SLOVENSKI STANDARD
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Vodomeri - 4. del: Dodatne funkcije

Water meters - Part 4: Additional functionalities

Wasserzähler - Teil 4: Zusätzliche Funktionalitäten

Compteurs d'eau - Partie 4 : Fonctionnalités additionnelles

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English Version

Water meters - Part 4: Additional functionalities

Compteurs d'eau - Partie 4 : Fonctionnalités additionnelles

Wasserzähler - Teil 4: Zusätzliche Funktionalitäten

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 92.

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

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European foreword

This document (prEN 14154-4:2021) has been prepared by Technical Committee CEN/TC 92 “Water meters”, the secretariat of which is held by SNV.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 14154-4:2014.

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

Introduction

This European Standard has been defined as part of the work being undertaken by the European Standards Organizations (CEN/CENELEC/ETSI) under the Commission Mandate M/441. This document utilizes the six functionalities agreed by the Smart Meters Coordination Group (SM-CG) (see Annex B) as the basis for its additional functionalities. It is not required for the Additional Functionality Device (AFD) to incorporate all functions defined in this document.

Communications for water meters are outside the scope of this document and are covered by the appropriate parts of EN 13757-1, EN 13757-2, EN 13757-3, EN 13757-4, EN 13757-5 and EN 13757-6 which provide a number of protocols and transport layers for meter communications for Gas, Water and Heat meters. The additional functionality for water meters can be provided by a number of methods; these are illustrated below, see Figure 1 (4.1), and described in detail within this document. The AFD can be integrated in the meter, attached to the meter or remote from the meter.

1 Scope

This document specifies definitions, requirements and testing of additional functionalities for water meters, without metrological impact, in combination with Additional Functionality Devices (AFD) and in response to EU/EFTA Mandate M/441 EN. These AFDs are considered as "ancillary devices" as defined in EN ISO 4064-1:2017 and EN ISO 4064-4:2014.

This document does not cover the changing of metrological software within the meter or the upload/download of metrological software.

NOTE A manufacturer can claim compliance only for additional functionalities described in this document. It is not mandatory that an AFD complies with all additional functionalities described herein.

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.

EN ISO 4064-1:2017, *Water meters for cold potable water and hot water - Part 1: Metrological and technical requirements (ISO 4064-1:2014)*

EN ISO 4064-2:2017, *Water meters for cold potable water and hot water - Part 2: Test methods (ISO 4064-2:2014)*

EN ISO 4064-4:2014, *Water meters for cold potable water and hot water - Part 4: Non-metrological requirements not covered in ISO 4064-1 (ISO 4064-4:2014)*

EN ISO 4064-5:2017, *Water meters for cold potable water and hot water - Part 5: Installation requirements (ISO 4064-5:2014)*

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

3 Terms and definitions

For the purposes of this document, the terms, definitions and symbols given in EN ISO 4064-1:2017, EN ISO 4064-2:2017, EN ISO 4064-4:2014 and EN ISO 4064-5:2017, and the following apply.

NOTE The following terms and definitions are only related to additional functionalities.

3.1
functionality
process which constantly or at defined intervals, automatically or on demand, performs specific activities such as sampling data, reading a data set, verifying or changing a status, or activating a switch

3.2
additional functionality
functionality that a smart meter provides, over and above the metrological functionality covered by the Measuring Instruments Directive

3.3
additional functionality device
device providing any additional functionality

3.4
additional functionality device type 1
AFD1
additional functionality device integrated into the meter

3.5
additional functionality device type 2
AFD2
additional functionality device directly attached to the meter

3.6
additional functionality device type 3
AFD3
additional functionality device remotely connected to the meter

3.7
automatic meter reading
technology for obtaining metering data from an on-site meter by communication from a remote access point

3.8
universal time coordinated
UTC
world time, without daylight savings

3.9
reading
primary indication of the total volume passed through the meter

3.10
metrological software
software identified during the type testing examination, which is part of the meter and is critical to its metrological characteristics

3.11
register
Indication of the specific section in the memory of the control and metering unit that records data as determined by the programme in the unit

