

**SLOVENSKI STANDARD**  
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**Specifikacija za merilne naprave in metode za merjenje radijskih motenj in odpornosti - 1-4. del: Merilne naprave za merjenje radijskih motenj in odpornosti - Pomožna oprema - Sevane motnje (CISPR 16-1-4:2007)**

Specification for radio disturbance and immunity measuring apparatus and methods -- Part 1-4: Radio disturbance and immunity measuring apparatus - Ancillary equipment - Radiated disturbances

Anforderungen an Geräte und Einrichtungen sowie Festlegung der Verfahren zur Messung der hochfrequenten Störaussendung (Funkstörungen) und Störfestigkeit – Teil 1-4: Geräte und Einrichtungen zur Messung der hochfrequenten Störaussendung (Funkstörungen) und Störfestigkeit – Zusatz-/Hilfseinrichtungen – Gestrahlte Störaussendung

Spécifications des méthodes et des appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques -- Partie 1-4: Appareils de mesure des perturbations radioélectriques et de l'immunité aux perturbations radioélectriques - Matériels auxiliaires - Perturbations rayonnées

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English version

**Specification for radio disturbance  
and immunity measuring apparatus and methods -  
Part 1-4: Radio disturbance and immunity measuring apparatus -  
Ancillary equipment -  
Radiated disturbances  
(CISPR 16-1-4:2007)**

Spécifications des méthodes  
et des appareils de mesure des  
perturbations radioélectriques  
et de l'immunité aux perturbations  
radioélectriques -  
Partie 1-4: Appareils de mesure  
des perturbations radioélectriques  
et de l'immunité aux perturbations  
radioélectriques -  
Matériels auxiliaires -  
Perturbations rayonnées  
(CISPR 16-1-4:2007)

Anforderungen an Geräte  
und Einrichtungen sowie Festlegung  
der Verfahren zur Messung  
der hochfrequenten Störaussendung  
(Funkstörungen) und Störfestigkeit -  
Teil 1-4: Geräte und Einrichtungen  
zur Messung der hochfrequenten  
Störaussendung (Funkstörungen)  
und Störfestigkeit -  
Zusatz-/Hilfseinrichtungen -  
Gestrahlte Störaussendung  
(CISPR 16-1-4:2007)

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This European Standard was approved by CENELEC on 2007-06-01. 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.

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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

The text of document CISPR/A/710/FDIS, future edition 2 of CISPR 16-1-4, prepared by CISPR SC A, Radio-interference measurements and statistical methods, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 55016-1-4 on 2007-06-01.

This European Standard supersedes EN 55016-1-4:2004 + A1:2005 + A2:2005.

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) 2008-03-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2010-06-01

Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard CISPR 16-1-4:2007 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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-161	- <sup>1)</sup>	International Electrotechnical Vocabulary (IEV) - Chapter 161: Electromagnetic compatibility	-	-
CISPR 16-1-1	- <sup>1)</sup>	Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus	EN 55016-1-1	2007 <sup>2)</sup>
CISPR 16-2-3	- <sup>1)</sup>	Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-3: Methods of measurement of disturbances and immunity - Radiated disturbance measurements	EN 55016-2-3	2006 <sup>2)</sup>
CISPR 16-3	- <sup>1)</sup>	Specification for radio disturbance and immunity measuring apparatus and methods - Part 3: CISPR technical reports	-	-
CISPR 16-4	Series	Specification for radio disturbance and immunity measuring apparatus and methods - Uncertainties, statistics and limit modeling	-	-
CISPR 16-4-2	2003	Specification for radio disturbance and immunity measuring apparatus and methods - Part 4-2: Uncertainties, statistics and limit modelling - Uncertainty in EMC measurements	EN 55016-4-2	2004

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

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

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ELECTROTECHNICAL  
COMMISSION

**CISPR**  
**16-1-4**

Second edition  
2007-02

INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

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**Specification for radio disturbance and immunity  
measuring apparatus and methods –**

**Part 1-4:**

**Radio disturbance and immunity measuring  
apparatus – Ancillary equipment –  
Radiated disturbances**

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**SPECIFICATION FOR RADIO DISTURBANCE AND IMMUNITY  
MEASURING APPARATUS AND METHODS –**

**Part 1-4: Radio disturbance and immunity measuring apparatus –  
Ancillary equipment – Radiated disturbances**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard CISPR 16-1-4 has been prepared by CISPR subcommittee A: Radio interference measurements and statistical methods.

This second edition of CISPR 16-1-4 cancels and replaces the first edition published in 2003, amendment 1 (2004) and amendment 2 (2005).

The document CISPR/A/710/FDIS, circulated to the National Committees as amendment 3, led to the publication of the new edition.

The text of this standard is based on the first edition, its Amendment 1, Amendment 2 and the following documents:

FDIS	Report on voting
CISPR/A/710/FDIS	CISPR/A/722/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of CISPR 16 series, under the general title *Specification for radio disturbance and immunity measuring apparatus and methods*, can be found on the IEC website.

CISPR 16-1 consists of the following parts, under the general title *Specification for radio disturbance and immunity measuring apparatus and methods – Radio disturbance and immunity measuring apparatus*:

Part 1-1: Measuring apparatus

Part 1-2: Ancillary equipment – Conducted disturbances

Part 1-3: Ancillary equipment – Disturbance power

Part 1-4: Ancillary equipment – Radiated disturbances

Part 1-5: Antenna calibration test sites for 30 MHz to 1 000 MHz

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed, [SIST EN 55016-1-4:2007](https://standards.iteh.ai/catalog/standards/sist/a86d691e-e1fd-4244-884e-d078286b78d4/sist-en-55016-1-4-2007)
- withdrawn, <https://standards.iteh.ai/catalog/standards/sist/a86d691e-e1fd-4244-884e-d078286b78d4/sist-en-55016-1-4-2007>
- replaced by a revised edition, or
- amended.

