International Standard

ISO 17438-2

First edition
2024-09

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

Part 2: Requirements and specification for indoor maps

Systèmes de transport intelligents — Navigation interne pour station personnelle et véhicules ITS —

Partie 2: Exigences et spécifications pour les cartes d'intérieure

Reference number
ISO 17438-2:2024(en)

© ISO 2024



COPYRIGHT PROTECTED DOCUMENT

© ISO 2024

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Normative references **1**
3 Terms, definitions, symbols and abbreviated terms **2**
3.1 Terms and definitions 2
3.2 Abbreviated terms 4
4 Requirement and conformance **4**
4.1 Requirements 4
4.2 Conformance 4
5 Conventions **4**
6 Indoor map for indoor navigation functionality **4**
6.1 Overview 4
6.2 Scope of indoor maps 5
6.3 Use cases of indoor maps 5
7 Definition of indoor map **5**
Annex A (normative) **ASN.1 Schema** **25**
Bibliography **29**

© ISO 2024 – All rights reserved

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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of 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 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 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.

© ISO 2024 – All rights reserved

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 a new killer application in the transport industry.

The objective of this document is to provide a basic data model and encoding format for indoor positioning reference data required for indoor navigation functionality for ITS applications. This document is intended to be used by designers, developers and providers of indoor navigation services. When implemented, this document is intended to:

1) provide developers and designers with concepts and appropriate information to implement indoor navigation services;

2) provide developers and designers with interoperable ways to use indoor navigation data from various sources for indoor navigation;

3) enable the provision of indoor navigation services to users;

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

© ISO 2024 – All rights reserved

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

Part 2: Requirements and specification for indoor maps

1 Scope

This document defines requirements and specifications of indoor positioning references, which can be referenced for positioning in indoor space, for supporting indoor navigation functionality of a personal/vehicle (P/V) ITS station.

NOTE Specific structure and contents of indoor positioning references depend on types of indoor positioning technologies.

This document defines:

a) the composition of an indoor map for indoor navigation of P/V ITS stations;

b) the schema and encoding format of the indoor map for indoor navigation at the P/V ITS stations.

This document focuses on the specification and format of the indoor map. 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*

© ISO 2024 – All rights reserved

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 and ISO 17438-1 and the following apply.

ISO and IEC maintain terminology 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/

3.1.1
nomadic device
ND
implementation of a personal ITS station which provides communication connectivity via portable equipment such as cellular telephones, wireless communication network (3G, 4G and 5G), mobile wireless broadband (WIMAX, HC-SDMA, etc.), etc. and includes short range links, such as IEEE 802.11x, etc. to connect portable devices to the motor vehicle communications system network

Note 1 to entry: In detail, nomadic devices that have hardware security modules and have been certified to be ITS trusted are called a personal ITS station.

[SOURCE: ISO 23795-2:2024, 3.1.1, modified — Note 1 to entry has been added.]

3.1.2
indoor navigation
navigation provided in indoor space

[SOURCE: ISO 17438-4:2019, 3.1.2]

3.1.3
indoor space
space within artificial structures such as buildings and facilities connected with transport corridors or roads

EXAMPLE A building or indoor parking lot.

[SOURCE: ISO 17438-1:2016, 3.1.2]

3.1.4
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

[SOURCE: ISO 13184-2:2016, 3.5]

3.1.5
personal/vehicle ITS station
P/V-ITS-S
ITS station implemented in a vehicle or nomadic device

[SOURCE: ISO 13184-2:2016, modified — "personal mobile device" has been replaced by "nomadic device" in the definition.]

3.1.6
well-known binary
WKB
binary equivalent used to transfer and store the same information in a more compact form, which is convenient for computer processing but which is not human-readable

© ISO 2024 – All rights reserved