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Intelligent transport systems — Vehicle interface for provisioning and support of ITS Services —

Part 4: Unified vehicle interface protocol (UVIP) conformance test specification

Systèmes de transport intelligents - Interface véhicule pour la fourniture et le support de services —

Partie 4: Spécification d'essai de conformité du protocole d'interface véhicule unifié (PIVU)

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Introduction

This document has been established to define the UVIP client and server conformance tests of a common protocol interface to a vehicle UVIP server to easily exchange vehicle information data amongst nomadic and/or mobile devices, cloud servers, vehicle servers and the vehicle's Electronic Control Units (ECUs).

NOTE The abbreviation "UVIP" (Unified Vehicle Interface Protocol) derives from the original abbreviation "UGP" (Unified Gateway Protocol) see ISO 13185-2. The name was changed to avoid confusion in regard to the need of a Gateway implementation in the vehicle.

To achieve this, it is based on the Open Systems Interconnection (OSI) Basic Reference Model specified in ISO/IEC 7498-1 and ISO/IEC 10731, which structures communication systems into seven layers.

This document can be used by vehicle manufacturers for future vehicle design to support the design of a UVIP server to interface with NDs.

The ND applications need vehicle information data through an in-vehicle interface access method.

This document supports ITS applications which are based on ND in vehicles to operate on a common software interface to a V-ITS-S to easily exchange vehicle information data among ND, vehicle V-ITS-S and ECUs.

Figure 1 shows an overview of the UVIP Client and Server API. A UVIP Client Application on a P-ITS-S communicates with a UVIP Server Application on a V-ITS-S. The UVIP Client Application implements the UVIP Client API using ISO 13185-2. The UVIP Server Application implements the UVIP Server API using ISO 13185-2.

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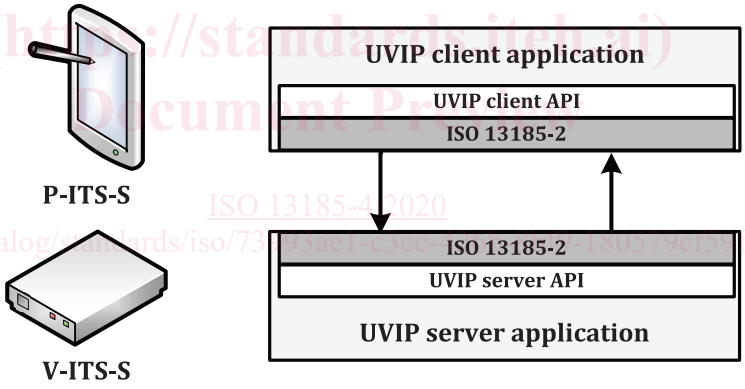

Figure 1 — UVIP client on clouds and vehicle server

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Intelligent transport systems — Vehicle interface for provisioning and support of ITS Services —

Part 4:
Unified vehicle interface protocol (UVIP) conformance test specification

1 Scope

This document specifies a conformance test for a UVIP server and client system developer assessment of self-conformance of the supplier's UVIP server and client system. The conformance test cases follow the use cases definition of ISO 13185-1 and the requirements stated in ISO 13185-2 and ISO 13185-3.

The purpose of this document is to provide information to the UVIP server and client system provider to build and test the UVIP server and client system against the conformance test cases.

2 Normative references

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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 13185-1, *Intelligent transport systems (ITS) — Vehicle interface for provisioning and support of ITS services — Part 1: General information and use case definition*

ISO 13185-2, *Intelligent transport systems — Vehicle interface for provisioning and support of ITS services — Part 2: Unified gateway protocol (UGP) requirements and specification for vehicle ITS station gateway (V-ITS-SG) interface*

ISO 13185-3, *Intelligent transport systems — Vehicle interface for provisioning and support of ITS Services — Part 3: Unified vehicle interface protocol (UVIP) server and client API specification*

ISO 21217, *Intelligent transport systems — Communications access for land mobiles (CALM) — Architecture*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13185-1, ISO 13185-2, ISO 13185-3, and ISO 21217 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 http://www.electropedia.org/

3.2 Abbreviated terms

For the purposes of this document, the abbreviations given in ISO 13185-1 and the following apply.

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CTC conformance test case

CTP conformance test plan

HVAC heating, ventilation and air conditioning

ND nomadic device

OBD on-board diagnostics

UC use case

4 Conventions

This document is based on the conventions discussed in the OSI Service Conventions in ISO/IEC 10731:1994[2] as they apply for communication services. The vehicle data transfer protocol is applicable to OSI layers 5, 6 and 7.

5 Conformance test plan (CTP) basic principles and clustering

5.1 Basic principles for CTC definition

Basic principles have been established as a guideline to define the UVIP implementation conformance test cases:

— BP1: The primary objective of the CTC is to support a company which has developed UVIP server and client systems in the assessment of self-conformance of the UVIP server and client system.

— BP2: The CTC addresses the UVIP implementation.

— BP3: The CTC is a positive test in order to test the proper functioning of the UVIP implementation i.e., correct input data provides correct output data.

— BP4: The person performing the CTC shall verify that the purpose of the use case is achieved following the descriptions of the UVIP regarding the implementation of the use case and the steps to enter the input and to obtain the output according to ISO 13185-1.

— BP5: The name of the CTC should be the same as the name of the use case (see ISO 13185-1) or requirement (see ISO 13185-2).

