IEC 61937-2

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 –
Part 2: Burst-info

Audionumérique – Interface pour les flux de bits audio à codage MIC non linéaire selon l'IEC 60958 –
Partie 2: Informations relatives à la salve

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DIGITAL AUDIO – INTERFACE FOR NON-LINEAR PCM ENCODED AUDIO BITSTREAMS APPLYING IEC 60958 –

Part 2: Burst-info

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IEC 61937-2 has been prepared by technical area 20: Analogue and digital audio, of IEC technical committee 100: Audio, video and multimedia systems and equipment. It is an International Standard.

This third edition cancels and replaces the second edition published in 2007, Amendment 1:2011 and Amendment 2:2018. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) new audio data-types of MPEG-D USAC, ACX, ACX HBR2, ACX HBR4 and ACX HBR8 have been added;

b) extended data-type field in Pe has been activated.

The text of this International Standard is based on the following documents:

Draft	Report on voting
100/3459/CDV	100/3541/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

The list of all the parts of the IEC 61937 series, under the general title *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

DIGITAL AUDIO – INTERFACE FOR NON-LINEAR PCM
ENCODED AUDIO BITSTREAMS APPLYING IEC 60958 –

Part 2: Burst-info

1   Scope

This part of IEC 61937 specifies the digital audio interface to convey non-linear PCM encoded audio bitstreams applying IEC 60958-1 and IEC 60958-3. This document specifies burst-info, which defines content information about the data contained in the burst-payload.

2   Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60958-1, *Digital audio interface – Part 1: General*

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

IEC 61937-1:2021, *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 – Part 1: General*

IEC 61937-3, *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 – Part 3: Non-linear PCM bitstreams according to the AC-3 format*

IEC 61937-4, *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 – Part 4: Non-linear PCM bitstreams according to the MPEG audio format*

IEC 61937-5, *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 – Part 5: Non-linear PCM bitstreams according to the DTS (Digital Theater Systems) format(s)*

IEC 61937-6, *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 – Part 6: Non-linear PCM bitstreams according to the MPEG-2 AAC and MPEG-4 AAC audio formats*

IEC 61937-7, *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 – Part 7: Non-linear PCM bitstreams according to the ATRAC, ATRAC2/3 and ATRAC-X formats*

IEC 61937-8, *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 – Part 8: Non-linear PCM bitstreams according to the Windows Media Audio (WMA) Professional format*

IEC 61937-9, *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 – Part 9: Non-linear PCM bitstreams according to the MAT format*

IEC 61937-10, *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 – Part 10: Non-linear PCM bitstreams according to the MPEG-4 audio lossless coding (ALS) format*

IEC 61937-11, *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 – Part 11: MPEG-4 AAC and its extensions in LATM/LOAS*

IEC 61937-12, *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 – Part 12: Non-linear PCM bitstreams according to the DRA formats*

IEC 61937-13, *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 – Part 13: MPEG-H 3D Audio*

IEC 61937-14, *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 – Part 14: Non-linear PCM bitstreams according to the AC-4 format*

IEC 61937-15, *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 – Part 15: Non-linear PCM bit streams according to Auro-Cx format*

3   Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
audio data-burst
data-burst with an encoded audio frame as burst-payload

3.2
audio data-word
16-bit data-word

3.3
audio frame
fixed number of audio samples

Note 1 to entry: The number of samples in an audio frame is dependent on the particular encoding system that is used to encode the audio frame into the encoded audio frame.

3.4
audio gap
period in the sequence of baseband audio samples where valid samples of audio are not available

3.5
bitstream
non-linear PCM encoded audio source, represented in a sequence of bits

Note 1 to entry: In this interface, the bitstream consists of a sequence of data-bursts.

3.6
data-burst
packet of data, including the burst-preamble, to be transmitted across the interface

3.7
burst-payload
information content of the data-burst

3.8
burst-preamble
header for the data-burst, containing synchronization and information about the data contained in the burst-payload

3.9
data-type
reference to the type of payload of the data-bursts

3.10
encoded audio frame
minimum decodable unit of an encoded data sequence

Note 1 to entry: Each encoded audio frame is the encoded representation of a fixed number of audio samples (for each original audio channel). The number of samples that are encoded into an encoded audio frame depends on the particular encoding system used to encode the audio frame into the encoded audio frame.

