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Digitalni zvokovni vmesnik - 3. del: Porabniške aplikacije (TA 20)

Digital audio interface - Part 3: Consumer applications (TA 20)

Digitalton-Schnittstelle - Teil 3: Allgemeingebrauch

Interface audionumérique - Partie 3: Applications grand public

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33.160.30	Avdio sistemi	Audio systems
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Digital audio interface - Part 3: Consumer applications (TA 20)

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117 INTERNATIONAL ELECTROTECHNICAL COMMISSION

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DIGITAL AUDIO INTERFACE –

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Part 3: Consumer applications

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FOREWORD

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128 all national electrotechnical committees (IEC National Committees). The object of IEC is to promote
129 international co-operation on all questions concerning standardization in the electrical and electronic fields. To
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157 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is
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161 IEC 60958-3 has been prepared by technical area 20: Analogue and digital audio of IEC
162 technical committee 100: Audio, video and multimedia systems and equipment. It is an
163 International Standard.

164 This 4th edition cancels and replaces the 3rd edition published in 2006, Amendment 1:2009
165 and Amendment 2:2015. This edition constitutes a technical revision.

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

168 a) The relevant part of IEC 60958-5 is supported.

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

Draft	Report on voting
XX/XX/FDIS	XX/XX/RVD

170
171 Full information on the voting for its approval can be found in the report on voting indicated in
172 the above table.

173 The language used for the development of this International Standard is English.

174 This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in
175 accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement,
176 available at www.iec.ch/members_experts/refdocs. The main document types developed by
177 IEC are described in greater detail at www.iec.ch/standardsdev/publications.

178 The committee has decided that the contents of this document will remain unchanged until the
179 stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to
180 the specific document. At this date, the document will be

- 181 • reconfirmed,
- 182 • withdrawn,
- 183 • replaced by a revised edition, or
- 184 • amended.

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187 **DIGITAL AUDIO INTERFACE –**

188

189 **Part 3: Consumer applications**

190

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193 **1 Scope**

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

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

199 **2 Normative references**

200 The following documents are referred to in the text in such a way that some or all of their
201 content constitutes requirements of this document. For dated references, only the edition
202 cited applies. For undated references, the latest edition of the referenced document (including
203 any amendments) applies.

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

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

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

<https://standards.iteh.ai/catalog/standards/sist/9b79da73-4be5-4c73-b678->

207 IEC 60958-5:2020 (in preparation), *Digital audio interface – Part 5: Consumer application*
208 *enhancement*

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

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

213 IEC 62574:2020, *Audio, video and multimedia systems – General channel assignment of*
214 *multichannel audio*

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

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

218 Recommendation ITU-R BS.775-3:2012, *Multichannel stereophonic sound system with and*
219 *without accompanying picture*

220 **3 Terms and definitions**

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

222 ISO and IEC maintain terminological databases for use in standardization at the following
223 addresses:

- 224 • IEC Electropedia: available at <http://www.electropedia.org/>
- 225 • ISO Online browsing platform: available at <http://www.iso.org/obp>

226 **4 Interface format**

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

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

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

234 **5 Channel status**

235 **5.1 General**

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

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

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

242 The primary application is indicated by channel status bit 0.

243 As stated in IEC 60958-1, for the consumer digital audio applications described in this
244 document and IEC 60958-5, this first channel status bit equals “0”.

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

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

247 **5.2 Application**

248 **5.2.1 Channel status general format**

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

251

252

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				

253

254 *Byte 0*: General control and mode information

255 Control:

Bit 0 “0” Consumer use of channel status block (Notes 1 and 2)

256 NOTE 1 The significance of byte 0, bit 0 is such that transmission from an interface conforming to IEC 60958-4
257 can be identified.
258

Bit 1 “0” Audio sample word represents linear PCM samples (Note 2)

“1” Audio sample word used for other purposes

259 NOTE 2 The functions of channel status bits 0 and 1 are defined in IEC 60958-1.

260

Bit 2 “0” Software for which copyright is asserted (Note 3)

“1” Software for which no copyright is asserted

261 NOTE 3 Bit 2 is referred to as the “Cp-bit”. It should indicate whether copyright protection has been asserted.

262 The copyright status may be unknown for certain applications. The above interpretation is
263 therefore not valid in combination with some category codes (as indicated in the annex
264 associated with the category code). The Cp-bit can alternate between 0 and 1 at a rate
265 between 4 Hz and 10 Hz (see 29).

