SLOVENSKI STANDARD
SIST ENV 50121-4:1998

01-november-1998

Railway applications - Electromagnetic compatibility - Part 4: Emission and immunity of the signalling and telecommunications apparatus

Railway applications - Electromagnetic compatibility -- Part 4: Emission and immunity of the signalling and telecommunications apparatus

Bahnanwendungen - Elektromagnetische Verträglichkeit -- Teil 4: Störaussendung und Störfestigkeit von Signal- und Telekommunikationseinrichtungen

Applications ferroviaires - Compatibilité électromagnétique -- Partie 4: Emission et immunité des équipements de signalisation et de télécommunication

Ta slovenski standard je istoveten z: **ENV 50121-4:1996**

ICS:

33.100.01	Elektromagnetna združljivost na splošno	Electromagnetic compatibility in general
45.020	Železniška tehnika na splošno	Railway engineering in general

SIST ENV 50121-4:1998 **en**

EUROPEAN PRESTANDARD

PRÉNORME EUROPÉENNE

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ENV 50121-4

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ICS 29.020; 29.280; 45.020

Descriptors: Railway rolling stock, signalling, communications, electric equipment, radio disturbances, electromagnetic compatibility, tests, limits

English version

Railway applications - Electromagnetic compatibility Part 4: Emission and immunity of the signalling and telecommunications apparatus

Applications ferroviaires - Compatibilité électromagnétique
Partie 4: Emission et immunité des équipements de signalisation et de télécommunication

Bahnanwendungen - Elektromagnetische Verträglichkeit
Teil 4: Störaussendung und Störfestigkeit von Signal- und Telekommunikationseinrichtungen

This European Prestandard (ENV) was approved by CENELEC on 1995-12-11 as a prospective standard for provisional application. The period of validity of this ENV is limited initially to three years. After two years the members of CENELEC will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard (EN).

CENELEC members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

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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

This European Prestandard was prepared by the Technical Committee CENELEC TC 9X, Electrical and electronic applications for railways, in accordance with the decision taken by CLC/TC9X at its 11th meeting on 1995-05-12/13.

The text of the draft was submitted to the formal vote and was approved by CENELEC as ENV 50121-4 on 1995-12-11.

- latest date by which the existence of the ENV has to be announced at national level (doa) 1996-01-15

This European Prestandard is to be used in conjunction with ENV 50121-1 - Railway applications, Electromagnetic compatibility, Part 1: General.

In this Prestandard, annex A is informative.

Contents

Introduction

This European Prestandard has been prepared in the form of a product specific standard to provide one method of compliance with the EC Directive on electromagnetic compatibility (EMC). The purpose of the EMC Directive is to allow apparatus to function as intended in an environment where there are emissions of electrical energy which might interfere with its normal operation, and to ensure as far as possible that the apparatus does not itself interfere with other users in the electromagnetic spectrum. The requirements of this Prestandard have been specified for apparatus operating in the railway environment.

1 Scope

This European Prestandard specifies limits for emission and immunity and provides performance criteria for signalling and telecommunications (S&T) apparatus which may interfere with other apparatus in the railway environment, or increase the total emissions for the railway environment beyond the limits defined in the appropriate standard, and so risk causing Electro-magnetic interference (EMI) to apparatus outside the railway system (The railway system is described in ENV 50121-1). The specific provisions are to be used in conjunction with ENV 50121-1.

The immunity levels given for the apparatus will in most cases allow the apparatus to perform as intended in the railway environment (see note). The immunity level establishes a common reference for evaluating the performance of the apparatus when subject to interference resulting from direct exposure of the apparatus and associated cables to a radio frequency field, or by coupling of the interference from a remote source.

This Prestandard does not specify basic personal safety requirements for apparatus such as protection against electric shock, unsafe operation, insulation co-ordination and related dielectric tests. The requirements were developed for and are applicable to this set of apparatus when operating under normal conditions. Fault conditions of the apparatus have not been taken into account.

Safety requirements are not covered by this Prestandard. The requirements and test methods also apply to telecommunications and signalling data and power lines connected to the equipment under test (EUT) and which interconnect the functional modules of the apparatus.

The frequency limits for emission and immunity requirements are from d.c. to 400 Ghz. At present testing is not defined for frequencies above 1 GHz.

Testing methods are given in the basic standards listed in clause 2, Normative references. The environments considered are defined in clause 3, Definitions.

