

CONSOLIDATED VERSION

VERSION CONSOLIDÉE



**Digital audio interface –
Part 3: Consumer applications**

**Interface audionumérique –
Partie 3: Applications grand public**

Withdrawing

iTech Standards
(<https://standards.iteh.ai>)
Document Preview

IEC 60958-3:2006

<https://standards.iteh.ai/catalog/standards/iec/12966047-5b10-453b-bc18-e1d3dec6634b/iec-60958-3-2006>



THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2009 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 l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
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.

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

IEC publications search - www.iec.ch/searchpub

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 It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

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

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in 14 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

More than 55 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) 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 IEC

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

Catalogue IEC - webstore.iec.ch/catalogue

Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

Recherche de publications IEC - www.iec.ch/searchpub

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org

Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 14 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary

Plus de 55 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.

CONSOLIDATED VERSION

VERSION CONSOLIDÉE



**Digital audio interface –
Part 3: Consumer applications**

**Interface audionumérique –
Partie 3: Applications grand public**

<https://standards.iteh.ai/standards/iec/12966047-5b10-453b-be18-e1d3dec6634b/iec-60958-3-2006>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 33.160.01

ISBN 978-2-8322-1754-2

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

Withdrawn

iTech Standards
(<https://standards.iteh.ai>)
Document Preview

[IEC 60958-3:2006](#)

<https://standards.iteh.ai/catalog/standards/iec/1a966047-5b10-453b-be18-e1d3dec6634b/iec-60958-3-2006>

REDLINE VERSION

VERSION REDLINE



**Digital audio interface –
Part 3: Consumer applications**

**Interface audionumérique –
Partie 3: Applications grand public**

Withdrawing

iTech Standards
(<https://standards.iteh.ai>)
Document Preview

IEC 60958-3:2006

<https://standards.iteh.ai/standards/iec/12966047-5b10-453b-be18-e1d3dec6634b/iec-60958-3-2006>

CONTENTS

FOREWORD.....	5
INTRODUCTION to Amendment 1	7
1 Scope.....	8
2 Normative references	8
3 Terms and definitions	8
4 Interface format.....	8
5 Channel status	9
5.1 General.....	9
5.2 Application	9
5.3 Copyright management guidelines for consumer application of the digital audio interface	16
6 User data	20
6.1 General.....	20
6.2 Application	20
6.3 Information for synchronization.....	24
Annex A (normative) Application of the digital audio interface in the compact disc digital audio system	27
Annex B (normative) Application of the digital interface in the 2-channel PCM encoder/decoder.....	29
Annex C (normative) Application of the digital interface in the 2-channel digital audio tape recorder in the consumer mode.....	30
Annex D (normative) Application of the digital interface in laser optical digital audio systems for which no other category code is defined.....	34
Annex E (normative) Application of the digital interface in a digital audio mixer in the consumer mode.....	35
Annex F (normative) Application of the digital interface with a sampling rate converter in the consumer mode.....	36
Annex G (normative) Application of the digital interface with a digital sound sampler in the consumer mode.....	37
Annex H (normative) Application of the digital interface in a digital broadcast receiver (Japan) in the consumer mode.....	38
Annex J (normative) Application of the digital interface in a digital broadcast receiver (Europe) in the consumer mode.....	39
Annex K (normative) Application of the digital interface in a digital broadcast receiver (USA) in the consumer mode.....	40
Annex L (normative) Application of the digital interface for electronic software delivery in the consumer mode.....	41
Annex M (normative) Application of the digital interface in the digital compact cassette system in the consumer mode.....	42
Annex N (normative) Application of the digital interface in the mini-disc system in the consumer mode	47
Annex O (normative) Application of the digital interface in a digital sound processor in the consumer mode	48
Annex P (normative) Application of the digital interface in the digital versatile disc system (DVD) in the consumer mode	49

Annex Q (informative) Use of original sampling frequency, sampling frequency and clock accuracy	50
Annex R (normative) Application of the digital interface in magnetic disc digital audio systems in the consumer mode	52
Annex S (normative) Explanations of category code implementation	53
Annex T (informative) Application of the digital audio interface for synchronization of audio, video and multi-media equipments	58
Annex U (normative) MPEG Surround over PCM	64
Bibliography.....	66

