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## **Järnvägsanläggningar – System för ledning och styrning av spårbunden tätortstrafik (UGTMS) – Del 1: Grundläggande begrepp och principer**

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

Som svensk standard gäller europastandarden EN 62290-1:2006. Den svenska standarden innehåller den officiella engelska språkversionen av EN 62290-1:2006.

### **Nationellt förord**

Europastandarden EN 62290-1:2006<sup>\*)</sup>

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 62290-1, First edition, 2006 - Railway applications - Urban guided transport management and command/control systems - Part 1: System principles and fundamental concepts**

utarbetad inom International Electrotechnical Commission, IEC.

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<sup>\*)</sup> EN 62290-1:2006 ikraftsattes 2007-10-22 som SS-EN 62290-1 genom offentliggörande, d v s utan utgivning av något svenskt dokument.

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Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

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**Railway applications -  
Urban guided transport management  
and command/control systems  
Part 1: System principles and fundamental concepts  
(IEC 62290-1:2006)**

Applications ferroviaires -  
Systèmes de contrôle/commande  
et de gestion des transports  
guidés urbains  
Partie 1: Principes système  
et concepts fondamentaux  
(CEI 62290-1:2006)

Bahnanwendungen -  
Betriebsleit- und Zugsicherungssysteme  
für den städtischen schienengebundenen  
Personennahverkehr  
Teil 1: Systemgrundsätze  
und grundlegende Konzepte  
(IEC 62290-1:2006)

This European Standard was approved by CENELEC on 2006-11-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

# CENELEC

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

## Foreword

The text of document 9/949/FDIS, future edition 1 of IEC 62290-1, prepared by IEC TC 9, Electrical equipment and systems for railways, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62290-1 on 2006-11-01.

The following dates were fixed:

- latest date by which the EN has to be implemented  
at national level by publication of an identical  
national standard or by endorsement (dop) 2007-08-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2009-11-01

Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 62290-1:2006 was approved by CENELEC as a European Standard without any modification.

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## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

NOTE 1 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Where a standard cited below belongs to the EN 50000 series, this European Standard applies instead of the relevant International Standard.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 62236	Series	Railway applications - Electromagnetic compatibility	EN 50121	Series
IEC 62278	- <sup>1)</sup>	Railway applications - Specification and demonstration of reliability, availability, maintainability and safety (RAMS)	EN 50126-1 + corr. May	1999 <sup>2)</sup> 2006
IEC 62279	- <sup>1)</sup>	Railway applications - Communications, signalling and processing systems - Software for railway control and protection systems	EN 50128	2001 <sup>2)</sup>
IEC 62280-1	- <sup>1)</sup>	Railway applications - Communication, signalling and processing systems Part 1: Safety-related communication in closed transmission systems	EN 50159-1	2001 <sup>2)</sup>
IEC 62280-2	- <sup>1)</sup>	Railway applications - Communication, signalling and processing systems Part 2: Safety-related communication in open transmission systems	EN 50159-2	2001 <sup>2)</sup>

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<sup>1)</sup> Undated reference.

<sup>2)</sup> Valid edition at date of issue.

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## INTRODUCTION

Standard IEC 62290 specifies the functional, system and interface requirements for the command, control, and management systems that are used on urban, guided passenger transport lines and networks. Trains operating on such lines may include heavy-duty underground (metros) trains, commuter trains, light rail trains, trams and regional trains. This standard does not apply to lines that are operated under specific railway regulations, unless otherwise specified by the authority having jurisdiction, however this standard will recognise the importance of maximising operational interoperability between interconnected UGTMS and non-UGTMS networks.

These systems are designated here as Urban Guided Transport Management and Command/Control Systems (UGTMS). UGTMS systems cover a wide range of applications from manual to fully automated operation. A line may be equipped with UGTMS on its full length or only partly equipped.

UGTMS requirements include consideration of the following:

- command/control and supervision of train movements;
- safety of train movement;
- safety of passengers and staff;
- factors affecting line capacity, train throughput and average train speed;
- factors affecting system availability;
- factors affecting system safety.

This standard does not specifically address security issues. However, aspects of safety requirements may apply to assuring security within the urban guided transit system.

