



**SLOVENSKI STANDARD**  
**SIST EN 60728-10:2008**  
**01-marec-2008**

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**Kabelska omrežja za televizijske in zvokovne signale ter interaktivne storitve - 10.  
del: Lastnosti sistema za povratne poti (IEC 60728-10:2005)  
(Istoveten SIST EN 50083-10:2003 (bumerang))**

Cable networks for television signals, sound signals and interactive services - Part 10:  
System performance for return paths (IEC 60728-10:2005)

Kabelnetze für Fernsehsignale, Tonsignale und interaktive Dienste - Teil 10: Rückkanal-  
Systemanforderungen (IEC 60728-10:2005)

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Réseaux de distribution par câbles pour signaux de télévision, signaux de radiodiffusion  
sonore et services interactifs - Partie 10: Caractéristiques des systèmes de voie de  
retour (IEC 60728-10:2005)

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**Ta slovenski standard je istoveten z: EN 60728-10:2006**

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**ICS:**

33.060.40

**SIST EN 60728-10:2008**

**en**

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## Corrigendum to EN 50083-10:2002

English version

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### Foreword

#### **Add:**

By Technical Board decision D124/184 the text of the International Standard IEC 60728-10:2005, which is identical with EN 50083-10:2002, was approved by CENELEC as EN 60728-10 on 2005-09-13. As a consequence EN 50083-10:2002 is renumbered as EN 60728-10:2006.

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The following date was fixed:

- latest date by which the existence of [SIST EN 60728-10:2008](#) EN 60728-10 has to be announced at national level [http://standards.iteh.ai/catalog/standards/sist-en-60728-10-2008](#) (doa) 2006-08-01

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April 2006

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EUROPEAN STANDARD

**EN 50083-10**

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2002

ICS 33.060.40

Supersedes EN 50083-10:1999

English version

**Cable networks for television signals,  
sound signals and interactive services  
Part 10: System performance for return paths**

Réseaux de distribution par câbles  
pour signaux de télévision,  
signaux de radiodiffusion sonore  
et services interactifs  
Partie 10: Caractéristiques des systèmes  
de voie de retour

Kabelnetze für Fernsehsignale,  
Tonsignale und interaktive Dienste  
Teil 10: Rückkanal-Systemanforderungen

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This European Standard was approved by CENELEC on 2001-10-01. 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, 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

This European Standard was prepared by CENELEC Technical Committee TC 209, "Cable networks for television signals, sound signals and interactive services" on the basis of EN 50083-10:1999 and the first amendment to EN 50083-10.

The text of this first amendment was submitted to the Unique Acceptance Procedure and was approved by CENELEC on 2001-10-01 to be published as part of a second edition of EN 50083-10.

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) 2002-10-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2004-10-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, Annex B is normative and Annexes A and C are informative.

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## 1 Scope

### 1.1 General

Standards of EN 50083 series deal with cable networks for television signals, sound signals and interactive services including equipment, systems and installations

- for headend-reception, processing and distribution of television and 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.

All kinds of networks like

- CATV-networks
- MATV-networks and SMATV-networks
- individual receiving networks

and all kinds of equipment, systems and installations installed in such networks, are within this scope.

The extent of these standardisation work is from the antennas, special signal source inputs to the headend or other interface points to the network up to the system outlet or the terminal input, where no system outlet exists.

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

### 1.2 Specific scope of this part 10

This standard is dealing with the transparent return path of cable networks operated in the frequency range between 5 MHz and 65 MHz or parts thereof. Higher frequencies may be used in fibre based networks.

NOTE In addition it is possible to use the frequency range from 0 MHz to 5 MHz for return path transmissions, e.g. for NMS or other control, monitoring and signalling purposes. Applications below 5 MHz are not covered by this standard.

An active return path carries typically only return signals. A passive return path can be used for both return and forward signals.

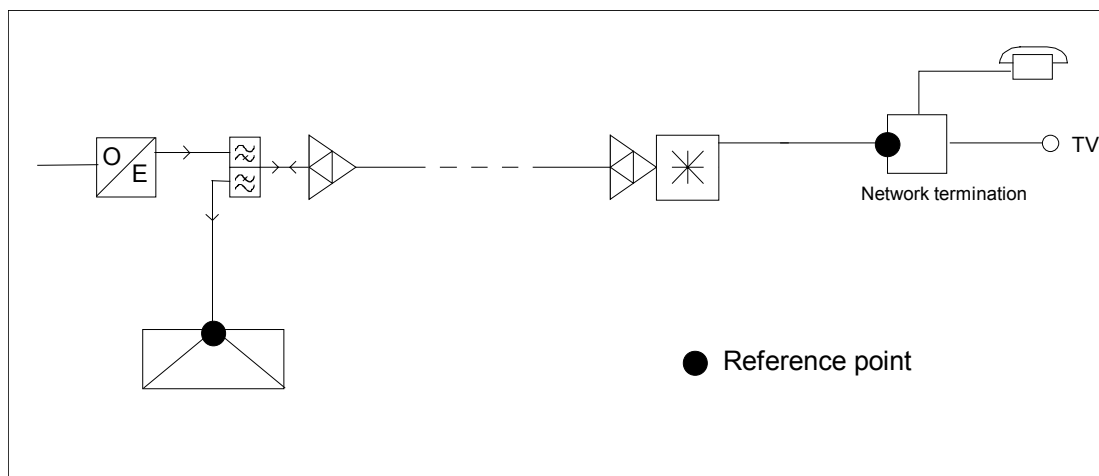
This standard lays down the basic methods of measurement for signals typically used in the return path of cable networks in order to assess the performance of those signals and their performance limits.

All requirements refer to the performance limits which shall be obtained between the reference points (Figure 1) of the return path system.