Figure 1 – Example of message structure using information units	21
Figure 2 – First UI contents.....	22
Figure 3 – Second UI contents	22
Figure 4 – Third UI contents	23
Figure 5 – User information.....	23
Figure 6 – SMPTE time code information	24
Figure 7 – LTC information alignment	24
Figure 8 – VITC information alignment	25
Figure 9 – Latency information.....	25
Figure 10 – Latency information alignment.....	26
Figure C.1 – Example of different combinations of start-ID and shortening-ID	33
Figure M.1 – Marker mode.....	42
Figure M.2 – Extended mode.....	43
Figure Q.1 – Player and interface model.....	50
Figure S.1 – Multi-media player	53
Figure S.2 – Home-recorded medium player	54
Figure S.3 – Direct monitoring	54
Figure S.4 – Monitoring after recording	55
Figure S.5 – Integrated product	55
Figure S.6 – Digital/digital converter	56
Figure S.7 – Integrated product including digital/digital converter.....	56
Figure S.8 – Integrated product including magnetic disc recorder	57
Figure T.1 – Lip-sync system model.....	58
Figure T.2 – Lip-sync compensation	59
Figure T.3 – Time-code transmission	59
Figure T.4 – Latency parameter transmission	60
Figure T.5 – Latency parameter transmission with TLv.....	60
Figure T.6 – Example of latency parameter transmission	62
Figure T.7 – Another example for solving lip-sync problems.....	63
Figure U.1 – Relations between MPEG Surround buried data frame and IEC 60958-3 frame.....	64

Table 1– Channel status general format for consumer use.....	10
Table 2 – Mode 0 channel status format for consumer use.....	12
Table 3 – Category code groups	17
Table 4 – Category code groups for laser optical products.....	18
Table 5 – Category code groups for digital/digital converter and signal-processing products	18
Table 6 – Category code groups for magnetic tape or magnetic disc based products	18
Table 7 – Category code groups for broadcast reception of digitally encoded audio with/without video signals	19
Table 8 – Category code groups for musical instruments, microphones and other sources that create original sound	19
Table 9 – Category code groups for A/D converters for analogue signals without copyright information	19
Table 10 – Category code groups for A/D converters for analogue signals with copyright information	20
Table 11 – Category code groups for solid-state memory-based products.....	20
Table A.1 – Example of 2-channel compact disc format.....	28
Table C.1 – Use of Cp-bit, L-bit and category code for DAT.....	30
Table C.2 – User data application in the DAT system.....	32
Table M.1 – Layout of message number “000000”.....	43
Table M.2 – Deck status codes.....	44
Table M.3 – ITTS packet extended message example.....	45
Table Q.1 – Term definitions.....	50
Table Q.2 – Cases.....	51
Table Q.3 – Example.....	51

INTERNATIONAL ELECTROTECHNICAL COMMISSION

DIGITAL AUDIO INTERFACE –

Part 3: Consumer applications

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.

This Consolidated version of IEC 60958-3 bears the edition number 3.1. It consists of the third edition (2006-05) [documents 100/1009/CDV and 100/1070/RVC] and its amendment 1 (2009-10) [documents 100/1513/CDV and 100/1592/RVC]. The technical content is identical to the base edition and its amendment.

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.

This publication has been prepared for user convenience.

International Standard IEC 60958-3 has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment.

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

- Electrical and optical requirements are removed from IEC 60958-3; they should be specified in IEC 60958-1. The third edition of IEC 60958-1 will include these.

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 60958 series, under the general title *Digital audio interface*, can be found on the IEC website.

The committee has decided that the contents of the base publication and its amendment will remain unchanged until the stability 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.

IMPORTANT – The “colour inside” logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this publication using a colour printer.

INTRODUCTION to Amendment 1

The revision of IEC 60958-3 (2006) has become necessary to transmit the audio signal and its information of the current improved audio formats and systems. The revised items apply to the small parts of IEC 60958-3.

