HD HDD Recorder

HDR-200

with HS-1000

USER GUIDE

Rev 060809

www.datavideo-tek.com

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 12 months 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.

Item	Description	Q'ty
1	HDR-200 HD HDD Recorder	1
2	Power Supply (12V/4.2A)	1
3	AC cord 3P	1
4	2.5" Removable HDD Enclosure	1
5	19" L Type Rack Ears	2
6	M3 X 4 m/m Screws	10
7	2.0 X 8 m/m Screws	2
8	HD Label	2
9	Label	4
10	Instruction Manual	1

Introduction

This user guide will show you how to get the most from this HDR-200 unit when fitted within a Datavideo HS-1000 Mobile Video Studio.

The Datavideo HDR-200 can normally record from HD-SDI, HD-YPbPr and HDV (IEEE-1394) sources. However, within the HS-1000, this HDR-200 unit is cabled and configured to record HD-SDI and XLR audio. Upon playback it can output tracks via HDMI connections (to TLM-170D monitor) and HD-SDI connections (TLM-170D and RP-36 panel on AUX HD-SDI output).

This recorder is supplied with a removable HE-1 HDD enclosure which allow for easy management of your recordings and projects when a 2.5" SATA drive is fitted inside. These removable HE-1 HDD enclosure can also be used as external USB drives from which your project files can be dragged and dropped to a PC or MAC.

HDR-200 Features within HS-1000 set up

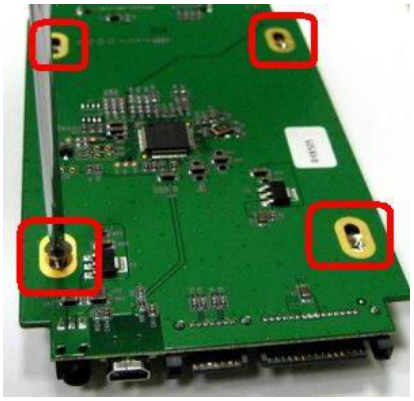
HD-SDI (BNC) and HDV (IEEE-1394) Hard Drive Recorder.
Supports HD-SDI pass-through with embedded audio.
Supports HDMI output with audio.
RS-422 / RS-232 control *
GPI input *
Drag and Drop file transfer to PC or MAC via IEEE-1394. *
2.5" Removable HDD enclosure with SATA and USB interface for easy file transfer.

**** N.B. The HDR-200 cannot be operated as a DV Device from a Computer - The AVC Command set is not supported. Also to control the unit via GPI and RS-422 / RS-232 further cabling would be required within the HS-1000 set up. Please speak to your local Datavideo office for further information.***

How to install a 2.5" SATA HDD into the removable HE-1 HDD Enclosure

1. Remove the two screws from the 2.5" HE-1 front cover then slide out the PCB.

2. Slide the drive into the PCB and secure with the supplied screws.



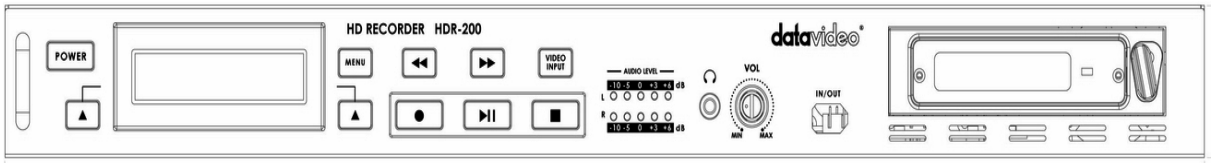
3. Slide the PCB and drive module back into the HE-1 enclosure.

4. Re-assemble the HE-1 with the two screws to secure the front cover.

5. Slide HE-1 with drive fitted into HDR-200 then move locking button to the left.

Connections & Controls

Front Panel



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.

Display Panel. Displays the status of the HDR-200. The display will show Track Number, timecode, or if the Menu Button is pressed the Menu Display.

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.

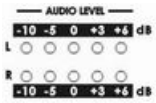
Video Input Button. Switches the HDR-200 to Video Input (Component YUV / S-Video Y/C / Composite CVBS) - Video Inputs can only be recorded in DV formats. See ***Operation with an analogue video source*** for more details.

