

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Electricity metering data exchange – The DLMS/COSEM suite –  
Part 6-2: COSEM interface classes**

**Échange de données dans les équipements de comptage de l'énergie  
électrique – La suite DLMS/COSEM –  
Partie 6-2: Classes d'interfaces COSEM**



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Part 6-2: COSEM interface classes**

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Partie 6-2: Classes d'interfaces COSEM**

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**ELECTRICITY METERING DATA EXCHANGE –  
THE DLMS/COSEM SUITE –****Part 6-2: COSEM interface classes**

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DLMS<sup>1</sup> User Association  
Zug/Switzerland  
www.dlms.ch

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<sup>1</sup> Device Language Message Specification.

International Standard IEC 62056-6-2 has been prepared by IEC technical committee 13: Electrical energy measurement, tariff- and load control.

This edition cancels and replaces IEC 62056-62 published in 2006. It constitutes a technical revision.

The significant technical changes with respect to IEC 62056-62 are listed in Annex A.

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

FDIS	Report on voting
13/1525/FDIS	13/1543/RVD

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

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

A list of all the parts in the IEC 62056 series, published under the general title *Electricity metering data exchange – The DLMS/COSEM suite*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

The numbering scheme has changed from IEC 62056-XY to IEC 62056-X-Y. For example IEC 62056-62 becomes IEC 62056-6-2.

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## INTRODUCTION

Driven not only by the business needs of utilities – often in a deregulated competitive market – but also by the increasing desire to manage natural resources efficiently as regards production, distribution and use, the utility meter is increasingly part of an integrated metering, control, and billing system. Not only at grid level but, with the advent of initiatives to involve consumers in energy and resource management, in industry and even down to the domestic level, the meter is no simple data recording device but relies critically on communication capabilities, system integration and interoperability.

COSEM, the Companion Specification for Energy Metering, addresses these challenges by looking at the meter as an integrated part of a communication system which requires above all the ability to convey measurements of the delivered product (energy) from the diverse points where these measurements are made to the business processes which use them, over a variety of connecting media. Such systems handle a gamut of additional information and support setup and control functions which allow operating the meter remotely at virtually all times.

COSEM achieves all this in a way which is essentially non-proprietary and does not make assumptions about the technical processes in place within the meter. Using *object modelling* techniques established in the world of information science, the data to be supplied by the meter is defined in a standard way that is accessible to the utility's business processes and relevant parts of its behaviour are similarly represented, while the communications are defined following the *Open Systems Interconnection* that is fundamental to the telecommunications world. The formal specification of interface classes and objects, which enables this, forms a major part of COSEM.

To allow further analysis of information, for the purposes of billing, load-, customer- and contract management, it is necessary to uniquely identify data items, whether collected manually or automatically, via local or remote data exchange, in a manufacturer-independent way. The definition of identification codes to achieve this – the OBIS codes – is based on DIN 43863-3:1997, *Electricity meters – Part 3: Tariff metering device as additional equipment for electricity meters – EDIS – Energy Data Identification System*.

The COSEM model represents the meter as a server – see 4.7 – used by client applications that retrieve data from, provide control information to, and instigate known actions within the meter via controlled access to the attributes and specific methods of objects making up the server interface. This client may be supporting the business processes of utilities, customers, meter operators, or meter manufacturers.

The information content and abilities of the server are not fixed; instead, the standardized objects and interface classes (ICs) form an extensible library from which the manufacturer can assemble (model) its products according to national specifications or contract requirements. As a key element, the server offers means to retrieve its particular structural model (the list of logical devices and the list of objects visible through the interface). The library is designed so that the entire range of products (from residential to commercial, industrial, and transmission and distribution applications) can be covered. The choice of the subset of ICs used to build a meter, and the instantiation and implementation of those ICs are part of the product design and therefore left to the manufacturer. The concept of the standardized metering interface class library provides the different users and manufacturers with a maximum of diversity without having to sacrifice interoperability.

