

SLOVENSKI STANDARD
SIST EN 55016-2-3:2010/A1:2010
01-december-2010

**Specifikacija merilnih naprav in metod za merjenje radijskih motenj in odpornosti -
2-3. del: Metode za merjenje radijskih motenj in odpornosti - Merjenje sevanih
motenj- Dodatek A1**

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

Anforderungen an Geräte und Einrichtungen sowie Festlegung der Verfahren zur
Messung der hochfrequenten Störaussendung (Funkstörungen) und Störfestigkeit - Teil
2-3: Verfahren zur Messung der hochfrequenten Störaussendung (Funkstörungen) und
Störfestigkeit - Messung der gestrahlten Störaussendung

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Spécifications des méthodes et des appareils de mesure des perturbations
radioélectriques et de l'immunité aux perturbations radioélectriques - Partie 2-3:
Méthodes de mesure des perturbations et de l'immunité - Mesures des perturbations
rayonnées

Ta slovenski standard je istoveten z: EN 55016-2-3:2010/A1:2010

ICS:

| | | |
|-----------|------------------|------------------------|
| 17.240 | Merjenje sevanja | Radiation measurements |
| 33.100.20 | Imunost | Immunity |

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 55016-2-3/A1

October 2010

ICS 33.100.10; 33.100.20

English version

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

**Part 2-3: Methods of measurement of disturbances and immunity -
Radiated disturbance measurements
(CISPR 16-2-3:2010/A1:2010)**

Spécifications des méthodes et des
appareils de mesure des perturbations
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perturbations radioélectriques -
Partie 2-3: Méthodes de mesure des
perturbations et de l'immunité
Mesures des perturbations rayonnées
(CISPR 16-2-3:2010/A1:2010)

Anforderungen an Geräte und
Einrichtungen sowie Festlegung der
Verfahren zur Messung der
hochfrequenten Störaussendung
(Funkstörungen) und Störfestigkeit -
Teil 2-3: Verfahren zur Messung der
hochfrequenten Störaussendung
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Messung der gestrahlten Störaussendung
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This amendment A1 modifies the European Standard EN 55016-2-3:2010; it was approved by CENELEC on 2010-10-01. 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 Central Secretariat 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 Central Secretariat 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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document CISPR/A/878/CDV, future amendment 1 to CISPR 16-2-3:2010, 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 amendment A1 to EN 55016-2-3:2010 on 2010-10-01.

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.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2011-07-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2013-10-01

Endorsement notice

The text of amendment 1:2010 to the International Standard IEC 55016-2-3:2010 was approved by CENELEC as an amendment to the European Standard without any modification.

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE
COMITÉ INTERNATIONAL SPÉCIAL DES PERTURBATIONS RADIOÉLECTRIQUES

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AMENDMENT 1
AMENDEMENT 1

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FOREWORD

This amendment has been prepared by CISPR subcommittee A: Radio-interference measurements and statistical methods, in cooperation with CISPR subcommittee D: Electromagnetic disturbances related to electric/electronic equipment on vehicles and internal combustion engine powered devices, of IEC technical committee CISPR: International special committee on radio interference.

The text of this amendment is based on the following documents:

| | |
|-----------------|------------------|
| Enquiry draft | Report on voting |
| CISPR/A/878/CDV | CISPR/A/894/RVC |

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

The committee has decided that the contents of this publication will remain unchanged until the stability 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,
- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

The recent addition of FFT-based measuring instrumentation in CISPR 16-1-1 necessitates the addition of related specifications for the test methods covered in CISPR 16-2-3. Those new specifications are introduced in this amendment.

3 Terms and definitions

3.18 measuring receiver

Replace the existing definition by the following new definition:

instrument such as a tunable voltmeter, an EMI receiver, a spectrum analyzer or an FFT-based measuring instrument, with or without preselection, that complies with CISPR 16-1-1

Add, after the existing definition 3.24.5, the following new terms and definitions 3.25 and 3.26:

3.25 measurement

process of experimentally obtaining one or more quantity values that can reasonably be attributed to a quantity

[2.1 of ISO/IEC Guide 99:2007][8]¹

3.26

test

technical operation that consists of the determination of one or more characteristics of a given product, process or service according to a specified procedure

NOTE A test is carried out to measure or classify a characteristic or a property of an item by applying to the item a set of environmental and operating conditions and/or requirements.

[IEC 60050-151:2001, 151-16-13][9]

6.1 General

Delete the existing item c) from the list.

