SLOVENSKI STANDARD
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Consumer audio/video equipment - Digital interface - Part 1: General (IEC 61883-1:2003)

Consumer audio/video equipment - Digital interface -- Part 1: General

Audio/Video-Geräte der Unterhaltungselektronik - Digitale Schnittstelle -- Teil 1: Allgemeines

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Matériel audio/vidéo grand public - Interface numérique -- Partie 1: Généralités

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ICS:

33.160.01	Avdio, video in avdiovizualni sistemi na splošno	Audio, video and audiovisual systems in general
35.200	Vmesniška in povezovalna oprema	Interface and interconnection equipment

SIST EN 61883-1:2003 **en**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61883-1

April 2003

ICS 33.160.01; 35.200

Supersedes EN 61883-1:1998

English version

Consumer audio/video equipment - Digital interface Part 1: General (IEC 61883-1:2003)

Matériel audio/vidéo grand public - Interface numérique Partie 1: Généralités (CEI 61883-1:2003)

Audio/Video-Geräte der Unterhaltungselektronik - Digitale Schnittstelle Teil 1: Allgemeines (IEC 61883-1:2003)

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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 three official versions (English, French, 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.

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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

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Foreword

The text of document 100/557/FDIS, future edition 2 of IEC 61883-1, prepared by technical area 4, Digital system interfaces, of IEC TC 100, Audio, video and multimedia systems and equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61883-1 on 2003-03-01.

This European Standard supersedes EN 61883-1:1998.

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)	2003-12-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2006-03-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annex ZA is normative and annex A is informative.
Annex ZA has been added by CENELEC.

Endorsement notice

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The text of the International Standard IEC 61883-1:2003 was approved by CENELEC as a European Standard without any modification.

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

Publication	Year	Title	EN/HD	Year
IEEE Std 1212	2001	Standard for a Control and Status Registers (CSR) Architecture for Microcomputer Buses	-	-
IEEE Std 1394	1995	Standard for a High Performance Serial Bus	-	-
IEEE Std 1394A	2000	Standard for a High Performance Serial Bus - Amendment 1	-	-

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INTERNATIONAL STANDARD

IEC 61883-1

Second edition
2003-01

Consumer audio/video equipment – Digital interface –

Part 1: General

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Partie 1: Généralités

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

CONSUMER AUDIO/VIDEO EQUIPMENT – DIGITAL INTERFACE –

Part 1: General

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

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International Standard IEC 61883-1 has been prepared by technical area 4, Digital system interfaces, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

This second edition of IEC 61883-1 cancels and replaces the first edition, published in 1998, of which it constitutes a technical revision.

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

FDIS	Report on voting
100/557/FDIS	100/609/RVD

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.

International Standard IEC 61883 consists of the following parts under the general title *Consumer audio/video equipment – Digital interface:*

Part 1: General

Part 2: SD-DVCR data transmission

Part 3: HD-DVCR data transmission

Part 4: MPEG2-TS data transmission

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Part 5: SDL-DVCR data transmission

Part 6: Audio and music data transmission protocol

Part 7: Transmission of ITU-R BO.1294 System B

The committee has decided that the contents of this publication will remain unchanged until 2005. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

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CONSUMER AUDIO/VIDEO EQUIPMENT – DIGITAL INTERFACE –

Part 1: General

1 Scope

This part of IEC 61883 specifies a digital interface for consumer electronic audio/video equipment using IEEE 1394, High Performance Serial Bus. It describes the general packet format, data flow management and connection management for audio-visual data, and also the general transmission rules for control commands.

The object of this standard is to define a transmission protocol for audio-visual data and control commands which provides for the interconnection of digital audio and video equipment, using IEEE 1394.

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.

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IEEE 1212:2001, *Standard for a Control and Status Registers (CSR) Architecture for microcomputer buses*

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IEEE 1394:1995, *Standard for a High Performance Serial Bus*

IEEE 1394a:2000, *Standard for a High Performance Serial Bus – Amendment 1*

NOTE Throughout this document, the term "IEEE 1394" indicates a reference to the standard that is the result of the editorial combination of IEEE 1394:1995 and IEEE 1394a:2000. Devices conforming solely to IEEE 1394:1995 may conform to IEC 61883. Devices conforming to IEC 61883 should conform to IEEE 1394a:2000.

3 Abbreviations

For the purpose of this part of IEC 61883, the following abbreviations apply:

AV/C	Audio Video Control
CHF	CIP Header Field
CIP	Common Isochronous Packet
CMP	Connection Management Procedures
CSR	Command and Status Register
CTS	Command/Transaction Set
CRC	Cyclic Redundancy Check Code
DVCR	Digital Video Cassette Recorder
EOH	End of CIP Header
FCP	Function Control Protocol
iPCR	Input Plug Control Register
iMPR	Input Master Plug Register
MPEG	Motion Picture Experts Group
oPCR	Output Plug Control Register
oMPR	Output Master Plug Register
ROM	Read Only Memory

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4 High performance serial bus layers

4.1 Cable physical layer

All cable physical layer implementations conforming to this standard shall meet the performance criteria specified by IEEE 1394. Either the cable and connector defined in IEEE 1394:1995, or the cables and connector defined in IEEE 1394a:2000, shall be used.

