HD/SD Recorder

HDR-45

Quick Start Guide

Table of contents

⚠️ **Warnings and Precautions**

1. Read all of these warnings and save them for later reference.
2. Follow all warnings and instructions marked on this unit.
3. Unplug this unit from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this unit in or near water.
5. Do not place this unit on an unstable cart, stand, or table. The unit may fall, causing serious damage.
6. Slots and openings on the cabinet top, back, and bottom are provided for ventilation. To ensure safe and reliable operation of this unit, and to protect it from overheating, do not block or cover these openings. Do not place this unit on a bed, sofa, rug, or similar surface, as the ventilation openings on the bottom of the cabinet will be blocked. This unit should never be placed near or over a heat register or radiator. This unit should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should only be operated from the type of power source indicated on the marking label of the AC adapter. If you are not sure of the type of power available, consult your Datavideo dealer or your local power company.
8. Do not allow anything to rest on the power cord. Do not locate this unit where the power cord will be walked on, rolled over, or otherwise stressed.
9. If an extension cord must be used with this unit, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord's rating.
10. Make sure that the total amperes of all the units that are plugged into a single wall outlet do not exceed 15 amperes.
11. Never push objects of any kind into this unit through the cabinet ventilation slots, as they may touch dangerous voltage points or short out parts that could result in risk of fire or electric shock. Never spill liquid of any kind onto or into this unit.
12. Except as specifically explained elsewhere in this manual, do not attempt to service this product yourself. Opening or removing covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks, and will void your warranty. Refer all service issues to qualified service personnel.
13. Unplug this product from the wall outlet and refer to qualified service personnel under the following conditions:
    a. When the power cord is damaged or frayed;
    b. When liquid has spilled into the unit;
    c. When the product has been exposed to rain or water;
    d. When the product does not operate normally under normal operating conditions. Adjust only those controls that are covered by the operating instructions in this manual; improper adjustment of other controls may result in damage to the unit and may often require extensive work by a qualified technician to restore the unit to normal operation;
    e. When the product has been dropped or the cabinet has been damaged;
    f. When the product exhibits a distinct change in performance, indicating a need for service.

To avoid any possible static damage to your equipment please ensure your camcorder / deck is switched off when connecting or disconnecting the IEEE-1394 cable.

Warranty

Datavideo warrants that the equipment it manufactures shall be free from defects in material and workmanship for a period of 2 years from the date of product purchased. If equipment fails due to such defects, Datavideo will, at its option, repair or provide a replacement for the defective part or product.
Equipment that fails after the warranty period, has been operated or installed in a manner other than that specified by Datavideo, or has been subjected to abuse or modification, will be repaired for time and material charges at the Buyer's expense.
This warranty does not affect your statutory rights within the Country of purchase.

Disposal

For EU Customers only - WEEE Marking.
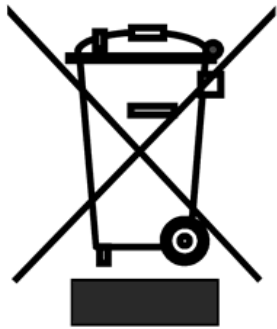
This symbol on the product indicates that it will not be treated as household waste. It must be handed over to the applicable take-back scheme for the recycling of electrical and electronic equipment. For more detailed information about the recycling of this product, please contact your local Datavideo office.

Packing List

The following items should be included in the box. If any items are missing please contact your supplier.

1	x	AD Switch DC12V / 3A
1	x	USB Cable (Y type)
2	x	2.5" Removable HDD Enclosure
10	x	M3 X 4 m/m Screws
2	x	2.0 X 6 m/m Screws
2	x	HD Label
4	x	Label
1	x	Instruction Manual

Introduction

The Datavideo HDR-45 is a hard drive based video recorder & player, with a removable hard drive enclosure. The HDR-45 records from standard and high definition video via SDI with a convenient loop through / pass through for monitoring. RS-422 & RS-232 remote control interface are standard.

The HDR-45 provides a choice of recording formats in MPEG-Ⅱ including 1080i, 720p, 576i and 480i with a choice if IBP or Intra-frame(i-frame).

The recorded files are compatible with a wide range of NLE and play out solutions. The compatible 2U design can be easily integrated with other equipment or can be used as a stand alone recorder / player in the studio or on location.

Features

- HD-SDI & SD-SDI video input (with loop though)
- HDMI output and SDI output
- Video record format:
    - SD: 5Mbps-15Mbps.IBS.4:2:0 colour sampling
    - SD: 50Mbps-IBS.4:2:2 colour sampling
    - HD: 20Mbps-60Mbps.IBS.4:2:0 colour sampling
    - HD: 100Mbps-I frame 4:2:2 colour sampling (1080i only)
    - M2t recording format (Compatible with most NLE systems)
- Audio record format:
    - MPEG-Ⅰ Layer 2
    - Sampling rate: 48KHZ
    - Bit rate: 384 Kbps
- Hard drive enclosure includes convenient USB 2.0 connector and SATA connector
- 2U Height-Half 19'' standard rack mount size
- Audio monitor function
- XLR balanced audio input
- Support RS-422, RS-232 & GPI control interface
- DC In 12V

How to Assemble 2.5" HDD in Removable Rack

1. Remove two screws from the 2.5" removable HDD rack front cover then pull out the PCB.

2. Assemble four screws to fasten 2.5" HDD on PCB.
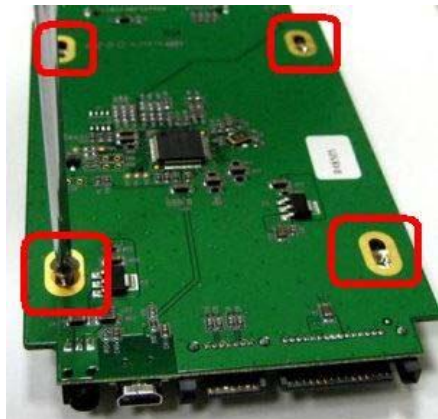
3. Push PCB into the HDD rack
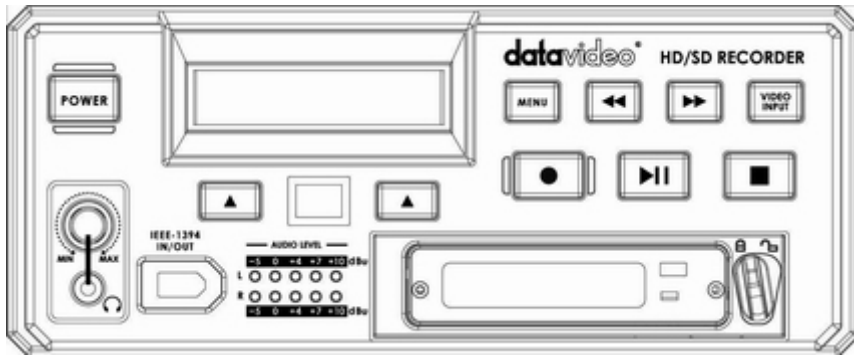

4. Assemble two screws to fasten HD rack front cover.

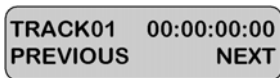**5. Push 2.5" HDD Removable rack into HDR-45 then turn button to left lock the rack.**

Connections & Controls

Front Panel

POWER	Power On / Off Button. This is a soft power on / off button which powers the unit on from a state of standby; the main power on / off switch is on the rear panel.
TRACK01 00:00:00:00 **PREVIOUS NEXT**	Display Panel. Displays the status of the HDR-45. The display will show Track Number, timecode, or if the Menu Button is pressed the Menu Display.
MENU	Menu Button. This calls up the menu display which is navigated using the Fwd / Rew Buttons and Previous / Next Buttons.
◀◀ ▶▶	Fwd / Rew Buttons. In playback mode these buttons will operate as Fast Forward and Rewind Buttons. If the Menu Button is pressed these buttons will navigate backwards and forwards between the various menu options. The HDR-45 has "auto Rewind and Playback" function. You just need to press "Rew" key first +"PLAY" key then the HDR-45 will replay the last segment just recorded (2G file size maximum).
VIDEO INPUT	Video Input Button. Switches the HDR-45 to SDI Input mode.
●	Record Button. Puts the HDR-45 into record mode. To start recording press the Record Button and Play Button simultaneously. ***N.B. Unit will not record if no video signal is present.***
▶❚❚	Play / Pause Button. Starts playback of a track, or pauses playback of a track- status will be displayed on the Display Panel. Also Starts / Pauses a recording when unit is in Record mode
■	Stop Button. Stops playback or record.
▲	Previous / Next Buttons. These buttons navigate up and down between recorded tracks and menu options.
	Audio Level Adjustments allow you to adjust the headphone volume. **Stereo mini jack plug** for stereo headphone. The headphone volume is controlled by the Audio Level Adjustments.
IEEE-1394 IN/OUT	6 Pin DV In/Out Port. This is a convenient front mounted DV / IEEE-1394 Port for connection to a DV / HDV camcorder, or to a PC for file transfer.
AUDIO LEVEL	The Audio Input Level LEDs show the audio input levels from the incoming source.
	2.5" Removable HDD Rack, SATA & USB interface connecting to a PC for file transfer.
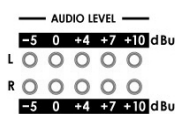
Rear Panel

 The GPI socket can be used for simple external control. The HDR-45 can accept pulse or level trigger inputs, which can trigger record or playback and pause commands *See GPI Mode & Function Menus for more details*.
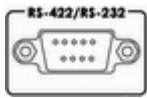
 RS-422 / RS-232 Port. The HDR-45 can be controlled via RS-422 from external devices, or via RS- 232 from PC. The HDR-45 uses standard Sony protocol.

