SLOVENSKI STANDARD
oSIST prEN ISO 13143-1:2024

01-marec-2024

Elektronsko pobiranje pristojbin - Ugotavljanje skladnosti opreme v vozilu in obcestni napravi s standardom ISO 12813 - 1. del: Zgradba preskuševalnega niza in namen preskušanja (ISO/DIS 13143-1:2023)

Electronic fee collection - Evaluation of on-board and roadside equipment for conformity to ISO 12813 - Part 1: Test suite structure and test purposes (ISO/DIS 13143-1:2023)

Elektronische Gebührenerhebung - Bewertung der Konformität fahrzeuginterner und straßenseitiger Ausrüstung nach ISO 12813 - Teil 1: Struktur und Zweck des Prüfprogrammes (ISO/DIS 13143-1:2023)

Perception de télépéage - Évaluation des équipements embarqués et en bord de route quant à la conformité avec l'ISO 12813 - Partie 1: Structure de suite d'essais et buts des essais (ISO/DIS 13143-1:2023)

Ta slovenski standard je istoveten z: **prEN ISO 13143-1**

ICS:

03.220.20	Cestni transport	Road transport
35.240.60	Uporabniške rešitve IT v prometu	IT applications in transport
43.040.15	Avtomobilska informatika. Vgrajeni računalniški sistemi	Car informatics. On board computer systems

oSIST prEN ISO 13143-1:2024 **en,fr,de**

DRAFT INTERNATIONAL STANDARD

ISO/DIS 13143-1

ISO/TC **204**

Secretariat: **ANSI**

Voting begins on:
2023-12-18

Voting terminates on:
2024-03-11

Electronic fee collection — Evaluation of on-board and roadside equipment for conformity to ISO 12813 —

Part 1:
Test suite structure and test purposes

Perception de télépéage — Évaluation des équipements embarqués et en bord de route quant à la conformité avec l'ISO 12813 —

Partie 1: Structure de suite d'essais et buts des essais

ICS: 03.220.20; 35.240.60

This document is circulated as received from the committee secretariat.

ISO/CEN PARALLEL PROCESSING

Reference number
ISO/DIS 13143-1:2023(E)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

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 of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 278, *Intelligent transport systems*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the secondedition (ISO 13143-1:2020), which has been technically revised. In addition, as a result of the withdrawal of ISO 13143-2, the title of this document is changed to ISO 13141 Electronic fee collection — Evaluation of on-board and roadside equipment for conformity to ISO 12813.

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

— amendments to reflect changes to the underlying requirements standards, in particular ISO 12813 and ISO 14906;

— updating of terms and definitions, including the reference to ISO/TS 17573-2 as the primary source;

— updating of data definitions, including the reference to ISO 17573-3 and ISO/FDIS 12813:2023 as the primary sources;

— amendment of terms to reflect the harmonization of terms across electronic fee collection (EFC) standards.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

On-board equipment (OBE) that uses satellite-based positioning technology to collect data required for charging for the use of roads operates in an autonomous way (i.e. without relying on dedicated roadside infrastructure). The OBE records the amount of road usage in all toll charging systems it passes through.

This document defines the process and tests for evaluation of OBE and roadside equipment (RSE) for conformity to ISO 12813.

ISO 12813 defines requirements for dedicated short-range communication (DSRC) between OBE and an interrogator for the purpose of checking conformance of road use with a local toll regime. It assumes an electronic fee collection (EFC) services architecture according to ISO 17573-1.

This document is intended to:

— assess OBE and RSE capabilities,

— assess OBE and RSE behaviour,

— serve as a guide for OBE and RSE conformance evaluation and type approval,

— achieve comparability between the results of the corresponding tests applied in different places at different times, and

— facilitate communication between parties.

This document is based on:

— ISO 12813,

— the set of DSRC standards defining the communication stack, and

— ISO/IEC 9646.

Electronic fee collection — Evaluation of on-board and roadside equipment for conformity to ISO 12813 —

Part 1:
Test suite structure and test purposes

1 Scope

This document specifies the test suite structure (TSS) and test purposes (TPs) for evaluating the conformity of on-board equipment (OBE) and roadside equipment (RSE) to ISO 12813.

It provides a basis for conformance tests for dedicated short-range communication (DSRC) OBE and RSE to support interoperability between different equipment supplied by different manufacturers.

ISO 12813 defines requirements on the compliance check communication (CCC) interface level, but not for the RSE or OBE internal functional behaviour. Consequently, tests regarding OBE and/or RSE functional behaviour remain outside the scope of this document.