# ELECTRICITY METERING DATA EXCHANGE – THE DLMS/COSEM SUITE –

## Part 6-2: COSEM interface classes

### 1 Scope

This part of IEC 62056 specifies a model of a meter as it is seen through its communication interface(s). Generic building blocks are defined using object-oriented methods, in the form of interface classes to model meters from simple up to very complex functionality.

### 2 Normative references

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

IEC 61334-4-32:1996, *Distribution automation using distribution line carrier systems – Part 4: Data communication protocols – Section 32: Data link layer – Logical link control (LLC)*

IEC 61334-4-41:1996, *Distribution automation using distribution line carrier systems – Part 4: Data communication protocols – Section 41: Application protocols – Distribution line message specification*

IEC 61334-4-511:2000, *Distribution automation using distribution line carrier systems – Part 4-511: Data communication protocols – Systems management – CIASE protocol*

IEC 61334-4-512:2001, *Distribution automation using distribution line carrier systems – Part 4-512: Data communication protocols – System management using profile 61334-5-1 – Management Information Base (MIB)*

IEC 61334-5-1:2001, *Distribution automation using distribution line carrier systems – Part 5-1: Lower layer profiles – The spread frequency shift keying (S-FSK) profile*

IEC/TR 62051:1999, *Electricity metering – Glossary of terms*

IEC/TR 62051-1:2004, *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*

IEC 62056-21:2002, *Electricity metering – Data exchange for meter reading, tariff and load control – Part 21: Direct local data exchange*

Draft IEC 62056-3-1:—, *Electricity metering data exchange – The DLMS/COSEM suite – Part 3-1: Use of local area networks on twisted pair with carrier signalling<sup>2</sup>*

IEC 62056-46:2002, *Electricity metering – Data exchange for meter reading, tariff and load control – Part 46: Data link layer using HDLC protocol*  
Amendment 1:2006

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<sup>2</sup> To be published.

IEC 62056-5-3:—, *Electricity metering data exchange – The DLMS/COSEM suite – Part 5-3: DLMS/COSEM application layer*<sup>3</sup>

IEC 62056-6-1:—, *Electricity metering data exchange – The DLMS/COSEM suite – Part 6-1: Object identification system (OBIS)*<sup>4</sup>

ISO/IEC 8802-2:1998, *Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 2: Logical link control*

ISO/IEC/IEEE 60559:2011, *Information technology – Microprocessor Systems – Floating-Point arithmetic*

EN 13757-2:2004, *Communication system for meters and remote reading of meters – Part 2: Physical and Link layer*

EN 13757-3:2004, *Communication system for meters and remote reading of meters – Part 3: Dedicated application layer*

EN 13757-5:2008, *Wireless meter readout – Communication system for meters and remote reading of meters – Part 5: Relaying*

ANSI C12.19:1997, *IEEE 1377:1997, Utility industry end device data tables*

RFC 1332: 1992, Internet Engineering Task Force (IETF). *The PPP Internet Protocol Control Protocol (IPCP)*. Edited by G. McGregor, May 1992. Available from: <http://www.rfc-editor.org/rfc/rfc1332.txt>

RFC 1570: 1994, Internet Engineering Task Force (IETF). *PPP LCP Extensions*, Edited by W. Simpson, January, 1994. Available from: <http://www.rfc-editor.org/rfc/rfc1570.txt>

RFC 1661: 1994, Internet Engineering Task Force (IETF) *The Point-to-Point Protocol (PPP) (Also: IETF STD 0051)*, 1994. Edited by W. Simpson, July, 1994. Available from: <http://www.rfc-editor.org/rfc/rfc1661.txt>

RFC 1662: 1994, Internet Engineering Task Force (IETF). *PPP in HDLC-like Framing (Also: IETF STD 0051)*. Edited by W. Simpson, July, 1994. Available from: <http://www.rfc-editor.org/rfc/rfc1662.txt>

RFC 1700: 1994, Internet Engineering Task Force (IETF). *Assigned numbers (Also: IETF STD 0002)*. Edited by J. Reynolds, J. Postel, October 1994. Available from: <http://www.rfc-editor.org/rfc/rfc1700.txt>

RFC 2507:1999, Internet Engineering Task Force (IETF). *IP Header Compression*. Edited by M. Degermark, B. Nordgren, S. Pink, October 1994. Available from: <http://www.rfc-editor.org/rfc/rfc2507.txt>

RFC 3241: 2002, Internet Engineering Task Force (IETF). *Robust Header Compression (ROHC) over PPP*, 2002. Edited by C. Bormann, April 2002. Available from: <http://www.rfc-editor.org/rfc/rfc3241.txt>

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<sup>3</sup> To be published simultaneously with this part of IEC 62056.

