

BS EN 60728-1-1:2010



BSI Standards Publication

Cable networks for television signals, sound signals and interactive services

Part 1-1: RF cabling for two way home networks

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This British Standard is the UK implementation of EN 60728-1-1:2010. It is identical to IEC 60728-1-1:2010.

The UK participation in its preparation was entrusted to Technical Committee EPL/100, Audio, video and multimedia systems and equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

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EUROPEAN STANDARD
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EN 60728-1-1

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English version

**Cable networks for television signals, sound signals
and interactive services -
Part 1-1: RF cabling for two way home networks
(IEC 60728-1-1:2010)**

Réseaux de distribution par câbles
destinés aux signaux de télévision,
de radiodiffusion sonore et aux services
interactifs -
Partie 1-1 : câblage RF pour réseaux
domestiques bidirectionnels
(CEI 60728-1-1:2010)

Kabelnetze für Fernsehsignale,
Tonsignale und interaktive Dienste -
Teil 1-1: Zweiwege-HF-
Wohnungsvernetzung
(IEC 60728-1-1:2010)

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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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European Committee for Electrotechnical Standardization
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Foreword

The text of document 100/1622/FDIS, future edition 1 of IEC 60728-1-1, prepared by IEC TC 100, Audio, video and multimedia systems and equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60728-1-1 on 2010-04-01.

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 EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2011-01-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2013-04-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60728-1-1:2010 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61169-2	NOTE Harmonized as EN 61169-2.
IEC 61169-24	NOTE Harmonized as EN 61169-24.
IEC 61196-2	NOTE Harmonized as EN 61196-2.

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>
-	-	Coaxial cables - Part 2-4: Sectional specification for cables used in cabled distribution networks - Indoor drop cables for systems operating at 5 MHz - 3 000 MHz	EN 50117-2-4	-
IEC 60050-705	-	International Electrotechnical Vocabulary (IEV) - Chapter 705: Radio wave propagation	-	-
IEC 60050-712	-	International Electrotechnical Vocabulary (IEV) - Chapter 712: Antennas	-	-
IEC 60050-725	-	International Electrotechnical Vocabulary (IEV) - Chapter 725: Space radiocommunications	-	-
IEC 60617	-	Standard data element types with associated classification scheme for electric components - Part 4: IEC reference collection of standard data element types and component classes	-	-
IEC 60728-1	2007	Cable networks for television signals, sound signals and interactive services - Part 1: System performance of forward paths	EN 60728-1	2008
IEC 60728-1-2	-	Cable networks for television signals, sound signals and interactive services - Part 1-2: Performance requirements for signals delivered at the system outlet in operation	EN 60728-1-2	-
IEC 60728-3	2005	Cable networks for television signals, sound signals and interactive services - Part 3: Active wideband equipment for coaxial cable networks	EN 60728-3	2006
