SLOVENSKI STANDARD
SIST-TS CEN ISO/TS 19321:2015

01-september-2015

Inteligentni transportni sistemi - Kooperativni sistem (ITS) - Podatkovni slovar informacijskih struktur v vozilih (IVI) (ISO/TS 19321:2015)

Intelligent transport systems - Cooperative ITS - Dictionary of in-vehicle information (IVI) data structures (ISO/TS 19321:2015)

Intelligente Transportsysteme - Kooperative ITS - Beschreibungsverzeichnis fahrzeuginterner Informationen von Datenstrukturen (IVI) (ISO/TS 19321:2015)

Systèmes intelligents de transport - Coopérative STI - Dictionnaire de structures de données d'informations dans les véhicules (IVI) (ISO/TS 19321:2015)

Ta slovenski standard je istoveten z: **CEN ISO/TS 19321:2015**

ICS:

35.240.60	Uporabniške rešitve IT v transportu in trgovini	IT applications in transport and trade
43.040.15	Avtomobilska informatika. Vgrajeni računalniški sistemi	Car informatics. On board computer systems

SIST-TS CEN ISO/TS 19321:2015 **en,fr,de**

TECHNICAL SPECIFICATION

SPÉCIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

CEN ISO/TS 19321

April 2015

ICS 43.040.15; 35.240.60

English Version

Intelligent transport systems - Cooperative ITS - Dictionary of in-vehicle information (IVI) data structure (ISO/TS 19321:2015)

Systèmes intelligents de transport - Coopérative STI - Dictionnaire de structures de données d'informations dans les véhicules (IVI) (ISO/TS 19321:2015)

Intelligente Transportsysteme - Kooperative ITS - Beschreibungsverzeichnis fahrzeuginterner Informationen von Datenstrukturen (IVI) (ISO/TS 19321:2015)

This Technical Specification (CEN/TS) was approved by CEN on 7 March 2015 for provisional application.

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Ref. No. CEN ISO/TS 19321:2015 E

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Foreword

This document (CEN ISO/TS 19321:2015) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems” the secretariat of which is held by NEN, in collaboration with Technical Committee ISO/TC 204 “Intelligent transport systems”.

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The text of ISO/TS 19321:2015 has been approved by CEN as CEN ISO/TS 19321:2015 without any modification.

TECHNICAL SPECIFICATION

ISO/TS 19321

First edition
2015-04-15

Intelligent transport systems — Cooperative ITS — Dictionary of in-vehicle information (IVI) data structures

Systèmes intelligents de transport — Coopérative STI — Dictionnaire de structures de données d'informations dans les véhicules (IVI)

Reference number
ISO/TS 19321:2015(E)

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Published in Switzerland

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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 meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword — Supplementary Information.

ISO/TS 19321 was prepared by European Committee for Standardization (CEN) in collaboration with ISO/TC 204, *Intelligent transport systems*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Introduction

In Cooperative-ITS (C-ITS), presenting information related to the traffic situation or regulation of a road to the driver of a vehicle is an important component of road operations. The road operators are responsible for road setup, operation, signage, and maintenance for traffic management and road safety, and in some countries, also for the enforcement of road laws. For road operators, efficient transport of vehicles on roadways ensures a safe and predictable trip for all road users. Road operators, together with equipment manufacturers, be it that they are of vehicles or of roadside equipment, contribute to how road information is properly presented to drivers.

So far, one defined C-ITS method for notifying road users of road and/or traffic situations and events is by transmission of messages such as Cooperative Awareness Messages (CAM), Decentralized Environment Notification Messages (DENM), or Basic Safety Messages (BSM).

This Technical Specification supports mandatory and advisory road signage such as contextual speeds and road works warnings. In-vehicle information can be sent by an ITS-S and either corresponds to physical road signs such as static or variable road signs or not correspond to physical road signs (a virtual sign) or correspond to road works. IVI does not include identification of road events as already provided by DENM.

This Technical Specification provides a toolbox of information elements for IVI. It can be used to fulfil the requirements of the service provider considering the needs of receiving ITS-S. The container concept provides a way for an ITS-S to manage the relevant IVI information, determine where the IVI is relevant, and to provide details for the application of IVI. The description of data elements encompasses the data syntax and semantics, i.e. a definition of data format and content together with a description of how to use those data elements.

This Technical Specification is of an enabling nature. It does not specify which information is necessary for a certain service, but it supports those IVI information elements that can be necessary to be transmitted to a receiving ITS-S to carry out a certain service. Usage of the IVI information elements depends on the specific context and application of IVI for a specific service and usage is established as mandatory or optional only for messaging purposes, not for application purposes. The IVI Structure is intended to be profiled to fulfil the requirements of a specific service.