Previous / Next Buttons. These buttons navigate up and down between recorded tracks and menu options.

Record Button. Puts the HDR-200 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.



The Audio Input Level LEDs show the audio input levels from the incoming source.

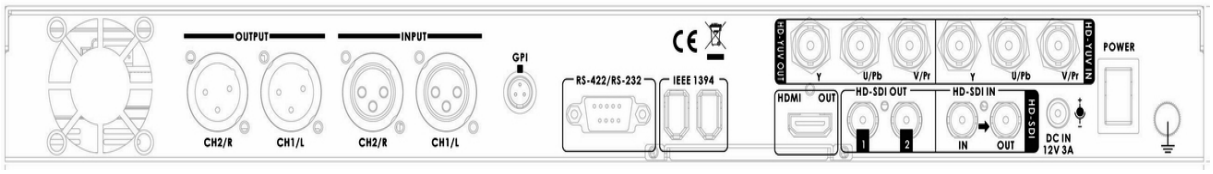
The Audio Level Adjustments allow you to adjust the headphone volume.

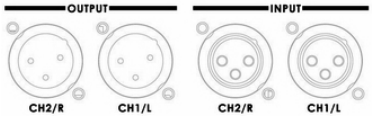
Accepts a stereo mini jack plug for stereo headphone. The headphone volume is controlled by the Audio Level Adjustments.

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.

2.5" Removable HDD Rack, SATA & USB interface connecting to a PC for file transfer.

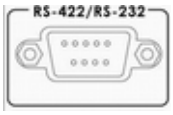
Rear Panel





2 channels XLR Balanced Audio input & output.
This audio will also be passed to the HDMI and HD-SDI outputs.

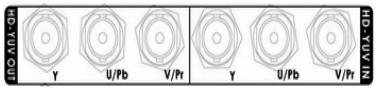
The GPI socket can be used for simple external control. The HDR-200 can accept pulse or level trigger inputs, which can trigger record or playback or pause commands. See GPI Mode & Function Menus for more details.



RS-422 Port. The HDR-200 can be controlled via RS-422 from external devices. The HDR-200 uses standard Sony protocol. Connect the RS-422 control cable to this port.

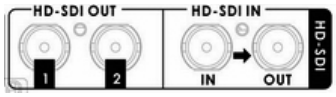
NB: The RP-36 panel on the rear of the HS-1000 has an RS-422 port which is directly wired to the SE-1000 mixer. Please contact your local Datavideo office if you also wish to control the HDR-200 via RS-422 within the HS-1000 set up.

6 Pin DV In/Out Port. This is a convenient rear mounted DV / IEEE Port for connection to PC for file transfer.



HD- YUV component analogue input and output connecters.

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



HD-SDI output connecters.
HD- 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

Within the HS-1000 set up the HDR-200 is supplied with power from the PD-1 Power Distribution unit on the rear of the HS-1000. Please ensure the PD-1 is supplied with power and switched on before attempting to power on the HDR-200.

Press the Power Button until it lights up

The LCD display panel should show HDR-200 and after a few seconds the track display should appear and then the HDR-200 is ready to be operated.

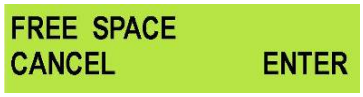
Menu Options

The HDR-200 is a menu driven unit; there are 19 menus which are used to initially set up the 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 19 Menus are:

HDD MODE
This mode allows the HDR-200 to connect to a computer for drag and drop file transfers via IEEE-1394 cabling to a PC or MAC.
See HDD Mode Menu for more details.

SETUP LOOP PLAY
The HDR-200 will continuously loop play the selected track until stopped.



FREE SPACE
Displays how much free space is available on the current HDR-200 removable drive.

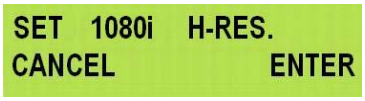
TOTAL SPACE
Displays the total space or capacity of the current HDR-200 removable drive.

