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HD-Bridge Dec

Guide to Installation and Operation

M777-9500-101

HDV to HD/SD SDI Interface

HD-Bridge Dec

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Miranda
Technologies inc.
3499 Douglas-B.-Floreani
St-Laurent, Québec, Canada H4S 1Y6
Tel. 514-333-1772
Fax. 514-333-9828
www.miranda.com

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1 HD-Bridge Dec: HDV to HD/SD SDI Interface

1.1 Introduction

Miranda's HD-Bridge Dec is a neat and affordable desktop interface that addresses multiple HDV interfacing tasks. The interface accepts HDV via an IEEE-1394 (iLink, Firewire) connection, and provides dual HD/SD-SDI outputs at 1080i/720p with embedded audio and Time Code. The interface also outputs HD/SD component video (with optional burned-in Time Code and Graticule Markers on SD), composite video with burned-in Time Code and Graticule Markers, AES, analog audio, and LTC. An RS-422 port is provided for VTR control.

The HD-Bridge Dec has an internal cross-converter, allowing the conversion of 1080i HDV material into 720p, and 720p material into 1080i. It incorporates a down-converter to generate SD component (when selected) and composite (always active) outputs

HD-Bridge Dec can be used to convert compressed HDV into uncompressed HD/SD SDI for lossless editing.

1.2 Features

- Affordable, high quality HDV to HD/SD SDI interface
- Multiple outputs:
  - ◊ Dual HD/SD SDI with embedded audio and time code
  - ◊ Analog HD/SD components
  - ◊ Composite video
  - ◊ AES audio
  - ◊ Analog audio
  - ◊ LTC
- HD-SDI cross conversion: HD-SDI output at 1080i or 720p
- Dual HD/SD SDI outputs
- RS-422 to IEEE-1394 VTR control for batch capture
- Desktop design with front (4-pin) and rear (6-pin) IEEE-1394 HDV connections
- HDV Device auto detection with optimized time code search algorithm for SONY and JVC
- Easy to use with push button configuration using front panel display

1.3 Functional Block diagram

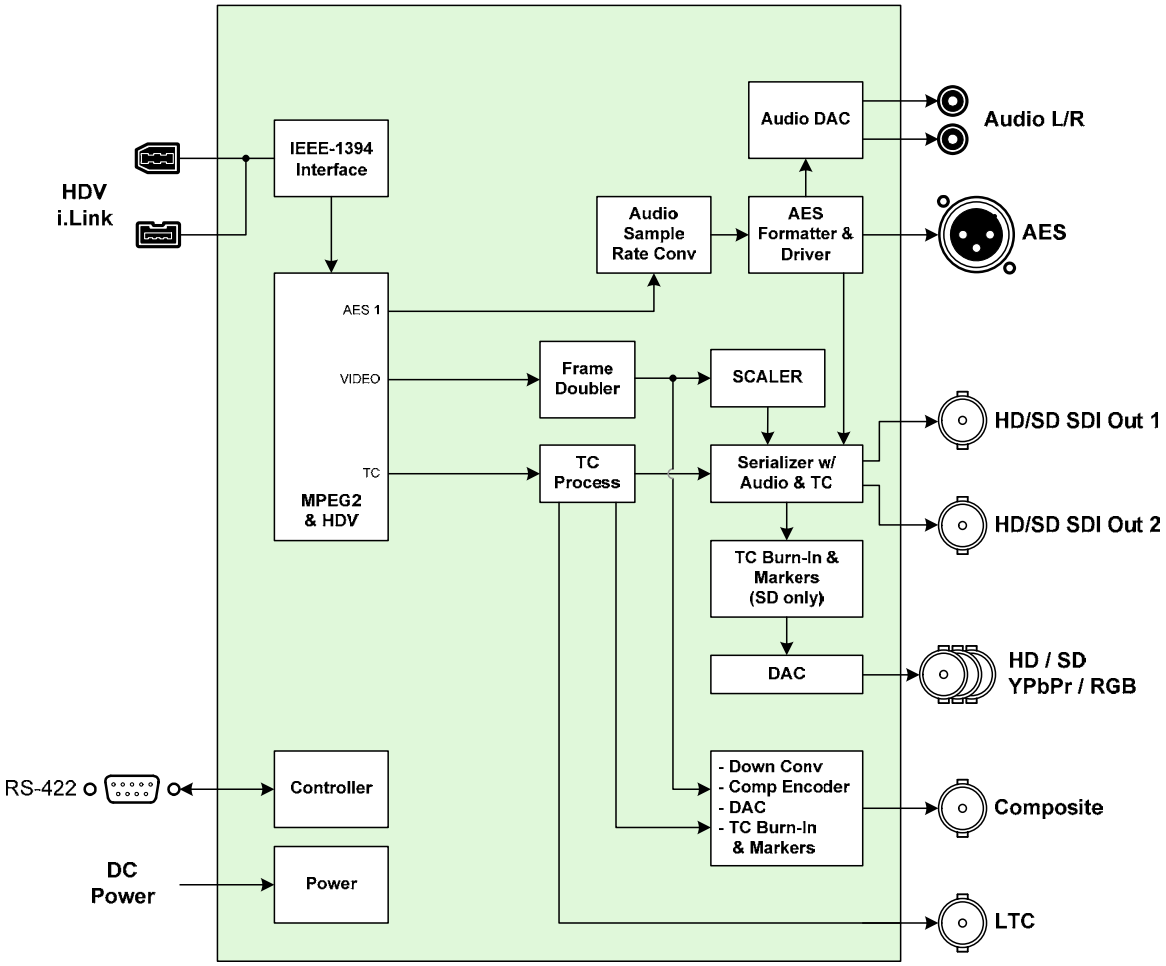
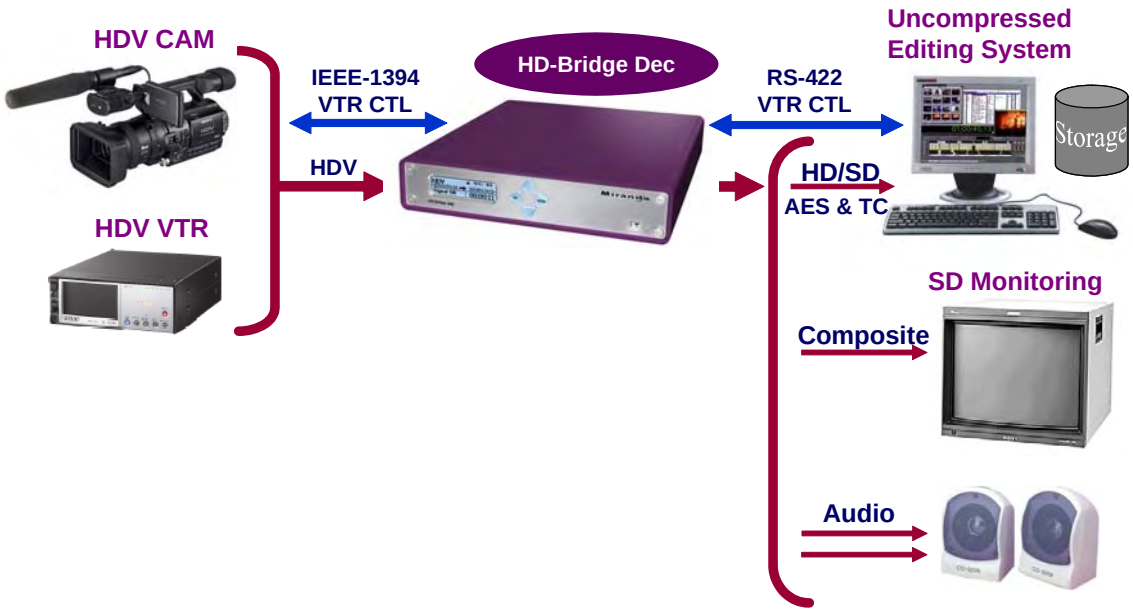


