

# Specification for radio disturbance and immunity measuring apparatus and methods —

## Part 4-2: Uncertainties, statistics and limit modelling — Uncertainty in EMC measurements

The European Standard EN 55016-4-2:2004 has the status of a British Standard

ICS 33.100.10; 33.100.20

National foreword

This British Standard is the official English language version of EN 55016-4-2:2004. It is identical with CISPR 16-4-2:2003. It supersedes BS CISPR 16-4:2002 which will be withdrawn on 2007-09-01.

The standards in the new BS EN 55016 series have been produced following the publication by CISPR of a new multi-part edition of CISPR 16 and constitute an editorial reorganisation of CISPR 16 without technical changes. This has resulted in the BS CISPR 16 series being replaced as follows:

BS CISPR 16-1:1999 replaced by BS EN 55016-1-1:2004,  
BS EN 55016-1-2:2004, BS EN 55016-1-3:2004, BS EN 55016-1-4:2004 and BS EN 55016-1-5:2004.

BS CISPR 16-2:1996 replaced by BS EN 55016-2-1:2004,  
BS EN 55016-2-2:2004, BS EN 55016-2-3:2004 and BS EN 55016-2-4:2004.

BS CISPR 16-3 replaced by PD CISPR/TR 16-3:2003,  
PD CISPR/TR 16-4-1:2003, PD CISPR/TR 16-4-3:2003 and PD CISPR/TR 16-4-4:2003.

BS CISPR 16-4:2002 replaced by BS EN 55016-4-2:2004.

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- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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Cross-references

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 23 and a back cover.

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

Spécifications des méthodes  
et des appareils de mesure  
des perturbations radioélectriques  
et de l'immunité aux perturbations  
radioélectriques  
Partie 4-2: Incertitudes, statistiques  
et modélisation des limites –  
Incertitudes de mesure CEM  
(CISPR 16-4-2:2003)

Anforderungen an Geräte und  
Einrichtungen sowie Festlegung der  
Verfahren zur Messung der  
hochfrequenten Störaussendung  
(Funkstörungen) und Störfestigkeit  
Teil 4-2: Unsicherheiten, Statistik  
und Modelle zur Ableitung von  
Grenzwerten (Störmodell) –  
Unsicherheit bei EMV-Messungen  
(CISPR 16-4-2:2003)

This European Standard was approved by CENELEC on 2004-09-01. 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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, 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**

## **Foreword**

The text of the International Standard CISPR 16-4-2:2003, prepared by CISPR SC A, Radio-interference measurements and statistical methods, was submitted to the formal vote and was approved by CENELEC as EN 55016-4-2 on 2004-09-01 without any modification.

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) 2005-09-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2007-09-01

Annex ZA has been added by CENELEC.

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## **Endorsement notice**

The text of the International Standard CISPR 16-4-2:2003 was approved by CENELEC as a European Standard without any modification.

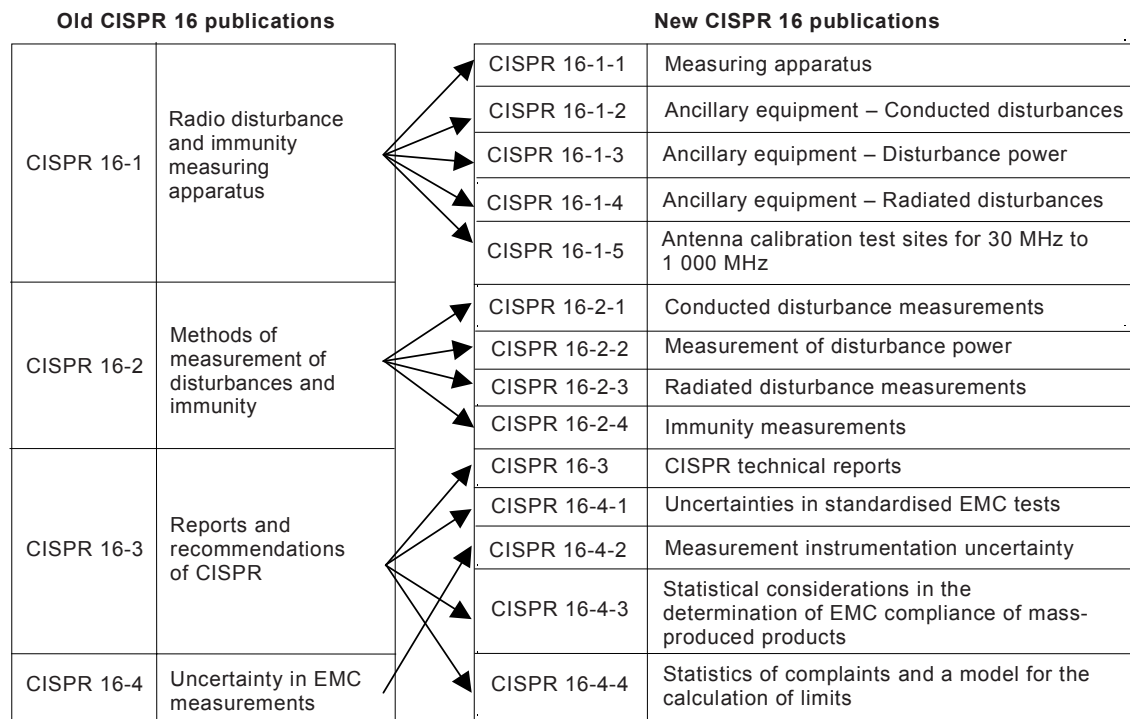
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## INTRODUCTION

