



**NSAI**  
Standards

Irish Standard  
I.S. EN 50238-1:2003&AC:2014

# Railway applications - Compatibility between rolling stock and train detection systems

**I.S. EN 50238-1:2003&AC:2014**

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

EN 50238-1:2003/AC:2014

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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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Corrigendum to EN 50238:2003

English version

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**Modification due to Corrigendum from May 2010**

**Annex ZZ**  
(informative)

**Coverage of Essential Requirements of EC Directives**

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and within its scope the standard covers all relevant essential requirements as given in Annex III of the EC Directive 2008/57/EC.

Compliance with this standard provides one means of conformity with the specified essential requirements of the Directive(s) concerned.

WARNING: Other requirements and other EC Directives may be applicable to the products falling within the scope of this standard.

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May 2010

**Modifications due to Corrigendum from November 2014**

Numbering

Add "-1" after "EN 50238".

Title

Add "- Part 1: General" after the current title.

November 2014

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EUROPEAN STANDARD

**EN 50238**

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2003

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ICS 29.180; 45.060.10

English version

**Railway applications –  
Compatibility between rolling stock  
and train detection systems**

Applications ferroviaires –  
Compatibilité entre matériel roulant  
et systèmes de détection de train

Bahnanwendungen –  
Kompatibilität zwischen Fahrzeugen  
und Gleisfreimeldesystemen

This European Standard was approved by CENELEC on 2002-12-01. 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and 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**

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## Foreword

This European Standard was prepared by SC 9XA, Communication, signalling and processing systems, of Technical Committee CENELEC TC 9X, Electrical and electronic applications for railways.

The text of the draft was submitted to the formal vote and was approved by CENELEC as EN 50238 on 2002-12-01.

This European Standard was prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and supports the essential requirements of Directive 96/48/EC.

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) 2003-12-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2005-12-01

This European Standard is intended to be read in conjunction with the EN 50121 series.

Annexes designated “informative” are given for information only.  
In this standard annexes A, B, C and D are informative.

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## Contents

	<b>Page</b>
<b>Introduction</b> .....	<b>5</b>
<b>1 Scope</b> .....	<b>5</b>
<b>2 Normative references</b> .....	<b>7</b>
<b>3 Definitions</b> .....	<b>7</b>
<b>4 Acceptance process</b> .....	<b>8</b>
4.1 Overview .....	8
4.2 Responsibilities .....	9
4.3 Acceptance process.....	9
4.4 Compatibility case .....	11
4.5 Quality management.....	11
4.6 Route identification.....	11
4.7 Characterisation .....	11
4.8 Tests .....	12
4.9 Compatibility analysis.....	12
4.10 Certificate of acceptance .....	13
<b>5 Characterisation of train detection systems</b> .....	<b>13</b>
5.1 Objective of procedure.....	13
5.2 Physical compatibility .....	13
5.3 Electromagnetic compatibility .....	14
5.4 Factor of safety .....	17
5.5 Track circuit susceptibility .....	17
5.6 Wheel detector susceptibility .....	17
5.7 Train detection system gabarit.....	18
5.8 Interference signal generated by rolling stock and substations.....	18
5.9 Test report .....	19
<b>6 Characterisation of rolling stock</b> .....	<b>20</b>
6.1 Objectives of procedure .....	20
6.2 Description of rolling stock and factors affecting its characteristics.....	20
6.3 Configuration (design status).....	20
6.4 Test plan .....	20
6.5 Test report.....	22
6.6 Archive of test results.....	22
<b>7 Characterisation of traction power supply systems</b> .....	<b>22</b>
7.1 Objective .....	22
7.2 D.C. traction power supplies .....	23
7.3 A.C. traction power supplies .....	23

<b>Annex A</b> (informative) <b>Guidelines for the determination of susceptibility of train detection systems</b> .....	<b>24</b>
<b>Annex B</b> (informative) <b>Guidelines for the measurement of rolling stock characteristics</b> .....	<b>32</b>
<b>Annex C</b> (informative) <b>Factors affecting rolling stock characteristics</b> .....	<b>34</b>
<b>Annex D</b> (informative) <b>D.C. traction power supplies</b> .....	<b>35</b>
Figure 1 – Sources of electromagnetic interference .....	4
Figure 2 – The parties concerned in the acceptance process .....	8
Figure 3 – The acceptance process .....	9
Figure 4 – Relationship between gabarit and permissible interference .....	11
Figure A.1 – Interference mechanism with rails intact .....	23
Figure A.2 – Interference mechanism with self-revealing broken rail .....	23
Figure A.3 – Interference mechanism with unrevealed broken rail .....	24
Figure A.4 – Double rail track circuit .....	25
Figure A.5 – Double rail track circuit with broken rail .....	25
Figure A.6 – Interference mechanism due to voltage between axles – Case 1 .....	26
Figure A.7 – Interference mechanism due to voltage between axles – Case 2 .....	26
Figure A.8 – Effect of inter-vehicle current .....	27
Figure A.9 – Equivalent circuit for previous figure .....	27
Figure A.10 – Example of radiated interference .....	28
Figure A.11 – Sensitive zone of wheel detector .....	29
Figure B.1 – Example of system for measurement of interference currents .....	31
Figure D.1 – Rolling stock with DC supply .....	35
Figure D.2 – Circulation of interference current generated by rolling stock .....	35
Figure D.3 – Circulation of interference current generated by the substation .....	35



## Introduction

This European Standard defines a process to obtain the assurance that specific rolling stock operating on a specific route does not interfere with train detection systems installed on this route.