Figure 1.1 *Functional block diagram of the HD-Bridge Dec*

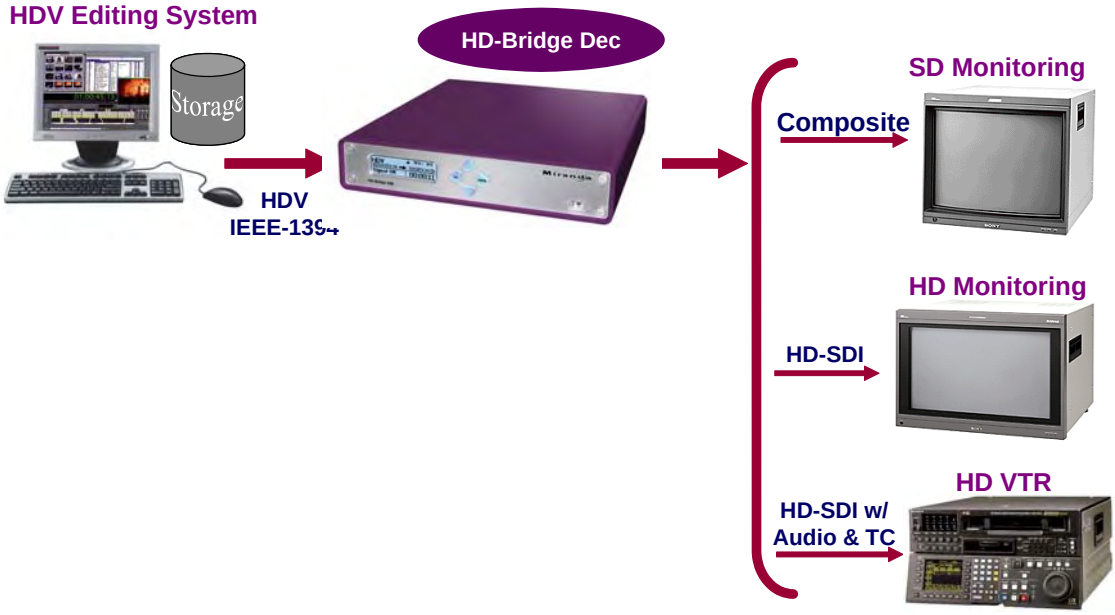
1.4 Application Examples

Here are some examples of typical uses and applications of the HD-Bridge Dec:

1.4.1 Post-Production HD/SD SDI Capture



1.4.2 HDV Edit, HD/SD SDI Recording



2 Installation

2.1 Connections

Refer to figure 2.1 and to the descriptions below when connecting the HD-Bridge Dec.

