TECHNICAL REPORT

IEC TR 62051-1

First edition
2004-01

Electricity metering – Data exchange for meter reading, tariff and load control – Glossary of terms –

Part 1: Terms related to data exchange with metering equipment using DLMS/COSEM

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Part 1: Terms related to data exchange with metering equipment using DLMS/COSEM

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ELECTRICITY METERING – DATA EXCHANGE FOR METER READING, TARIFF AND LOAD CONTROL – GLOSSARY OF TERMS –

Part 1: Terms related to data exchange with metering equipment using DLMS/COSEM

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IEC 62051-1, which is a technical report, has been prepared by IEC technical committee 13: Equipment for electrical energy measurement and load control.

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

Enquiry draft	Report on voting
13/1299/DTR	13/1302/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 publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until 2008. At this date, the publication will be

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- withdrawn;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

The contents of the corrigendum of June 2005 have been included in this copy.

ELECTRICITY METERING – DATA EXCHANGE FOR METER READING, TARIFF AND LOAD CONTROL – GLOSSARY OF TERMS –

Part 1: Terms related to data exchange with metering equipment using DLMS/COSEM

1 Scope

This part of IEC 62051 reflects the most important terms used in International Standards after the publication of IEC 62051 in 1999. The new terms are mainly related to data exchange with metering equipment for meter reading, tariff and load control using DLMS/COSEM as specified in the IEC 62056 series of standards.

2 Normative references

The following referenced documents are indispensable for the application 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 60050-714:1992, *International Electrotechnical Vocabulary (IEV) – Chapter 714: Switching and signalling in telecommunications*

IEC 60050-716-1:1995, *International Electrotechnical Vocabulary (IEV) – Chapter 716-1: Integrated services digital network (ISDN) – Part 1: General aspects*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following definitions, as well as those given in IEC 60050-714 and IEC 60050-716-1, apply.

3.1.1
3-layer, connection-oriented, HDLC-based profile (relevant to IEC 62056-46)
communication profile based on the OSI collapsed architecture, which consists of a physical layer, a data link layer based on the HDLC standard and the COSEM application layer containing the connection-oriented Application Control Service Element (ACSE)

3.1.2
abstract data and objects (relevant to IEC 62056-61 and IEC 62056-62)
data, other than measurement values, which may be related to an energy type and which are modelled using abstract interface objects

3.1.3
ACTION (relevant to IEC 62056-53)
xDLMS data communication service used with logical name (LN) referencing for the invocation of methods of COSEM interface objects. The availability of this service is indicated in the xDLMS conformance block and its use is negotiated upon application association establishment

3.1.4
activation mask (relevant to IEC 62056-62)
element of the mask_list attribute of the COSEM interface class “Register activation”. Activation masks define which “Register”, “Extended Register” and “Demand Register” objects are enabled when an activation mask is active. Masks can be added to or deleted from the mask list. At any time, only one mask is active

3.1.5
activity calendar (relevant to IEC 62056-62)
COSEM interface class used to model handling of different tariff structures. It defines scheduled actions inside the meter, which follow the classical method of using calendar-based schedules by defining seasons, weeks, etc. An “activity calendar” object may coexist with the more general object “Schedule” and can even overlap with it

3.1.6
application association (AA) (relevant to IEC 62056-53 and IEC 62056-62)
logical connection between two application processes, defining the context of the information exchange. In DLMS/COSEM, application associations are always established by the client application process, using the COSEM-OPEN services. Application associations are identified by lower layer addresses (SAP-s)

3.1.7
application association request (AARQ) (relevant to IEC 62056-53)
application protocol data unit (APDU) sent by the client application layer to the server application layer, as a result of invoking the COSEM-OPEN.request service. It holds the parameters defining the proposed application context and xDLMS context. It is carried by the supporting layer

3.1.8
application association response (AARE) (relevant to IEC 62056-53)
application protocol data unit (APDU) which may be sent by the server application layer to the client application layer proposing the association, as a result of invoking the COSEM-OPEN.response service. It holds the parameters of the negotiated application context and xDLMS context, or in case of failure, diagnostic information. It is carried by the supporting layer

3.1.9
application context (relevant to IEC 62056-53)
common set of rules that govern the data exchange in a given application association. In DLMS/COSEM, application contexts are pre-defined and they are identified by the Application_Context_Name parameter of the COSEM-OPEN service

3.1.10
application control service element (ACSE) (relevant to IEC 62056-53)
service element of the application layer, controlling the establishment and release of application associations

3.1.11
association LN (relevant to IEC 62056-62)
COSEM interface class used to model application associations between client and server application processes when the server uses logical name (LN) referencing. A COSEM Logical Device has one instance of this IC for each association the device is able to support. An Association LN object holds the parameters of the application association context and the xDLMS context, it provides a list of COSEM objects available within the given application association together with access rights to their attributes and methods, and it handles the authentication process (see also 3.1.12.)

