

BS EN 60958-1:2008+A1:2014



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Digital audio interface —

Part 1: General

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National foreword

This British Standard is the UK implementation of EN 60958-1:2008+A1:2014. It is identical to IEC 60958-1:2008, incorporating amendment 1:2014. It supersedes BS EN 60958-1:2008, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 is indicated by A1 A1.

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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**Digital audio interface -
Part 1: General
(IEC 60958-1:2008)**

Interface audionumérique -
Partie 1: Généralités
(CEI 60958-1:2008)

Digitalton-Schnittstelle -
Teil 1: Allgemeines
(IEC 60958-1:2008)

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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

The text of document 100/1252/CDV, future edition 3 of IEC 60958-1, 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 60958-1 on 2008-10-01.

This European Standard supersedes EN 60958-1:2004.

It includes the following significant changes with respect to EN 60958-1:2004:

Electrical and optical requirements are removed from EN 60958-3; they are specified in EN 60958-1.

The following dates were fixed:

- latest date by which the EN has to be implemented
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- latest date by which the national standards conflicting
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Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60958-1:2008 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 60793-2	NOTE	Harmonized as EN 60793-2:2008 (not modified).
IEC 60794-2	NOTE	Harmonized as EN 60794-2:2003 (not modified).
IEC 60874-1	NOTE	Harmonized as EN 60874-1:2007 (not modified).
IEC 60958	NOTE	Harmonized in EN 60958 series (not modified).
IEC 61883-6	NOTE	Harmonized as EN 61883-6:2005 (not modified).
IEC 61937-1	NOTE	Harmonized as EN 61937-1:2007 (not modified).
IEC 61937-2	NOTE	Harmonized as EN 61937-2:2007 (not modified).
IEC 61937-3	NOTE	Harmonized as EN 61937-3:2003 (not modified).
IEC 61937-4	NOTE	Harmonized as EN 61937-4:2003 (not modified).
IEC 61937-5	NOTE	Harmonized as EN 61937-5:2006 (not modified).
IEC 61937-6	NOTE	Harmonized as EN 61937-6:2006 (not modified).
IEC 61937-7	NOTE	Harmonized as EN 61937-7:2005 (not modified).
IEC 61937-8	NOTE	Harmonized as EN 61937-8:2007 (not modified).
IEC 61937-9	NOTE	Harmonized as EN 61937-9:2007 (not modified).
IEC 62105	NOTE	Harmonized as EN 62105:2002 (not modified).

Foreword to amendment A1

The text of document 100/2164/CDV, future IEC 60958-1:2008/A1, prepared by IEC/TC 100 "Audio, video and multimedia systems and equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60958-1:2008/A1:2014.

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- latest date by which the national (dow) 2017-06-03
standards conflicting with the
document have to be withdrawn

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

IEC 60874-1	NOTE	Harmonised as EN 60874-1.
IEC 61937-3	NOTE	Harmonised as EN 61937-3.

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

IEC 61937-4	NOTE	Harmonised as EN 61937-4
IEC 61937-5	NOTE	Harmonised as EN 61937-5.
IEC 61937-6	NOTE	Harmonised as EN 61937-6.
IEC 61937-7	NOTE	Harmonised as EN 61937-7.
IEC 61937-8	NOTE	Harmonised as EN 61937-8.
IEC 61937-9	NOTE	Harmonised as EN 61937-9.

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>
IEC 60268-11	- ¹⁾	Sound system equipment - Part 11: Application of connectors for the interconnection of sound system components	HD 483.11 S3	1993 ²⁾
IEC 60874-17	- ¹⁾	Connectors for optical fibres and cables - Part 17: Sectional specification for fibre optic connector - Type F-05 (friction lock)	EN 60874-17	1997 ²⁾
IEC 60958-3	- ¹⁾	Digital audio interface - Part 3: Consumer applications	EN 60958-3	2006 ²⁾
IEC 60958-4	- ¹⁾	Digital audio interface - Part 4: Professional applications	EN 60958-4	2003 ²⁾

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

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DIGITAL AUDIO INTERFACE –

Part 1: General

1 Scope

This part of IEC 60958 describes a serial, uni-directional, self-clocking interface for the interconnection of digital audio equipment for consumer and professional applications.

It provides the basic structure of the interface. Separate documents define items specific to particular applications.