VIDEO INPUT SOURCE
The HDR-200 has two types of Analogue Input, YPbPr or SDI can be set.
See Video Input Source Menu for more details.

AUDIO INPUT SOURCE
The HDR-200 has two types Audio Input can be set.
- **ANALOG AUDIO** relates to an XLR audio input source, this audio will be embedded into the SDI output.
- **SDI EMBEDDED AUDIO** relates to an SDI input, this audio will also be embedded into the SDI output.

SET MPEG2 BIT RATE
The HDR-200 has 9 Bit Rate modes
Bit rates of 20, 25, 30, 35, 40, 45, 50, 55, or 60 Mbps can be set.
See SET MPEG2 BIT RATE Menu for more details.

SET I-FRAME ONLY
Set the HDR-200 to encode Intra frame only.



SET 1080i H-RES.
To select the encoding horizontal resolution
- Select **1920** and the record format is 1920x1080i.
- Select **1440** and the record format is 1440x1080i.

See SET 1080i H-RES. Menu for more details.

SET GPI TRIGGER MODE
The HDR-200 has two GPI trigger modes, Pulse or Level trigger can be set.
See GPI Mode & Function Menus for more details.

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
Sets the date and time on the HDR-200; the setting is non-volatile so it is stored even when the unit is powered off.
See Set Date & Time Menu for more details.

FORMAT HARD DISK
Formats the HDD and erases all files and tracks from the HDR-200.
See Format Hard Disk Menu for more details.

ERASE TRACK
Erases the selected track from the HDR-200.
See Erase Track Menu for more details.

SET OUTPUT CHANNEL
Allows the output channel of the HDR-200 to be switched to a different I.D. number.
See Set Output Channel Menu for more details.

HDD SURFACE SCAN
Checks the HDD for errors / bad sectors. This is only necessary if your HDR-200 is not performing correctly, or if 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.
The HDR-200 has two types of cable mode that can be set when connecting the HDR-200 to either a 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**.

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-200 RS-232 from PC.
- Select **RS-422** mode, you can control HDR-200 via RS-422 from external devices.

FP FIRMWARE UPDATE
To upgrade the front panel firmware.

FIRMWARE VERSION
Display the Revision Number and Firmware Version of the HDR-200

HDD Mode Menu

The HDD Mode Menu will set the HDR-200 up 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-200 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-200 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.

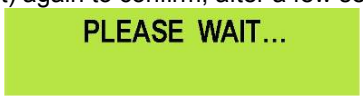
Connecting to a PC / MAC

NB: Although your PC / MAC may see the HDR-200 as an AVC compliant DV Device it is not intended to be operated as such.

Connect the HDR-200 IEEE-1394 output to a PC or MAC.
To set the HDR-200 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-200 can be used just like any external drive.

To return the HDR-200 to Deck Mode either use “Safely Remove Hardware” with a PC, or with a MAC use “Eject” or Drag the HDR-200 Drive to “Trash”. Once un-mounted the HDR-200 display will return to the Track Display.

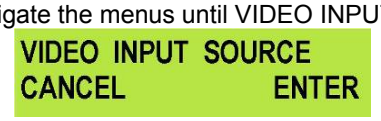
Video Input Source Menu

The Video Input Source Menu sets the analogue input mode of the HDR-200.
The HDR-200 has YPbPr and SDI analogue inputs.

To select the Video Input Source:

Press the Menu Button, to enter menu mode

Press the FWD (►►) Button to navigate the menus until VIDEO INPUT SOURCE is displayed.



Press the Next (▲) Button(right) to enter the VIDEO INPUT SOURCE set up menu.

Press the FWD (►►) Button to select either SDI or YPbPr.

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

Then press the Menu Button to leave menu mode.

SET MPEG2 BIT RATE Menu

To select the MPEG2 encoding BIT RATE:

Press the Menu Button, to enter the menu mode

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

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

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

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

Then press the Menu Button to leave menu mode

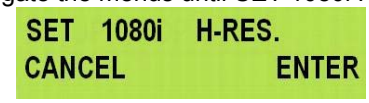
For example, the table of 120 GB HDD is the reference of **Bit Rate mode** selection.

