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Intelligent transport systems — Roadside modules AP-DATEX data interface

Part 10: Variable message signs

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Systèmes de transport intelligents — Interface de données AP-DATEX pour les modules en bord de route — Partie 10: Panneaux à messages variables

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Contents

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Foreword

~~Foreword~~

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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~~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~~www.iso.org/directives).

~~Attention is drawn~~ISO draws attention to the possibility that ~~some of~~ the ~~elements~~implementation of this document may ~~be~~involve the ~~subject~~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. ~~Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).~~

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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 22741 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~~www.iso.org/members.html.

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Introduction

~~0.1~~0.1 Background

A variable message sign (~~hereinafter referred to as a "~~VMS~~")~~) is an electronic traffic sign installed on the roadside to provide real-time traffic information to travellers, thereby improving their efficiency in ~~utilization of the~~using road traffic~~, and~~. A VMS is a major physical component of the intelligent transportation system (~~hereinafter referred~~ITS), to ~~as an "ITS")~~ which it supplies ~~the system with~~ information for improvement of the safety on the road.

More ~~VMS~~VMSs are expected to be installed and operated due to ~~increase in~~increasing demand for the establishment of ITS and ~~for~~the replacement of existing ~~VMS~~VMSs which have exceeded their durability terms.

~~The operator~~Operators of ~~the~~ traffic management ~~centre needs~~centres need real~~-~~time data exchange between a VMS and the centre in order to supply information to the VMS in real time and to control and manage the VMS.

However, no standards for the information transmitted and received between the traffic management centre and the VMS have been established, leading to the development of various protocols and their application to each VMS construction project. As a result, a variety of problems have arisen, including redundant investment in development costs and forced dependence on the protocol of the previous operator when replacing the existing ~~VMS~~VMSs with new ones.

~~Hence, this~~This document therefore defines the data items (messages), formats~~,~~ and communication protocols (~~Application, Presentation, Session,~~application, presentation, session and ~~Transport~~transport layers) required to ensure the interoperability of the information transmitted and received between the VMS and the traffic management centre, thereby ensuring interoperability between the VMS and the centre.

~~0.2~~0.2 Overview

This document defines the message, the data elements making up the message, and the application layer profile for message transmission in order to ensure the interoperability between the VMS and the traffic management centre.

In particular, in order to ensure the interoperability between the VMS and the traffic management centre, the interoperability ~~shall be~~is developed based on OSI (open system interconnection) 7 layers. A collection of standard protocols for each layer is referred to as a ~~'~~"profile~~.'~~".

ISO/IEC TR 10000-2 defines the basic classification and object presentation of OSI profiles as follows.

a) Interchange ~~Format~~format and ~~Representation~~representation profiles define the information on and message structure of the data exchanged by applications.

b) Application profiles define the transmission mechanism for data exchange (concerning OSI layers 5 to 7 ~~- Session, Presentation, and Application~~– session, presentation and application layers).

c) Transport profiles define the procedures and methods to exchange data packets between systems (concerning OSI layers 1 to 4 ~~- Transport, Network, Data Link, and Physical~~– transport, network, data link and physical layers).

d) Relay profiles define the relaying function which enables the interconnection between systems while using different transmission profiles.

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This document ~~defines 'Interchange Formats~~specifies "interchange format and ~~Representation'~~representation" as defined in ISO/IEC TR 10000-2~~.~~, covering the following points:

~~a)~~1) ~~Components~~components and data elements of basic messages define the messages and detailed data elements which the operator of the traffic information system needs for operation of the VMS~~.~~;

~~b)~~2) ~~Data~~the data exchange communication profile defines the procedures and encoding methods for information exchange between the traffic management centre and the VMS.

~~0.3~~0.3 Document approach and layout

This document ~~defines~~specifies the following:

a) ~~Physical Architecture~~physical architecture for varible message signs ~~(Section 6)~~(Clause 6);

b) ~~User~~user needs that are deemed to be common to many types of field devices ~~(Section 7)~~(Clause 7);

c) ~~Requirements~~requirements for implementing the identified user needs, organized by major feature ~~(Section 8)~~(Clause 8);

d) ~~Dialogues~~dialogues for exchange data between varible message signs and the ~~Central/Local~~central/local computer ~~(Section 9)~~(Clause 9)

e) ~~The~~the management information base (MIB) for the features defined by this document ~~(Annex A – Normative)~~(Annex A);

f) ~~A~~a requirements traceability table that traces requirements to the design elements ~~(Annex B – Normative)~~(Annex B).

