SVENSK STANDARD SS-EN 62056-7-5

Fastställd	Utgåva	Sida	Ansvarig kommitté
2017-06-14	1	1 (1+43)	SEK TK 13

Elmätare – Datakommunikation för avläsning av elmätare och för styrning av tariff och belastning – DLMS/COSEM-familjen – Del 7-5: Lokala kommunikationsprofiler för lokala nät

Electricity metering data exchange – The DLMS/COSEM suite – Part 7-5: Local data transmission profiles for Local Networks (LN)

Som svensk standard gäller europastandarden EN 62056-7-5:2016. Den svenska standarden innehåller den officiella engelska språkversionen av EN 62056-7-5:2016.

Nationellt förord

Europastandarden EN 62056-7-5:2016

består av:

- **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
- **IEC 62056-7-5, First edition, 2016 - Electricity metering data exchange - The DLMS/COSEM suite - Part 7-5: Local data transmission profiles for Local Networks (LN)**

utarbetad inom International Electrotechnical Commission, IEC.

ICS 17.220.20; 35.100.01; 91.140.50

Denna standard är fastställd av SEK Svensk Elstandard,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
Postadress: Box 1284, 164 29 KISTA
Telefon: 08 - 444 14 00.
E-post: sek@elstandard.se. Internet: www.elstandard.se

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a mätning, säkerhet och provning och för utförande, skötsel och dokumentation av elprodukter och elanläggningar.

Genom att utforma sådana standarder blir säkerhetsfordringar tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringsarbetet inom elområdet

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

SEK Svensk Elstandard
Box 1284
164 29 Kista
Tel 08-444 14 00
www.elstandard.se

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62056-7-5

December 2016

ICS 17.220.20; 35.100.01; 91.140.50

English Version

Electricity metering data exchange - The DLMS/COSEM suite - Part 7-5: Local data transmission profiles for Local Networks (LN) (IEC 62056-7-5:2016)

Échange des données de comptage de l'électricité - la suite DLMS/COSEM - partie 7-5: Profils de transmission de données locales pour réseaux locaux (LN) (IEC 62056-7-5:2016)

Datenkommunikation der elektrischen Energiemessung - DLMS/COSEM - Teil 7-5: Kommunikationsprofile zur lokalen Datenübertragung für lokale Netze (IEC 62056-7-5:2016)

This European Standard was approved by CENELEC on 2016-06-16. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 62056-7-5:2016 E

SEK Svensk Elstandard

European foreword

The text of document 13/1605/CDV, future edition 1 of IEC 62056-7-5, prepared by IEC/TC 13 "Electrical energy measurement, tariff- and load control" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62056-7-5:2016.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2017-06-09
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2019-12-09

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 62056-7-5:2016 was approved by CENELEC as a European Standard without any modification.

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.

Publication	Year	Title	EN/HD	Year
IEC 60050-300	-	International Electrotechnical Vocabulary - Electrical and electronic measurements and measuring instruments -- Part 311: General terms relating to measurements -- Part 312: General terms relating to electrical measurements -- Part 313: Types of electrical measuring instruments -- Part 314: Specific terms according to the type of instrument	-	-
IEC 60950-1 (mod)	2005	Information technology equipment - Safety - Part 1: General requirements	EN 60950-1	2006
-	-		+ A11	2009
+ A1 (mod)	2009		+ A1	2010
-	-		+ A12	2011
-	-		+ AC	2011
+ A2 (mod)	2013		+ A2	2013
IEC 62052-31	-	Electricity metering equipment (AC) - General requirements, tests and test conditions - Part 31: Product safety requirements and tests	EN 62052-31	-
IEC 62056-1-0	-	Electricity metering data exchange - The DLMS/COSEM suite - Part 1-0: Smart metering standardisation framework	EN 62056-1-0	-
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	EN 62056-3-1	2014
IEC 62056-4-7	2015	Electricity metering data exchange - The DLMS/COSEM suite -- Part 4-7: DLMS/COSEM transport layer for IP networks	EN 62056-4-7	2015
IEC 62056-5-3	2016		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
IEC 62056-6-2	2016	Electricity metering data exchange - The DLMS/COSEM suite - Part 6-2: COSEM interface classes	EN 62056-6-2	2016
IEC 62056-9-7	-	Electricity metering data exchange - The DLMS/COSEM suite -- Part 9-7: Communication profile for TCP-UDP/IP networks	EN 62056-9-7	-
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 62056-46	2002	Electricity metering - Data exchange for meter reading, tariff and load control -- Part 46: Data link layer using HDLC protocol	EN 62056-46	2002
+ A1	2006		+ A1	2007
IEC/TR 62051	-	Electricity metering - Glossary of terms	-	-
IEC/TR 62051-1	-	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	-	-
ISO/IEC 13239	2002	Information technology - Telecommunications and information exchange between systems - High-level data link control (HDLC) procedures	-	-
	-	Communication systems for and remote reading of meters - Part 2: Physical and link layer	EN 13757-2	-

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

ELECTRICITY METERING DATA EXCHANGE – THE DLMS/COSEM SUITE –

Part 7-5: Local data transmission profiles for Local Networks (LN)

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 International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this International Standard may involve the use of a maintenance service concerning the stack of protocols on which the present standard IEC 62056-7-5 is based.

