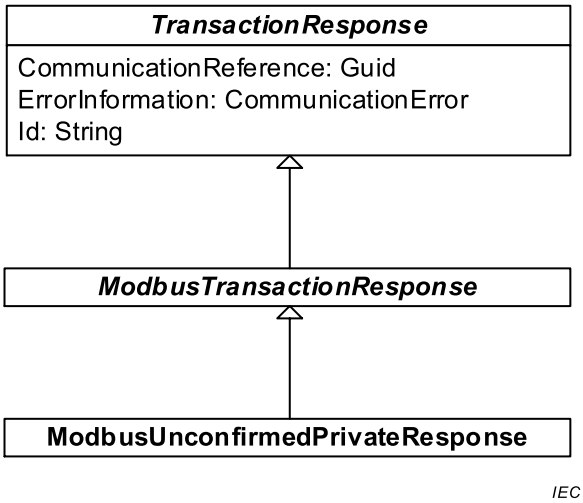
The properties of the ModbusUnconfirmedPrivateRequest datatype are described in Table 60.

Table 60 – ModbusUnconfirmedPrivateRequest datatype

Property	Description	Equivalent IEC 61158-5-15 service parameter
Id	[Optional] Identifier for a single Transaction Request.	
PrivateRequest	Sequence of hexadecimal digits representing the private Modbus request.	

10.53 ModbusUnconfirmedPrivateResponse

This subclause describes the response for an unconfirmed private Modbus service (see Figure 57).



Used in:
ICommunication.EndCommunicationRequest()

Figure 57 – ModbusUnconfirmedPrivateResponse

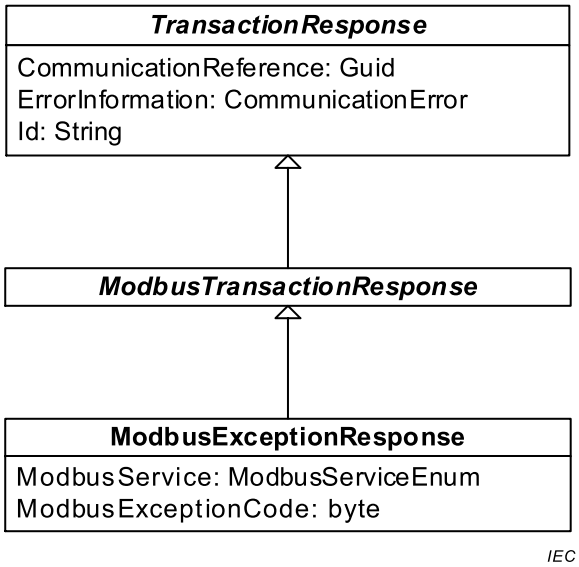
The properties of the ModbusUnconfirmedPrivateResponse datatype are described in Table 61.

Table 61 – ModbusUnconfirmedPrivateResponse

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	

10.54 ModbusExceptionResponse

This subclause describes the Modbus Exception Response (see Figure 58).



Used in:
ICommunication.EndCommunicationRequest()

Figure 58 – ModbusExceptionResponse

The properties of the ModbusExceptionResponse datatype are described in Table 62.

Table 62 – ModbusExceptionResponse

Property	Description	Equivalent IEC 61158-5-15 service parameter
CommunicationReference	Identifier for a communication link to a device.	CommunicationReference
ErrorInformation	[Optional] Description of a fieldbus protocol independent error occurred during communication.	
Id	[Optional] Identifier for a single Transaction Request.	
ModbusService	Enumeration of Modbus service names, used to identify the Modbus service on which the exception occurred.	
ModbusExceptionCode	Modbus Exception Code.	Exception code

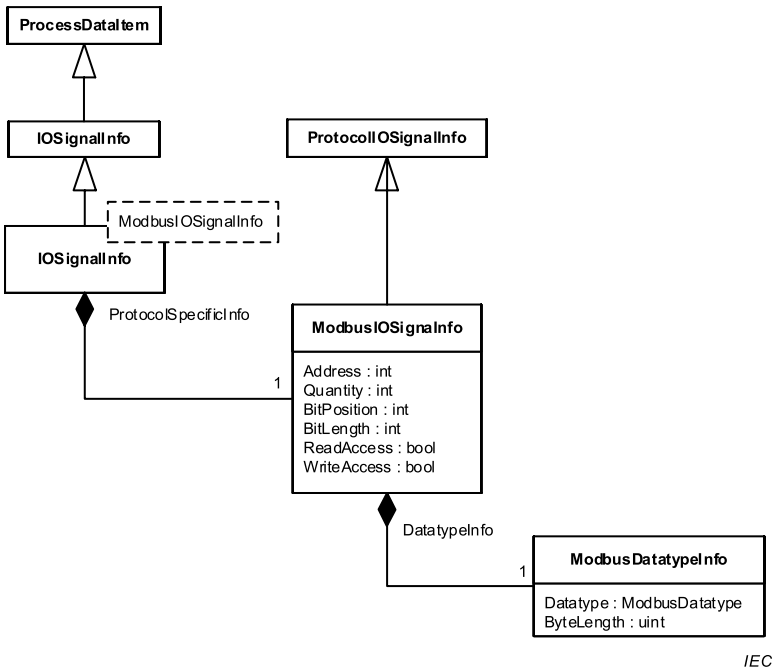
11 Datatypes for process data information