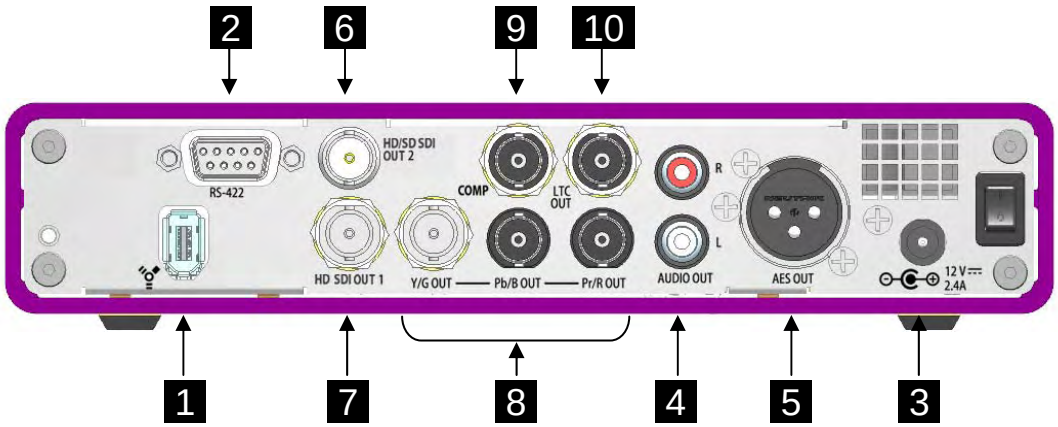


Figure 2.1 *Rear view of the HD-Bridge Dec*

1 *HDV In (IEEE-1394 iLink or Firewire interface)*
Connect an HDV source to one of the HDV connectors. There is one on the front panel (see figure 3.1) as well as the one on the rear panel. The source must comply with the IEEE-1394 standard.

2 *Control In (RS-422)* – Connect to a computer or editing system able to control HDV devices

3 *DC In* – Connect the supplied DC power supply.

4 *Audio L R Out (RCA plugs)*

5 *AES Out (XLR connector)*

6 *HD/SD SDI Out 2 (BNC connector)* – Clean feed

7 *HD/SD SDI Out 1 (BNC connector)* – Clean feed

8 *HD/SD component out (3 BNC connectors)* – Includes burned-in time code and markers (on SD only) if enabled.

9 *Composite out* – Includes burned-in time code and markers

10 *LTC out (BNC connector)*

3 Operation

Turn the HD-Bridge Dec ON using the rear-panel power switch (see fig. 2.1)

3.1 Front Panel User Interface

Operating controls for the HD-Bridge Dec are found on the front panel (see figure 3.1).

The controls consist of four pushbuttons that allow the user to move through menus displayed on an LCD display, where operating parameters can be selected.

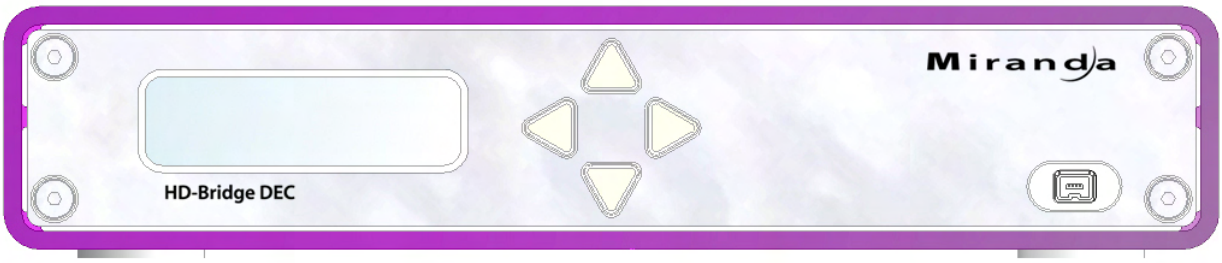
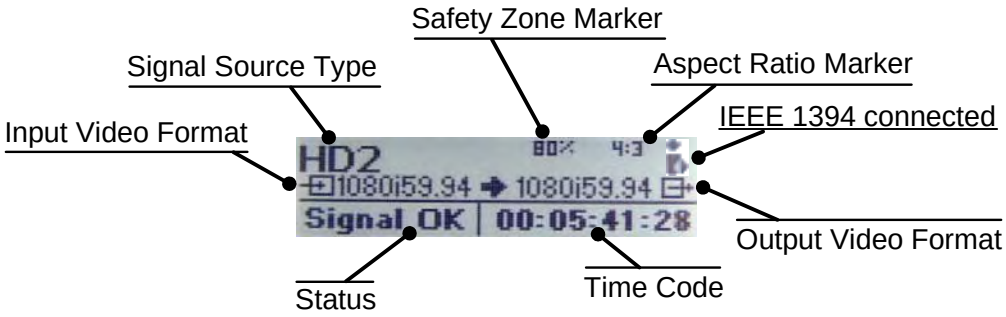


