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Electricity metering data exchange - The DLMS/COSEM suite - Part 8-3: The PLC S-FSK profile for neighbourhood networks (IEC 62056-8-3:2013)

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Echange de données pour le comptage de l'énergie électrique - La suite DLMS/COSEM - Partie 8-3: Profil PLC S-FSK pour réseaux de voisinage (CEI 62056-8-3:2013)

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**Electricity metering data exchange -
The DLMS/COSEM suite -
Part 8-3: Communication profile for PLC S-FSK neighbourhood networks
(IEC 62056-8-3:2013)**

Echange des données de comptage de
l'électricité -
La suite DLMS/COSEM -
Partie 8-3: Profil de communication pour
réseaux de voisinage CPL S-FSK
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Datenkommunikation der elektrischen
Energiemessung -
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Teil 8-3: PLC S-FSK Spezifikation für
Areal-Netze
(IEC 62056-8-3:2013)

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Foreword

The text of document 13/1526/FDIS, future edition 1 of IEC 62056-8-3, 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 62056-8-3:2013.

The following dates are fixed:

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- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2016-06-20

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Endorsement notice

The text of the International Standard IEC 62056-8-3:2013 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 61334-4-512:2001 NOTE Harmonized as EN 61334-4-512:2002 (not modified).

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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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050	Series	International Electrotechnical Vocabulary (IEV)	-	-
IEC 61334-4-1	1996	Distribution automation using distribution line carrier systems - Part 4: Data communication protocols - Section 1: Reference model of the communication system	EN 61334-4-1	1996
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 61334-4-511	2000	Distribution automation using distribution line carrier systems - Part 4-511: Data communication protocols - Systems management - CIASE protocol	EN 61334-4-511	2000
IEC 61334-5-1	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
IEC/TR 62051	1999	Electricity metering - Glossary of terms	-	-
IEC/TR 62051-1 + corr. June	2004 2005	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 62056-5-3	2013	Electricity metering data exchange - The DLMS/COSEM suite - Part 5-3: DLMS/COSEM application layer	EN 62056-5-3	2013
IEC 62056-6-2	2013	Electricity metering data exchange - The DLMS/COSEM suite - Part 6-2: COSEM interface classes	EN 62056-6-2	2013
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
ISO/IEC 8802-2 + corr. October	1998 2000	Information technology - Telecommunications - and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 2: Logical link control	-	-

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**Electricity metering data exchange – The DLMS/COSEM suite –
Part 8-3: Communication profile for PLC S-FSK neighbourhood networks**

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Partie 8-3: Profil de communication pour réseaux de voisinage CPL S-FSK**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRICITY METERING DATA EXCHANGE –
THE DLMS/COSEM SUITE –**
Part 8-3: Communication profile for PLC S-FSK neighbourhood networks

FOREWORD

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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:

DLMS¹ User Association
Zug/Switzerland
www.dlms.ch

¹ Device Language Message Specification.

International Standard IEC 62056-8-3 has been prepared by technical committee 13: Electrical energy measurement, tariff- and load control.

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

FDIS	Report on voting
13/1526/FDIS	13/1544/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 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,
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ELECTRICITY METERING DATA EXCHANGE – THE DLMS/COSEM SUITE –

Part 8-3: Communication profile for PLC S-FSK neighbourhood networks

1 Scope

This part of IEC 62056 specifies the DLMS/COSEM PLC S-FSK communication profile for neighbourhood networks.

It uses standards established by IEC TC 57 in the IEC 61334 series, *Distribution automation using distribution line carrier systems* and it specifies extensions to some of those standards.

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 (all parts), *International Electrotechnical Vocabulary* (available at <http://www.electropedia.org>)

IEC 61334-4-1:1996, *Distribution automation using distribution line carrier systems – Part 4: Data communication protocols – Section 1: Reference model of the communication system*

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

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

IEC 62056-5-3:—, *Electricity metering data exchange – The DLMS/COSEM suite – Part 5-3: DLMS/COSEM application layer²*

² To be published simultaneously with this part of IEC 62056.

IEC 62056-6-2:—, *Electricity metering data exchange – The DLMS/COSEM suite – Part 6-2: COSEM interface classes*³

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*

NOTE See also the Bibliography.