When necessary for an AV device to generate a bus reset, it shall follow the requirements of IEEE 1394a:2000, 8.2.1. An AV device that initiates a bus reset should generate an arbitrated (short) bus reset, as specified by IEEE 1394a:2000, in preference to the long bus reset defined by IEEE 1394:1995.

4.2 Link layer

All link layer implementations conforming to this standard shall meet the specifications of IEEE 1394.

4.3 Transaction layer

All transaction layer implementations conforming to this standard shall meet the specifications of IEEE 1394.

5 Minimum node capabilities

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A node shall conform to the following requirements:

- a node shall be cycle master capable. This is because every node has the possibility to be assigned as a root;
- a node shall be isochronous resource manager capable, as specified by IEEE 1394:1995, and shall implement the additional isochronous resource manager facilities and responsibilities specified by IEEE 1394a:2000 in subclauses 8.3.1.5, 8.3.2.3.8, 8.3.2.3.11, 8.4.2.3 and 8.4.2.6A;
- a node which transmits or receives isochronous packets shall have plug control registers (see 7.2).

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5.1 Serial bus management

Bus manager capability is optional for AV devices, but, if implemented by devices conforming to this standard, shall conform to IEEE 1394.

5.2 Command and status registers

5.2.1 CSR core registers

This standard conforms to the CSR architecture. Details of its registers are specified by IEEE 1394.

The STATE_CLEAR.*cmstr* bit shall be implemented as specified by IEEE 1394a:2000, 8.3.2.2.1.

NOTE The *cmstr* bit is set automatically (see IEEE 1394a:2000, 8.3.2.2.1) by system software or hardware when a node becomes the new root after the bus reset process is completed. In this manner, it is possible to ensure the fast resumption and continuity of data transmission where the time scale is critical at the level of microseconds. The rapid activation of a new cycle master decreases the likelihood of a gap in the transmission of cycle start packets; uninterrupted transmission of cycle start packets at nominal 125 µs intervals is critical to the delivery of isochronous data within its latency requirements.

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5.2.2 Serial bus node registers

Implementation requirements for bus-dependent registers in this standard conform to IEEE 1394. A node shall have the following registers:

CYCLE_TIME register

BUS_TIME register

BUS_MANAGER_ID register

BANDWIDTH_AVAILABLE register

CHANNELS_AVAILABLE register

A node should have the following register specified by IEEE 1394a:2000:

BROADCAST_CHANNEL register

5.2.3 Configuration ROM requirements

A node shall implement the general ROM format as defined in IEEE 1212:2001 and IEEE 1394. Additional information required for implementations of this standard shall be included in one of the unit directories. Figure 1 shows an example of the configuration ROM implementation for this standard.

5.2.3.1 Bus_Info_Block entry

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Implementation requirements for the Bus_Info_Block in this standard shall conform to IEEE 1394.

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5.2.3.2 Root directory

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The following entries shall be present:

– Module_Vendor_ID;

– Node_Capabilities;

– Unit_Directory (offset to a unit directory defined by this standard).

Other entries may be implemented in addition to the above required entries.

5.2.3.3 Unit directory

The following entries shall be present:

– Unit_Spec_ID;

– Unit_SW_Version.

The value of the Unit_Spec_ID and the Unit_SW_Version for this standard are given as follows:

Unit_Spec_ID:	First octet	= 00_{16}
	Second octet	= $A0_{16}$
	Third octet	= $2D_{16}$
Unit_SW_Version:	First octet	= 01_{16}

The second and third octets of Unit_SW_Version for this standard are specified in Table 9 and indicate capabilities for command/transaction sets. The Unit_SW_Version field is used to identify which protocol is supported by the device. If a device supports more than one protocol, the device shall have a separate unit directory for each protocol supported.

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6 Real time data transmission protocol

6.1 Common isochronous packet (CIP) format

6.1.1 Isochronous packet structure

The structure of the isochronous packet utilized by this standard is illustrated in Figure 2. The packet header and header CRC are the first two quadlets of an IEEE 1394 isochronous packet. The CIP header is placed at the beginning of the data field of an IEEE 1394 isochronous packet, immediately followed by zero or more data blocks.

6.1.2 Packet header structure

The packet header consists of the following items as specified in IEEE 1394.

Data_length: specifies the length of the data field of the isochronous packet in bytes, which is determined as follows:

CIP header size + signal data size

Tag: provides a high level label for the format of data carried by the isochronous packet.

00_2 = No CIP header included

01_2 = CIP header included as specified in 6.1.3

10_2 = Reserved

11_2 = Reserved

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Channel: specifies the isochronous channel number for the packet.

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Tcode: specifies the packet format and the type of transaction that shall be performed (fixed at 1010_2).

Sy: application-specific control field.

6.1.3 CIP header structure

The CIP header is placed at the beginning of the data field of an IEEE 1394 isochronous packet. It contains information on the type of the real time data contained in the data field following it. The structure of the CIP header is shown in Figure 3.

The definitions of the fields are given as follows:

EOH_n (End of CIP header): means the last quadlet of a CIP header.

0 = Another quadlet will follow

1 = The last quadlet of a CIP header

Form_n: in combination with EOH, shows the additional structure of CHF_n.

CHF_n (CIP header field): CIP header field of n^{th} quadlet. The additional structure of CHF_n depends on EOH_0, form_0, EOH_1, form_1, ... EOH_n, and form_n.