



SLOVENSKI STANDARD
oSIST prEN IEC 62290-1:2023
01-junij-2023

Železniške naprave - Komandno-kontrolni sistemi za upravljanje urbanega prometa - 1. del: Sistemska načela in osnovni koncepti

Railway applications - Urban guided transport management and command/control systems - Part 1: System principles and fundamental concepts

Bahnanwendungen - Betriebsleit- und Zugsicherungssysteme für den städtischen schienengebundenen Personennahverkehr - Teil 1: Systemgrundsätze und grundlegende Konzepte

Applications ferroviaires - Systèmes de contrôle/commande et de gestion des transports guidés urbains - Partie 1: Principes système et concepts fondamentaux

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OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: <input type="checkbox"/> Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: <input type="checkbox"/> EMC <input type="checkbox"/> ENVIRONMENT <input type="checkbox"/> QUALITY ASSURANCE <input type="checkbox"/> SAFETY	
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TITLE: Railway applications – Urban guided transport management and command/control systems – Part 1: System principles and fundamental concepts

PROPOSED STABILITY DATE: 2029

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RAILWAY APPLICATIONS –
URBAN GUIDED TRANSPORT MANAGEMENT
AND COMMAND/CONTROL SYSTEMS –****Part 1: System principles and fundamental concepts****FOREWORD**

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International Standard IEC 62290-1 has been prepared by IEC technical committee 9: Electrical equipment and systems for railways.

This third edition cancels and replaces the second edition issued in 2014. It constitutes a technical revision.

The main technical changes with regard to the previous edition are as follows:

- the figure 3 giving the system environment of UGTMS has been amended to reflect the adaptation of it. We have removed external equipment for which no requirement is described in the series. And we have added new external equipment having such requirements (like the washing machine)

The text of this standard is based on the following documents:

Draft	Report on voting
9/XXXX/FDIS	9/XXXX/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of IEC 62290 series, under the general title: *Railway applications – Urban guided transport management and command/control systems*, can be found on the IEC website. (See also introduction to this standard.)

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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1

INTRODUCTION

2 IEC 62290 standard series specifies the functional, system and interface requirements for the
3 command, control, and management systems intended to be used on urban, guided
4 passenger transport lines and networks. This series does not apply to lines that are operated
5 under specific railway regulations, unless otherwise specified by the authority having
6 jurisdiction.

7 These systems are designated here as Urban Guided Transport Management and
8 Command/Control Systems (UGTMS). UGTMS cover a wide range of operations needs from
9 non-automated (GOA1) to unattended (GOA4) operation. A line may be equipped with
10 UGTMS on its full length or only partly equipped.

11 This series does not specifically address security issues. However, aspects of safety
12 requirements may apply to ensuring security within the urban guided transit system.

13 The main objective of this series is to achieve interoperability, interchangeability and
14 compatibility.

15 This series is a recommendation for those transport authorities wishing to introduce
16 interoperable, interchangeable and compatible equipment.

17 It is the responsibility of the transport authority concerned in accordance with the authority
18 having jurisdiction to decide on how to apply this series and to take into account their
19 particular needs.

20 IEC 62290 series is also intended to support applications for upgrading existing signalling and
21 command control systems. In this case, interchangeability and compatibility could be ensured
22 only for the additional UGTMS equipment. Checking the possibility for upgrading existing
23 equipment and the level of interoperability is the responsibility of the transport authority
24 concerned.

25 Application of the series should take into account the differences between the various
26 networks operated in different nations. Those differences include operational and regulatory
27 requirements as well as different safety cultures.

28 This series defines a catalogue of UGTMS requirements split into mandatory and optional
29 functions. The functions used are based on the given grade of automation. Most of the
30 functions characterized as mandatory are to be considered with no condition. Some specific
31 functions have a condition to be mandatory (this condition being generally related to the use
32 of an external equipment by UGTMS). By fulfilling the requirements, a supplier can create one
33 or more generic applications including all mandatory functions and all or a subset of optional
34 functions. A generic application will achieve interoperability within the defined specific
35 application conditions. Customising a generic application will create a specific application
36 taking into account of local conditions like track layout and headway requirements. It is the
37 choice of supplier and transport authority to add additional functions to a generic or specific
38 application. These additional functions are not described in this series.

39 According to IEC 62278, it is the responsibility of the transport authority, in agreement with
40 the authority having jurisdiction, to decide, taking into account their risk acceptance principles
41 to conduct specific hazard and risk analysis for each specific application. The safety levels for
42 the functions of each specific application have to be determined by a specific risk analysis.

43 Terms such as "safety related command", "safety conditions", "safe station departure" are
44 mentioned without having performed any hazard analysis.

45 Standard series IEC 62290 is intended to consist of four parts:

46 – Part 1 “System principles and fundamental concepts” provides an introduction to the
47 standard and deals with the main concepts, the system definition, the principles and the
48 main basic functions of UGTMS (Urban Guided Transport Management and
49 Command/Control Systems).

50 The three other parts correspond to the three steps (see Figure 1) required in the process of
51 specifying UGTMS and are to be used accordingly.

52 – Part 2 “Functional requirements specification” specifies the functional requirements
53 associated to the basic functions provided by Part 1, within the system boundaries and
54 interfaces as defined in Figure 3 of Part 1.

55 The FRS (Functional Requirements Specification) identifies and defines the functions that
56 are necessary to operate an urban guided transport system. Two types of functions are
57 distinguished for a given grade of automation: mandatory functions (e.g. train detection)
58 and optional functions (e.g. manage stabling). Requirements of functions have the same
59 allocation, unless they are marked otherwise.

