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BSI Standards Publication

Intelligent transport systems — Guidance protocol via personal ITS station for advisory safety systems

Part 1: General information and use case definitions

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National foreword

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Intelligent transport systems — Guidance protocol via personal ITS station for advisory safety systems —

Part 1: General information and use case definitions

Systèmes intelligents de transport — Protocole d'orientation par station ITS personnelle pour systèmes à avis de sécurité —

Partie 1: Information générale et définition des cas d'usage

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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. www.iso.org/directives

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The committee responsible for this document is ISO/TC 204, *Intelligent transport systems.*

ISO 13184 consists of the following parts, under the general title *Intelligent transport systems — Guidance protocol via personal ITS station for advisory safety systems*:

— *Part 1: General information and use cases definitions*

The following parts are under preparation:

— *Part 2: Road guidance protocol (RGP) requirements and specification*

— *Part 3: Protocol conformance test cases*

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Introduction

This part of ISO 13184 specifies the requirements of a real-time decision support system for guidance information, designed to enhance mobility and vehicle safety and to provide a parking guide service using personal ITS stations. The purpose of the system is to transmit guidance or warning messages to drivers and pedestrians in real time, enhance the user's convenience, and avoid congestion in parking facilities by preventing accidents and enabling easy parking.

In addition, an application level guidance protocol for crossroads, safety warning and parking bay guidance services between roadside ITS stations, installed at the road side, and user's personal ITS stations, is defined.

This part of ISO 13184 considers a protocol, which covers all subjects related to traffic safety, including pedestrians and vehicle drivers. Therefore, this protocol describes how the safety-related services are provided using personal ITS stations.

This system is based on the following assumptions:

— Personal ITS stations have limited resources. Therefore, the protocol is designed in such way that it can be implemented with limited resources.

— The use cases related to the safety warning and parking bay guidance services can be classified in various ways. Also, these use cases can be enabled or disabled depending on the specific circumstances of roads and parking bays. Therefore, the protocol is designed to be flexible and extendable, which enables to add or delete use cases conveniently.

— The protocol contains core data elements to configure the messages transmitted by personal ITS stations and roadside ITS stations. The major use case includes safety warning at the road and the parking bay guidance.

— The protocol provided by this part of ISO 13184 does not take the network or transport level protocol into account. Instead, only the application level protocol for the safety warning and parking bay guidance services are presented.

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Intelligent transport systems — Guidance protocol via personal ITS station for advisory safety systems —

Part 1: General information and use case definitions

1 Scope

This part of ISO 13184 specifies guidance information protocol to provide real-time decision support system to drivers or pedestrians using personal ITS stations:

Reference architecture for the real-time decision support system

This reference architecture provides a general structure for real-time decision support systems and the method of message exchange between the personal ITS station and the roadside ITS station. This reference architecture is used to build the interconnections between personal ITS stations and roadside ITS stations.

Design method of application protocols for light-weighted devices

This method is a flexible application protocol for safety warning and parking guidance services. Unlike many other application protocols in the ITS and Telematics domains, this protocol makes the client part independent of use cases for supporting light-weighted devices.

Use cases at the road and parking bays for warning and parking guide

This part of ISO 13184 describes the use cases applicable to the communication services between personal ITS stations and roadside ITS stations for the purposes of providing safety warning and parking guidance.

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

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO°21217 and the following apply.

3.1.1
document type definition
DTD
set of mark-up declarations that define a document type of SGML-family Mark-up languages (SGML, XML, HTML)

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3.1.2
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 the safety warning and parking guide service to vehicles and pedestrians, and that is installed at the road side

3.1.3
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

3.1.4
light-weighted devices
client device such as a nomadic or mobile device

Note 1 to entry: In the ITS nomenclature, this is a P-ITS-S.

3.1.5
personal ITS station
P-ITS-S
implementation of an ITS station in a personal ITS subsystem

Note 1 to entry: Personal ITS station is used to send the information of each user (drivers and pedestrians) to the roadside ITS station, and receives the safety warning and parking guide service and transfers them to the users.

3.1.6
sensor
device designed to collect general information (e.g. road surface state, potential hazard vehicle's speed) within the server's zone

3.2 Abbreviated terms

RGP	road guidance protocol
DSRC	dedicated short range communications
DTD	document type definition
HTML	hypertext mark-up language
ITS-S	intelligent transport systems station
P-ITS-S	personal intelligent transport systems station
OSI	open systems interconnection
R-ITS-S	roadside intelligent transport systems station
RSE	roadside equipment
OBE	on-board equipment
SGML	standard generalized mark-up language
XML	eXtended mark-up language

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4 Conventions

This part of ISO 13184 is based on the conventions discussed in the OSI Service Conventions (ISO/IEC 10731:1994) as they apply for communication services. The ASN.1-based Road Guidance Protocol (RGP) is applicable to OSI layers 5, 6 and 7.

5 Series overview and structure

ISO 13184 provides all documents and references required to support the implementation of the requirements related to standardized access to guidance via personal ITS station for advisory safety systems. ISO 13184 consists of the following parts.

Part 1: General information and use case definition

Part 1 provides an overview of the document set and structure along with the use case definition and common set of resources (definitions, references), which are used for all subsequent parts.

Part 2: Road guidance protocol (RGP) requirements and specification

Part 2 specifies all technical requirements related to the application level Road Guidance Protocol (RGP) to be used between the personal ITS station and the roadside ITS station. The requirements will reflect the deriving needs from the use cases as specified in this part of the technical report. The protocol shall be defined according to the requirements as specified in ISO 14817 [2].

Part 3: Protocol conformance test cases

Part 3 specifies conformance test cases for a self-conformance test by the provider of the personal ITS station and the roadside ITS station. The conformance test cases will follow the use cases defined in part 1 as well as the requirements stated in Part 2.

The purpose of Part 3 is to provide the test procedure of the information flow between the personal ITS station and the roadside ITS station. The information is transferred only from the corresponding roadside ITS station to the personal ITS stations, where the personal ITS station locates within the communication range of the corresponding local sever. This final step in the development process enables to verify the system for all providers that their personal ITS station and/or the roadside ITS stations meet a high degree of functional requirements expected by the end user.

Figure 1 shows the structure of the ISO 13184 series.

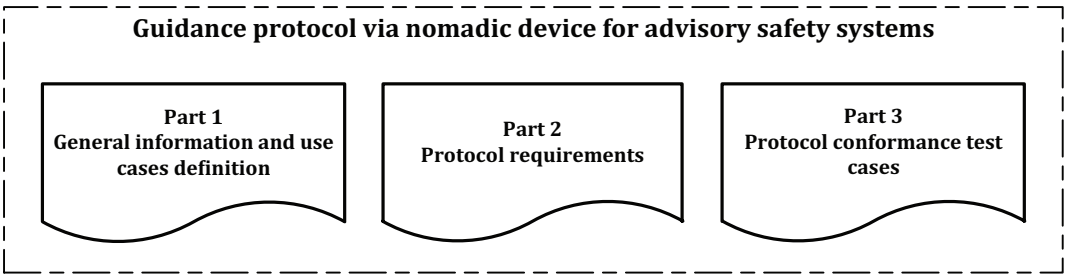

Figure 1 — ISO 13184 series structure

6 General information

6.1 Purpose of this part of ISO 13184

This part of ISO 13184 addresses three major areas:

— identification of the requirements of application level protocol for safety warning and parking guidance services, that can be frequently inserted, modified and deleted;

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