 1 channels XLR Balanced Audio input

 HDMI Out Ports. Ports for connecting to HDMI external devices.

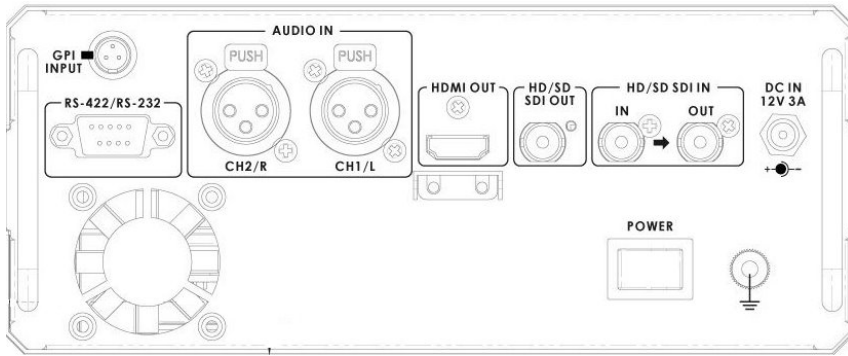 HD- SDI Output. 4:2:2 SDI Video data supports SMPTE 292M standard at 1.5G Mbps.
SDI transfers professional level video signals and it's can connect to long distance transmission systems.
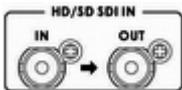
 HD/SD-SDI input and pass-through output connectors.

 DC In Socket. Connect the supplied 12V / 3A PSU to this socket. The connection can be secured by screwing the outer fastening ring of the DC In plug to the socket.

 Power On/Off Switch. Switches the power On / Off.

 Grounding Terminal. When connecting this unit to any other component, make sure that it is properly grounded by connecting this terminal to an appropriate point. When connecting, use the socket and be sure to use wire with a cross-sectional area of at least 1.0 mm2.

Powering On

Connect the HDR-45 power supply to the DC In socket. Ensure the power cable is connected to a suitable mains socket.

POWER   Press the Power Button until it lights up

The LCD display panel should show HDR-45 and after a few seconds the track display should appear and the HDR-45 is ready to go

Datavideo HDR-45	INITIALIZING........ MAIN SYSTEM	TRACK 01 00:00:00:00 PREVIOUS ■ NEXT
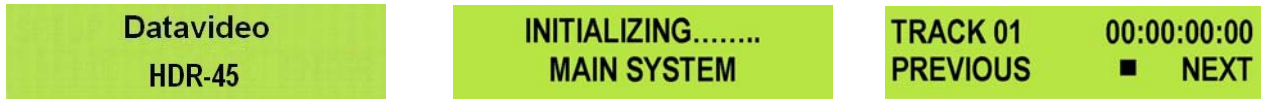
Menu Options

The HDR-45 is a menu driven unit; The menu settings are non-volatile (they are stored even when the unit is switched off), so many of the settings, such as date and time, you will only need to set once. We will look at each individual menu in more detail, but here is a quick overview of them. **N.B.** *Not all menus appear when the Video Input Button is illuminated.*

The Menus are:

HDD MODE
This mode is setting the HDR-45 to HDD mode for drag and drop file transfers to a PC or MAC.
See HDD Mode Menu for more details.

SETUP LOOP PLAY
Sets the HDR-45 to loop play a track; the track will continuously loop until stopped.

FREE SPACE
Displays how much HDD space is available on the HDR-45.

TOTAL SPACE
Displays the total available HDD storage on the HDR-45.

AUDIO INPUT SOURCE
The HDR-45 has two types Audio Input can be set.
- Select **ANALOG AUDIO** is from XLR audio input.
- Select **SDI EMBEDDED AUDIO** is from SDI input.

HD MPEG2 BIT RATE
The HDR-45 has nine modes HD MPEG2 Bit Rate
(20,25,30,35,40,45,50,55,60 Mbps) can be set.
See HD MPEG2 BIT RATE Menu for more details.

SD MPEG2 BIT RATE
The HDR-45 has Three modes SD MPEG2 Bit Rate (5,10,15Mbps) can be set.
See SD MPEG2 BIT RATE Menu for more details.

SET I-FRAME ONLY
Set HDR to encode Intra frame only.

SET 1080i H-RES.

SET 1080i H-RES.
To select the encoding horizontal resolution while input source is 1920x1080i
- Select **1920**, the record format is 1920x1080i.
- Select **1440**, the record format is 1440x1080i.
See *SET 1080i H-RES. Menu for more details.*

SET SD ASPECT RATIO

SET SD ASPECT RATIO
To select the aspect ratio.
- Select **16:9**, the record aspect ratio format is 16:9.
- Select **4:3**, the record aspect ratio format is 4:3.

SET GPI TRIGGER MODE

SET GPI TRIGGER MODE
The HDR-45 has two GPI trigger modes, Pulse or Level trigger can be set.
See GPI Mode & Function Menus for more details.

SELECT GPI FUNCTION

SELECT GPI FUNCTION
The GPI function can be set to either Play / Play Pause or Record / Record Pause.
See GPI Mode & Function Menus for more details.

SET DATE & TIME

SET DATE & TIME
Sets the date and time on the HDR-45; the setting is non-volatile so it is stored when the unit is powered off.
See Set Date & Time Menu for more details.

FORMAT HARD DISK

FORMAT HARD DISK
Formats the HDD and removes all files and tracks from the HDR-45.
See Format Hard Disk Menu for more details.

ERASE TRACK

ERASE TRACK
Erases individual tracks from the HDR-45.
See Erase Track Menu for more details.

HDD SURFACE SCAN

HDD SURFACE SCAN
Checks the HDD for errors / bad sectors. This is only necessary if your HDR-45 is not performing correctly, or you install a new HDD. A result.txt file is created in the root directory of the HDD, this can be viewed from a PC.

HDD MODE CABLE LEN.

HDD MODE CABLE LEN.
The HDR-45 has two types cable mode can be set when connect the HDR to PC or MAC.
- If your IEEE 1394 cable length≦20 M, please select cable mode:
  LONG DISTANCE CABLE.
- If your IEEE 1394 cable length≦1.8 M, please select cable mode:
  SHORT DISTANCE CABLE.

SELECT HDV TYPE

SELECT HDV TYPE
Select the HDV type (via IEEE-1394 input)
- 1440x1080 59.94i
- 1440x1080 50i
- 1280x720 59.94p
- 1280x720 50p

Note: Please check input source is the same with this setting.

SET HDV MONITOR

SET HDV MONITOR
This mode is set HDV monitor Enable or Disable.
When set this mode to enable, HDV input source will pass through to HDMI output.

D-SUB H/W INTERFACE
The 9 pin D-SUB can be set to either RS-422 (differential) or RS-232 (single end) transmission mode
- Select **RS-232** mode, you can control HDR-45 via RS-232 from PC.
- Select **RS-422** mode, you can control HDR-45 via RS-422 from external devices.

UPDATE FP FIRMWARE
When this mode set enable, HDR-45 will into the BOOT Loader mode for upgrade FP firmware.

FIRMWARE VERSION
Display the Rev No. and Firmware Version of the HDR-45

HDD Mode Menu

These Datavideo Recorder are FAT32 based, giving an approximate 2G file limit.
There can't be clips longer than 2Gs, resulting in multiple files per track.
The Open GOP structure of the 1080 stream requires information that contained in these multiple files to have a truly contiguous video/audio file, because of the nature of Open GOP compression.
Some NLE systems do not combine the m2t files when imported, so this needs to be done prior to import. Hence Datavideo provide a utility (M2T_FileCombine.exe) to combine the m2t files.

