

ICS 35.240.60; 91.140.50

English Version

**Electricity metering data exchange - The DLMS/COSEM suite -
Part 8-7: AMC-SS PLC communication profile for neighbourhood
networks**

This Technical Specification was approved by CENELEC on 2014-11-11.

CENELEC members are required to announce the existence of this TS in the same way as for an EN and to make the TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force.

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

CONTENTS

Foreword	4
1 Scope	5
2 Normative references	5
3 Abbreviations	6
4 Targeted communication environments	8
5 Reference model	9
6 Physical Layer (PHY)	10
6.1 Overview – main features and functions	10
6.2 PHY layer services	10
7 Data Link Layer	11
7.1 Functions and structure	11
7.2 The Medium Access Control sub-layer	13
7.3 The Logical Link Control sub-layer	13
7.3.1 Overview	13
7.3.2 Layer-2-network management functions	13
7.3.3 Communication functions	14
7.3.4 Segmentation and reassembly	14
7.4 The Convergence sub-layer	14
7.4.1 Overview	14
7.4.2 DLMS/COSEM AL specific convergence sub-layer	14
7.4.3 IPv4 specific convergence sub-layer	19
7.4.4 IPv6 specific convergence sub-layer	26
7.5 Identification and addressing	32
8 Upper layers (Session, Presentation, Application)	33
8.1 Overview	33
8.2 Mapping of application layer services	34
8.3 Registration services	35
8.3.1 Overview	35
8.3.2 CL_control.indication	35
8.3.3 CL_IPv4_control.indication	36
8.3.4 CL_IPv6_control.indication	37
9 Data Model	38
Annex A (normative) IP header compression parameters	39
Annex B (informative) Data exchange examples	40
B.1 Data retrieval from slave node	40
B.2 Data retrieval error case	41
List of Figures	
Figure 1 – Communication architecture	8
Figure 2 – DLMS/COSEM AMC-SS PLC architecture	9
Figure 3 – Primitives between layer 2 and layer 1	11
Figure 4 – Structure of Data Link Layer	11
Figure 5 – DLMS/COSEM AL specific primitives between higher layer and layer 2 in a bidirectional data transmission	12

Figure 6 – DLMS/COSEM AL specific primitives between higher layer and layer 2 in the case of broadcast	12
Figure 7 – DLMS/COSEM AL specific primitives between higher layers and layer 2 in the case of an unsolicited data transmission	13
Figure 8 – The IPv4 communication architecture	20
Figure 9 – The IPv6 communication architecture	26
Figure 10 – Mapping of the DLMS/COSEM Application layer services	34
Figure 11 – Registration services specific for DLMS/COSEM AL	36
Figure 12 – IPv4 registration services	37
Figure 13 – IPv6 registration services	38
Figure B 1 – Successful GET command specific for DLMS/COSEM AL	40
Figure B 2 – Data retrieval error case specific for DLMS/COSEM AL	41

List of Tables

Table 1 – Coding of the DLC extended control field	14
Table 2 – Mapping of CL_data.request to DL_data.request in the master node	15
Table 3 – Mapping of CL_data.request to DL_data.request in the slave node	16
Table 4 – Mapping of DL_data.indication to CL_data.indication in the master node	17
Table 5 – Mapping of DL_data.indication to CL_data.indication in the slave node	17
Table 6 – Mapping of DL_data_identifier.confirm to CL_data_request.confirm in the master node	18
Table 7 – Mapping of DL_data_identifier.confirm to CL_data_request.confirm in the slave node	19
Table 8 – Reserved SAP values on the master node side	19
Table 9 – Reserved SAP values on the slave node side	19
Table 10 – Mapping of CL_IPv4_data.request to DL_data.request in the master node	21
Table 11 – Mapping of CL_IPv4_data.request to DL_data.request in the slave node	22
Table 12 – Mapping of DL_data.indication to CL_IPv4_data.indication in the master node	23
Table 13 – Mapping of DL_data.indication to CL_IPv4_data.indication in the slave node	23
Table 14 – Mapping of DL_data_identifier.confirm to CL_IPv4_data_request.confirm in the master node	25
Table 15 – Mapping of DL_data_identifier.confirm to CL_IPv4_data_request.confirm in the slave node	25
Table 16 – Mapping of CL_IPv6_data.request to DL_data.request in the master node	28
Table 17 – Mapping of CL_IPv6_data.request to DL_data.request in the slave node	28
Table 18 – Mapping of DL_data.indication to CL_IPv6_data.indication in the master node	29
Table 19 – Mapping of DL_data.indication to CL_IPv6_data.indication in the slave node	30
Table 20 – Mapping of DL_data_identifier.confirm to CL_IPv6_data_request.confirm in the master node	31
Table 21 – Mapping of DL_data_identifier.confirm to CL_IPv6_data_request.confirm in the slave node	32
Table 22 – Mapping of DL_control.indication to CL_control.indication	36
Table 23 – Mapping of DL_control.indication to CL_IPv4_control.indication	37
Table 24 – Mapping of DL_control.indication to CL_IPv6_control.indication	38

Foreword

This document (CLC/TS 52056-8-7:2015) has been prepared by CLC/TC 13 "Electrical energy measurement and control".

The following date is fixed:

- latest date by which the existence of (doa) 2015-07-24
this document has to be announced
at national level

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.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

1 Scope

This Technical Specification specifies the DLMS/COSEM communication profile using a compatibly-extendable form (CX1) of Adaptive Multi-Carrier Spread-Spectrum (AMC-SS) PLC for neighbourhood networks. Its structure is in line with the DLMS/COSEM framework as described in EN 62056-1-0 [GK1].

The transport layer, the application layer and the data model are as specified in the EN 62056 DLMS/COSEM suite.

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.

CLC/TS 50590:2015, *Electricity metering data exchange - Lower layer PLC profile using Adaptive Multi-Carrier Spread-Spectrum for CX1 networks*

EN 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 61334-4-32:1996)

EN 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 61334-4-1:1996)

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

EN 62056-6-1, *Electricity metering data exchange – The DLMS/COSEM suite – Part 61: OBIS Object identification system* (IEC 62056-6-1)

EN 62056-6-2, *Electricity metering data exchange – The DLMS/COSEM suite – Part 62: Interface classes* (IEC 62056-6-2)

FprEN 62056-4-7:2014, *Electricity metering data exchange - The DLMS/COSEM suite – Part 4-7: DLMS/COSEM transport layer for IP networks* (IEC 62056-4-7:201X, 13/1570/CDV)

EN 62056-9-7:2013, *Electricity metering data exchange – The DLMS/COSEM Suite – Part 9-7: Communication profile for TCP-UDP/IP networks* (IEC 62056-9-7:2013)

RFC 2507 - IP Header Compression. Authors: M. Degermark, B. Nordgren, S. Pink. February 1999. Available from <http://tools.ietf.org/html/rfc2507>

Ipv4 TOS Byte and Ipv6 Traffic Class Octet <http://www.iana.org/assignments/ipv4-tos-byte/ipv4-tos-byte.xml>