
HD-Bridge Dec+
Guide to Installation and Operation
M777-9800-102

*HDV to HD/SD SDI
with Genlock
and ASI Inputs*

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HD-Bridge DEC+

Safety Compliance Information

Safety Compliance

This equipment complies with:

- CSA C22.2 No. 60950-1-03 / Safety of Information Technology Equipment, Including Electrical Business Equipment.
- UL 60950-1 (1st Edition) / Safety of Information Technology Equipment, Including Electrical Business Equipment.
- IEC 60950-1 (1st Edition) / Safety of Information Technology Equipment, Including Electrical Business Equipment.

CAUTION

These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel. Servicing should be done in a static-free environment.

Electromagnetic Compatibility

- This equipment has been tested for verification of compliance with FCC Part 15, Subpart B, class A requirements for Digital Devices.
- This equipment complies with the requirements of:
EN 55022 Class A, Electromagnetic Emissions,
EN 61000-3-2 & -3-3, Disturbance in Supply Systems
EN 61000-4-2, -3, -4, -5, -6, -8 & -11 Electromagnetic Immunity

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1 HD-Bridge Dec+: HDV to HD/SD SDI with Genlock & ASI Inputs

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 DVB-ASI, and outputs HD-SDI at 1080i/720p, or SD-SDI with embedded audio and Time Code. Dual HD/SD SDI outputs provide one clean feed, and one feed with Time Code and Graticule Markers. The interface also provides HD/SD component video, composite video, AES, analog audio and LTC outputs. An RS-422 port is provided for VTR control. The unit can genlock to its reference input.

The HD-Bridge Dec+ has an internal cross-converter, allowing the conversion of 1080i HDV material into 720p, and 720p material into 1080i, and a down-converter to generate SD outputs from its HD inputs.

The interface can be used for broadcast distribution and playout, with edited HDV material converted into HD-SDI for direct playout into an HD-SDI infrastructure. HD-Bridge Dec+ can also be used to convert compressed HDV into uncompressed HD-SDI for lossless editing.



1.2 Features

- Affordable, high quality HDV to HD/SD SDI interface
- HDV and DVB-ASI inputs
- Multiple outputs:
 - ◊ 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, including 720p24 HDV to 1080PsF24 HDSDI conversion
- HD to SD downconversion
- Dual HD/SD SDI outputs – one clean output, and one with burned-in time code and graticule markers
- RS-422 to IEEE-1394 VTR control for batch capture
- Reference input for genlock
- 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