IEC 60728-10	-	Cable networks for television signals, sound signals and interactive services - Part 10: System performance of return paths	EN 60728-10	-
IEC 60966	Series	Radio frequency and coaxial cable assemblies	EN 60966	Series
IEC 60966-2-4	-	Radio frequency and coaxial cable assemblies - Part 2-4: Detail specification for cable assemblies for radio and TV receivers - Frequency range 0 MHz to 3 000 MHz, IEC 61169-2 connectors	EN 60966-2-4	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60966-2-5	-	Radio frequency and coaxial cable assemblies - Part 2-5: Detail specification for cable assemblies for radio and TV receivers - Frequency range 0 MHz to 1 000 MHz, IEC 61169-2 connectors	EN 60966-2-5	-
IEC 60966-2-6	-	Radio frequency and coaxial cable assemblies - Part 2-6: Detail specification for cable assemblies for radio and TV receivers - Frequency range 0 MHz to 3 000 MHz, IEC 61169-24 connectors	EN 60966-2-6	-
ETSI EN 300 421	-	Digital Video Broadcasting (DVB): Framing structure, channel coding and modulation for 11/12 GHz satellite services	-	-
ETSI EN 300 429	-	Digital Video Broadcasting (DVB): Framing structure, channel coding and modulation for cable systems	-	-
ETSI EN 300 473	-	Digital Video Broadcasting (DVB): Satellite Master Antenna Television (SMATV) distribution systems	-	-
ETSI EN 300 744	-	Digital Video Broadcasting (DVB): Framing structure, channel coding and modulation for digital terrestrial television	-	-
ETSI EN 302 307	-	Digital Video Broadcasting (DVB); Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications	-	-
IEEE 802.11	1999	IEEE Standard for Information technology- Telecommunications and information exchange between systems-Local and metropolitan area networks-Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications	-	-
IEEE 802.11a	1999	IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications	-	-
IEEE 802.11b	1999	Supplement to 802.11-1999, Wireless LAN MAC and PHY specifications: Higher speed Physical Layer (PHY) extension in the 2.4 GHz band	-	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEEE 802.11e	2005	IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications	-	-
IEEE 802.11g	2003	IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications	-	-
IEEE 802.11h	2003	IEEE Standard for Information technology – Telecommunications and Information Exchange Between Systems – LAN/MAN Specific Requirements – Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications: Spectrum and Transmit Power Management Extensions in the 5GHz band in Europe	-	-
IEEE 802.11n/D4.0	-	March 2008 Active Unapproved Draft – IEEE Draft STANDARD for Information Technology-Telecommunications and information exchange between systems- Local and metropolitan area networks-Specific requirements- Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications	-	-
IEEE 802.16	2004	IEEE Standard for Local and metropolitan area networks – Part 16: Air Interface for Fixed Broadband Wireless Access Systems (WiMax)	-	-
ITU-R Recommendation BT.500	-	Methodology for the subjective assessment of the quality of television pictures	-	-
ITU-T Recommendation J.61	-	Transmission performance of television circuits designed for use in international connections	-	-
ITU-T Recommendation J.63	-	Insertion of test signals in the field-blanking interval of monochrome and colour television signals	-	-

