



IEC 62056-7-3

Edition 1.0 2017-03

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**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 17.220.20; 35.100.01; 91.140.50

ISBN 978-2-8322-4012-0

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD	4
INTRODUCTION	6
1 Scope	7
2 Normative references	7
3 Terms, definitions and abbreviated terms	8
3.1 Terms and definitions	8
3.2 Abbreviated terms	8
4 Targeted communication environments	9
5 Use of the communication layers for this profile	9
5.1 Information related to the use of the standard specifying the lower layers	9
5.2 Structure of the communication profiles	9
5.3 Lower protocol layers and their use	10
5.3.1 Physical layer	10
5.3.2 Link layer	10
5.3.3 Transport layer	11
5.4 Service mapping and adaptation layers	11
5.4.1 Overview	11
5.4.2 MBUS-DATA service primitives	12
5.4.3 MBUS-DATA protocol specification	14
5.5 Registration and connection management	16
6 Identification and addressing scheme	16
6.1 Overview	16
6.2 Link Layer Address for wired M-Bus	17
6.3 Link Layer Address for wireless M-Bus	18
6.4 Link Layer Address for M-Bus broadcast	18
6.5 Transport layer address	19
6.6 Application addressing extension – M-Bus wrapper	21
7 Specific considerations and constraints for using certain services within profile	22
7.1 Overview	22
7.2 Application association establishment and release: ACSE services	22
7.3 xDLMS services	23
7.3.1 Request – response type services	23
7.3.2 Unsolicited services	23
7.3.3 Broadcast messages	23
7.4 Security mechanisms	24
7.5 Transporting long application messages	24
7.6 Media access, bandwidth and timing considerations	24
8 Communication configuration and management	24
Annex A (informative) M-Bus frame structures, addressing schemes and examples	25
A.1 General	25
A.2 None, short or long M-Bus data header	26
A.2.1 Wired M-Bus	26
A.2.2 Wireless M-Bus	27
A.3 Encoding example: Data-Notification carrying daily billing data	30
A.3.1 Overview	30
A.3.2 Example: Daily billing data	31

Annex B (normative) New COSEM interface classes related to the M-Bus communication profiles	33
Annex C (informative) Message sequence charts	34
Bibliography	37
Figure 1 – Entities and interfaces of a smart metering system using the terminology of IEC 62056-1-0	9
Figure 2 – The DLMS/COSEM wired and wireless M-Bus communication profiles	10
Figure 3 – Summary of DLMS/COSEM M-Bus-based TL services	12
Figure 4 – Identification and addressing scheme in the wired M-Bus profile	17
Figure 5 – Link Layer Address for wireless M-Bus	18
Figure 6 – M-Bus TPDU formats	20
Figure 7 – CI_{TL} without M-Bus data header	20
Figure A.1 – M-Bus communication paths direct or cascaded	25
Figure A.2 – Wired M-Bus frame structure, none M-Bus data header	27
Figure A.3 – Wired M-Bus frame structure with long M-Bus data header	27
Figure A.4 – Wireless M-Bus frame structure with short ELL, no M-Bus data header	29
Figure A.5 – Wireless M-Bus frame structure with long ELL, no M-Bus data header	29
Figure A.6 – Wireless M-Bus frame structure with long ELL and long M-Bus data header	30
Figure A.7 – Daily billing data without / with DLMS/COSEM security applied	32
Figure C.1 – MSC for the COSEM-OPEN service for wired M-Bus, no M-Bus header	35
Figure C.2 – MSC the GET service for wired M-Bus, no M-Bus header	36
Table 1 – Wired M-Bus Link Layer Addresses	18
Table 2 – DLMS/COSEM M-Bus-based TL CI_{TL} values	19
Table 3 – CI fields used for link management purposes	21
Table 4 – Client and server SAPs	21
Table 5 – Application associations and data exchange in the M-Bus-based profiles	22
Table A.1 – Example: Daily billing data	31

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****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 62056-5-3 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:

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,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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.

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.

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)*