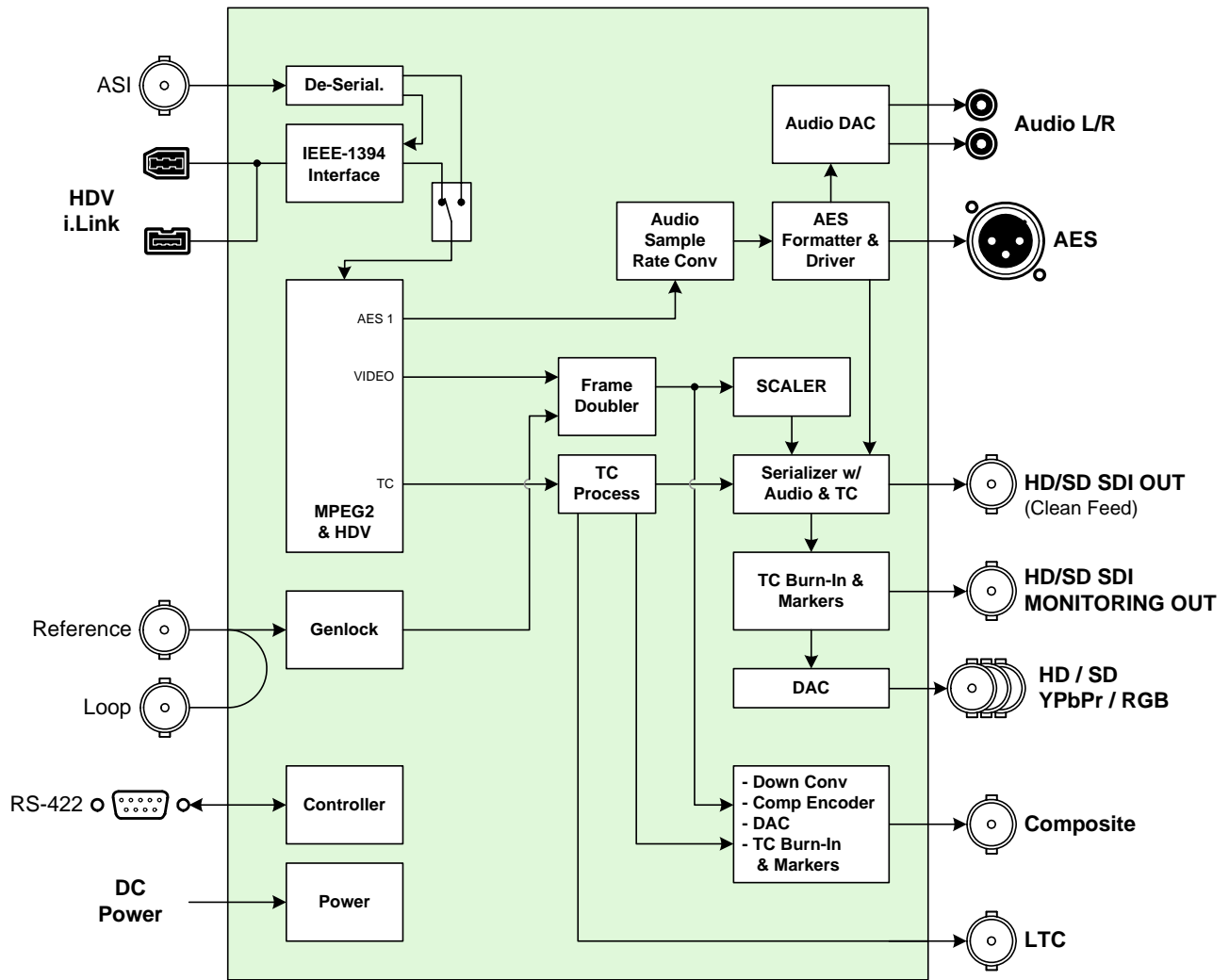
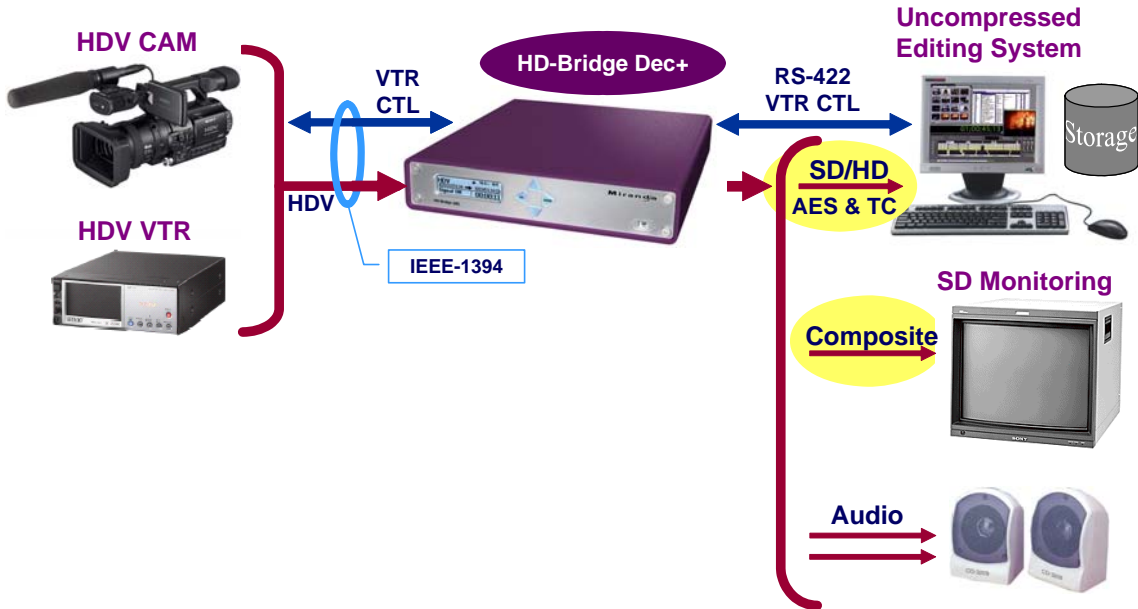