6.2.1 General

Replace the second sentence of this subclause by the following new sentence:

Should the ambient noise level exceed the required level, it shall be recorded in the test report.

Add, after the existing Subclause 6.5.2, the following new Subclause 6.5.3:

6.5.3 Measurement of the duration of disturbance

The duration of a disturbance must be known in order to measure it correctly and to determine if it is discontinuous. The duration of a disturbance may be measured in one of the following ways:

- through the connection of an oscilloscope to a measuring receiver's IF output to allow monitoring of the disturbance in the time-domain;
- through the tuning of either an EMI receiver or a spectrum analyzer to the disturbance frequency without frequency scanning (i.e. 'zero-span' mode) to allow monitoring of the disturbance in the time-domain; or
- through the use of the time-domain output of an FFT-based measuring receiver.

Guidance for the determination of the appropriate measurement time can be found in 8.3.

6.6.2 Minimum measurement times

Replace the existing first sentence of the first paragraph of this subclause by the following two new sentences:

The minimum measurement (dwell) times are given in Table 7. The minimum measurement (dwell) times for scanning receivers and FFT-based measuring instruments in Table 1 and the scan times for spectrum analyzers in Table 2 apply to CW signals.

Add, immediately before the existing Table 1, the following new Table 7:

¹ Figures in square brackets refer to the Bibliography.

Table 7 – Minimum measurement times for the four CISPR bands

| Frequency band | | Minimum measurement time T_m |
|----------------|---------------------|--------------------------------|
| A | 9 kHz to 150 kHz | 10,00 ms |
| B | 0,15 MHz to 30 MHz | 0,50 ms |
| C and D | 30 MHz to 1 000 MHz | 0,06 ms |
| E | 1 GHz to 18 GHz | 0,01 ms |

Add, after the existing Subclause 6.6.5, the following new Subclause 6.6.6:

6.6.6 Timing considerations using FFT-based instruments

FFT-based measuring instruments may combine the parallel calculation at N frequencies and a stepped scan. For this purpose the frequency range of interest is subdivided into a number of segments N_{seg} that are scanned sequentially. The procedure is shown in Figure 20 for three segments. The total scan time for the frequency range of interest T_{scan} is calculated as:

$$T_{\text{scan}} = T_m N_{\text{seg}} \quad (18)$$

where

T_m is the measurement time for each segment, and

N_{seg} is the number of segments.

FFT-based measuring instruments may also provide methods to improve the frequency resolution across a given frequency range. In general, an FFT-based measuring instrument will have a fixed frequency step $f_{\text{step FFT}}$ that is determined by the number of frequencies of the FFT. Increased frequency resolution is achieved by performing repeat calculations over a given frequency range. For each repeat calculation, the lowest frequency is incremented by a frequency step, $f_{\text{step final}}$.

Hence the first calculation over the given frequency range considers the following frequencies:

$$\begin{aligned} &f_{\text{min}}, \\ &f_{\text{min}} + f_{\text{step FFT}}, \\ &f_{\text{min}} + 2f_{\text{step FFT}}, \\ &f_{\text{min}} + 3f_{\text{step FFT}} \dots \end{aligned}$$

The second calculation over the given frequency range considers the following frequencies:

$$\begin{aligned} &f_{\text{min}} + f_{\text{step final}}, \\ &f_{\text{min}} + f_{\text{step final}} + f_{\text{step FFT}}, \\ &f_{\text{min}} + f_{\text{step final}} + 2f_{\text{step FFT}}, \\ &f_{\text{min}} + f_{\text{step final}} + 3f_{\text{step FFT}} \dots \end{aligned}$$

This procedure, applied for a step ratio of 3, is displayed on Figure 21.

The scan time T_{scan} is calculated as:

$$T_{\text{scan}} = T_m \frac{f_{\text{step FFT}}}{f_{\text{step final}}} \quad (19)$$

where

T_m is the measurement time, and

$\frac{f_{\text{step FFT}}}{f_{\text{step final}}}$ is the step ratio.

For a system that combines both methods the scan time T_{scan} is calculated as:

$$T_{\text{scan}} = T_m N_{\text{seg}} \frac{f_{\text{step FFT}}}{f_{\text{step final}}} \quad (20)$$

NOTE 1 FFT-based measuring instruments may combine both methods, the stepped scan as well as a method to improve the frequency resolution.

NOTE 2 Additional background information is currently in preparation for CISPR 16-3².

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² A CISPR/TR 16-3 is to be published to replace CISPR 16-3:2003 and its amendments.