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INTRODUCTION

Standards of the IEC 60728 series deal with cable networks including equipment and associated methods of measurement for headend reception, processing and distribution of television signals, sound signals and their associated data signals, and for processing, interfacing and transmitting all kinds of signals for interactive services using all applicable transmission media.

This includes

- CATV¹-networks,
- MATV-networks and SMATV-networks,
- individual receiving networks

and all kinds of equipment, systems and installations installed in such networks.

The extent of this standardisation work is from the antennas, special signal source inputs to the headend or other interface points to the network up to the terminal input.

The standardization of any user terminals (i.e. tuners, receivers, decoders, multimedia terminals, etc.) as well as of any coaxial, balanced and optical cables and accessories thereof is excluded.

The reception of television signals inside a building requires an outdoor antenna and a distribution network to convey the signal to the TV receivers.

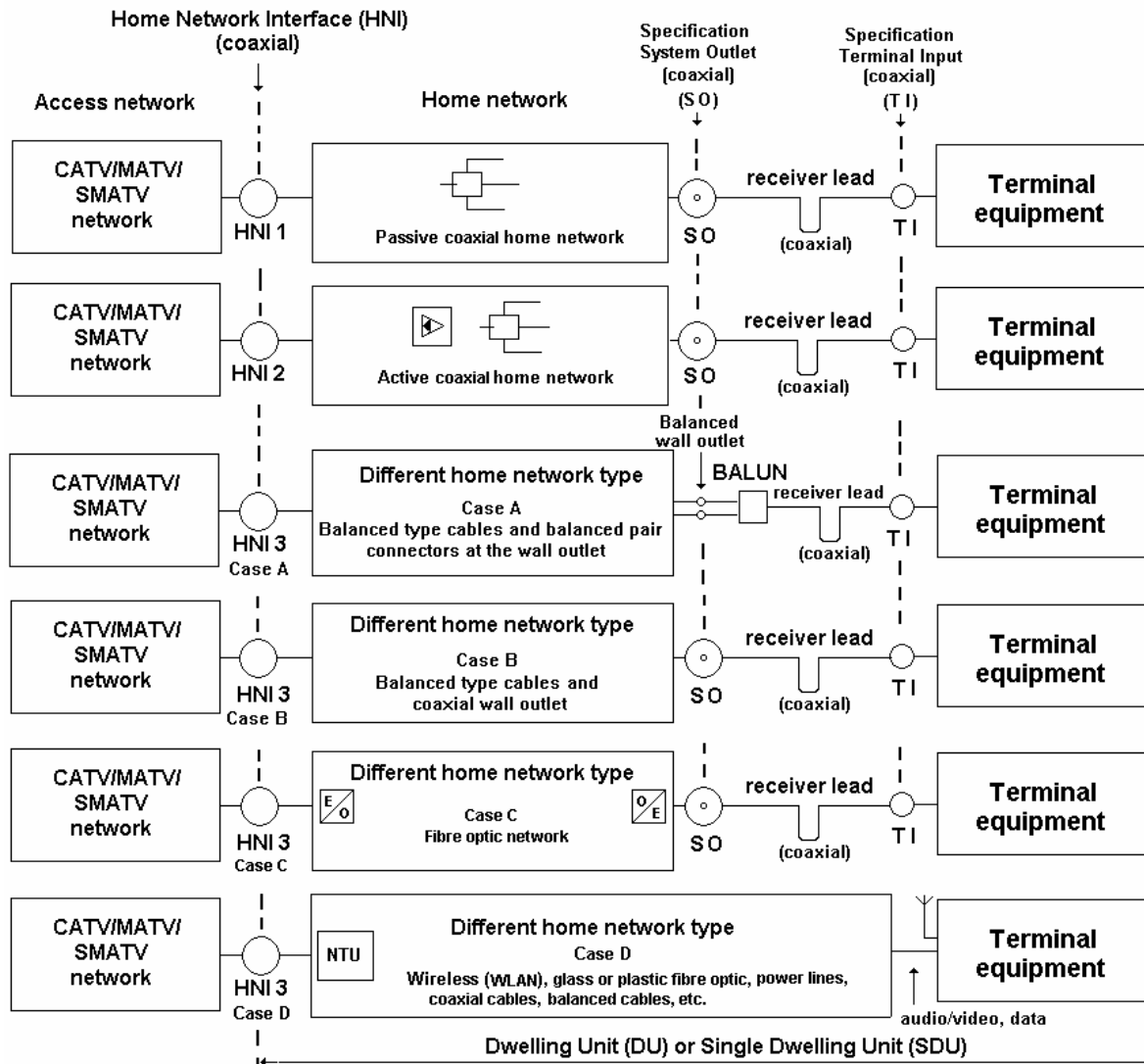
This part of the IEC 60728 deals with the requirements and implementation guidelines for a home network that can be realised with different techniques. The following types of home networks (HN) are possible:

- passive coaxial home network;
- active coaxial home network;
- different home network types.

Figure 1 shows typical situations that are possible when considering RF home networks.

The RF home network can be realised using coaxial cables, balanced cables, optical cables or radio links.

¹ This word encompasses the Hybrid Fibre Coaxial (HFC) networks used nowadays to provide telecommunications services, voice, data and audio and video both broadcast and narrowcast.



IEC 2523/09

Figure 1 – Examples of RF home network types

CABLE NETWORKS FOR TELEVISION SIGNALS, SOUND SIGNALS AND INTERACTIVE SERVICES –

Part 1-1: RF cabling for two way home networks

1 Scope

This part of IEC 60728 provides the requirements and describes the implementation guidelines of RF cabling for two-way home networks; it is applicable to any home network that distributes signals provided by CATV/MATV/SMATV cable networks (including individual receiving systems) having a coaxial cable output. It is also applicable to home networks where some part of the distribution network uses wireless links, for example in place of the receiver cord.

