

INTERNATIONAL STANDARD



**Electricity metering data exchange – The DLMS/COSEM suite –
Part 7-3: Wired and wireless M-Bus communication profiles for local and
neighbourhood networks**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRICITY METERING DATA EXCHANGE – THE DLMS/COSEM SUITE –

Part 7-3: Wired and wireless M-Bus communication profiles for local and neighbourhood networks

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DLMS¹ User Association
Zug/Switzerland
www.dlms.com

International Standard IEC 62056-7-3 has been prepared by IEC technical committee 13: Electrical energy measurement and control.

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

| FDIS | Report on voting |
|--------------|------------------|
| 13/1729/FDIS | 13/1731/RVD |

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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

- reconfirmed,
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1 Device Language Message Specification.

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 wired and wireless M-Bus networks using the lower layers specified in the EN 13757 series.

It follows the rules defined in IEC 62056-5-3, Annex A.

The DLMS/COSEM wired and wireless M-Bus communication profiles for local and neighbourhood networks may be used for smart energy data exchange with meters as well as with simple consumer displays and home automation systems.

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ELECTRICITY METERING DATA EXCHANGE – THE DLMS/COSEM SUITE –

Part 7-3: Wired and wireless M-Bus communication profiles for local and neighbourhood networks

1 Scope

This International Standard specifies DLMS/COSEM wired and wireless M-Bus communication profiles for local and neighbourhood networks.

Setting up and managing the M-Bus communication channels of M-Bus devices, the M-Bus network, registering slave devices and – when required – repeaters is out of the scope of this International Standard.

The scope of this communication profile standard is restricted to aspects concerning the use of communication protocols in conjunction with the COSEM data model and the DLMS/COSEM application layer. Data structures specific to a communication protocol are out of the scope of this standard. Any project-specific definitions of data structures and data contents may be provided in project-specific companion specifications.

Annex A (informative) provides information on M-Bus frame structures, addressing schemes and an encoding example.

Annex B (normative) points to COSEM interface classes to set up and manage the wired and wireless M-Bus communication channel.

Annex C (informative) provides MSCs for representative instances of communication.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

² Under preparation. Stage at the time of publication: IEC/CDV 62056-6-2:2016.

EN 13757-1, *Communication system for meters – Part 1: Data exchange*

EN 13757-2:2004, *Communication system for and remote reading of meters – Part 2: Physical and link layer*

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

EN 13757-4:2013, *Communication systems for meters and remote reading of meters – Part 4: Wireless meter readout (Radio meter reading for operation in SRD bands)*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 62056-5-3, IEC 62056-6-1, IEC 62056-6-2 and in the EN 13757 series apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.2 Abbreviated terms

The following M-Bus specific abbreviated terms are used in this standard.

| Abbrev. | Term | Standard domain |
|-------------------|---|-----------------|
| ACC | Access number field | M-Bus |
| ALA | Application Layer Address | M-Bus |
| CFG | Configuration byte | M-Bus |
| CI _{ELL} | CI field introducing the extended link layer (wireless M-Bus) | M-Bus |
| CI Field | Control Information field | M-Bus |
| CI _{TL} | CI field introducing the transport layer | M-Bus |
| DTSAP | Destination Transport Service Access Point | Telecontrol |
| ELL | Extended Link Layer | M-Bus |
| ELLA | Extended Link Layer Address | M-Bus |
| FIN (bit) | Final bit | Telecontrol |
| FT1.2 | Data integrity format class FT1.2 | Telecontrol |
| FT3 | Data integrity format class FT3 | Telecontrol |
| LLA | Link Layer Address | M-Bus |
| MSC | Message Sequence Chart | General |
| STS | Status byte | M-Bus |
| STSAP | Source Transport Service Access Point | Telecontrol |
| TL | Transport layer | M-Bus |
| wM-Bus | Wireless M-Bus | M-Bus |

4 Targeted communication environments

In the context of the smart metering architecture introduced in IEC 62056-1-0 and shown in Figure 1, the wired and wireless M-Bus communication profiles for local and neighbourhood networks cover the following interfaces:

- the C interface between an NNAP and metering devices;
- the M interface between an LNAP and metering devices;
- the H1 interface between a metering device and a simple consumer display;
- the H2 interface between an LNAP and a home automation system.

