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Komunikacijski sistemi za merilnike - 1. del: Izmenjava podatkov

Communication systems for meters - Part 1: Data exchange

Kommunikationssysteme für Zähler - Teil 1: Datenaustausch

Systemes de communication et de télérelevé de compteurs - Partie 1 : Echange de données

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English Version

Communication systems for meters - Part 1: Data exchange

Systèmes de communication et de télérelevé de compteurs
- Partie 1 : Echange de donnéesKommunikationssysteme für Zähler - Teil 1:
Datenaustausch

This European Standard was approved by CEN on 30 August 2014.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists 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.

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

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

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Foreword

This document (EN 13757-1:2014) 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of an identical text or by endorsement, at the latest by April 2015, and conflicting national standards shall be withdrawn at the latest by April 2015.

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 13757-1:2002.

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

This document has been revised in order to reflect the 7 – layer OSI model, significant updates in Security practices, and updates to the OBIS model to reflect the state of the art.

EN 13757 comprises the following parts:

- *Part 1: Data exchange* [the present document];
- *Part 2: Physical and link layer*;
- *Part 3: Dedicated application layer*;
- *Part 4: Wireless meter readout (Radio meter reading for operation in SRD bands)*;
- *Part 5: Wireless relaying*;
- *Part 6: Local Bus*.

This document is referred to in the CEN/CLC/ETSI TR 50572:2011, *Functional Reference Architecture for Communications in Smart Metering Systems*, as a standard for communications between elements in the Smart Metering Architecture. The M/441 Mandate, which led to the CEN/CLC/ETSI TR 50572, is driving significant development of standards in smart metering.

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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

There are a number of other activities taking place in the smart metering and smart grid environment. The reader's attention is drawn to M/490, the mandate for standardization for smart grid, available from http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/2011_03_01_mandate_m490_en.pdf, and C(2012) 1342, "Guidelines for conducting a cost-benefit analysis of Smart Grid projects", available from http://ec.europa.eu/energy/gas_electricity/smartgrids/doc/20120427_smartgrids_guideline.pdf.

This document describes the data exchange and communications for meters and remote reading of meters in a generic way. It is Part 1 of EN 13757.

The main use of EN 13757-1 is to provide an overview of the protocols at the different levels and to provide a specification for the DLMS/COSEM application Layer for meters.

Additional parts to the series of standard EN 13757 are:

- *Part 2: Physical and link layer;*
- *Part 3: Dedicated application layer;*
- *Part 4: Wireless meter readout (radio meter reading for operation in SRD bands);*
- *Part 5: Wireless relaying;*
- *Part 6: Local Bus.*

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The world of metering is going through a period of rapid change, and it is anticipated that this and other parts of the standard will require amendment in a short period of time.

NOTE 1 This document makes reference to EN 62056 standards repeatedly. An exercise is taking place to reissue and renumber these standards, and it is anticipated that CEN-listed versions of these standards will be confirmed shortly. References to older versions of these standards will be comprehensively updated as part of the response to comments to this draft.

NOTE 2 Some of the ISO/IEC documents listed under Clause 2 may be available only from ISO or IEC directly. If the document you require is not available from your national standards organization, it is recommended that you contact ISO or IEC to establish the status of the document and its availability. ISO can be contacted via www.iso.org.

NOTE 3 Clause 3 contains the terms and definitions special to remote reading of meters. Annex B is used to explain terms related to the object oriented model used in COSEM, detailed in EN 62056-6-2 and OBIS, detailed in EN 62056-6-1.

1 Scope

This European Standard specifies data exchange and communications for meters and remote reading of meters in a generic way.

This European Standard establishes a protocol specification for the Application Layer for meters and establishes several protocols for meter communications which may be applied depending on the application being fulfilled.

NOTE Electricity meters are not covered by this standard, as the standardization of remote readout of electricity meters is a task for CENELEC.

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 834, *Heat cost allocators for the determination of the consumption of room heating radiators — Appliances with electrical energy supply*

EN 1434-1, *Heat meters — Part 1: General requirements*

EN 1434-2, *Heat meters — Part 2: Constructional requirements*

EN 1434-3, *Heat Meters — Part 3: Data exchange and interfaces*

EN 13757-2:2004, *Communication systems 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)*

EN 13757-5:2008, *Communication systems for meters and remote reading of meters — Part 5: Wireless relaying*

EN 13757-6, *Communication systems for meters and remote reading of meters — Part 6: Local Bus*

CEN/CLC/ETSI TR 50572, *Functional Reference Architecture for Communications in Smart Metering Systems*

EN 60870-5-2, *Telecontrol equipment and systems — Part 5: Transmission protocols — Section 2: Link transmission procedures (IEC 60870-5-2)*

EN 61334-4-1, *Distribution automation using distribution line carrier systems — Part 4: Data communication protocols — Section 1: Reference model of the communication system (IEC 61334-4-1)*

