SLOVENSKI STANDARD
SIST EN 50121-4:2017

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Nadomešča:

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Železniške naprave - Elektromagnetna združljivost - 4. del: Sevanje in odpornost signalnih in telekomunikacijskih naprav

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

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

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

Ta slovenski standard je istoveten z: EN 50121-4:2016

ICS:

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

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EUROPEAN STANDARD

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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 appareils de signalisation et de télécommunication

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

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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

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European foreword

This document (EN 50121-4:2016) has been prepared by CLC/TC 9X: “Electrical and electronic applications for railways”.

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2017-07-24
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2019-10-24

This document supersedes EN 50121-4:2015.

EN 50121-4:2016 includes the following significant technical changes with respect to EN 50121-4:2006:

— clarification of scope (Clause 1);

— set dated normative references (Clause 2);

— new definition (Clause 3);

— emission requirement extended in the frequency range 1 GHz to 6 GHz following EN 61000-6-4;

— immunity requirement extended in the frequency range 5,1 GHz to 6 GHz;

EN 50121-4:2016 includes the following significant technical changes with respect to EN 50121-4:2015

— revision of Annex ZZ.

This European Standard is to be read in conjunction with EN 50121-1.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

This standard forms Part 4 of the European Standard series EN 50121, published under the general title “Railway applications - Electromagnetic compatibility”. The series consists of:

— Part 1: *General;*

— Part 2: *Emission of the whole railway system to the outside world;*

— Part 3-1: *Rolling stock – Train and complete vehicle;*

— Part 3-2: *Rolling stock – Apparatus;*

— Part 4: *Emission and immunity of the signalling and telecommunications apparatus;*

— Part 5: *Emission and immunity of fixed power supply installations and apparatus.*

Introduction

This European Standard has been prepared in the form of a Product Standard.

It defines the immunity and emission test requirements for apparatus defined in the scope in relation to the electromagnetic disturbances likely to be experienced in the railway. In particular, the test requirements represent the essential electromagnetic immunity requirements and have been selected to ensure an adequate level of immunity for apparatus installed on the railway locations.

Test requirements are specified for each port considered.

Safety considerations are not covered by this standard.

In specific situations, where the level of disturbances may exceed the levels considered in this standard, e.g. at a special location or where a hand-held transmitter is used in very close proximity to an apparatus, special mitigation measures may have to be employed.

1 Scope

This European Standard applies to signalling and telecommunication apparatus that is installed inside the railway environment. Signalling and telecommunication apparatus mounted in vehicles is covered by EN 50121-3-2:2016, signalling and telecommunication apparatus installed inside the substation and connected to substation equipment is covered by EN 50121-5:2016.

This European Standard specifies limits for emission and immunity and provides performance criteria for signalling and telecommunications (S&T) apparatus (including power supply systems belonging to S&T) which may interfere with other apparatus inside the railway environment, or increase the total emissions for the railway environment and so risk causing Electro-Magnetic Interference (EMI) to apparatus outside the railway system.

The requirements specified in this standard apply for:

— vital equipment such as interlocking or command and control;

— apparatus inside the 3 m zone;

— ports of apparatus inside the 10 m zone with connection inside the 3 m zone;

— ports of apparatus inside the 10 m zone with cable length > 30 m.

Other apparatus not covered by at least one of these given cases should be in compliance with EN 61000-6-2.

If a port is intended to transmit or receive for the purpose of radio communication (intentional radiators, e.g. transponder systems), then the radiated emission requirement in this standard are not intended to be applicable to the intentional transmission from a radio-transmitter as defined by the ITU.

Immunity limits do not apply in the exclusion bands as defined in the corresponding EMC related standard for radio equipment.

The standard 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.

The frequency range considered is from DC to 400 GHz. No measurements need to be performed at frequencies where no requirement is specified.

For products in the scope of EN 61000-3-2, EN 61000-3-3, EN 61000-3-11 or EN 61000-3-12 the requirements of those standards also apply.

These specific provisions are to be used in conjunction with the general provisions in EN 50121-1:2016.

The immunity and emission levels do not of themselves guarantee that the integration of apparatus will necessarily be satisfactory. The standard cannot cover all the possible configurations of the apparatus, but the test levels are sufficient to achieve satisfactory EMC in the majority of cases.