Figure 1.1 Functional block diagram of the HD-Bridge Dec+

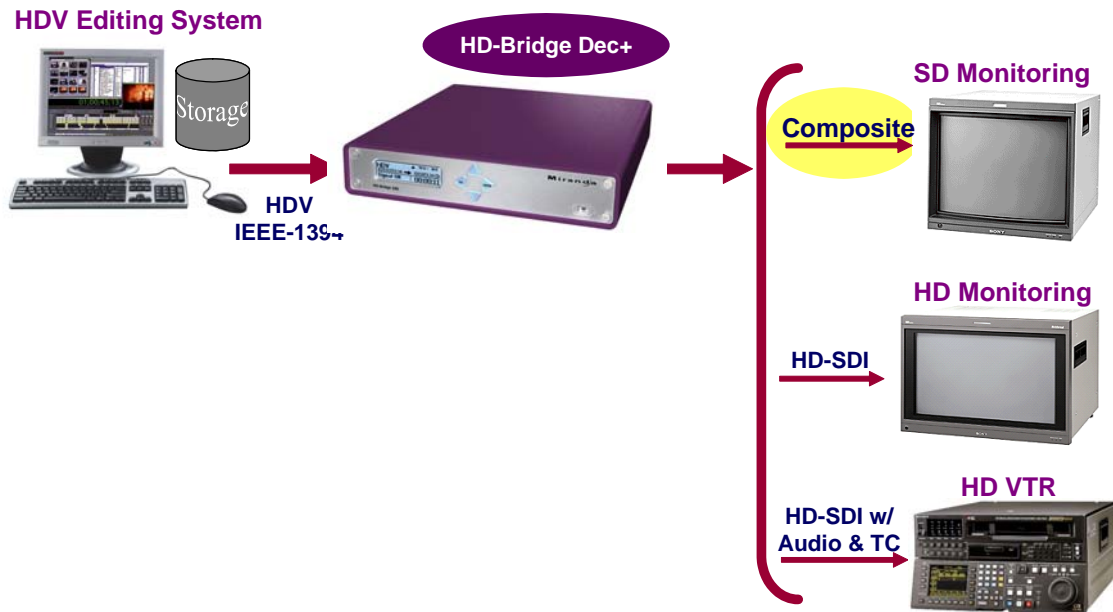
1.4 Application Examples

Here are some examples of typical uses and applications for the HD-Bridge Dec+.

1.4.1 Post-Production HD/SD SDI Capture



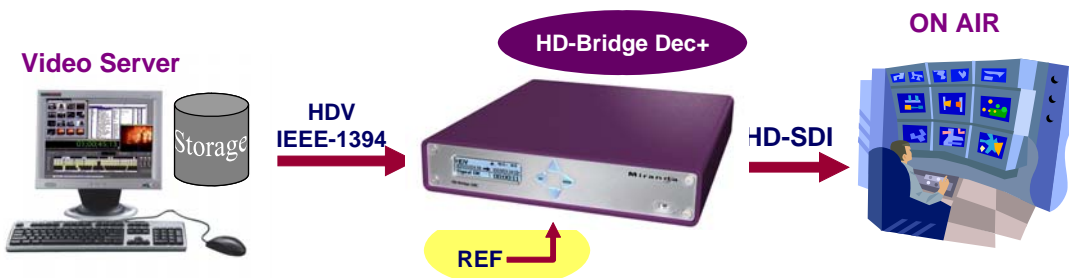
1.4.2 HDV Edit, HD/SD SDI Recording



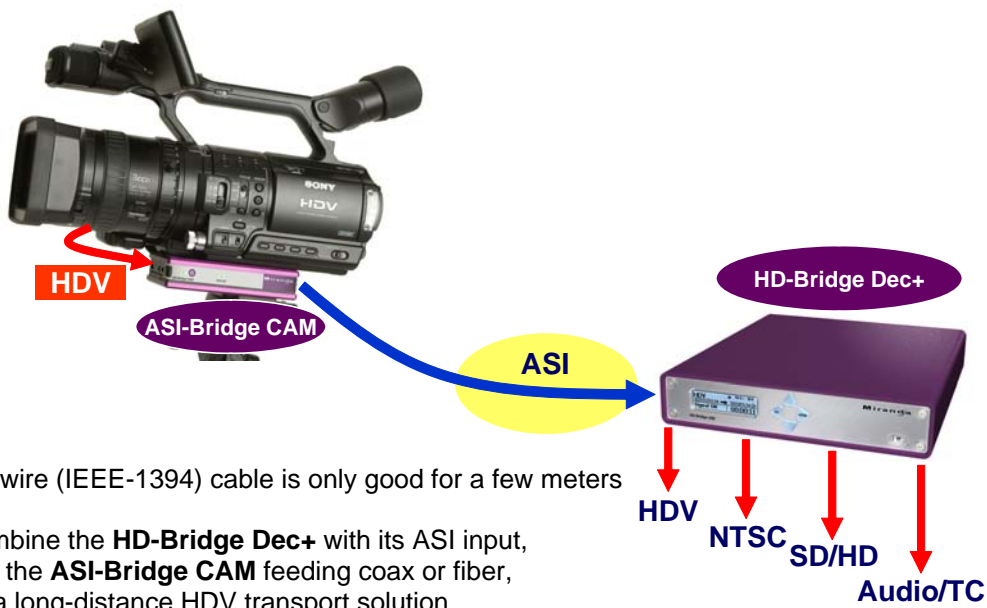
1.4.3 24p “Universal Mastering Format”



