

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

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

[standards.iteh.ai](https://standards.iteh.ai)

**Audionumérique – Interface pour les flux de bits audio à codage MIC non linéaire conformément à la CEI 60958 – Partie 2: Salve d'informations**





## THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2007 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, 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 either IEC or IEC's member National Committee in the country of the requester.

If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de la CEI ou du Comité national de la CEI du pays du demandeur.

Si vous avez des questions sur le copyright de la CEI ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de la CEI de votre pays de résidence.

IEC Central Office  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland  
Email: [inmail@iec.ch](mailto:inmail@iec.ch)  
Web: [www.iec.ch](http://www.iec.ch)

### About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

### About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

- Catalogue of IEC publications: [www.iec.ch/searchpub](http://www.iec.ch/searchpub)

The IEC on-line Catalogue enables you to search by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, withdrawn and replaced publications.

- IEC Just Published: [www.iec.ch/online\\_news/justpub](http://www.iec.ch/online_news/justpub)

Stay up to date on all new IEC publications. Just Published details twice a month all new publications released. Available on-line and also by email.

[IEC 61937-2:2007](#)

- Electropedia: [www.electropedia.org](http://www.electropedia.org)

The world's leading online dictionary of electronic and electrical terms containing more than 20 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary online.

- Customer Service Centre: [www.iec.ch/webstore/custserv](http://www.iec.ch/webstore/custserv)

If you wish to give us your feedback on this publication or need further assistance, please visit the Customer Service Centre FAQ or contact us:

Email: [csc@iec.ch](mailto:csc@iec.ch)

Tel.: +41 22 919 02 11

Fax: +41 22 919 03 00

### A propos de la CEI

La Commission Electrotechnique Internationale (CEI) est la première organisation mondiale qui élabore et publie des normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

### A propos des publications CEI

Le contenu technique des publications de la CEI est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

- Catalogue des publications de la CEI: [www.iec.ch/searchpub/cur\\_fut-f.htm](http://www.iec.ch/searchpub/cur_fut-f.htm)

Le Catalogue en-ligne de la CEI vous permet d'effectuer des recherches en utilisant différents critères (numéro de référence, texte, comité d'études,...). Il donne aussi des informations sur les projets et les publications retirées ou remplacées.

- Just Published CEI: [www.iec.ch/online\\_news/justpub](http://www.iec.ch/online_news/justpub)

Restez informé sur les nouvelles publications de la CEI. Just Published détaille deux fois par mois les nouvelles publications parues. Disponible en-ligne et aussi par email.

- Electropedia: [www.electropedia.org](http://www.electropedia.org)

Le premier dictionnaire en ligne au monde de termes électroniques et électriques. Il contient plus de 20 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans les langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International en ligne.

- Service Clients: [www.iec.ch/webstore/custserv/custserv\\_entry-f.htm](http://www.iec.ch/webstore/custserv/custserv_entry-f.htm)

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions, visitez le FAQ du Service clients ou contactez-nous:

Email: [csc@iec.ch](mailto:csc@iec.ch)

Tél.: +41 22 919 02 11

Fax: +41 22 919 03 00

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

---

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

STANDARD PREVIEW  
(standards.iteh.ai)

**Audionumérique – Interface pour les flux de bits audio à codage MIC non linéaire conformément à la CEI 60958 – Partie 2: Salve d'informations**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