3.1.12
association SN (relevant to IEC 62056-62)
COSEM interface class used to model application associations between client and server application processes when the server uses short name (SN) referencing. A COSEM Logical Device has one instance of this IC for each association the device is able to support. An Association SN object provides a list of COSEM objects available within the given association and it has specific methods to provide information about access rights to their attributes and methods and to handle the authentication process (see also 3.1.11)

3.1.13
attribute (relevant to IEC 62056-62)
element of an interface object, having a defined meaning, together with the data type to be used and a statement of the set of possible values it may take. In COSEM, the first attribute of each object is the logical name (see also 3.1.82)

3.1.14
attribute_0 reference (relevant to IEC 62056-53)
feature provided by xDLMS to refer to all public attributes of an interface object in a single GET or SET service. The availability of this feature is indicated in the xDLMS conformance block and its use is negotiated upon application association establishment (see also 3.1.84)

3.1.15
attribute descriptor (relevant to IEC 62056-53)
parameter of the xDLMS attribute-related GET and SET services, used with logical name (LN) referencing. An attribute is fully identified by the COSEM interface class identifier, the COSEM object instance identifier (logical name) and the attribute identifier within the given object. GET and SET services may access the whole attribute, or only a part of it (selective access). A GET and SET service may refer to one attribute only, or several attributes. In this latter case, the GET/SET.request service includes a list of attribute descriptors

3.1.16
authentication (relevant to IEC 62056-53 and IEC 62056-62)
process to establish the true identity of the communicating partners before requesting and providing data communication services. It is one element of the security mechanisms provided by DLMS/COSEM. There are three levels of authentication security defined:

- lowest level security: in this case neither the client nor the server is identified;
- low-level security (LLS, see 3.1.69);
- high-level security (HLS, see 3.1.57)

3.1.17
automatic capturing (relevant to IEC 62056-62)
concept used in relation with interface class "Profile generic". When automatic capturing is chosen, the capture_objects are collected periodically, as defined by the capture_period attribute (see also 3.1.223)

3.1.18
base_name (relevant to IEC 62056-62)
When short-name (SN) referencing is used, the base_name determines the short name to which the logical name attribute of a COSEM interface object in the server is mapped. The other attributes and the methods of the object are mapped to short names with an offset defined for each COSEM interface class. This mapping is done for each object during the implementation phase of the server. The base_names for each object are retrieved by reading the object_list attribute of the association SN object

3.1.19
billing period identifier (relevant to IEC 62056-61)
In COSEM, values related to one or more previous billing periods are identified by the value group F of the OBIS code identifying objects, generally profiles, holding historical data

3.1.20
block transfer (relevant to IEC 62056-46 and IEC 62056-53)
method of transferring long-service parameters, not fitting in the maximum PDU size. When LN referencing is used, an application layer level block transfer is defined with the GET service in the server to client direction, with the SET service in the client to server direction and with the ACTION service in both directions. The availability of this feature is indicated in the xDLMS conformance block, and its use is negotiated upon application association establishment. When the lower layers provide segmentation (for example, with the HDLC-based data link layer), block transfer is defined in a transparent manner to the application layer, for the direction server to client

3.1.21
calendar (relevant to IEC 62056-62)
see also 3.1.5

3.1.22
capture (relevant to IEC 62056-62)
method of the COSEM interface class “Profile generic”, which, when invoked, copies the values of capture_object into the buffer by reading the specified attributes (or, if the attribute is complex , the part of the attribute defined by the data index)

3.1.23
capture_object (relevant to IEC 62056-62)
attribute of a "Data", "Register", "Extended register", "Demand register", "Clock" or "Profile generic" object captured into the buffer of a "Profile generic object"

3.1.24
challenge (relevant to IEC 62056-62)
information passed from the client to the server and from the server to the client when the HLS authentication mechanism is used. The challenges are processed by both parties in a secret way and the results are sent back

3.1.25
channel (relevant to IEC 62056-61)
measuring input of a physical or logical metering device, used to measure energy from different sources, to be identified and handled separately. The channel is identified by group B of the OBIS code

3.1.26
class_Id (relevant to IEC 62056-62)
identifier of a COSEM interface class characterized by a specific set of attributes and methods. COSEM objects are instances of COSEM interface classes. A COSEM object is unambiguously identified with the class_id of the interface class to which it belongs and its logical name (COSEM instance identifier)

3.1.27
client (relevant to IEC 62056-42, IEC 62056-46 and IEC 62056-53)
In DLMS/COSEM, data exchange between metering equipment and data collection systems is based on the client/server paradigm. The client is an application process running in the data collection system, the server is an application process running in the metering equipment and providing a view of the resources of the meter as available through its communication interfaces. The client application process requests remote services from the server, which provides them

3.1.28
client management application process (relevant to IEC 60256-46 and IEC 60256-53)
client application process having a reserved address whose role is to support event notification from the servers

3.1.29
clock (relevant to IEC 62056-62)
COSEM interface class modelling the handling of all date- and time-related information

3.1.30
communication profile (relevant to IEC 62056-53)
given set of protocol layers, including the application layer characterized by the type of layer and by the application control service element of the application layer. An example is the 3-layer, connection-oriented, HDLC-based communication profile