11.1 General

The process data information of a DTM represents the “Device Variables”, available on that device. A Process Control System (i.e. some external system which monitors values on a device) can query the DTM's process data information via the IProcessData interface. The process data describes the process values such that an external system can use the information to access and interpret the values from the device during normal device runtime. The external system might not use FDT to access the values.

11.2 ModbusIOSignalInfo

This is the Modbus specific implementation of the abstract class ProtocolIOSignalInfo (see Figure 59).



Used in:
IProcessData.<ProcessData>()
IProcessData.SetIOSignalInfo()

Figure 59 – ModbusIOSignalInfo

The properties of the ModbusIOSignalInfo datatype are described in Table 63.

Table 63 – ModbusIOSignalInfo datatype

Property	Description
Address	Address of the discrete input, coil or register which shall be accessed. In case of a range of these Modbus data items shall be accessed, the address datatype contains the address of the first Modbus data item within this range.
BitLength	Number of bits
BitPosition	If the access to single bits or some collections of bits is needed, it can be defined the BitPosition and BitLength property
ModbusDatatypeInfo	The datatype of the IO signal.
Quantity	Number of discrete inputs, coils or registers which represent the channel object in the device.
ReadAccess	Defines whether the IOSignal can be read or not.
WriteAccess	Defines whether the IOSignal can be written or not.

The Modbus data model defines four primary datatypes:

- Discrete Inputs;
- Coils;
- Input Registers;
- Holding Registers.

The bit access is defined for Discrete Inputs and Coils. Nevertheless, most devices use Holding Register for input and output data, also with bit access.

If the access to single bits or some collections of bits is needed, it can be defined inside the ModbusIOSignalInfo datatype with the BitPosition and BitLength properties. It is also feasible to define the bits of a Holding Register and additionally the whole word of the same Holding Register as an IO signal. In other words, it is possible to define 17 process data objects for a single holding register. On the other hand it is not mandatory to describe all bits of a register word.

11.3 Mapping of Modbus datatypes to FDT datatypes

The datatype mapping defines how Modbus IO Signals are mapped to PLC applications using datatypes defined in IEC 61131-3.

See Table 1 for a mapping of datatypes.

