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Intelligent transport systems (ITS) — The use of personal ITS station to support ITS service provision for travellers —

Part 1: General information and use case definitions

Systèmes intelligents de transport (ITS) — Utilisation de la station ITS personnelle à l'appui de la fourniture du service ITS aux voyageurs —

Partie 1: Informations générales et définition des cas d'utilisation

Reference number
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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).

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

A list of all parts in the ISO 13111 series can be found on the ISO website.

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Introduction

This document specifies the interface to support a variety of applications based on the personal ITS station and data exchange between the stations being defined in the related standards or specifications in TC 204 such as vehicle ITS station, central ITS station, roadside ITS station, etc.

Applications supporting ITS service provisions and multimedia use via the personal ITS station need to harmonize with existing or developing standards or technical reports in the concerned areas. These applications would be implemented using vehicle information, driver advisory, warning systems, entertainment systems, traffic information, public transport information, slow transport system (non-motorized travel) information and multi-modal navigation service based on the communication architecture and protocol defined in ISO/TR 13185 and other related standards.

Besides ISO/TR 13185, the following standards are subject to analysis in regard to their applicability to supporting ITS service provisions and multimedia use via personal ITS stations:

— ISO 14819 defines TTI messages via traffic message coding (RDS-TMC) using ALERT-C;

— ISO/TS 18234 and ISO/TS 24530 defines TTI via Transport Protocol Experts Group (TPEG);

— ISO 19132, ISO 19133 and ISO 19134 define the conceptual schema of location base service, tracking and navigation service, and multi-modal navigation service;

— ISO 15031 defines emissions-related diagnostic data supported by vehicles in all countries requiring OBD compliance;

— ISO 27145;

— ISO 22900-2 defines the Modular Vehicle Communication Interface (MVCI) D-PDU API to separate the protocol data unit (PDU) from vehicle specific protocols;

— ISO 22901 defines the Open Diagnostic data eXchange (ODX) format which is an XML-based standard for describing diagnostic related ECU data. This standard is becoming the vehicle manufacturer's choice to document vehicle system diagnostic data and protocol information;

— ISO 22902 is a multimedia and telematics standard based on AMI-C specifications and reference documents for automotive industry. The important logical element of the architecture is a vehicle interface;

— ISO 22837 defines the reference architecture for probe vehicle systems and a basic data framework for probe data;

— ISO 29284 defines the standardization of information, communication and control systems in the field of urban and rural surface transport, including intermodal and multimodal aspects thereof, traveller information, traffic management, public transport, commercial transport, emergency services and commercial services in the ITS field;

— SAE J2735 defines the support of interoperability among DSRC applications through the use of standardized message sets, data frames and data elements.

This document defines the personal ITS stations applications such as public transport information services, slow transport (non-motorized travel as bicycle and walking) information service, multi-modal navigation services, etc.

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Intelligent transport systems (ITS) — The use of personal ITS station to support ITS service provision for travellers —

Part 1: General information and use case definitions

1 Scope

This document defines the general information and use cases of the applications based on the personal ITS station to provide and maintain ITS services to travellers including drivers, passengers and pedestrians. The ITS applications supported by this document include multi-modal transportation information service and multimodal navigation service which are based on personal ITS stations in various application scenarios as follows.

— Slow transport information service and navigation service such as pedestrians, bicycles and disabled (wheelchair accessible) navigation, as well as internal traffic navigation inside the local transport area.

— Transfer information service. The considered application environment includes the transfer information service in a transfer node such as the integrated transportation hub, bus stations, car parking lot, an indoor transfer area, etc.

— Multi-modal traffic information service. Types of traffic information include real-time road traffic information, public transport operating information, service information for pedestrians' road network and service information for transfer node such as integrated transportation hub, bus stations, car parking lot, an indoor transfer area, etc.

— Multi-modal navigation service. Includes static and dynamic multi-modal routing and re-routing service, as well as real-time guidance service with voice/image/text/map drawings.

— Communities activities. For example, a team travel when a group of vehicles (or bicycles) track the lead vehicle on the way to the same destination.

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 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 15031-2, *Road vehicles — Communication between vehicle and external equipment for emissions-related diagnostics — Part 2: Guidance on terms, definitions, abbreviations and acronyms*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 15031-2 and the following apply.