In all cases, metering devices act as DLMS/COSEM servers.

On the C and M interface, metering devices act as M-Bus slaves. The M-Bus master is the NNAP or the LNAP.

On the H1 and H2 interfaces the metering device acts as a DLMS/COSEM server. It may operate in pull mode or push mode, as M-Bus master or M-Bus slave, depending on the selection of wired or wireless M-Bus and the operating mode for wireless M-Bus.

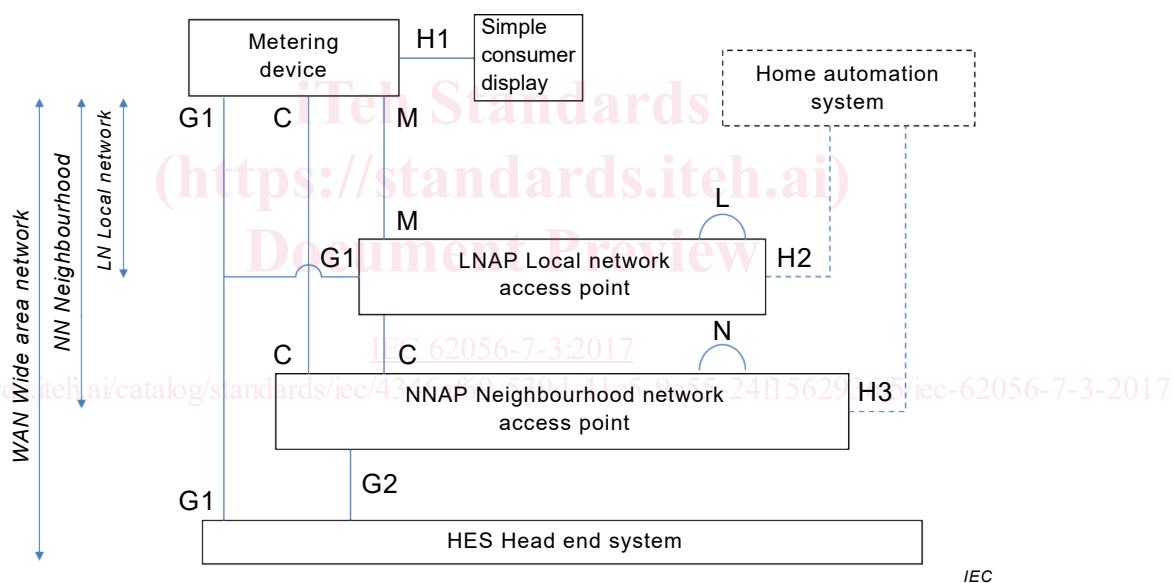


Figure 1 – Entities and interfaces of a smart metering system using the terminology of IEC 62056-1-0