## CONTENTS

FOREWORD.....	3
1 Scope.....	5
2 Normative references .....	5
3 Terms, definitions and abbreviations .....	6
3.1 Terms and definitions .....	6
3.2 Abbreviations .....	7
4 Burst-info .....	7
4.1 General.....	7
4.2 Data-type and subdata-type .....	7
4.3 Audio data-bursts .....	9
4.3.1 General .....	9
4.3.2 AC-3.....	9
4.3.3 MPEG-1 layer-1.....	9
4.3.4 MPEG-1 layer-2 or -3 or MPEG-2 without extension .....	9
4.3.5 MPEG-2 with extension .....	9
4.3.6 MPEG-2 AAC .....	9
4.3.7 MPEG-2 layer-1 low sampling frequency .....	9
4.3.8 MPEG-2 layer-2 low sampling frequency .....	10
4.3.9 MPEG-2 layer-3 low sampling frequency .....	10
4.3.10 DTS type I .....	10
4.3.11 DTS type II .....	10
4.3.12 DTS type III .....	10
4.3.13 DTS type IV .....	10
4.3.14 ATRAC .....	10
4.3.15 ATRAC 2/3 .....	10
4.3.16 ATRAC-X.....	10
4.3.17 MPEG-2 AAC low sampling frequency .....	10
4.3.18 MPEG-4 AAC .....	11
4.3.19 Windows Media Audio professional.....	11
4.3.20 Enhanced AC-3 .....	11
4.3.21 MAT .....	11
Table 1 – Fields of burst-info .....	7
Table 2 – Data-types .....	8

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**DIGITAL AUDIO –  
INTERFACE FOR NON-LINEAR PCM ENCODED  
AUDIO BITSTREAMS APPLYING IEC 60958 –****Part 2: Burst-info**

## 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 61937-2 has been prepared by technical area 4: Digital system interfaces and protocols, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

This second edition of IEC 61937-2 cancels and replaces the first edition published in 2000. This edition contains the following significant technical changes with respect to the previous edition.

- a) New audio data-types of enhanced AC-3 data, MPEG-2 AAC low sampling frequency, MPEG-4 AAC, DTS type IV, ATRAC-X, WMA professional and MAT are added.
- b) Data-type field in Pc is expanded from bit 0-4 to 0-6.

This bilingual version corresponds to the monolingual English version, published in 2007-05.

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

CDV	Report on voting
100/1115/CDV	100/1221/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.

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.

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.

**iTeh STANDARD PREVIEW**  
(standards.iteh.ai)

[IEC 61937-2:2007](https://standards.iteh.ai/catalog/standards/sist/2d47349a-0d9b-4ecf-83df-5709bf8655f4/iec-61937-2-2007)

<https://standards.iteh.ai/catalog/standards/sist/2d47349a-0d9b-4ecf-83df-5709bf8655f4/iec-61937-2-2007>

# 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 standard specifies burst-info which defines content information about the data contained in the burst payload.

### 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 60958-1, *Digital audio interface – Part 1: General*

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

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

<https://standards.iteh.ai/catalog/standards/sist/2d47349a-0d9b-4ecf-83df-5709b8655f4/iec-61937-2-2007>

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<sup>1</sup>*

---

<sup>1</sup> To be published.

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, definitions and abbreviations

#### 3.1 Terms and definitions

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

audio data-burst	data-burst with an encoded audio frame as burst-payload
audio data-word	16-bit data word
audio frame	fixed number of audio samples. The number of samples in an audio frame is dependent on the particular encoding system which is used to encode the audio frame into the encoded audio frame
audio gap	period in the sequence of baseband audio samples where valid samples of audio are not available
bitstream	non-linear PCM encoded audio source, represented in a sequence of bits. In this interface the bitstream consists of a sequence of data-bursts
data-burst	packet of data, including the burst-preamble, to be transmitted across the interface
burst-payload	information content of the data-burst
burst-preamble	header for the data-burst, containing synchronization and information about the data contained in the burst-payload
data-type	reference to the type of payload of the data-bursts
encoded audio frame	minimum decodable unit of an encoded data sequence. Each encoded audio frame is the encoded representation of a fixed number of audio samples (for each original audio channel). The number of samples which are encoded into an encoded audio frame depends on the particular encoding system which is used to encode the audio frame into the encoded audio frame
length-code	length of the data-burst-payload in bits
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
sampling frequency	sampling frequency of the encoded PCM audio samples (i.e. before encoding and after decoding)
sampling period	period related to the sampling frequency of the PCM audio samples, represented in the encoded bitstream
stuffing	occupying the unused data capacity of the interface
stuffing sub-frame	occupying the unused data capacity in 16-bit audio data words
stream gap	period within the encoded audio bitstream without any audio frame; a discontinuity in the bitstream. 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 is specified in Table 1.