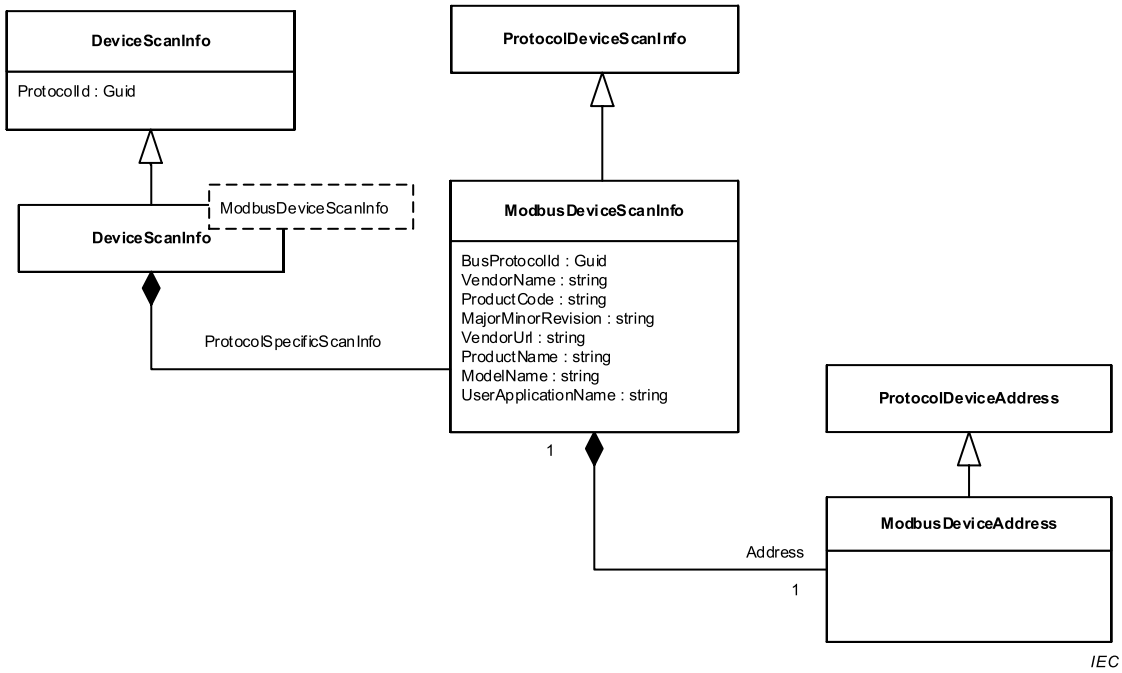
12 Device identification

12.1 General

This subclause defines identification relevant protocol specific datatypes.

12.2 ModbusDeviceScanInfo datatype

This is the Modbus specific implementation of the abstract class ProtocolDeviceScanInfo (see Figure 60).



Used in:
IDtmScanning.EndScanRequest()

Figure 60 – ModbusDeviceScanInfo

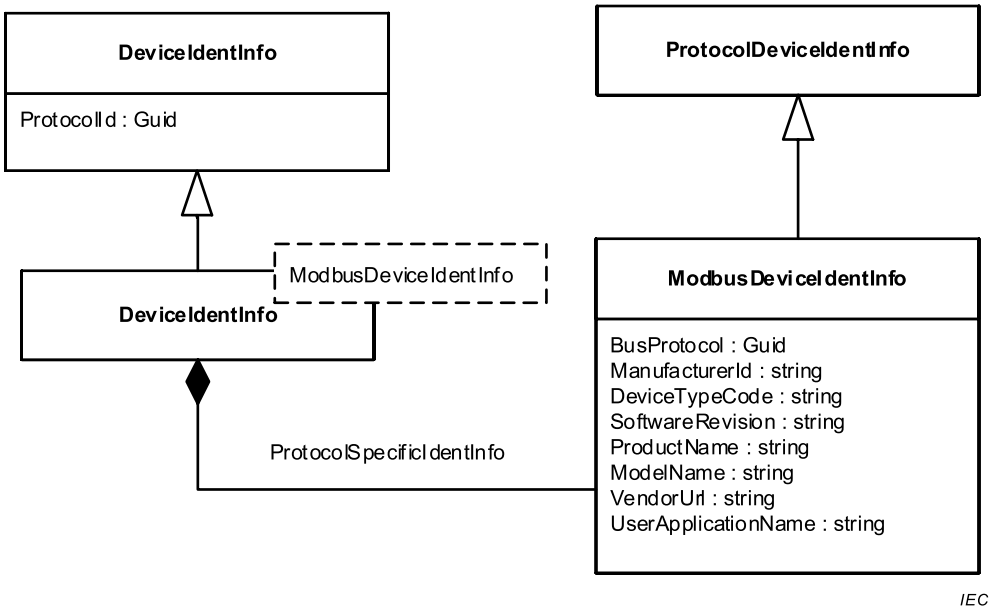
The properties of the ModbusDeviceScanInfo datatype are described in Table 64.

Table 64 – ModbusDeviceScanInfo datatype

Property	Description
Address	The bus address of the device.
BusProtocolId	Can be set to either Modbus Serial or Modbus TCP. This information is provided by the Communication Channel (based on the ScanRequest)
MajorMinorRevision	Information of the Modbus protocol specific identification object MajorMinorRevision
ModelName	Information of the Modbus protocol specific identification object ModelName
ProductCode	Information of the Modbus protocol specific identification object ProductCode
ProductName	Information of the Modbus protocol specific identification object ProductName
UserApplicationName	Information of the Modbus protocol specific identification object UserApplicationName
VendorName	Information of the Modbus protocol specific identification object VendorName
VendorUrl	Information of the Modbus protocol specific identification object VendorUrl

12.3 ModbusDeviceIdentInfo datatype

Modbus DTMs that may connect to a Modbus Communication Channel (e.g. Device DTMs and Gateway DTMs) shall provide information, which may be used to identify the corresponding devices on the fieldbus. This subclause describes the offline information (see Figure 61). For DTM assigned after Fieldbus-scanning, the frame application can check in a protocol independent way if the identification of a scanned device type (DeviceScanInfo) matches the supported DeviceInfo.