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

SET 1080i H-RES. Menu

Press the Menu Button, to enter the menu mode

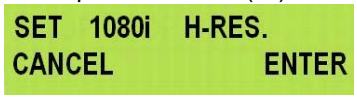
Press the FWD (►►) Button to navigate the menus until SET 1080i H-RES. is displayed.



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

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

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



Then press the Menu Button to leave menu mode

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

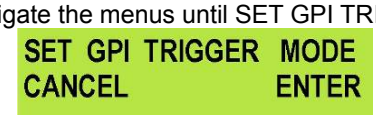
1080i is a high-definition television (HDTV) video mode. The term usually assumes a widescreen aspect ratio of 16:9, implying a horizontal resolution of 1920 pixels and a frame resolution of 1920 × 1080 or about 2.07 million pixels.

GPI Mode & Functions Menus

The HDR-200 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

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

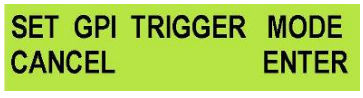


Press the Next (▲) Button(right) to enter the SET GPI TRIGGER MODE menu

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

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

Then press the Menu Button to leave menu mode



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

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

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

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

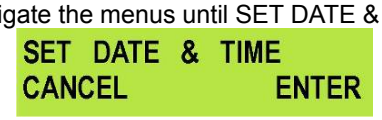
Then press the Menu Button to leave menu mode

Set Date & Time Menu

To set the Date & Time on the HDR-200

Press the Menu Button, to enter menu mode

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



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

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

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

Then press the Menu Button to leave menu mode

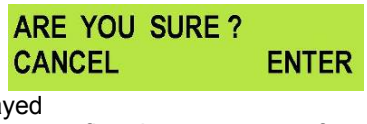
Format Hard Disk Menu

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

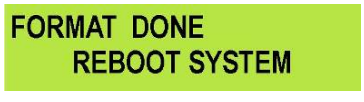
Press the Menu Button, to enter menu mode

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

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



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



After a few seconds the HDR-200 will reboot and the display will return to normal

Erase Track Menu

Erase Track is used for deleting individual tracks from the HDR-200.

Press the Menu Button, to enter menu mode

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

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

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

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

Then press the Menu Button to leave menu mode

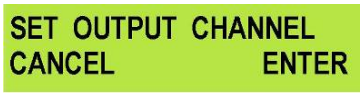
Set Output Channel Menu

It is not a frequent occurrence but when it happens it is possible to change the Output Channel I.D of the HDR-200 to overcome the conflict. For example if another device has the same output channel I.D. as the HDR-200 this will result in a conflict, which will mean that the HDR-200 output is blocked. Please change the output channel I.D. of the HDR-200 to solve the problem.

The default output channel of the HDR-200 is 1, selecting any other value, between 0 - 63 will overcome the conflict.

Press the Menu Button, to enter menu mode

Press the REW (◄◄) Button to navigate the menus until SET OUTPUT CHANNEL is displayed



Press the Next (▲) Button(right) to enter the SET OUTPUT CHANNEL menu

Use FWD (►►) or REW (◄◄) to change the output channel number - in this case we have selected 1

CHANNEL NUMBER: 1
CANCEL SET

Press the Next (▲) Button(right) to confirm the setting

SET OUTPUT CHANNEL
CANCEL ENTER

Then press the Menu Button to leave menu mode

SET OUTPUT CHANNEL
CANCEL ENTER

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-200 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 ?
CANCEL ENTER

HDD SURFACE SCAN
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
SCANNING > 1% DONE

SURFACE SCAN DONE !
CHECK RESULT .T XT OK

A txt file called Result will have been created in the root directory of the HDR-200 HDD, this can be accessed via a PC, by connecting the HDR-200 as a HDD.

Playing an M2T Track

It is playback M2T tracks to analogue monitors or recorders via the HD(YUV), HD-SDI or 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.

It is also possible to set the HDR-200 to loop play. In loop play the track will seamlessly 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.

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

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

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

To record from an analogue video source you first need to set the analog input – ***see Video Input Source Menu for more details***.