Figure 3.1 *Front panel*

3.2 LCD Display Layout

The LCD display is laid out as shown in the figure below:



The following table lists all the possible indications that can appear in the display:

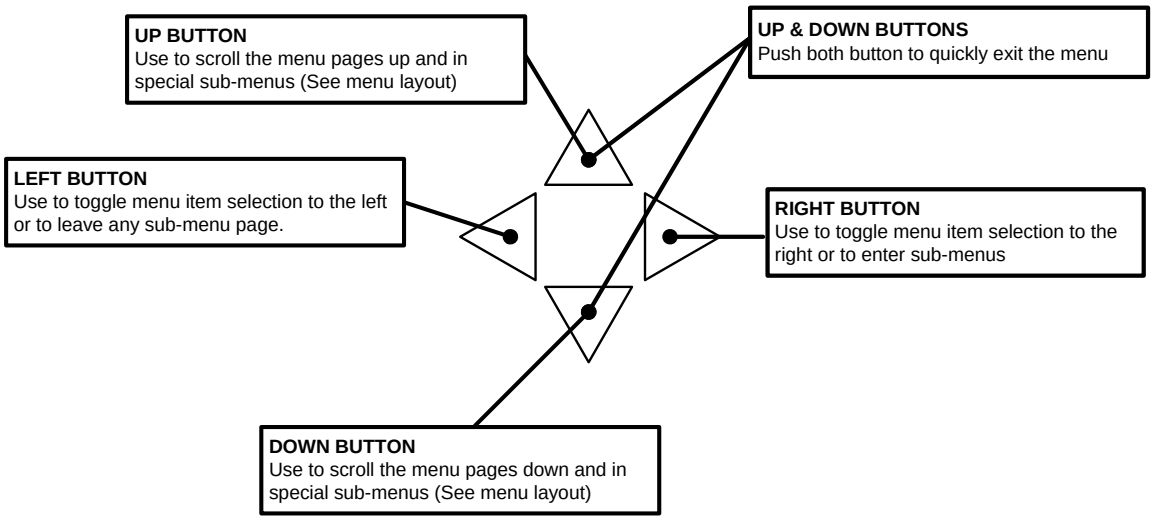
Signal Source Type	INTERNAL	When no signal is present and the color bar generator is ON
	HD1	When 720p HDV signal is detected
	HD2	When 1080i HDV signal is detected
Safety Zone Marker	<blank>	When the safety zone markers are turned-off
	80%	When set to 80%
	90%	When set to 90%
	92.5%	When set to 92.5%
	95%	When set to 95%
Aspect Ratio Marker	<blank>	When turned-off
	4:3	Left and right markers indicsating a 4:3 aspect ratio are ON
	1.85	Top and bottom markers indicating a 1.85 aspect ratio are ON
	2.35	Top and bottom markers indicating a 2.35 aspect ratio are ON

Input Video Format	no signal	When no HDV signal is detected
	1080i59.94	The HDV signal input format detected
	1080i50	
	720p59.94	
	720p50	
	720p29.97	
	720p25	
	720p23.98	
Output Video Format	no signal	When the outputs are killed (no outputs)
	1080i59.94	The signal format being output *(Note: no 720p29.97 or 720p25 available at output)*
	1080i50	
	720p59.94	
	720p50	
Status	<Text>	Any error such as no signal or other potential system errors will be scrolled in this area. Also, when an AV/C compliant device is connected, its name will appear in this region
Time Code	<Value>	Displays the current time code of the HDV signal being fed

3.3 Front panel operating menu

Use the front panel keys to scroll through the menu shown on the LCD display and to select and modify the various operating parameters of the HD-Bridge Dec.

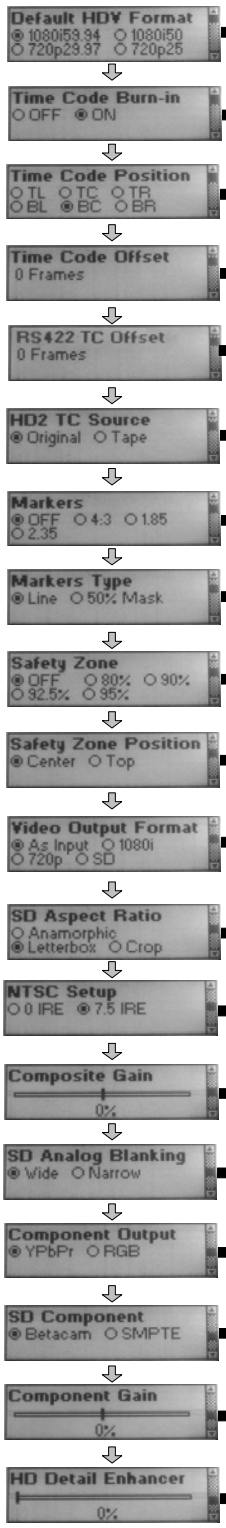
The functionality of the buttons is shown here:



Note the use of the (up) and (down) buttons together to immediately exit the menus and return to normal operation.

