SLOVENSKI STANDARD
oSIST prEN ISO 16407-2:2017

01-julij-2017

Elektronsko pobiranje pristojbin - Ugotavljanje skladnosti opreme z ISO/TS 17575-1 - 2. del: Abstraktni preskuševalni niz (ISO/DIS 16407-2:2017)

Electronic fee collection - Evaluation of equipment for conformity to ISO 17575-1 - Part 2: Abstract test suite (ISO/DIS 16407-2:2017)

Elektronische Gebührenerhebung - Konformitätsbeurteilung von Geräten nach ISO/TS 17575-1 - Teil 2: Abstrakte Prüfreihe (ISO/DIS 16407-2:2017)

Perception de télépéage - Évaluation de conformité de l'équipement à l'ISO 17575-1 - Partie 2: Suite de test abstraite (ISO/DIS 16407-2:2017)

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03.220.20	Cestni transport	Road transport
35.240.60	Uporabniške rešitve IT v prometu	IT applications in transport

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

Part 2:
Abstract test suite

Perception de télépéage — Évaluation de conformité de l'équipement à l'ISO/TS 17575-1 —

Partie 2: Suite de test abstraite

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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).

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For an explanation on 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.

The committee responsible for this document is ISO/TC204

This edition of ISO 16407-2 cancels and replaces ISO/TS 16407-2:2011, which has been technically revised. The following changes have been made:

— conversion from a Technical Specification to an International Standard,

— amendments to reflect changes to the underlying base standards, especially ISO 17575,

— major changes regarding,

  — data element changes introduced by ISO 17575-1:2016 and ISO 17575-3:2016

  — new test cases related:

    — authentication support in Charge Report,

    — authentication support in Usage Statement,

    — DUT responses behavior.

  — removed test cases related to:

  — communicatons services,

  — rules with respect to support of charging which are not anymore required by ISO 17575-1:2016.

— revised terms and definitions,

— editorial and formal corrections as well as changes to improve readability.

Introduction

This document, ISO 16407-2, is part of a set of standards that supports interoperability of autonomous EFC-systems. Autonomous systems use satellite positioning, often combined with additional sensor technologies such as gyroscopes, odometers, and accelerometers, to localise 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 equiment (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 may also be referred to as GNSS/CN systems.

Within the suite 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.

ISO 16407-2 is based on ISO 16407-1.

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ISO/DIS 16407-2:2017(E)

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

Part 2: Abstract test suite

1 Scope

The scope of ISO 16407 (all parts) is to provide a suite of tests in order to assess the Front End and Back End behaviours compliancy towards the requirements listed in ISO 17575-1. This document contains the definition of such tests in the form of Test Cases, reflecting the required individual steps listed in specific Test Purposes defined in ISO 16407-1. The Test Cases are written in Testing and Test Control Notation version 3 (TTCN v3).

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*

ISO 17575-3:2016, *Electronic fee collection — Application interface definition for autonomous systems — Part 3: Context data*

ISO 16407-1:2016, *Electronic fee collection — Evaluation of equipment for conformity to ISO 17575-1 — Part 1: Test suite structure and test purposes*

3 Terms and definitions

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

3.1
Back End
part of a back office system interfacing to one or more Front Ends

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

3.2
conformance testing
assessment to determine whether an implementation complies with the requirements

3.3
Front End
part of a tolling system consisting of an OBE and possibly a proxy where road tolling information and usage data are collected and processed for delivery to the Back End

[SOURCE: ISO/TS 19299:2015, 3.17]

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3.4
implementation under test
implementation of one or more open systems interconnection (OSI) protocols in an adjacent user/provider relationship, being part of a real system which is to be studied by testing

3.5
system under test
real system in which the implementation under test resides

[SOURCE: ISO/IEC 9646-1, definition 3.3.103 modified]

3.6
test case
description of test purpose, unique test case identifier, test inputs, test execution conditions, test steps, and the results required to pass the test

[SOURCE: ISO/IEC 18013-4:2011, 4.1]

4   Abbreviated terms

For the purposes of this document, the following abbreviated terms apply.

