



# INTERNATIONAL STANDARD

---

**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**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

---

ICS 33.160.30; 35.240.99

ISBN 978-2-8322-4560-6

**Warning! Make sure that you obtained this publication from an authorized distributor.**

## CONTENTS

FOREWORD.....	3
1 Scope.....	5
2 Normative references .....	5
3 Terms, definitions, abbreviated terms and conventions .....	5
3.1 Terms and definitions.....	5
3.2 Abbreviated terms.....	7
3.3 Presentation convention.....	7
4 Mapping of the audio bitstream onto IEC 61937.....	7
4.1 General.....	7
4.2 MPEG-4 ALS burst-info.....	7
5 Format of MPEG-4 ALS data-bursts.....	8
5.1 General.....	8
5.2 Audio data-bursts.....	9
5.2.1 Data-burst for MPEG-4 ALS.....	9
5.2.2 Latency of MPEG-4 ALS decoding.....	10
5.2.3 Data-burst for MPEG-4 ALS in LATM/LOAS.....	12
Annex A (informative) Effect of repetition period of data-burst and IEC 60958 frame rate on frame period for the MPEG-4 ALS bitstreams .....	13
Annex B (normative) Burst payload format for MPEG-4 ALS .....	14
Annex C (normative) Values for ALSSpecificConfig in the MPEG-4 ALS burst payload format.....	15
Annex D (informative) Example use case of the ALS simple profile in LATM/LOAS .....	17
Figure 1 – MPEG-4 ALS data-burst.....	9
Figure 2 – Latency of MPEG-4 ALS decoding .....	11
Figure 3 – The MPEG-4 ALS burst-payload.....	11
Figure 4 – MPEG-4 ALS burst-payload with LATM/LOAS header .....	12
Figure B.1 – MPEG-4 ALS burst-payload .....	14
Table 1 – Fields of burst-info (data-type bits 0-4=23, data-type bits 5-6=0/ data-type bits 0-4=25, data-type bits 5-6=2) .....	8
Table 2 – Sampling frequency, multiplier, and IEC 60958 frame rate .....	10
Table A.1 – MPEG-4 ALS payload and frame repetition: some examples .....	13
Table C.1 – Recommended values for the ALSSpecificConfig in the MPEG-4 ALS burst-payload.....	15
Table D.1 – MPEG-4 ALS simple profile, maximum payload size and frame repetition: some examples.....	17

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### **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**

#### 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 itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 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 61937-10 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 cancels and replaces the first edition published in 2011. This edition constitutes a technical revision.

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

- a) Addition of Levels 2, 3, 4 of MPEG-4 ALS Simple Profile;
- b) Addition of data-type bits 0-4 and data-type bits 5-6 for MPEG-4 ALS with LATM/LOAS header.

The text of this International Standard is based on the following documents:

CDV	Report on voting
100/2630/CDV	100/2930/RVC

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

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

A list of all the parts in the IEC 61937 series, published 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 "<http://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.

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 10: Non-linear PCM bitstreams according to the MPEG-4 audio lossless coding (ALS) format**

#### **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-4 audio lossless coding (ALS) format.

#### **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, *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 14496-3:2009, *Information technology – Coding of audio-visual objects – Part 3: Audio*

ISO/IEC 14496-3:2009/AMD2:2010, *ALS simple profile and transport of SAOC*

ISO/IEC 14496-3:2009/AMD5:2015, *Support for Dynamic Range Control, New Levels for ALS Simple Profile, and Audio Synchronization*