- Menu selections will not be saved until the menu is exited.

3.4 Menu Layout



Default input format to use at power-on. This will be used by the internal colorbar generator and when the outputs are black after a power-on.

Enables on-screen display of time code on the component and composite out

Select the position on-screen of time code. Choices are top-left (TL) , top-center (TC), top-right (TR), bottom-left (BL), bottom-center(BC), bottom-right (BR)

Select the number of frames to add or subtract in the time code. This can be used to compensate for other equipment delay.

Select the number of frames to add or subtract in the RS-422 time code with respect to other time codes. This can be used to compensate for other equipment delay.

In HD2 formats, there are many sources of time code on tape. The user can select the tape time code (time code that appears in the view finder of the camera) or the original time code which is generated by PC when exporting a clip.

Enable and choose aspect ratio markers

Select aspect ration marker type when markers are enabled.

Select safety zone markers to be displayed on component & composite outputs

Select safety zone marker vertical reference as center of screen or top of screen

Select the video output format of the HD-Bridge. According to the selection, the input signal will be either cross-converted, down-converted, or same as input. Selecting SD will output SD on both SDI and component outputs.

Select the aspect ratio (resizing parameters) of the SD output. This will affect the composite out at all times and all other outputs if selected in SD.

Select the NTSC setup.

Adjust the gain of the composite output. To increase the gain, slide to the right.

Select Wide or Narrow blanking for the SD analog outputs.

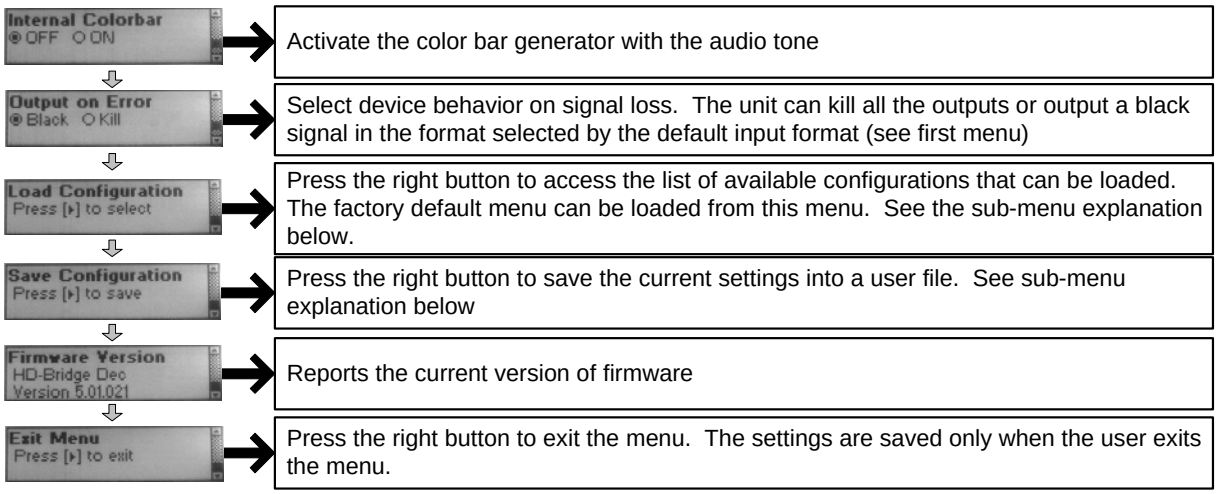
Select the analog component output type. If YPbPr is selected, use the following menu to select the SD analog level.

Select the analog SD component output type. If previous menu is set in RGB, this menu does not appear.

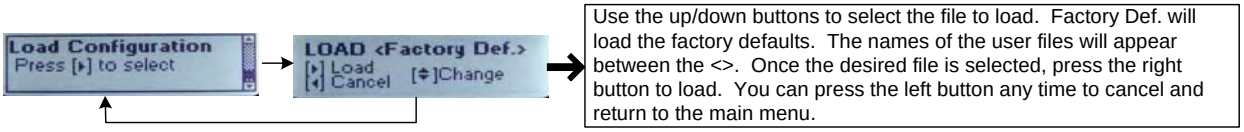
Adjust the gain of the component output. To increase the gain, slide to the right.

Select the levels of the detail enhancer. Zero means it is off.

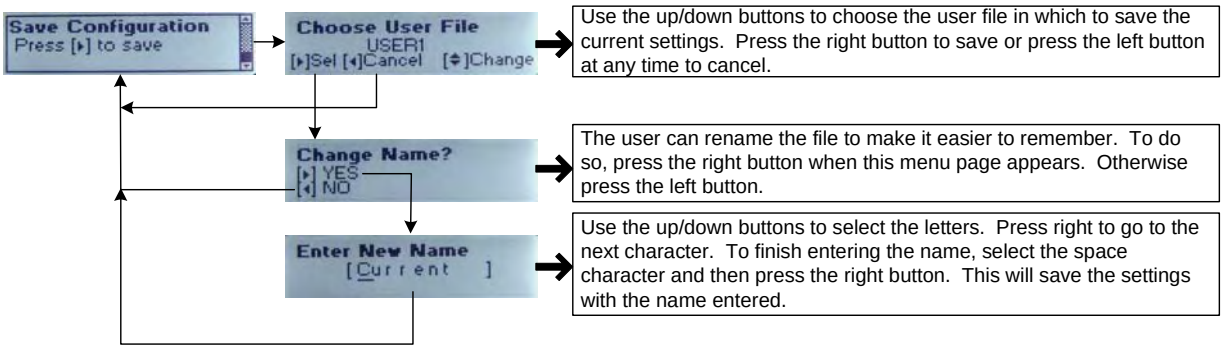
(continued on next page)



