



SLOVENSKI STANDARD SIST EN ISO 16407-1:2018

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Elektronsko pobiranje pristojbin - Ugotavljanje skladnosti opreme z ISO/TS 17575-1 - 1. del: Zgradba preskuševalnega niza in namen preskušanja (ISO 16407-1:2017)

Electronic fee collection - Evaluation of equipment for conformity to ISO 17575-1 - Part 1: Test suite structure and test purposes (ISO 16407-1:2017)

Elektronische Gebührenerhebung - Konformitätsbeurteilung von Geräten nach ISO 17575-1 - Teil 1: Struktur und Zweck des Prüfprogrammes (ISO 16407-1:2017)

Perception du télépéage - Évaluation de la conformité de l'équipement à l'ISO 17575-1 - Partie 1: Structure de la suite d'essais et objectifs des essais (ISO 16407-1:2017)

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NORME EUROPÉENNE
EUROPÄISCHE NORM

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December 2017

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Supersedes CEN ISO/TS 16407-1:2011

English Version

**Electronic fee collection - Evaluation of equipment for
conformity to ISO 17575-1 - Part 1: Test suite structure
and test purposes (ISO 16407-1:2017)**

Perception du télépéage - Évaluation de la conformité
de l'équipement à l'ISO 17575-1 - Partie 1: Structure de
la suite d'essais et objectifs des essais (ISO 16407-
1:2017)

Elektronische Gebührenerhebung -
Konformitätsbeurteilung von Geräten nach ISO/TS
17575-1 - Teil 1: Struktur und Zweck des
Prüfprogrammes (ISO 16407-1:2017)

This European Standard was approved by CEN on 5 December 2017.

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN ISO 16407-1:2017) has been prepared by Technical Committee ISO/TC 204 “Intelligent transport systems” in collaboration with Technical Committee CEN/TC 278 “Intelligent transport systems” the secretariat of which is held by NEN.

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of an identical text or by endorsement, at the latest by June 2018, and conflicting national standards shall be withdrawn at the latest by June 2018.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 CEN ISO/TS 16407-1:2011.

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INTERNATIONAL
STANDARD

ISO
16407-1

First edition
2017-11

**Electronic fee collection — Evaluation
of equipment for conformity to ISO
17575-1 —**

**Part 1:
Test suite structure and test purposes**

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*Perception du télépéage — Évaluation de la conformité de
l'équipement à l'ISO 17575-1 —
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Partie 1: Structure de la suite d'essais et objectifs des essais*

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
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ISO 16407-1:2017(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html. (standards.iteh.ai)

This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

This first edition cancels and replaces ISO/TS 16407-1:2011, which has been technically revised.

The main changes compared to the previous edition are as follows:

- this document has been converted from a Technical Specification to an International Standard;
- this document has been amended to reflect changes to the underlying base standards, especially ISO 17575;
- this document contains major changes regarding
 - data element changes introduced by ISO 17575-1 and ISO 17575-3,
 - new test purposes related to protocol version handling and authenticated data elements,
 - removed test purposes related to rules with respect to charging which are not anymore required by ISO 17575-1,
 - revised terms and definitions, and
 - editorial and formal corrections, as well as changes to improve readability.

A list of all parts in the ISO 16407 series can be found on the ISO website.

Introduction

This document, is part of a series of International Standards that supports interoperability of autonomous electronic fee collection (EFC) systems. Autonomous systems use satellite positioning, often combined with additional sensor technologies, such as gyroscopes, odometers and accelerometers, to localize the vehicle and to find its position on a map containing the charged geographic objects, such as charged roads or charged areas. From the charged objects, the vehicle characteristics, the time of day and other data that are relevant for describing road use, the tariff and ultimately, the road usage fee is determined.

Autonomous on-board equipment (OBE) operates without relying on dedicated road-side infrastructure by employing wide-area technologies such as Global Navigation Satellite Systems (GNSS) and Cellular Communications Networks (CN). Therefore, autonomous systems can also be referred to as GNSS/CN systems.

Within the series of EFC standards, this document defines tests for conformity evaluation of Front End and Back End that comply with the requirements towards the charging specified in ISO 17575-1.

This document is based on ISO 17575-1 and the ISO/IEC 9646 series of standards on conformance test methodology.

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Electronic fee collection — Evaluation of equipment for conformity to ISO 17575-1 —

Part 1: Test suite structure and test purposes

1 Scope

The ISO 16407 series of standards specifies a suite of tests in order to assess the Front End and Back End behaviour compliancy towards the requirements listed in ISO 17575-1. This document contains the definition of such tests in the form of test purposes, listing the required initial conditions, references and individual steps in a structured textual manner.