This part of IEC 60728 is therefore applicable to RF cabling for two-way home networks with wired cords or wireless links inside a room and primarily intended for television and sound signals operating between about 5 MHz and 3 000 MHz. The frequency range is extended to 6 000 MHz for distribution techniques that replace wired cords with a wireless two-way communication inside a room (or a small number of adjacent rooms) that uses the 5 GHz to 6 GHz band.

In a building divided into apartment blocks, the distribution of the signals inside the home starts from the home network interface (HNI) up to the system outlet or terminal input. The requirements at the system outlet are given in IEC 60728-1, Clause 5 and the requirements at the HNI are given in IEC 60728-1, Clause 7. In Clause 5 of this standard additional requirements are given.

This standard deals with various possibilities to distribute signals in a home network, using coaxial cables, balanced pair cables, fibre optic cables (glass or plastic) and also wireless links inside a room (or a small number of adjacent rooms) to replace wired cords.

This standard gives references to basic methods of measurement of the operational characteristics of the home cable network in order to assess its performance.

All requirements refer to the performance limits, which are obtained between the input(s) at the home network interface (HNI) and the output at any system outlet when terminated in a resistance equal to the nominal load impedance of the system, unless otherwise specified. Where system outlets are not used, the above applies to the terminal input.

NOTE 1 If the home network is subdivided into a number of parts, using different transmission media (e.g. coaxial cabling, balanced cabling, optical cabling, wireless links) the accumulation of degradations should not exceed the figures given below.

NOTE 2 Performance requirements of return paths as well as special methods of measurement for the use of the return paths in cable networks are described in IEC 60728-10.

Clause 5 defines the performance limits measured at system outlet or terminal input for an unimpaired (ideal) test signal applied at the HNI. Under normal operating conditions for any analogue channel and meeting these limits, the cumulative effect of the impairment of any single parameter at the HNI and that due to the home network will produce picture and sound signals not worse than Grade four on the five-grade impairment scale contained in ITU-R BT.500. These requirements are given in IEC 60728-1-2. For digitally modulated signals the quality requirement is a QEF (Quasi Error Free) reception.

This standard describes the physical layer connection for home networks. Description of protocols required for Layer 2 and higher layers is out of the scope of this standard. Logical connections between devices within the home network are therefore not always guaranteed.

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.

IEC 60050-705, *International Electrotechnical Vocabulary – Chapter 705: Radio wave propagation*

IEC 60050-712, *International Electrotechnical Vocabulary – Chapter 712: Antennas*

IEC 60050-725, *International Electrotechnical Vocabulary – Chapter 725: Space radiocommunications*

IEC 60617, *Graphical symbols for diagrams*

IEC 60728-1:2007, *Cable networks for television signals sound signals and interactive services – Part 1: System performance of forward paths*

IEC 60728-1-2, *Cable networks for television signals sound signals and interactive services – Part 1-2: Performance requirements for signals delivered at system outlet in operation*

IEC 60728-3:2005, *Cable networks for television signals sound signals and interactive services – Part 3: Active wideband equipment for coaxial cable networks*

IEC 60728-10, *Cable networks for television signals, sound signals and interactive services – Part 10: System performance of return paths*

IEC 60966 (all parts), *Radio frequency and coaxial cable assemblies*

IEC 60966-2-4, *Radio frequency and coaxial cable assemblies – Part 2-4: Detail specification for cable assemblies for radio and TV receivers – Frequency range 0 MHz to 3 000 MHz, IEC 61169-2 connectors*

IEC 60966-2-5, *Radio frequency and coaxial cable assemblies – Part 2-5: Detail specification for cable assemblies for radio and TV receivers – Frequency range 0 MHz to 1 000 MHz, IEC 61169-2 connectors*

IEC 60966-2-6, *Radio frequency and coaxial cable assemblies – Part 2-6: Detail specification for cable assemblies for radio and TV receivers – Frequency range 0 MHz to 3 000 MHz, IEC 61169-24 connectors*