Additional sampling frequencies have been defined for the use of audio transmission of IEC 60958 conformant data format for the new formats of the IEC 61937 series.

CGMS-A validity is added to clarify the use of CGMS-A information.

The identification of the embedded MPEG Surround information to LPCM and its normative Annex U are added.

Table 2 includes the new additions and Table 3 has been clarified.

Withhold

iTech Standards
(<https://standards.iteh.ai>)
Document Preview

DIGITAL AUDIO INTERFACE –

Part 3: Consumer applications

1 Scope

This part of IEC 60958 specifies the consumer application of the interface for the inter-connection of digital audio equipment defined in IEC 60958-1.

NOTE When used in a consumer digital processing environment, the interface is primarily intended to carry stereophonic programmes, with a resolution of up to 20 bits per sample, an extension to 24 bits per sample being possible.

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 60841:1988, *Audio recording – PCM encoder/decoder system*

IEC 60908:1999, *Audio recording – Compact disc digital audio system*

IEC 60958-1:2004, *Digital audio interface – Part 1: General*

IEC 61119-1:1992, *Digital audio tape cassette system (DAT) – Part 1: Dimensions and characteristics*

IEC 61119-6:1992, *Digital audio tape cassette system (DAT) – Part 6: Serial copy management system*

IEEE 1394:2004, *IEEE standard for high-performance serial bus bridges*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60958-1 apply.

4 Interface format

The interface format as defined in IEC 60958-1 shall be used.

Unless otherwise specified in the annexes, the following specification is applicable.

- Audio sample word has a length of 20 bits/sample. The auxiliary sample bits are an optional expansion of the audio sample, if not used = “0”.
- User data is not used, all bits = “0”.
- Channel status is identical for both subframes of the interface, with the exception of the channel number, if that is not equal to zero.

5 Channel status

5.1 General

For every subframe, the channel status bit provides information related to the audio channel that is carried in that same subframe.

Channel status information is organized in a 192-bit block, subdivided into 24 bytes, numbered 0 to 23 (see Table 1). The first bit of each channel status block is carried in the frame with preamble “B”.

The individual bits of a channel status block are numbered 0 to 191.

The primary application is indicated by channel status bit 0.

As stated in IEC 60958-1, for the consumer digital audio applications described in this standard, this first channel status bit equals “0”.

NOTE As stated in IEC 60958-1, for professional application this first channel status bit equals “1”.

Secondary applications may be defined within the framework of these primary applications.

5.2 Application

5.2.1 Channel status general format

For each channel, the channel status block provides the information described in this clause and summarized in Table 1.

Table 1- Channel status general format for consumer use

Byte

0	a = "0"	b	c	d			Mode	
bit	0	1	2	3	4	5	6	7
1								
bit	8	9	10	11	12	13	14	15
2								
bit	16	17	18	19	20	21	22	23
3								
bit	24	25	26	27	28	29	30	31
4								
bit	32	33	34	35	36	37	38	39
5								
bit	40	41	42	43	44	45	46	47
6								
bit	48	49	50	51	52	53	54	55
7								
bit	56	57	58	59	60	61	62	63
8								
bit	64	65	66	67	68	69	70	71
9								
bit	72	73	74	75	76	77	78	79
10								
bit	80	81	82	83	84	85	86	87
11								
bit	88	89	90	91	92	93	94	95
12								
bit	96	97	98	99	100	101	102	103
13								
bit	104	105	106	107	108	109	110	111
14								
bit	112	113	114	115	116	117	118	119
15								
bit	120	121	122	123	124	125	126	127
16								
bit	128	129	130	131	132	133	134	135
17								
bit	136	137	138	139	140	141	142	143
18								
bit	144	145	146	147	148	149	150	151
19								
bit	152	153	154	155	156	157	158	159
20								
bit	160	161	162	163	164	165	166	167
21								
bit	168	169	170	171	172	173	174	175
22								
bit	176	177	178	179	180	181	182	183
23								
bit	184	185	186	187	188	189	190	191
		a: use of channel status block b: linear PCM identification			c: copyright information d: additional format information			