3.1.31
confirmed services (relevant to IEC 62056-53)
services involving a single .request primitive at a service element access point, an .indication primitive at a different service element access point and a .confirm primitive at the same service access point as the .request primitive. In DLMS/COSEM confirmed services can be used for establishing and releasing confirmed application associations and for exchanging data with a response from the server

3.1.32
conformance block (relevant to IEC 62056-53 and IEC 62056-62)
parameter of the COSEM_OPEN service, listing the xDLMS services and features, proposed by the client and negotiated by the server

3.1.33
conformance testing
See 3.1.50

3.1.34
COSEM (relevant to IEC 62056-62)
(acronym for COmpanion Specification for Energy Metering)

interface model of communicating energy metering equipment, providing a view of the functionality available through the communication interfaces. The modelling uses an object-oriented approach

3.1.35
COSEM interface object (relevant to IEC 62056-62)
instance of a COSEM interface class. The set of objects instantiated in the logical devices of a physical device model the functionality of the metering equipment as seen through its communicating interfaces

3.1.36
COSEM meter model (relevant to IEC 62056-62)
COSEM models metering equipment as physical devices, containing one or more logical devices. Each logical device contains a number of COSEM objects, modelling the functionality of the logical device. Each logical device supports one or more application associations with clients. An application association defines the context of the data exchange and the scope of access to the objects and their attributes and methods. Each logical device is uniquely identified world wide by its logical device name. Each physical device must contain a management logical device

3.1.37
cumulative values (relevant to IEC 60256-62)
In COSEM, objects which are instances of the interface class “Register”

3.1.38
current and last average value objects (relevant to IEC 62056-62)
In COSEM, respective attributes of COSEM objects which are instances of interface class "Demand register" using the OBIS code of the current value as logical name

3.1.39
data (relevant to IEC 62056-62)
COSEM interface class typically used to store configuration data and parameters

3.1.40
date and time (relevant to IEC 62056-62)
In COSEM, attributes with the data type “octet-string”. The formatting of each element is defined precisely

3.1.41
day_profile_table (relevant to IEC 62056-62)
attribute of the interface class ”Activity calendar“ defining an ordered list of actions and the corresponding activation times for each day type

3.1.42
daylight saving (relevant to IEC 62056-62)
attributes of the “Clock” interface object controlling the management of daylight saving. The interface class “Schedule” defines the rules for the execution of scripts when the clock is moved forward or backward

3.1.43
dedicated_key (relevant to IEC 62056-53)
parameter of the COSEM-OPEN.request service and an element of the xDLMS-Initiate.request PDU used when ciphered data communication services (APDU-s) are used

3.1.44
demand register (relevant to IEC 62056-62)
COSEM interface class used to store a demand value with its associated scaler_unit, status and time information. It provides the current average and last average values. Both block demand and sliding demand calculation are supported. It provides a reset method and a next_period method to terminate an integration period and to start a new one

3.1.45
device ID (relevant to IEC 62056-61 and IEC 62056-62)
device identifiers defined by the manufacturer and/or by the user and generally represented by instances of interface class “Data”

3.1.46
device language message specification – user association (DLMS UA)
provider of maintenance services

3.1.47
DLMS (relevant to IEC 62056-53)
(acronym for distribution line message specification)

application layer specification, independent of the lower layers and thus of the communication channel, designed to support messaging to and from (energy) distribution devices in a computer-integrated environment. It is an International Standard published as IEC 61334-4-41. The concept has been driven forward to become device language message specification with the aim of providing an interoperable environment for structured modelling and meter data exchange. Applications like remote meter reading, remote control and value added services for metering any kind of energy, like electricity, water, gas or heat are supported

3.1.48
DLMS/COSEM (relevant to IEC 62056-53 and IEC 62056-62)
standard specification using COSEM for interface modelling metering equipment and using DLMS for exchanging data with such metering equipment

3.1.49
DLMS/COSEM compliant
metering equipment which has successfully passed the DLMS/COSEM conformance test

3.1.50
DLMS/COSEM conformance testing
verification that an implementation meets the requirements of the DLMS/COSEM standard as specified in the relevant parts of the IEC 62056 series. During the test phase the implementation is referred to as the "Implementation under test"

3.1.51
DLMS/COSEM- TCP/UDP wrapper
converts the interface of the COSEM application layer to the interface of the Internet TCP/UDP protocols

3.1.52
error values (relevant to IEC 62056-61 and IEC 62056-62)
COSEM objects used to represent error conditions of the metering device. They are generally instances of the COSEM interface class “Data”, with data type of the value attribute “octet string”

3.1.53
event notification (relevant to IEC 62056-53)
non-client/server type data communication service used with logical name (LN) referencing. Using the EventNotification.request service, the server application process is able to send an unsolicited notification of the occurrence of an event to the remote client application. The availability of this service is indicated in the xDLMS conformance block and its use is negotiated upon application association establishment

3.1.54
extended register (relevant to IEC 62056-62)
COSEM interface class modelling a process value with its associated scaler_unit, status and time information and providing a reset method. Extended register objects know the nature of the process value, which is described by the logical name identifying the object

3.1.55
GET (relevant to IEC 62056-53)
xDLMS data communication service used with logical name (LN) referencing to retrieve attributes of COSEM interface objects. The availability of this service is indicated in the xDLMS conformance block and its use is negotiated upon application association establishment