IEEE 802.11, 1999 *IEEE Standards for Information Technology – Telecommunications and Information Exchange between Systems – Local and Metropolitan Area Network – Specific Requirements – Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications*²

² Parts of IEEE 802.11 are reproduced in ISO/IEC 8802-11:2005, *Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specification*

IEEE 802.11a-1999, *IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications – Amendment 1: High-speed Physical Layer in the 5 GHz band*

IEEE 802.11b-1999 Supplement to 802.11-1999, *Wireless LAN MAC and PHY specifications: Higher speed Physical Layer (PHY) extension in the 2.4 GHz band*

IEEE 802.11e-2005, *IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications: Amendment 8: Medium Access Control (MAC) Quality of Service Enhancements*

IEEE 802.11g-2003 *IEEE Standard for Information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications – Amendment 4: Further Higher-Speed Physical Layer Extension in the 2.4 GHz Band*

IEEE 802.11h-2003 *IEEE Standard for Information technology – Telecommunications and Information Exchange Between Systems – LAN/MAN Specific Requirements – Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications: Spectrum and Transmit Power Management Extensions in the 5GHz band in Europe*

IEEE 802.11n/D4.0, March 2008 Active Unapproved Draft – *IEEE Draft STANDARD for Information Technology-Telecommunications and information exchange between systems-Local and metropolitan area networks-Specific requirements-Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications: Amendment 4: Enhancements for Higher Throughput*

IEEE 802.16-2004 *IEEE Standard for Local and metropolitan area networks – Part 16: Air Interface for Fixed Broadband Wireless Access Systems (WiMax)*

ITU-R Recommendation BT.500, *Methodology for the subjective assessment of the quality of television pictures*

ITU-T Recommendation J.61, *Transmission performance of television circuits designed for use in international connections*

ITU-T Recommendation J.63, *Insertion of test signals in the field-blanking interval of monochrome and colour television signals*

EN 50117-2-4, *Coaxial cables – Part 2-4: Sectional specification for cables used in cabled distribution networks - Indoor drop cables for systems operating at 5 MHz to 3000 MHz*

ETSI EN 300 421, *Digital Video Broadcasting (DVB): DVB framing structure, channel coding and modulation for 11/12 GHz satellite services*

ETSI EN 300 429, *Digital Video Broadcasting (DVB): DVB framing structure, channel coding and modulation for cable systems*

ETSI EN 300 473, *Digital Video Broadcasting (DVB): DVB Satellite Master Antenna Television (SMATV) distribution systems*

ETSI EN 300 744, *Digital Video Broadcasting (DVB): Framing structure, channel coding and modulation for digital terrestrial television*

ETSI EN 302 307, *Digital Video Broadcasting (DVB): Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications*

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

For the purpose of this document, the terms and definitions given in IEC 60050-705, IEC 60050-712 and IEC 60050-725, apply.

NOTE The most important definitions are repeated below.

3.1.1

active home network

home network that uses active equipment (for example, amplifiers) in addition to passive equipment like splitters, taps, system outlets, cables and connectors up to the coaxial RF interface (input and/or output) of the terminal equipment for distributing and combining RF signals

3.1.2

antenna

that part of a radio transmitting or receiving system which is designed to provide the required coupling between a transmitter or a receiver and the medium in which the radio wave propagates

NOTE 1 In practice, the terminals of the antenna or the points to be considered as the interface between the antenna and the transmitter or receiver should be specified.

NOTE 2 If the transmitter or receiver is connected to its antenna by a feeder line, the antenna may be considered to be a transducer between the guided radio waves of the feeder line and the radiated waves in space.

[IEV 712-01-01]

3.1.3

attenuation

ratio of the input power to the output power of an equipment or system, expressed in decibels

3.1.4

balun

device for transforming an unbalanced voltage to a balanced voltage or vice-versa. The term is derived from balanced to unbalanced transformer.

