SLOVENSKI STANDARD
SIST EN 13757-3:2013

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Nadomešča:
SIST EN 13757-3:2005

Komunikacijski sistemi za merilnike in daljinsko odčitavanje - 3. del: Poseben aplikacijski sloj

Communication systems for and remote reading of meters - Part 3: Dedicated application layer

Kommunikationssysteme für Zähler und deren Fernablesung - Teil 3: Spezielle Anwendungsschicht

Systèmes de communication et de télérelevé de compteurs - Partie 3: Couche d'application spéciale

Ta slovenski standard je istoveten z: **EN 13757-3:2013**

ICS:

33.200	Daljinsko krmiljenje, daljinske meritve (telemetrija)	Telecontrol. Telemetering
35.100.70	Uporabniški sloj	Application layer

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EUROPEAN STANDARD

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English Version

Communication systems for and remote reading of meters - Part 3: Dedicated application layer

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This European Standard was approved by CEN on 7 March 2013.

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Foreword

This document (EN 13757-3:2013) has been prepared by Technical Committee CEN/TC 294 "Communication systems for meters and remote reading of meters", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2013, and conflicting national standards shall be withdrawn at the latest by November 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13757-3:2004.

It shall be noted that the following significant technical changes compared to the previous edition have been incorporated in this European Standard:

— Extension of existing frames formats for different data protocols to support various wireless transmission schemes (harmonisation with EN13757-4).

— Adding an annex with a Smart Metering profile based on the requirements of the "Smart Meter Coordination Group" of the ESO's.

— Adding an annex to have a unique translation of M-Bus-data points to OBIS-Codes.

— Update of the encryption methods to the state of the art.

— Enhancement of data points for electricity meter.

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

EN 13757, *Communication systems for meters and remote reading of meters* consists of the following parts:

— *Part 1: Data exchange*

— *Part 2: Physical and link layer*

— *Part 3: Dedicated application layer*

— *Part 4: Wireless meter readout*

— *Part 5: Wireless relaying*

— *Part 6: Local bus*

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document belongs to a series of parts of EN 13757, which covers communication systems for meters and remote reading of meters. EN 13757-1 contains generic descriptions and a communication protocol. EN 13757-2 contains a physical and a link layer for twisted pair based Meter-Bus (M-Bus). EN 13757-4 describes wireless communication (often called wireless M-Bus or wM-Bus). EN 13757-5 describes the wireless network used for repeating, relaying and routing for the different modes of EN 13757-4. EN 13757-6 describes a twisted pair local bus for short distance (Lo-Bus).

This dedicated application layer (M-Bus-Protocol) can be used with various physical layers and with link layers and network layers, which support the transmission of variable length binary transparent messages. Frequently, the physical and link layers of EN 13757-2 (twisted pair) and EN 13757-4 (wireless) as well as EN 13757-5 (wireless with routing function) or the alternatives described in EN 13757-1 are used. This dedicated application layer has been optimised for minimum battery consumption of meters, especially for the case of wireless communication to ensure long battery lifetimes of the meters. Secondly, it is optimised for minimum message length to minimise the wireless channel occupancy and hence the collision rate. Thirdly, it is optimised for minimum requirements towards the meter processor regarding requirements of RAM size, code length and computational power.

An overview of communication systems for meters is given in EN 13757-1, which also contains further definitions.

This standard concentrates on the meter communication. The meter communicates with one (or occasionally several) fixed or mobile communication partners which again might be part of a private or public network. These further communication systems might use the same or other application layer protocols, security, privacy, authentication, and management methods.

To facilitate common communication systems for CEN-meters (e.g. gas, heat, water meters and heat cost allocators) and for electricity meters, in this standard occasionally electricity meters are mentioned. All these references are for information only and are not standard requirements. The definition of communication standards for electricity meters (possibly by a reference to CEN standards) remains solely in the responsibility of CENELEC.

NOTE 1 Annex L describes how parts of this standard and of EN 13757-2 and EN 13757-4 can be used to implement smart meter functionalities. Similar functionalities could also be implemented using other physical and link layers.

NOTE 2 For information on installation procedures and their integration in meter management systems, see Annex M.

1 Scope

This European Standard applies to communication systems for meters and remote reading of meters.

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.

EN 13757-1, *Communication system for meters and remote reading of meters — Part 1: Data exchange*

EN 13757-2, *Communication systems for meters and remote reading of meters — Part 2: Physical and link layer*

EN 13757-4, *Communication systems for meters and remote reading of meters — Part 4: Wireless meter readout (Radio meter reading for operation in the 868 MHz to 870 MHz SRD band)*

EN 13757-5, *Communication systems for meters and remote reading of meters — Part 5: Wireless relaying*

EN 62056-21, *Electricity metering — Data exchange for meter reading, tariff and load control — Part 21: Direct local data exchange (IEC 62056-21)*

EN 62056-5-3, *Electricity metering data exchange — The DLMS/COSEM Suite — Part 5-3: DLMS/COSEM application layer (IEC 62056-5-3:2013)*

NOTE Further information and examples are available in the download area of http://www.m-bus.com.

3 Terms and definitions, abbreviated terms and numbers

For the purposes of this document, the following terms and definitions apply.

