IEC 61937-6

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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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 formats

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

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IEC 61937-6 edition 2.1 contains the second edition (2006-01) [documents 100/942/CDV and 100/1043A/RVC] and its amendment 1 (2014-01) [documents 100/2052/CDV and 100/2117/RVC].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions and deletions are displayed in red, with deletions being struck through. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 61937-6 has been prepared by technical area 4: Digital systems interfaces, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

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

a) addition of data-type for MPEG2 AAC low sampling frequency;

b) addition of data-type for MPEG-4 AAC.

The French version of this standard has not been voted upon.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

IEC 61937 consists of the following parts under the general title *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958*:

Part 1:   General
Part 2:   Burst-info
Part 3:   Non-linear bitstreams according to the AC-3 format
Part 4:   Non-linear PCM bitstreams according to the MPEG audio formats
Part 5:   Non-linear PCM bitstreams according to the DTS (Digital Theater Systems) format(s)
Part 6:   Non-linear PCM bitstreams according to the MPEG-2 AAC and MPEG-4 AAC formats
Part 7:   Non-linear PCM bitstreams according to the ATRAC, ATRAC2/3 and ATRAC-X formats

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INTRODUCTION TO AMENDMENT 1

The revision of IEC 61937-6:2006 has become necessary to define new additional data-type-dependent information. This Amendment 1 contains the following significant technical changes with respect to the base publication. The revised items apply to the small parts of IEC 61937-6.

- LC profile with MPEG Surround, LC profile with SBR and MPEG Surround in MPEG-2 AAC are defined data-type-dependent information field in Pc.

- HE-AAC V2 profile itself, and MPEG-4 AAC profile, HE-AAC profile, HE-AAC V2 profile combined with MPEG Surround respectively are defined data-type-dependent information field in Pc.

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1 Scope

This part of IEC 61937 specifies the method for IEC 60958 to convey non-linear PCM bitstreams encoded in accordance with the MPEG-2 AAC (Advanced Audio Coding) and MPEG-4 AAC formats.

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 60958 (all parts), *Digital audio interface*

IEC 61937 (all parts), *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958*

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

IEC 61937-2, *Digital audio – Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 – Part 2: Burst-info*

ISO/IEC 13818-7:2004, *Information technology – Generic coding of moving pictures and associated audio information – Part 7: Advanced Audio Coding (AAC)*

ISO/IEC 14496-3:2001, *Information technology – Coding of audio-visual objects – Part 3: Audio*
Amendment 1 (2003)

ISO/IEC 23003-1, *Information technology – MPEG audio technologies – Part 1: MPEG Surround*

3 Terms, definitions, abbreviations and presentation convention

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

3.1 Terms and definitions

3.1.1
subdata-type
reference to the type of payload of the data-burst defined for use with the specified data-type

3.1.2
MPEG-2 AAC LC profile
MPEG-2 AAC low complexity profile identified in ISO/IEC 13818-7

3.1.3
MPEG-2 AAC LC profile with SBR
MPEG-2 AAC low complexity profile with spectral band replication identified in ISO/IEC 13818-7

3.1.4
latency
delay time of an external audio decoder to decode a MPEG-2 AAC or MPEG-4 AAC data-burst defined as the sum of two values of the receiving delay time and the decoding delay time

3.1.5
MPEG-4 AAC profile
MPEG-4 AAC profile identified in ISO/IEC 14496-3

3.1.6
MPEG-4 HE-AAC profile
MPEG-4 HE-AAC profile identified in ISO/IEC 14496-3

3.1.7
MPEG-4 HE-AAC V2 profile
MPEG-4 HE-AAC V2 profile identified in ISO/IEC 14496-3

3.1.8
MPEG Surround
technology used for coding of multichannel signals based on a down mixed signal of the original multichannel signal, and associated spatial parameters

Note 1 to entry: MPEG Surround in defined in ISO/IEC 23003-1.

3.2   Abbreviations

AAC	Advanced Audio Coding
ADTS	Audio Data Transport Stream
SBR	Spectral Band Replication
HE-AAC	MPEG-4 High Efficiency AAC
HE-AAC V2	MPEG-4 High Efficiency AAC Version 2
MPEG	Moving Picture Experts Group

3.3   Presentation convention

01_2 Value "01" in binary format

4   Mapping of the audio bitstream on to IEC 61937

The coding of the bitstream and data-burst is in accordance with IEC 61937.

