INTERNATIONAL STANDARD

IEC 61883-3

Second edition 2004-08

Consumer audio/video equipment – Digital interface –

Part 3: HD-DVCR data transmission



Reference number IEC 61883-3:2004(E)

Publication numbering

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CONSUMER AUDIO/VIDEO EQUIPMENT – DIGITAL INTERFACE –

Part 3: HD-DVCR data transmission

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International Standard IEC 61883-3 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 61883-3 cancels and replaces the first edition published in 1998. This edition contains the following significant technical changes with respect to the previous edition:

Added specifications of IEEE 1394 packet, CIP header and transmission timing in high speed transmission.

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

CDV	Report on voting
100/728/CDV	100/817/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.

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

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
- 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 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- withdrawn;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.

A bilingual version of this document may be issued at a later date.

CONSUMER AUDIO/VIDEO EQUIPMENT – DIGITAL INTERFACE –

Part 3: HD-DVCR data transmission

1 Scope

This part of IEC 61883 specifies the packet format and the transmission timing for HD-DVCR data. It describes the specifications for the IEEE 1394 packet, the CIP header for 1125-60 and 1250-50 television systems, and the transmission timing.

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 61834-3, Recording – Helical-scan digital video cassette recording system using 6,35 mm magnetic tape for consumer use (525-60, 625-50, 1125-60 and 1250-50 systems) – Part 3: HD format for 1125-60 and 1250-50 systems

IEC 61883-1, Consumer audio/video equipment – Digital interface – Part 1: General

IEC 61883-2, Consumer audio/video equipment – Digital interface – Part 2: SD-DVCR data transmission

3 Abbreviations

For the purpose of this document, the following abbreviations apply:

1125-60 system:	the 1125-line system with a frame frequency of 30,00 \mbox{Hz}
1250-50 system:	the 1250-line system with a frame frequency of 25,00 \mbox{Hz}
HD-DVCR:	high-definition digital video cassette recorder
IEEE 1394 packet:	IEEE 1394 isochronous packet defined in IEC 61883-1

4 Construction of IEEE 1394 packet

4.1 Source packet structure of the HD-DVCR data stream

For the HD-DVCR data stream, the data structure for digital interface defined in IEC 61834-3, Clause 10 is used. The source packet size for the HD-DVCR data stream is 960 bytes, divided into 12 DIF blocks.

The correspondence between DIF blocks and source packets for the 1125-60 system and the 1250-50 system are shown in Figure 1 and Figure 2 respectively.

4.2 Packetization of source packet of the HD-DVCR data stream

A source packet shall not be divided and shall be equal to a data block.

Data blocks transmitted in an IEEE 1394 isochronous cycle shall be determined according to the TR value in the CIP header (see 5.2). An empty packet is placed in any cycle with no data block.

Where the TR value is

- 00_2 (1x), one or no data block is transmitted;
- 01₂ (2x), two or no data block are transmitted;
- 10_2 (4x), four or no data block are transmitted.

The SYT field of the CIP header (see 5.1) is used to synchronize the transmitter and the receiver.

4.3 Transmission order of video frames for high-speed transmission

Transmission order of data within one video frame is defined in Figure 1 and Figure 2. For high-speed transmission, the transmission order of each video frame data shall follow the time sequence.

5 CIP header

5.1 CIP header for HD-DVCR data stream

The structure of the CIP header for the HD-DVCR data stream is the same as the structure of the CIP header for the SD-DVCR data stream (see IEC 61883-2, 5.1).

The DBS for HD takes different values from that for SD through the difference of data block size as given in 4.1.

5.2 FDF area

The STYPE takes different values as shown in Table 1 of IEC 61883-2.

Where the STYPE is 00010_2 , TR is defined as follows.

TR: 01₂ = 2x

 $10_2 = 4x$

 11_2 = Reserved for future definition

5.3 DBC values

Increments of DBC value shall be determined according to the TR value.

Where the TR value is

 00_2 (1x), the DBC value increments with 1;

 01_2 (2x), the DBC value is a multiple of 2;

 10_2 (4x), the DBC value is a multiple of 4.