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 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country code*

ISO/FDIS 12813:2023, *Electronic fee collection — Compliance check communication for autonomous systems*

ISO 14816, *Road transport and traffic telematics — Automatic vehicle and equipment identification — Numbering and data structure*

ISO 14906:2022, *Electronic fee collection — Application interface definition for dedicated short-range communication*

ISO 14907-2:2021, *Electronic fee collection — Test procedures for user and fixed equipment — Part 2: Conformance test for the on-board unit application interface*

EN 12834:2003, *Road transport and traffic telematics — Dedicated Short Range Communication (DSRC) — DSRC application layer*

EN 13372:2004, *Road Transport and Traffic Telematics (RTTT) — Dedicated short-range communication — Profiles for RTTT applications*

EN 15509:2023, *Electronic fee collection — Interoperability application profile for DSRC*

EN 15876-1, *Electronic fee collection — Evaluation of on-board and roadside equipment for conformity to EN 15509 — Part 1: Test suite structure and test purposes*

ETSI/TS 102 486-2-2 V1.2.1, *(2008-10), Intelligent Transport Systems (ITS); Road Transport and Traffic Telematics (RTTT); Test specifications for Dedicated Short Range Communication (DSRC) transmission equipment; Part 2: DSRC application layer; Sub-Part 2: Test Suite Structure and Test Purposes (TSS & TP)*

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:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
access credentials
trusted attestation or secure module that establishes the claimed identity of an object or application

[SOURCE: ISO/TS 17573-2:2020, 3.4]

3.2
attribute
addressable package of data consisting of a single data element or structured sequences of data elements

[SOURCE: ISO/TS 17573-2:2020, 3.13]

3.3
authentication
security mechanism allowing verification of the provided identity

[SOURCE: EN 301 175 V1.1.1:1998, 3]

3.4
authenticator
data, possibly encrypted, that is used for *authentication* (3.3)

[SOURCE: ISO/TS 17573-2:2020, 3.16]

3.5
data group
class of closely related *attributes* (3.2)

[SOURCE: ISO/TS 17573-2:2020, 3.55]

3.6
element
dedicated short-range communication (DSRC) directory containing application information in the form of *attributes* (3.2)

3.7
implementation conformance statement
statement of capabilities and options that have been implemented that defines to what extent the implementation is compliant with a given specification

[SOURCE: ISO/TS 17573-2:2020, 3.90]

3.8
protocol implementation conformance statement
ICS (3.7) for an implementation or system claimed to conform to a given protocol specification

[SOURCE: ISO/IEC 9646-1:1994, 3.3.80]

3.9
on-board equipment
all required equipment on-board a vehicle for performing required electronic fee collection (EFC) functions and communication services

[SOURCE: ISO/TS 17573-2:2020, 3.126]

3.10
roadside equipment
fixed of moveable electronic fee collection (EFC) equipment located along or on the road

[SOURCE: ISO/TS 17573-2:2020, 3.161]

3.11
tester
combination of equipment, humans and processes able to perform specified conformance tests

[SOURCE: ISO/TS 17573-2:2020, 3.188]

3.12
transaction
whole of the exchange of information between two physically separated communication facilities

[SOURCE: ISO/TS 17573-2:2020, 3.211]

4 Abbreviated terms

AC_CR	access credentials
AID	application identifier
APDU	application protocol data unit
AP	application process
ATS	abstract test suite
BI	behaviour invalid (i.e. invalid behaviour tests)
BST	beacon service table
BV	behaviour valid (i.e. valid behaviour tests)
CCC	compliance check communication
DLC	data link control
DSRC	dedicated short-range communication
DUT	device under test
EFC	electronic fee collection
EID	element identifier
ICS	implementation conformance statement
LLC	logical link control
MAC	medium access control

OBE	on-board equipment
PCTR	protocol conformance test report
PDU	protocol data unit
PICS	protocol implementation conformance statement
PIXIT	protocol implementation extra information for testing
RSE	roadside equipment
SCTR	system conformance test report
T-APDU	transfer-application protocol data unit
TP	test purpose
TP-ID	Test purpose identifier
TSS	test suite structure
VST	vehicle service table

5 Conformance

The supplier of the OBE and RSE, respectively, is responsible for providing a conformance test report.

The supplier of the OBE shall complete the protocol conformance test report (PCTR) for the OBE as specified in Annex C.

The supplier of the RSE shall complete the PCTR for the RSE as specified in Annex D.