Bits 3 to 5 Additional format information, meaning depends on bit 1.

When bit 1 = “0”, linear PCM audio mode:

Bit	3 4 5	
State	“0 0 0”	2 audio channels without pre-emphasis
	“1 0 0”	2 audio channels with 50 µs / 15 µs pre-emphasis
	“0 1 0”	Reserved (for 2 audio channels with pre-emphasis)
	“1 1 0”	Reserved (for 2 audio channels with pre-emphasis)
	“0 0 1”	Assigned for IEC 60958-5
	“0 1 1”	Assigned for IEC 60958-5

All other states of bits 3 to 5 are reserved and shall not be used until further defined.

NOTE 4 The single and dual channel operating modes are defined with the frame format in IEC 60958-1.

When bit 1 = “1”, other than linear PCM applications:

Bit	3 4 5	
State	“0 0 0”	Default state for applications other than linear PCM

All other states of bits 3 to 5 are reserved and shall not be used until further defined.

266

Bits 6 to 7 Channel status mode, indicates one of four possible channel status formats (bytes 1 to 23). There are four possible modes for each of the states of bit 1.

Bit	6 7	
State	“0 0”	Mode 0, refer to 11

All other states of bits 6 and 7 are reserved and shall not be used until further defined.

267 The contents of bits 8 to 191 depend on the mode as indicated by bits 6 and 7. If not defined
268 otherwise, the default value is “0”.
269

270 **5.2.2 Mode 0 channel status format for digital audio equipment for consumer use**

271 When the audio sample word represents linear PCM and the channel status mode is mode 0,
272 the channel status format shown in Table 2 should be applied.

273 **Table 2 – Mode 0 channel status format for consumer use**

Byte	a = "0"		b = "0"		c		d		Mode = "0 0"		
0	bit	0	1	2	3	4	5	6	7		
1	Category code										
1	bit	8	9	10	11	12	13	14	15		
2	Source number					Channel number					
2	bit	16	17	18	19	20	21	22	23		
3	Sampling frequency				Clock accuracy			Sampling frequency extension			
3	bit	24	25	26	27	28	29	30	31		
4	Word length				Original sampling frequency						
4	bit	32	33	34	35	36	37	38	39		
5	CGMS-A		CGMS-A validity		Auto sampling frequency coefficient						
5	bit	40	41	42	43	44	45	46	47		
6	Information hidden in PCM signal	General channel assignment channel number for A channel							General channel assignment channel number for B channel		
6		48	49	50	51	52	53	54	55		
7	General channel assignment channel number for B channel					LFE Playback level					
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					c: copyright information				
		b: linear PCM identification					d: additional format information				

274 *Byte 0* as defined in 5.2.1, with

Bit 1	“0”	Audio sample word represents linear PCM samples
Bits 6 to 7	“0 0”	Mode 0

275

276 *Byte 1: Category code*

277 The category code indicates the kind of equipment that generates the digital audio interface
278 signal. See the relevant annexes for the assignments. Bit 8 = LSB, bit 15 = MSB.

279 *Byte 2: Source and channel number*

Bits 16 to 19 Source number, bit 16 = LSB, bit 19 = MSB

Bit 16 17 18 19

State “0 0 0 0” Do not take into account

“1 0 0 0” 1

“0 1 0 0” 2

“1 1 0 0” 3

.....

“1 1 1 1” 15

280

Bits 20 to 23 Channel number (audio channel), bit 20 = LSB, bit 23 = MSB.

Bit 20 21 22 23

State “0 0 0 0” Do not take into account.

“1 0 0 0” (left channel for stereo channel format)

“0 1 0 0” (right channel for stereo channel format)

“1 1 0 0”

.....

“1 1 1 1”

281 NOTE 1 The single and dual channel operating modes are defined with the frame format in IEC 60958-1.

282 *Byte 3: Sampling frequency and clock accuracy*

Bits 24 to 27 Sampling frequency

Bit 24 25 26 27

State “0 0 1 0” 22,05 kHz

“0 0 0 0” 44,1 kHz

“0 0 0 1” 88,2 kHz

“0 0 1 1” 176,4 kHz

“0 1 1 0” 24 kHz

“0 1 0 0” 48 kHz

“0 1 0 1” 96 kHz

“0 1 1 1” 192 kHz

“1 1 0 0” 32 kHz

“1 0 0 0” Sampling frequency not indicated

“1 0 0 1” 768 kHz

All other combinations are reserved and shall not be used until further