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-200 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-200 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 analogue video input present.

The Video Input Button is illuminated

The track you have selected on the HDR-200 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-200 Hard Disk - Go to the FREE SPACE Menu and check that the HDR-200 is not full.

During record you can pause the HDR-200 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-200 to start recording again.

Connecting to a Computer

Files that have been recorded onto the HDR-200 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-200 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-200 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:

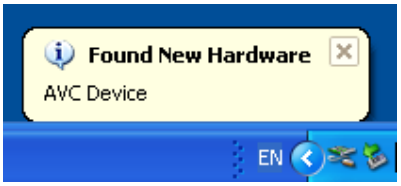
hdv02.m2t (2 GB)	-	hdv02 is the file name for Track 02
hdv02_01.m2t (2 GB)	-	Each 2 GB section is given a sequential _xx numeric extension
hdv02_02.m2t (2 GB)		
hdv02_03.m2t (2 GB)		
hdv02_04.m2t (2 GB)		
hdv02_05.m2t (2 GB)		
hdv02_06.m2t (77 MB)	-	The last file in the sequence is likely to be smaller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

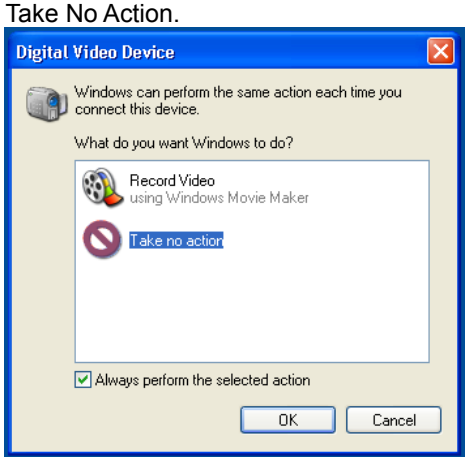
Once transferred to a PC / MAC files can be dropped onto a timeline, in a suitable NLE application, and they will playback seamlessly.

Connecting to a PC

NB: Although a PC may see the HDR-200 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.



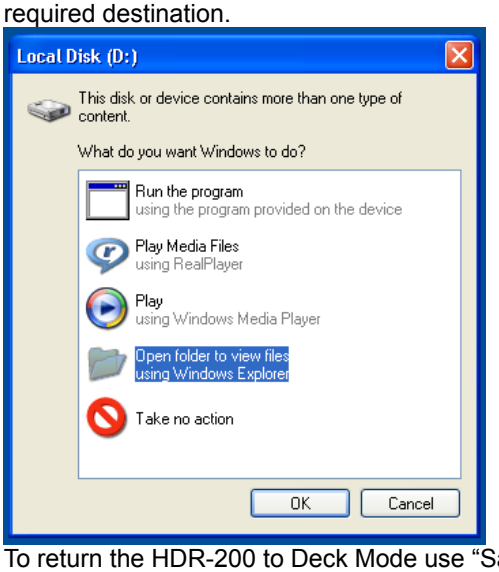


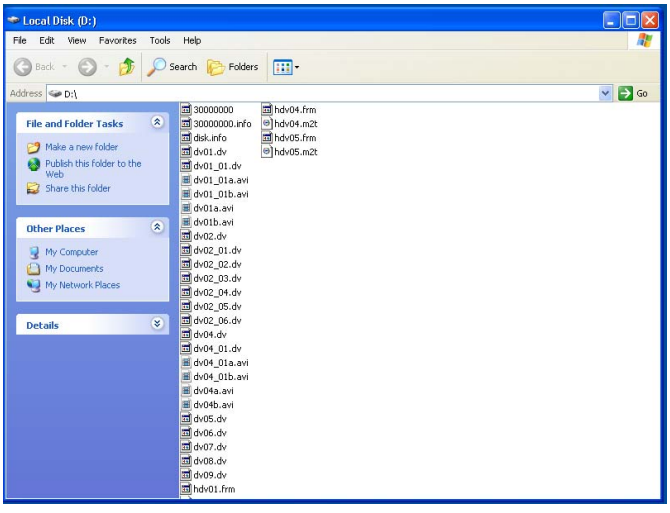
Connect the HDR-200 IEEE-1394 output to a PC.
To set the HDR-200 into HDD Mode firstly press the Menu button so that it is illuminated.
You will see the display change to the HDD Mode Menu