3.1.56
high-level data link control (HDLC) (relevant to IEC 62056-46)
control of data links by means of a bit-oriented protocol using the frame structure defined in ISO/IEC 13239 for information interchange

3.1.57
high-level security (HLS) (relevant to IEC 62056-53 and IEC 62056-62)
authentication mechanism used to establish the true identity of both the client and the server and typically used when the communication channel offers no intrinsic security and precautions have to be taken against eavesdroppers and against message (password) replay

3.1.58
identification service (relevant to IEC 62056-42)
optional application level service allowing the client to obtain information, after establishing a physical connection, about the protocol stack implemented in the server which uses the data communication services of the physical layer direct and bypasses the remaining part of the protocol

3.1.59
information report (relevant to IEC 62056-53)
non-client/server type data communication service used with short-name (SN) referencing. Using the InformationReport.request service, the server application process is able to send an unsolicited notification of the occurrence of an event to the remote client application. The availability of this service is indicated in the xDLMS conformance block, and its use is negotiated upon application association establishment

3.1.60
instantiation (relevant to IEC 62056-62)
process of creating an interface object of a particular interface class having the same set of attributes and methods as the interface class to which it belongs. It has a specific instance identifier, also called the logical name, specifying the meaning of the information it is modelling

3.1.61
interface class (IC) (relevant to IEC 62056-62)
abstract entity containing a specific set of attributes and methods and defining their use. Each interface class is identified by its instance_id

3.1.62
interface modelling (relevant to IEC 62056-62)
process for modelling the functionality of the metering equipment, as seen through its communication interfaces, using COSEM interface objects

3.1.63
interface object (relevant to IEC 62056-62)
instance of an interface class identified by the class_id of the interface class to which it belongs, and its own instance_id/logical name. In COSEM, the OBIS codes are used for identifying interface objects

3.1.64
I/O control signals (relevant to IEC 62056-61 and IEC 62056-62)
COSEM interface objects representing the status of the I/O lines of the metering equipment

3.1.65
interoperability
capability of a data collection system to exchange data with meters of different types and/or from different manufacturers, and the capability of a metering equipment to exchange data with different data collection systems, when both parties are compliant to the DLMS/COSEM specification. Generally, interoperability is required for meter reading and limited programming, while meter configuration may be carried out using a manufacturer- specific programming tool

3.1.66
logical device (relevant to IEC 62056-62)
abstract entity within a physical device, representing a subset of the functionality modelled using COSEM interface objects. Each physical device must at least contain a “management logical device”. It may contain further logical devices, for example, electricity, gas, etc. Information exchange always takes place between an application process running in a data collection system and acting as a client, and an application process running in the logical device and acting as a server, using the client/server paradigm

3.1.67
logical name (relevant to IEC 62056-53 and IEC 62056-62)
first attribute of any COSEM interface object which, together with the version of the interface class, defines the meaning of the object

3.1.68
logical name (LN) referencing (relevant to IEC 62056-53 and IEC 62056-62)
method of accessing attributes and methods of COSEM interface objects, using the identifier of the COSEM interface class and the COSEM object instance to which these attributes and methods belong. The alternate method is short name (SN) referencing

3.1.69
low-level security (LLS) (relevanta to IEC 62056-53 and IEC 62056-62)
authentication mechanism used to establish the true identity of the client by verifying a password used when the communication channel provides adequate security to avoid eavesdropping and message (password) replay

3.1.70
lower HDLC address (relevant to IEC 62056-46)
data link layer address of a physical device used to support multi-drop configurations

3.1.71
management logical device (relevant to IEC 62056-62)
mandatory element of any physical device, with a reserved address. It must support an application association to a public client with the lowest security level. Its role is to support the revelation of the internal structure of the physical device and the notification of events in the server

3.1.72
manufacturer-specific abstract objects (relevant to IEC 62056-62)
manufacturer-specific objects, modelling manufacturer-specific abstract information

3.1.73
manufacturer-specific attributes and methods (relevant to IEC 62056-62)
attributes and methods of a standard interface class, which are not present in the definition of the interface class, but added by a manufacturer. Whereas standard attributes and methods have positive indexes, manufacturer specific attributes and methods have negative indexes

3.1.74
manufacturer-specific class_id (relevant to IEC 62056-62)
interface class identifier in the range of 8 192 to 32 767, used for identifying manufacturer-specific interface classes

3.1.75
manufacturer-specific interface class (relevant to IEC 62056-62)
interface class having a manufacturer-specific set of attributes and methods and identified by a manufacturer-specific class_id

3.1.76
manufacturer-specific OBIS codes (relevant to IEC 62056-61)
OBIS code in which any of the value groups B to F has a value in the manufacturer- specific range

3.1.77
manufacturer-specific objects (relevant to IEC 62056-62)
interface objects, which are manufacturer-specific instances of standard interface classes, or instances of manufacturer-specific interface classes and which may be used to model information which cannot be modelled using standard objects. Manufacturer-specific objects are allowed to support competition and innovation. Manufacturer-specific objects, which are instances of a standard interface class, are identified with manufacturer-specific OBIS codes. Data exchange with manufacturer-specific objects is possible using the standard data communication services, but, for the interpretation of the data, extra information from the manufacturer may be necessary

