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**Elektromagnetna združljivost (EMC) – Standard oddajanja motenj za skupino izdelkov za žična telekomunikacijska omrežja**

Electromagnetic compatibility (EMC) – Product family emission standard for wire-line telecommunication networks

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**Electromagnetic compatibility (EMC) - Product family emission standard  
for wire-line telecommunication networks**

This draft European Standard is submitted to CENELEC members for CENELEC enquiry.  
Deadline for CENELEC: 2005-12-16

It has been drawn up by CENELEC/ETSI JWG on EMC.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CENELEC 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.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

**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

This European standard has been prepared by a Joint Working Group between CENELEC and ETSI on EMC of conducted transmission networks. It is submitted to the CENELEC enquiry.

This version constitutes the first edition of this standard.

**CS note 1:** This document has been prepared by the CENELEC/ETSI JWG on EMC of Conducted Transmission Networks and is intended to become the main deliverable under EC Mandate M/313. In order to ensure due consensus from the stakeholders of both CENELEC and ETSI, the document is circulated to a simultaneous public enquiry in both organizations.

With a message dated 26 May 2005 to the CENELEC President, the ETSI Director General has confirmed that the subsequent vote and publication of the document will be assigned to CENELEC.

**CS note 2:** Crossreferences to CISPR 16-1 should be checked before voting as CISPR 16-1:1999 has been superseded by CISPR 16-1-X series and replaced by the corresponding EN 55016-1-X.

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## Introduction

This EMC standard specifies limits and methods of measurement for disturbance emissions emanating from wire-line telecommunication networks. These limits and methods of measurement address disturbance emissions occurring in and along wire-line telecommunication networks under normal operation conditions.

## 1 Scope and Object

This EMC standard specifies limits and methods of measurement for disturbance emissions emanating from wire-line telecommunication networks as defined in Clause 3, including their in-house extensions, installed and operated as intended.

This standard covers the frequency range 9 kHz to 400 GHz. To date, it specifies limits and methods of measurement for conducted and radiated disturbances from telecommunication networks in the frequency range 150 kHz to 1 GHz. The assessment of a network needs to be performed only in the frequency ranges where limits are defined.

The limits set in this standard do not apply to wanted emissions from radio transmitters.

The emission requirements have been selected so as to ensure that disturbances generated by a network, or parts thereof, operating normally do not exceed a level that could prevent other apparatus from operating as intended. Fault conditions of the network are not taken into account. Not all disturbance phenomena have been included for testing purposes in this standard but only those considered as relevant for the network covered by this standard. These test requirements represent essential electromagnetic compatibility emission requirements.

NOTE In special cases, situations will arise where the levels specified in this standard will not offer adequate protection; for example where a sensitive receiver is used in close proximity to a network. In these instances, special mitigation measures may have to be employed.

## 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.

EN 50083-2, *Cable networks for television signals, sound signals and interactive services – Part 2: Electromagnetic compatibility for equipment*

EN 55013, *Sound and television broadcast receivers and associated equipment - Radio disturbance characteristics - Limits and methods of measurement (CISPR 13, mod.)*

EN 55022, *Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement (CISPR 22, mod.)*

EN 300 386, *Electromagnetic compatibility and Radio spectrum Matters (ERM); Telecommunication network equipment; ElectroMagnetic Compatibility (EMC) requirements*

TR 101 651, *Electromagnetic compatibility and Radio spectrum Matters (ERM) – Classification of the electromagnetic environment conditions for equipment in telecommunication networks*

EN 301489-1, *Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services – Part1: common technical requirements*

EN 55016-1 series, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1: Radio disturbance and immunity measuring apparatus* (CISPR 16-1 series)

EN 55016-2 series, *Specification for radio disturbance and immunity measuring apparatus and methods - Part 2: Methods of measurement of disturbances and immunity* (CISPR 16-2 series)

EN 55016-4-2:2004, *Specification for radio disturbance and immunity measuring apparatus and methods - Uncertainties, statistics and limit modelling - Uncertainty in EMC measurements* (CISPR 16-4-2)

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

### 3 Definitions and abbreviations

#### 3.1 Definitions

For the purpose of this standard the following definitions apply.

**disturbance field strength**

field strength produced at a given location by an electromagnetic disturbance, measured under specified conditions  
[(IEC – IEC 161-04-02)]

**electromagnetic disturbance**

any electromagnetic phenomenon that may degrade the performance of a device, equipment or system, or adversely affect living or inert matter  
[(IEC – IEC 161-01-05)]

**emission**

The phenomenon by which electromagnetic energy emanates from a source  
[(IEC – IEC 161-01-08)]

**radio (frequency) disturbance**

electromagnetic disturbance having components within the radio frequency range  
[(IEC – IEC 161-01-13)]

**measurement distance**

the measurement distance is taken as a straight line rectangular from the telecommunication cable tract (or its projection to the floor level), from the boundary of the premises, office, or flat, or from the exterior wall of the building hosting the network concerned, to the measuring antenna reference point. This reference point can be:

- the centre of the coil of a loop antenna used for measurements of the magnetic component of electromagnetic fields; or
- the balun, in case of a broadband dipole, or the reference point of a logarithmic-periodical or horn antenna referred to for calibration purposes.