EN 61334-4-41, *Distribution automation using distribution line carrier systems — Part 4: Data communication protocols — Section 41: Application protocols — Distribution line message specification (IEC 61334-4-41)*

EN 62056-3-1, *Electricity metering data exchange — The DLMS/COSEM suite — Part 3-1: Use of local area networks on twisted pair with carrier signalling (IEC 62056-3-1)*

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

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EN 62056-6-1:2013¹⁾, *Electricity metering data exchange — The DLMS/COSEM suite — Part 6-1: Object Identification System (OBIS) (IEC 62056-6-1:2013)*

EN 62056-6-2:2013¹⁾, *Electricity metering data exchange — The DLMS/COSEM suite — Part 6-2: COSEM interface classes (IEC 62056-6-2:2013)*

EN 62056-21:2002¹⁾, *Electricity metering — Data exchange for meter reading, tariff and load control — Part 21: Direct local data exchange (IEC 62056-21:2002)*

EN 62056-42¹⁾, *Electricity metering - Data exchange for meter reading, tariff and load control — Part 42: Physical layer services and procedures for connection-oriented asynchronous data exchange (IEC 62056-42)*

EN 62056-46:2002¹⁾, *Electricity metering — Data exchange for meter reading, tariff and load control — Part 46: Data link layer using HDLC protocol (IEC 62056-46:2002)*

EN 62056-47¹⁾, *Electricity metering — Data exchange for meter reading, tariff and load control — Part 47: COSEM transport layers for IPv4 networks (IEC 62056-47)*

ISO 1155, *Information processing — Use of longitudinal parity to detect errors in information messages*

ISO 1177, *Information processing — Character structure for start/stop and synchronous character oriented transmission*

ISO 1745, *Information processing — Basic mode control procedures for data communication systems*

ISO 7498-2, *Information processing systems — Open Systems Interconnection — Basic Reference Model — Part 2: Security Architecture*

ISO 9506-1, *Industrial automation systems — Manufacturing Message Specification — Part 1: Service definition*

ISO/IEC 646, *Information technology — ISO 7-bit coded character set for information interchange*

ISO/IEC 7498-1, *Information technology — Open Systems Interconnection — Basic Reference Model: The Basic Model*

ISO/IEC 8802-2, *Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — Specific requirements — Part 2: Logical link control*

ISO/IEC 13239, *Information technology — Telecommunications and information exchange between systems — High-level data link control (HDLC) procedures*

ISO/IEC 15408 (all parts), *Information technology — Security techniques — Evaluation criteria for IT security*

ISO/IEC 15953, *Information technology — Open Systems Interconnection — Service definition for the Application Service Object Association Control Service Element*

ISO/IEC 15954, *Information technology — Open Systems Interconnection — Connection-mode protocol for the Application Service Object Association Control Service Element*

ISO/IEC 27033 (all parts), *Information technology — Security techniques — Network security*

IETF RFC 791, *Internet Protocol — Darpa Internet Program — Protocol Specification [IPv4 Network Layer]*

1) The EN 62056 series of standards are in the process of revision/renumbering.

IETF RFC 793, *Transmission Control Protocol — Darpa Internet Program — Protocol Specification*

IETF RFC 768, *User Datagram Protocol*

IETF RFC 2460, *Internet Protocol, Version 6 (IPv6) — Specification*

IETF RFC 4301, *Security Architecture for the Internet Protocol [IPsec]*

IETF RFC 5246, *The Transport Layer Security (TLS) Protocol — Version 1.2*

3 Terms and definitions

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

3.1

authorized party

utility, energy retailer, network operator, meter operator or data collection company authorized to access the information stored in the meter that is accessible to them according to the application association they can use

3.2

base conditions

fixed conditions used to express the volume of gas independently of the measurement conditions (e.g. temperature of 273,15 K and absolute pressure of 1,013 25 bar or temperature of 288,15 K and absolute pressure of 1,013 25 bar)

3.3

billing period

period over which a consumer bill is calculated

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See also B.7.

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<https://standards.iteh.ai/catalog/standards/sist/b6c3c4a7-1690-454f-811b-b0abca938d55/sist-en-13757-1-2015>

3.4

calendar

mechanism to program changes to active registers for Time-of-Use Tariffs

Note 1 to entry:

See Activity Calendar B.3.

3.5

concentrator

intelligent station in a hierarchical communications network where incoming data (generated by multiple meters) is processed as appropriate and then repackaged, relayed, retransmitted, discarded, responded to, consolidated, prioritized and / or increased to multiple messages

3.6

disturbances

influence quantity having a value within the limits specified, but outside the specified rated operating conditions of the measurement instrument

3.7

gas-volume conversion device

device that computes, integrates and indicates the volume increments measured by a gas meter as if it were operating at base conditions, using as inputs the volume at measurement conditions as measured by the gas meter, and other characteristics such as gas temperature and gas pressure

Note 1 to entry:

The conversion device can also include the error curve of the gas meter and associated measuring transformers.

Note 2 to entry:

The deviation from the ideal gas law can be compensated by the compressibility factor.