How to use M2T_FileCombine.exe to combine the .m2t or .dv files

Step1 - Please connect HDR-45 to PC via IEEE1394 or USB cable

Step2 - Open **M2T_FileCombine.exe**

Step3 - Select source from hard disk (HDR-45)

Step4 - Select file **DV_TRACK01(01)** or **M2T_TRACK02(01)** …

Step5 - Click START to edit file name and then press SAVE combine the files.

The HDD Mode Menu will set up the HDR-45 as an external IEEE-1394 (Firewire) drive, for direct drag and drop file transfer to a PC or MAC.
The files appear in the root directory of the HDR-45 hard disk, and are numbered with the track number that appears in the LCD display when you are recording or playing back the track.

The HDR-45 uses a FAT32 file structure, so large tracks are broken down into 2 GB files which are sequentially named:

For example if Track 02 is 1 hour in duration it will appear as follows:
hdv02.m2t(2 GB)   -   hdv02 is the file name for Track 02
hdv02_01.m2t (2 GB)   -   Each 2 GB section is given a sequential _xx numeric extension
hdv02_02.m2t (2 GB)
hdv02_03.m2t (2 GB)
hdv02_04.m2t (2 GB)
hdv02_05.m2t (2 GB)
hdv02_06.m2t (77 MB) -   The last file in the sequence is likely to be smaller than 2GB.

Connecting to a PC / MAC

NB: Although your PC / MAC may see the HDR-45 as an AVC compliant DV Device it is not intended to be operated as such.

Connect the HDR-45 IEEE-1394 output to a PC or MAC.
To set the HDR-45 into HDD Mode firstly press Menu button so that it is illuminated.
You will see the display change to the HDD Mode Menu

Press the Next (▲) Button(right) to select ENTER and the display will show the HDD Enable Confirmation Screen

Press the Next (▲) Button(right) (right) again to confirm, after a few seconds HDD Mode will be enabled

The PC / MAC should recognise that an external IEEE-1394 (Firewire) HDD has been connected. The HDR-45 can be used just like any external drive.

To return the HDR-45 to Deck Mode either use "Safely Remove Hardware" with a PC, or with a MAC use "Eject" or Drag the HDR-45 Drive to "Trash". Once un-mounted the HDR-45 display will return to Track Display.

HD MPEG2 BIT RATE Menu

To select the HD MPEG2 encoding BIT RATE:

Press the Menu Button, to enter the menu mode


```
HDD  MODE
CANCEL          ENTER
```

Press the FWD (►►) Button to navigate the menus until HD MPEG2 BIT RATE is displayed


```
HD  MPEG2  BIT  RATE
CANCEL             ENTER
```

Press the Next (▲) Button(right) to enter the HD MPEG2 BIT RATE menu


```
HD  MPEG2  BIT  RATE
CANCEL             ENTER
```

Use the FWD(►►) or REW(◄◄) Button to select the desire bit rates (20,25,30,35,40,45,50,55,60)


```
 60Mbps  MPEG2
CANCEL             ENTER
```

To confirm your selection and exit the menu press the Next (▲) Button(right).


```
HD  MPEG2  BIT  RATE
CANCEL             ENTER
```

Then press the Menu Button to leave menu mode


```
TRACK 01         00:00:00:00
PREVIOUS      ■    NEXT
```

For example, the table of 120 GB HDD is the reference of **Bit Rate mode** selection.

HDD Type	Bit Rate Mode	Maximum Recordable Time
120GB	20 Mbps	810 minutes 760
120GB	40 Mbps	405 minutes 390
120GB	60 Mbps	270 minutes 260

SD MPEG2 BIT RATE Menu

To select the SD MPEG2 encoding BIT RATE:

Press the Menu Button, to enter the menu mode

HDD MODE
CANCEL   ENTER

Press the FWD (►►) Button to navigate the menus until SD MPEG2 BIT RATE is displayed

SD MPEG2 BIT RATE
CANCEL   ENTER

Press the Next (▲) Button(right) to enter the SD MPEG2 BIT RATE menu

SD MPEG2 BIT RATE
CANCEL   ENTER

Use the FWD(►►) or REW(◄◄) Button to select the desire bit rates (5,10,15)

5Mbps MPEG2
CANCEL   ENTER

To confirm your selection and exit the menu press the Next (▲) Button(right).

SD MPEG2 BIT RATE
CANCEL   ENTER

Then press the Menu Button to leave menu mode

TRACK 01   00:00:00:00
PREVIOUS   ■   NEXT

SET 1080i H-RES. Menu

Press the Menu Button, to enter the menu mode

[MENU]

HDD MODE
CANCEL   ENTER

Press the FWD (►►) Button to navigate the menus until SET 1080i H-RES. is displayed.

[►►]

SET 1080i H-RES.
CANCEL   ENTER

Press the Next (▲) Button(right) to enter the SET 1080i H-RES. menu

[▲]

SET 1080i H-RES.
CANCEL   ENTER

Press the FWD (►►) Button to select either 1440 or 1920.

[►►]

1440   ►
CANCEL   SET

To confirm your selection and exit the menu press the Next (▲) Button(right).

[▲]

SET 1080i H-RES.
CANCEL   ENTER

Then press the Menu Button to leave menu mode

[MENU]

TRACK 01   00:00:00:00
PREVIOUS   ■   NEXT

1080i is the shorthand name of a format of high definition video modes. 1080 is number of horizontal scan lines, and the letter i stands for interlaced.

1080i is a high-definition television (HDTV) video mode. The term usually assumes a widescreen aspect ratio of 16:9, implying a horizontal resolution of 1920 pixels and a frame resolution of 1920 × 1080 or about 2.07 million pixels.

GPI Mode & Functions Menus

The HDR-45 can be set to receive either pulse or level GPI triggers, which can be set to activate Play / Pause or Rec / Pause.

To select the GPI Mode:

Press the Menu Button, to enter menu mode

```
HDD MODE
CANCEL          ENTER
```

Press the FWD (►►) Button to navigate the menus until SET GPI TRIGGER MODE is displayed

```
SET GPI TRIGGER MODE
CANCEL          ENTER
```

Press the Next (▲) Button(right) to enter the SET GPI TRIGGER MODE menu

```
PULSE TRIGGER        ►
CANCEL          SELECT
```

Press the FWD (►►) Button to select either Pulse Trigger or Level Trigger

```
PULSE TRIGGER        ►          LEVEL TRIGGER        ►
CANCEL          SELECT          CANCEL          SELECT
```

To confirm your selection and exit the menu press the Next (▲) Button(right).

```
PULSE TRIGGER        ►          SET GPI TRIGGER MODE
CANCEL          SELECT          CANCEL          ENTER
```

Then press the Menu Button to leave menu mode

```
SET GPI TRIGGER MODE          TRACK 01        00:00:00:00
CANCEL          ENTER          PREVIOUS      ■    NEXT
```

Select the GPI Function

Press the Menu Button, to enter the menu mode

Press the FWD (►►) Button to navigate the menus until SET GPI FUNCTION is displayed

SELECT GPI FUNCTION
CANCEL   ENTER

Press the Next (▲) Button(right) to enter the SET GPI FUNCTION menu

PLAY/PLAY PAUSE   ►
CANCEL   SELECT

Press the FWD (►►) Button to select either Pulse Trigger or Level Trigger

PLAY/PLAY PAUSE   ►
CANCEL   SELECT

RECORD/RECORDPAUSE►
CANCEL   SELECT

To confirm your selection and exit the menu press the Next (▲) Button(right).

RECORD/RECORDPAUSE►
CANCEL   SELECT

SELECT GPI FUNCTION
CANCEL   ENTER

Then press the Menu Button to leave menu mode

SELECT GPI FUNCTION
CANCEL   ENTER

TRACK 01   00:00:00:00
PREVIOUS   ■   NEXT

Set Date & Time Menu

To set the Date & Time on the HDR-45

Press the Menu Button, to enter menu mode

| MENU |

```
HDD MODE
CANCEL          ENTER
```

Press the REW (◄◄) Button to navigate the menus until SET DATE & TIME is displayed

| ◄◄ |

```
SET  DATE  &  TIME
CANCEL          ENTER
```

Press the Next (▲) Button(right) to enter the SET Date & Time menu

| ▲ |

```
16 Feb 2007        12:00
CANCEL             SET
```

You will see a flashing cursor on the date value.
To set the date use the Play/Pause Button to increase the value or the Stop Button to decrease the value

| ►II | Increases Value | ■ | Decreases Value

Use the FWD (►►) Button to move the cursor to the next column to the right i.e. Month / Year / Hours / Minutes or the REW (◄◄) Button to move the cursor back to the left.

| ►► | Moves the cursor to the right | ◄◄ | Moves the cursor to the left

Once you have set the date & time press the Next (▲) Button(right) to exit the menu

| ▲ |

```
16 Oct 2007        14:30        SET  DATE  &  TIME
CANCEL             SET          CANCEL          ENTER
```

Then press the Menu Button to leave menu mode

| MENU |

```
SET  DATE  &  TIME        TRACK 01      00:00:00:00
CANCEL          ENTER      PREVIOUS    ■    NEXT
```

Format Hard Disk Menu

Format Hard Disk will remove all tracks from the hard drive.