This Technical Specification refers to ISO/TS 14823 as one system of standardized codes for existing road signs codes. Note that ISO/TS 14823 does not contain codes for specific national or regional signs which are not commonly used. ISO/TS 14823 also does not represent a catalogue of road sign pictograms for all applicable nations.

Intelligent transport systems — Cooperative ITS — Dictionary of in-vehicle information (IVI) data structures

1 Scope

This Technical Specification specifies the in-vehicle information (IVI) data structures that are required by different ITS services (for example, refer to ISO/TS 17425 and ISO/TS 17426) for exchanging information between ITS Stations. A general, extensible data structure is specified (see Clause 5). This is split into structures called containers to accommodate current-day information (see Clause 6). Transmitted information includes IVI such as contextual speed, road works warnings, vehicle restrictions, lane restrictions, road hazards warnings, location-based services, re-routing, etc. The information in the containers is organized in sub-structures called data frames and data elements which are described in terms of its content (see Clause 7) and its syntax (see Annex A).

The data structures are specified as communications agnostic. This Technical Specification does not provide the communication protocols. This Technical Specification then provides scenarios for usage of the data structure, e.g. in case of real time, short-range communications.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 639-1:2002, *Codes for the representation of names of languages — Part 1: Alpha-2 code*

ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes*

ISO 14816:2005, *Road transport and traffic telematics — Automatic vehicle and equipment identification — Numbering and data structure*

ISO 14906:2011, *Electronic fee collection — Application interface definition for dedicated short-range communication*

ISO/IEC 8824-1:2008, *Information technology — Abstract Syntax Notation One (ASN.1): Specification of basic notation*

ISO/TS 14823, *Traffic and travel information — Messages via media independent stationary dissemination systems — Graphic data dictionary for pre-trip and in-trip information dissemination systems*

ETSI/TS 102 894-2 V1.1.12, *Intelligent Transport Systems (ITS); Users and applications requirements; Part 2: Applications and facilities layer common data dictionary*

3 Terms and definitions

3.1
application data unit
data unit exchanged between ITS-S applications

3.2
container
group of *data frames* (3.4) and data elements semantically belonging together in one place in the IVI structure

3.3
data element
data type that contains one single data

[SOURCE: ETSI/TS 102 894-2 V1.1.1]

3.4
data frame
data type that contains more than one *data element* (3.3) in a predefined order

[SOURCE: ETSI/TS 102 894-2 V1.1.1]

3.5
detection zone
part of the road network that is passed by a vehicle in approach of the *relevance zone* (3.12)

3.6
driver awareness zone
parts of road network on which a message is presented to inform drivers about upcoming situations

Note 1 to entry: This definition will be aligned with ISO/TS 17425.

3.7
in-vehicle information
information contained in the In-vehicle Information (IVI) data structure that is required by different ITS services

3.8
in-vehicle signage
ITS service that provides static, as well as dynamic road sign and message sign information to drivers

Note 1 to entry: This definition will be aligned with ISO/TS 17425.

3.9
International Terrestrial Reference Frame
realisation of the ITRS

[SOURCE: ISO 17572-1:2008]

3.10
International Terrestrial Reference System
reference system for the earth derived from precise and accurate space geodesy measurements not restricted to GPS Doppler measurements which is periodically tracked and revised by the International Earth Rotation Service

[SOURCE: ISO 17572-1:2008]

3.11
Minimum Dissemination Area
parts of the road network where the IVS message can be received by the potentially targeted vehicles

Note 1 to entry: This definition will be aligned with ISO/TS 17425.

3.12
Relevance Zone
parts of the road network for which the information in an Application Container is valid

[SOURCE: ISO/TS 17425]

3.13
road hazard warning
ITS service that provides road hazard information to drivers

3.14
Road Works Warning
alerts for routing road users around road construction and/or road repair

3.15
Variable Message Sign
electronic sign board presenting text, symbols, or a combination of them

4 Abbreviated terms

The following abbreviations are used in this document.

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ASN.1	Abstract Syntax Notation One
BLOB	Binary Large Object
DAZ	Driver Awareness Zone
DE	Data Element
DENM	Decentralized Environmental Notification Message
DF	Data Frame
ETRF	European Terrestrial Reference Frame
HOT	High-Occupancy Toll (lane)
HOV	High-Occupancy Vehicle
ID	Identification
ITRF	International Terrestrial Reference Frame
ITRS	International Terrestrial Reference System
ITS	Intelligent Transport Systems
ITS-S	ITS Station
IVI	In-vehicle Information
IVS	In-vehicle Signage
MDA	Minimum Dissemination Area
OEM	Original Equipment Manufacturer
POI	Point of Interest
RZ	Relevance Zone
RWW	Road Works Warning
VMS	Variable Message Sign