Load Configuration Sub-Menus



Save Configuration Sub Menus



3.5 Discussion of Menu Pages

Power-On Input Default Format
This format is used by the HD-Bridge Dec right after Power-on. It determines the format of the internal color bar generator and of the black that will be generated before any valid video signal is detected.

Select among these options:

- 1080i59.94
- 720p29.97
- 1080i50
- 720p25

Time Code Burn-in
When ON, time code is burned into the component (in SD only) and composite monitoring outputs.

Time Code Position
Set the position of the burned-in time code when it is enabled. Select among these options:
- TL (top left)
- TC (top center)
- TR (top right)
- BL (bottom left)
- BC (bottom center)
- BR (bottom right)

Time Code Offset
Select a number of frames to add or subtract from the time code with respect to the picture contents. The result will be all time codes being offset with respect to the contents of the image. If you experience an offset between the time code burn-in and the clip time code, use the RS422 TC Offset.

RS422 TC Offset
Select a number of frames to add or subtract from the time code with respect to other time codes. The effect will be an offset of the captured clips with respect to other time codes.

HD2 TC Source
In the HD2 format, there are multiple time codes stored and available. Use this dialog to select between two options for the time code that will be used at the HD-Bridge Dec output:
- Original time code: time code associated with the item prior to being recorded on the tape, e.g. time code generated by a PC when the clip is exported
- Tape time code: code on the tape when a scene was recorded, as would have been displayed in the camera viewfinder.

When the input format is HD1 (720p), this selection has no effect

Markers
Select an aspect ratio and display markers on the component (SD only) and composite monitoring outputs. Select among these options:
- OFF
- 4:3
- 1.85
- 2.35

Markers Type
Choose whether the aspect ratio markers will be:
- A line outlining the marked region
- A mask at 50% brightness surrounding the marked region

Safety Zone
Select a safety zone and display markers on the component (SD only) and composite monitoring outputs. Select among these options:
- OFF
- 80%
- 90%
- 92.5%
- 95%

Safety Zone Position
Select the vertical reference point on the screen for the safety zone markers:
- Center
- Top

Video Output Format
The HD-Bridge Dec output format can be allowed to follow the input format, or it can be forced to one of the two HD formats. Select among these options:
- As input
- 1080i
- 720p
- SD

SD Aspect Ratio
Select the mode of presentation of the SD outputs (4:3 downconverted from 16:9):
- Anamorphic
- Letterbox
- Crop

NTSC Setup
Select the setup to be applied to the NTSC composite output:
- 0 IRE
- 7.5 IRE

Composite Gain
Use the slider to adjust the gain of the composite output

SD Analog Blanking
Select Wide or Narrow blanking for the SD outputs, depending on the destination of the signal.
- Wide
- Narrow

Component Output
Select the desired component output format:
- YPbPr
- RGB

SD Component
If the component output in the previous menu was set to YPrPb, this menu will appear and allow the choice of SD component formats:
- Betacam
- SMPTE

Component Gain
Adjust the level of the component output using the on-screen slider

Detail Enhancer
- Use the slider to adjust the level of detail enhancement applied to the output. A 0% setting (slider fully left) turns the detail enhancer OFF. View the output and adjust the slider for best picture quality.

Internal Color Bar
The test signal package includes color bars in a format appropriate for the output format, and audio tone. Select among these options:
- Off
- On

Output on Error
When an error is detected on the input, the HD-Bridge Dec provides two options for the output:
- Black – place a video black signal at the output
- Kill – turn the output OFF

Load Configuration
Press (right) to move to the *LOAD* screen. Press (down) and (up) to move through various named configurations. Factory Def. is a factory-defined set of values. When the desired name is displayed, press (right) to load it into the HD-Bridge Dec. Press (left) to return to the main menu at any time.

Save Configuration
Press (right) to move to the *Choose User File* screen. Press (down) and (up) to move through various named configurations. When the name of the file into which you wish to save the current configuration is displayed, press (right) to select it. In the *Change Name?* screen, choose whether to save the current data into that named file (left) or to move to the next screen and create a new name (right). If you have chosen to create a new name, enter it at the *Enter new name* screen. Use (up) and (down) to change the character in the current position (underlined). Use (right) to move to the next position. When finished, select the space character and press (right) to save the settings under that name and return to the Save Configuration screen.

Note: All configurations will be erased when the firmware is upgraded.

Firmware version
This screen allows you to display the firmware version installed in your HD-Bridge Dec.