Press the Menu Button, to enter menu mode

HDD MODE
CANCEL   ENTER

Press the REW (◄◄) Button to navigate the menus until FORMAT HARD DISK is displayed

FORMAT HARD DISK
CANCEL   ENTER

Press the Next (▲) Button(right) to enter the FORMAT HARD DISK menu

ARE YOU SURE ?
CANCEL   ENTER

You will see ARE YOU SURE? displayed
Press the Next (▲) Button(right)again to confirm that you want to format the hard disk.

FORMATTING HARD DISK
        WAITING .....

FORMAT DONE
     REBOOT SYSTEM

After a few seconds the HDR-45 will reboot and the display will return to normal

INITIALIZING........
MAIN SYSTEM

TRACK 01   00:00:00:00
PREVIOUS   ■   NEXT

Erase Track Menu

Erase Track is used for deleting individual tracks from the HDR-45.

Press the Menu Button, to enter menu mode

HDD MODE
CANCEL   ENTER

Press the REW (◄◄) Button to navigate the menus until ERASE TRACK is displayed

ERASE TRACK
CANCEL   ENTER

Press the Next (▲) Button(right) to enter the ERASE TRACK menu

TRACK 01   00:00:10:15
CANCEL   ERASE

Use the FWD (►►) or REW (◄◄) Button to select the track that you want to erase - (Track 01 in this case)

TRACK 01   00:00:10:15
CANCEL   ERASE

Press the Next (▲) Button(right) to erase the selected track - The track duration will return to 00:00:00:00

TRACK 01   00:00:10:15
CANCEL   ERASE

TRACK 01   00:00:00:00
CANCEL   ERASE

Then press the Menu Button to leave menu mode

TRACK 01   00:00:00:00
CANCEL   ERASE

TRACK 01   00:00:00:00
PREVIOUS   ■   NEXT

HDD Surface Scan Menu

Surface scan is a utility which checks the disc surface for errors and bad sectors. It is not generally necessary to use Surface Scan unless your HDR-45 is not performing correctly, or you have changed the HDD.

To run Surface Scan press the Menu Button to enter menu mode.

```
HDD MODE
CANCEL          ENTER
```

Press the REW (◄◄) Button to navigate the menus until SCAN HDD SURFACE is displayed

```
HDD  SURFACE  SCAN
CANCEL          ENTER
```

Press the Next (▲) Button(right) twice to start the HDD Surface Scan.

```
ARE YOU SURE ?              HDD  SURFACE  SCAN
CANCEL          ENTER       SCANNING  >   1% DONE
```

The progress of the scan will appear in the LCD display. Once complete the Surface Scan Done message will appear. Press the Next (▲) Button(right) to exit the surface scan.

```
HDD  SURFACE  SCAN         SURFACE  SCAN   DONE !
SCANNING  >   1% DONE      CHECK  RESULT .T XT  OK
```

A txt file called Result will have been created in the root directory of the HDR-45 HDD, this can be accessed via a PC, by connecting the HDR-45 as a HDD.

Playing a Track

It is playback M2T tracks to analogue monitors or recorders via the HDMI video outputs.

Use the Previous (▲) / Next (▲) Button(right)s to select the track you want to play, and then press the Play (►II) Button.

▲	TRACK 02 01:25:12:09 PREVIOUS ■ NEXT	►II

It is also possible to set the HDR-45 to loop play. In loop play the track will looped until stopped.
To set up loop play press the Menu Button to enter menu mode and then the FWD (►►) Button until SETUP LOOP PLAY is displayed.

MENU	✚ ►►	SETUP LOOP PLAY CANCEL ENTER

Press the Next (▲) Button(right) to enter the setup loop play menu, and then press the FWD (►►) Button to select ENABLE

▲	DISABLE ► CANCEL SET	►►	ENABLE ► CANCEL SET

Press the Next (▲) Button(right) to select SET and then press the Menu Button to return to track display.

▲	SETUP LOOP PLAY CANCEL ENTER	MENU TRACK 02 01:25:12:09 PREVIOUS ■ NEXT

When you press play the selected track will start playing, and will loop until the Stop (■) Button is pressed.
To cancel loop playback, follow the above procedure but select disable instead of enable.

Recording a track

Press the Video Input Button so that it is illuminated. You should see the video source on your output monitor

Use the Next / Previous Buttons to select an empty track from the HDR-45 track list, one that shows a duration of 00:00:00:00 in the LCD display.

 Not suitable - Track has been recorded   Suitable - Track is empty

Press both the Record and Play/Pause Buttons simultaneously and the HDR-45 should start recording.

   The counter should start counting and the REC symbol should appear

If it does not start recording check the following:

There is an video input present.

The Video Input Button is illuminated

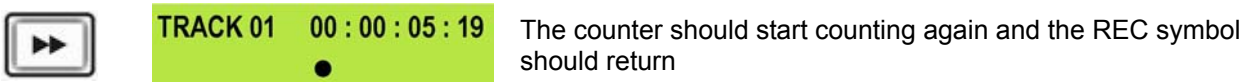The track you have selected on the HDR-45 is empty. The counter next to the TrackNo on the LCD display should b showing 00:00:00:00.

There is some available space on the HDR-45 Hard Disk - Go to the FREE SPACE Menu and check that the HDR-45 is not full.

During record you can pause the HDR-45 by pressing the Play/Pause button, the counter on the LCD display will stop.

   The counter should stop counting and the REC PAUSE symbol should appear
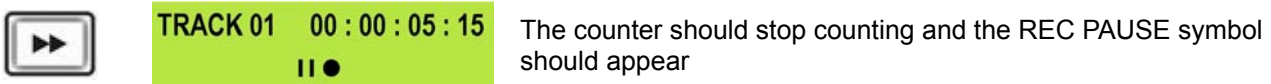
To release pause press the Play/Pause button again.

   The counter should start counting again and the REC symbol should return

N.B. It is not possible to stop recording and then restart on the same track, once a track has been stopped you must select a new empty track from the HDR-45 to start recording again.

Connecting to a Computer

Files that have been recorded onto the HDR-45 can be transferred directly to a PC or MAC via the IEEE-1394 (iLink, FireWire) port.

The files appear in the root directory of the HDR-45 hard disk, and are numbered with the track number that appears in the LCD display when you are recording or playing back the track.

The HDR-45 uses a FAT32 file structure, so large tracks are broken down into 2 GB files which are sequentially named:

For example if Track 02 is 1 hour in duration it will appear as follows:

hdv02.m2t (2 GB)   -   hdv02 is the file name for Track 02
hdv02_01.m2t (2 GB)   -   Each 2 GB section is given a sequential _xx numeric extension
hdv02_02.m2t (2 GB)
hdv02_03.m2t (2 GB)
hdv02_04.m2t (2 GB)
hdv02_05.m2t (2 GB)
hdv02_06.m2t (77 MB) -   The last file in the sequence is likely to be smaller than 2GB.

Once transferred to a PC / MAC files can be dropped onto a timeline, in a suitable NLE application, and they will playback seamlessly.

Connecting to a PC

NB: Although a PC may see the HDR-45 as an AVC compliant DV Device it is not intended to be operated as such.

