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

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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Electricity metering data exchange - The DLMS/COSEM suite -
Part 6-2: COSEM interface classes
(IEC 62056-6-2:2016)

Échange des données de comptage de l'électricité -
La suite DLMS/COSEM - Partie 6-2: Classes d'interfaces
COSEM
(IEC 62056-6-2:2016)

Datenkommunikation der elektrischen Energiemessung -
DLMS/COSEM - Teil 6-2: COSEM Interface-Klassen
(IEC 62056-6-2:2016)

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EN 62056-6-2:2016**European foreword**

The text of document 13/1651A/FDIS, future edition 2 of IEC 62056-6-2, prepared by IEC/TC 13 "Electrical energy measurement and control" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62056-6-2:2016.

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- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2019-12-09

This document supersedes EN 62056-6-2:2013.

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 62056-4-7:2015	NOTE	Harmonized as EN 62056-4-7:2015 (not modified).
IEC 62056-7-6:2013	NOTE	Harmonized as EN 62056-7-6:2013 (not modified).
IEC 62056-8-3:2013	NOTE	Harmonized as EN 62056-8-3:2013 (not modified).
IEC 62056-9-7:2013	NOTE	Harmonized as EN 62056-9-7:2013 (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
-	-	Communication systems for meters and remote reading of meters - Part 2: Physical and link layer	EN 13757-2	2004
-	-	Communication systems for meters and remote reading of meters - Part 3: Dedicated application layer	EN 13757-3	2004 ¹⁾
-	-	Communication systems for meters and remote reading of meters - Part 3: Dedicated application layer	EN 13757-3	2013
-	-	Communication systems for meters - Part 5: Wireless M-Bus relaying	EN 13757-5	2015
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)	EN 61334-4-32	1996
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	EN 61334-4-41	1996
IEC 61334-4-511	2000	Distribution automation using distribution line carrier systems - Part 4-511: Data communication protocols - Systems management - CIASE protocol	EN 61334-4-511	2000
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)	EN 61334-4-512	2002
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	EN 61334-5-1	2001

¹⁾ Superseded by EN 13757-3:2013.

EN 62056-6-2:2016

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61334-6	2000	Distribution automation using distribution line carrier systems - Part 6: A-XDR encoding rule	EN 61334-6	2000
IEC 62056-21	2002	Electricity metering - Data exchange for meter reading, tariff and load control - Part 21: Direct local data exchange	EN 62056-21	2002
IEC 62056-31	1999	Electricity metering - Data exchange for meter reading, tariff and load control - Part 31: Use of local area networks on twisted pair with carrier signalling	EN 62056-31	2000 ²⁾
IEC 62056-3-1	2013	Electricity metering data exchange - The DLMS/COSEM suite - Part 3-1: Use of local area networks on twisted pair with carrier signalling	EN 62056-3-1	2014
IEC 62056-46 + A1	2002 2006	Electricity metering - Data exchange for meter reading, tariff and load control - Part 46: Data link layer using HDLC protocol	EN 62056-46 + A1	2002 2007
IEC 62056-5-3	2016	Electricity metering data exchange - The DLMS/COSEM suite - Part 5-3: DLMS/COSEM application layer	EN 62056-5-3	2016
IEC 62056-6-1	2015	Electricity metering data exchange - The DLMS/COSEM suite - Part 6-1: Object Identification System (OBIS)	EN 62056-6-1	2016
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	-	-
IEEE 802.15.4	2006	IEEE Standard for Information technology- Telecommunications and information exchange between systems- Local and metropolitan area networks- Specific requirements Part 15.4: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low-Rate Wireless Personal Area Networks (WPANs)	-	-
ITU-T G.9901	2014	SERIES G: TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS - Access Networks - In premises networks - Narrow-band orthogonal frequency division multiplexing power line communication transceivers - Power spectral density specification	-	-