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

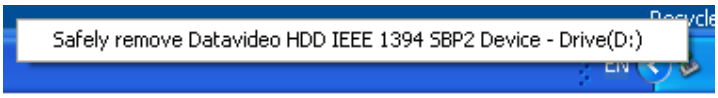
Press the Next (▲) Button(right) again to confirm, after a few seconds HDD Mode will be enabled

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-200 can be used just like any HDD. You can select the required files and drag and drop them to the required destination.

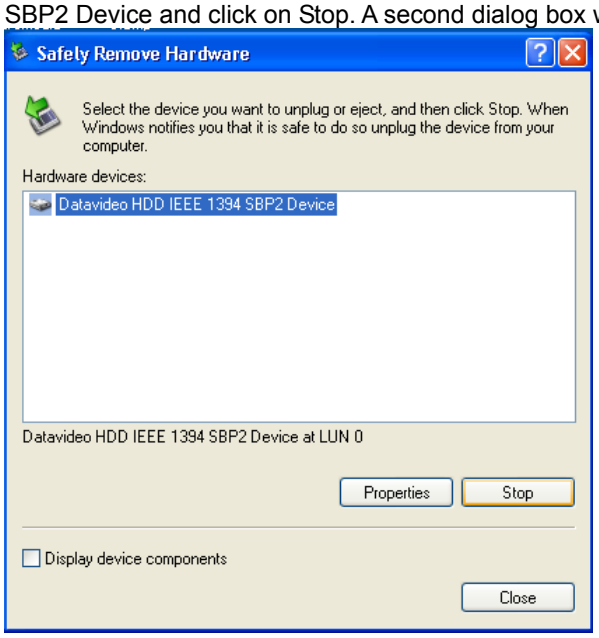


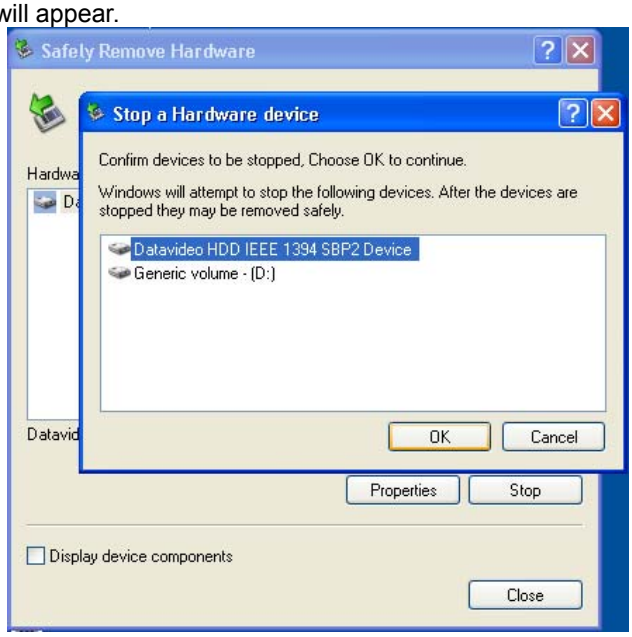


To return the HDR-200 to Deck Mode use “Safely Remove Hardware”. You will find “Safely Remove Hardware” on the Taskbar.



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-200.

Once un-mounted from the PC the HDR-200 display will leave HDD Mode and return to Track Display.