Used in:
IDtmInformation.GetDeviceIdentInfo()

Figure 61 – ModbusDeviceIdentInfo

The properties of the ModbusDeviceIdentInfo datatype are described in Table 65.

Table 65 – ModbusDeviceIdentInfo datatype

Property	Description
BusProtocol	The unique identifier of either Modbus Serial or Modbus TCP
DeviceTypeCode	Modbus product code
ManufacturerId	Modbus vendor name
ModelName	Modbus model name
ProductName	Modbus product name
SoftwareRevision	Modbus Major Minor Version
UserApplicationName	Modbus user application name
VendorUrl	Modbus Vendor URL

The information described here will be used to match the information retrieved from Communication Channels via the method ICommunication.<ScanRequest()>. This match is executed by device independent software. That is why it is important to provide in ModbusDeviceIdentInfo information that can be matched with the ModbusDeviceScanInfo information. Developers of DTMs need to consider which information the devices will provide (see 12.4).

12.4 Mapping of Information Source

Table 66 defines the semantics of ModbusDeviceScanInfo properties and how this information is mapped to predefined properties of DeviceScanInfo.

The Communication channel will read these values from the device and write them into the properties of ModbusDeviceScanInfo.

Table 66 – Protocol specific mapping of scan information

ModbusDeviceScanInfo property name	Mapped DeviceScanInfo property name	Data Request in physical device	Protocol specific name	Modbus data format	Specific reference
-	ProtocolIdentificationProfile	-	-	-	-
Address	Address.BusAddress	Modbus device address	-	-	-
BusProtocolId	ProtocolId	Set by CommunicationChannel	-	-	-
-	PhysicalLayer	-	-	-	-
VendorName	ManufacturerId	Function code 43 /14, Object Id 0x00	VendorName	String	[2] 6.21
ProductCode	DeviceTypeId	Function code 43 /14, Object Id 0x01	ProductCode	String	[2] 6.21
MajorMinorRevision	SoftwareRevision	Function code 43 /14, Object Id 0x02	MajorMinorRevision	String	[2] 6.21
ProtocolSpecificProperties:					
VendorUrl	ProtocolSpecificProperty	Function code 43 /14, Object Id 0x03	VendorUrl	String	[2] 6.21
ProductName	ProtocolSpecificProperty	Function code 43 /14, Object Id 0x04	ProductName	String	[2] 6.21
ModelName	ProtocolSpecificProperty	Function code 43 /14, Object Id 0x05	ModelName	String	[2] 6.21
UserApplicationName	ProtocolSpecificProperty	Function code 43 /14, Object Id 0x06	UserApplicationName	String	[2] 6.21

Table 67 defines the semantics of ModbusDeviceIdentInfo properties and how this information is mapped to predefined properties of DeviceIdentInfo.

Table 67 – Profile specific mapping of identification information

ModbusDeviceIdentInfo property name	Mapped DeviceIdentInfo property name	Data Request in physical device	Protocol specific name	Modbus data format	Specific reference
BusProtocol	ProtocolId	Set by CommunicationChannel	-	-	-
-	ProtocolIdentificationProfile	-	-	-	-
ManufacturerId	ManufacturerId	Function code 43 /14, Object Id 0x00	VendorName	String	[2] 6.21
DeviceTypeCode	DeviceTypeId	Function code 43 /14, Object Id 0x01	ProductCode	String	[2] 6.21
SoftwareRevision	SoftwareRevision	Function code 43 /14, Object Id 0x02	MajorMinorRevision	String	[2] 6.21
ProtocolSpecificProperties:					
VendorUrl	ProtocolSpecificProperty	Function code 43 /14, Object Id 0x03	VendorUrl	String	[2] 6.21
ProductName	ProtocolSpecificProperty	Function code 43 /14, Object Id 0x04	ProdcutName	String	[2] 6.21
ModelName	ProtocolSpecificProperty	Function code 43 /14, Object Id 0x05	ModelName	String	[2] 6.21
UserApplicationName	ProtocolSpecificProperty	Function code 43 /14, Object Id 0x06	UserApplicationName	String	[2] 6.21

The ModbusDeviceIdentInfo properties may have either a single value which shall exactly match the supported device, or a range of matching values may be defined in regular expressions.

Bibliography

[1] FDT 2.0 Specification v1.0, July 2012, Order No. of FDT Group: 0001-0008-000, available at http://fdtgroup.org/download/3823/ [viewed 2017-04-06]

[2] MODBUS Application Protocol Specification V1.1a, Modbus IDA, June 4, 2004

_____

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