5 Use of the communication layers for this profile

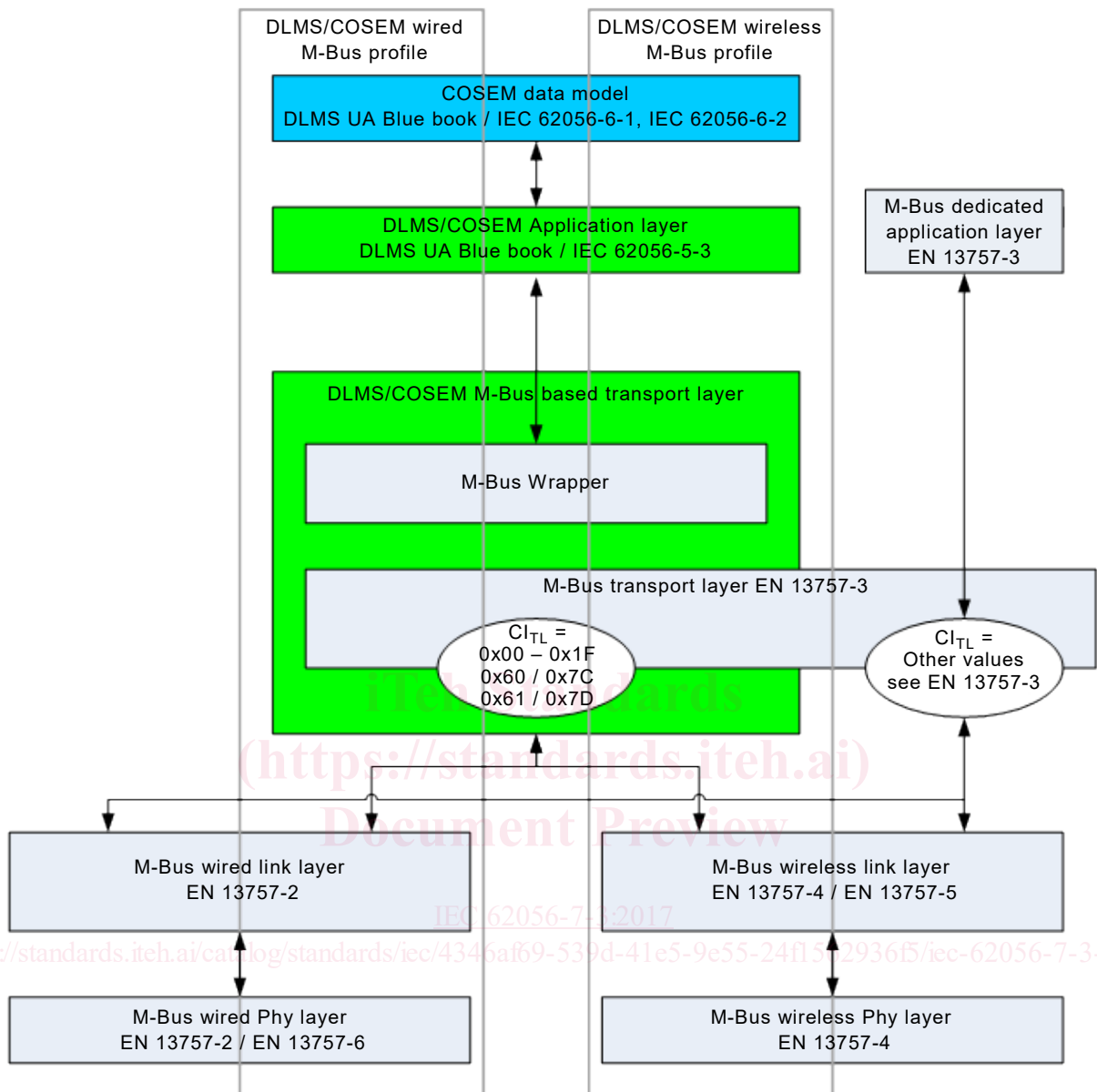
5.1 Information related to the use of the standard specifying the lower layers

The DLMS/COSEM wired and wireless M-Bus communication profiles for local and neighbourhood networks use the lower-layer protocols specified in the EN 13757 series.

Subclause 5.3.3 provides additional information on the use of the M-Bus transport layer in this communication profile.

5.2 Structure of the communication profiles

The structure of the DLMS/COSEM M-Bus wired and wireless M-Bus communication profiles is shown in Figure 2.



IEC

Figure 2 – The DLMS/COSEM wired and wireless M-Bus communication profiles

5.3 Lower protocol layers and their use

5.3.1 Physical layer

The physical layer is as specified in EN 13757-2:2004 (wired, twisted pair based) and in EN 13757-4:2013 (wireless).

For battery-operated masters and/or a small number of connected meters, a wired M-Bus physical layer is specified in EN 13757-6 (twisted pair based for short distances).

5.3.2 Link layer

The M-Bus link layer is as specified in EN 13757-2:2004 (wired) and in EN 13757-4:2013 (wireless).

NOTE For wireless meter readout EN 13757-5:2015 supports simple retransmission (single-hop repeating) as well as routed wireless networks that allow extending the range of transmission.