In addition, a simplified version of the conformance table and the data packet structures ~~-~~are available electronically at ~~https://standards.iso.org/iso/ts/22741/-10/ed-1/en/.~~https://standards.iso.org/iso/ts/22741/-10/ed-1/en/.

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Intelligent transport systems — Roadside modules AP-DATEX data interface ~~— Part 10: Variable message signs —~~

Part 10: Variable message signs

~~2~~1 Scope

Variable ~~Message Signs~~message signs (VMSs) are installed in areas where traffic managers identify a frequent need to convey information to the ~~travelling~~travelling public, such as upstream from interchanges to alert the public to downstream congestion in time for them to alter their routes. This allows traffic managers to improve the efficiency, safety~~,~~ and quality of ~~traveler~~traveller journeys.

In order to manage the operation of a VMS and the messages displayed, information exchange between the management systems and the VMS is needed.

This document identifies basic user needs for the management of light-emitting diode (LED) matrix VMSs and traces these needs to interoperable designs. This includes the ability to identify the device, its capabilities, and its status.

NOTE 1 ISO 22741-1 provides additional details about how the ISO 22741 series ~~relate~~relates to the overall ITS architecture.

~~3~~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 22741-1, *Intelligent transport systems — Roadside modules AP-DATEX data interface — Part 1: Overview*

~~ISO 22741-2 Intelligent transport systems – Roadside modules AP-DATEX data interface – Part 2: Generalized Field Device – Basic Management~~

~~4~~3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 22741-1 and the following apply.

ISO and IEC maintain ~~terminological~~terminology databases for use in standardization at the following addresses:

— ~~-~~ ISO Online browsing platform: available at ~~http://www.iso.org/obp~~https://www.iso.org/obp

— ~~-~~ IEC Electropedia: available at ~~http://www.electropedia.org/~~https://www.electropedia.org/

~~For the purposes of this document, the following terms and definitions apply.~~

~~4.1~~
3.1
architecture
fundamental concepts or properties of a system in its environment embodied in its elements, relationships, and in the principles of its design and evolution

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~~[Source: ISO 42010:2011, 3.2]~~

~~4.2~~
3.2
centre system
intelligent transport systems (ITS) component that provides application, management~~,~~ and/or administrative functions from a centralized location (i.e~~.,~~ not at the roadside)

~~3.3~~3.3
message
data concept ~~that is~~consisting of a grouping of data elements, data frames, or data elements and data frames, that is used to convey a complete set of information

~~3.4~~3.4
traffic management system
~~centre system~~centre system that monitors and controls traffic and the road network

~~3.5~~3.5
variable message sign
VMS
field device that can display real-time traveller information to the public~~. A VMS can display the message predefined in stored library by the operator. VMS can also immediately display the message desired by the operator.~~

~~NOTE~~ Note 1 to entry: A VMS can display the message predefined in a stored library by the operator. A VMS can also immediately display the message desired by the operator.

Note 2 to entry: A VMS typically consists of one sign display, one sign controller, a cabinet that houses the sign controller, and potentially other components.

~~5~~4 Symbols and abbreviated terms

~~ASCII American Standard Code for Information Interchange~~
~~ASN.1 Abstract Syntax Notation One~~
~~AP-DATEX Application Profile-DATa EXchange~~
~~CRC Cyclical Redundancy Check~~
~~I/O Input/Output~~
~~ITS Intelligent Transportation Systems~~
~~MULTI Markup Language For Transportation Information~~
~~NTCIP National Transportation Communications for ITS Protocol~~
~~UTF-8 Universal Coded Character Set Transformation Format - 8-bit~~
~~VMS Variable Message Signs~~

ASCII american standard code for information interchange
AP-DATEX application profile-data exchange
CRC cyclical redundancy check

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