²⁾ Superseded by EN 62056-3-1:2014 (IEC 62056-3-1:2013).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ITU-T G.9903:2012/A1	2013	SERIES G: TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS - Access networks - In premises networks – Narrow-band orthogonal frequency division multiplexing power line communication transceivers for G3-PLC networks	-	-
ITU-T G.9903	2014	SERIES G: TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS - Access networks - In premises networks - Narrow-band orthogonal frequency division multiplexing power line communication transceivers for G3-PLC networks	-	-
ITU-T G.9904	2012	SERIES G: TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS - Access networks - In premises networks - Narrow-band orthogonal frequency division multiplexing power line communication transceivers for PRIME networks	-	-
ETSI GSM 05.08	-	Digital cellular telecommunications system - (Phase 2+); Radio subsystem link control	-	-
ANSI C12.19/ IEEE 1377	1997 1997	Utility Industry End Device Data Tables	-	-
IETF STD 51	1994	The Point-to-Point Protocol (PPP)	-	-
IETF RFC 791	1981	INTERNET PROTOCOL DARPA INTERNET PROGRAM PROTOCOL SPECIFICATION	-	-
IETF RFC 1332	1992	The PPP Internet Protocol Control Protocol- (IPCP)	-	-
IETF RFC 1570	1994	PPP LCP Extensions	-	-
IETF RFC 1661	1994	Point-to-Point Protocol (PPP)	-	-
IETF RFC 1662	1994	PPP in HDLC-like Framing	-	-
RFC 1994	1996	PPP Challenge Handshake Authentication Protocol (CHAP)	-	-
RFC 2433	1998	PPP CHAP Extension	-	-
IETF RFC 2474	1998	Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers	-	-
IETF RFC 2507	1999	IP Header Compression	-	-
RFC 2759	2000	Microsoft PPP CHAP Extensions	-	-
IETF RFC 3241	2002	Robust Header Compression (ROHC) over-PPP	-	-
RFC 3513	2003	Internet Protocol Version 6 (IPv6) Addressing Architecture	-	-
RFC 3544	2003	IP Header Compression over PPP	-	-
IETF RFC 4861	2007	Neighbor Discovery for IP version 6 (IPv6)	-	-

Point-to-Point (PPP) Protocol Field Assignments. Online database. Available from:

<http://www.iana.org/assignments/ppp-numbers/ppp-numbers.xhtml>



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

**Échange des données de comptage de l'électricité – La suite DLMS/COSEM –
Partie 6-2: Classes d'interfaces COSEM**





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INTERNATIONAL STANDARD

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

**Échange des données de comptage de l'électricité – La suite DLMS/COSEM –
Partie 6-2: Classes d'interfaces COSEM**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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DLMS¹ User Association
Zug/Switzerland
www.dlms.com

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

This second edition cancels and replaces the first edition of IEC 62056-6-2, published in 2013. It constitutes a technical revision.

The significant technical changes with respect to IEC 62056-6-2:2013 are listed in Annex F (informative).

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

FDIS	Report on voting
13/1651A/FDIS	13/1659/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.

¹ Device Language Message Specification.

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

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

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 second edition of IEC 62056-6-2 has been prepared by IEC TC13 WG14 with a significant contribution of the DLMS User Association, its D-type liaison partner.

This edition is in line with the DLMS UA Blue Book Edition 11.0. The main new features are the client user identification mechanism, the “Push setup”, the “Parameter monitor”, the “GSM diagnostic”, the “IPv6 setup”, the “Prime NB OFDM PLC setup”, the “G3-PLC setup” and the “ZigBee® setup”² interface classes.

In 2014, the DLMS UA has published Blue Book Edition 12.0 adding several new features regarding functionality, efficiency and security while keeping full backwards compatibility.

The intention of the DLMS UA is to bring also these latest developments to international standardization. Therefore, IEC TC13 WG14 launched a project to bring these new elements also to the IEC 62056 suite that will lead to Edition 3.0 of the standard.

Object modelling and data identification

Driven by the business needs of the energy market participants – generally in a liberalized, competitive environment – and by the desire to manage natural resources efficiently and to involve the consumers, the utility meter became part of an integrated metering, control and billing system. The meter is not any more a simple data recording device but it relies critically on communication capabilities. Ease of system integration, interoperability and data security are important requirements.

COSEM, the Companion Specification for Energy Metering, addresses these challenges by looking at the utility meter as part of a complex measurement and control system. The meter has to be able to convey measurement results from the metering points to the business processes which use them. It also has to be able to provide information to the consumer and manage consumption and eventually local generation.

COSEM achieves this by using object modelling techniques to model all functions of the meter, without making any assumptions about which functions need to be supported, how those functions are implemented and how the data are transported. The formal specification of COSEM interface classes forms a major part of COSEM.

To process and manage the information it is necessary to uniquely identify all data items in a manufacturer-independent way. The definition of OBIS, the Object Identification System is another essential part of COSEM. It 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 set of OBIS codes has been considerably extended over the years to meet new needs.

COSEM models the utility meter as a server application – 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 COSEM objects. The clients act as agents for third parties i.e. the business processes of energy market participants.

The standardized COSEM interface classes form an extensible library. Manufacturers use elements of this library to design their products that meet a wide variety of requirements.

² ZigBee® is a trademark owned by ZigBee corporation. This information is given for the convenience of users of this document and does not constitute an endorsement by the IEC of the product named.

The server offers means to retrieve the functions supported, i.e. the COSEM objects instantiated. The objects can be organized to logical devices and application associations and to provide specific access rights to various clients.