The IEC takes no position concerning the evidence, validity and scope of this maintenance service.

The provider of the maintenance service has assured the IEC that he is willing to provide services under reasonable and non-discriminatory terms and conditions for applicants throughout the world. In this respect, the statement of the provider of the maintenance service is registered with the IEC. Information may be obtained from:

DLMS User Association
Zug/Switzerland
www.dlms.com

International Standard IEC 62056-7-5 has been prepared by technical committee 13: Electrical energy measurement and control.

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

CDV	Report on voting
13/1605/CDV	13/1650/RVC

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 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.

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

As defined in IEC 62056-1-0, the IEC 62056 DLMS/COSEM suite provides specific communication profile standards for communication media relevant for smart metering.

Such communication profile standards specify how the COSEM data model and the DLMS/COSEM application layer can be used on the lower, communication media-specific protocol layers.

Communication profile standards refer to communication standards that are part of the IEC 62056 DLMS/COSEM suite or to any other open communication standard.

This International Standard specifies DLMS/COSEM communication profiles for transmitting metering data modelled by COSEM interface objects through Local Data Transmission Interfaces (LDTI). The LDTI may be part of a meter or of a Local Network Access Point (LNAP) hosting a DLMS/COSEM server.

The specification of the communication profiles follows the rules defined in IEC 62056-5-3:2016, Annex A.

A major driver for the introduction of smart metering is to provide the consumer with suitable metering information to optimise his/her energy consumption and/or production. For that purpose, smart meters are equipped with local interfaces providing metering data for the consumer on consumer devices.

IEC 62056-21 and IEC 62056-3-1 are communication standards that specify direct local data exchange and data exchange through local networks. They provide protocol modes that support the DLMS/COSEM application layer and thus the COSEM object model. They also specify legacy modes that do not support the DLMS/COSEM application layer.

In order to allow connecting legacy consumer equipment to the LDTI, this International Standard also specifies communication profiles using protocol modes that do not support the DLMS/COSEM application layer.

It is assumed, however, that in all cases the metering application is modelled by COSEM interface objects.

It is also assumed that the meter has interfaces that fully support DLMS/COSEM and allow the configuration of the local data transmission interface by a DLMS/COSEM client.

The requirements on the physical type of the interface, the choice of the data transmitted and the transmitting pattern highly depends on the markets and projects the meter is designed for.

ELECTRICITY METERING DATA EXCHANGE – THE DLMS/COSEM SUITE –

Part 7-5: Local data transmission profiles for Local Networks (LN)

1 Scope

This part of IEC 62056 specifies DLMS/COSEM communication profiles for transmitting metering data modelled by COSEM interface objects through a Local Data Transmission Interface (LDTI). The LDTI may be part of a meter or of a Local Network Access Point (LNAP) hosting a DLMS/COSEM server.

The main body of this standard specifies the common aspects of the different communication profiles for the LDTI interface.

The Annexes specify the communication protocol specific elements. The Annexes form an integral part of this International Standard.

Annex A (normative) specifies a communication profile using the protocol specified in IEC 62056-21. Clause A.1 specifies the communication profile that supports the DLMS/COSEM application layer and Clause A.2 specifies the communication profile using the legacy Mode D. The physical interface is the optical interface specified in IEC 62056-21:2002, 4.3.

Annex B (normative) specifies a communication profile using the protocol specified in IEC 62056-3-1. Clause B.1 specifies the communication profile that supports the DLMS/COSEM application layer and Clause B.2 specifies the communication profile using the legacy mode. The physical interface is twisted pair using carrier signalling known as the Euridis Bus.

Annex C (normative) specifies a communication profile based on the DLMS/COSEM 3-layer, connection oriented HDLC based profile specified in IEC 62056-7-6. The physical interface is RS 485 or TIA-232-F.

Annex D (normative) specifies a communication profile using the physical layer specified in EN 13757-2 and the HDLC based data link layer specified in IEC 62056-46. The physical interface is twisted pair with baseband signalling.

Annex E (normative) species a communication profile using UDP/IP. The physical layer is out of the scope of this International Standard.

The communication profiles in Clauses A.1, B.1, and Annexes C, D and E support the DLMS/COSEM application layer.

Annex F (informative) specifies an LDTI configuration example.