Connecting to a MAC

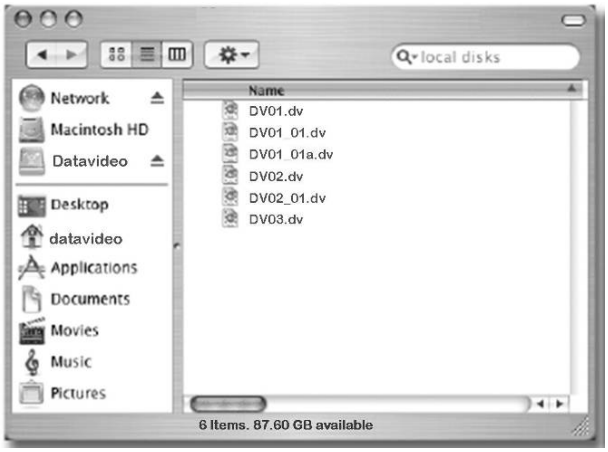
NB: Although a MAC may see the HDR-200 as an AVC compliant DV Device it is not intended to be operated as such.

Connect the HDR-200 IEEE-1394 output to a MAC.
To set the HDR-200 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 MAC should see the HDR-200 as a HDD and the files will appear in the root directory of the drive.

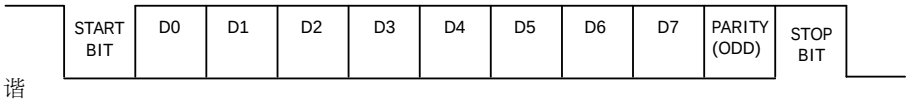


You can select the required files and drag and drop them to the required destination.

To un-mount the HDR-200 from your MAC either “Eject” the drive, or drag it to the Trash Can. Once the HDR-200 is un-mounted from the MAC the LCD display will return to normal.

1. Interface Overview

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



谐

- 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

1. MSN stands for Most Significant Nibble (4 bits)
2. 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 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-200)
2x	Transport Control	Controller
4x	Preset And Select Control	Controller
6x	Sense Request	Controller
7x	Sense Return	Device (HDR-200)
Ex	DVR Control	Controller
Fx	DVR Return	Device (HDR-200)

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 pin assignment of the Controller and HDR-200 is shown in the following table:

Signal / ***Pin***	***Controller***	***HDR-200***
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

4. Communication Protocol

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

   When the DEVICE (HDR-200) 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

2. The CONTROLLER must not transmit additional COMMAND blocks to a DEVICE (HDR-200) prior to response to a previous COMMAND block.
3. The CONTROLLER must transmit of bytes in a COMMAND block for with intervals less than 10 milliseconds. If a DEVICE (HDR-200) 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).
4. When a DEVICE (HDR-200) 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.
5. When a DEVICE (HDR-200) 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	RETURN
00h 11h : Device Type Request	12h 11h 20h 41h NTSC Mode 12h 11h 21h 41h PAL Mode
20h 00h : Stop	10h 01h : Acknowledge
20h 01h : Play	10h 01h : Acknowledge
20h 02h : Rec	10h 01h : Acknowledge
20h 10h : Fast Forward	10h 01h : Acknowledge
2xh 13h : Shuttle Forward	10h 01h : Acknowledge
21h 13h 00h : Pause	10h 01h : Acknowledge
20h 20h : Rewind	10h 01h : Acknowledge
2xh 23h : Shuttle Rewind	10h 01h : Acknowledge
40h 50h : Increase Track Number	10h 01h : Acknowledge
40h 51h : Decrease Track Number	10h 01h : Acknowledge
41h 52h nnh: Set Track Number	10h 01h : Acknowledge
41h 53h nnh: Select Video Input Source	10h 01h : Acknowledge
61h 0Ch 01h : Current Time Sense	74h 04h : LTC Time Data
61h 20h : Status Sense	7xh 20h : Status Data
E0h 01h : Get Current Track Length	F4h 01h : Track Length

6. Detailed Description of Commands

00h 11h : DEVICE TYPE REQUEST
Send: 00h 11h 11h
Return: 12h 11h B0h 01h D4h (HDR-200)
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 : INREASE TRACK NUMBER
Send: 40h 50h 90h
Return: 10h 01h 11h
40h 51h : DECREASE TRACK NUMBER
Send: 40h 51h 91h
Return: 10h 01h 11h
41h 52h NNh : SET TRACK NUMBER
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
41h 53h NNh : SELECT VIDEO INPUT SOURCE
NN = Video Source, 0 = YPbPr, 1 = SDI, 2 = Decode MPEG-2
Send: 41h 53h 00h 94h (YPbPr input)
Return: 10h 01h 11h
Send: 41h 53h 01h 95h (SDI input)
Return: 10h 01h 11h
Send: 41h 53h 02h 96h (Decode MPEG-2)
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
E0h 01h : TRACK LENGTH SENSE
Send: E0h 01h E1h
Return: F4h 01h 29h 41h 56h 00h B5h (Track Length 00:56:41:29)

