INTERNATIONAL STANDARD

IEC 61937-8

First edition
2006-10

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

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FOREWORD

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International Standard IEC 61937-8 has been prepared by Technical Area 4: Digital system interfaces, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this standard is based on the following documents:

CDV	Report on voting
100/1018A/CDV	100/1095/RVC

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

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

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 publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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- withdrawn,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

A bilingual version of this publication may be issued at a later date.

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

1 Scope

This part of IEC 61937 specifies the method for the digital audio interface specified in IEC 60958 to convey non-linear PCM bitstreams encoded in accordance with the WMA Professional format.

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 61937-1, *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*

3 Terms, definitions and abbreviations

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

3.1 Terms and definitions

3.1.1
latency
delay time of an external audio decoder to decode a WMA Professional data burst, defined as the sum of two values of the receiving delay time and the decoding delay time

3.2 Abbreviations

ATSC	Advanced Television Systems Committee
MPEG	The Moving Pictures Expert Group, a joint committee of ISO and IEC
ITU-R	International Telecommunication Union, Radio communication Bureau
WMA	Windows Media Audio

3.3 Presentation convention

F872h
Value ‘F872’ in hexadecimal format

4 Mapping of the audio bitstream on to IEC 61937

4.1 General

The coding of the bitstream and data-burst shall be in accordance with IEC 61937-1.

4.2 Windows Media Audio Professional burst-info

The 16-bit burst-info contains information about the data that will be found in the data-burst in accordance with Table 1.

Table 1 – Fields of burst-info

Bits of Pc	Value	Contents	Reference point R	Repetition period of data-burst in IEC 60958 frames
0 – 4		Data-type		
	0-17	According to IEC 61937-2		
	18	WMA Professional	Subtype dependent	Subtype dependent
	19-31	According to IEC 61937-2		
5 – 6		Data subtype		
	0	WMA Professional – Type I	Bit 0 of Pa[a]	2 048
	1	WMA Professional – Type II	Bit 0 of Pa	2 048
	2	WMA Professional – Type III	Bit 0 of Pa	1 024
	3	WMA Professional – Type IV	Bit 0 of Pa	512
7 – 15		According to IEC 61937-2		

[a] The reference point for a WMA Professional Type I stream is bit 0 of Pa of the first of a payload pair.

5 Format of WMA Professional data-burst

5.1 General

This clause specifies the audio data-burst for WMA Professional. 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 picture and decoded audio.

5.2 Pause data-burst

Pause data-burst for WMA Professional Types I, II, III, and IV are given in Table 2.

Table 2 – Repetition period of Pause data-bursts

Data-type of Audio data-burst	Repetition period of Pause data-burst	
	Mandatory	Recommended
Windows Media Audio Professional – Type I	-	3 IEC 60958 frames
Windows Media Audio Professional – Type II	-	3 IEC 60958 frames
Windows Media Audio Professional – Type III	-	3 IEC 60958 frames
Windows Media Audio Professional – Type IV	-	3 IEC 60958 frames

5.3 Audio data-bursts

5.3.1 The data-burst for WMA Professional Type I

WMA Professional Type I is primarily intended for use at sample rates above 48 kHz (for example, 88,2 kHz or 96 kHz). The IEC 60958 link should be operated at the sample rate of the decoded audio.

The WMA Professional bitstream consists of a sequence of WMA Professional frames. The data-type of a WMA Professional Type I data-burst is 12 h and the subtype is 0 h. A WMA Professional Type I frame represents 4 096 samples of each encoded audio channel (left, centre, etc.) transmitted in two sequential data-bursts. The data-burst is headed with a burst-preamble, followed by the burst-payload. The burst-payload of each pair of data-bursts of WMA Professional Type I data shall contain one complete WMA Professional frame. The length of the WMA Professional data-burst will depend on the encoded bit rate (which determines the WMA Professional frame length).

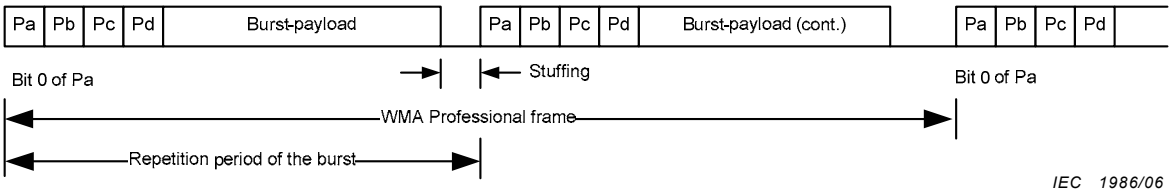

Figure 1 – Windows Media Audio Professional Type I data-burst

The data-type-dependent info for WMA Professional is given in Table 3.

Table 3 – Data-type-dependent when data-type = 18 and subtype = 0

Bits of Pc LSB..MSB	Data type dependent, bit number LSB..MSB	Contents
8-12	0-4	Reserved, shall be set to '00'

The data-bursts containing WMA Professional Type I frames shall occur at a regular rate, with the reference point of each WMA Professional frame (bit 0 of Pa of the first of the pair of data-bursts) beginning (except in the case of a gap) 4 096 sampling periods of the audio after the reference point of the preceding WMA Professional frame (of the same bit-stream-number).