1.4.4 HDV to HD/SD SDI Playback



1.4.5 HDV over Coax



- Firewire (IEEE-1394) cable is only good for a few meters
- Combine the **HD-Bridge Dec+** with its ASI input, and the **ASI-Bridge CAM** feeding coax or fiber, for a long-distance HDV transport solution

2 Installation

2.1 Connections

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

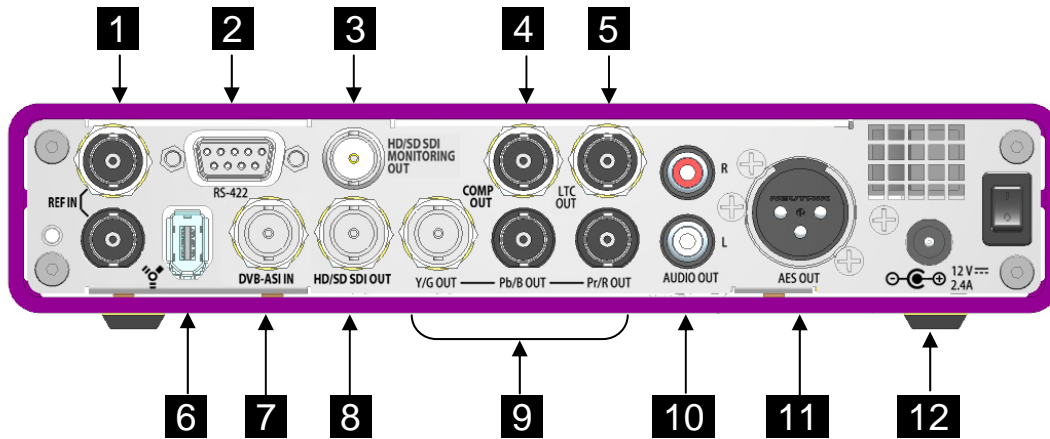


Figure 2.1 Rear view of the HD-Bridge Dec+

- 1** Reference In and Loop-through (BNC connectors)
- 2** Control In (RS-422) – Connect to a computer or editing system able to control HDV devices
- 3** HD/SD SDI Monitoring Out (BNC connector) – Signal with burned-in time code and markers if enabled.
- 4** Composite Out (BNC connector)
- 5** LTC Out (BNC connector)
- 6** 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.
- 7** DVB-ASI In (BNC connector)
- 8** HD/SD SDI Out (BNC connector) Clean feed
- 9** HD component Out (3 BNC connectors) – Includes burned-in time code and markers if enabled
- 10** Audio L R Out (RCA plugs)
- 11** AES Out (XLR connector)
- 12** DC In – Connect the provided DC power supply.

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.

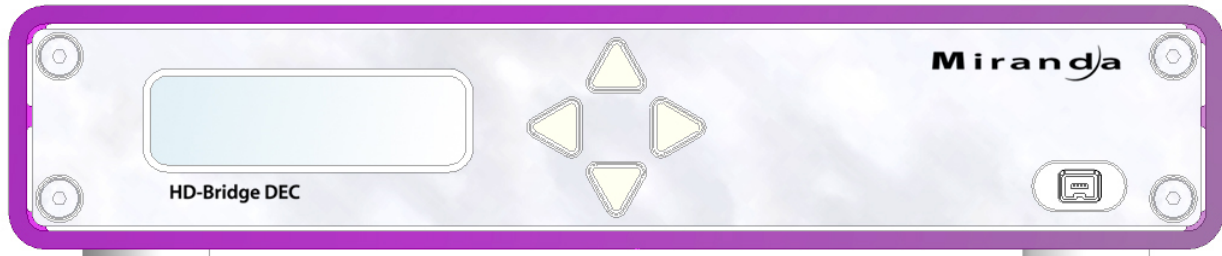
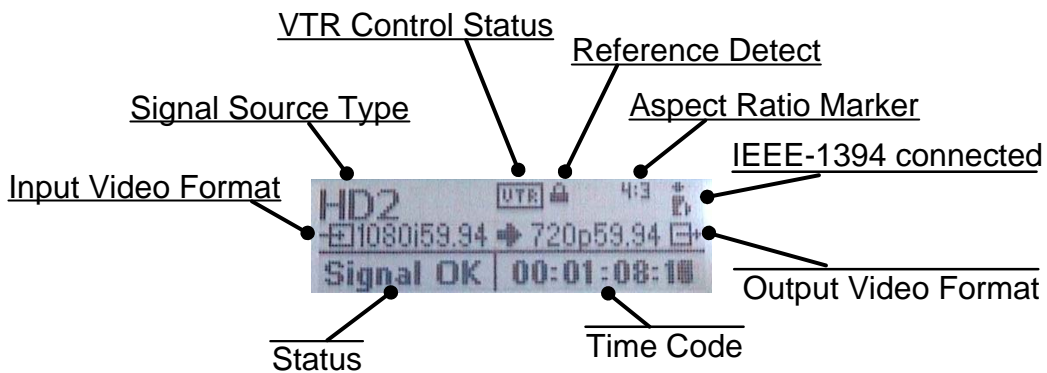