If your PC sees an AVC DV Device select Take No Action.
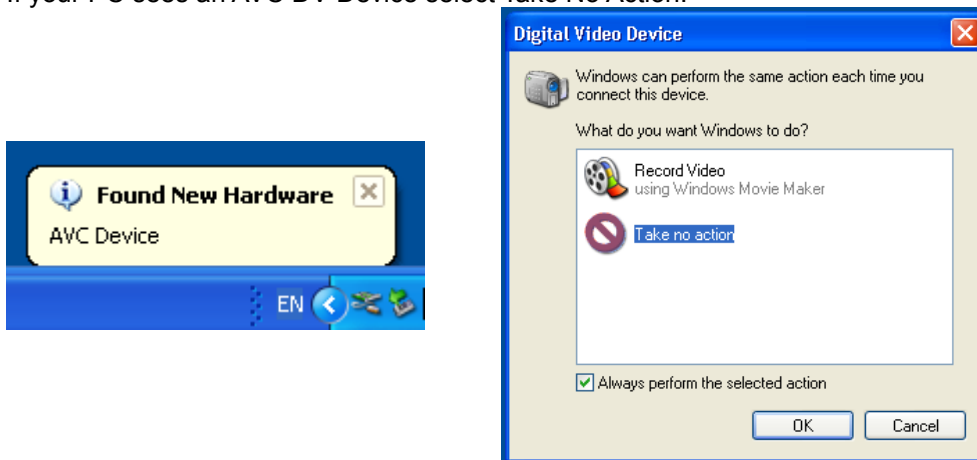
Connect the HDR-45 IEEE-1394 output to a PC.
To set the HDR-45 into HDD Mode firstly press the Menu button so that it is illuminated.
You will see the display change to the HDD Mode Menu

Press the Next (▲) Button(right) to select ENTER and the display will show the HDD Enable Confirmation Screen



Press the Next (▲) Button(right) again to confirm, after a few seconds HDD Mode will be enabled

The PC should recognise that an external IEEE-1394 (Firewire)HDD has been connected. Select Open Folder to View Files. The drive should also appear in My Computer as an internal HDD. Once connected the HDR-45 can be used just like any HDD. You can select the required files and drag and drop them to the required destination.
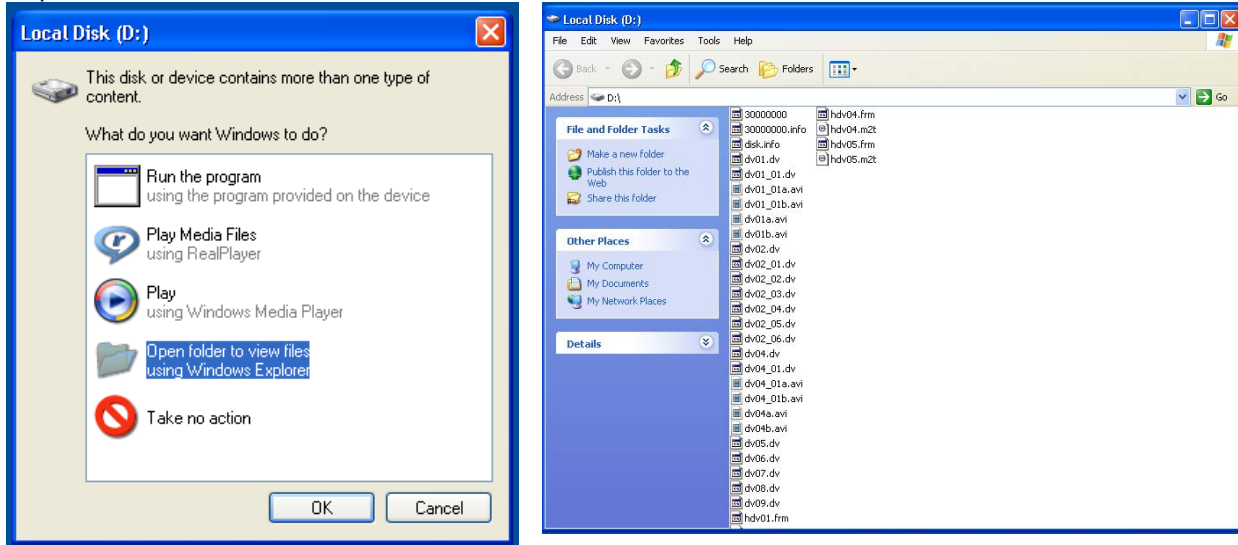
To return the HDR-45 to Deck Mode use "Safely Remove Hardware". You will find "Safely Remove Hardware" on the Taskbar.

Double click on Safely Remove Hardware and the dialog box will appear, select the Datavideo HDD IEEE SBP2 Device and click on Stop. A second dialog box will appear.
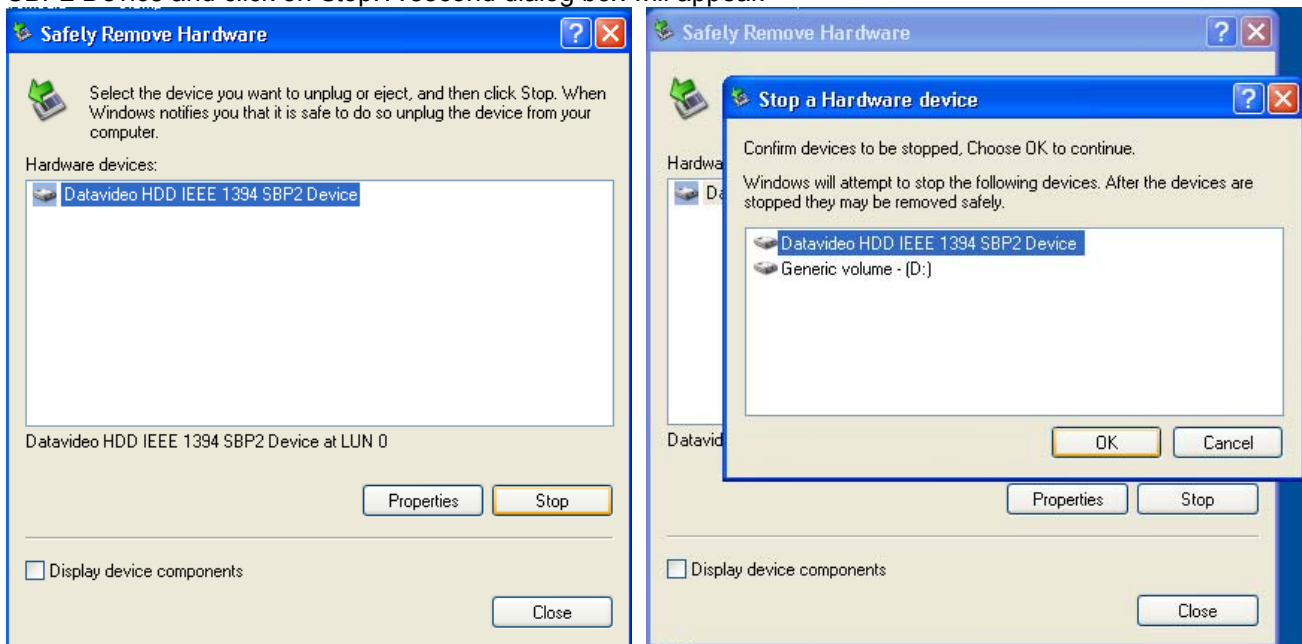
Select Datavideo HDD IEEE SBP2 Device and click on OK. After a few seconds a "Safe To Remove Hardware" message should appear above the Taskbar. You can then disconnect the HDR-45.

Once un-mounted from the PC the HDR-45 display will leave HDD Mode and return to Track Display.

Connecting to a MAC

NB: Although a MAC may see the HDR-45 as an AVC compliant DV Device it is not intended to be operated as such.

Connect the HDR-45 IEEE-1394 output to a MAC.
To set the HDR-45 into HDD Mode firstly press the Menu button so that it is illuminated.
You will see the display change to the HDD Mode Menu

HDD MODE
CANCEL   ENTER

Press the Next (▲) Button(right) to select ENTER and the display will show the HDD Enable Confirmation Screen

ENABLE HDD MODE?
CANCEL   ENTER

Press the Next (▲) Button(right) again to confirm, after a few seconds HDD Mode will be enabled


PLEASE WAIT…   HDD MODE ENABLED

The MAC should see the HDR-45 as a HDD and the files will appear in the root directory of the drive.
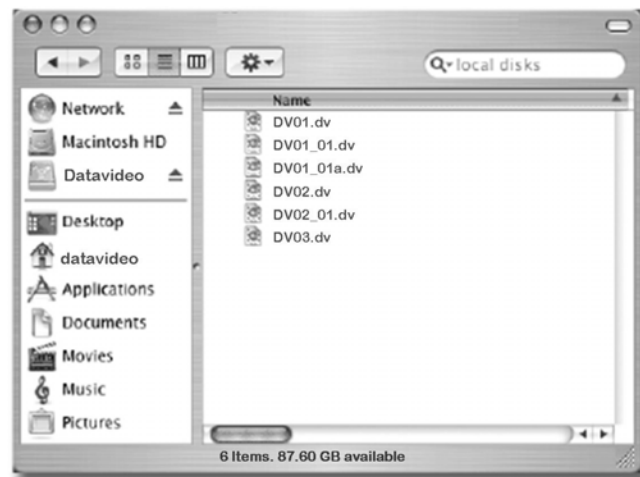
You can select the required files and drag and drop them to the required destination.

To un-mount the HDR-45 from your MAC either "Eject" the drive, or drag it to the Trash Can. Once the HDR-45 is un-mounted from the MAC the LCD display will return to normal.

