

**Cable networks for television signals, sound signals and interactive services - Part 13-1: Bandwidth expansion for broadcast signal over FTTH system**

## EESTI STANDARDI EESSÕNA

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**Cable networks for television signals, sound signals  
and interactive services -  
Part 13-1: Bandwidth expansion for broadcast signal  
over FTTH system  
(IEC 60728-13-1:2012)**

Réseaux de distribution par câbles  
pour signaux de télévision, signaux  
de radiodiffusion sonore et services  
interactifs -  
Partie 13-1: Extension de bande  
pour le signal de diffusion sur le système  
FTTH  
(CEI 60728-13-1:2012)

Kabelnetze für Fernsehsignale,  
Tonsignale und interaktive Dienste -  
Teil 13-1: Bandbreitenerweiterung  
für Rundfunksignale in FTTH-Systemen  
(IEC 60728-13-1:2012)

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Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Management Centre: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of document 100/1801/CDV, future edition 1 of IEC 60728-13-1, prepared by Technical Area 5 "Cable networks for television signals, sound signal and interactive services" of IEC/TC 100 "Audio, video and multimedia systems and equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60728-13-1:2012.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2013-03-13
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-06-13

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

IEC 60068 series	NOTE	Harmonised as EN 60068 series (not modified).
IEC 60825-1	NOTE	Harmonised as EN 60825-1.
IEC 60825-2	NOTE	Harmonised as EN 60825-2.
IEC 60825-12	NOTE	Harmonised as EN 60825-12.
IEC 60875-1	NOTE	Harmonised as EN 60875-1.
IEC 61280-1-1	NOTE	Harmonised as EN 61280-1-1.
IEC 61280-2-9	NOTE	Harmonised as EN 61280-2-9.
IEC 61281-1	NOTE	Harmonised as EN 61281-1.
IEC 61290-1-2	NOTE	Harmonised as EN 61290-1-2.
IEC 61290-1-3	NOTE	Harmonised as EN 61290-1-3.
IEC 61291-1:2006	NOTE	Harmonised as EN 61291-1:2006 (not modified).
IEC 61300-3-2	NOTE	Harmonised as EN 61300-3-2.
IEC 61754-13	NOTE	Harmonised as EN 61754-13.
IEC 61755-1	NOTE	Harmonised as EN 61755-1.

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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.

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>
IEC 60068-1 + corr. October	1988 1988	Environmental testing - Part 1: General and guidance	EN 60068-1 <sup>1)</sup>	1994
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 60728-6	2011	Cable networks for television signals, sound signals and interactive services - Part 6: Optical equipment	EN 60728-6	2011
IEC 60728-13 + corr. August	2010 2010	Cable networks for television signals, sound signals and interactive services - Part 13: Optical systems for broadcast signal transmissions	EN 60728-13	2010
IEC 61280-1-3	-	Fibre optic communication subsystem test procedures - Part 1-3: General communication subsystems - Central wavelength and spectral width measurement	EN 61280-1-3	-
ITU-T Recommendation G.694.1	-	Spectral grids for WDM applications: DWDM - frequency grid		-
ITU-T Recommendation G. 94.2	-	Spectral grids for WDM applications: CWDM - wavelength grid		-

<sup>1)</sup> EN 60068-1 includes A1 to IEC 60068-1 + corr. October.

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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

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

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

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

The extent of this standardization 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, terminals, etc.) as well as of any coaxial and optical cables and accessories thereof is excluded.

In this standard, informative Annex A describes the system composition and model system based on this standard, and Annex B describes basic concepts for optical wavelength division multiplexing and adds notes for system configuration. Annex C gives the minimum wavelength separation, and Annex D explains the relationship between *CIN* degradation and rain attenuation.

This standard describes the pass-through method of satellite broadcast signals over the FTTH system which uses AM-FDM (SCM) transmission. For an FTTH system below 1 GHz refer to IEC 60728-13. This standard contains descriptions of the measurement methods and specifications for optical wavelength division multiplex and for PSK modulation systems. It specifies the downstream video signal transmission and thus the two-way optical transmission system is out of the scope of this standard. This standard applies to the FTTH system of broadband broadcast signal transmission which conveys satellite broadcast signals using one or multiple optical wavelengths. It is provided for cable/satellite operators to extend their broadband services in order to avoid interference between optical wavelengths based on the technologies described in IEC 60728-13.

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

## **Part 13-1: Bandwidth expansion for broadcast signal over FTTH system**

### **1 Scope**

The purpose of this part of IEC 60728 is the precise description of the fibre to the home (FTTH) system for expanding broadband broadcast signal transmission from CATV services only, towards CATV plus broadcast satellite (BS) plus communication satellite (CS) services, additionally to other various signals such as data services.

The scope is limited to the RF signal transmission over the FTTH (fibre to the home) system. Thus, this part of IEC 60728 does not include IP transport technologies.

### **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.

IEC 60068-1:1988, *Environmental testing – Part 1: General and guidance*

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

IEC 60728-6:2011, *Cable networks for television signals, sound signals and interactive services – Part 6: Optical equipment*

IEC 60728-13:2010, *Cable networks for television signals, sound signals and interactive services – Part 13: Optical systems for broadcast signal transmissions*

IEC 61280-1-3, *Fibre optic communication subsystem test procedures – Part 1-3 General communication subsystems – Central wavelength and spectral width measurement*

ITU-T Recommendation G.694.1, *Spectral grids for WDM applications: CWDM wavelength grid*

ITU-T Recommendation G.694.2, *Spectral grids for WDM applications: CWDM wavelength grid*

### **3 Terms, definitions, symbols and abbreviations**

#### **3.1 Terms and definitions**

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