The interface is primarily intended to carry monophonic or stereophonic programmes, encoded using linear PCM and with a resolution of up to 24 bits per sample.

When used for other purposes, the interface is able to carry audio data coded other than as linear PCM coded audio samples. Provision is also made to allow the interface to carry data related to computer software or signals coded using non-linear PCM. The format specification for these applications is not part of this standard.

The interface is intended for operation at audio sampling frequencies of 32kHz and above. Auxiliary information is transmitted along with the programme.

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 60268-11, *Sound system equipment – Part 11: Application of connectors for the interconnection of sound system components*

IEC 60874-17, *Connectors for optical fibres and cables – Part 17: Sectional specification for fibre optic connector – Type F-05 (friction lock)*

IEC 60958-3, *Digital audio interface – Part 3: Consumer applications*

IEC 60958-4, *Digital audio interface – Part 4: Professional applications*

3 Terms and definitions

For the purpose of this International Standard, the following terms and definitions apply.

3.1 sampling frequency

frequency of the samples representing an audio signal

NOTE When more than one signal is transmitted through the same interface, the sampling frequencies are identical.

3.2

audio sample word

value of a digital audio sample; representation is linear in 2's complement binary form

NOTE Positive numbers correspond to positive analogue voltages at the input of the analogue-to-digital converter (ADC).

3.3

auxiliary sample bit

the four least significant bits (LSBs) which can be assigned as auxiliary sample bits and used for auxiliary information when the number of audio sample bits in the main data field is less than or equal to 20

3.4

validity bit

bit indicating whether the main data field bits in the sub-frame (time slots 4 to 27 or 8 to 27, depending on the audio word length as described in 4.1.1) are reliable or not

3.5

channel status

the channel status carries, in a fixed format, information associated with each main data field channel which is decodable by any interface user

NOTE Examples of information to be carried in the channel status are: length of audio sample words, pre-emphasis, sampling frequency, time codes, alphanumeric source and destination codes.

3.6

user data

the user data channel is provided to carry any other information

3.7

parity bit

bit provided to permit the detection of an odd number of errors resulting from malfunctions in the interface

3.8

preamble

specific patterns used for synchronization

NOTE There are three different preambles (see 4.3).

3.9

sub-frame

fixed structure used to carry information (see 4.1.14.1.1 and 4.1.2)

3.10

frame

sequence of two successive and associated sub-frames

3.11

block

group of 192 consecutive frames

NOTE The start of a block is designated by a special sub-frame preamble (see 4.3).

3.12

channel coding

coding method by which the binary digits are represented for transmission through the interface

3.13

unit interval (UI)

the shortest nominal time interval in the coding scheme

NOTE There are 128 UI in a sample frame.

3.14

interface jitter

deviation in the timing of interface data transitions (zero crossings) when compared with an ideal clock

3.15

intrinsic jitter

output interface jitter of a device that is either free-running or is synchronized to a jitter-free reference

3.16

jitter gain

ratio of the amplitude of jitter components at the output to their amplitude at the synchronization input to the device under test

4 Interface format

4.1 Structure of format

4.1.1 Sub-frame format

Each sub-frame is divided into 32 time slots, numbered from 0 to 31 (see Figure 1).

Time slots 0 to 3 (preambles) carry one of the three permitted preambles (see 4.1.2 and 4.3; also see Figure 2).

Time slots 4 to 27 (main data field) carry the audio sample word in linear 2's complement representation. The most significant bit (MSB) is carried by time slot 27.

When a 24-bit coding range is used, the LSB is in time slot 4 (see Figure 1).

When a 20-bit coding range is used, time slots 8 to 27 carry the audio sample word with the LSB in time slot 8. Time slots 4 to 7 may be used for other applications. Under these circumstances, the bits in the time slots 4 to 7 are designated auxiliary sample bits (see Figure 1).

If the source provides fewer bits than the interface allows (either 20 or 24), the unused LSBs are set to a logical "0".

For a non-linear PCM audio application or a data application the main data field may carry any other information.

Time slot 28 (validity bit) carries the validity bit associated with the main data field (see 4.4).

Time slot 29 (user data bit) carries 1 bit of the user data channel associated with the main data field channel transmitted in the same sub-frame. For the applications, refer to the other parts of IEC 60958.

Time slot 30 (channel status bit) carries 1 bit of the channel status information associated with the main data field channel transmitted in the same sub-frame. For details refer to the other parts of IEC 60958.