4.1   MPEG-2 AAC burst-info

MPEG-2 AAC burst-info (data-type=7) is given in Table 1.

Table 1 – Fields of burst-info (data-type=7)

Bits of Pc	Value	Contents	Reference point R	Repetition period of data-burst in IEC 60958 frames
0-4		Data-type		
	7	MPEG-2 AAC ADTS	Bit 0 of Pa	1 024
5,6	00_2	Reserved		
7-15		In accordance with IEC 61937-1 and IEC 61937-2		

MPEG-2 AAC burst-info (data-type=19) is given in Table 2.

Table 2 – Fields of burst-info (data-type=19)

Bits of Pc	Value	Contents	Reference point R	Repetition period of data-burst in IEC 60958 frames
0-4		Data-type		
	19	MPEG-2 AAC ADTS low sampling frequency		Depends on subdata-type
5,6		Subdata-type		
	00_2	Subdata-type for MPEG-2 AAC ADTS half-rate low sampling frequency	Bit 0 of Pa	2 048
	01_2	Subdata-type for MPEG-2 AAC ADTS quarter-rate low sampling frequency	Bit 0 of Pa	4 096
	$10_2, 11_2$	Reserved		
7-15		In accordance with IEC 61937-1 and IEC 61937-2		

4.2   MPEG-4 AAC burst-info

MPEG-4 AAC burst-info (data-type=20) is given in Table 3.

Table 3 – Fields of burst-info (data-type=20)

Bits of Pc	Value	Contents	Reference point R	Repetition period of data-burst in IEC 60958 frames
0-4		Data-type		
	20	MPEG-4 AAC		Depends on subdata-type
5,6		Subdata-type		
	00_2	Subdata-type for MPEG4 AAC	Bit 0 of Pa	1024
	01_2	Subdata-type for MPEG4 AAC half-rate low sampling frequency	Bit 0 of Pa	2 048
	10_2	Subdata-type for MPEG4 AAC quarter-rate low sampling frequency	Bit 0 of Pa	4 096
	11_2	Subdata-type for MPEG4 AAC double-rate high sampling frequency	Bit 0 of Pa	512
7-15		In accordance with IEC 61937-1 and IEC 61937-2		

5 Format of MPEG-2 AAC and MPEG-4 AAC data-bursts

This clause specifies the audio data-bursts MPEG-2 AAC and MPEG-4 AAC. 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, should be used by the transmitter to schedule data-bursts as necessary to establish synchronization between the picture and the decoded audio.

5.1 Pause data-burst

5.1.1 The data MPEG-2 AAC

The pause data-burst for MPEG-2 AAC is given in Table 4.

Table 4 – Repetition period of pause data-bursts

Data-type of audio data-burst	Repetition period of pause data-burst	
	Mandatory	Recommended
MPEG-2 AAC	-	32 IEC 60958 frames
MPEG-2 AAC and half-rate low sampling frequency	-	64 IEC 60958 frames
MPEG-2 AAC and quarter-rate low sampling frequency	-	128 IEC 60958 frames

5.1.2 The data MPEG-4 AAC

The pause data-burst for MPEG-4 AAC is given in Table 5.

Table 5 – Repetition period of pause data-bursts

Data-type of audio data-burst	Repetition period of pause data-burst	
	Mandatory	Recommended
MPEG-4 AAC	-	32 IEC 60958 frames
MPEG-4 AAC and half-rate low sampling frequency	-	64 IEC 60958 frames
MPEG-4 AAC and quarter-rate low sampling frequency	-	128 IEC 60958 frames
MPEG-4 AAC double-rate high sampling frequency	-	16 IEC 60958 frames

5.2 Audio data-bursts

5.2.1 The data MPEG-2 AAC

The stream of the data-bursts for MPEG-2 AAC consists of sequences of MPEG-2 AAC ADTS frames. The data-type of an MPEG-2 AAC data-burst is 7. The data-burst is headed with a burst-preamble, followed by the burst-payload, and stuffed with stuffing bits. The burst-payload of each data-burst of MPEG-2 AAC data shall contain one complete MPEG-2 AAC ADTS frame and represents 1 024 samples for each encoded channel. The length of the MPEG-2 AAC data-burst depends on the encoded bit rate (which determines the MPEG-2 AAC ADTS frame length). The reference to the specification for the MPEG-2 AAC bitstream, representing 1 024 samples of encoded audio per frame is found in ISO/IEC 13818-7.