One reference point is the network termination close to the subscriber. It is the last point where all forward and return signals are present and carried on the same cable. If no network termination point exists, the reference point is the system outlet.



The other reference point is the input of the return signal receiver (or transceiver). At this point the transparent signal path ends and behind this point the signal is treated in a non-transparent way. The return signal receiver can be situated at the headend but can also be at the node of the coaxial cell or at any other point of the network.



**Figure 1 - Reference points of an active return path system (example)**

In addition to the system performance requirements for the transparent return path, system performance recommendations were laid down in this standard e.g. for the overall frequency allocation, for the use of specific modulation techniques for different interactive multimedia services or for different sub-bands within the return path frequency range, etc.

Specific equipment installed in cable networks for the operation of such return paths is standardised in the relevant equipment standards, parts 3 to 6 of the EN 50083 series.

Transmission systems are not within the scope of this standard.

## 2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN 50083		Cable networks for television signals, sound signals and interactive services
EN 50083-1	1993	Part 1: Safety requirements
+ A1	1997	
+ A2	1997	
EN 50083-2	2001	Part 2: Electromagnetic compatibility for equipment
EN 50083-3	2002	Part 3: Active wideband equipment for coaxial cable networks
EN 50083-4	1998	Part 4: Passive wideband equipment for coaxial cable networks

EN 50083-5	2001	Part 5: Headend equipment
EN 50083-6	1997	Part 6: Optical equipment
EN 50083-7 + A1	1996 2000	Part 7: System performance
EN 50083-8	2002	Part 8: Electromagnetic compatibility for networks
ES 200 800 V1.3.1	2001	Digital Video Broadcasting (DVB); DVB interaction channel for Cable TV distribution systems (CATV)

### 3 Terms, definitions, symbols and abbreviations

#### 3.1 Terms and definitions

##### 3.1.1

##### **amplitude response variation**

peak-to-peak variation in frequency amplitude response of a specified signal path over a specified frequency band, expressed in dB

##### 3.1.2

##### **broadcast signal**

signal comprising of video and/or audio and/or data content which is distributed to several receivers simultaneously

##### 3.1.3

##### **channel availability**

percentage of the time during which the channel fulfils all performance requirements. The duration of the observation time has to be published

##### 3.1.4

##### **downstream direction**

direction of signal flow in a cable network from the headend or any other central point (node) of a cable network to the subscribers' area

##### 3.1.5

##### **forward path (downstream)**

part of a cable network by which signals are distributed in the downstream direction from the headend or any other central point (node) of a cable network to the subscribers' area

##### 3.1.6

##### **frequency error**

quality of supply evaluated on the basis of the actual frequency of an electrical system compared to the nominal value. Frequency error consists of initial error, short term and long term frequency stability

##### 3.1.7

##### **headend**

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

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

### 3.1.8

#### **hybrid fibre coaxial network (HFC)**

cable network which is comprised of optical equipment and cables and coaxial equipment and cables in different parts

### 3.1.9

#### **impulse noise**

noise which is caused by electromagnetic interference into cable networks. Impulse noise is characterised by pulses with a duration of typically  $< 10 \mu\text{s}$

### 3.1.10

#### **ingress noise**

noise which is caused by electromagnetic interference into cable networks. Its power decreases with increasing frequency. It is permanently present but slowly varies in its intensity as a function of time

### 3.1.11

#### **interaction path**

part of a cable network by which interactive signals are transmitted in the downstream direction (from the headend or node to the subscriber) and in the upstream direction (from the subscriber to the headend or node)

### 3.1.12

#### **location specific noise**

noise which occurs at a specific area of a cable network or which occurs in a cable network located in a specific environment

### 3.1.13

#### **multiple interference**

interfering signal which consists of  $\geq 2$  signals which originate from  $\geq 2$  sources

NOTE On return path the multiple interference consists of ingress noise and intermodulation distortion products.

### 3.1.14

#### **multimedia signal**

signal comprising of two or more different media contents e.g. video, audio, text, data, etc.

### 3.1.15

#### **network management system (NMS)**

software based system for controlling and supervising cable networks

### 3.1.16

#### **network segment**

part of a cable network comprising a set of functions and/or a specific extent of the complete cable network

### 3.1.17

#### **network termination**

electrical termination of a cable network at any outlet on subscribers' side and headend or node side

### 3.1.18

#### **node**

central point of a network segment at which signals could be fed into the forward path or could be gathered from a number of subscribers out of the return path

**3.1.19**

**return path (upstream)**


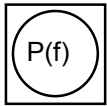
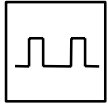
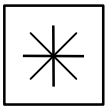
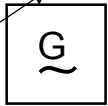

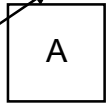
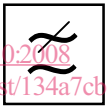

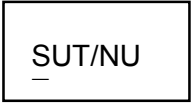
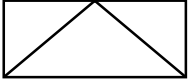
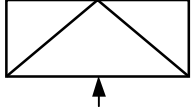
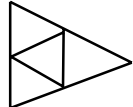

part of a cable network by which signals are transmitted in the upstream direction from any subscriber, connected to the network, to the headend or any other central point (node) of a cable network

**3.1.20**

**upstream direction**

direction of signal flow in a cable network from a subscriber to the headend or any other central point (node) of a cable network

**3.2 Symbols**

Symbols	Terms	Symbols	Terms
	Optical receiver		Spectrum analyser
	Test waveform generator		Passive distribution network
	Variable signal generator		Oscilloscope
	Variable attenuator		Low pass filter
	High pass filter		System Under Test Network Under Test
	Demodulator		Modulator
	Amplifier with return path amplifier		Bit Error Rate Detector