Test purposes defined in this document reflect the structural and semantical requirements stated in ISO 17575-1:

- presence/absence of particular data elements;
- semantics related to various data elements:
 - data group General (see ISO 17575-1:2016, 7.3);
 - data group Security (see ISO 17575-1:2016, 7.4);
 - data group Contract (see ISO 17575-1:2016, 7.5);
 - data group Usage (see ISO 17575-1:2016, 7.6);
 - data group Account (see ISO 17575-1:2016, 7.7);
 - data group Versioning (see ISO 17575-1:2016, 7.8).

With regard to the individual data sets and EFC attributes defined in ISO 17575-1, the test purposes have been organized into the test suite groups designated for the Front End and Back End, respectively.

Besides the test purposes, this document also specifies proforma conformance test report templates for both the Front End and Back End test purposes.

For more information regarding the requirements against which the conformance is evaluated in this document, see ISO 17575-1.

Testing of the following behaviours and functionalities is outside of the scope of this document:

- dynamic behaviour, i.e. sequence of messages and triggering events that can be exchanged/happen to fulfil certain charging scenarios;
- profiles and business logic built on top of particular pricing schemas;
- as ISO 17575-1 does not specify any Behaviour Invalid of Front End and Back End, BI test purposes are not applicable for any test purpose group.

ISO 16407-1:2017(E)

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.

ISO 17575-1:2016, *Electronic fee collection — Application interface definition for autonomous systems — Part 1: Charging*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1
area charging
charging based on road usage within a given area

[SOURCE: ISO 17575-1:2016, 3.1]

3.2
attribute
addressable package of data consisting of a single *data element* (3.9) or structured sequences of data elements

[SOURCE: ISO 17575-1:2016, 3.2]

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3.3
authenticator
data, possibly encrypted, that is used for authentication

[SOURCE: EN 15509:2014, 3.3]

3.4
Back End
part of a back office system interfacing to one or more *Front Ends* (3.11)

[SOURCE: ISO 17575-1:2016, 3.4]

3.5
charge object
geographic or road related object for the use of which a charge is applied

[SOURCE: ISO 17575-1:2016, 3.5]

3.6
charge report
information containing road usage and related information originated at the *Front End* (3.11)

[SOURCE: ISO 17575-1:2016, 3.6]

3.7
cordon
border line of an area

[SOURCE: ISO 17575-1:2016, 3.7]

3.8**cordon charging**

charging for the crossing of a *cordon* (3.7)

[SOURCE: ISO 17575-1:2016, 3.8]

3.9**data element**

coded information, which might itself consist of lower level information structures

[SOURCE: ISO 17575-1:2016, 3.9]

3.10**data set**

logical set of *data elements* (3.9) with a semantic relation

[SOURCE: ISO 17575-1:2016, 3.10, modified — Note 1 to entry has been deleted.]

3.11**Front End**

part of a tolling system consisting of an *OBE* (3.13) and possibly, a *proxy* (3.14) where road tolling information and usage data are collected and processed for delivery to the *Back End* (3.4)

[SOURCE: ISO/TS 19299:2015, 3.17, modified — The term “road” has been added in the definition as well as Note 1 to entry.]

Note 1 to entry: The Front End comprises the OBE and an optional proxy.

3.12**layout**

technical description of the location of tolled objects including their borders

[SOURCE: ISO 17575-3:2016, 3.12]

3.13**on-board equipment****OBE**

all required equipment on-board a vehicle for performing required EFC functions and communication services

[SOURCE: ISO 17575-3:2016, 3.13]

3.14**proxy**

optional part of a *Front End* (3.11) that communicates with external equipment and processes the data received into an agreed format to be delivered to the *Back End* (3.4)

[SOURCE: ISO 17575-1:2016, 3.13]

3.15**road section charging**

tolling principle where the fee is due if predefined sections of roads are used

[SOURCE: ISO 17575-1:2016, 3.14]

3.16**toll**

charge, tax, or duty levied in connection to using a vehicle in a *toll domain* (3.20)

Note 1 to entry: The definition is the generalization of the classic definition of a toll as a charge, a tax, or a duty for permission to pass a barrier or to proceed along a road, over a bridge, etc. The definition also includes fees regarded as an (administrative) obligation, e.g. a tax or a duty.