3.1.78
mapping (short names) (relevant to IEC 62056-53 and IEC 62056-62)
process, during the design phase of DLMS/COSEM metering equipment, of assigning short names to attributes and methods of COSEM interface objects

3.1.79
maximum and minimum value objects (relevant to IEC 62056-62)
interface objects representing minimum and/or maximum values of process values. They may be instances of the interface class “Extended register” or “Profile generic”

3.1.80
measuring algorithm (relevant to IEC 62056-61 and IEC 62056-62)
calculation method, implementing a certain definition for active, reactive or apparent power and energy and power factor. The algorithms differ from each other in the way harmonics and per phase values are handled. They are identified by instances of the interface class “Data”

3.1.81
media (relevant to IEC 62056-61)
concept allowing the handling and identifying of measurement data related to various energy types, like electricity, heat, gas and water and identified by the value group A of the OBIS code

3.1.82
method (relevant to IEC 62056-62)
element of an interface object, used to examine or modify the values of attributes. Methods of COSEM interface classes are generally optional. They may be invoked using the ACTION service (with logical name referencing), the Read, Write or UnconfirmedWrite service (with short-name referencing) or by executing a script. If the method is invoked using a data communication service, the server may return data as a response

3.1.83
method descriptor (relevant to IEC 62056-62)
parameter of the xDLMS method related ACTION service, used with logical name (LN) referencing. A method is fully identified by the COSEM interface class identifier, the COSEM object instance identifier (logical name) and the method identifier within the given object. The ACTION service may refer to a single method or to a list of methods

3.1.84
multiple references (relevant to IEC 62056-53)
feature provided by xDLMS to refer to more than one short name in a single Read/Write/UnconfirmedWrite service when using SN referencing. The availability of this feature is indicated in the xDLMS conformance block and its use is negotiated upon application association establishment. See also 3.1.14

3.1.85
object identification system (OBIS) (relevant to IEC 62056-61)
system defining identification codes for commonly used data items in metering equipment

3.1.86
parameterized access (relevant to IEC 62056-62)
feature of COSEM to allow access to just a part of an attribute using the xDLMS services Read/Write when short-name (SN) referencing is used. The part of the attribute is identified by specific selective access parameters, defined as part of the attribute specification of the COSEM interface class specification. The availability of this feature is indicated in the xDLMS conformance block and its use is negotiated upon application association establishment. See also 3.1.118

3.1.87
password (relevant to IEC 62056-53 and IEC 62056-62)
information held by the server and submitted by the client when the LLS authentication mechanism is used. It is carried by the Calling/Responding_Authentication_ Value parameter of the COSEM-OPEN service

3.1.88
physical device (relevant to IEC 62056-62)
physical metering equipment, the highest level element used in the COSEM interface model of metering equipment

3.1.89
physical quantity (relevant to IEC 62056-61)
quantity measured by the metering equipment using the appropriate algorithms. Value group C of the OBIS code, identifying the COSEM interface object modelling the quantity, identifies the kind of physical quantity

3.1.90
power-failure handling (relevant to IEC 62056-61)
capability of DLMS/COSEM servers to handle power failure events in a well-defined manner. The rules are set in the definition of interface classes “Schedule” and “Activity calendar”

3.1.91
power-failure monitoring (relevant to IEC 62056-61 and IEC 62056-62)
capability of DLMS/COSEM servers to model data concerning power failures. This may be simple counting of events, the cumulation of duration of such events, etc.

3.1.92
pre-established association (relevant to IEC 62056-53)
application association established without the use of a COSEM-OPEN service and which cannot be released. It can be confirmed or unconfirmed. Pre-established associations are used to simplify communication with simple devices, generally in one way, either from the client to the server or from the server to the client

3.1.93
preferred readout-values (relevant to IEC 62056-62)
defined set of data stored in the metering equipment, provided as a response to a single GET (LN) or Read (SN) service request

3.1.94
priority (relevant to IEC 62056-53)
feature of COSEM to handle urgent messages. The availability of this feature is indicated in the xDLMS conformance block and its use is negotiated upon application association establishment. The priority handling feature is available with LN referencing only

3.1.95
processing methods (relevant to IEC 62056-61)
further processing of a measured physical quantity, like active power, voltage, pressure, etc. The processing methods may deliver instantaneous, time integral, energy or demand values and information about crossing set threshold values. They are identified by the value group D of the OBIS code

3.1.96
profile for billing periods (relevant to IEC 62056-61 and IEC 62056-62)
profile objects holding a series of data related to a number of billing periods