**wire-line telecommunication network**

a combination of equipment and passive devices (network cables, connectors) interconnected together (see Figure 1) to constitute the wire-line part of an electronic communications network



**electronic communications network**

means transmission systems and, where applicable, switching or routing equipment and other resources which permit the conveyance of signals by wire, by radio, by optical or by other electromagnetic means, including satellite networks, fixed (circuit- and packet-switched, including Internet) and mobile terrestrial networks, electricity cable systems, to the extent that they are used for the purpose of transmitting signals, networks used for radio and television broadcasting, and cable TV networks, irrespective of the type of information conveyed

**network cable**

the cable infrastructure (transmission line) used to connect together telecom installations, systems and telecom terminal equipment. The network cable may also include in-premises extension cables

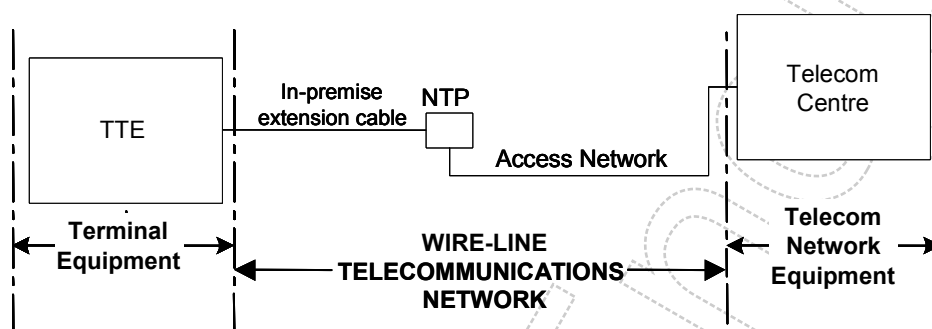


Figure 1 - Diagram showing alignment of definitions to a typical wire-line telecommunications network

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**3.2 Abbreviations**

CENELEC	European Committee for Electrotechnical Standardisation
CISPR	International Special Committee on Radio Interference
EMC	Electromagnetic Compatibility
ETSI	European Telecommunications Standards Institute
IEC	International Electrotechnical Committee
IEV	International Electrotechnical Vocabulary
ITE	Information Technology Equipment
NTP	Network Termination Point
TTE	Telecom Terminal Equipment
TV	Television

**4 Assessment procedure for telecommunication networks**

The whole or part of the telecommunication network is deemed to be compliant to the present standard:

- If all equipment directly connected to the network or part thereof meets the emission requirements defined in the applicable EMC product standard (see Annex A) taking the properties of the network cable type into account;
- or
- If the network meets the requirements specified in 4.1.

## 4.1 Network requirements

### 4.1.1 Applicability

Emission measurements shall either be performed on real operating networks installed in the field or on a representative reference network. The assessment can be made either on a complete network or over a given part of it.

Measurements are not required within equipment enclosures, in telecommunication centres or in industrial areas.

### 4.1.2 Limits below 30 MHz

The telecommunication network shall meet the limits specified in Table 1 according to the measurement method specified in 5.2 and using the measurement procedure defined in Clause 7.

**Table 1 – Limits of conducted common-mode (asymmetric mode) disturbances on wire-line telecommunications network cables**

Frequency range MHz	Current limits dB(μA)		Measurement bandwidth
	Quasi-peak	Average	
0,15 to 0,5	40 to 30 <sup>1</sup>	30 to 20 <sup>1</sup>	9 kHz
0,5 to 30	30	20	9 kHz

NOTE 1 In the frequency range 0,15 MHz to 0,5 MHz, the limit decreases linearly with the logarithm of frequency.

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### 4.1.3 Limits above 30 MHz

The telecommunication network shall meet the radiated limits specified in Table 2 according to the measurement method specified in 5.3. The normalisation to the reference measurement distance shall be as defined in 6.1.2. The measurement procedure defined in Clause 7 shall be used.

In the case of rooms or buildings where both telecommunication networks and their connected equipment are used, measurements shall be made only outside those rooms or buildings.

**Table 2 – Limits of radiated disturbances from wire-line telecommunications networks above 30 MHz**

Frequency range MHz	Quasi-Peak Field strength limit dB(μV/m)	Reference measurement distance	Measurement bandwidth
30 to 230	30	10 m	120 kHz
230 to 1 000	37	10 m	120 kHz

NOTE 1 The lower limit shall apply at the transition frequency.