

Communication systems for meters - Part 2: Wired  
M-Bus communication

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN 13757-2:2018 sisaldab Euroopa standardi EN 13757-2:2018 ingliskeelset teksti.	This Estonian standard EVS-EN 13757-2:2018 consists of the English text of the European standard EN 13757-2:2018.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
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English Version

## Communication systems for meters - Part 2: Wired M-Bus communication

Systèmes de communication pour compteurs - Partie 2  
: Communication M-Bus filaire

Kommunikationssysteme für Zähler - Teil 2:  
Drahtgebundene M-Bus-Kommunikation

This European Standard was approved by CEN on 8 February 2018.

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## European foreword

This document (EN 13757-2:2018) has been prepared by Technical Committee CEN/TC 294 “Communication systems for 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of an identical text or by endorsement, at the latest by October 2018, and conflicting national standards shall be withdrawn at the latest by October 2018.

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

This document supersedes EN 13757-2:2004.

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

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

- a) more precise definition of collision state under 4.3.3.8;
- b) modification of application under 5.7.3.4 from “required” to “optional”;
- c) additional explanations for usage of REQ-SKE under 5.7.3.4;
- d) addition of new datagram SND-UD2 under 5.7.3.5;
- e) alignment of Annex D with revised definition of collision state under 4.3.3.8 and
- f) editorial alignments with other parts of this standard, e.g. replacement of \$E5 with ACK.

EN 13757 is currently composed with the following parts:

- *Communication systems for meters — Part 1: Data exchange;*
- *Communication systems for meters — Part 2: Wired M-Bus communication;*
- *Communication systems for meters — Part 3: Application protocols;*
- *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;*
- *CEN/TR 17167, Communication systems for meters — Accompanying TR to EN 13757-2,-3 and -7, Examples and supplementary information.*

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Introduction

This European Standard belongs to the EN 13757 series, which covers communication systems for meters. EN 13757-1 contains generic descriptions and a communication protocol. EN 13757-3 contains detailed description of the application protocols especially the M-Bus Protocol. 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). EN 13757-7 describes transport mechanism and security methods for data. The Technical Report CEN/TR 17167 contains informative annexes from EN 13757-2, EN 13757-3 and EN 13757-7.

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

The Physical and Link Layer parameters for baseband communication over twisted pairs have first been specified in EN 1434-3:1997 ("M-Bus") for heat meters. This standard is a compatible and interworking update of a part of EN 1434-3:2015 and includes also other measured media (e.g. water, gas, thermal energy, heat cost allocators), the master side of the communication and newer technical developments. It should be noted that EN 1434-3: 2015 covers also other communication techniques.

It can be used with various application layers especially the application layer of EN 13757-3.

## 1 Scope

This European Standard is applicable to the physical and link layer parameters of baseband communication over twisted pair (M Bus) for meter communication systems. It is especially applicable to thermal energy meters, heat cost allocators, water meters and gas meters.

NOTE It is usable also for other meters (like electricity meters) and for sensors and actuators. For generic descriptions concerning communication systems for meters and remote reading of meters see EN 13757-1.

## 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 13757-1:2014, *Communication systems for meters - Part 1: Data exchange*

EN 60870-5, (all parts), *Telecontrol equipment and systems (IEC 60870-5 series)*

EN 60870-5-1, *Telecontrol equipment and systems - Part 5: Transmission protocols - Section 1: Transmission frame formats*

EN 60870-5-2:1993, *Telecontrol equipment and systems - Part 5: Transmission protocols - Section 2: Link transmission procedures*

EN 61000-4-4, *Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test*

EN 61000-4-5, *Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13757-1:2014 and the following apply.

### 3.1

#### unit load

one unit load ( $1 U_L$ ) is the maximum mark state current of 1,5 mA

## 4 Physical layer specifications

### 4.1 General

Figure 1 shows the principal electrical concept of the physical layer: Information from the master to the slaves is transmitted via voltage level changes. A mark state voltage  $U_{\text{Mark}}$  (idle state, typically 36 V) and an space state voltage which is typically 12 V below  $U_{\text{Mark}}$  (but at least 12 V) is used for the data transmission. The high voltage step improves the noise immunity in the master to slave direction. The required minimum voltage supports a stable remote powering of all slaves of a segment. Signalling via a voltage change rather than by absolute voltage levels supports even large voltage drops due to wiring