3 Terms, definitions and abbreviations

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

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

3.1 Terms and definitions

3.1.1

initiator

user-element of a client System Management Application Entity (SMAE). It uses the CIASE and xDLMS ASE and it is identified by its system title

[SOURCE: IEC 61334-4-511:2000, 3.8.1, modified]

3.1.2

active initiator

initiator, which issues or has last issued a CIASE Register request when the server is in the unconfigured state

[SOURCE: IEC 61334-4-511:2000, 3.9.1]

3.1.3

new system

server system, which is in the unconfigured state: its MAC address equals "NEW-address"

[SOURCE: IEC 61334-4-511:2000, 3.9.3]

3.1.4

new system title

system-title of a new system

Note 1 to entry: This is the system title of a system, which is in the new state.

[SOURCE: IEC 61334-4-511:2000, 3.9.4, modified]

3.1.5

registered system

server system, which has an individual, valid MAC address

Note 1 to entry: Therefore, this MAC address is different from "NEW Address", see IEC 61334-5-1: Medium Access Control.

[SOURCE: IEC 61334-4-511:2000, 3.9.5, modified]

³ To be published simultaneously with this part of IEC 62056.

3.1.6**reporting system**

server system, which issues a DiscoverReport

[SOURCE: IEC 61334-4-511:2000, 3.9.6, modified]

3.1.7**sub-timeslot**

the time needed to transmit two bytes by the physical layer

Note 1 to entry: Timeslots are divided to sub-slots in the RepeaterCall mode of the physical layer.

3.1.8**timeslot**

the time needed to transmit a physical frame

Note 1 to entry: As specified in IEC 61334-5-1:2001, 3.3.1, a physical frame comprises 2 bytes preamble, 2 bytes start subframe delimiter, 38 bytes PSDU and 3 bytes pause.

3.2 Abbreviations

.cnf	.confirm service primitive
.ind	.indication service primitive
.req	.request service primitive
.res	.response service primitive
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
AES	Advanced Encryption Standard
AL	Application Layer
AP	Application Process
APDU	Application Layer Protocol Data Unit
ASE	Application Service Element
ASO	Application service Object
A-XDR	Adapted Extended Data Representation
CIASE	Configuration Initiation Application Service Element
CI-PDU	CIASE PDU
Client	A station, asking for services. In the case of the 3-layer, CO HDLC based profile it is the master station
COSEM	Companion Specification for Energy Metering
DA	Destination Address
DLMS	Device Language Message Specification
DLMS UA	DLMS User Association
FCS	Frame Check Sequence
GCM	Galois/Counter Mode, an algorithm for authenticated encryption with associated data
HCS	Header Check Sequence
HDLC	High-level Data Link Control
HES	(Metering) Head End System
ISO	International Organization for Standardization

LLC	Logical Link Control (Sublayer)
LN	Local Network
LNAP	Local Network Access Point
L-SAP	LLC sublayer Service Access Point
LSDU	LLC Service Data Unit
LV	Low voltage
MAC	Medium Access Control (sublayer)
MPDU	MAC Layer Protocol Data Unit
MSC	Message Sequence Chart
NN	Neighbourhood Network
NNAP	Neighbourhood Network Access Point
NS	Number of subframes (S-FSK MAC sublayer)
OSI	Open System Interconnection
PDU	Protocol Data Unit
PhL	Physical Layer
PLC	Power Line Carrier
PSDU	Physical Layer Service Data Unit
RDR	Reply Data on Request (used in IEC 61334-4-32)
RLRE	A-Release Response – an APDU of the ACSE
RLRQ	A-Release Request – an APDU of the ACSE
SA	Source Address
SAP	Service Access Point
SDN	Send Data Non-acknowledged (used in IEC 61334-4-32)
SDU	Service Data Unit
SMAE	Systems Management Application Entity
SMAP	Systems Management Application Process
SNRM	Set Normal Response Mode (a HDLC frame type)

4 Targeted communication environments

The DLMS/COSEM PLC S-FSK communication profile is intended for remote data exchange on Neighbourhood Networks (NN) between Neighbourhood Network Access Points (NNAP) and Local Network Access Points (LNAPs) or End Devices using S-FSK power line carrier technology over the low voltage electricity distribution network as a communication medium. The functional reference architecture is shown in Figure 1.