Exit Menu
Press (right) to exit the menu.

3.6 VTR Control via RS-422

The HD-Bridge Dec can be controlled using the RS-422 connector. The SONY VTR Commands received are translated into AV/C commands and sent to the HDV device via firewire.

You can use the VTR control feature to transform your HDV deck into a “real” HD-SDI professional VTR. Although the control has some limitations, batch capture with uncompressed non-linear editing stations will work just fine.

IMPORTANT NOTES

The HD-Bridge Dec emulates in part a DVW-A500 VTR from SONY. It should be automatically detected as a DVW-A500, or otherwise configured manually as a DVW-A500. Please note that in order for the NLE station to detect the proper operating frame rate (30/25) YOU MUST SELECT THE OPERATING FORMAT IN THE "Power-On Format" MENU OF THE HD-BRDIGE AND TURN THE UNIT OFF THEN BACK ON. Once this is done, the station will detect the proper format.

It is strongly recommended to set the HD-Bridge to black on error using the "Output on error" menu, to ensure that the HD-SDI output has a continuous signal. Some VTRs or editing systems might report errors when pushing PLAY due to the fact that the HD-SDI output glitches momentarily to genlock to the input signal.

YOU MUST USE PREROLL TIMES OF 5 SECONDS OR ABOVE. The HD-Bridge needs to lock-up on the incoming HDV signal and requires about 2-3 seconds to do so. Once video is locked it requires another second to sync-up with time code. Therefore it is guaranteed that after 5 seconds both time code and video are stable. This is to avoid "discontinuity in time code" messages.

You will experience longer than usual total system latency when doing VTR control.

Please remember that the HD-Bridge / HDV Deck cannot exactly imitate a perfect VTR. This is due to the fact that VTR commands have to be translated to HDV commands and then transmitted to the HDV deck. While this is done pretty quickly, the HDV deck takes about 3-5 seconds to execute HDV commands. Therefore there is an unusual latency when controlling the deck (even manually). This is unfortunately a limitation due to the response of the HDV devices over which we have no control.

Also due to the nature of HDV (MPEG2 video with GOP of 15 frames) any HDV device cannot play in reverse really easily, and certainly cannot go to previous frames without rewinding first. In order to display a picture, the device needs to go back to the GOP head (which occurs twice per second) and start reading the frames from there. Therefore "previous frame" commands will take time to execute as the tape first need to be rewound to about 2 seconds before the desired frame. This is a limitation due to the long GOP of the HDV and cannot be avoided.

4 Updating the Firmware

4.1 Preparation:

You will need the following in order to use the updater:

- A computer equipped with a firewire port
- Windows XP with SP2 (SP1 will not work)
- A firewire cable

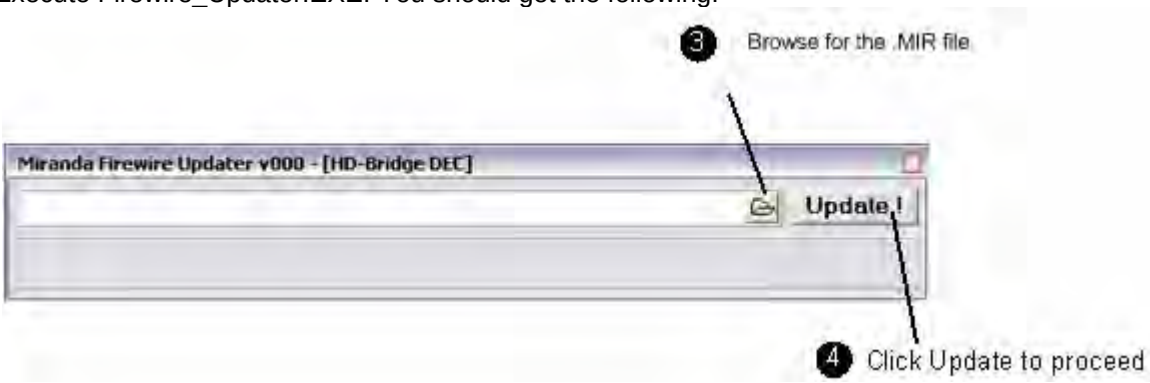
Simply connect the HD-Bridge directly to the computer using the firewire cable.

DO NOT CONNECT ANY OTHER DEVICES IN THE FIREWIRE CHAIN.

The HD-Bridge must be the unique device connected to the computer.

4.2 Instructions:

1. Locate and download the updater from the Miranda website:
    - Go to the Miranda website at www.Miranda.com
    - At the top of the page, mouse-over *tech support*, and click Software Updates in the pop-up
    - Scroll to *HD-Bridge Dec* in the product list, and click on download update
2. Unzip the updater to a known folder such as My Documents
3. Execute Firewire_Updater.EXE. You should get the following:



4. Click on the Open File icon (see above) and browse for the .MIR file containing the new firmware.
5. Click the Update button to proceed.
    - If this is the first time you are running the application on the computer, it will ask you to install a new driver. Simply follow the instructions on the following pages.
    - Otherwise it will simply begin to update the unit.