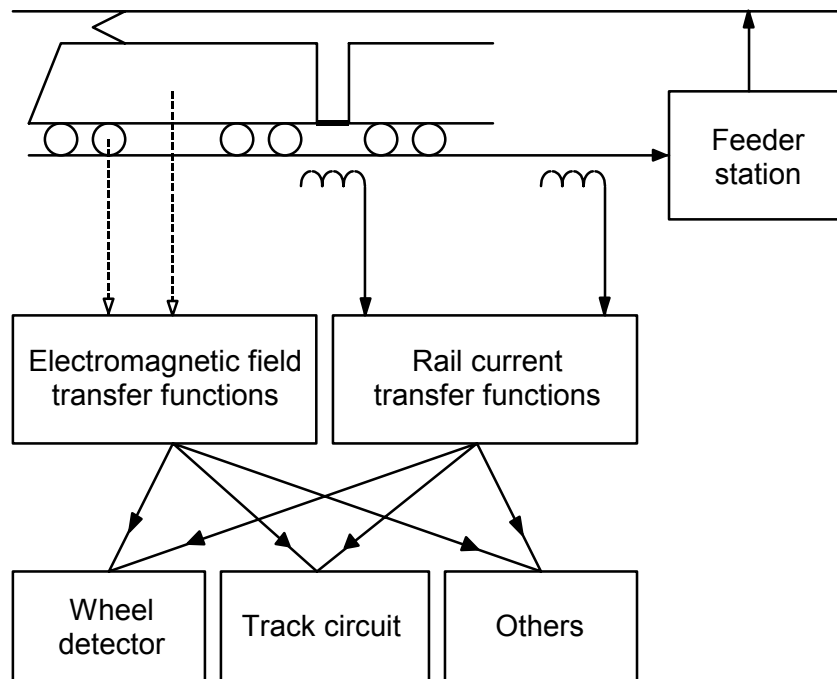
Compatibility problems between train detection systems and rolling stock are a significant obstacle to cross-acceptance of rolling stock in Europe. Unfortunately it is not possible to establish general rules for the maximum levels of interference allowed, valid for every country. This is due to the great diversity of rolling stock, power supply and return current systems, and train detection systems installed in Europe. This diversity leads to consideration of the problem of compatibility of rolling stock and train detection systems for specific routes to avoid unnecessarily restrictive specifications.

Compatibility is determined by both physical and electromagnetic considerations. With regard to EMC, the need is not for general values for maximum levels of interference permitted, but for convenient methods by which to specify the level of interference allowed for operation on specific routes.

Interference may be caused by

- rail currents,
- electromagnetic fields,
- differential voltage between axles,

as shown in Figure 1:



**Figure 5 – Sources of electromagnetic interference**

In practice, the susceptibility of the system is determined by

- the sensitivity of individual components of the system,
- the application of the components, i.e. the configuration of the system.

Therefore the problems concerning track circuits and axle counters or wheel detection systems will be looked at separately.

For determining the susceptibility of signalling systems, laboratory/simulation testing methods as well as methods to conduct tests on the “real railway” are proposed. Modelling enables worst-case conditions to be simulated. In addition, particular test sites are used because, from experience, they are known to provide the test evidence required. Then, taking account of the experience of the railways, it is possible to establish a general method for determining the susceptibility of train detection systems, described in this European Standard.

Before measuring the interference level on rolling stock, a sufficient knowledge of the electric circuit diagram of the power equipment is required, e.g. switching frequencies of on-board static converters, type of regulation used for power converters, resonant frequency of each filter, operating limits under high and low supply voltages, downgraded modes of operation etc.

## 1 Scope

The scope of this European Standard is to describe a procedure for mutual acceptance of rolling stock to run over specific routes. It describes the methods of measurement of interference currents, the methods of measurement of the susceptibility of train detection systems, the characterisation of traction power supplies and the procedure for acceptance. The result of the acceptance procedure is a structured justification document referred to as a “compatibility case”, which documents the evidence that the conditions for compatibility have been satisfied.

This European Standard is not generally applicable to those combinations of rolling stock, traction power supply and train detection system which were accepted as compatible prior to the issue of this European Standard. However, as far as is reasonably practicable, this European Standard may be applied to modifications of rolling stock, traction power supply or train detection systems which may affect compatibility.

The scope of the compatibility case is restricted to the demonstration of compatibility of rolling stock with a train detection system’s characterisation (e.g. gabarit). Radio based signalling systems are not within the scope of this European Standard.

## 2 Normative references

This European Standard incorporates by dated or undated references, provisions from other publications. These normative references are cited at 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 Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 50121	Series	Railway applications – Electromagnetic compatibility
EN 50126		Railway applications – The specification and demonstration of Reliability, Availability, Maintainability and Safety (RAMS)
EN 50163		Railway applications – Supply voltages of traction systems
EN/ISO 9001		Quality management systems – Requirements
EN ISO/IEC 17025		General requirements for the competence of testing and calibration laboratories
ORE B108/1		Unification of air-conditioning and electrical equipment in coaches
UIC 737-3		The application of thyristors in railway technology: Measures for the prevention of functional disturbances in signalling installations
UIC 550		Power supply installations for passenger stock

## 3 Definitions

For the purposes of this European Standard, the following definitions apply:

### 3.1

#### **accepting body**

the body responsible for the evaluation of the compatibility case and the issue of a certificate of acceptance

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