
Aparati za komunikacije po elektroenergetskih vodih pri nizkonapetostnih inštalacijah - Karakteristike radijskih motenj - Omejitve in merilne metode - 3. del: Aparati, ki delujejo nad 30 MHz

Powerline communication apparatus used in low-voltage installations – Radio disturbance characteristics – Limits and methods of measurement – Part 3: Apparatus operating above 30 MHz

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33.040.60	Telekomunikacije po elektroenergetskih vodih	Powerline telecommunications
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English Version

Power line communication apparatus used in low-voltage installations - Radio disturbance characteristics - Limits and methods of measurement - Part 3: Apparatus operating above 30 MHz

Appareils de communication par courant porteur utilisés dans les installations basse tension - Caractéristiques de perturbations radioélectriques - Limites et méthodes de mesure - Partie 3 : Appareils fonctionnant au-dessus de 30 MHz

Kommunikationsgeräte auf elektrischen Niederspannungsnetzen - Funkstöreigenschaften - Grenzwerte und Messverfahren - Teil 3: Geräte für Frequenzen über 30 MHz

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

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European foreword

This document (EN 50561-3:2016) has been prepared by CLC/TC 210, "Electromagnetic compatibility (EMC)".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2016-11-23
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2018-11-23

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This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EU Directive(s).

For the relationship with EU Directive(s) see informative Annex ZZ, which is an integral part of this document.

The scope is extended to the whole radio-frequency range from 9 kHz to 400 GHz, but limits are formulated only in restricted frequency bands, which ensure that the electromagnetic disturbance generated does not exceed the level above which radio and telecommunications equipment or other equipment cannot operate as intended.

EN 50561-3:2016 (E)**1 Scope**

This part of EN 50561 specifies limits and methods of measurement of radio disturbance characteristics for in-home communication apparatus that use the low voltage power installation as the transmission medium. This part of EN 50561 applies to equipment that uses frequencies including those above 30 MHz in order to communicate.

Procedures are given for the measurement of signals generated by the equipment and limits are specified within the frequency range 9 kHz to 400 GHz. No measurement is required at frequencies where no limits are specified.

The radiated emission requirements in this standard are not intended to be applicable to the intentional transmissions from a radio-transmitter as defined by the ITU, nor to any spurious emissions related to these intentional transmissions.

NOTE The requirements defined in this standard effectively restrict the intended transmission frequencies to below 87,5 MHz.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50561-1:2013, *Power line communication apparatus used in low-voltage installations — Radio disturbance characteristics — Limits and methods of measurement — Part 1: Apparatus for in-home use*

EN 55032:2012, *Electromagnetic compatibility of multimedia equipment — Emission requirements (CISPR 32:2012)*

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EN 55016-1-1:2010, *Specification for radio disturbance and immunity measuring apparatus and methods — Part 1-1: Radio disturbance and immunity measuring apparatus — Measuring apparatus (CISPR 16-1-1:2010)*

EN 55016-1-2:2004, *Specification for radio disturbance and immunity measuring apparatus and methods — Part 1-2: Radio disturbance and immunity measuring apparatus — Ancillary equipment — Conducted disturbances (CISPR 16-1-2:2003)*

EN 55016-4-2:2011, *Specification for radio disturbance and immunity measuring apparatus and methods — Part 4-2: Uncertainties, statistics and limit modelling — Measurement instrumentation uncertainty (CISPR 16-4-2:2011)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply:

3.1**AC mains power port**

port that connects to the low voltage AC mains power network for the sole purpose of supplying electrical energy to the EUT

3.2**AC mains output port**

port of the EUT that provides AC mains power to other apparatus

3.3**Artificial PLC Measurement Network****APMN**

measurement network which provides a defined impedance at high frequencies across the power feed at the point of measurement of the terminal voltage, and also providing isolation of the circuit under test from the ambient noise on the power lines. The network also provides a defined coupling path between EUT and AE

3.4**Associated Equipment****AE**

equipment needed to maintain the data traffic on the cable attached to the EUT port under test and (or) to maintain the normal operation of the EUT during the test. The associated equipment may be physically located outside the test area

Note 1 to entry: The AE can be another ITE, a traffic simulator or a connection to a network. The AE can be situated close to the measurement set-up, outside the measurement room or be represented by the connection to a network. AE should not have any appreciable influence on the test results.

3.5**Equipment Under Test****EUT**

representative equipment used for evaluation purposes

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3.6**in-Home PLC apparatus**

PLC apparatus that connects to the low voltage AC mains power network and intended to be linked to other PLC apparatus connected in the same home

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3.7**Information Technology Equipment****ITE**

any equipment:

- a) which has a primary function of either (or a combination of) entry, storage, display, retrieval, transmission, processing, switching, or control, of data and of telecommunication messages and which may be equipped with one or more terminal ports typically operated for information transfer;
- b) with a rated supply voltage not exceeding 600 V

Note 1 to entry: ITE includes, for example, data processing equipment, office machines, electronic business equipment and telecommunication equipment.

