

ICS 35.240.60; 03.220.20

English Version

**Electronic fee collection - Evaluation of equipment for conformity
to ISO/TS 17575-1 - Part 1: Test suite structure and test
purposes (ISO/TS 16407-1:2011)**

Perception du télépéage - Évaluation de la conformité de
l'équipement à l'ISO/TS 17575-1 - Partie 1: Structure de la
suite d'essais et objectifs des essais (ISO/TS 16407-
1:2011)

Elektronische Gebührenerfassung -
Konformitätsevaluierung von Geräten gemäß CEN ISO/TS
17575-1 - Teil 1: Struktur der Testfälle und deren Absichten
(ISO/TS 16407-1:2011)

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Foreword

This document (CEN ISO/TS 16407-1:2011) 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 16407 is part of a set of standards that supports interoperability of autonomous electronic fee collection (EFC) systems, which includes ISO/TS 17575 parts 1 to 4 that define 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 17575-1.

This part of ISO/TS 16407 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 evaluations and type approvals,
- achieve comparability between the results of the corresponding tests applied in different places at different times, and
- facilitate communication between parties.

This part of ISO 16407 is based on

- ISO/TS 17575-1, and
- the ISO 9646 family of standards on conformance test methodology.

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

Part 1: Test suite structure and test purposes

1 Scope

This part of ISO/TS 16407 specifies the test suite structure (TSS) and test purposes (TP) to evaluate the conformity of Front End and Back End to ISO/TS 17575-1.

The objective of this part of ISO/TS 16407 is to provide a basis for conformance tests for the Front End and the Back End in electronic fee collection (EFC) based on autonomous on-board equipment (OBE) to enable interoperability between different equipment supplied by different manufacturers.

Autonomous 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). 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.

The testing of the following behaviours and functionalities is outside of the scope of this part of ISO/TS 16407:

- dynamic behaviour, i.e. sequence of messages and triggering events that must be exchanged/happen to fulfil certain charging scenarios;
- profiles and business logic built on top of particular pricing schemas;
- authentication, as its handling is not described in ISO/TS 17575-1;
- account update procedure ("reload" and "add to account") with respect to time and duration based on on-board accounts, as run-time environment has significant impact on test purpose outcome.

As ISO/TS 17575-1 does not specify any invalid behaviour of Front End and Back End, BI test purposes are not applicable for any test purpose group.

As ISO/TS 17575-1 does not define which of the data elements shall be present in the charge report response (CRR) (and under which conditions), the scope of test purposes (TP) for Back End is very limited.

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/IEC 9646-6, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 6: Protocol profile test specification*

ISO/TS 17575-1, *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.

3.1 attribute

application information formed by one or by a sequence of data elements, and that is managed by different actions used for implementation of a transaction

[ISO 14906:2011, definition 3.3]

3.2 authenticator

data appended to, or a cryptographic transformation of, a data unit that allows a recipient of the data unit to prove the source and/or the integrity of the data unit and protect against forgery

[ISO 14906:2011, definition 3.4]

3.3 Back End

generic name for the computing and communication facilities of the Service Provider and/or the Toll Charger

[ISO/TS 17575-1:2010, definition 3.4]

3.4 charge report

data structure transmitted from the Front End to the Back End to report road usage data and supplementary related information

[ISO/TS 17575-1:2010, definition 3.5]

3.5 contract

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

[ISO 14906:2011, definition 3.7]

3.6 data element

datum, which might itself consist of lower level data elements

[ISO/TS 17575-1:2010, definition 3.10]