3.1.5

bit error ratio

BER

ratio between erroneous bits and the total number of transmitted bits

3.1.6

broadcast and communication technologies

BCT

group of applications including RF distribution of sound signals and video signals

NOTE For this standard, this is a group of applications using the HF band (3 MHz to 30 MHz), the VHF band (30 MHz to 300 MHz) and the UHF band (300 MHz to 3 000 MHz) for transmission of television signals, sound signals and interactive services, as well as for in-home inter-networking.

3.1.7**carrier-to-intermodulation ratio****C/I**

difference in decibels between the carrier level at a specified point in a piece of equipment or a system and the level of a specified intermodulation product or combination of products

3.1.8**carrier-to-noise ratio****C/N**

difference in decibels between the vision or sound carrier level at a given point in a piece of equipment or a system and the noise level at that point (measured within a bandwidth appropriate to the television or radio system in use)

3.1.9**cross-modulation**

undesired modulation of the carrier of a desired signal by the modulation of another signal as a result of equipment or system non-linearities

3.1.10**decibel ratio**

ten times the logarithm to the base 10 of the ratio of two quantities of power P_1 and P_2 , i.e.

$$10 \lg \frac{P_1}{P_2} \quad \text{in dB}$$

NOTE May also be expressed in terms of voltages for a common impedance (e.g. 75 Ω).

$$20 \lg \frac{U_1}{U_2} \quad \text{in dB}$$

3.1.11**designed receiving antenna**

antenna that has the gain, the directivity and the polarization for receiving the wanted signal at the headend site with the required performance

3.1.12**directivity**

attenuation between output port and interface or tap port minus the attenuation between input port and interface or tap port, of any equipment or system

3.1.13**DOCSIS****Euro-DOCSIS**

standards defining interface specifications for cable modems and cable modem termination systems for high-speed data communication over RF cable networks

3.1.14**dwelling unit****DU**

home or office where television and sound signals are distributed and where is access to interactive services

3.1.15**echo rating****E**

result of a system test with a 2T sine-squared pulse (as determined in ITU-T Recommendation J.61 and ITU-T Recommendation J.63) using the boundary line on a specified graticule (for example, Figure 29 of IEC 60728-1) within which all parts of the received pulse fall

NOTE The object of the graticule design is to ensure that the subjective effect of an echo of rating E % is the same as that of a single echo, with displacement greater than $12T$, of $(E/2)$ % relative to the peak amplitude of the test pulse.

3.1.16

feeder

transmission path forming part of a cable network; such a path may consist of a metallic cable, optical fibre, waveguide, or any combination thereof

NOTE By extension, the term is also applied to paths containing one or more radio links.

3.1.17

gain

ratio of the output power to the input power of any equipment or system, expressed in decibels

3.1.18

headend

equipment which is connected between receiving antennas or other signal sources and the remainder of the cable networks, to process the signals to be distributed

NOTE The headend may, for example, comprise antenna amplifiers, frequency converters, combiners, separators and generators.

3.1.19

headend for individual reception

headend supplying an individual household

NOTE This type of installation may include one or more system outlets.

3.1.20

headend input

interface of the headend where the signals received by antennas or individual feeder lines are applied for signal processing

3.1.21

home cable link

HCL

physical link (cable) between the home distributor (HD) and the system outlet or the terminal input

3.1.22

home distributor

HD

distributor within a home where cables terminate

3.1.23

home network

HN

RF cable network inside a single dwelling (one-family house or one unit of a multi-dwelling building) in the SOHO (Small Offices Home Offices) environments or in the rooms of hotels, hospitals, etc.; the preferred topology of this network is a star

NOTE This network carries television signals, sound signals and interactive services up to the coaxial RF interface (input and/or output) of the terminal equipment. It may comprise active equipment, passive equipment, cables and connectors.

3.1.24

home network interface

HNI

interface for access to the network for transmission of television signal, sound signals and interactive services inside a home (single dwelling)

NOTE 1 It is the first accessible point after the entrance of the network into an individual home (see Figure 2).