3.12
event
condition requiring action or to log an action

3.13
event log
temporary or mid-term memorized listing of events, containing their occurrence, actions taken and their reset

3.14
interface
point or means of interaction between two systems

4 General requirements

4.1 Types of additional functionality devices and requirements

The additional functionality shall be provided by one of the following devices:

— AFD1; where all functions are within the same metrological enclosure as the meter;

— AFD2; where the AFD is attached directly to the meter. The manufacturer shall declare the appropriate device compatibility;

— AFD3; where the AFD is located remotely and connected to the meter via a pulse interface or communication interface. The manufacturer shall declare the appropriate device compatibility.

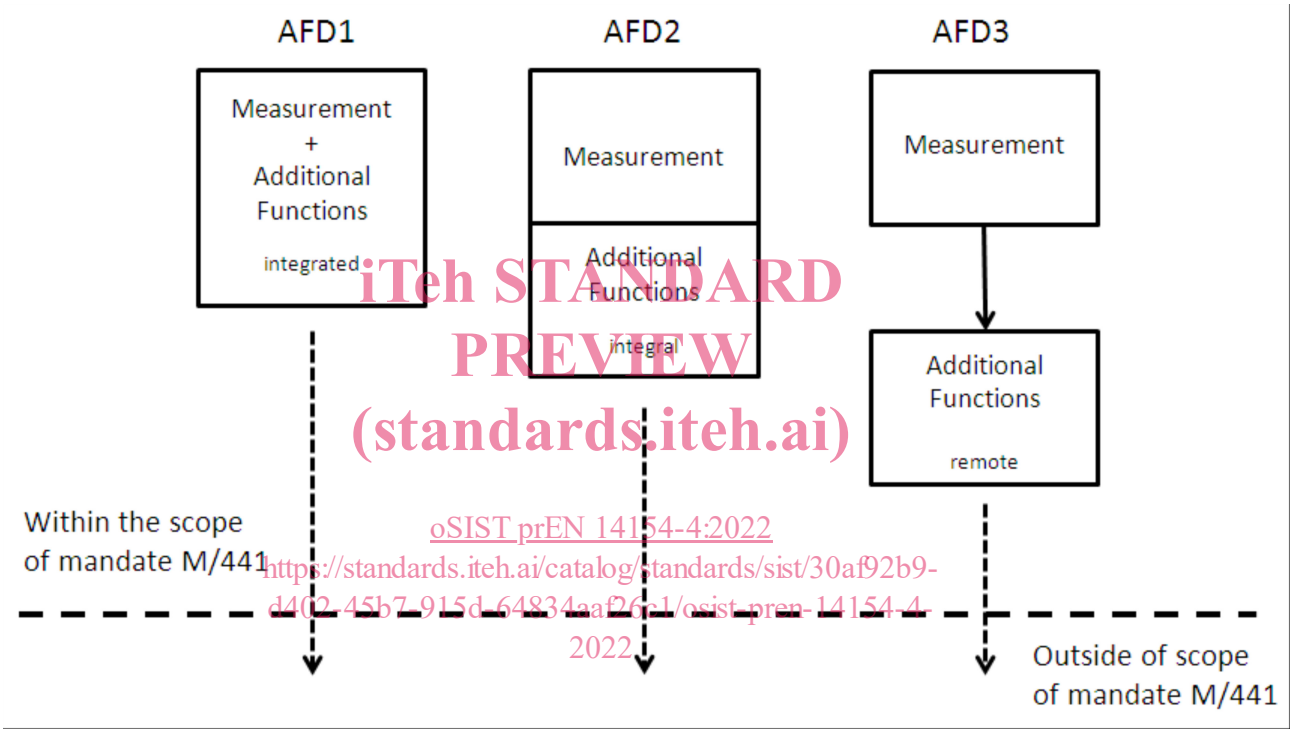

Figure 1 — Additional functionality devices

4.2 Connection requirements

The AFD2 and AFD3 shall be connected to the meter and tested as a combined unit in all the tests given in 4.11.2 to ensure the connection of the AFD to the meter has no metrological influence.