3.11
length-code
length of the data-burst-payload in bits, bytes or 8-byte units

3.12
repetition period
period between the reference point of the current data-burst, and the reference point of the immediately following data-burst of the same data-type

3.13
sampling frequency
frequency of the encoded PCM audio samples (i.e. before encoding and after decoding)

3.14
sampling period
period related to the sampling frequency of the PCM audio samples, represented in the encoded bitstream

3.15
stuffing
occupation of the unused data capacity of the interface

3.16
stuffing sub-frame
occupation of the unused data capacity in 16-bit audio data-words

3.17
stream gap
period within the encoded audio bitstream without any audio frame; a discontinuity in the bitstream

Note 1 to entry: Typically, a stream gap will occur between encoded audio frames.

4   Burst-info

4.1   General

The 16-bit burst-info contains information about the data found in the data-burst. Fields of burst-info are specified in Table 1.

Table 1 – Fields of burst-info

Bits of Pc		Value	Contents
0 to 6			Data-type (defined in IEC 61937-1)
	0 to 4		*Conventional* data-type
		0 to 31	See Table 2
	5 to 6		Subdata-type
		0 to 3	See Table 2
7			Error-flag
		0	Error-flag indicating a valid burst-payload
		1	Error-flag indicating that the burst-payload may contain errors
8 to 2			Data-type-dependent info
13 to 15		0 to 7	Bit-stream-number
NOTE Refer to IEC 61937-1:2021, 6.1.8.1 and 6.1.8.2.			

4.2   Data-type, subdata-type and extended data-type

Data-type defined in Pc bits 0-6 in IEC 61937-1 consists of conventional data-type (0 to 4) and sub-data-type (5 to 6) for historical reasons. All conventional data-types and subdata-types are defined in Table 2.

Extended data-type is defined in Pe bits 0 to 15 in IEC 61937-1. All extended data-types are defined in Table 3.

Table 2 – Data-types

Data-type value of Pc bit 0 to 6		Contents	Reference point R	Repetition period of data-burst measured in IEC 60958 frames	Units of Pd
Conventional data-type Value of data-type bits 0 to 4	Subdata-type Value of data-type bits 5 to 6				
0	0	Null data		a	
1	0	AC-3 data	R-AC-3	1 536	bits
2	0 to 3	Refer to SMPTE ST 338			bits
3	0	Pause	bit 0 of Pa	b	bits
4	0	MPEG-1 layer 1 data	bit 0 of Pa	384	bits
5	0	MPEG-1 layer 2 or 3 data or MPEG-2 without extension	bit 0 of Pa	1 152	bits
6	0	MPEG-2 data with extension	bit 0 of Pa	1 152	bits
7	0	MPEG-2 AAC	bit 0 of Pa	1 024	bits
8	0	MPEG-2, layer-1 low sampling frequency	bit 0 of Pa	768	bits
9	0	MPEG-2, layer-2 low sampling frequency	bit 0 of Pa	2 304	bits
10	0	MPEG-2, layer-3 low sampling frequency	bit 0 of Pa	1 152	bits
11	0	DTS type I	bit 0 of Pa	512	bits
12	0	DTS type II	bit 0 of Pa	1 024	bits
13	0	DTS type III	bit 0 of Pa	2 048	bits
14	0	ATRAC	bit 0 of Pa	512	bits
15	0	ATRAC2/3	bit 0 of Pa	1 024	bits
16	0	ATRAC-X	bit 0 of Pa	2 048	bits
	1	ATRAC-X low latency	bit 0 of Pa	512	bits
	2	ATRAC-X low latency	bit 0 of Pa	256	bits
	3	ATRAC-X low latency	bit 0 of Pa	128	bits
17	0	DTS type IV	bit 0 of Pa	See IEC 61937-5	bytes
18	0	WMA professional type I	bit 0 of Pa c	2 048	bits
	1	WMA professional type II	bit 0 of Pa	2 048	bits
	2	WMA professional type III	bit 0 of Pa	1 024	bits
	3	WMA professional type IV	bit 0 of Pa	512	bits
19	0	MPEG-2 AAC low sampling frequency	bit 0 of Pa	2 048	bits
	1	MPEG-2 AAC low sampling frequency	bit 0 of Pa	4 096	bits
	2 to 3	MPEG-2 AAC low sampling frequency	reserved	reserved	bits
20	0	MPEG-4 AAC	bit 0 of Pa	1 024	bits
	1	MPEG-4 AAC	bit 0 of Pa	2 048	bits
	2	MPEG-4 AAC	bit 0 of Pa	4 096	bits
	3	MPEG-4 AAC	bit 0 of Pa	512	bits
21	0	Enhanced AC-3	bit 0 of Pa	6 144	bytes
22	0	MAT	R-MAT	15 360	bytes
23	0	MPEG-4 ALS	bit 0 of Pa	See IEC 61937-10	8-bytes
	1	MPEG-4 AAC LC in LATM/LOAS	bit 0 of Pa	See IEC 61937-11	bytes
	2	MPEG-4 HE AAC in LATM/LOAS	bit 0 of Pa	See IEC 61937-11	bits
	3	DRA	bit 0 of Pa	See IEC 61937-12	bits