Figure 3.1 Front panel

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:

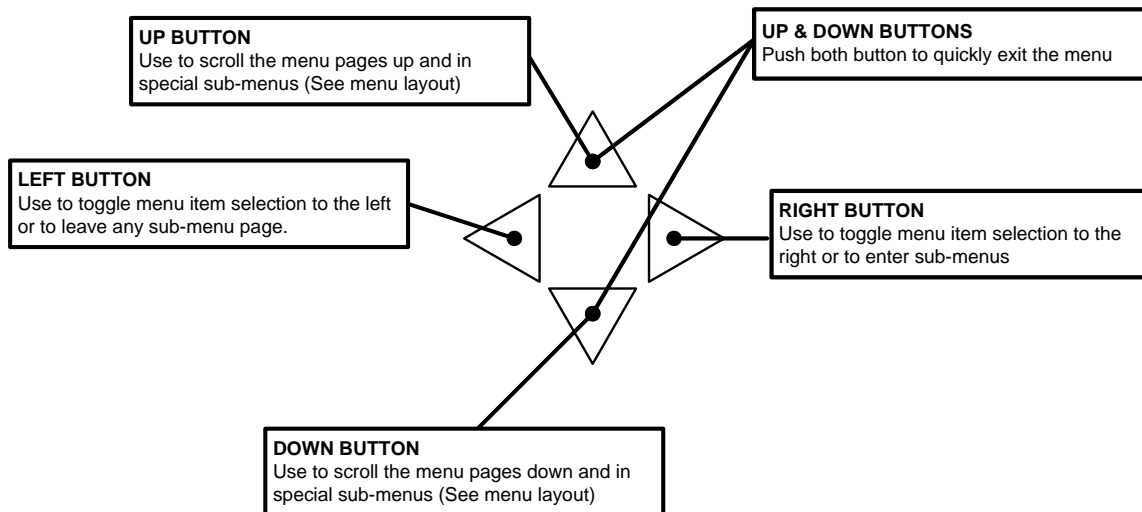
Signal Source Type	INTERNAL	When no signal is present and the color bar generator is ON
	HD1	When 720p HDV signal is detected
	HD2	When 1080i HDV signal is detected
Aspect Ratio Marker	<blank>	When turned-off
	4:3	Left and right markers indicating a 4:3 aspect ratio are ON
	1.85	Top and bottom markers 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	
	720p23.98	
	1080p23sf	
	1080p25sF	
	1080p29sF	
Status	<Text>	
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:



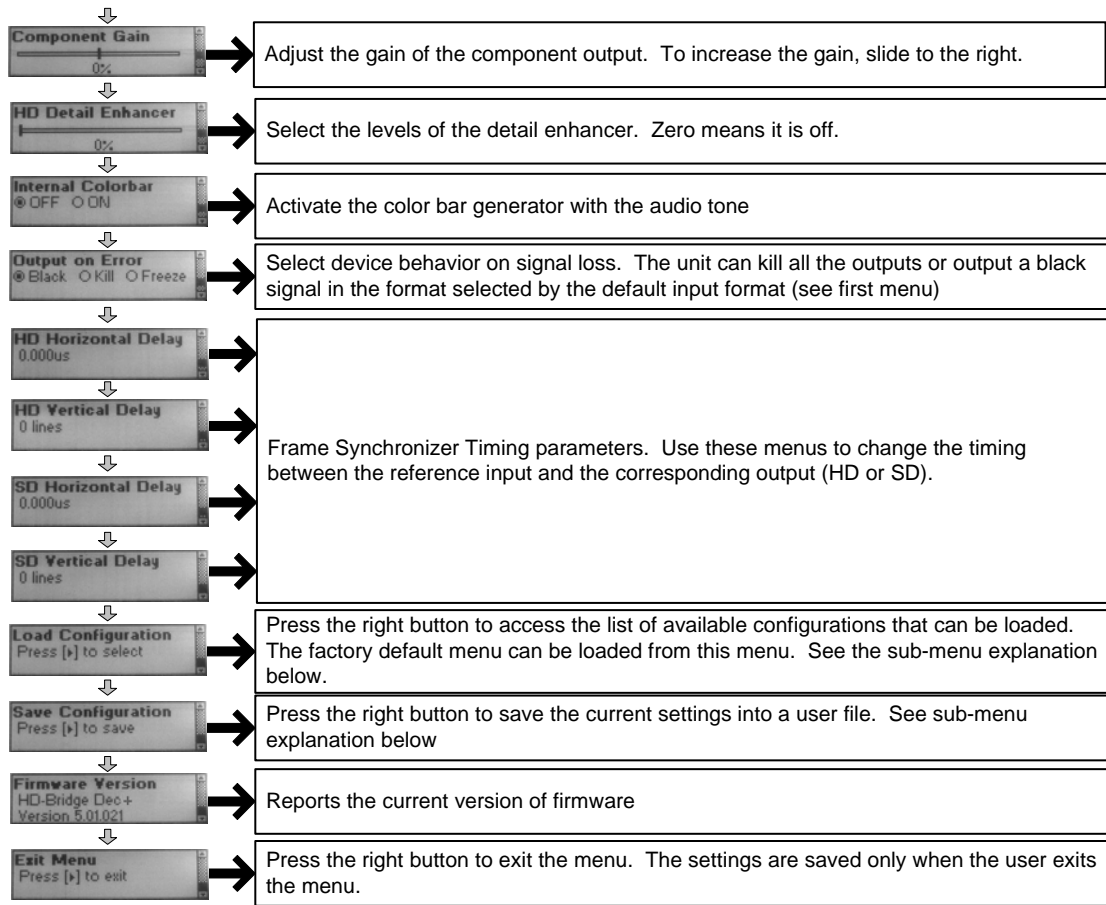
Note the use of the (up) and (down) buttons together to immediately exit the menus and return to normal operation.

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

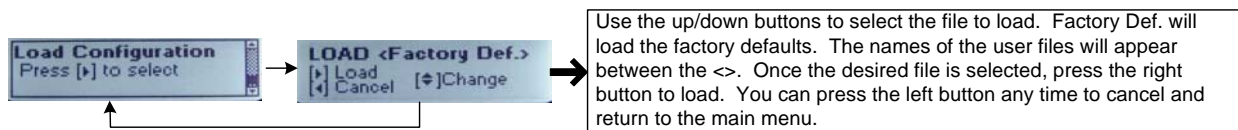
3.4 Menu Layout

	→	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.
	→	Select the input that has priority when both have a valid signal.
	→	Enables on-screen display of time code on the component & monitor HD-SDI outputs
	→	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 & monitoring HD-SDI 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.
	→	Choose the 24p input mode processing. See text for more details.
	→	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.

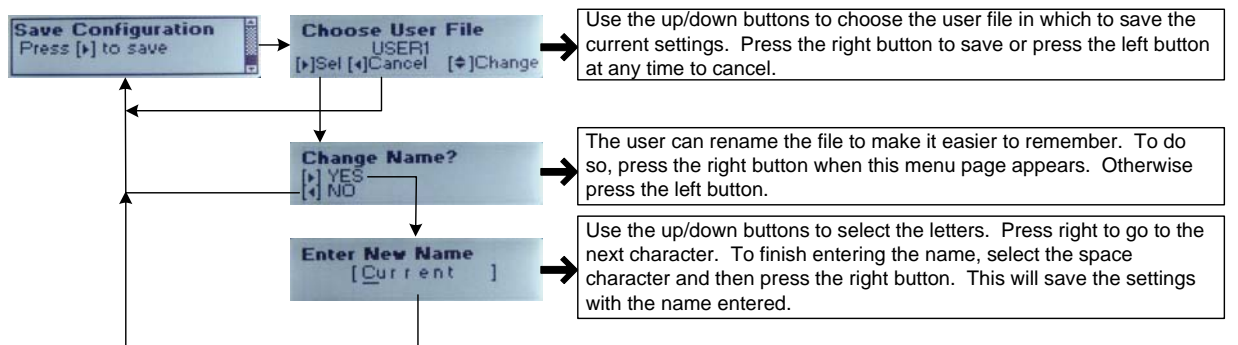
(continued on next page)