HDD MODE ENABLED   TRACK 02   01:25:12:09
                          PREVIOUS   ■   NEXT

RS-422 Protocol Reference V1.0

1. Interface Overview

1   Conforming to EIA RS-422A.
2   Full duplex communications channel is utilized.
3   Data is transmitted asynchronously, bit serial, word serial with data exchange between devices.
4   Standard transmission rate on the interface bus is 38400 bits per seconds (bps)
5   The data word utilized by the interface system is as follows :

START BIT	D0	D1	D2	D3	D4	D5	D6	D7	PARITY (ODD)	STOP BIT
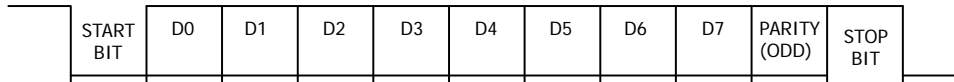
6   1 Start bit + 8 Data bits + 1 Parity bit + 1 Stop bit. Odd Parity

ODD parity : The total of "1"s in D0+D1+ . . . D7+PARITY equals an odd number.

2. Command Block Format

The data communication is composed of the **CMD-1/DATA COUNT** byte, the **CMD-2** byte, optional **DATA** bytes and the **CHECKSUM** byte. Commands are transmitted in order from the MSB (Most Significant Byte) to the LSB (Least Significant Byte). This means that when using the examples in this manual, the order in which the bytes are read is the same order in which they are transmitted. When the **DATA COUNT** nibble is 0, no **DATA** bytes are transmitted or required (the **CMD-1/DATA COUNT** byte, **CMD-2** byte and **CHECKSUM** byte are still transmitted). When the **DATA COUNT** nibble is not 0, the number of **DATA** bytes transmitted must correspond with the **DATA COUNT**. These bytes are inserted between the **CMD-2** byte and **CHECKSUM** byte.

COMMAND BLOCK FORMAT
The data communication between the controller and the device is performed as follows:

Name	CMD-1	Data Count	CMD-2	Data 0~15 (per Data Count)	Checksum
Nibble	MSN	LSN			
Size	1 Byte		1 Byte	0..15 Byte(s)	1 Byte

- MSN stands for Most Significant Nibble (4 bits)
- LSN stands for Least Significant Nibble (4 bits)

COMMAND CONTENTS
CMD-1:
This is the first (Most Significant) nibble of the first byte of the command. The DATA COUNT (below) fills the lower (Least Significant) nibble. It (**CMD-1**) indicates the command or return group to which the command belongs as per the table below

CMD-1	Function	Initiator
0x	System Control	Controller
1x	System Control Return	Device (HDR-45/55)
2x	Transport Control	Controller
4x	Preset And Select Control	Controller
6x	Sense Request	Controller
7x	Sense Return	Device (HDR-45/55)
Ex	DVR Control	Controller
Fx	DVR Return	Device (HDR-45/55)

DATA COUNT:
This is the second (Least Significant) nibble of the first byte of the command. The upper (Most Significant) nibble is filled by the **CMD-1** (above). It indicates the number of data bytes (0-15) that are required to be inserted between the **CMD-2** byte and the **CHECKSUM** byte.

CMD-2:
Designates the exact command within the section specified by **CMD-1**.

DATA 0..15:
If the command requires extended data, the **DATA COUNT** will be set to between 1 and 15 (a 0 indicates that no extra data is required). These bytes will be placed here.

CHECKSUM:
This byte is used to check the data for communication errors. To calculate the checksum, each byte of the command (**CMD-1**+**DATA COUNT**, **CMD-2**, and any **DATA BYTES**) are added together. The least significant 8 bits (1 byte) are then truncated to create a 1-byte checksum.

I.e.: The command "61.0C.03" becomes

	MSB	LSB	
	0110	0001	(=61)
	0000	1100	(=0C)
+)	0000	0011	(=03)
	0111	0001	(=70)

CHECKSUM = "70"
Therefore, the complete command is "61.0C.03.70"

3. Connector Pin Assignment

Interface : 9 pin D-Sub female
The RS-422 pin assignment of the Controller and HDR-45/55 is shown in the following table:

Signal Pin	Controller	HDR-45/55
1	Frame Ground	Frame Ground
2	Receive A(RX-)	Transmit A(TX-)
3	Transmit B(TX+)	Receive B(RX+)
4	Transmit Common	Receive Common
5	Spare	Spare
6	Receive Common	Transmit Common
7	Receive B(RX+)	Transmit B(TX+)
8	Transmit A(TX-)	Receive A(RX-)
9	Frame Ground	Frame Ground

The RS-232 pin assignment of the Controller and HDR-45/55 is shown in the following table:

Signal Pin	Controller	HDR-45/55
1	-	-
2	Receive (RX)	Transmit (TX)
3	Transmit (TX)	Receive (RX)
4	-	-
5	GND	GND
6	-	-
7	-	-
8	-	-
9	-	-

4. Communication Protocol

- All communications between the CONTROLLER and the DEVICE will be under the direct supervision of the CONTROLLER.

  When the DEVICE (HDR-45/55) receives the COMMAND from CONTROLLER, the following COMMAND is returned.

ACK:	In case that the DEVICE receives a COMMAND not requiring data
COMMAND+DATA:	In case that the DEVICE receives a COMMAND requiring data
NAK+ERROR DATA:	In case that a communication error is detected or an undefined
	COMMAND is received

- The CONTROLLER must not transmit additional COMMAND blocks to a DEVICE (HDR-45/55) prior to response to a previous COMMAND block.

- The CONTROLLER must transmit of bytes in a COMMAND block for with intervals less than 10 milliseconds. If a DEVICE (HDR-45/55) detects an interruption of a byte in a COMMAND block that exceeds 10 milliseconds, it executes a TIME-OUT error sequence, voids the receiving COMMAND block, and transmit a NAK (TIME OUT).

- When a DEVICE (HDR-45/55) receives a COMMAND block from the CONTROLLER, the DEVICE must transmit a response within 9 milliseconds. Therefore if the CONTROLLER cannot receive the appropriate response from the DEVICE within 10 milliseconds after transmitting the COMMAND block the CONTROLLER detects a communication error, and must execute an appropriate process.

- When a DEVICE (HDR-45/55) detects a communication error, it must immediately transmit a NAK to the CONTROLLER. (The content of an error is shown on the COMMAND tables.)   When the CONTROLLER receives a NAK, if must immediately stop transmission of the block. The DEVICE must not accept a subsequent command within 10 milliseconds after that (except NAK-UNDEFINED command) and must execute a necessary process.

5. Command Table (without Checksum byte)

Command	Name	Response	Name
10h 01h	Acknowledge (ACK) – command succeeded		
12h 11h	Device Return		
11h 12h	Negative Acknowledge (NAK) – command failed		
00h 11h	Device Type Request	12h 11h	Device Type Response
20h 00h	Stop	10h 01h	ACK
20h 01h	Play	10h 01h	ACK
20h 02h	Record	10h 01h	ACK
20h 10h	Fast Forward	10h 01h	ACK
2xh 13h	Shuttle Forward	10h 01h	ACK
21h 13h 00h	Pause	10h 01h	ACK
20h 20h	Fast Rewind	10h 01h	ACK
2xh 23h	Shuttle Rewind	10h 01h	ACK
40h 50h	Next Track	10h 01h	ACK
40h 51h	Previous Track	10h 01h	ACK
40h 54h	Delete Current Track	10h 01h	ACK
40h 62h	Enable HDD mode	10h 01h	ACK
41h 52h nnh mmh	Select Track (Track 01 ~ 99)	10h 01h	ACK
42h 52h nnh mmh	Select Track (Track 001 ~ 999)	10h 01h	ACK
41h 53h nnh	Select Video Input Source	10h 01h	ACK
41h 61h nnh	Select Audio Input Source	10h 01h	ACK
61h 0Ch 01h	Current Time Sense	74h 04h	Current Time
61h 20h	Status Sense	7xh 20h	Current Status
E0h 01h	Get Length of Current Track	F4h 01h	Length of Track
E0h 02h	Current Video Sourc Sense	F1h 02h	Video Source Number
E0h 03h	Current Audio Source Sense	F1h 03h	Audio Source Number
E0h 04h	Current Track Number Data Sense (Track 01 ~ 99)	F1h 04h	Track Number (BCD)
E0h 05h	Current Track Number Data Sense (Track 001 ~ 999)	F2h 05h	Track Number (BCD)
E6h 06h	Current Encode Bit Rate Sense	F1h 06h	Bit Rate
E2h 10h 01h nnh	Set Loop Play	10h 01h	ACK
E3h 10h AAh 55h 01h	Format Hard Disk	10h 01h	ACK

6. Detailed Description of Commands

00h 11h : DEVICE TYPE REQUEST
Send: 00h 11h 11h
Return: 12h 11h B0h 12h E4h (HDR-45/55)