The concept of the standardized interface class library provides different users and manufacturers with a maximum of diversity while ensuring 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.

Annexes A to F (informative) provide additional information related to some interface classes.

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 61334-6:2000, *Distribution automation using distribution line carrier systems – Part 6: A-XDR encoding rule*

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

IEC 62056-31:1999, *Electricity metering – Data exchange for meter reading, tariff and load control – Part 31: Using local area networks on twisted pair with carrier signalling*

NOTE This Edition is referenced in the interface class “IEC twisted pair (1) setup” (class_id: 24, version: 0).

IEC 62056-3-1:2013, *Electricity metering data exchange – The DLMS/COSEM suite – Part 3-1: Use of local area networks on twisted pair with carrier signalling*

NOTE This Edition is referenced in the interface class “IEC twisted pair (1) setup” (class_id: 24, version: 1).

IEC 62056-46:2007, *Electricity metering – Data exchange for meter reading, tariff and load control – Part 46: Data link layer using HDLC protocol*

IEC 62056-5-3:2016, *Electricity metering data exchange – The DLMS/COSEM suite – Part 5-3: DLMS/COSEM application layer*

IEC 62056-6-1:2015, *Electricity metering data exchange – The DLMS/COSEM suite – Part 6-1: Object identification system (OBIS)*

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 and remote reading of meters – Part 2: Physical and link layer*

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

NOTE This standard is referenced in the “M-Bus client setup” interface class version 0.

EN 13757-3:2013, *Communication systems for and remote reading of meters – Part 3: Dedicated application layer*

NOTE This standard is referenced in the M-Bus client setup interface class version 1.

EN 13757-5:2015, *Communication systems for meters – Part 5: Wireless relaying*

IEEE 802.15.4:2006, *Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 15.4: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low-Rate Wireless Personal Area Networks (WPANs)*

NOTE This standard is also available as ISO/IEC/IEEE 8802-15-4:2010.

ITU-T G.9901:2014, *SERIES G: TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS – Access Networks – In premises networks – Narrow-band orthogonal frequency division multiplexing power line communication transceivers – Power spectral density specification*

ITU-T G.9903 Amd. 1:2013, *SERIES G: TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS – Access networks – In premises networks – Narrow-band orthogonal frequency division multiplexing power line communication transceivers for G3-PLC networks*

ITU-T G.9903:2014, *SERIES G: TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS – Access networks – In premises networks – Narrow-band orthogonal frequency division multiplexing power line communication transceivers for G3-PLC networks*

ITU-T G.9904:2012, *SERIES G: TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS – Access networks – In premises networks – Narrow-band orthogonal frequency division multiplexing power line communication transceivers for PRIME networks*

ETSI GSM 05.08, *Digital cellular telecommunications system (Phase 2+); Radio subsystem link control*

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

The following RFCs are available online from the Internet Engineering Task Force (IETF):
<http://www.ietf.org/rfc/std-index.txt>, <http://www.ietf.org/rfc/>

IETF STD 51, *The Point-to-Point Protocol (PPP)*, 1994. (Also RFC 1661, RFC 1662)

RFC 791, *Internet Protocol (Also: IETF STD 0005)*, 1981. RFC 1332, *The PPP Internet Protocol Control Protocol (IPCP)*, 1992, Updated by: RFC 3241. Obsoletes: RFC 1172

RFC 1570, *PPP LCP Extensions*, 1994

IETF STD 51 / RFC 1661, *The Point-to-Point Protocol (PPP) (Also: IETF STD 0051)*, 1994, Updated by: RFC 2153, Obsoletes: RFC 1548

IETF STD 51 / RFC 1662, *PPP in HDLC-like Framing*, (Also: IETF STD 0051), 1994, Obsoletes: RFC 1549

RFC 1994, *PPP Challenge Handshake Authentication Protocol (CHAP)*, 1996. Obsoletes: RFC 1334

RFC 2433, *PPP CHAP Extension*, 1998

RFC 2474, *Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers*, 1998

RFC 2507, *IP Header Compression*, 1999

RFC 2759, *Microsoft PPP CHAP Extensions, Version 2*, 2000

RFC 3241 *Robust Header Compression (ROHC) over PPP*, 2002. Updates: RFC1332

RFC 3513, *Internet Protocol Version 6 (IPv6) Addressing Architecture*, 2003

RFC 3544, *IP Header Compression over PPP*, 2003

RFC 4861, *Neighbor Discovery for IP version 6 (IPv6)*, 2007

Point-to-Point (PPP) Protocol Field Assignments. Online database. Available from:
<http://www.iana.org/assignments/ppp-numbers/ppp-numbers.xhtml>

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