6 Test suite structure (TSS)

6.1 Structure

Table 1 shows the test suite structure (TSS) including its subgroups that are inherited from other specifications.

Table 1 — Test suite structure

Group	Type of DUT	Behaviour
Physical layer	OBE	BV
		BI
	RSE	BV
		BI
Data link control (DLC) Medium access control (MAC) sublayer	OBE	BV
		BI
	RSE	BV
		BI
DLC logical link control (LLC) sublayer	OBE	BV
		BI
	RSE	BV
		BI

Table 1 *(continued)*

Group	Type of DUT	Behaviour
Application layer	OBE	BV
		BI
	RSE	BV
		BI

Physical layer tests shall be performed in a radio wave laboratory.

6.2 Reference to conformance test specifications

Conformance to a profile standard implies conformance to the related base standards. Hence, a number of test cases for the CCC application are identical to the conformance test cases for the related base standards. Other test cases are derived from the base standards conformance test cases, by applying some restrictions or choices in, for example, the parameters values, according to what is stated in the profile standard. Finally, specific conformance test cases for the CCC application are identified for statements contained in the CCC application, which have no equivalence in the base standards. These latter cases cover for example, the application layer data test purposes. This document takes into account already defined test purposes for conformance to the base standards by referencing them, so that:

a) For test purposes that are identical to those defined in the base standards conformance test cases (see e.g. ETSI/TS 102 486-2-2 or EN 15876-1), a direct reference is reported. For the reader's convenience, the title or a verbal description of the referenced test purpose is provided, together with the reference.

b) For test purposes that are derived from those defined in the base standards conformance test cases, a direct reference is reported, plus an indication on how the referred test purpose has been modified for the profile conformance testing.

c) For test purposes that are specific to the standard profile, a complete description is provided.

An indication on whether a test purpose is identical, derived, or specific is given in each test purpose.

6.3 Test purposes (TPs)

6.3.1 TP definition conventions

The TPs are defined following the template and rules shown in Table 2. All TPs are defined in Annex A (tests related to OBE) and Annex B (test related to RSE).

Table 2 — TP definition rules

TP ID according to the TP naming conventions	Title
	Reference
	TP origin
	Initial condition
	Stimulus and expected behaviour
TP ID	The TP ID is a unique identifier. It is specified according to the TP naming conventions defined in 5.3.2.
Title	Short description of TP objective.
Reference	Contains the reference (document, clause, paragraph) to the subject to be validated by the actual TP.
TP origin	Indicates if the TP is identical to a TP defined in another test standard, derived from a TP defined in another test standard, or specific for this standard profile.

Table 2 *(continued)*

TP ID according to the TP naming conventions	Title
	Reference
	TP origin
	Initial condition
	Stimulus and expected behaviour
Initial condition	The condition defines the required initial state of the device under test (DUT) MACPCTR at the time of launching of the actual TP.
Stimulus and expected behaviour	Definition of the events the tester performs and the events that are expected from the DUT to conform to the base specification.

6.3.2 TP naming conventions

Each TP is given a unique identification. This unique identification is built up to contain the following string of information:

TP/ <group>/<dut>/<x>-<nn>

TP : to indicate that it is a test purpose;

<group> : to which group among those defined in Table 1 the TP applies;

<dut> : type of DUT (i.e. OBE or RSE);

<x> : type of testing (i.e. Valid behaviour tests, BV, or Invalid behaviour tests, BI);

<nn> : sequential TP number (01 to 99).

The naming conventions are as described in Table 3.

Table 3 — TP naming conventions

<group>	<dut>	<x>
applicable for OBE/RSE	PHY	Physical layer
applicable for OBE/RSE	MAC/LLC	MAC/LLC sublayer
applicable for OBE/RSE	AP-BAS	Application layer – I Kernel support
applicable for OBE	AP-FUN	Application layer – T Kernel support
applicable for OBE	AP-DAT	Application layer – Data attributes support
applicable for OBE	AP-SEC	Application layer – Security Level 1 support
applicable for RSE	AP-GET	Application layer - GET-rq protocol data unit (PDU) test purposes,
applicable for RSE	AP-STA	Application layer - GET-STAMPED-rq PDU test purposes
applicable for RSE	AP-MMI	Application layer - SET-MMI-rq PDU test purposes
applicable for RSE	AP-ECH	Application layer - ECHO-rq PDU test purposes
applicable for RSE	AP-REL	Application layer - EVENT-REPORT-rq PDU test purposes