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.

EN 50121-1:2017, *Railway applications — Electromagnetic compatibility — Part 1: General*

EN 55016-2-1:2014, *Specification for radio disturbance and immunity measuring apparatus and methods — Part 2-1: Methods of measurement of disturbances and immunity — Conducted disturbance measurements (CISPR 16-2-1:2014)*

EN 61000-4-2:2009, *Electromagnetic compatibility (EMC) — Part 4-2: Testing and measurement techniques — Electrostatic discharge immunity test (IEC 61000-4-2:2008)*

EN 61000-4-3:2006, *Electromagnetic compatibility (EMC) — Part 4-3: Testing and measurement techniques — Radiated, radio-frequency, electromagnetic field immunity test (IEC 61000-4-3:2006)*

EN 61000-4-4:2012, *Electromagnetic compatibility (EMC) — Part 4-4: Testing and measurement techniques — Electrical fast transient/burst immunity test (IEC 61000-4-4:2012)*

EN 61000-4-5:2014, *Electromagnetic compatibility (EMC) — Part 4-5: Testing and measurement techniques — Surge immunity test (IEC 61000-4-5:2014)*

EN 61000-4-6:2014, *Electromagnetic compatibility (EMC) — Part 4-6: Testing and measurement techniques — Immunity to conducted disturbances, induced by radio-frequency fields (IEC 61000-4-6:2013)*

EN 61000-4-8:2010, *Electromagnetic compatibility (EMC) — Part 4-8: Testing and measurement techniques — Power frequency magnetic field immunity test (IEC 61000-4-8:2009)*

EN 61000-6-2:2005, *Electromagnetic compatibility (EMC) — Part 6-2: Generic standards — Immunity for industrial environments (IEC 61000-6-2:2005)*

EN 61000-6-4:2007[1], *Electromagnetic compatibility (EMC) — Part 6-4: Generic standards — Emission standard for industrial environments (IEC 61000-6-4:2006)*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

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

3.1.1
port
particular interface of the specified apparatus with the external environment

EXAMPLE AC power port, DC power port, I/O (input/output) port, earth port.

[SOURCE: IEC 60050-821: CDV2015, 821-11-36]

3.1.2
enclosure port
physical boundary of the apparatus through which electromagnetic fields may radiate or impinge

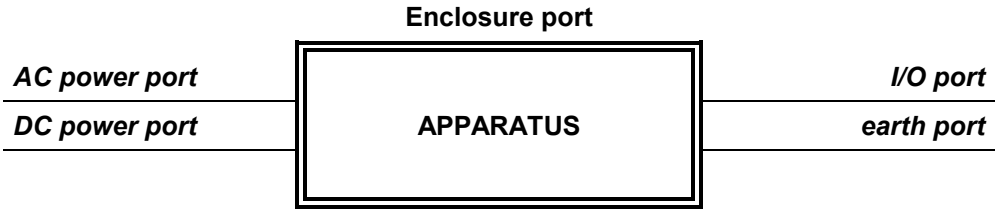

Figure 1 — Main categories of ports

[1] As impacted by EN 61000-6-4:2007/A1:2011

3.1.3
3 m zone
area along the railway line within a distance of 3 m from the centreline of the nearest track at both sides of the track

3.1.4
10 m zone
area along the railway line within a distance of 10 m from the centreline of the nearest track at both sides of the track

3.2 Abbreviations

AC	Alternating current
AM	Amplitude modulation
DC	Direct current
EMC	Electromagnetic compatibility
EMI	Electromagnetic interference
I/O	Input / Output
ITU	International Telegraph Union
S&T	Signalling and telecommunication

4 Description of location

The railway environment is characterized as described in EN 50121-1:2017.

5 Emission limits for apparatus

Apparatus which complies with the emission levels of EN 61000-6-4 is deemed to meet the emission requirements of this standard provided that emissions from any DC power port are within the emission limits specified for AC power ports.

The emission limits defined in Table 1 shall be complied with. The conducted emission limits shall apply to both AC and DC power ports. Where the apparatus is intended to be used in an environment other than the railway environment, then the emission limits given in the appropriate standards shall apply.