## SPECIFICATION FOR RADIO DISTURBANCE AND IMMUNITY MEASURING APPARATUS AND METHODS –

### Part 1-4: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Radiated disturbances

#### 1 Scope

This part of CISPR 16 is designated a basic standard, which specifies the characteristics and performance of equipment for the measurement of radiated disturbances in the frequency range 9 kHz to 18 GHz.

Specifications for ancillary apparatus are included for: antennas and test sites, TEM cells, and reverberating chambers.

The requirements of this publication must be complied with at all frequencies and for all levels of radiated disturbances within the CISPR indicating range of the measuring equipment.

Methods of measurement are covered in Part 2-3, and further information on radio disturbance is given in Part 3 of CISPR 16. Uncertainties, statistics and limit modelling are covered in Part 4 of CISPR 16.

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#### 2 Normative references

SIST EN 55016-1-4:2007

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.

CISPR 16-1-1, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus*

CISPR 16-2-3, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-3: Methods of measurement of disturbances and immunity – Radiated disturbance measurements*

CISPR 16-3, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 3: CISPR technical reports*

CISPR 16-4 (all parts), *Specification for radio disturbance and immunity measuring apparatus and methods – Uncertainties, statistics and limit modelling*

CISPR 16-4-2:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements*

IEC 60050-161, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply. Also see IEC 60050(161).

#### 3.1

##### bandwidth

###### $B_n$

width of the overall selectivity curve of the receiver between two points at a stated attenuation, below the midband response

NOTE The bandwidth is represented by the symbol  $B_n$ , where  $n$  is the stated attenuation in decibels.

#### 3.2

##### CISPR indicating range

range specified by the manufacturer which gives the maximum and the minimum meter indications within which the receiver meets the requirements of this part of CISPR 16

#### 3.3

##### calibration test site

###### CALTS

open area test site with metallic ground plane and tightly specified site attenuation performance in horizontal and vertical electric field polarization

NOTE 1 A CALTS is used for determining the free-space antenna factor of an antenna.

NOTE 2 Site attenuation measurements of a CALTS are used for comparison to corresponding site attenuation measurements of a compliance test site, in order to evaluate the performance of the compliance test site.

#### 3.4

##### compliance test site

###### COMTS

environment which assures valid, repeatable measurement results of disturbance field strength from equipment under test for comparison to a compliance limit

#### 3.5

##### antenna

that part of a transmitting or receiving system that is designed to radiate or to receive electromagnetic waves in a specified way

NOTE 1 In the context of this standard, the balun is a part of the antenna.

NOTE 2 See also the term "wire antenna".

#### 3.6

##### balun

passive electrical network for the transformation from a balanced to an unbalanced transmission line or device or vice versa

#### 3.7

##### free-space-resonant dipole

wire antenna consisting of two straight colinear conductors of equal length, placed end to end, separated by a small gap, with each conductor approximately a quarter-wavelength long such that at the specified frequency the input impedance of the wire antenna measured across the gap is pure real when the dipole is located in the free space

NOTE 1 In the context of this standard, this wire antenna connected to the balun is also called the "test antenna".

NOTE 2 This wire antenna is also referred to as "tuned dipole".

### 3.8

#### site attenuation

insertion loss determined by a two-port measurement, when a direct electrical connection between the generator output and receiver input is replaced by transmitting and receiving antennas placed at the specified positions

### 3.9

#### test antenna

combination of the free-space-resonant dipole and the specified balun

NOTE For the purpose of this standard only.

### 3.10

#### wire antenna

a specified structure consisting of one or more metallic wires or rods for radiating or receiving electromagnetic waves

NOTE A wire antenna does not contain a balun.

### 3.11

#### fully anechoic room

##### FAR

shielded enclosure, the internal surfaces of which are lined with radio-frequency absorbing material (i.e. RF absorber), which absorbs electromagnetic energy in the frequency range of interest

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### 3.12

#### quasi-free space test-site (standards.iteh.ai)

test-site for which the site attenuation measured with vertically polarized tuned dipoles deviates by no more than  $\pm 1$  dB from the calculated free-space attenuation at any frequency

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### 3.13

#### test volume

volume in the FAR in which the EUT is positioned

NOTE In this volume the quasi-free space condition is met and this volume is typically 0,5 m or more from the absorbing material of the FAR.

## 4 Antennas for measurement of radiated radio disturbance

The antenna and the circuits inserted between it and the measuring receiver shall not appreciably affect the overall characteristics of the measuring receiver. When the antenna is connected to the measuring receiver, the measuring system shall comply with the bandwidth requirements of CISPR 16-1-1 appropriate to the frequency band concerned.

The antenna shall be substantially plane polarized. It shall be orientable so that all polarizations of incident radiation can be measured. The height of the centre of the antenna above ground may have to be adjustable according to a specific test procedure.

For additional information about the parameters of broadband antennas see Annex A.

### 4.1 Accuracy of field-strength measurements

The accuracy of field-strength measurement of a uniform field of a sine-wave shall be better than  $\pm 3$  dB when an antenna meeting the requirements of this subclause is used with a measuring receiver meeting the requirements of CISPR 16-1-1.

NOTE This requirement does not include the effect due to a test site.