3.8**PLC apparatus**

apparatus with a PLC port

Note 1 to entry: PLC apparatus are also called PLT apparatus

EN 50561-3:2016 (E)**3.9****PLC port**

port for the purpose of data transfer and communications that may also carry electrical energy to or from the EUT

Note 1 to entry: PLC ports are also called PLT ports

3.10**user data**

data originated from or destined to another device

3.11**telecommunications/network port**

point of connection for voice, data and signalling transfers intended to interconnect widely-dispersed systems via such means as direct connection to multi-user telecommunications networks (e.g. public switched telecommunications networks (PSTN) integrated services digital networks (ISDN), x-type digital subscriber lines (xDSL), etc.), local area networks (e.g. Ethernet, Token Ring, etc.) and similar networks

Note 1 to entry: A port generally intended for interconnection of components of an ITE system under test (e.g. RS-232, IEEE Standard 1284 (parallel printer), Universal Serial Bus (USB), IEEE Standard 1394 ("Fire Wire"), etc.) and used in accordance with its functional specifications (e.g. for the maximum length of cable connected to it), is not considered to be a telecommunications/network port under this definition.

Note 2 to entry: A PLC port is not considered a telecommunications network port in the sense of this definition.

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4 Compliance with this standard

Equipment compliant with this standard shall exclusively transmit signals between phases or between phase and neutral and shall not intentionally transmit PLC signals at frequencies higher than 87,5 MHz.

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5 Requirements for the frequency range below 30 MHz**5.1 Requirement for conducted disturbances at AC mains power port**

The AC mains power port of the EUT shall comply with the class B limits of EN 55032, using the measurement conditions and the methodology defined in EN 55032 for mains terminals.

5.2 Requirement for conducted disturbances at telecommunication/network port

The telecommunications/network port of the EUT shall comply with the class B limits of EN 55032, using the measurement conditions and methodology defined in EN 55032 for wired network ports.

5.3 Requirement for conducted disturbances and communications signals at PLC ports

The methods and limits for conducted measurements of EN 50561-1 apply for PLC apparatus for measurement frequencies 30 MHz and below.

6 Requirement for the frequency range above 30 MHz

6.1 Requirement for conducted disturbances and communications signals for frequencies between 30 MHz and 87,5 MHz

When user data are being transmitted by the PLC port at frequencies between 30 and 87,5 MHz the unsymmetrical voltage of the transmitted signal shall not exceed the limits given in Table 1 using the methods and procedures given in 7.2, with the exception of the frequency bands listed in Table A.1 for which the limits for the unsymmetrical disturbances specified in Table 2 apply.

Unless otherwise noticed, limits are given in dB(μ V) (PK) in a 120 kHz bandwidth.

Table 1 — Maximum unsymmetrical PLC transmit signal level injected between two phases or between phase and neutral conductors between 30 MHz and 87,5 MHz except for the frequency bands listed in Table A.1

Maximum unsymmetrical voltages of the transmitted signal from 30 MHz to 80 MHz, in dB(μ V) (PK)	85 at 30 MHz, decreasing to 80 at 80 MHz (see note 3)
Maximum unsymmetrical voltages of the transmitted signal from 80 MHz to 87,5 MHz in dB(μ V) (PK)	80 at 80 MHz decreasing to 60 at 87,5 MHz (see note 4)
NOTE 1: The Voltage Division Factor of the Coupling device has to be taken into account. NOTE 2: The maximum symmetrical voltage is 6 dB above the maximum unsymmetrical voltage. NOTE 3: The limit decreases linearly with frequency in the range 30 MHz to 80 MHz NOTE 4: The limit decreases linearly with frequency in the range 80 MHz to 87,5 MHz	

Table 2 — Maximum conducted unsymmetrical disturbance signal level in the frequency bands listed in Table A.1 for services requiring increased protection

Maximum unsymmetrical voltages of the transmitted signal in dB(μ V) (PK)	55
NOTE 1: The Voltage Division Factor of the Coupling device has to be taken into account. NOTE 2: The maximum symmetrical voltage is 6 dB above the maximum unsymmetrical voltage.	

6.2 Requirement for conducted disturbances for frequencies between 87,5 MHz and 118 MHz

The unsymmetrical disturbances from the PLC port when transmitting user data shall comply with the disturbance limits between 87,5 MHz and 118 MHz given in Table 3.

Table 3 — Maximum conducted unsymmetrical disturbance signal level

Maximum unsymmetrical voltages of the transmitted signal from 87,5 MHz to 108 MHz, in dB(μ V) (PK)	60
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