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English Version

Public transport - Communication between contactless readers and fare media - Part 2: Test plan for ISO/IEC 14443

Transport Public - Communication entre terminaux et objets sans contact - Partie 2 : Plan de test pour l'ISO/IEC 14443

Öffentlicher Verkehr - Kommunikation zwischen berührungslosen Lesegeräten und Fahrscheinmedien - Teil 2: Prüfplan zur ISO/IEC 14443

This Technical Specification (CEN/TS) was approved by CEN on 17 June 2019 for provisional application.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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

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European foreword

This document (CEN/TS 16794-2:2019) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN.

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/TS 16794-2:2017.

This edition updates the test plan to verify the requirements expressed within CEN/TS 16794-1:2019 and relies on the test methods described in ISO/IEC 10373-6:—.

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1 Scope

This document comes as a complement to the technical requirements expressed in CEN/TS 16794-1, for ensuring contactless communication interoperability between Public Transport (PT) devices or between PT devices compliant to CEN/TS 16794-1 and NFC mobiles devices compliant to NFC Forum specifications.

This document lists all the test conditions to be performed on a PT reader or a PT object in order to ensure that all the requirements specified in CEN/TS 16794-1 are met for the PT device under test.

This document applies to PT devices only:

— PT readers which are contactless fare management system terminals acting as a PCD contactless reader based on the ISO/IEC 14443 series;

— PT objects which are contactless fare media acting as a PICC contactless object based on the ISO/IEC 14443 series.

This document applies solely to the contactless communication layers described in Parts 1 to 4 of the ISO/IEC 14443 series. Application-to-application exchanges executed once contactless communication has been established at RF level fall outside the scope of this document. However, a test application will be used so as to make end-to-end transactions during tests on the RF communication layer.

This document does not duplicate the contents of the ISO/IEC 14443 series or ISO/IEC 10373-6 standard. It makes reference to the ISO/IEC 10373-6 applicable test methods, specifies the test conditions to be used and describes the additional specific test conditions that may be run.

The list of test conditions applicable to the PT device under test will be conditioned by the Information Conformance Statement (ICS) declaration made by the device manufacturer. For each test case, the test conditions are clearly specified in order to determine the pertinence to run or not the test case in accordance with the device capabilities or in accordance with the device manufacturer's choice.

In order to facilitate the test report issuance, a test report template is included in Annex A of this document.

Although this document aims at becoming the primary basis for certification of contactless communication protocol applicable to PT readers and PT objects, it does not describe any certification or qualification processes as such processes should be defined between local or global transit industry stakeholders.

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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.

CEN/TS 16794-1, *Public transport — Communication between contactless readers and fare media — Part 1: Implementation requirements for ISO/IEC 14443*

ISO/IEC 10373-6:—[1], *Identification cards — Test methods — Part 6: Proximity cards*

ISO/IEC 14443-1:2018, *Cards and security devices for personal identification — Contactless proximity objects — Part 1: Physical characteristics*

[1] Under preparation. Stage at the time of publication: ISO/IEC DIS 10373-6:2017.

ISO/IEC 14443-2:—,[2] *Identification cards — Contactless integrated circuit cards — Proximity cards – Part 2: Radio frequency power and signal interface*

ISO/IEC 14443-3:2018, *Cards and security devices for personal identification — Contactless proximity objects — Part 3: Initialization and anticollision*

ISO/IEC 14443-4:2018, *Cards and security devices for personal identification — Contactless proximity objects — Part 4: Transmission protocol*

ISO/IEC 15693-2, *Cards and security devices for personal identification — Contactless vicinity objects — Part 2: Air interface and initialization*

ISO/IEC 18092, *Information technology — Telecommunications and information exchange between systems — Near Field Communication — Interface and Protocol (NFCIP-1)*

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 http://www.iso.org/obp
- IEC Electropedia: available at http://www.electropedia.org/

3.1
PT device
PT reader or PT object

3.2
PT object
ISO/IEC 14443 PICC specifically designed for the use in PT systems

3.3
PT reader
ISO/IEC 14443 PCD specifically designed for the use in PT systems

3.4
Reference PICC
Reference PICC card as defined in test method ISO/IEC 10373-6

4 Symbols and abbreviated terms

For the purposes of this document, the symbols and abbreviated terms given in CEN/TS 16794-1, ISO/IEC 14443 (all parts), ISO/IEC 10373-6 and the following apply.

t_{detect} Maximum Reference PICC time-to-detection

[2] Under preparation. Stage at the time of publication: ISO/IEC DIS 14443-2:2017.

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5 Description of the test environment

5.1 Test bench

The test bench shall conform to the specifications set out in ISO/IEC 10373-6:—, Clause 5.

5.2 Tolerances applicable to ambient-environment tests

The ambient temperature and relative humidity shall conform to the specifications set out in ISO/IEC 10373-6:—, 4.1. The tolerance for minimum and maximum temperatures is ± 3 °C.

5.3 Test conditions for PCD

Unless otherwise specified, the test conditions defined below shall be applied.

— For IFM readers:

Conditions	Values
Test positions and Reference PICCs	Range A: Every position of range A (Position A1 to Position A7) with Reference PICCs 1, 2 and 3 Range B: Every position of range B (Position B1 to Position B3) with Reference PICC 3

— For Common readers:

Conditions	Values
Test positions and Reference PICCs	Range A: Position A1, Position A1,1, Position A1,2, Position A1,3, Position A1,4 and Position A2 of range A with Reference PICCs 1, 2 and 3 Range B: no position

IFM readers, Common readers and test positions are defined in CEN/TS 16794-1.

Unless otherwise specified, the values defined in ISO/IEC 10373-6:—, Table 4 shall be used to adjust PCD-test-apparatus parameters.

5.4 Test conditions for PICC

Unless otherwise specified, the test conditions defined below shall be applied.

Conditions	Values
Field strength	For PICC Class 1: 1,5 A/m, 2 A/m, 2,5 A/m, 3,5 A/m, 4,5 A/m, 6 A/m and 7,5 A/m For PICC Class 2 and Class 3: 1,5 A/m, 2 A/m, 2,5 A/m, 3,5 A/m, 4,5 A/m, 6 A/m and 8,5 A/m

Unless otherwise specified, the values defined in ISO/IEC 10373-6:—, Table 7 shall be used to adjust PICC-test-apparatus parameters.

5.5 Positional tolerance

Parameter	Unit	Tolerance
PICC-to-PCD distance	Millimetres (mm)	±1 mm, except at 0

5.6 Admissible tolerances on the measurements

Tolerances specified in ISO/IEC 10373-6 shall be applied.

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