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ISO and IEC maintain terminological databases for use in standardization at the following addresses:

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

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

3.1.1
bluetooth
BT
communication protocol for exchanging data over short distances

3.1.2
communications access for land mobiles
CALM
specification of a common architecture, network protocols and communications interface definitions to enable continuous or quasi continuous communications between vehicles and the infrastructure, or between vehicles, using wireless telecommunications media that are available in any particular location, and have the ability to migrate to a different available media where required

3.1.3
central ITS station
C-ITS-S
implementation of an ITS station a central ITS subsystem

3.1.4
eco lamp
lamp implemented on the dashboard or nomadic device to guide the driver to drive the vehicle in the most economical way, i.e. a green lamp/symbol will indicate high fuel efficiency driving or travelling at a constant speed while a red lamp/symbol will indicate low fuel efficiency, i.e. strong acceleration or sudden braking

3.1.5
event log file
data record with multiple event data stored with time stamp

3.1.6
ITS service
service provided by a set of *ITS-S application* (3.1.8)

3.1.7
ITS station
ITS-S
entity in a communication network, comprised of application, facilities, networking and access layer components specified in ISO 21217 that operate within a bounded secure management domain

3.1.8
ITS-S application
functionality in an *ITS-S* (3.1.7) that uses ITS-S services to connect to one or more other ITS-S applications

3.1.9
ITS-S gateway
gateway functionality provided in the facilities layer of an *ITS-S* (3.1.7)

3.1.10
ITS-S router
routing functionality provided in an *ITS-S* (3.1.7)

3.1.11
ITS-S service
communication functionality offered by an *ITS-S* (3.1.7) to an *ITS-S application* (3.1.8)

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3.1.12
multi-modal LBS
service, query, or process whose return or other property is dependent on the location of the client requesting the service and/or of some other thing, object, or person using various modes of transport for daily activities.

3.1.13
multi-modal navigation
navigation for complex transport includes public transport, walking and driving.

3.1.14
nomadic device
ND
device that provides communications connectivity via equipment such as cellular telephones, mobile wireless broadband (WIMAX, HC-SDMA, etc.), WiFi, etc. and includes short range links, such as bluetooth, Zigbee, etc. to connect nomadic devices to the motor vehicle communications system network

3.1.15
network-based multi-hopping
multi-hopping from *ITS-S* (3.1.7) to ITS-S performed by a networking protocol

3.1.16
personal ITS station
P-ITS-S
implementation of an *ITS station* (3.1.7) with a personal ITS subsystem

Note 1 to entry: P-ITS-S is used to send the information of each user (drivers, passengers and pedestrians) to the other ITS station and receives messages from other ITS stations which will be processed and presented on the user's terminal device according to the ITS station services and/or applications being executed

3.1.17
roadside ITS station
R-ITS-S
system that receives and processes vehicular and pedestrian information within a certain zone and determines the situation, in order to provide safety warning and parking guide services to vehicles and pedestrians

Note 1 to entry: The system is installed at the roadside.

3.1.18
slow transport system
non-motorized travel
transport system via pedestrians and bicycles

3.1.19
vehicle ITS station
V-ITS-S
implementation of an *ITS station* (3.1.7) with a vehicle ITS subsystem

3.1.20
vehicle state of capability log file
VSOCLogFile
data record with multiple data snapshots including a pre-selected data set providing a vehicle capability status for the vehicle's electronic system(s)

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3.2 Abbreviated terms

BT	bluetooth
CALM	communications access for land mobiles
DLL	dynamic link library
DSRC	dedicated short-range communications
DTC	diagnostic trouble code
GUI	graphical user interface
ITS-S	intelligent transport system-station
LL	logical link
ND	nomadic device
OBE	on-board equipment
PDU	protocol data unit
RMI	repair and maintenance information
RSE	roadside equipment
VIN	vehicle identification number
V-ITS-SG	vehicle-intelligent transport system-station gateway
VSOC	vehicle state of capabilities

4 Conventions

This document is based on the conventions discussed in the OSI Service Conventions (ISO/IEC 10731:1994) as they apply for communication services. The XML-based vehicle data transfer protocol is applicable to OSI layers 4, 5, 6 and 7.

5 Document overview and structure

This document set provides the application requirements to support the implementation of the personal ITS station in accordance with the related standard.

— ISO 13111-1

This document provides an overview of the document set and structure along with the use case definitions and a common set of resources (definitions, references) for use by all subsequent parts.

— ISO 13111-2

This document specifies data exchange schema between personal ITS station and the other stations. We shall reflect the general requirements derived from the use cases as specified in ISO 13111-1.

Because it is difficult to enumerate specific details of the protocol for all sorts of application, ISO 13111-2 only defines the general protocol.

If there are more specific and more complete descriptions of the details of the protocol based on the specific implementing application, we shall submit a new work item proposal.

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