SLOVENSKI STANDARD
oSIST prEN 13757-3:2016

01-september-2016

Komunikacijski sistemi za merilnike - 3. del: Aplikacijski protokoli

Communication systems for meters - Part 3: Application protocols

Kommunikationssysteme für Zähler - Teil 3: Anwendungsprotokolle

Systèmes de communication pour compteurs - Partie 3 : Protocoles d'application

Ta slovenski standard je istoveten z: prEN 13757-3

ICS:

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

oSIST prEN 13757-3:2016 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 13757-3

July 2016

ICS 33.200; 35.100.70

Will supersede EN 13757-3:2013

English Version

Communication systems for meters - Part 3: Application protocols

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 294.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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 United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. prEN 13757-3:2016 E

Contents

Page

Figures

Tables

European foreword

This document (prEN 13757-3:2016) has been prepared by Technical Committee CEN/TC 294 "Communication systems for meters", the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document together with prEN 13757-7 will supersede EN 13757-3:2013.

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

This document falls under Mandate EU M/441 "Standardisation mandate to CEN, CENELEC and ETSI in the field of measuring instruments for the development of an open architecture for utility meters involving communication protocols enabling interoperability" by providing the relevant definitions and methods for meter data transmission on application layer level. The M/441 Mandate is driving significant development of standards in smart metering.

The following significant technical changes have been incorporated in the new edition of this European Standard:

— extension of application select;

— introduction of second level table for VIFE = FDh;

— introduction of inverse compact load profile;

— introduction of new VIFE for descriptor;

— extension of VIFE = FCh table;

— extension of definitions for DIF = 0Fh/1Fh;

— transport and security services were moved to prEN 13757-7;

— informative annexes from previous version of EN 13757-3 were moved to a new technical report (in preparation).

EN 13757 is currently composed with the following parts:

— *Communication systems for meters — Part 1: Data exchange*;

— *Communication systems for meters and remote reading of meters — Part 2: Physical and link layer*;

— *Communication systems for meters — Part 3: Application protocols* [Enquiry stage; the present document];

— *Communication systems for meters and remote reading of meters — Part 4: Wireless meter readout (Radio meter reading for operation in SRD bands)*;

— *Communication systems for meters — Part 5: Wireless M-Bus relaying*;

— *Communication systems for meters — Part 6: Local Bus*;

— *Communication systems for meters — Part 7: Transport and security services* [Enquiry stage].

Introduction

This draft European Standard belongs to the EN 13757 series, 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). In prEN 13757-7 transport and security services are described.

These upper M-Bus protocol layers 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. These upper M-Bus protocol layers have been optimized for minimum battery consumption of meters, especially for the case of wireless communication, to ensure long battery lifetimes of the meters. Secondly, it is optimized for minimum message length to minimize the wireless channel occupancy and hence the collision rate. Thirdly, it is optimized for minimum requirements towards the meter processor regarding requirements of RAM size, code length and computational power.

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, water meters, thermal energy 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.

The European Committee for Standardization (CEN) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning Image Transfer given in Annex I.

CEN takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has ensured CEN that he/she is willing to negotiate licences either free of charge or under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with CEN. Information may be obtained from:

ITRON, INC
Shig Furukawa, Associate General Counsel IP, Legal Department
2111 N. Molter Road
Liberty Lake, Washington 99019
USA

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those identified above. CEN shall not be held responsible for identifying any or all such patent rights.

CEN and CENELEC maintain online lists of patents relevant to their standards. Users are encouraged to consult the lists for the most up to date information concerning patents (ftp://ftp.cencenelec.eu/EN/IPR/Patents/IPRdeclaration.pdf).

1 Scope

This draft European Standard specifies application protocols for communication systems for meters and remote reading of meters.

This draft European Standard specifies application protocols, especially the M-Bus application protocol.

This draft European Standard is intended to be used with the lower layer specifications determined in EN 13757-2, EN 13757-4, EN 13757-5, EN 13757-6 and prEN 13757-7.

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 13757-2, *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 SRD bands)*

EN 13757-5, *Communication systems for meters — Part 5: Wireless M-Bus relaying*

EN 13757–6, *Communication systems for meters — Part 6: Local Bus*

prEN 13757-7:2016, *Communication systems for meters — Part 7: Transport and security services*

EN 62056-61, *Electricity metering — Data exchange for meter reading, tariff and load control — Part 61: Object identification system (OBIS) (IEC 62056-61)*

ISO/IEC 8859-1, *Information technology — 8-bit single-byte coded graphic character sets — Part 1: Latin alphabet No. 1*

ISO/IEC/IEEE 60559:2011-06, *Information technology — Microprocessor Systems — Floating-Point arithmetic*

3 Terms and definitions

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

3.1.1
byte
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
fragment
datagram of a fragmented message

3.1.4
Hex-ASCII
base-16 numbers encoded as ASCII characters ('0'-'9', 'A'-'F')

[SOURCE: ANSI X9 TR-31:2010]

3.1.5
message
functional set of data transferred from source to destination

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

3.1.6
sublayer
subdivision of a layer

[SOURCE: ISO/IEC 7498-1]

4 Abbreviations and symbols

4.1 Abbreviations

ACK	Acknowledge
AES	Advanced Encryption Standard
AFL	Authentication and Fragmentation Layer
ASCII	American Standard Code for Information Interchange
BCD	Binary Coded Decimal numbers
CI	Control Information field
CMD	Command
CNF-IR	Confirm Installation Request
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

4.2 Symbols

Hexadecimal numbers are designated by a following "h".

Binary numbers are designated by a following "b".

Decimal numbers have no suffix.

5 Application Layer (APL)

5.1 Introduction

This draft European Standard supports several application layer protocols. A specific protocol shall be chosen accordingly to the selected CI-Field described in prEN 13757-7:2016, 4.2. Beside the M-Bus protocol there are specific protocols described in the following chapters. Further application protocols applying DLMS/COSEM or M-Bus based usage of OBIS-type value descriptors are referenced in prEN 13757-7:2016, Table 2. Annex H defines translation from M-Bus type record descriptors to OBIS-type record descriptors.

5.2 M-Bus protocol

5.2.1 General

The single datagram has a maximum length of 255 bytes. The data, together with information regarding coding, length and the type of data, is transmitted in data records in arbitrary sequence. According to EN 13757-2, the maximum space for data are 252 bytes. The effective usable space depends on the layers with variable length below the application layer and the applied header type and the encryption method. This restriction is required to enable gateways to other link- and application layers.

The M-Bus Application Layer data may consist of two segments of data. The first segment holds M-Bus data records (see 5.2.2). The second, optional segment, holds manufacturer specific data. (see Table 1).

Table 1 — Structure of a M-Bus APL with manufacturer specific data

APL Variable data blocks (Records)	MDH (opt.)	Manufacturer specific data (optional)
Variable number	1 byte	Variable number