Installing a new driver:

If this window appears,

select “No, not this time” and click 

The following window will then appear:

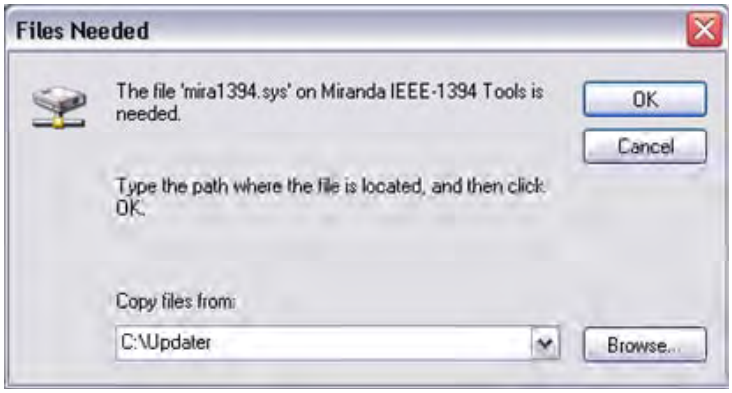
Select “Install from a list or specific location” and click 

The following window will appear:

Select “Search for the best driver”, check “Include this location in the search” and browse for the folder where you have unzipped the Firewire Updater.

Click 

You may then see the following dialog box asking for mira1394.sys:



This file is included in the same folder as the updater itself, so simply select that folder and click “Ok”.

The following window will pop-up:

Simply click “Finish” and you’re done!!!

You may have to restart your computer for the updater to work.

In that case, simply run Firewire_Updater.EXE after reboot and repeat steps 1 to 4. The computer will not ask you for the driver again since it is already installed.

4.3 Troubleshooting

4.3.1 I keep getting an “Error” when trying to update the unit

Turn the unit OFF for about 30 seconds, and then back on. Wait for about 1 minute (this is required for the unit to boot properly after errors have occurred) before re-trying to update.

4.3.2 I click “Update” and nothing happens

This means the updater is unable to find the HD-Bridge. Make sure the unit is properly connected to the computer and turned-on. Also make sure there are no other devices attached to the computer besides the HD-Bridge.

It can also be the driver that has problems executing properly. In that case simply reboot your computer.

5 Specifications

INPUTS

HDV	HD1 or HD2 on IEEE-1394a
FORMATS	1440x1080i59.94, 1440x1080i50 (HD2) 1280x720p59.94, 1280x720p50 1280x720p29.97, 1280x720p25 (HD1) 1280x720p23.98
CONNECTOR	IEEE-1394 6-pin and 4-pin

OUTPUTS

HD/SD SDI SIGNALS	4:2:2 SMPTE 292M, SMPTE 299M, SMPTE 256, SMPTE 272M-A (20-bit 48K synchronous audio), SMPTE 259M-C
FORMATS	1080i59.94, 1080i50, 1080p29.97sF, 1080p25sF, 720p50, 720p59.94, 525i, 625i (SD formats) 1280x720p23.98, 1080p23.98sf (JVC formats)
RETURN LOSS	> 15 dB up to 1.5 GHz
JITTER	< 0.2 UI p-p (HD) < 700ps (SD)
CONNECTOR (2)	75 Ω BNC
HD/SD CAV SIGNAL	G/Y, B/B-Y, R/R-Y (SD/HD) / RGB 1.0 Vp-p ±1% nominal with sync on RGB
RETURN LOSS	> 26dB up to 30MHz
FREQUENCY RESP.	< 1 dB up to 20 MHz for Y channel < 1 dB up to 13.5MHz for color channels
SNR	< -48 dB to 30MHz
CONNECTOR (3)	75 Ω BNC
COMPOSITE (1)	NTSC (525/60) SMPTE 170M (setup in the VBI) PAL (625/50) ITU RT 470
SIGNAL LEVEL	1 vpp ±2%
RETURN LOSS	> 35 dB up to 5.75 MHz
SNR	< -56 dB to 5.75 MHz
CONNECTOR	75 Ω BNC
AUDIO AES3 SIGNAL (1):	AES-3
LEVEL	3.0 Vp-p ±20%
SAMPLING	48kHz, 20 bits
IMPEDANCE	110Ω balanced

AUDIO SIGNAL:	Stereo Unbalanced Line Out
LEVEL	1.0 Vp-p maximum
CONNECTOR (2)	RCA
LTC SIGNAL	SMPTE 12M
LEVEL	1 Vp-p
CONNECTOR	75 Ω BNC

VIDEO PROCESSING PERFORMANCE

HDV INPUT	8 bits
SIGNAL PATH	10 bits

AUDIO PROCESSING PERFORMANCE

QUANTIZATION	16-bit
PROCESSING	20-bit
SAMPLING	48 KHz, synchronous
NUMBER OF CHANNELS	1 pair

OTHER

TEST PATTERN GENERATOR:	Color bars 75% white with white box for 4:3/16:9 Aspect Ratio
TEST TONE GENERATOR:	-18 dBFs, 20 bit, 1 KHz continuous tone on right channel with pulsed tone on left channel.
POWER	18W @ 11VDC to 14VDC
PHYSICAL FORMAT	Standalone ½ RU