This standard defines a complete catalogue of UGTMS functional requirements split into mandatory and optional functions, as well as customisation principles. The functions used are based on the given grade of automation taking into account the grade of line. By fulfilling the requirements, a supplier can create one or more generic applications including all mandatory functions and all or a subset of optional functions. A generic application will achieve interoperability within the defined boundary conditions. Customising a generic application will create a specific application taking into account of local conditions like track layout and headway requirements. It is in the choice of supplier and transport authority to add additional functions to a generic or specific application. These additional functions are not described in this standard.

The application of this standard is the responsibility of the transport authority concerned in accordance with the authority having jurisdiction.

This standard is a recommendation for those transport authorities, wishing to introduce interoperable, interchangeable and compatible equipment. It is the responsibility of transport authorities, in accordance with authorities having jurisdiction, to take into account their particular needs in the application of the standard.

This standard is also applicable for upgrading of existing systems. In this case, interchangeability and compatibility could be ensured only for the additional UGTMS equipment. Checking the possibility for upgrading existing equipment and the level of interoperability is the responsibility of the transport authority concerned. The definition of generic interfaces with existing equipment, which may be customised for a specific application, is within the scope of the standard.

This standard is not applicable to existing command and control systems or projects in progress prior to the effective date of this standard.

Command and control systems which do not use data communications, between wayside equipment and trains, for train protection purposes are not within the scope of this standard.

The main objective of this standard is to achieve interoperability, interchangeability and compatibility.

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

The standard is divided into four parts.

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

The three other parts correspond to the three steps required in the process of specifying UGTMS and are to be used accordingly.

- Part 2 “Functional specifications” deals with the standardisation of functions and takes into account all essential requirements and assignment of safety integrity level (SIL) (see IEC 62278) as well as functional requirement specifications (FRS).

The FRS (Functional Requirement Specification) identifies and defines the functions that are necessary to operate an urban guided transport system. Two types of functions are distinguished for a given grade of automation taking into account grade of line: mandatory functions (e.g. train detection) and optional functions (e.g. CCTV monitoring of platforms and tracks).

- Part 3 “System specifications” deals with the architecture of the system and the allocation of the requirements and functions identified in part 2 to architecture constituents (SRS).

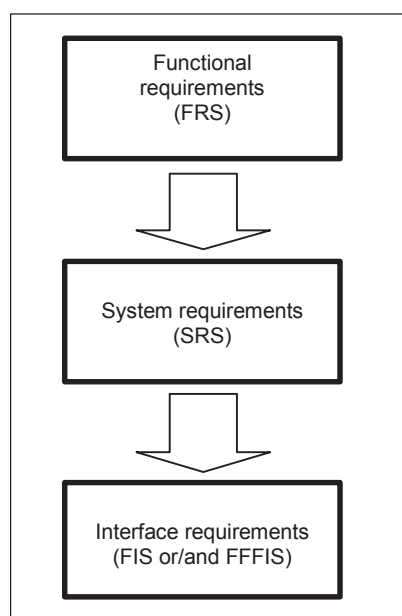
The SRS (System Requirement Specification) specifies the architecture of a UGTMS system, with mandatory and optional constituents.

- Part 4 “Interface specifications” deals with the definition of the interfaces, as well as the data exchanged by them (FIS or/and FFFIS), for the interoperable and interchangeable constituents identified in part 3.

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

NOTE The specific structures of part 3 and part 4 will be established following completion of part 2 to accommodate optional and mandatory constituents, and to reflect local conditions. In principle, only one FIS or/and FFFIS will be defined for the same interface. However, when justified in some cases several FIS or several FFFIS will be defined for the same interface.





IEC 1339/06

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

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

## Part 1: System principles and fundamental concepts

### 1 Scope

This part of IEC 62290 provides an introduction to the standard and deals with the main concepts, the system definition, the principles and the main functions of UGTMS (Urban Guided Transport Management and Command/Control Systems).

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including amendments) applies.

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

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

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

IEC 62280-1: *Railway applications – Communication, signalling and processing systems – Part 1: Safety-related communication in closed transmission systems*

IEC 62280-2: *Railway applications – Communication, signalling and processing systems – Part 2: Safety-related communication in open transmission systems*