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

Input Priority

In this dialog, select the default input that will be used when both inputs carry a valid signal. Select between:

- Firewire
- DVB-ASI

Time Code Burn-in

When ON, time code is burned into the component and HD/SD SDI 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 and HD-SDI/SDI 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 and HD-SDI/SDI 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 or to SD. Select among these options:

- As input
- 1080i
- 720p
- SD

24p Out processing

Due to hardware limitations, the HD-Bridge cannot simultaneously output SD at 59.94Hz and HD at 23.98Hz with a reference. Refer to section 3.7 for more details.

SD Aspect Ratio

Select how the SD output (if selected) and the Composite output (at all times) will be transformed from the 16:9 input. The choices are:

- Anamorphic
- Letterbox
- Crop

NTSC Setup

Select the amount of setup that will be applied to an NTSC composite output:

- 0 IRE
- 7.5 IRE

Composite gain

Adjust the gain of the composite output using the on-screen slider. The display indicates the percentage of change vs the nominal value.

SD Analog Blanking

Select the blanking width for the composite output:

- Wide
- Narrow

Component Output

Select the desired component output format:

- YPbPr
- RGB

SD Component

If the Component Output is selected as YPbPr in the previous menu, this menu becomes available, and allows the component set to be selected from these options:

- Betacam
- SMPTE

Component Gain

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

HD 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 three options for the output:

- Black – place a video black signal at the output
- Kill – turn the output OFF
- Freeze – display the last valid video frame at the output

HD Horizontal Delay

Frame synchronizer timing setup – set the horizontal delay of the HD output vs the reference input in μs

HD Vertical Delay

Frame synchronizer timing setup – set the vertical delay of the HD output vs the reference input in lines

SD Horizontal Delay

Frame synchronizer timing setup – set the horizontal delay of the SD output vs the reference input in μs

SD Vertical Delay

Frame synchronizer timing setup – set the vertical delay of the SD output vs the reference input in lines

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 IEEE-1394.

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.

Please read the application note “How to use the HD-Bridge Dec with AVID Nitris and other NLE stations” available on the HD-Bridge support web page.

3.7 Operating in 720p24 mode

The HD-Bridge Dec+ can extract the 24p information from the JVC cameras. Note that we currently do not support the 24p format from CANON cameras.

Due to product limitations, many of the features are altered when activating the 24p HD-SDI output mode. To activate the extraction, use the menu item “24p Out Processing”. See the table below for explanations.

Selection	HD-SDI Out	Component Out	Composite Out	Notes
23.98p w/ Ref (No Analog)	23.98Hz	None	None	No analog video outputs available
23.98p w/ Analog	23.98Hz	59.94Hz	59.94Hz	No Reference Possible. In this mode the reference is simply ignored if connected. Also note that the audio is in-sync with the HD-SDI output. Due to processing delays in extracting the 24 frames, the SD output is advanced about 2 frames with respect to the HD-SDI output. **Another important note is that the analog output cannot be frozen or forced to black. Therefore it is always killed when no signal is input.
3:2	59.94Hz	59.94Hz	59.94Hz	No restrictions in this mode.

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.

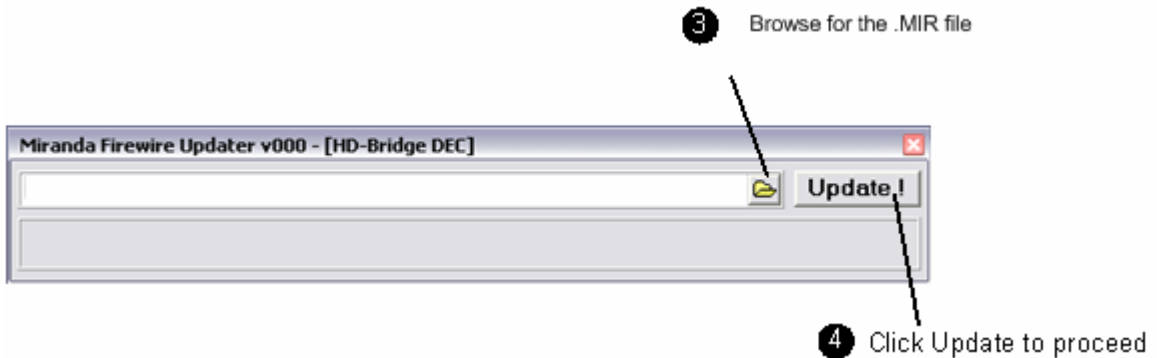


DO NOT CONNECT ANY OTHER DEVICES IN THE FIREWIRE CHAIN.
The HD-Bridge must be the only device connected to the computer.