ASN.1   Abstract Syntax Notation One

ATM   Abstract Test Method

ATS   Abstract Test Suite

BE   Back End

DUT   Device Under Test

FE   Front End

IUT   Implementation Under Test

PIXIT   Protocol Implementation Extra Information for Testing

SCS   Semiconductor Characterization System

SUT   System Under Test

TC   Test Case

TTCN-3   Testing and Test Control Notation version 3

5   Abstract Test Method (ATM)

5.1   Introduction

This clause describes the abstract test method (ATM) used to test the layers at the front end (FE) side and at the back end (BE) side.

5.2   Test architecture

The *implementation under test* (IUT) is either the FE or the BE. The *System under test* (SUT) comprises also the communication sub-layer, which is necessary to perform the IUT tests.

The tester shall execute the testing and test control notation version 3 (TTCN-3) *test cases* of the present document as specified in <u>Annex A</u>, running on an emulated communication sub-layer.
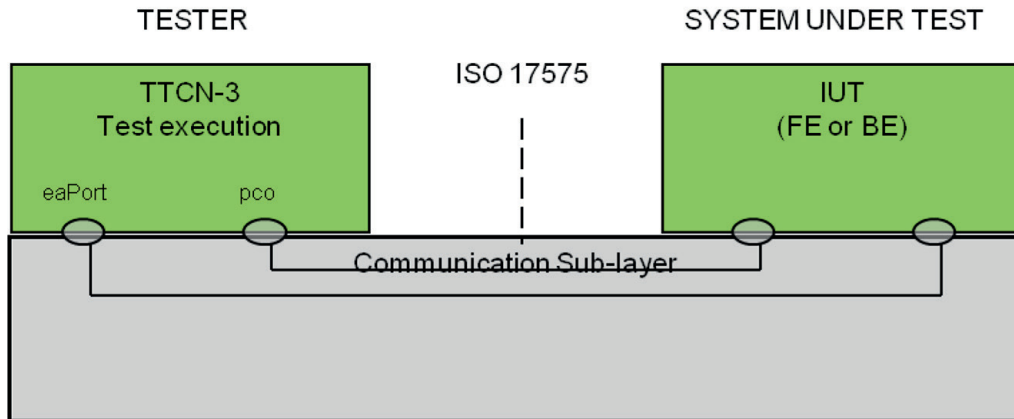
The Figure 1 describes the test architecture.

Figure 1 — Test system architecture

5.3   Protocol Implementation Extra Information for Testing (PIXIT)

The supplier of the Front End and Back End, respectively, is responsible for providing the Protocol Implementation Extra Information for Testing (PIXIT).

The supplier of the Front End and the Back End shall complete a PIXIT; see <u>Annex B</u> for a proforma.

6   Untestable Test Purposes (TP)

This clause gives a list of test purposes (TPs), which are not implemented in the abstract test suite (ATS) due to the chosen Abstract Test Method or other restrictions.

Table 1 — Untestable TPs

Test purpose	Reason
(empty)	(empty)

NOTE   Currently no untestable TPs have been identified.

7   Parameterized support

Several definitions of data elements, according to the abstract syntax definition one (ASN.1), (see Table 2 for the full list of concerned data elements) use the parametrisation feature of ASN.1. At the time of writing this document, such feature is yet not supported by TTCN-3 standards. In order to provide functional and compilable test suite, all the data elements defined in parametrised way in ASN.1 have been manually defined directly in TTCN code, using TTCN-3 advanced parametrisation feature (see Example). This measure does not have any implications on the testing procedure, however in order to compile the TTCN-3 code, the software tool to be used for such purpose has to support the TTCN-3 advanced parametrisation feature.

NOTE 1   Such workaround is considered temporary.