<sup>4</sup> To be published simultaneously with this part of IEC 62056.

STD 0005:1981, Internet Engineering Task Force (IETF). *Internet Protocol. Also: RFC0791 (RFC0792, RFC0919, RFC0922, RFC0950, RFC1112). Intellectual Property Rights in IETF Technology.* Edited by Jon Postel. September 1981. Available from: <http://www.faqs.org/rfcs/std/std5.html>

STD 0051:1994, Internet Engineering Task Force (IETF): *The Point-to-Point Protocol (PPP).* Edited by W. Simpson July 1994. (Also RFC1661, RFC1662). Available from: <http://www.faqs.org/rfcs/std/std51.html>

NOTE See also the Bibliography.

### 3 Abbreviations

AA	Application Association
AARE	A-Associate Response – an APDU of the ACSE
AARQ	A-Associate Request– an APDU of the ACSE
ACSE	Association Control Service Element
AL	Application Layer
AP	Application Process
APDU	Application Layer Protocol Data Unit
ASE	Application Service Element
A-XDR	Adapted Extended Data Representation
base_name	The short_name corresponding to the first attribute (“logical_name”) of a COSEM object
CHAP	Challenge Handshake Authentication Protocol
class_id	COSEM interface class identification code
COSEM	Companion Specification for Energy Metering
COSEM object	An instance of a COSEM interface class
CtoS	Client to Server challenge
DHCP	Dynamic Host Configuration Protocol
DLMS	Device Language Message Specification
DLMS UA	DLMS User Association
DNS	Domain Name Server
EAP	Extensible Authentication Protocol
GCM	Galois/Counter Mode, an algorithm for authenticated encryption with associated data
GMT	Greenwich Mean Time. Replaced by Coordinated Universal Time (UTC).
GPS	Global Positioning System
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
HART	Highway Addressable Remote Transducer see <a href="http://www.hartcomm.org/">http://www.hartcomm.org/</a> (in relation with the Sensor manager interface class)
HDLC	High-level Data Link Control
HLS	High Level Security
IANA	Internet Assigned Numbers Authority
IC	Interface Class

IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IETF	Internet Engineering Task Force
IP	Internet Protocol
IPCP	Internet Protocol Control Protocol
IT	Information Technology
ISO	International Organization for Standardization
KEK	Key Encryption Key
LCP	Link Control Protocol
LLC	Logical Link Control (Sublayer)
LLS	Low Level Security
LN	Logical Name (used in relation to referencing attributes and methods of COSEM objects)
LSB	Least Significant Bit
m	mandatory
MD5	Message Digest Algorithm 5
MID	Measuring Instruments Directive 2004/22/EC
MSB	Most Significant Bit
o	optional
OBIS	Object Identification System
PAP	Password Authentication Protocol
PDU	Protocol Data Unit
PLMN	Public Land Mobile Network
PIN	Personal Identity Number
PPP	Point-to-Point Protocol
PSTN	Public Switched Telephone Network
RDR	Reply Data on Request (used in IEC 61334-3-32)
REJ PDU	Reject Protocol Data Unit
ROHC	Robust Header Compression
SAP	Service Access Point
SHA-1	Secure Hash Algorithm
SMS	Short Message Service
SMTP	Simple Mail Transfer Protocol
SN	Short Name (used in relation to referencing attributes and methods of COSEM objects)
StoC	Server to Client Challenge
UI PDU	Unnumbered Information Protocol Data Unit
UTC	Coordinated Universal Time