

**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**

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

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 61937-8:2007 sisaldab Euroopa standardi EN 61937-8:2007 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 27.04.2007 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 61937-8:2007 consists of the English text of the European standard EN 61937-8:2007.</p> <p>This document is endorsed on 27.04.2007 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p><b>Käsitlusala:</b></p> <p>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</p>	<p><b>Scope:</b></p> <p>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</p>
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**ICS** 35.040

**Võtmesõnad:**

**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 61937-8:2006)**

Audionumérique -  
Interface pour les flux de bits audio  
à codage MIC non linéaire,  
conformément à la CEI 60958 -  
Partie 8: Flux de bits MIC non linéaire  
selon le format "Windows Media Audio  
(WMA) Professional"  
(CEI 61937-8:2006)

Digitalton -  
Schnittstelle für nichtlinear PCM-codierte  
Audio-Bitströme unter Verwendung  
von IEC 60958 -  
Teil 8: Nichtlineare PCM-Bitströme  
nach dem Windows-Media-Audio(WMA)-  
Professional-Format  
(IEC 61937-8:2006)

This European Standard was approved by CENELEC on 2007-02-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in two official versions (English and German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

**CENELEC**

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

## Foreword

The text of the International Standard IEC IEC 61937-8:2006, prepared by Technical Area 4, Digital system interfaces, of IEC TC 100, Audio, video and multimedia systems and equipment, was submitted to the formal vote and was approved by CENELEC as EN 61937-8 on 2007-02-01 without any modification.

The following dates were fixed:

- latest date by which the EN has to be implemented  
at national level by publication of an identical  
national standard or by endorsement (dop) 2008-02-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2010-02-01

Annex ZA has been added by CENELEC.

---

## Endorsement notice

The text of the International Standard IEC IEC 61937-8:2006 was approved by CENELEC as a European Standard without any modification.

---

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60958	Series	Digital audio interface	EN 60958	Series
IEC 61937-1	- <sup>1)</sup>	Digital audio - Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 - Part 1: General	EN 61937-1	2007 <sup>2)</sup>
IEC 61937-2	- <sup>1)</sup>	Digital audio - Interface for non-linear PCM encoded audio bitstreams applying IEC 60958 - Part 2: Burst-info	EN 61937-2	2003 <sup>2)</sup>

---

<sup>1)</sup> Undated reference.

<sup>2)</sup> Valid edition at date of issue.

# 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**



Reference number  
IEC 61937-8:2006(E)

## Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

## Consolidated editions

The IEC is now publishing consolidated versions of its publications. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

## Further information on IEC publications

The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology. Information relating to this publication, including its validity, is available in the IEC Catalogue of publications (see below) in addition to new editions, amendments and corrigenda. Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is also available from the following:

- **IEC Web Site** ([www.iec.ch](http://www.iec.ch))

- **Catalogue of IEC publications**

The on-line catalogue on the IEC web site ([www.iec.ch/searchpub](http://www.iec.ch/searchpub)) enables you to search by a variety of criteria including text searches, technical committees and date of publication. On-line information is also available on recently issued publications, withdrawn and replaced publications, as well as corrigenda.

- **IEC Just Published**

This summary of recently issued publications ([www.iec.ch/online\\_news/justpub](http://www.iec.ch/online_news/justpub)) is also available by email. Please contact the Customer Service Centre (see below) for further information.

- **Customer Service Centre**

If you have any questions regarding this publication or need further assistance, please contact the Customer Service Centre:

Email: [custserv@iec.ch](mailto:custserv@iec.ch)  
Tel: +41 22 919 02 11  
Fax: +41 22 919 03 00

# 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**

© IEC 2006 — Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland  
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: [inmail@iec.ch](mailto:inmail@iec.ch) Web: [www.iec.ch](http://www.iec.ch)



Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

PRICE CODE

**M**

*For price, see current catalogue*



## CONTENTS

FOREWORD.....	3
1 Scope.....	5
2 Normative references .....	5
3 Terms, definitions and abbreviations .....	5
3.1 Terms and definitions .....	5
3.2 Abbreviations .....	5
3.3 Presentation convention .....	5
4 Mapping of the audio bitstream on to IEC 61937 .....	6
4.1 General.....	6
4.2 Windows Media Audio Professional burst-info .....	6
5 Format of WMA Professional data-burst .....	6
5.1 General.....	6
5.2 Pause data-burst.....	7
5.3 Audio data-bursts .....	7
Bibliography.....	13
Figure 1 – Windows Media Audio Professional type I data-burst .....	7
Figure 2 – Latency of WMA Professional type I decoding.....	8
Figure 3 – Windows Media Audio Professional type II data-burst .....	8
Figure 4 – Latency of WMA Professional type II decoding.....	9
Figure 5 – Windows Media Audio Professional type III data-burst .....	10
Figure 6 – Latency of WMA Professional type III decoding.....	10
Figure 7 – Windows Media Audio Professional type IV data-burst .....	11
Figure 8 – Latency of WMA Professional type IV decoding.....	11
Table 1 – Fields of burst-info .....	6
Table 2 – Repetition period of Pause data-bursts.....	7
Table 3 – Data-type-dependent when data-type = 18 and sub-type = 0 .....	7
Table 4 – Data-type-dependent when data-type = 18 and sub-type = 1 .....	9
Table 5 – Data-type-dependent when data-type = 18 and sub-type = 2 .....	10
Table 6 – Data-type-dependent when data-type = 18 and sub-type = 3 .....	11

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

# **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**

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

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