20h 00h : STOP
Send: 20h 00h 20h
Return: 10h 01h 11h

20h 01h : PLAY
Send: 20h 01h 21h
Return: 10h 01h 11h

20h 02h : RECORD
Send: 20h 02h 22h
Return: 10h 01h 11h

20h 10h : FAST FORWARD
Send: 20h 10h 30h
Return: 10h 01h 11h

2xh 13h : SHUTTLE FORWARD
Send: 21h 13h 01h 35h
Return: 10h 01h 11h

21h 13h 00h : PAUSE
Send: 21h 13h 00h 34h
Return: 10h 01h 11h

20h 20h : FAST REWIND
Send: 20h 20h 40h
Return: 10h 01h 11h

2xh 23h : SHUTTLE REWIND
Send: 21h 23h 01h 45h
Return: 10h 01h 11h

40h 50h : NEXT TRACK
Send: 40h 50h 90h
Return: 10h 01h 11h

40h 51h : PREVIOUS TRACK
Send: 40h 51h 91h
Return: 10h 01h 11h

40h 54h : DELETE CURRENT TRACK
Send: 40h 54h 94h
Return: 10h 01h 11h

40h 62h : ENABLE HDD MODE
Send: 40h 62h A2h
Return: 10h 01h 11h

41h 52h NNh : SELECT TRACK NUMBER (Track 01 ~ 99)
NN = Track Number
Send: 41h 52h 01h 94h   (Select Track 1)
Return: 10h 01h 11h
Send: 41h 52h 10h A3h (Select Track 16)
Return: 10h 01h 11h

42h 52h NNh MMh : SELECT TRACK NUMBER (Track 001 ~ 999)
NN = Track Number (Hex) % 100h
MM = Track Number (Hex) / 100h
Set track number to 900(384h):
NN = 384h % 100h = 84h (quotient)
MM = 384h / 100h = 03h
Send: 42h 52h 84h 03h 1Bh (Select Track 900)
Return: 10h 01h 11h
Set track number to 168(A8h):
NN = A8h % 100h = A8h (quotient)
MM = A8h / 100h = 00h
Send: 42h 52h A8h 00h 3Ch (Select Track 168)
Return: 10h 01h 11h

41h 53h NNh : SELECT VIDEO INPUT SOURCE
NN = Video Source,   1 = SDI, 2 = Decode MPEG-2
Send: 41h 53h 01h 95h (SDI input)
Return: 10h 01h 11h
Send: 41h 53h 02h 96h (Decode MPEG-2)
Return: 10h 01h 11h

41h 61h NNh : SELECT AUDIO INPUT SOURCE
    NN = Audio Source, 0 = Analog audio, 1 = SDI Embedded Audio
    Send: 41h 61h 00h A2h (Analog audio input)
    Return: 10h 01h 11h
    Send: 41h 61h 01h A3h (SDI Embedded Audio)
    Return: 10h 01h 11h

41h 63h NNh : SELECT SD VIDEO ASPECT RATIO
    NN = Aspect Ratio, 2 = 4:3, 3 = 16:9, 0, 1 = Reserved
    Send: 41h 63h 02h A6h (SD video aspect ratio = 4:3)
    Return: 10h 01h 11h
    Send: 41h 63h 03h A7h (SD video aspect ratio = 16:9)
    Return: 10h 01h 11h

61h 0Ch 01h : CURRENT TIME SENSE
    Send: 61h 0Ch 01h 6Eh
    Return: 74h 04h 01h 02h 03h 04h 82h (Time code   04:03:02:01)

61h 20h : STATUS SENSE
    DATA-1 Most Significant Nibble = 1st status data byte number to be returned
    DATA-1 Least Significant Nibble = number of status data bytes to be returned
    Send: 61h 20h 03h 84h (return data byte 0, 1, and 2)
    Return: 73h 20h 00h 81h 80h 94h
    Send: 61h 20h A1h 22h (return the current track number)
    Return: 71h 20h 99h 2Ah (Current track number is 99)

E0h 01h : TRACK LENGTH SENSE
    Send: E0h 01h E1h
    Return: F4h 01h 29h 41h 56h 00h B5h (Track Length 00:56:41:29)

E0h 02h : CURRENT VIDEO SOURCE SENSE
    1 = SDI, 2 = Decode MPEG-2
    Send: E0h 02h E2h
    Return: F1h 02h 01h F4h   (SDI Input)
    Send: E0H 02h E2h
    Return: F1h 02h 02h F5h (Decode MPEG-2)

E0h 03h : CURRENT AUDIO SOURCE SENSE
    0 = Analog audio, 1 = SDI Embedded Audio
    Send: E0h 03h E3h
    Return: F1h 03h 00h F4h   (Analogue Input)

E0h 04h : CURRENT TRACK NUMBER SENSE
    Send: E0h 04h E4h
    Return: F1h 04h 17h 0Ch (Current Track Number is 17<BCD>)

E0h 05h : CURRENT TRACK NUMBER SENSE (Track 001 ~ 999)
    Send: E0h 05h E5h
    Return: F2h 05h 17h 01h 0Fh (Current Track Number is 117 <BCD>)

E0h 06h : CURRENT ENCODE BIT RATE SENSE
    Send: E0h 06h E6h
    Return: F1h 06h 3Ch 33h (I-Frame Only = Disable, Current Bit Rate = 60Mbps)

E2h 10h 01h NNH: Set Loop Play
    NN = Disable (00h) or Enable (01h)
    Send: E2h 10h 01h 00h F3h (Disable Loop Play)
    Return: 10h 01h 11h
    Send: E2h 10h 01h 01h F4h (Enable Loop Play)
    Return 10h 01h 11h

E3h 10h AAh 55h 01h : Format Hard Disk
    Send: E3h 10h AAh 55h 01h F3h
    Return: 10h 01h 11h

7. Return Data

10h 01h : ACK

When a command from the CONTROLLER is received normally, the DEVICE returns this command as acknowledgment.

11h 12h : NAK

When a communication error is detected or an undefined COMMAND is received, the DEVICE returns this command as not-acknowledgment. BIT-7 to BIT-0 of DATA-1 will be set in accordance with the contents.
[DATA-1]

BIT-7	BIT-6	BIT-5	BIT-4	BIT-3	BIT-2	BIT-1	BIT-0
TIME OUT	FRAMING ERROR	OVERRUN ERROR	PARITY ERROR	INHIBIT	CHECKSUM ERROR	SOFTWARE OVERRUN	UNDEFINED COMMAND

12h 11h : DEVICE TYTPE

The "00h 11h : DEVICE TYPE REQUEST" command is used for asking the specifications of the HDR-45/55 used as DEVICE. When the DEVICE receives this command, it attaches 2-bytes specification data to "12h 11h : DEVICE TYPE" and sends the information to the CONTROLLER.
HDR-45/55:　　　　12h 11h B0h 12h

74h 04h : Current Time Code (BCD)

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data 0	0	0	Tens of Frames		Frames			
Data 1	0	Tens of Seconds			Seconds			
Data 2	0	Tens of Minutes			Minutes			
Data 3	0	0	Tens of Hours		Hours			

Send: 61h 0Ch 01h 6Eh

Return: 74h 04h 01h 02h 03h 04h 82h   (Time code   04:03:02:01)

F4h 01h : Length of Current Track (BCD)

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data 0	0	0	Tens of Frames		Frames			
Data 1	0	Tens of Seconds			Seconds			
Data 2	0	Tens of Minutes			Minutes			
Data 3	0	0	Tens of Hours		Hours			

Send: E0h 01h E1h

Return: F4h 01h 29h 41h 56h 00h B5h (Track Length 00:56:41:29)

F1h 04h : Current Track Number (BCD) (Track 01 ~ 99)

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data 0	Tens of Track Number (BCD)				Track Number (BCD)			

Send: E0h 04h E4h
Return: F1h 04h 17h 0Ch (Current Track Number is 17 <BCD>)

F2h 05h : Current Track Number (BCD) (Track 001 ~ 999)

	Bit 7	Bit	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data 0	Tens of Track Number (BCD)				Track Number (BCD)			
Data 1	0				Hundreds of Track Number (BCD)			

Send: E0h 05h E5h
Return: F2h 05h 17h 01h 0Fh (Current Track Number is 117 <BCD>)

F1h 06h : Current Bit Rate

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data 0	I-Frame Only	Current Encode Bit Rate (Hex)						

Bit 7, I-Frame Only : 0 = Disable, 1 = Enable
Bit 6 ~ Bit 0 : Current Encode Bit Rate (Hex)
Send: E0h 06h E6h
Return: F1h 06h 1Eh 15h (I-Frame Only Disable, Current Bit rate = 30Mbps)
Send: E0h 06h E6h
Return: F1h 06h B2h A9h (I-Frame Only Enable, Current Bit rate = 50Mbps)
If I-Frame Only is enable then Bit Rate will be fixed at
HD: 100Mbps,   SD: 50Mbps

8. Status return data

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data 0	Busy		Disk Out			Hardware Error		Local
Data 1	Standby On		Stop	Eject	Rewind	Fast Forward	Record	Play
Data 2			Shuttle			Reverse	Still	
Data 3								
Data 4								
Data 5								
Data 6		Lamp Still	Lamp Forward	Lamp Reverse				
Data 7								
Data 8				Disk Full				Record Inhibit
Data 9	SD Aspect Ratio		HDV Type		HDV Monitor	GPI Mode	GPI Function	Loop Play
Data 10	Tens of Track Number(BCD) 0~9				Track Numbers(BCD) 0~9			
Data 11	0				Hundreds of Track Number (BCD) 0~9			
Data 10								
Data 13								
Data 14			SDI Embedded	Analogue Audio		Decode MPEG-2	Encode SDI	
Data 15								

Data-0

BIT-0   **LOCAL**
This bit will be set to 1 when the device will only accept commands from the front panel, and not the controller (RS-232/422).