3.1.97
profile generic (relevant to IEC 62056-62)
COSEM interface class, based on a generalized concept to store dynamic process values which collects data by capturing capture_objects, i.e. one or more attributes of other interface objects, Registers, Clock or even other ”Profile generic” objects and placing them in the buffer. The capturing takes place by invoking the “capture” method by an xDLMS service or by executing a script. This may take place occasionally or periodically. The Profile generic object may also use auto-capture. The buffer can be sorted on the basis of a capture_object defined. Various sort methods are available. Selective access to the buffer, either to a value range or to an entry range is available. The buffer may be reset by invoking the Reset method. "Profile generic" objects may be used for storing a series of minimum/maximum values, standard readout values, historical values, load profiles, harmonics and many more

3.1.98
profile objects (relevant to IEC 62056-61 and IEC 62056-62)
COSEM interface objects, instances of the interface class “Profile generic”, holding one or more series of data

3.1.99
public client (relevant to IEC 62056-53)
client side application process with a reserved service access point (SAP). Its role is to support revealing the structure of a server

3.1.100
read (relevant to IEC 62056-53)
xDLMS service used with short-name (SN) referencing. It is used to get values of attributes or to action methods when a response is expected. The availability of this service is indicated in the xDLMS conformance block and its use is negotiated upon application association establishment

3.1.101
readout mode and programming mode (relevant to IEC 62056-21 and IEC 62056-62)
operating modes provided for direct local data exchange in Modes A, B, C and E, as defined in **IEC 62056-21**. In Mode E, data readout and programming takes places using the COSEM model and the 3-layer, connection-oriented, HDLC-based profile

3.1.102
register (relevant to IEC 62056-62)
COSEM interface class modelling a process value with its associated scaler_unit information and providing a reset method. "Register" objects know the nature of the process value, which is described by the logical name identifying the object

3.1.103
register activation (relevant to IEC 60256-62)
COSEM interface class used to handle different tariffication structures. It specifies which “Register”, “Extended register” and “Demand register” objects are enabled when a specific activation mask is active. The interface class provides methods to add registers and to add and delete activation_masks. At any time, only one activation_mask is active

3.1.104
registered COSEM names (relevant to IEC 62056-53 and IEC 62056-62)
items used for the COSEM meter model and DLMS/COSEM protocols, which must have globally unique and unambiguous names. These objects are registered by the DLMS user association and include the following:
- COSEM interface class_id-s and versions;
- standard COSEM object identifiers (OBIS names);
- COSEM_Application_Context_Names;
- COSEM_Authentication_Mechanism_Names

3.1.105
register monitor (relevant to IEC 62056-62)
COSEM interface class defining a set of threshold values, an attribute of another interface object to be monitored and a set of scripts to be executed when the attribute monitored crosses a threshold value

3.1.106
release request (RLRQ) APDU (relevant to IEC 62056-53)
application protocol data unit (APDU) which may be sent by the client application layer to the server application layer as a result of invoking the COSEM-RELEASE.request service. It is carried by the supporting layer

3.1.107
release response (RLRE) APDU (relevant to IEC 62056-53)
application protocol data unit (APDU) which may be sent by the server application layer to the client application layer as a result of invoking the COSEM-RELEASE.response service. It is carried by the supporting layer

3.1.108
reset
method provided by some COSEM interface classes. When invoked, certain attributes are set to an instance specific default value

3.1.109
reset, indication of source (relevant to IEC 62056-21 and IEC 62056-62)
When OBIS codes are used in Mode A to D as defined in IEC 62056-21, some value groups of the OBIS code may be suppressed when they are not relevant. In this case, to allow interpretation of such shortened codes, delimiters are inserted between the value groups. The delimiter between the value groups E and F may carry information about the source of a reset

3.1.110
response-allowed (relevant to IEC 62056-53)
parameter of the xDLMS_Initiate.request service

3.1.111
SAP_assignment (relevant to IEC 62056-62)
COSEM interface class, containing information on the assignment of logical devices within a physical device to their service access points. The SAP is a lower layer address or a combination of lower layer addresses

3.1.112
scaler_unit (relevant to IEC 62056-62)
attribute of the interface classes “Register”, “Extended register” and “Demand register” which provides information on the unit and the scaler of the value attribute. If the value uses a complex data type, the scaler and unit apply to all elements. IEC 62056-62 defines codes for all units used in COSEM

3.1.113
schedule (relevant to IEC 62056-62)
COSEM interface class used to model handling time- and date-related activities within a metering device. A "Schedule" object works together with a "Special days" object. The “entry” attribute includes a list of scripts together with the date- and time-bound conditions of their execution. Methods allow the addition, deletion, enabling and disabling of entries. A "Schedule" object may coexist with an "Activity calendar" object and it can even overlap with it

3.1.114
script (relevant to IEC 62056-62)
feature provided by COSEM to change the value of attributes or to invoke methods of COSEM objects

3.1.115
script table (relevant to IEC 62056-62)
COSEM interface class, containing a table of script entries and a method to execute any of them. A script entry identifies an attribute of an object to be written or a method of an object to be invoked, and if necessary, a service parameter. Scripts are activated by invoking the execute method of the script table. This may be initiated by another COSEM object within the same logical device or by an external ACTION or Write service. COSEM objects capable of invoking scripts are the “Schedule”, “Activity calendar”, “Single action schedule” and “Register monitor”. Several "Script table" objects are pre-defined