CISPR 16-1, CISPR 16-2, CISPR 16-3 and CISPR 16-4 have been reorganised into 14 parts, to accommodate growth and easier maintenance. The new parts have also been renumbered. See the list given below.



More specific information on the relation between the 'old' CISPR 16-4 and the present 'new' CISPR 16-4-2 is given in the table after this introduction (TABLE RECAPITULATING CROSS REFERENCES).

Measurement instrumentation specifications are given in five new parts of CISPR 16-1, while the methods of measurement are covered now in four new parts of CISPR 16-2. Various reports with further information and background on CISPR and radio disturbances in general are given in CISPR 16-3. CISPR 16-4 contains information related to uncertainties, statistics and limit modelling.

CISPR 16-4 consists of the following parts, under the general title *Specification for radio disturbance and immunity measuring apparatus and methods - Uncertainties, statistics and limit modelling*:

- Part 4-1: Uncertainties in standardised EMC tests,
- Part 4-2: Uncertainty in EMC measurements,
- Part 4-3: Statistical considerations in the determination of EMC compliance of mass-produced products,
- Part 4-4: Statistics of complaints and a model for the calculation of limits.

## TABLE RECAPITULATING CROSS-REFERENCES

First edition of CISPR 16-4  
Clauses

1  
2  
3  
4

Annex  
A

First edition of CISPR 16-4-2  
Clauses

1  
2  
3  
4

Annex  
A

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

### Part 4-2: Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements

#### 1 Scope

This part of CISPR 16 is designated a basic standard, which specifies the manner in which measurement uncertainty is to be taken into account in determining compliance with CISPR limits. The material is also relevant to any EMC test when interpretation of the results and conclusions reached will be impacted by the uncertainty of the instrumentation used during the testing. Annex A contains the background material used in providing the amount of measurement uncertainty found in generating the CISPR values shown in Clause 4 and hence provides valuable background material for those needing both initial and further information on measurement uncertainty and how to take into account individual uncertainties in the measurement chain. The annex however is not intended to be a tutorial or user manual or to be copied when making uncertainty calculations. For that, the references shown in the bibliography should be used.

Measurement instrumentation specifications are given in CISPR 16-1, while the methods of measurement are covered in CISPR 16-2. Further information and background on CISPR and radio disturbances is given in CISPR 16-3. The other parts of CISPR 16-4 contain further information on uncertainties in general, statistics and limit modelling.

#### 2 Normative references

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 (all parts), *Specification for radio disturbance and immunity measuring apparatus and methods – Radio disturbance and immunity measuring apparatus*

CISPR 16-2 (all parts), *Specification for radio disturbance and immunity measuring apparatus and methods – Methods of measurement of disturbances and immunity*

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

CISPR 16-4-1, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-1: Uncertainties, statistics and limit modelling - Uncertainties in standardised EMC tests*

CISPR 16-4-3, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-3: Uncertainties, statistics and limit modelling - Statistical considerations in the determination of EMC compliance of mass-produced products*