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Intelligent transport systems — Indoor navigation for personal and vehicle ITS stations —

Part 5: Requirements and message specification for central ITS station (C-ITS-S) based positioning

Systèmes de transport intelligents — Navigation intérieure pour les stations ITS personnelles et de véhicules —

Partie 5: Exigences et spécification de message pour le positionnement basé sur la station ITS centrale (C-ITS-S)

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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.

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

A list of all parts in the ISO 17438 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

With the spread of nomadic and mobile devices such as smart phones and the rapid expansion of indoor spaces, many of the services and facilities related to the transport system have become accessible to indoor spaces. Consequently, navigation in indoor space is considered an increasingly critical functionality for variety of applications, including indoor navigation for vehicles and public-area mobile robots in the transport industry.

The ISO 17438 series are intended to be used by designers, developers and providers of indoor navigation services. The ISO 17438 series define requirements, data model, and encoding format of indoor positioning reference data for supporting indoor navigation in intelligent transport systems. When implemented, this document will:

a) provide developers and designers with concepts and appropriate information to implement the central ITS station (C-ITS-S) based positioning

b) provide developers and designers with interoperable ways to use the central ITS station (C-ITS-S) based positioning for indoor navigation;

c) enable users to be provided with indoor navigation;

d) provide developers and designers with an extendable base for indoor navigation.

The objective of this document is to define requirements and message specification for central ITS station (C-ITS-S) based positioning required for indoor navigation functionality for ITS applications, as a part of the ISO 17438 series.

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Intelligent transport systems — Indoor navigation for personal and vehicle ITS stations —

Part 5: Requirements and message specification for central ITS station (C-ITS-S) based positioning

1 Scope

This document defines detailed use cases, requirements and message specifications for supporting central ITS station based indoor positioning to provide indoor navigation functionality between a personal/vehicle (P/V) ITS station and the central ITS station.

This document is only applicable to the core flow for the central ITS station based indoor positioning. The following issues which are adjunctive but essential for commercial navigation services are beyond the scope of this document:

— authorized and authenticated access of users and services, including security;

— payment;

— preparation of indoor data which are necessary for indoor navigation;

— low-level communication protocols required to transfer and share data from and to a roadside ITS station or a central ITS station;

— other issues dependent on implementation of an instance of indoor navigation.

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 13184-2, *Intelligent transport systems (ITS) — Guidance protocol via personal ITS station for advisory safety systems — Part 2: Road guidance protocol (RGP) requirements and specification*

ISO 17438-1, *Intelligent transport systems — Indoor navigation for personal and vehicle ITS station — Part 1: General information and use case definition*

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 13184-2, ISO 17438-1 and the following 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 https://www.electropedia.org/

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3.1.1
server-based indoor positioning
indoor positioning executed at a central ITS station (C-ITS-S)

[SOURCE: ISO 17438-4:2019, 3.1.9]

3.1.2
indoor positioning infrastructure
infrastructure used to determine locations of personal/vehicle ITS stations (P/V-ITS-S) in an indoor space

EXAMPLE Wi-Fi, Bluetooth, etc.

[SOURCE: ISO 17438-4:2019, 3.1.11]

3.1.3
indoor positioning reference
information to support indoor positioning

Note 1 to entry: Detailed specifications and contents of indoor positioning references depend on the specific indoor positioning technologies.

EXAMPLE 1 A good example of an indoor positioning reference is information about indoor positioning infrastructure.

EXAMPLE 2 For Wi-Fi based positioning, the indoor positioning infrastructure information includes the Wi-Fi APs information, such as location, SSID, and RSSI values of APs.

[SOURCE: ISO 17438-4:2019, 3.1.12]

3.2 Abbreviated terms

AP	Access Point
ASN	Abstract Syntax Notation
BLE	Bluetooth Low Energy
BS	Base Station
ITS	Intelligent Transport Systems
ITS-S	ITS Station
P/V-ITS-S	Personal/Vehicle ITS Station
C-ITS-S	Central ITS Station
CID	Cell IDentifier
LTE	Long Term Evolution
M/O	Mandatory/Optional
MCC	Mobile Country Code
MNC	Mobile Network Code
MO	Maximum Occurrence
PCI	Physical Cell Identifier
RSSI	Received Signal Strength Indicator

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