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
 - Unzip the updater to a known folder such as My Documents

2. Execute Firewire_Updater.EXE. You should get the following:




3. Click on the Open File icon (see above) and browse for the .MIR file containing the new firmware.
4. 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.

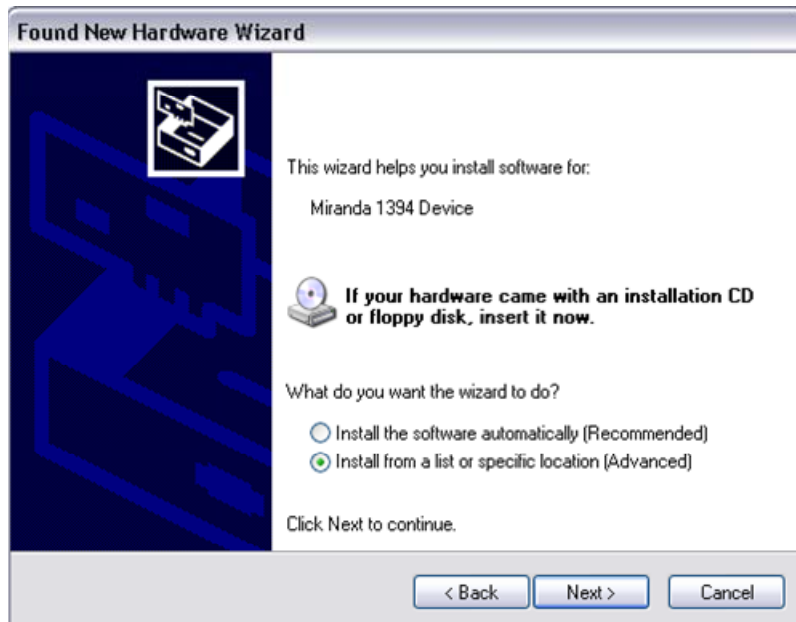
Installing a new driver:

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 

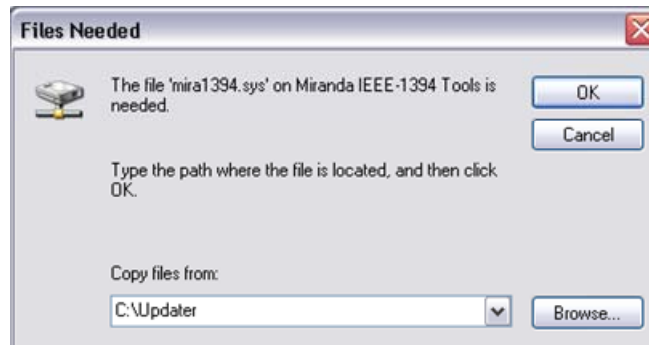
The following window will appear:



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 2 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) JVC 1280x720p23.98
CONNECTOR	IEEE-1394 6-pin and 4-pin
REFERENCE	SMPTE 170M/SMPTE 318M/ITU 624-4/BUT 470-6 or Comp. Sync SMPTE 274M / SMPTE 296M Tri-Level Sync Tri Level Sync 1080i59.94 and 1080i50 Tri Level Sync 720p59.94 and 720p50 SD bi-level sync or black burst 525i59.94 and 625i50
RETURN LOSS	>35 dB up to 5.75 MHz
CONNECTOR (2)	75 Ω BNC
DVB-ASI	EN 50083-9, EN/ISO/IEC 13818-1(MPEG-2 TP 188 bytes), HDV_VER1.00_55: HD1(720p25/50/29.97/59.94) HD2(1080i50/59.94Hz)
RETURN LOSS	>15 dB up to 270 MHz
CONNECTOR	75 Ohms BNC non-isolated with transformer

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 \pm 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 \pm 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 \pm 20%
SAMPLING 48kHz, 20 bits
IMPEDANCE 110 Ω 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

VTR CONTROL

SIGNAL TYPE RS-422 (SMPTE-207)
PROTOCOL Sony protocol tributary mode only. SONY DNW-A500 VTR is emulated.
CONNECTOR: DE-9P

VIDEO PROCESSING PERFORMANCE

HDV INPUT 8 bits
SD SDI INPUT 10 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 1/2 RU