3.1.116
season_profile (relevant to IEC 62056-62)
attribute of the interface class "Activity calendar" containing a list defining the starting date of seasons. This list is sorted according to season_start. Each season activates a specific week_profile

3.1.117
segmentation (relevant to IEC 62056-62)
feature provided by HDLC to transport long-service data units in several segments allowing long APDU-s to be transported by the data link layer between peer application layers in a transparent manner

3.1.118
selective access (relevant to IEC 62056-53 and IEC 62056-62)
feature of COSEM to allow access to just a part of an attribute using the xDLMS services GET/SET when logical name (LN) referencing is used. The part of the attribute is identified by specific selective access parameters, defined as part of the attribute specification of the COSEM interface class specification. The availability of this feature is indicated in the xDLMS conformance block and its use is negotiated upon application association establishment (see also 3.1.86)

3.1.119
server (relevant to IEC 62056-53 and IEC 62056-62)
in a client/server environment, communication entity providing services to a client. In DLMS COSEM the application process running in a metering equipment plays the role of the server

3.1.120
service_class (relevant to IEC 62056-53)
parameter of the COSEM-OPEN and the GET/SET/ACTION .request services indicating whether the service is invoked in a confirmed or an unconfirmed manner. When the client invokes a service in a confirmed manner, a response is expected from the server

3.1.121
services provided with logical name (LN) references
in DLMS/COSEM, clients always use data communication services with logical name (LN) referencing. The server may use either services with logical name (LN) referencing or services with short-name (SN) referencing. For LN referencing, DLMS/COSEM defines three client/server type services: the attribute-related GET and SET services and the method-related ACTION service. A non-client/server type service, the EventNotification service is also defined. The xDLMS conformance block indicates the availability of these services and their use is negotiated upon application association establishment (see also 3.1.21)

3.1.122
services provided with short-name (SN) references (relevant to IEC 62056-53)
For use with short-name (SN) referencing, three client/server type data communication services are defined: the Read, Write and UnconfirmedWrite services. A non-client/server type service, the InformationReport service is also defined. The xDLMS conformance block indicates the availability of these services and their use is negotiated upon application association establishment (see also 3.1.121)

3.1.123
SET (relevant to IEC 62056-53)
xDLMS data communication service used with logical name (LN) referencing to modify attributes of COSEM interface objects. The availability of this service is indicated in the xDLMS conformance block and its use is negotiated upon application association establishment

3.1.124
short name (relevant to IEC 62056-53)
identifier of a COSEM interface object attribute or method, using the syntax of a DLMS named variable. Short names are assigned during the process of mapping

3.1.125
short-name mapper (relevant to IEC 62056-53)
optional application service element of the client side application layer, which is necessary when the server uses short-name referencing. The role of the short-name mapper is to map data communication service requests using LN referencing to data communication service requests using SN referencing and to map data communication service responses using SN referencing to data communication service responses using LN referencing

3.1.126
short-name (SN) referencing (relevant to IEC 60256-53)
method of accessing attributes and methods of COSEM interface objects, after first mapping them to short names. The alternate method is Logical Name (LN) referencing

3.1.127
single-action schedule (relevant to IEC 60256-62)
COSEM interface class used to model specific periodic actions in the metering equipment. An instance of this interface class, the “End of billing period” action is pre-defined

3.1.128
special addresses
addresses reserved for special purposes, identifying specific application processes or used for broadcasting

3.1.129
special days table (relevant to IEC 62056-62)
COSEM interface class allowing defining dates, on which a special switching behaviour will override normal switching behaviour. “Special days table” interface objects work in conjunction with the interface objects “Schedule” and “Activity calendar”

3.1.130
standard readout (relevant to IEC 62056-21 and IEC 62056-62)
pre-defined "Profile generic" objects carrying standard readout value sets, as they would appear when direct local data exchange as defined IEC 62056-21 is used. They may relate to an energy type or a channel

3.1.131
tariff (relevant to IEC 62056-62)
feature of the OBIS code to identify measurement values related to various tariffs. They are identified with the value of the value group E in the OBIS code

3.1.132
tariffication (relevant to IEC 62056-62)
capability of COSEM to assign measured values to different tariff periods. Tariffication is modelled by the interface objects "Register Activation", "Schedule", "Activity Calendar" and "Special Days Table"

3.1.133
threshold (relevant to IEC 62056-62)
attribute of the interface class “Register monitor”. It defines a value to which the attribute of the referenced register is compared (see also 3.1.105)

3.1.134
time integral values (relevant to IEC 62056-61)
COSEM offers different time integral values, calculated starting from different time points and over different time intervals. Such values are represented by COSEM objects which are instances of interface class "Register" or “Extended register”. The various time integrals are identified by value group D of the object identifier (OBIS name)

3.1.135
time setting (relevant to IEC 62056-62)
the “Clock” interface class offers several mechanisms for setting/adjustment of the clock, including daylight saving. The definition of the “Schedule” interface class defines which scripts need to be executed after a time setting/adjustment of the clock

3.1.136
time stamps (in relation with IC "PSTN auto dial") (relevant to IEC 62056-62)
calling_window attribute of the interface class "PSTN auto dial" containing the start and end date/time stamp when the window becomes active or inactive

