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

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NATIONAL FOREWORD

See Eesti standard EVS-EN 62056-7-5:2016 sisaldab Euroopa standardi EN 62056-7-5:2016 ingliskeelset teksti.	This Estonian standard EVS-EN 62056-7-5:2016 consists of the English text of the European standard EN 62056-7-5:2016.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 09.12.2016.	Date of Availability of the European standard is 09.12.2016.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 17.220.20, 35.100.01, 91.140.50

EUROPEAN STANDARD

NORME EUROPÉENNE

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EN 62056-7-5

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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.

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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

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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

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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

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.

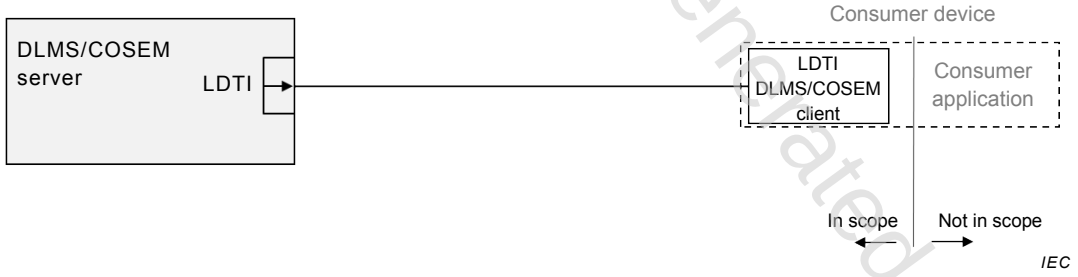

Figure 1 – LDTI DLMS/COSEM client as part of a consumer device

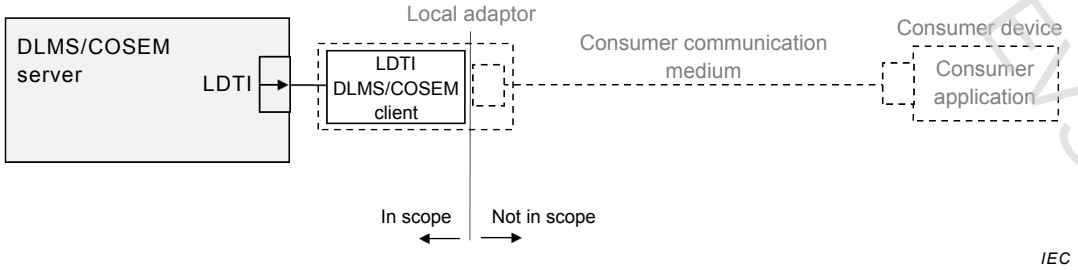

Figure 2 – LDTI DLMS/COSEM client as part of a local adaptor