IEC 61883-2

Edition 2.0 2004-08

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

Matériel audio/vidéo grand public – Interface numérique –
Partie 2: Transmission de données SD-DVCR

IEC 61883-2:2004

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CONSUMER AUDIO/VIDEO EQUIPMENT – DIGITAL INTERFACE –

Part 2: SD-DVCR data transmission

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International Standard IEC 61883-2 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 61883-2 cancels and replaces the first edition published in 1998. This edition contains the following significant technical changes with respect to the previous edition:

a) Added STYPE for SMPTE Type D-7 50Mbit/s system and SMPTE Type D-12 100Mbit/s system.
b) Added specifications of IEEE 1394 packet, CIP header and transmission timing in high speed transmission.

This bilingual version (2013-02) corresponds to the monolingual English version, published in 2004-08.The text of this standard is based on the following documents:

CDV	Report on voting
100/727/CDV	100/816/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.

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.

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- withdrawn;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.

CONSUMER AUDIO/VIDEO EQUIPMENT – DIGITAL INTERFACE –

Part 2: SD-DVCR data transmission

1 Scope

This part of IEC 61883 specifies the packet format and the transmission timing for SD-DVCR data. It describes the specifications for the IEEE 1394 packet, the CIP header for 525-60 and 625-50 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 61834-2, *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 2: SD format for 525-60 and 625-50 systems*

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

3 Abbreviations

For the purposes of this document, the following abbreviations apply.

525-60 system:	the 525-line system with a frame frequency of 29,97 Hz
625-50 system:	the 625-line system with a frame frequency of 25,00 Hz
IEEE 1394 packet:	IEEE 1394 isochronous packet defined in IEC 61883-1
SD-DVCR:	standard definition digital video cassette recorder

4 Construction of IEEE 1394 packet

4.1 Source packet structure of the SD-DVCR data stream

For the SD-DVCR data stream, the data structure for digital interface defined in IEC 61834-2, Clause 11 is used. The source packet size for SD-DVCR data stream is 480 bytes, divided into 6 DIF blocks.

The correspondence between DIF blocks and source packets for the 525-60 system and the 625-50 system are shown in Figure 1 and Figure 2 respectively.

4.2 Packetization of source packet of the SD-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;

01_2 (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 transmitter and 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 SD-DVCR data stream

The structure of the CIP header for the SD-DVCR data stream is conform to the two-quadlet CIP header format with SYT (see 6.2.1 of IEC 61883-1). The whole structure including the details of FDF is shown in Figure 3. The value of FMT shall be set to 000000_2 to indicate the DVCR signal.

5.2 FDF area

The definition of the components of FDF is given as follows:

50/60: Field system

0 = 60 field system

1 = 50 field system

STYPE: Signal type of video signal in combination with 50/60 flag as shown in Table 1.

TR: TR indicates transmission rate with following values

00_2 = 1x (normal transmission rate)

others = defined dependent on STYPE

Where STYPE is 00000_2, TR is defined as follows.

TR: 01_2 = 2x

10_2 = 4x

11_2 = reserved for future definition

SYT: Time stamp of the video frame synchronization (see 6.2.1 of IEC 61883-1).

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 525-60 system

For the 525-60 system, the values of the CIP header components are as follows.

DBS: 01111000_2

FN: 00_2

QPC: 000_2

SPH: 0

DBC (see 5.3)

FMT: 000000_2

50/60 : 0

STYPE: 00000_2

TR: 00_2 = 1x, 01_2 = 2x, 10_2 = 4x

5.5 CIP header for 625-50 system

For the 625-50 system, the values of the CIP header components are as follows.

DBS: 01111000_2

FN: 00_2

QPC: 000_2

SPH: 0

DBC (see 5.3)

FMT: 000000_2

50/60 : 1

STYPE: 00000_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 shall 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 shall 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 (525-60 system)

K = 300 (625-50 system)

