TECHNICAL SPECIFICATION

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CEN ISO/TS 16403-1

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English Version

Electronic fee collection - Evaluation of equipment for conformity to ISO/TS 17575-4 - Part 1: Test suite structure and test purposes (ISO 16403-1:2012)

Perception du télépéage - Évaluation de conformité de l'équipement à l'ISO/TS 17575-4 - Partie 1: Structure de la suite d'essais et objectif d'essai (ISO 16403-1:2012)

Elektronische Gebührenerhebung - Konformitätsevaluierung von Einrichtungen nach CEN ISO/TS 17575-4 - Teil 1: Prüfreihen Struktur und Prüfabsichten (ISO 16403-1:2012)

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Foreword

This document (CEN ISO/TS 16403-1:2012) has been prepared by Technical Committee CEN/TC 278 "Road transport and traffic telematics", the secretariat of which is held by NEN, in collaboration with Technical Committee ISO/TC 204 "Intelligent transport systems".

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Introduction

This part of ISO/TS 16403 is part of a set of standards that supports interoperability of autonomous EFC-systems, which includes ISO/TS 17575 that defines the EFC context data, their charge reports and their use of communication infrastructure.

Within the suite of EFC standards this conformance evaluation procedure defines the process and tests for conformity evaluation of Front End and Back End that comply with the requirements in ISO/TS 17575-4.

This part of ISO/TS 16403 is intended to

— assess Front End and Back End capabilities,

— assess Front End and Back End behaviour,

— serve as a guide for Front End and Back End conformance evaluation and type approval,

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

— facilitate communications between parties.

This part of ISO/TS 16403 is based on ISO/TS 17575-4.

Electronic fee collection — Evaluation of equipment for conformity to ISO/TS 17575-4 —

Part 1:
Test suite structure and test purposes

1 Scope

This part of ISO/TS 16403 specifies the test suite structure (TSS) and test purposes (TP) to evaluate the conformity of Front End and Back End to ISO/TS 17575-4.

The objective of the present document is to provide a basis for conformance tests for the Front End and the Back End in Electronic Fee Collection based on autonomous on-board equipment (OBE) to enable interoperability between different equipment supplied by different manufacturers.

Autonomous OBE operate without relying on dedicated road-side infrastructure by employing wide-area technologies such as Global Navigation Satellite Systems (GNSS) and Cellular Communications Networks (CN). These EFC systems are referred to by a variety of names. Besides the terms autonomous systems and GNSS/CN systems, also the terms GPS/GSM systems, and wide-area charging systems are in use.

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.

Test Purposes applicable for the Back End focus on the output produced by the Back End, i.e. Roaming Rules data element. Test Purposes related to Front End focus on the main scenarios defined in ISO/TS 17575-4 6.2.4. To verify the Front End behaviour it is needed to observe Charge Reports which are defined in ISO/TS 17575-1.

The dependencies between Context Data (defined in ISO/TS 17575-3), Charge Report (defined in ISO/TS 17575-1) and Roaming (defined in ISO/TS 17575-4) to support a particular pricing scheme scenario are outside of the scope of this part of ISO/TS 16403.

As ISO/TS 17575-4 does not specify any invalid behaviour of Front End and Back End, BI test purposes are not applicable for any Test Purpose group.

2 Normative references

The following referenced documents are indispensable for the application 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 14906, *Electronic fee collection — Application interface definition for dedicated short-range communication*

ISO 17573, *Electronic fee collection — Systems architecture for vehicle-related tolling*

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

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

ISO/TS 17575-4, *Electronic fee collection — Application interface definition for autonomous systems — Part 4: Roaming*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 17573, ISO/TS 17575-1 and the following apply.

3.1
contract
expression of an agreement between two or more parties concerning the use of the road infrastructure

NOTE   A contract specifies obligations, permissions and prohibitions for the objects involved.

[ISO 14906:2011, definition 3.7]

3.2
service provider
operator that accepts the user's payment means and in return provides a road-use service to the user

NOTE   Taken from ISO 14906:2004.

3.3
toll charger
legal entity charging toll for vehicles in a toll domain

[ISO/TS 17574:2009, definition 3.27]

4 Abbreviations

For the purposes of this document, the following abbreviations apply, unless otherwise specified.

ADU   Application Data Unit

ASN.1   Abstract Syntax Notation One

ATS   Abstract Test Suite

BI   Invalid Behaviour

BV   Valid Behaviour

CCC   Compliance Check Communication

CN   Cellular Network

DUT   Device Under Tests

EFC   Electronic Fee Collection

GNSS   Global Navigation Satellite Systems

HMI   Human Machine Interface