



**NSAI**  
Standards

Irish Standard  
I.S. EN 50121-4:2016&A1:2019

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

**I.S. EN 50121-4:2016&A1:2019**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

EN 50121-4:2016/A1:2019

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I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

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SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

*This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):*

*NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.*

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## National Foreword

I.S. EN 50121-4:2016&A1:2019 is the adopted Irish version of the European Document EN 50121-4:2016, Railway applications - Electromagnetic compatibility - Part 4: Emission and immunity of the signalling and telecommunications apparatus

This document does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

**Compliance with this document does not of itself confer immunity from legal obligations.**

*In line with international standards practice the decimal point is shown as a comma (,) throughout this document.*

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 50121-4:2016/A1**

April 2019

ICS 29.280; 33.100.01; 45.020

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

This amendment A1 modifies the European Standard EN 50121-4:2016; it was approved by CENELEC on 2018-10-30. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 CEN-CENELEC Management Centre or to any CENELEC member.

This amendment 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.

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



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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

## **European foreword**

This document (EN 50121-4:2016/A1:2019) 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 (dop) 2019-10-05  
to be implemented at national level by  
publication of an identical national  
standard or by endorsement
- latest date by which the national (dow) 2019-10-24  
standards conflicting with this document  
have to be withdrawn

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

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 EN 50121-4:2016.

## **1 Modifications to Annex ZZ, Relationship between this European Standard and the essential requirements of Directive 2014/30/EU [2014 OJ L96] aimed to be covered**

*Replace the first paragraph:*

“This European Standard has been prepared under a Commission’s standardization request as regards harmonized standards in support of Directive 2014/30/EU relating to electromagnetic compatibility, to provide one voluntary means of conforming to essential requirements of Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility [2014 OJ L96].”

*with:*

“This European Standard has been prepared under the European Commission standardisation request C(2016) 7641 final of 30.11.2016<sup>1</sup>, (‘M/552’), as regards harmonised standards in support of Directive 2014/30/EU relating to electromagnetic compatibility, to provide one voluntary means of conforming to essential requirements of Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility [2014 OJ L96].”

*Replace the title of Table ZZ.1:*

“Correspondence between this European standard and Annex I of Directive 2014/30/EU [2014 OJ L96]”

*with:*

“Correspondence between this European standard and the Essential Requirements set out in Directive 2014/30/EU [2014 OJ L96]”

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<sup>1</sup> COMMISSION IMPLEMENTING DECISION C(2016) 7641 final of 30.11.2016 on standardization request to the European Committee for Standardisation, to the European Committee for Electrotechnical Standardisation and the European Telecommunications Standards Institute as regards harmonised standards in support of Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonization of the laws of the Member States relating to electromagnetic compatibility.

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EUROPEAN STANDARD  
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EUROPÄISCHE NORM

**EN 50121-4**

December 2016

ICS 29.280; 33.100.01; 45.020

Supersedes EN 50121-4:2015

English Version

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

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Teil 4: Störaussendungen und Störfestigkeit von Signal-  
und Telekommunikationseinrichtungen

This European Standard was approved by CENELEC on 2016-10-24. 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.

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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)*

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