Data-type value of Pc bit 0 to 6		Contents	Reference point R	Repetition period of data-burst measured in IEC 60958 frames	Units of Pd
Conventional data-type Value of data-type bits 0 to 4	Subdata-type Value of data-type bits 5 to 6				
24	0	AC-4	bit 0 of Pa	See IEC 61937-14	bytes
	1	AC-4 HBR4	bit 0 of Pa	See IEC 61937-14	bytes
	2	AC-4 HBR16	bit 0 of Pa	See IEC 61937-14	8-bytes
	3	AC-4 LD	bit 0 of Pa	See IEC 61937-14	bytes
25	0	MPEG-H 3D Audio	bit 0 of Pa	See IEC 61937-13	bytes
	1	MPEG-H 3D Audio HBR	bit 0 of Pa	See IEC 61937-13	8-bytes
	2	MPEG-4 ALS in LATM/LOAS	bit 0 of Pa	See IEC 61937-10	8-bytes
	3	MPEG-D USAC	bit 0 of Pa	See IEC 61937-11	bits
26	0	ACX	bit 0 of Pa	See IEC 61937-15	bytes
	1	ACX HBR2	bit 0 of Pa	See IEC 61937-15	bytes
	2	ACX HBR4	bit 0 of Pa	See IEC 61937-15	bytes
	3	ACX HBR8	bit 0 of Pa	See IEC 61937-15	bytes
27 to 30	0 to 3	Refer to SMPTE ST 338			bits
31	0	Extended data-type (see table 3)			
	1 to 3	Extended data-type (do not use until defined)			

a   Refer to IEC 61937-1:2021, 7.4.

b   The repetition period of pause data-bursts depends on the application. The repetition period of pause data-bursts is defined for each audio data-burst.

c   Refer to IEC 61937-8:2006, 4.2.

Table 3 – Extended data-types

Extended data-type value of Pe bit 0 to 15	Contents	Reference point R	Repetition period of data-burst measured in IEC 60958 frames	Units of Pd
0 to 65 535	Reserved for future use			

4.3   Audio data-bursts

4.3.1   General

Subclause 4.3 specifies the audio data-bursts. Specific properties such as reference points, repetition period, the method of filling stream gaps, and decoding latency are specified for each data-type.

The decoding latency (or delay), indicated for the data-types, shall be used by the transmitter to schedule data-bursts as necessary to establish synchronization between picture and decoded audio.

4.3.2   AC-3

The AC-3 bitstream consists of a sequence of AC-3 syncframes. The data-type of an AC-3 data-burst is 1 and the subdata-type of an AC-3 data-burst is 0. An AC-3 syncframe represents 1 536 samples of each encoded audio channel (left, centre, etc.). The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of AC-3 data shall contain one complete AC-3 syncframe.