3.1.137
time stamp (in relation with billing periods) (relevant to IEC 62056-62)
time stamps of previous data values are part of the captured objects within the COSEM objects representing the data of previous billing periods

3.1.138
time synchronization (relevant to IEC 62056-62)
“Clock” interface class offers several mechanisms for time synchronization, used to correct small deviations between a master clock and a local clock

3.1.139
unconfirmed services (relevant to IEC 62056-46 and IEC 62056-53)
services involving a single .request primitive at a service element access point, and one or more .indication primitives at different service element access points. In DLMS/COSEM unconfirmed service invocations can be used for establishing unconfirmed application associations and for sending broadcast data from the client to servers

3.1.140
unconfirmed write (relevant to IEC 62056-53)
xDLMS service used with short-name (SN) referencing. It is used to set values of attributes, or to action methods. The availability of this service is indicated in the xDLMS conformance block and its use is negotiated upon application association establishment

3.1.141
unique identifier (relevant to IEC 62056-62)
OBIS provides a unique identifier for all and every data within the metering equipment, including not only measurement values, but also abstract values used for configuration or obtaining information about the behaviour of the metering equipment. The ID codes are used for identification of

- logical names of the various instances of the interface classes, or objects;
- data transmitted through communication lines;
- data displayed on the metering equipment

3.1.142
upper HDLC address (relevant to IEC 62056-46)
data link layer address of a logical device within the physical device

3.1.143
utility tables (relevant to IEC 62056-62)
COSEM interface class encapsulating ANSI C12.19 Utility tables, both standard and manufacturer specific ones. Each "Utility tables" object encapsulates one utility table

3.1.144
value group (relevant to IEC 62056-61)
element of the OBIS code which currently consists of six value groups

3.1.145
version (of DLMS) (relevant to IEC 62056-53)
identifier of the DLMS protocol

3.1.146
version (of an interface class) (relevant to IEC 62056-62)
element of the identifier of a COSEM interface object. The version information is returned when the object_list of the “Association LN” or the “Association SN” interface object is read. In the standard, several versions of the interface classes may co-exist but within one logical device, all instances of a certain interface class being of the same version

3.1.147
week_profile_table (relevant to IEC 62056-62)
attribute of the interface class «Activity calendar». It defines the name of the day profiles to be used for every day of the week in a particular season

3.1.148
window size (relevant to IEC 62056-46)
the HDLC standard allows the transfer of more than one frame in a sequence before an acknowledge is due. The send and receive sequence numbers allow acknowledgement with information onthe number of frames which have been correctly received. The maximum number of consecutive frames is referred to as the window size

3.1.149
write (relevant to IEC 62056-53)
xDLMS service used with short-name (SN) referencing. It is used to set values of attributes or to action methods when no response is expected. The availability of this service is indicated in the xDLMS conformance block and its use is negotiated upon application association establishment

3.1.150
xDLMS (relevant to IEC 62056-53)
extension to the DLMS standard. The main objective of the COSEM approach is to provide a business domain oriented interface object model for metering devices and systems while keeping backward compatibility to the existing DLMS standard. To meet these objectives, COSEM includes an evolution of DLMS. Remaining fully compliant to the DLMS standard, COSEM provides a more metering specific view of the meter through the COSEM interface objects. xDLMS is the application layer service element providing access to the COSEM objects. It contains a few new services, mainly to support LN referencing, and defines additional data types. It defines a new conformance block. The current DLMS version of xDLMS is 6

3.2 Abbreviations

AA	Application Association (see 3.1.6)
AARE	Application Association REsponse (see 3.1.8)
AARQ	Application Association ReQuest (see 3.1.7)
ACSE	Application Control Service Element (see 3.1.10)
AE	Application Entity (see IEC 62051, 12.3.4)
APDU	Application Layer Protocol Data Unit (see IEC 62051, 12.3.11)
COSEM	COmpanion Specification for Energy Metering (see 3.1.34)
DLMS	Distribution Line Message Specification (see 3.1.47)
DLMS UA	Device Language Message Specification – User Association (see 3.1.46)
HDLC	High-level Data Link Control (see 3.1.56)
HLS	High-level Security (see 3.1.57)
IC	Interface Class (see 3.1.61)
ID	Identifier (see IEV 714-21-07)
LN	Logical Name (see 3.1.67)
LLS	Low-level Security (see 3.1.69)
OBIS	Object Identification System (see 3.1.85)
OSI	Open System Interconnection (see IEV 716-01-20)
PDU	Protocol Data Unit (see IEC 62051, 12.3.11)
RLRQ	Release Request (see 3.1.106)
RLRE	Release Response (see 3.1.107)
SAP	Service Access Point (see 3.1.111)
SN	Short Name (see 3.1.124)
WPDU	Wrapper PDU (see IEC 62051, 12.3.11)
xDLMS	Extended DLMS (see 3.1.150)

Annex A
(informative)

Content of "Glossary of Terms" in IEC 62051

This extract is a copy of the index of IEC 62051 The page references are those of that document.

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Amendment 1[2]

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[1] To be published.

[2] To be published.

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