60 – Part 3 “System requirements specifications” deals with the architecture of the system and
61 the allocation of the requirements and functions identified in part 2 to UGTMS equipment.

62 The SRS (System Requirements Specification) specifies the architecture of a UGTMS
63 system, with mandatory and optional UGTMS equipment.

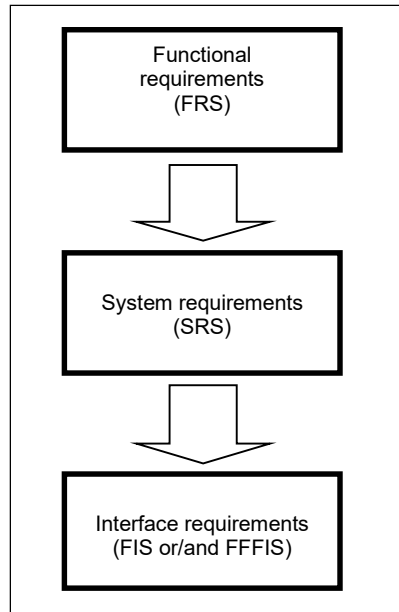
64 – Part 4 (under consideration) “Interface specifications” deals with the definition of the
65 interfaces, as well as the data exchanged by them (FIS and FFFIS), for the interoperable
66 and interchangeable UGTMS equipment identified in part 3.

67 For interfaces between UGTMS equipment, the logical interface or FIS (Functional
68 Interface Specification) and/or the physical and logical interface or FFFIS (Form Fit
69 Functional Interface Specification) will be considered.

70 NOTE The specific structure of Part 4 will be established to accommodate optional and mandatory UGTMS
71 equipment, and to reflect local conditions. In principle, only one FIS or/and FFFIS will be defined for the same
72 interface. However, when justified in some cases, several FIS or several FFFIS will be defined for the same
73 interface.

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IEC 1339/06

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Figure 1 – The three-step process followed by the UGTMS standard

78 Requirements are those necessary to fulfil all operational needs for safe and orderly operation
79 requested by transport authorities without regard to technical solutions.

80 The chosen level of detail in describing requirements enables customers as well as authorities
81 having jurisdiction to be assured that generic applications delivered by different suppliers will
82 cover at least the same functionality as specified in this document.

83 Requirements which are established by this series are indicated clearly with a requirement
84 identification number related to the function to be covered.

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RAILWAY APPLICATIONS – URBAN GUIDED TRANSPORT MANAGEMENT AND COMMAND/CONTROL SYSTEMS –

Part 1: System principles and fundamental concepts

95

1 Scope

96 This document provides an introduction to the standard and deals with the main concepts, the
97 system definition, the principles and the basic functions of UGTMS (Urban Guided Transport
98 Management and Command/Control Systems) for use in urban guided passenger transport
99 lines and networks. This standard is applicable for new lines or for upgrading existing
100 signalling and command control systems.

101 This document is applicable to applications using:

- 102
- 103 • continuous data transmission,
 - 104 • continuous supervision of train movements by train protection profile,
 - 105 • localisation of trains by onboard UGTMS equipment (reporting trains), and optionally
by external wayside (and optionally onboard) device.

106

2 Normative references

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

111 IEC 62236 (all parts), *Railway applications – Electromagnetic compatibility*

112 IEC 62278, *Railway applications – Specification and demonstration of reliability, availability,
113 maintainability and safety (RAMS)*

114 IEC 62279, *Railway applications – Communications, signalling and processing systems –
115 Software for railway control and protection systems*

116 IEC 62280, *Railway applications - Communication, signalling and processing systems - Safety
117 related communication in transmission systems*

118 IEC 62290-2, *Railway applications – Urban guided transport management and
119 command/control systems – Part 2: Functional requirements specification*

120 IEC 62425, *Railway applications – Communication, signalling and processing systems –
121 Safety related electronic systems for signalling*

122

3 Terms, definitions and abbreviations

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

124 3.1 Terms and definitions

125 3.1.1

126 additional function

127 function to be adapted to the specific requirements of each transport authority (due to local
128 rules or specific needs of the transport authority)

129 Note 1 to entry: The components affected by this function are not necessarily interchangeable nor interoperable.

130 3.1.2

131 automatic driving mode

132 operation in semi-automated train operation (GOA2), driverless train operation (GOA3),
133 unattended train operation (GOA4)

134 3.1.3

135 command

136 order used to perform a function in a system

137 Note 1 to entry: This order can originate from

- 138 – a system operator,
- 139 – an external system,
- 140 – inside UGTMS;

141 this order can be sent:

- 142 – to an external system,
- 143 – inside UGTMS.

144 3.1.4

145 commercial speed

146 nominal average speed of passenger service trains between two terminus stations of the line
147 (dwell times at stations taken into account)

148 Note 1 to entry: Commercial speed is equal to the length between two terminus stations divided by the nominal
149 journey time.

150 3.1.5

151 compatibility

152 capability of the UGTMS system to co-exist with other systems in the same transport network
153 without any interference

154 3.1.6

155 control

156 process to keep the output of the system within defined parameters using commands for non-
157 safety related control or safety related control

158 Note 1 to entry: An example of non-safety related control is the process of commanding acceleration or braking to
159 maintain speed at $x \text{ km/h} \pm y \text{ km/h}$. An example of safety related control is the process of commanding the
160 emergency brakes if the speed exceeds the predefined speed limit.

161 3.1.7

162 driving on sight

163 manual driving carried out at a speed that allows the train operator to stop the train before
164 reaching any obstacle on the track

165 3.1.8

166 dwell time

167 time during which a train is berthed in a station served by the mission