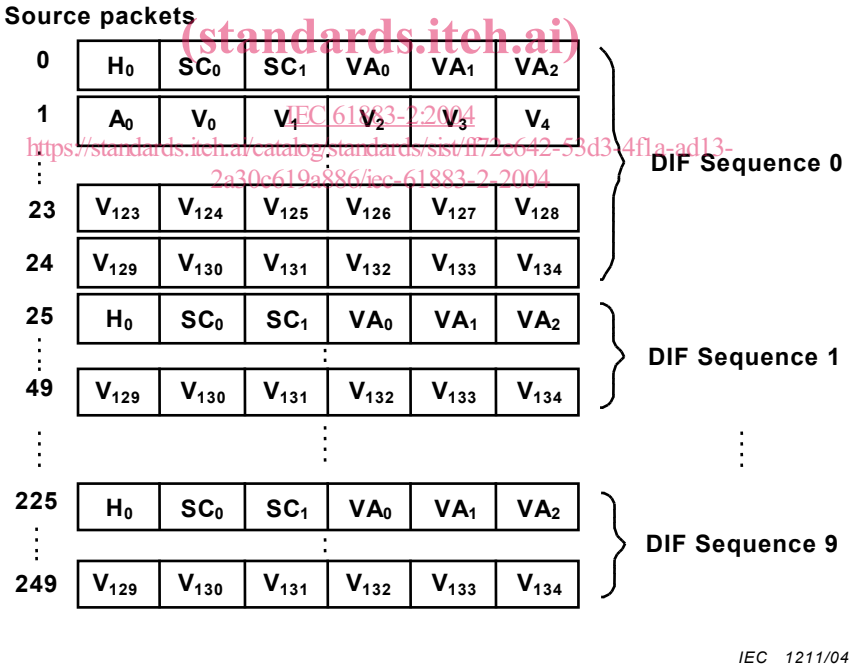
Nominal timing for isochronous packet $n = T_M + (T_{M+1} - T_M) \times n/K$

T_M is the time stamp for video frame period M transmitted in the SYT field.

Table 1 – Code allocation of 50/60 and STYPE

STYPE	50/60	
	0	1
00000	525-60 system	625-50 system
00001	SDL525-60 system	SDL625-50 system
00010	1125-60 system	1250-50 system
00011 ⋮ 11011	Reserved	
11100	SMPTE Type D-12 100 Mbit/s 60Hz system*	SMPTE Type D-12 100 Mbit/s 50Hz system*
11101	SMPTE Type D-7 50 Mbit/s 525-60 system*	SMPTE Type D-7 50 Mbit/s 625-50 system*
11110	SMPTE Type D-7 25 Mbit/s 525-60 system*	SMPTE Type D-7 25 Mbit/s 625-50 system*
11111	Reserved	

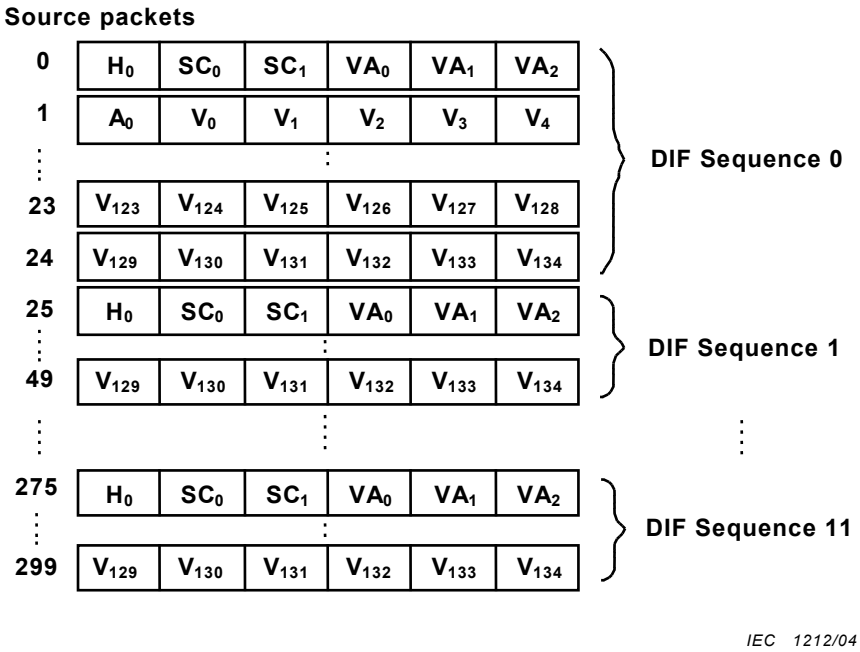
* Refer to SMPTE 396M.



Key:

H_0: Header DIF block
SC_i: Subcode DIF block i (i = 0,1)
VA_i: VAUX DIF block i (i = 0,1,2)
A_i: Audio DIF block i (i = 0,...,8)
V_i: Video DIF block i (i = 0,...,134)

Figure 1 – Source packets of SD-DVCR 525-60 system



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VA_i: VAUX DIF block i (i = 0,1,2)
A_i: Audio DIF block i (i = 0,...,8)
V_i: Video DIF block i (i = 0,...,134)

Figure 2 – Source packets of SD-DVCR 625-50 system

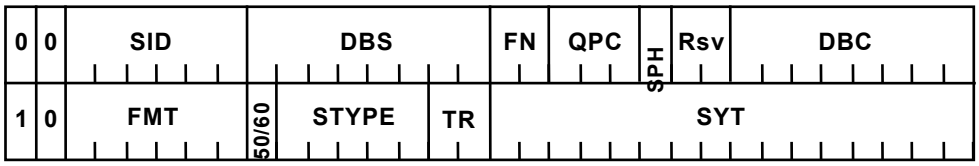

Figure 3 – CIP header for DVCR