The connection of the AFD to the meter or any labelling on the meter or the AFD shall not obscure or damage any metrological seal of the meter.

When the AFD is connected, the consumer shall be able to read the primary indication on the meter to units of at least cubic meters without the use of tools.

4.3 Environmental conditions

The AFD shall work with the meter at all operating conditions of the meter as required by the appropriate standards.

Any AFD should be suitable to meet one of the environmental classes from EN ISO 4064-1:2017, A.2 and A.3 and the related tests. An AFD3 may have a different environmental class to that of the meter.

4.4 Security

4.4.1 General

The AFD shall be constructed in such a way that any unauthorized intervention shall either cause permanently visible damage to the AFD or its protective seals, or creates a report in the event log. Any physical seals shall be visibly fixed, and easily accessible.

4.4.2 Software, data and hardware security

4.4.2.1 Requirement

When tested in accordance with 4.4.2.2 the requirements below shall be met.

All available connections, ports and interfaces of the AFD which can be used for unauthorized adjustment of the AFDs characteristics and additional functionality shall be effectively secured by protective seals.

No access shall be allowed to software and firmware by unauthorised persons. Software and data shall be protected against accidental or intentional changes by the breaking of a physical seal or by using an electronic seal.

For electronic seals the following requirements shall be met:

a) access shall only be obtained by using a password or a code;

b) unauthorized intervention shall be registered in the event log and the type of intervention identified, and where available date and time to be included.

In the case of intended consumer access to the AFD, it shall be ensured that the access by the consumer cannot inadvertently drain the battery capacity, where applicable.

4.4.2.2 Test

Compliance with the above requirements shall be checked by visual inspection and evaluation of the manufacturer's technical documentation.

4.4.3 Firmware upgrade of AFD

This part of the standard covers non-metrological upgrades only, providing there is clear separation between the metrological and non-metrological functions.

Following any upgrade the information/functionality of the AFD shall be as declared by the manufacturer. Any data still present shall be the same as prior to the upgrade.

NOTE Further guidance is available in WELMEC Guide 7.2

4.4.4 Software identification

The software (including version) shall have an unambiguous identifier that is retrievable.

4.5 Power supply

The power supply of the AFD shall comply with EN ISO 4064-1:2017, EN ISO 4064-4:2014 and shall be tested accordingly.

For battery powered AFD, the manufacturer shall specify the minimum operational lifetime of the battery depending on the stated functionality and operation. (E.G transmission intervals of radio communication device)

4.6 Data storage

The AFD shall be capable of storing data such as interval and event data. The manufacturer shall declare which data are stored and how to access the stored data.

The stored data shall be retained and retrievable in non-volatile memory in the event of power failure as tested according to EN ISO 4064-2:2017 unless the AFD has a non-replacable battery.

4.7 Clock requirements

4.7.1 General

Stored data shall be time stamped. The time stamps shall be generated by a clock which gives:

— a relative time stamp, or

— a non-synchronized time stamp, or

— a synchronized time stamp.

It is recommended that the synchronized time stamp within the AFD uses UTC.

The accuracy of the time stamp shall be suitable for its intended use.

4.7.2 Clock synchronisation

If the manufacturer declares that the AFD has a clock that can be synchronised with the clock of the meter, then it shall be possible to carry out this synchronization.

A record shall also be placed in the event log showing what action was taken.

4.7.3 Clock setting

If the manufacturer allows setting of the clock, access shall only be achieved by the use of an electronic seal or the breaking of a physical seal.

A record shall also be placed in the event log showing what action was taken.

4.8 Marking

4.8.1 Requirements

When tested in accordance with 4.8.2 the AFD shall as a minimum be marked as follows:

a) the number and date of this standard;

b) identification mark or name of the manufacturer;

c) serial number and year of manufacture;

d) mark with respective IP rating (EN 60529:1991);

e) ambient temperature range;

f) information about the type of battery (for security, transport and recycling purposes).

NOTE Additional marking might be required by legislation (e.g. CE marking, etc.).