— BP6: Each CTC should have a preamble (setup state).

— BP7: Classification for each CTC is included in order to support the classification criteria specified for use cases and requirements.

— BP8: A CTC is only applicable if the use case or requirement is supported by the UVIP client.

— BP9: Some CTCs may require payment or a valid subscription before processing the next step.

CAUTION — The person performing the conformance test is responsible for entering valid data and correctly executing necessary actions in order to maintain the integrity of the implementation of the UVIP implementation between the UVIP client and the UVIP server (V-ITS-SG).

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5.2 CTC structure

5.2.1 CTC – General structure

5.2.1.1 CTC reference number and title [CTC_...] [title]

Each CTC is structured by six (6) subclauses:

— Overview,

— Test purpose,

— Configuration,

— Preamble (setup state),

— Test execution,

— Postamble.

In the following, details and examples for each of these titles (ordered list) are given.

A reference to the corresponding CTC requirement is specified via a unique abbreviation, number and title as follows:

— [CTC_UC x.y] of ISO 13185-1;

where:

— 'x', 'y' are numeric numbers as assigned in ISO 13185-1.

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5.2.1.2 Overview

This is a conformance test for checking the UC x.y followed by the subject description as specified in ISO 13185-2.

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5.2.1.3 Test purpose

The test purpose gives a short description of the relevant CTCs and a reference to the corresponding requirement specified in ISO 13185-1 and ISO 13185-2.

NOTE The CTC approach depends on the definition of the referenced requirement in ISO 13185-1 and ISO 13185-2.

5.2.1.4 Configuration

The configuration describes the CTC scenario pre-requisites.

5.2.1.5 Preamble (setup state)

The "Preamble" defines preconditions which are used for preparation and initialisation of the UVIP with a view to performing the specific conformance test. For example, a precondition could be the successful establishment of a connection between the UVIP client and the UVIP server (V-ITS-SG).

5.2.1.6 Test execution

Test execution of a single CTC is organized in steps. These steps are described in the example in Table 1.

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Table 1 — CTC execution example

Step #	Description
1	Description of 1st test step.
2	Description of 2nd test step.
N	Description of Nth test step.

5.2.1.7 Postamble

The "Postamble" defines post conditions which are used to return the UVIP protocol implementation back to a definite state.

5.2.2 Result criteria

The CTC result criteria are composed of three different results as listed in Table 2.

Table 2 — CTC result criteria

Result	Definition
Pass	The CTC purpose was achieved as expected.
Deficiency	The CTC purpose was achieved with opportunities for improvement identified and documented in detail.
Fail	The CTC purpose was not achieved. Reason(s) shall be documented in detail.

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5.3 CTC system setup

Figure 2 shows the conformance test system setup.

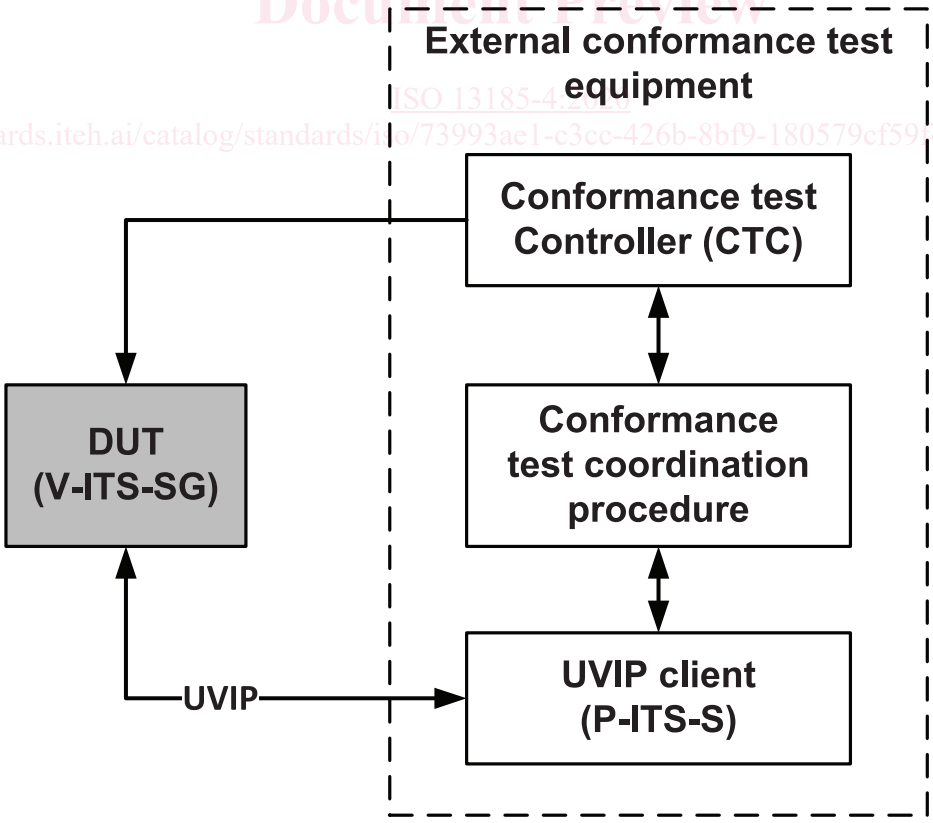

Figure 2 — Conformance test system setup

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