BIT-2   **HARDWARE ERROR**
This bit will set to 1 when a hardware error occurs in the device.

BIT-5   **DISK OUT**
The removable media is not present in the device.

BIT-7   **BUSY**
This bit is set to 1 if the device is currently unable to accept motion commands. Sense commands will be accepted.

Data-1

BIT-0   **PLAY**
This bit will be set to 1 when the device goes into the PLAY mode.

BIT-1   **RECORD**

This bit will set to 1 when the device goes into the REC mode.

BIT-2 **FAST FORWARD**
This bit will be set to 1 when the device goes into the FAST FORWARD mode.

BIT-3 **REWIND**
This bit will be set to 1 when the device goes into the FAST REWIND mode.

BIT-4 **EJECT**
This bit will be set to 1 when the device EJECTs hard disk.

BIT-5 **STOP**
This bit will be set to 1 when the device is in STOP mode.

Data-2

BIT-1 **STILL**
This bit will be set to 1 when the device is paused and displays the current frame.

BIT-2 **REVERSE**
This bit will be set to 1 when the device is outputting its material in reverse of the normal order. When moving in the normal direction, it will be 0.

BIT-5 **SHUTTLE**
This bit will be set to 1 when the device goes into SHUTTLE command mode.

Data-6

BIT-4 **LAMP REVERSE**
This bit will be set to 1 when the device is searching backwards.

BIT-5 **LAMP FORWARD**
This bit will be set to 1 when the device is searching forwards.

BIT-6 **LAMP STILL**
This bit will be set to 1 when the device has finished searching.

Data-8

BIT-0 **TRACK IS NOT EMPTY (REC INHIBIT)**
If this bit is set to 1, record command will be ignored. (it is not an empty track)

BIT-4 **DISK FULL**
Set to 1 if the device has reached the end of hard disk.

Data-9

BIT-0 **LOOP PLAY STATUS**
If this bit is set to 1, Loop Play is enable

BIT-1 **GPI FUNCTION**
0: RECORD/RECORD PAUSE
1: PLAY/PLAY PAUSE

BIT-2 **GPI MODE**
0: Edge/Pulse Trigger
1: Level Trigger

BIT-3 **HDV MONITOR**
This bit will set to 1 when the HDV monitor mode is enable

BIT-4~5 **HDV TYPE**
00: 1080 59i
01: 1080 50i
10: 720 59p
11: 720 50p

BIT-6~7 **SD ASPECT RATIO**
00 : Reserved
01 : Reserved
10 : 4:3
11 : 16:9

Data-10

BIT-0 ~ 3 **TRACK NUMBER**
Track number in BCD.

BIT-4 ~ 8 **TENS OF TRACK NUMBER**
Tens of Track number in BCD

Data-11

BIT-0 ~ 3 **HUNDREDS OF TRACK NUMBER**
    Hundreds of Track number in BCD

BIT-4 ~ 7 **0**

Data-14

BIT-1   **ENCODE SDI**
         This bit will be set to 1 if the device is encoding SDI source.

BIT-2   **DECODE MPEG-2**
         This bit will be set to 1 if the device is decoding MPEG-2.
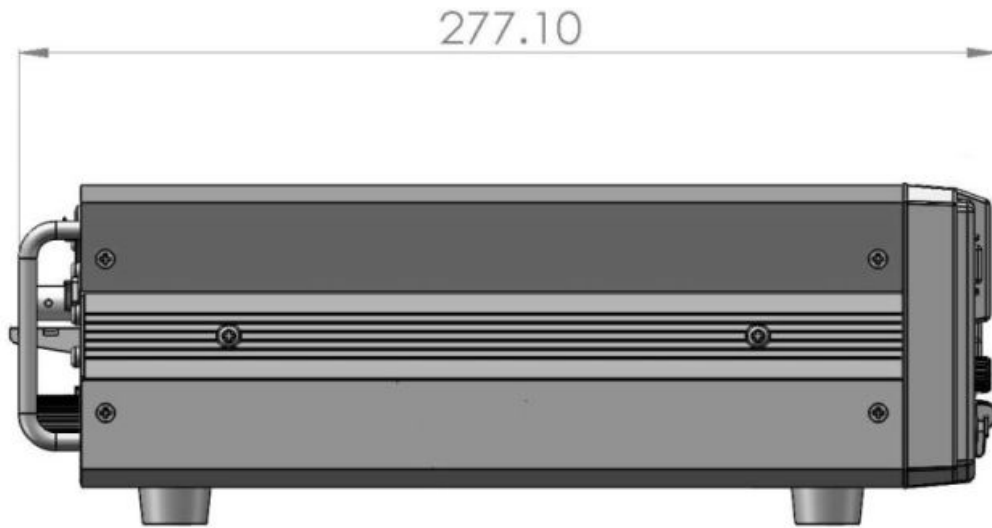
BIT-4   **ANALOGUE AUDIO**
         This bit will be set to 1 if the audio input source is analogue.

BIT-5   **SDI EMBEDDED**
         This bit will be set to 1 if the audio input source is SDI embedded audio.

Revision History:

Rev.	Description	Date	FP Rev.	MB Rev.
1.0	1. Initial release		V1.0.0	V1.5.0

Dimension

Specifications

Inputs Interface	• 1x BNC connector for HD/SD-SDI input • 2x XLR connector for audio input
Outputs Interface	• 1x BNC connector for HD/SD-SDI pass through output • 1x BNC connector for SDI output • 1x HDMI connector for HDMI output (1.1)
Record format	• Video：MPEG2 (.M2T) • Audio：MPEG1 Layer2 • Audio Bit rate：384Kbps • Audio Resolution：16bit
Other Interface	• 1x Mini XLR connector for GPI remote control • 1x D-Sub(9 Pin) for RS-422 or RS-232 either one • 1x IEEE-1394 Port for connection to PC, MAC and HDV device. • 1x Phone plugs for audio monitor output
Video Input	• HD (1080i/50　- 1080/59.94i – 720p/50 – 720/59.94p) • SD (480/59.94i, 576/50i)
HD SDI signal	SMPTE 292 standard complied with • Output return loss : More than 15 dB (5MHz to 750MHz) 　More than 10 dB (750MHz to 1.5 GHz) • Output level : 0.8 Vpp ± 10% • Rise time : Less than 270 ps • Fall time : Less than 270 ps • Difference between rise time and fall time within 100 ps • Alignment jitter : Less than 0.2 UI • Timing jitter : Less than 1.0 UI • Eye aperture ratio : More than 90% • DC offset : 0 ± 0.5V • Equalizer use 5C-FB cable support 100 meters
SD SDI signal	SMPTE 259M standard complied with • Output return loss : More than 15dB(5MHz to 270MHz) • Output level : 0.8Vpp ± 10% • Rise time : less than 1.5ns • Fall time : less than 1.5ns • Difference between rise time and fall time less than 0.5ns • Jitter less than : 0.2 UI
Audio	• Bandwidth 20~20KHz < +/- 3dB • S/N Ratio > 70 dB • THD. < 0.1%
Operating Temperature	• 0°C to 40°C **(32°F to 102°F)**
Humidity	• 10% to 90% (non condensing)
Dimension & Weight	• 211mm (W) x 280mm (D) x 97mm (H) / 3Kgs
Power	• Input AC 100 ~ 240V Switching Adaptor, Output DC 12V / 3A

Service & Support

It is our goal to make your products ownership a satisfying experience. Our supporting staff is available to assist you in setting up and operating your system. Please refer to our web site www.datavideo-tek.com for answers to common questions, support requests or contact your local office below.

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