**Table 1 – Fields of burst-info**

Bits of Pc	Value	Contents
0-4	0-31	Data-type See Table 2
5-6	0-3	Subdata-type See Table 2
7	0 1	Error-flag Error-flag indicating a valid burst-payload Error-flag indicating that the burst-payload may contain errors
8-12		Data-type-dependent info
13-15	0-7	Bit-stream-number
NOTE Refer to IEC 61937-1, 6.1.7 and 6.1.7.1.		

### 4.2 Data-type and subdata-type

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

Any combination of data-type and subdata-type which is not defined in Table 2 shall not be transmitted.

**Table 2 – Data-types**

Data-type	Subdata-type	Contents	Reference point R	Repetition period of data-burst measured in IEC 60958 frames
Value of PC bit 0-4	Value of PC bit 5-6			
0	0	Null data		See Note 1
1	0	AC-3 data	R-AC-3	1 536
2	0 – 3	Refer to SMPTE 338M		
3	0	Pause	bit 0 of Pa	See Note 2
4	0	MPEG-1 layer 1 data	bit 0 of Pa	384
5	0	MPEG-1 layer 2 or 3 data or MPEG-2 without extension	bit 0 of Pa	1 152
6	0	MPEG-2 data with extension	bit 0 of Pa	1 152
7	0	MPEG-2 AAC	bit 0 of Pa	1 024
8	0	MPEG-2, layer-1 low sampling frequency	bit 0 of Pa	768
9	0	MPEG-2, layer-2 low sampling frequency	bit 0 of Pa	2 304
10	0	MPEG-2, layer-3 low sampling frequency	bit 0 of Pa	1 152
11	0	DTS type I	bit 0 of Pa	512
12	0	DTS type II	bit 0 of Pa	1 024
13	0	DTS type III	bit 0 of Pa	2 048
14	0	ATRAC	bit 0 of Pa	512
15	0	ATRAC 2/3	bit 0 of Pa	1 024
16	0	ATRAC-X	bit 0 of Pa	2 048
17	0	DTS type IV	bit 0 of Pa	See IEC 61937-5
18	0	WMA professional type I	bit 0 of Pa *3	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
19	0	MPEG-2 AAC low sampling frequency	bit 0 of Pa	2 048
	1	MPEG-2 AAC low sampling frequency	bit 0 of Pa	4 096
	2 – 3	MPEG-2 AAC low sampling frequency	reserved	reserved
20	0	MPEG-4 AAC	bit 0 of Pa	1 024
	1	MPEG-4 AAC	bit 0 of Pa	2 048
	2	MPEG-4 AAC	bit 0 of Pa	4 096
	3	MPEG-4 AAC	bit 0 of Pa	512
21	0	Enhanced AC-3	bit 0 of Pa	6 144
	1 – 3	Reserved	reserved	reserved
22	0	MAT	R-MAT	15 360
	1 – 3	Reserved	reserved	reserved
23 – 26	0 – 3	Reserved		
27 – 30	0 – 3	Refer to SMPTE 338M		
31	0 – 3	Extended data-type (not use until defined)		

NOTE 1 Refer to IEC 61937-1, 7.3.

NOTE 2 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.

NOTE 3 Refer to IEC 61937-8, 4.2.

## 4.3 Audio data-bursts

### 4.3.1 General

This subclause 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. 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 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.

The length of the AC-3 data-burst will depend on the encoded bit rate (which determines the AC-3-frame 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 subdata-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 subdata-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 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.