5.4 CIP header for 1125-60 system

For the 1125-60 system, the values of the CIP header components are as follows.

DBS:	111100002
FN:	002
QPC:	000 ₂
SPH:	0
DBC	(see 5.3)
FMT:	000000 ₂
50/60:	0
STYPE:	00010 ₂
TR:	$00_2 = 1x, 01_2 = 2x, 10_2 = 4x$

5.5 CIP header for 1250-50 system

For the 1250-50 system, the values of the CIP header components are as follows.

DBS:	11110000 ₂
FN:	00 ₂
QPC:	0002
SPH:	0
DBC	(see 5.3)
FMT:	000000 ₂
50/60:	1
STYPE:	00010 ₂
TR:	$00_2 = 1x, 01_2 = 2x, 10_2 = 4x$

6 Transmission timing

The transmitter shall transmit a time stamp value in the SYT field once every video frame period. The time stamp should be transmitted in a packet that meets the following conditions:

- packet_arrival_time_L ≤ time stamp value
- time stamp value transmission_delay_limit ≤ packet_arrival_time_F
 - where

packet_arrival_time_F is the cycle time when the first bit of the packet which has the time stamp has arrived at the receiver;

packet_arrival_time_L is the cycle time when the last bit of the packet which has the time stamp has arrived at the receiver;

transmission_delay_limit = 450 µs.

In case of Hx (H = 1,2,4) transmission, KH data blocks are transmitted in a video frame period M using K isochronous packets. Isochronous packet n contains H data blocks of nH, nH+1, ... and (n+1) H-1.

The isochronous packet n of a video frame period M should be transmitted on the following conditions (n = 0, ..., K-1):

- packet_arrival_time_L ≤ nominal timing for isochronous packet n
- nominal timing for isochronous packet n transmission_delay_limit ≤ packet_arrival_time_F

where

packet_arrival_time_F is the cycle time when the first bit of the isochronous packet n has arrived at the receiver;

packet_arrival_time_L is the cycle time when the last bit of the isochronous packet n has arrived at the receiver;

K is the number of isochronous packets without empty packets in a video frame period.

K = 250 (1125-60 system)

K = 300 (1250-50 system)

Nominal timing for isochronous packet $n = T_M + (_{M+1} - T_M) \times n/K$

 T_{M} is the time stamp for video frame period *M* transmitted in the SYT field.



IEC 1214/04

Key:

H _{0.k} :	Header DIF block 0, section <i>k</i>	(k = 0, 1)
SC _{<i>i</i>,<i>k</i>} :	Subcode DIF block <i>i</i> , section <i>k</i>	(i = 0, 1), (k = 0, 1)
$VA_{i,k}$:	VAUX DIF block <i>i</i> , section <i>k</i>	(i = 0, 1, 2), (k = 0, 1)
$\mathbf{A}_{i,k}$:	Audio DIF block <i>i</i> , section <i>k</i>	(i = 0,,8), (k = 0,1)
V_{ik} :	Video DIF block <i>i</i> , section <i>k</i>	(i = 0,, 134), (k = 0, 1)

Figure 1 – Source packets of HD-DVCR 1125-60 system



Source packets

Key:

Header DIF block 0, section <i>k</i>	(k = 0, 1)
Subcode DIF block <i>i</i> , section <i>k</i>	(i = 0, 1), (k = 0, 1)
VAUX DIF block <i>i</i> , section <i>k</i>	(i = 0, 1, 2), (k = 0, 1)
Audio DIF block <i>i</i> , section <i>k</i>	(i = 0,,8), (k = 0,1)
Video DIF block <i>i</i> , section <i>k</i>	(i = 0,,134), (k = 0,1)
	Header DIF block 0, section k Subcode DIF block i, section k VAUX DIF block i, section k Audio DIF block i, section k Video DIF block i, section k

Figure 2 – Source packets of HD-DVCR 1250-50 system

Bibliography

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The following document contains additional information related to this standard:

[1] IEC 61834-1, Recording – Helical-scan digital video cassette recording system using 6,35 mm magnetic tape for consumer use (525-60, 625-50, 1125-60 and 1250-50 systems) – Part 1: General specifications



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