NOTE 2 In some cases the home network interface may coincide with the system outlet. In this case the performance requirements for a system outlet apply.

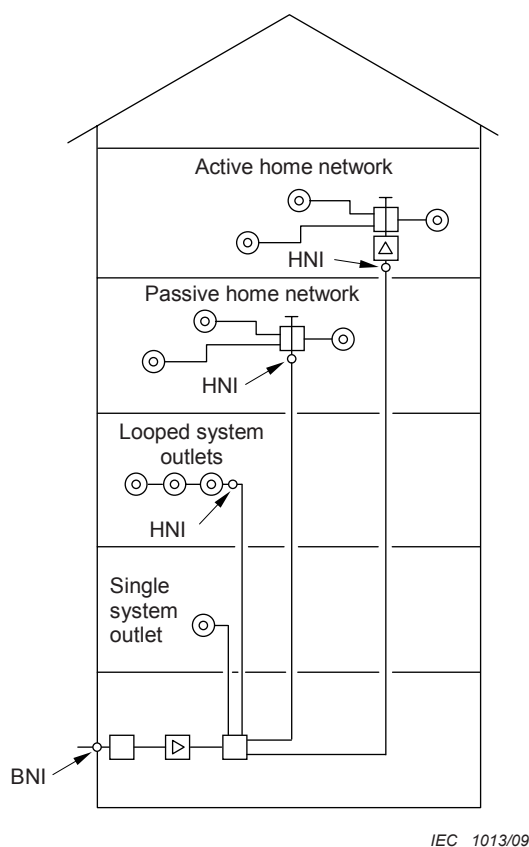


Figure 2 – Examples of location of HNI for various home network types

3.1.25 intermodulation

process whereby non-linearity of equipment in a system produces output signals (called intermodulation products) at frequencies which are linear combinations of those of the input signals

3.1.26 isolation

attenuation between two output, tap or interface ports of any equipment or system

3.1.27 level

decibel ratio of any power P_1 to the standard reference power P_0 , i.e.

$$10 \lg \frac{P_1}{P_0} \quad \text{in dB}$$

decibel ratio of any voltage U_1 to the standard reference voltage U_0 , i.e.

$$20 \lg \frac{U_1}{U_0} \quad \text{in dB}$$

NOTE This may be expressed in decibels (relative to 1 μV in 75 Ω) or more simply in dB(μV) if there is no risk of ambiguity and if based on a common impedance value (e.g. 75 Ω).

3.1.28**looped system outlet**

device through which the spur feeder passes and to which is connected a receiver lead, without the use of a subscriber feeder

3.1.29**MATV headend**

headend used in blocks of flats and in built-up sites to feed TV channels and FM radio channels into the house network or the spur network

3.1.30**multi dwelling unit****MDU**

building with many homes or offices used by single owners where television signals, sound signals are distributed and where is access to interactive services

3.1.31**multiplex**

signals from several separate sources assembled into a single composite signal for transmission over a common transmission channel

[IEV 701-03-10]

3.1.32**mutual isolation**

attenuation between two specified system outlets at any frequency within the range of the system under investigation which is always specified, for any particular installation, as the minimum value obtained within specified frequency limits

3.1.33**network interface****NI**

interface to the network for transmission of television signal, sound signals and interactive services

3.1.34**network termination unit****NTU**

equipment for access to the cable network for television signal, sound signals and interactive services

3.1.35**permanent link**

transmission path between any two test interfaces within a cabling subsystem link including the connecting hardware at each end

3.1.36**receiver lead**

lead which connects the system outlet to the subscriber's equipment

NOTE A receiver lead may include filters and balun transformers in addition to the cable.

3.1.37**satellite master antenna television system****SMATV**

system which is designed to provide sound and television signals to the outlets of a building or a group of buildings

NOTE Two system configurations are defined in ETSI EN 300 473 as follows: