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INTERNATIONAL STANDARD

colour inside

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

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

Part 2: Burst-info

FOREWORD

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 61937-2:2007+AMD1:2011+AMD2:2018 CSV. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

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- withdrawn,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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION to Amendment 1

The revision of IEC 61937-2 (2007) has become necessary to define additional data-types, in order to be consistent with the data-type field description in IEC 61937-1 and to clarify the rule and definition of this data-type. Amendment 1 contains the following significant technical changes with respect to the base publication (IEC 61937-2, second edition).

– New audio data-types of MPEG-4 ALS, MPEG-4 AAC LC in LATM/LOAS, MPEG-4 HE AAC in LATM/LOAS and DRA are added.

– The description of data-type and subdata-type fields in Pc is clarified.

– A rule has been defined for new data-types.

INTRODUCTION to Amendment 2

The revision of IEC 61937-2:2007 has become necessary to define additional data types. Amendment 2 contains the following significant technical changes with respect to the base publication (IEC 61937-2:2007 and IEC 61937-2:2007/AMD1:2011):

a) new audio data-types of ATRAC-X low latency, MPEG-H 3D Audio, MPEG-H 3D Audio HBR, AC-4, AC-4 HBR4, AC-4 HBR16, AC-4 LD and MPEG-4 ALS in LATM/LOAS are added;

b) units of Pd column is added to Table 2;

c) update SMPTE reference.

In the next full revision of IEC 61937-2, it is planned to relinquish the use of "Conventional data-type" and "Subdata-type", replacing them with "data-type bits 0 to 4" and "data-type bits 5 to 6", respectively.

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:~~2007~~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~~:2006~~, *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*

~~ISO/IEC 11172-3: *Information technology – Coding of moving pictures and associated audio for digital storage media at up to about 1,5 Mb/s – Part 3: Audio*~~

~~ISO/IEC 13818-3, *Information technology – Generic coding of moving pictures and associated audio information – Part 3: Audio*~~

~~ISO/IEC 13818-7, *Information technology – Generic coding of moving pictures and associated audio information – Advanced Audio Coding (AAC)*~~

~~ISO/IEC 14496-3, *Information technology – Coding of audio-visual objects – Part 3: Audio*~~

~~ITU-R Recommendation BS.1196, *Audio coding for digital terrestrial television broadcasting*~~

3 Terms and definitions ~~and abbreviations~~

~~3.1 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-bytes~~ 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
~~sampling~~ 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
~~occupying~~ occupation of the unused data capacity of the interface

3.16
stuffing sub-frame
~~occupying~~ 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.

~~**3.2 Abbreviations**~~

~~ATRAC~~	~~Adaptive TRansform Acoustic Coding~~
~~ATRAC2~~	~~Adaptive TRansform Acoustic Coding 2~~
~~ATRAC3~~	~~Adaptive TRansform Acoustic Coding 3~~
~~ATRAC2/3~~	~~ATRAC2 and/or ATRAC3~~
~~ATRAC-X~~	~~Adaptive TRansform Acoustic Coding-X~~
~~ATSC~~	~~Advanced Television Systems Committee~~
~~IEC~~	~~International Electrotechnical Commission~~
~~ISO/IEC MPEG~~	~~Moving Pictures Expert Group, a joint committee of ISO and IEC~~
~~ITU-R~~	~~International Telecommunication Union, Radiocommunication Bureau~~
~~MPEG~~	~~Motion Pictures Expert Group, a joint committee of ISO and IEC~~
~~SMPTE~~	~~Society of Motion Picture and Television Engineers~~

4 Burst-info

4.1 General

The 16-bit burst-info contains information about the data ~~which will be~~ 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
~~8-12~~ 8 to 2			Data-type-dependent info
13 to 15		0 to 7	Bit-stream-number
NOTE Refer to IEC 61937-1:2021, ~~6.1.7~~ 6.1.8.1 and ~~6.1.7.1~~ 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.

~~Further definition of data-type in the reserved area of Table 2 shall be allocated in PC bits 0-6, in ascending order and without skipping gap.~~

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

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				
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	ATRAC 2/3	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	bits
	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
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

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				
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	~~Reserved (do not use until defined)~~ MPEG-D USAC	bit 0 of Pa	See IEC 61937-11	bits
~~103 – 107~~		~~Reserved (do not use until defined)~~			
~~(26)~~	~~(0 – 3)~~				
~~27 – 30~~	~~0 – 3~~	~~Refer to SMPTE ST 338~~			~~bits~~
~~31~~	~~0 – 3~~	~~Extended data-type (do not use until defined)~~			
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:~~2007~~2021, ~~7.3~~ 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 ~~frames~~ 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 ~~frame~~ 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 ~~frame~~ syncframe.

The length of the AC-3 data-burst will depend on the encoded bit rate (which determines the AC-3 ~~frame~~ syncframe length). The specification for the AC-3 bitstream ~~may be found in ITU-R Recommendation BS.1196; the burst format~~ is specified in IEC 61937-3.

4.3.3 MPEG-1 layer-1

An MPEG-1 layer-1 MPEG-frame represents 384 samples of each encoded channel and can be transferred using data-type 4 and the subdata-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see ~~ISO/IEC 11172-3 and~~ IEC 61937-4.

4.3.4 MPEG-1 layer-2 or layer-3 or MPEG-2 without extension

The burst-payload of MPEG-1 layer-2, or layer-3, or MPEG-2 without extension, represents 1 152 samples of each encoded channel and can be transferred using data-type 5 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see ~~ISO/IEC 11172-3, ISO/IEC 13818-3 and~~ IEC 61937-4.

4.3.5 MPEG-2 with extension

The burst-payload of MPEG-2 with extension represents 1 152 samples of each encoded channel and can be transferred using data-type 6 and subdata-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see ~~ISO/IEC 13818-3 and~~ IEC 61937-4.

4.3.6 MPEG-2 AAC

The payload of MPEG-2 AAC represents 1 024 samples of each encoded channel and can be transferred using data-type 7 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see ~~ISO/IEC 13818-7 and~~ IEC 61937-6.

4.3.7 MPEG-2 layer-1 low sampling frequency

An MPEG-2 layer-1 frame with low sampling frequency represents 384 samples of each encoded channel and can be transferred using data-type 8 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see ~~ISO/IEC 13818-3 and~~ IEC 61937-4.

4.3.8 MPEG-2 layer-2 low sampling frequency

The payload of MPEG-2 layer-2 frame with low sampling frequency represents 1 152 samples of each encoded channel and can be transferred using data-type 9 and subdata-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see ~~ISO/IEC 13818-3 and~~ IEC 61937-4.

4.3.9 MPEG-2 layer-3 low sampling frequency

The payload of MPEG-2 layer-3 frame with low sampling frequency represents 576 samples of each encoded channel and can be transferred using data-type 10 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see ~~ISO/IEC 13818-3 and~~ IEC 61937-4.

4.3.10 DTS type I

The payload of DTS type I represents 512 samples of each encoded channel and can be transferred using data-type 11 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-5.

4.3.11 DTS type II

The payload of DTS type II represents 1 024 samples of each encoded channel and can be transferred using data-type 12 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-5.

4.3.12 DTS type III

The payload of DTS type III represents 2 048 samples of each encoded channel and can be transferred using data-type 13 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-5.

4.3.13 DTS type IV

The payload of DTS type IV represents samples of each encoded channel and can be transferred using data-type 17 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-5.

4.3.14 ATRAC

The payload of ATRAC represents 512 samples of each encoded channel and can be transferred using data-type 14 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-7.

4.3.15 ATRAC 2/3

The payload of ATRAC 2/3 represents 1 024 samples of each encoded channel and can be transferred using data-type 15 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-7.

4.3.16 ATRAC-X

The payload of ATRAC-X represents 2 048 samples of each encoded channel and can be transferred using data-type 16 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-7.

4.3.17 MPEG-2 AAC low sampling frequency

The payload of MPEG-2 AAC low sampling frequency represents 2 048 samples of each encoded channel and can be transferred using data-type 19 and sub-data-type 0 or it represents 4 096 samples of each encoded channel and can be transferred using data-type 19 and sub-data-type 1. The data-burst is headed with a burst-preamble, followed by the burst-payload; see ~~ISO/IEC 13818-7 and~~ IEC 61937-6.

4.3.18 MPEG-4 AAC

The payload of MPEG-4 AAC represents 1 024 samples of each encoded channel and can be transferred using data-type 20 and sub-data-type 0.

The payload of MPEG-4 AAC represents 2 048 samples of each encoded channel and can be transferred using data-type 20 and sub- data-type 1.

The payload of MPEG-4 AAC represents 4 096 samples of each encoded channel and can be transferred using data-type 20 and sub-data-type 2.

The payload of MPEG-4 AAC represents 512 samples of each encoded channel and can be transferred using data-type 20 and sub-data-type 3.

The data-burst is headed with a burst-preamble, followed by the burst-payload; see ~~ISO/IEC 14496-3 and~~ IEC 61937-6.

4.3.19 Windows Media Audio professional

The payload of WMA professional type I represents 2 048 samples of each encoded channel and can be transferred using data-type 18 and sub-data-type 0.

The payload of WMA professional type II represents 2 048 samples of each encoded channel and can be transferred using data-type 18 and sub-data-type 1.

The payload of WMA professional type III represents 1 024 samples of each encoded channel and can be transferred using data-type 18 and sub-data-type 2.

The payload of WMA professional type IV represents 512 samples of each encoded channel and can be transferred using data-type 18 and sub-data-type 3.

The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-8.

4.3.20 Enhanced AC-3

The enhanced AC-3 bitstream consists of a sequence of enhanced AC-3-frames. The data-type of an enhanced AC-3 data-burst is 21, and the sub-data-type of an enhanced AC-3 data-burst is 0. The contents of an enhanced AC-3 data-burst represent 1 536 samples of each encoded audio channel. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-3.

4.3.21 MAT

The MAT bitstream consists of a sequence of frames. The data-type of an MAT data-burst is 22, and the sub-data-type is 0. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of MAT data shall contain 1 complete MAT frame. The length of the MAT data-burst depends on the encoded bit rate (which determines the MAT frame length); see IEC 61937-9.

4.3.22 MPEG-4 ALS

The MPEG-4 ALS bitstream consists of a sequence of frames. The data-type of an MPEG-4 ALS data-burst is 23, and the sub-data-type is 0. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of MPEG-4 ALS data shall contain 1 complete MPEG-4 ALS frame. The length of the MPEG-4 ALS data-burst depends on the encoded bit rate (which determines the MPEG-4 ALS frame length); see IEC 61937-10.

4.3.23 MPEG-4 AAC LC in LATM/LOAS

The MPEG-4 AAC LC in LATM/LOAS bitstream consists of a sequence of frames. The data-type of an MPEG-4 AAC LC in LATM/LOAS data-burst is 23, and the sub-data-type is 1. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of MPEG-4 AAC LC in LATM/LOAS data shall contain 1 complete MPEG-4 AAC LC in LATM/LOAS frame. The length of the MPEG-4 AAC LC in LATM/LOAS data-burst depends on the encoded bit rate (which determines the MPEG-4 AAC LC in LATM/LOAS frame length); see IEC 61937-11.

4.3.24 MPEG-4 HE AAC in LATM/LOAS

The MPEG-4 HE AAC in LATM/LOAS bitstream consists of a sequence of frames. The data-type of an MPEG-4 HE AAC in LATM/LOAS data-burst is 23, and the sub-data-type is 2. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of MPEG-4 HE AAC in LATM/LOAS data shall contain 1 complete MPEG-4 HE AAC in LATM/LOAS frame. The length of the MPEG-4 HE AAC in LATM/LOAS data-burst depends on the encoded bit rate (which determines the MPEG-4 HE AAC in LATM/LOAS frame length); see IEC 61937-11.

4.3.25 DRA

The DRA bitstream consists of a sequence of frames. The data-type of a DRA data-burst is 23, and the sub-data-type is 3. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of DRA data shall contain 1 complete DRA frame. The length of the DRA data-burst depends on the encoded bit rate (which determines the DRA frame length); see IEC 61937-12.

4.3.26 ATRAC-X low latency

The payload of ATRAC-X represents 512 samples of each encoded channel and can be transferred by assigning 16 to data-type bits 0 to 4 and 1 to data-type bits 5 to 6, or it represents 256 samples of each encoded channel and can be transferred by assigning 16 to data-type bits 0 to 4 and 2 to data-type bits 5 to 6, or 128 samples of each encoded channel and can be transferred by assigning 16 to data-type bits 0 to 4 and 3 to data-type bits 5 to 6. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-7.

4.3.27 MPEG-H 3D Audio

The MPEG-H 3D Audio bitstream consists of a sequence of frames. The value of data-type bits 0 to 4 of an MPEG-H 3D Audio data-burst is 25, and the value of data-type bits 5 to 6 is 0. The value of data-type bits 0 to 4 of an MPEG-H 3D Audio HBR data-burst is 25 and the value of data-type bits 5 to 6 is 1. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of MPEG-H 3D Audio shall contain one complete MPEG-H 3D Audio frame. The length of the MPEG-H 3D Audio data-burst depends on the encoded bit rate (which determines the MPEG-H 3D Audio frame length); see IEC 61937-13.

4.3.28 AC-4, AC-4 HBR4, AC-4 HBR16 and AC-4 LD

The AC-4 bitstream consists of a sequence of frames. The value of data-type bits 0 to 4 of an AC-4 data-burst is 24 and the value of data-type bits 5 to 6 is 0. The value of data-type bits 0 to 4 of an AC-4 HBR4 data-burst is 24, and the value of data-type bits 5 to 6 is 1. The value of data-type bits 0 to 4 of an AC-4 HBR16 data-burst is 24, and the value of data-type bits 5 to 6 is 2. The value of data-type of an AC-4 LD data-burst is 24, and the value of data-type bits 5 to 6 is 3. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of AC-4 data shall contain one complete AC-4 frame. The length of the AC-4 data-burst depends on the encoded bit rate (which determines the AC-4 frame length); see IEC 61937-14.

4.3.29 MPEG-4 ALS in LATM/LOAS

The MPEG-4 ALS in LATM/LOAS bitstream consists of a sequence of frames. The value of data-type bits 0 to 4 of an MPEG-4 ALS in LATM/LOAS data-burst is 25, and the value of data-type bits 5 to 6 is 2. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of MPEG-4 ALS in LATM/LOAS data shall contain one complete MPEG-4 ALS frame. The length of the MPEG-4 ALS in LATM/LOAS data-burst depends on the encoded bit rate (which determines the MPEG-4 ALS in LATM/LOAS frame length); see IEC 61937-10.

4.3.30 MPEG-D USAC in LATM/LOAS

The MPEG-D USAC in LATM/LOAS bitstream consists of a sequence of frames. The value of data-type bits 0 to 4 of an MPEG-D USAC in LATM/LOAS data-burst is 25, and the value of data-type bits 5 to 6 is 3. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of MPEG-D USAC in LATM/LOAS data shall contain one complete MPEG-D USAC in LATM/LOAS frame. The length of the MPEG-D USAC in LATM/LOAS data-burst depends on the encoded bit rate (which determines the MPEG-D USAC in LATM/LOAS frame length), see IEC 61937-11.

4.3.31 ACX, ACX HBR2, ACX HBR4 and ACX HBR8

The Auro-Cx (ACX) bitstream consists of a sequence of blocks (or frames). The value of data-type bits 0 to 4 of an ACX data burst is 26, and the value of data-type bits 5 to 6 is 0. The value of data-type bits 0 to 4 of an ACX HBR2 data burst is 26, and the value of data-type bits 5 to 6 is 1. The value of data-type bits 0 to 4 of an ACX HBR4 data burst is 26, and the value of data-type bits 5 to 6 is 2. The value of data-type bits 0 to 4 of an ACX HBR8 data burst is 26, and the value of data-type bits 5 to 6 is 3. The data is headed with a burst pre-amble, followed by the burst-payload. The burst payload of each data-burst of Auro-Cx data shall contain one complete Auro-Cx block. The length of the Auro-Cx data-burst depends on the encoded bit rate (which determines the Auro-Cx block length); see IEC 61937-15.

Bibliography

SMPTE ST 338, *Format for Non-PCM Audio and Data in AES3 – Data Types*

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IEC 61937-2

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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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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 2: Burst-info

FOREWORD

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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	ATRAC 2/3	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	bits
	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.

The length of the AC-3 data-burst will depend on the encoded bit rate (which determines the AC-3 syncframe length). The specification for the AC-3 bitstream is specified in IEC 61937-3.

4.3.3 MPEG-1 layer-1

An MPEG-1 layer-1 MPEG-frame represents 384 samples of each encoded channel and can be transferred using data-type 4 and the subdata-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-4.

4.3.4 MPEG-1 layer-2 or layer-3 or MPEG-2 without extension

The burst-payload of MPEG-1 layer-2, or layer-3, or MPEG-2 without extension, represents 1 152 samples of each encoded channel and can be transferred using data-type 5 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-4.

4.3.5 MPEG-2 with extension

The burst-payload of MPEG-2 with extension represents 1 152 samples of each encoded channel and can be transferred using data-type 6 and subdata-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-4.

4.3.6 MPEG-2 AAC

The payload of MPEG-2 AAC represents 1 024 samples of each encoded channel and can be transferred using data-type 7 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-6.

4.3.7 MPEG-2 layer-1 low sampling frequency

An MPEG-2 layer-1 frame with low sampling frequency represents 384 samples of each encoded channel and can be transferred using data-type 8 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-4.

4.3.8 MPEG-2 layer-2 low sampling frequency

The payload of MPEG-2 layer-2 frame with low sampling frequency represents 1 152 samples of each encoded channel and can be transferred using data-type 9 and subdata-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-4.

4.3.9 MPEG-2 layer-3 low sampling frequency

The payload of MPEG-2 layer-3 frame with low sampling frequency represents 576 samples of each encoded channel and can be transferred using data-type 10 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-4.

4.3.10 DTS type I

The payload of DTS type I represents 512 samples of each encoded channel and can be transferred using data-type 11 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-5.

4.3.11 DTS type II

The payload of DTS type II represents 1 024 samples of each encoded channel and can be transferred using data-type 12 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-5.

4.3.12 DTS type III

The payload of DTS type III represents 2 048 samples of each encoded channel and can be transferred using data-type 13 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-5.

4.3.13 DTS type IV

The payload of DTS type IV represents samples of each encoded channel and can be transferred using data-type 17 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-5.

4.3.14 ATRAC

The payload of ATRAC represents 512 samples of each encoded channel and can be transferred using data-type 14 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-7.

4.3.15 ATRAC 2/3

The payload of ATRAC 2/3 represents 1 024 samples of each encoded channel and can be transferred using data-type 15 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-7.

4.3.16 ATRAC-X

The payload of ATRAC-X represents 2 048 samples of each encoded channel and can be transferred using data-type 16 and sub-data-type 0. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-7.

4.3.17 MPEG-2 AAC low sampling frequency

The payload of MPEG-2 AAC low sampling frequency represents 2 048 samples of each encoded channel and can be transferred using data-type 19 and sub-data-type 0 or it represents 4 096 samples of each encoded channel and can be transferred using data-type 19 and sub-data-type 1. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-6.

4.3.18 MPEG-4 AAC

The payload of MPEG-4 AAC represents 1 024 samples of each encoded channel and can be transferred using data-type 20 and sub-data-type 0.

The payload of MPEG-4 AAC represents 2 048 samples of each encoded channel and can be transferred using data-type 20 and sub- data-type 1.

The payload of MPEG-4 AAC represents 4 096 samples of each encoded channel and can be transferred using data-type 20 and sub-data-type 2.

The payload of MPEG-4 AAC represents 512 samples of each encoded channel and can be transferred using data-type 20 and sub-data-type 3.

The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-6.

4.3.19 Windows Media Audio professional

The payload of WMA professional type I represents 2 048 samples of each encoded channel and can be transferred using data-type 18 and sub-data-type 0.

The payload of WMA professional type II represents 2 048 samples of each encoded channel and can be transferred using data-type 18 and sub-data-type 1.

The payload of WMA professional type III represents 1 024 samples of each encoded channel and can be transferred using data-type 18 and sub-data-type 2.

The payload of WMA professional type IV represents 512 samples of each encoded channel and can be transferred using data-type 18 and sub-data-type 3.

The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-8.

4.3.20 Enhanced AC-3

The enhanced AC-3 bitstream consists of a sequence of enhanced AC-3-frames. The data-type of an enhanced AC-3 data-burst is 21, and the sub-data-type of an enhanced AC-3 data-burst is 0. The contents of an enhanced AC-3 data-burst represent 1 536 samples of each encoded audio channel. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-3.

4.3.21 MAT

The MAT bitstream consists of a sequence of frames. The data-type of an MAT data-burst is 22, and the sub-data-type is 0. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of MAT data shall contain 1 complete MAT frame. The length of the MAT data-burst depends on the encoded bit rate (which determines the MAT frame length); see IEC 61937-9.

4.3.22 MPEG-4 ALS

The MPEG-4 ALS bitstream consists of a sequence of frames. The data-type of an MPEG-4 ALS data-burst is 23, and the sub-data-type is 0. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of MPEG-4 ALS data shall contain 1 complete MPEG-4 ALS frame. The length of the MPEG-4 ALS data-burst depends on the encoded bit rate (which determines the MPEG-4 ALS frame length); see IEC 61937-10.

4.3.23 MPEG-4 AAC LC in LATM/LOAS

The MPEG-4 AAC LC in LATM/LOAS bitstream consists of a sequence of frames. The data-type of an MPEG-4 AAC LC in LATM/LOAS data-burst is 23, and the sub-data-type is 1. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of MPEG-4 AAC LC in LATM/LOAS data shall contain 1 complete MPEG-4 AAC LC in LATM/LOAS frame. The length of the MPEG-4 AAC LC in LATM/LOAS data-burst depends on the encoded bit rate (which determines the MPEG-4 AAC LC in LATM/LOAS frame length); see IEC 61937-11.

4.3.24 MPEG-4 HE AAC in LATM/LOAS

The MPEG-4 HE AAC in LATM/LOAS bitstream consists of a sequence of frames. The data-type of an MPEG-4 HE AAC in LATM/LOAS data-burst is 23, and the sub-data-type is 2. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of MPEG-4 HE AAC in LATM/LOAS data shall contain 1 complete MPEG-4 HE AAC in LATM/LOAS frame. The length of the MPEG-4 HE AAC in LATM/LOAS data-burst depends on the encoded bit rate (which determines the MPEG-4 HE AAC in LATM/LOAS frame length); see IEC 61937-11.

4.3.25 DRA

The DRA bitstream consists of a sequence of frames. The data-type of a DRA data-burst is 23, and the sub-data-type is 3. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of DRA data shall contain 1 complete DRA frame. The length of the DRA data-burst depends on the encoded bit rate (which determines the DRA frame length); see IEC 61937-12.

4.3.26 ATRAC-X low latency

The payload of ATRAC-X represents 512 samples of each encoded channel and can be transferred by assigning 16 to data-type bits 0 to 4 and 1 to data-type bits 5 to 6, or it represents 256 samples of each encoded channel and can be transferred by assigning 16 to data-type bits 0 to 4 and 2 to data-type bits 5 to 6, or 128 samples of each encoded channel and can be transferred by assigning 16 to data-type bits 0 to 4 and 3 to data-type bits 5 to 6. The data-burst is headed with a burst-preamble, followed by the burst-payload; see IEC 61937-7.

4.3.27 MPEG-H 3D Audio

The MPEG-H 3D Audio bitstream consists of a sequence of frames. The value of data-type bits 0 to 4 of an MPEG-H 3D Audio data-burst is 25, and the value of data-type bits 5 to 6 is 0. The value of data-type bits 0 to 4 of an MPEG-H 3D Audio HBR data-burst is 25 and the value of data-type bits 5 to 6 is 1. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of MPEG-H 3D Audio shall contain one complete MPEG-H 3D Audio frame. The length of the MPEG-H 3D Audio data-burst depends on the encoded bit rate (which determines the MPEG-H 3D Audio frame length); see IEC 61937-13.

4.3.28 AC-4, AC-4 HBR4, AC-4 HBR16 and AC-4 LD

The AC-4 bitstream consists of a sequence of frames. The value of data-type bits 0 to 4 of an AC-4 data-burst is 24 and the value of data-type bits 5 to 6 is 0. The value of data-type bits 0 to 4 of an AC-4 HBR4 data-burst is 24, and the value of data-type bits 5 to 6 is 1. The value of data-type bits 0 to 4 of an AC-4 HBR16 data-burst is 24, and the value of data-type bits 5 to 6 is 2. The value of data-type of an AC-4 LD data-burst is 24, and the value of data-type bits 5 to 6 is 3. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of AC-4 data shall contain one complete AC-4 frame. The length of the AC-4 data-burst depends on the encoded bit rate (which determines the AC-4 frame length); see IEC 61937-14.

4.3.29 MPEG-4 ALS in LATM/LOAS

The MPEG-4 ALS in LATM/LOAS bitstream consists of a sequence of frames. The value of data-type bits 0 to 4 of an MPEG-4 ALS in LATM/LOAS data-burst is 25, and the value of data-type bits 5 to 6 is 2. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of MPEG-4 ALS in LATM/LOAS data shall contain one complete MPEG-4 ALS frame. The length of the MPEG-4 ALS in LATM/LOAS data-burst depends on the encoded bit rate (which determines the MPEG-4 ALS in LATM/LOAS frame length); see IEC 61937-10.

4.3.30 MPEG-D USAC in LATM/LOAS

The MPEG-D USAC in LATM/LOAS bitstream consists of a sequence of frames. The value of data-type bits 0 to 4 of an MPEG-D USAC in LATM/LOAS data-burst is 25, and the value of data-type bits 5 to 6 is 3. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each data-burst of MPEG-D USAC in LATM/LOAS data shall contain one complete MPEG-D USAC in LATM/LOAS frame. The length of the MPEG-D USAC in LATM/LOAS data-burst depends on the encoded bit rate (which determines the MPEG-D USAC in LATM/LOAS frame length), see IEC 61937-11.

4.3.31 ACX, ACX HBR2, ACX HBR4 and ACX HBR8

The Auro-Cx (ACX) bitstream consists of a sequence of blocks (or frames). The value of data-type bits 0 to 4 of an ACX data burst is 26, and the value of data-type bits 5 to 6 is 0. The value of data-type bits 0 to 4 of an ACX HBR2 data burst is 26, and the value of data-type bits 5 to 6 is 1. The value of data-type bits 0 to 4 of an ACX HBR4 data burst is 26, and the value of data-type bits 5 to 6 is 2. The value of data-type bits 0 to 4 of an ACX HBR8 data burst is 26, and the value of data-type bits 5 to 6 is 3. The data is headed with a burst pre-ample, followed by the burst-payload. The burst payload of each data-burst of Auro-Cx data shall contain one complete Auro-Cx block. The length of the Auro-Cx data-burst depends on the encoded bit rate (which determines the Auro-Cx block length); see IEC 61937-15.

Bibliography

SMPTE ST 338, *Format for Non-PCM Audio and Data in AES3 – Data Types*

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SOMMAIRE

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AUDIONUMÉRIQUE – INTERFACE POUR LES FLUX DE BITS AUDIO À CODAGE MIC NON LINÉAIRE SELON L'IEC 60958 –

Partie 2: Informations relatives à la salve

AVANT-PROPOS

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Cette troisième édition annule et remplace la deuxième édition parue en 2007, l'Amendement 1:2011 et l'Amendement 2:2018. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

a) les nouveaux types de données audio MPEG-D USAC, ACX, ACX HBR2, ACX HBR4 et ACX HBR8 ont été ajoutés;
b) le champ de type de données étendu dans Pe a été activé.

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
100/3459/CDV	100/3541/RVC

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette norme.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/standardsdev/publications.

Une liste de toutes les parties de la série IEC 61937, publiées sous le titre général *Audionumérique – Interface pour les flux de bits audio à codage MIC non linéaire selon l'IEC 60958*, peut être consultée sur le site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. A cette date, le document sera

- reconduit,
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AUDIONUMÉRIQUE – INTERFACE POUR LES FLUX DE BITS AUDIO À CODAGE MIC NON LINÉAIRE SELON L'IEC 60958 –

Partie 2: Informations relatives à la salve

1 Domaine d'application

La présente partie de l'IEC 61937 spécifie l'interface audionumérique pour l'acheminement des flux de bits audio à codage MIC non linéaire selon l'IEC 60958-1 et l'IEC 60958-3. Le présent document spécifie les informations relatives à la salve, qui définissent les informations de contenu concernant les données contenues dans la charge utile de la salve.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60958-1, *Interface audionumérique – Partie 1: Généralités*

IEC 60958-3, *Digital audio interface – Part 3: Consumer applications* (disponible en anglais seulement)

IEC 61937-1:2021, *Audionumérique – Interface pour les flux de bits audio à codage MIC non linéaire selon l'IEC 60958 – Partie 1: Généralités*

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* (disponible en anglais seulement)

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* (disponible en anglais seulement)

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)* (disponible en anglais seulement)

IEC 61937-6, *Audionumérique – Interface pour les flux de bits audio à codage MIC non linéaire conformément à l'IEC 60958 – Partie 6: Flux de bits MIC non linéaire selon les formats MPEG-2 AAC et MPEG-4 AAC*

IEC 61937-7, *Audionumérique – Interface pour les flux de bits audio à codage MIC non linéaire conformément à l'IEC 60958 – Partie 7: Flux de bits MIC non linéaire selon les formats ATRAC, ATRAC2/3 et ATRAC-X*

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* (disponible en anglais seulement)

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* (disponible en anglais seulement)

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* (disponible en anglais seulement)

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* (disponible en anglais seulement)

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* (disponible en anglais seulement)

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

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* (disponible en anglais seulement)

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* (disponible en anglais seulement)

3 Termes et définitions

Pour les besoins du présent document, les termes et définitions suivants s'appliquent.

L'ISO et l'IEC tiennent à jour des bases de données terminologiques destinées à être utilisées en normalisation, consultables aux adresses suivantes:

- IEC Electropedia: disponible à l'adresse http://www.electropedia.org/
- ISO Online browsing platform: disponible à l'adresse http://www.iso.org/obp

3.1
salve de données audio
salve de données associée à une trame audio codée qui représente la charge utile de la salve

3.2
mot de données audio
mot de données de 16 bits

3.3
trame audio
nombre défini d'échantillons audio

Note 1 à l'article: Le nombre d'échantillons dans une trame audio dépend du système de codage particulier utilisé pour coder la trame audio en une trame audio codée.

3.4
intervalle audio
intervalle de temps dans la séquence des échantillons audio en bande de base, où aucun échantillon audio valide n'est disponible