7. Return Data

10h 01h:ACK

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

1h 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		CHECKSUM ERROR	SOFTWARE OVERRUN	UNDEFINED COMMAND

2h 11h : DEVICE TYTPE

The “00h 11h : DEVICE TYPE REQUEST” command is used for asking the specifications of the HDR-200 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-200: 12h 11h B0h 01h

74h 04h : Current Time Code return (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 : Current Track Length (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	Tens of Hours				Hours			

Send: E0h 01h E1h

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

8. Status return data

7xh 20h :

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Data 0	Busy		Disk Out			Hardware Error		Local Enable
Data 1	Standby On		Stop	Eject	Rewind	Fast Forward	Record	Play
Data 2			Shuttle			Tape Reverse	Still	
Data 6		Lamp Still	Lamp Forward	Lamp Reverse				
Data 8								Record Inhibit

Version History:

V1.0 Initial. 11-10-2008

Specifications

Inputs Interface	• 3x BNC connector for HD-YUV input • 1x BNC connector for HD-SDI input • 2x XLR connector for audio input
Outputs Interface	• 3x BNC connector for HD -YUV output • 2x BNC connector for HD-SDI output • 1x BNC connector for HD-SDI pass through output • 1x HDMI connector for HDMI output (1.3a) • 2x XLR connector for audio output
Record format	• Video：MPEGⅡ(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 • 3x IEEE-1394 Port for connection to PC, MAC and HDV device. • 1x Phone plugs for audio output
Video Input	• HD (1080i/50 - 1080/59.94i – 720p/50 - 720/59.94p)
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
HD-YUV signal	• Bandwidth 30MHz < +/- 3dB • S/N Ratio > 60 dB • Multiburst ≦1dB at 30Mhz
Audio	• Bandwidth 20~20KHz < +/- 3dB • S/N Ratio > 70 dB • THD. < 0.1%
IRE	• 0 - 7.5 IRE Options (NTSC Only)
Operating Temperature	• 0°C to 40°C **(32°F to 102°F)**
Humidity	• 10% to 90% (non condensing)
Dimension & Weight	• 482mm (W) x 293mm (D) x 44mm (H) / lbs/ 4Kgs
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.

Datavideo Corporation (USA)

7048 Elmer Avenue. Whittier, CA 90602 USA

Tel: +1 562 696 2324	contactus@datavideo.us	www.datavideo.us

Datavideo Technologies Europe BV

Floridadreef 106, 3565 AM Utrecht, The Netherlands

Tel: +31 30 261 9656	info@datavideo.nl	www.datavideo.info

Datavideo UK Limited

Unit 2 Waterside Business Park, Hadfield, Glossop, Derbyshire SK13 1BE UK

Tel: +44 1457 851000	sales@datavideo.co.uk	www.datavideo.info

Datavideo Technologies Co., Ltd.

10F, 176 Jian-Yi Rd, Chung Ho City, Taipei Hsien, Taiwan 235

Tel: +886 2 8227 2888	service@datavideo.com.tw	www.datavideo.com.tw

Datavideo Technologies China Co.

2F-D, 2 Lane 777, West Guangzhong Rd, Zhabei District, Shanghai, China

Tel: +86 21 5603 6599	service@datavideo.cn	www.datavideo.cn

Datavideo Technologies (S) PTE Ltd.

No. 22 Lorong 21A Geylang, #09-02 Prosper Industrial Building, Singapore 388431

Tel: +65 6749 6866	info@datavideo.sg	www.datavideo.sg

Datavideo Hong Kong Limited

G/F., 26 Cross Lane, Wanchai, HK

Tel: +852 2833 1981	info@datavideohk.com	www.datavideohk.com

G082060503B1