Annex G (informative) provides encoding examples.

Additional communication profiles for other media/communication protocols may be added in the future.

Table 1 shows the features of communication profiles using DLMS/COSEM compatible and legacy protocol modes.

Table 1 – Features of communication profiles using DLMS/COSEM compatible and legacy protocol modes

Feature	Communication profiles supporting	
	DLMS/COSEM compatible modes	**Legacy modes**
Application model	COSEM interface objects; any attribute value can be transmitted	COSEM interface objects; a limited set of attribute values can be transmitted
Data formats	A-XDR encoded	Protocol specific (typically ASCII strings)
DLMS/COSEM application layer support	Yes (xDLMS APDUs)	No
Cryptographic protection	COSEM attributes and COSEM APDUs	Out of scope (protocol specific)
Data transmission triggers	Time or event based, controlled by COSEM interface objects. Refresh rate can support time-critical applications.	Time or event based. Interface specific restrictions may apply.

The consumer device may directly support the LDTI communication protocol and data formats. In this case the LDTI DLMS/COSEM client is part of the consumer device as shown in Figure 1.

When the consumer device does not support the LDTI communication protocol and data formats then a local adaptor is necessary converting the communication medium and protocol of the LDTI to the communication means of the consumer device. In this case, the local adaptor may be part of the meter or LNAP as shown in Figure 2. The local adaptor and the data exchange between the local adaptor and the consumer device are out of the scope of this International Standard.

This difference is not relevant for this standard, so the arrangement shown in Figure 1 is assumed.

The consumer device is also out of the scope of this International Standard.

Figure 1 – LDTI DLMS/COSEM client as part of a consumer device

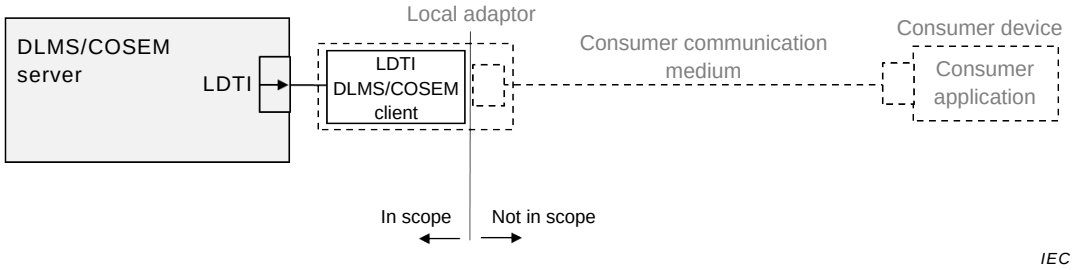

Figure 2 – LDTI DLMS/COSEM client as part of a local adaptor

The scope of these communication profiles is restricted to aspects concerning the use of communication protocols in conjunction with the DLMS/COSEM data models. Data structures specific to a communication protocol should be defined in the specific protocol standards. Any project specific definitions of data structures and data contents shall be provided in project specific companion specifications.

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 60050-300, *International Electrotechnical Vocabulary – Electrical and electronic measurements and measuring instruments – Part 311: General terms relating to measurements – Part 312: General terms relating to electrical measurements – Part 313: Types of electrical measuring instruments – Part 314: Specific terms according to the type of instrument*

IEC 60950-1:2005, *Information technology equipment – Safety – Part 1: General requirements*
Amendment 1:2009
Amendment 2:2013

IEC TR 62051, *Electricity metering – Glossary of terms*

IEC TR 62051-1, *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 62052-31 *Electricity metering equipment (AC) – General requirements, tests and test conditions – Part 31: Product safety requirements and tests*

IEC 62056-1-0, *Electricity metering data exchange – The DLMS/COSEM suite – Part 1-0: Smart metering standardization framework*

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

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*

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

IEC 62056-4-7:2015, *Electricity metering data exchange – The DLMS/COSEM suite – Part 4-7: DLMS/COSEM transport layer for IP networks*

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)*

IEC 62056-6-2:2016, *Electricity metering data exchange – The DLMS/COSEM suite – Part 6-2: COSEM interface classes*

IEC 62056-9-7, *Electricity metering data exchange – The DLMS/COSEM suite – Part 9-7: Communication profile for TCP-UDP/IP networks*

ISO/IEC 13239:2002, *Information technology – Telecommunications and information exchange between systems – High-level data link control (HDLC) procedures*

EN 13757-2, *Communication systems for and remote reading of meters – Part 2: Physical and link layer*

3 Terms, definitions and abbreviations

For the purposes of this document, the terms and definitions in IEC 60050-300, IEC TR 62051, IEC TR 62051-1 as well as the following apply.

NOTE Where there is a difference between the definitions in the glossary and those contained in product standards produced by TC 13, then the latter take precedence in applications of the relevant standard.