NOTE: The immunity and emission levels do not of themselves guarantee that the integration of apparatus will necessarily be satisfactory. The Prestandard cannot cover all the possible configurations of the apparatus, but the test levels are sufficient to achieve satisfactory EMC in the majority of cases. In exceptional circumstances, for instance near a Special Location (as defined in the EMC Directive) with unusually high levels of EMI, additional measures may be required to ensure proper operation. The resolution of this problem is a matter for discussion between the equipment supplier and the project manager or infrastructure controller or equivalent.

2 Normative references

This European Prestandard incorporates by dated or undated reference, provisions from other publications. These normative references are cited in the appropriate places in the text and the publications are listed below. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Prestandard only when incorporated into it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN 50121-1	Railway applications - Electromagnetic compatibility Part 1: General
EN 55022	Limits and methods of measurement of radio interference characteristics of information technology equipment (CISPR 22)

EN 61000-4-1	Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques Section 1: Overview of immunity tests (IEC 1000-4-1)
EN 61000-4-2	Section 2: Electrostatic discharge immunity test (IEC 1000-4-2)
EN 61000-4-4	Section 4: Electrical fast transient/burst immunity test (IEC 1000-4-4)
EN 61000-4-5	Section 5: Surge immunity test (IEC 1000-4-5)
EN 61000-4-8	Section 8: Power frequency magnetic field immunity test (IEC 1000-4-8)
EN 61000-4-10	Section 10: Damped oscillatory magnetic field immunity test (IEC 1000-4-10)
ENV 50140	Electromagnetic compatibility - Basic immunity standard - Radiated, radio-frequency electromagnetic field - Immunity test
ENV 50141	Electromagnetic compatibility - Basic immunity standard - Conducted disturbances induced by radio-frequency fields - Immunity test
ENV 50204	Radiated electromagnetic field from digital radio telephones - Immunity test
CISPR 16 -1:1993	Specification for radio disturbance and immunity measuring apparatus and methods - Part 1: Radio disturbance and immunity measuring apparatus
IEC 50(161)	International Electrotechnical Vocabulary - Chapter 161: Electromagnetic compatibility

3 Definitions

For the purpose of this Prestandard the definitions related to EMC and the relevant phenomena may be found in the EEC Directive, in Chapter 161 of the IEV (IEC 50) and in IEC and CISPR publications. The definitions in the Directive (89/336/EEC) take precedence. It is necessary to define different environments in which the apparatus is installed. This is especially important when setting the levels of immunity which are required. The particular definitions used in this Prestandard are as follows:

3.1 *Environments*

3.1.1 internal: Inside a building.

3.1.2 external: Outside a building, but 3 m or more from the nearest rail or in a protective cabinet.

3.1.3 trackside: Less than 3 m from the nearest rail and not in a protective cabinet.

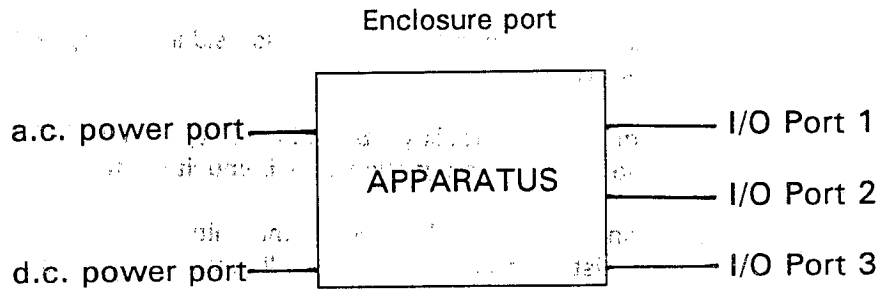
3.2 *Ports*

3.2.1 port: The particular interface of the specified apparatus with the external environment e.g. a.c. power port, d.c. power port, I/O (input/output) port.

3.2.2 enclosure port: The physical boundary of the apparatus through which electromagnetic fields may radiate or impinge.

3.2.3 power port: A port connected electrically to a power supply.

3.2.4 Port diagram



I/0 Port 1: A port connected to cables laid in a protected environment (e.g. building, conduit) where there is a physical separation from circuits which may generate high emission levels, and where there is a physical separation from unshielded power supply and control cables (for instance, a typical arrangement would have cables laid in separate conduits according to function).

I/0 Port 2: A port connected to cables laid in a protected environment but with poor separation from circuits which may generate high emission levels and less than ideal separation from power supply and control cables (for instance, cables of differing function laid in the same conduit). This configuration has separate dedicated cables for power supply, control, signal and telecommunications functions, and an earthing system.

I/0 Port 3: A port connected to cables not conforming to any of the above definitions.