



BSI Standards Publication

Intelligent transport systems (ITS) — Nomadic device service platform for micro mobility

Part 2: Functional requirements and dataset definitions

National foreword

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A list of organizations represented on this committee can be obtained on request to its committee manager.

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Intelligent transport systems (ITS) — Nomadic device service platform for micro mobility —

Part 2: Functional requirements and dataset definitions

*Systèmes de transport intelligents - Plateforme de services de
dispositifs portables pour la micro mobilité - Partie 2 : Exigences
fonctionnelles et définitions des données —*

Partie 2: Exigences fonctionnelles et définitions des données



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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 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 22085 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.

Introduction

Micro mobility can be defined as a small or compact-sized electric vehicle. Normally, it is designed to be used as a first-mile and last-mile service connecting public transit routes or to provide personal mobility with one or two passengers for a short-distance trip.

The nomadic device service platform aims to accommodate the specific needs of integrated mobility services for either urban or rural areas. The service platform focuses on the use of data exchange interface standards between micro mobility and nomadic devices to enable the development of cloud-based ITS using wireless networks.

This document fosters the introduction of nomadic devices in the public transport and automotive world. It specifies functional requirements and dataset definitions based on Vehicle Interface Data Format (VIDF) at the application level regarding pre-trip, post-trip and while driving, in order to identify connectivity between a user's personal ITS stations (P-ITS-S, for example nomadic devices), roadside-ITS-station, vehicle-ITS-station gateway (V-ITS-S) and central ITS station (C-ITS-S). The functional requirements and the dataset can be used as a measure for exchanging information required to implement mobility services to be included in integrated mobility and parcel delivery services.

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Intelligent transport systems (ITS) — Nomadic device service platform for micro mobility —

Part 2: Functional requirements and dataset definitions

1 Scope

This document provides definitions of functional requirements for connectivity among nomadic devices, cloud servers and micro mobility during pre-trip, post-trip and while driving, which is defined in [ISO/TR 22085-1](#), and datasets for providing seamless mobility service. In addition, it also delivers related standards required to develop and operate the service platform between a nomadic device and micro mobility with intelligent transport systems (ITS) technologies. The functional requirements and the datasets can be used as a measure of exchanging information required to promote micro mobility as a new type of urban and rural transport mode, and so increase the possibility of being included in an integrated mobility and parcel delivery system.

This document defines functional requirements and messages set by use case and a dataset of each message to provide services for use cases, which are defined in [ISO/TR 22085-1](#) as follows:

- Pre-trip (Use case 1.1-1.5)
- En-route (Use case 2.1-2.7)
- Post-trip (Use case 3.1-3.4)

2 Normative references

There are no normative references in this document.

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions 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/>

3.1.1

central ITS station

C-ITS-S

network server between personal ITS server (i.e. nomadic device or mobile device) and micro mobility service provider

3.1.2

personal ITS station

P-ITS-S

implementation of an ITS station as a personal ITS subsystem (e.g. nomadic device or mobile device) which provides communication connectivity via a wireless communication network (3G, 4G, and 5G), mobile wireless broadband (WIMAX, HC-SDMA, etc.), WiFi and short-range links, such as Bluetooth, Zigbee, etc. to connect portable devices to the motor vehicle communications system network

3.1.3

micro mobility

MM

new concept of eco-friendly personal electric vehicle for one or two passengers

3.1.4

in mobility network

IMN

local network bus among electrical control units in MM, providing diagnostics information to P-ITS-S through vehicle-ITS-station gateway (V-ITS-S)

3.1.5

micro mobility service provider

MMSP

service provider including parking lot management service, public transit authority, charging station management service, tolling service authority, car sharing service, traffic information service, etc.

3.1.6

micro mobility communication network

MMCN

communication network between P-ITS-S and C-ITS-S

3.1.7

public communication network

PCN

network between MMCS and service providers used to provide MM services information on, for example, charging stations, parking lots and traffic congestion

3.2 Abbreviated terms

C	conditional
Cvt.	convention (M, O, C)
DTC	diagnostic trouble code
EXE	executor
FR	functional requirement
IMN	in mobility network
ITIPS	interconnected transfer information providing service
ND	nomadic device
M	mandatory
MEC	mobile edge computing
MM	micro-mobility

MMCN	micro mobility communication network
MMCS	micro-mobility cloud server
MTS	mobile tolling service
O	optional
OBD	on board diagnostic
PCN	public communication network
R-ITS-S	roadside-intelligent transport system-station
SOC	state of charge
SAPSS	searching available parking space service on the way
SMMRS	shared micro mobility return service
V-ITS-S	vehicle ITS station
WiFi	wireless fidelity

4 Document overview and structure

This document provides all documents and references required to support the implementation of the requirements related to standardized access to nomadic device service platforms for micro mobility. This document consists of three sections:

- General information is provided in [Clause 5](#).

[Clause 5](#) provides a purpose and overview, including a service framework architecture.

- Functional requirements and messages set by use case are described in [Clause 6](#).

[Clause 6](#) specifies all use case technical requirements and datasets related to nomadic device service platforms for micro mobility to be interfaced with micro mobility cloud servers and micro mobility service providers. The requirements reflect functional requirements as specified in this document.

- Datasets are described in [Clause 7](#).

[Clause 7](#) provides definitions of each message including message ID, dataset and data type.

5 General information

5.1 Purpose

This document addresses two major areas:

- Identification of the functional requirements for describing the P-ITS-S interfaced with V-ITS-S and C-ITS-S (or MMCS).
- Definition of the message set required in the general use cases defined in [ISO/TR 22085-1](#).
- Definition of the dataset of each message from the use cases.