3.1 Terms and definitions

3.1.1
byte
an octet of bits

3.1.2
datagram
unit of data transferred from source to destination

Note 1 to entry: In previous versions of EN 13757-3 datagram was called telegram.

3.1.3
message
functional set of data transferred from source to destination

Note 1 to entry: A message may consist of one or more datagrams.

3.2 List of abbreviated terms

ACC-DMD Access Demand

ACC-NR	Access – No Reply
ACK	Acknowledge
AES	Advanced Encryption Standard
BCD	Binary Coded Decimal numbers
CI	Control Information field
CBC	Cipher Block Chaining
CMD	Command
CNF-IR	Confirm Installation Request
DES	Data Encryption Standard
DIB	Data Information Block
DIF	Data Information Field
DIFE	Data Information Field Extensions
DLMS	Device Language Message Specification
DRH	Data Record Header
E	Extension bit
LSB	Least Significant Byte
LSBit	Least Significant Bit
MDH	Manufacturer Data Header
MSB	Most Significant Byte
MSBit	Most Significant Bit
OBIS	Object Identification System (EN 62056-61)
REQ-UD	Request User Data (class 1 or 2)
RSP_UD	Respond User Data
RSSI	Received Signal Strength Indicator
SM-CG	Smart Meter Co-ordination Group
SND-IR	Send Installation Request
SND-NKE	Send Link Reset
SND-NR	Send – No Reply
SND-UD	Send User Data
VIB	Value Information Block

VIF Value Information Field

VIFE Value Information Field Extensions

3.3 Hexadecimal and binary numbers

Hexadecimal numbers are designated by a following "h"

Binary numbers are designated by a following "b"

Decimal numbers have no suffix!

4 General principles: CI-field

4.1 Overview

All higher protocol layer messages have a variable length. The length information is part of the link layer. It shall be known to the application layer in order to properly terminate its decoding of each datagram. Each message starts with a 1-byte CI (control information) field, which distinguishes between various message types and application functions and header length. It is also used to distinguish between true application layer communication and management commands for lower layers. The meaning of the remaining bytes of the message depends also on the value of the CI-field.

The fixed header structures after CI-fields are:

- No data header (None) (0 bytes), as for CI=78h: If the message contains such a “none” header the meter identification is taken from the link layer; additional control fields for application layer (like configuration field) are non-existent.

- Short data header (4 bytes or more), as for CI=7Ah: If the message contains such a “short” header, the meter identification is taken from the link layer; data header length is at least 4 bytes. Additional bytes may follow in dependency of the selected encryption mode. If no encryption is applied (encryption mode 0), the header has the minimum length of 4 bytes.

- Long data header (12 bytes or more), as for CI=72h: If the message contains such a “long” header, this header contains (independent of transmission direction) the meter identification; data header length is at least 12 bytes. Additional bytes may follow in dependency of the selected encryption mode. If no encryption is applied (encryption mode 0), the header has the minimum length of 12 byte.

When using a long data header, the meter application address is contained in this header, whereas the manufacturer assigned unique link layer address may be different (but still within the common universally unique address structure). This allows, for example, a wired to wireless converter to supply the supported meter application address in the long data header and its own address in the radio link layer. For a simple meter, which doesn’t need an additional converter, the short header is sufficient.

Refer to Annex J for the details of the CI-field specific frame structure.

Table 1 — CI-field codes used by the master or the slave

CI-field	Direction	Header	Higher layer protocol
00h-1Fh	Reserved for DLMS-based applications		DLMS (See EN 13757-1)
20h-4Fh	Reserved		
50h	Application reset or select to device	None	M-Bus

Table 1 *(continued)*

CI-field	Direction	Header	Higher layer protocol
51h	Data send to device	None	M-Bus (not for wireless)
52h	Selection of device	None	Generic
53h	Application reset or select to device	Long	M-Bus
54h-59h	Reserved		
5Ah	Command to device	Short	M-Bus
5Bh	Command to device	Long	M-Bus
5Ch	Synchronise action		
5Dh-5Fh	Reserved		
60h	Command to device	Long	Application layer DLMS/ COSEM with OBIS-Identifier (EN 62056-5-3)[a]
61h	Command to device	Short	Application layer DLMS/ COSEM with OBIS-Identifier (EN 62056-5-3)[a]
62h-63h	Reserved		
64h	Command to device	Long	Reserved for OBIS-type value descriptors[a]
65h	Command to device	Short	Reserved for OBIS-type value descriptors[a]
66h-68h	Reserved		
69h	Response from device (M-Bus-Format frame)	None	See Annex K
6Ah	Response from device (M-Bus-Format frame)	Short	See Annex K
6Bh	Response from device (M-Bus-Format frame)	Long	See Annex K
6Ch	Time sync to device	Long	Generic
6Dh	Time sync to device	Long	Generic
6Eh	Application error from device	Short	Generic
6Fh	Application error from device	Long	Generic
70h	Application error from device	None	Generic
71h	Alarm from device	None	Generic
72h	Response from device	Long	M-Bus
73h	Response from device (M-Bus-Compact frame)	Long	See Annex K
74h	Alarm from device	Short	Generic
75h	Alarm from device	Long	Generic
76h-77h	Reserved		
78h	Response from device	None	M-Bus
79h	Response from device (M-Bus-Compact frame)	None	See Annex K