TABLE OF CONTENTS

Figures

Tables

REVISION HISTORY

REVISION	DESCRIPTION	DATE
0.2	Preliminary Version	Aug 02
0.3	Updated with features of first firmware version 1.01 build 310	Feb 03
1.0	First release – added user defined aspect ratios, updated delay table	Aug 03
1.1	Added VITC Line Select, added filters, fixed typographical errors	Oct 03
1.2	Custom panel colours, minor changes to features and overview	Feb 04
1.3	Added 720p/50 Hz support, updated new audio embedder controls and misc feature additions.	Aug 06
1.4	Removed reference to +VBI option. It is standard in the base product.	Oct 06
1.5	Updated format	May 09

1. OVERVIEW

The 7710UC-HD High Definition Upconverter provides high quality conversion of 270 Mb/s standard definition (SMPTE 259M-C) signals to the common 1.5 Gb/s high definition (SMPTE 292M) video formats. The 7710UC-HD has 10-bit processing, 2 reclocked SDI outputs and 2 HD Serial Digital outputs. The 7710UC-HD outputs 1080i/59.94, 1080i/50, 720p/59.94 and 720p/50 HD video formats.

The 7710UC-HD has colour space conversion from ITU rec. 601 to ITU rec. 709. The 7710UC-HD provides user adjustable and the common 4:3 to 16:9 aspect ratio conversion choices; 4:3 with side panels, 16:9 anamorphic stretch, 16:9 letterbox zoom to full size and 13:9 or 14:9 letterbox zoom to full height 13:9 or 14:9 with side panels.

The upconverter accepts 2 groups of SMPTE 272M embedded audio on the input and re-embeds them into the HD SMPTE 292M 1.5Gbs output. The re-embedded audio is compliant to SMPTE 299M and will have appropriate delay added to compensate for video delay incurred by the upconversion process, thus avoiding the need for external de-embedding and re-embedding of audio. The audio is also available as 4 unbalanced AES outputs.

The 7710UC-HD occupies two card slots in the 15 slot 3RU frame, or one slot in the 3 slot 1RU frame. The 7710UC-HD provides card edge LEDs to indicate signal present, genlock present and audio groups present.

Features:

- High quality SD -> HD up conversion
- Supports 4:3 Side Panel, 16:9 Crop, 16:9 Stretch 13:9 Crop, 14:9 Crop and user defined aspect ratio conversions
- SD to HD colour space conversion (ITU rec. 601 to ITU rec. 709)
- Reference input allows for phasing of output video
- Module supports min. delay or variable delay for video output without reference
- Module supports video output referenced to genlock with variable delay
- Analog monitor output on screen display used to configure the operating modes
- De-embeds Audio from SD video and embeds into HD video (2 groups)
- VistaLINK® - enabled offering remote control and configuration capabilities via SNMP using VistaLINK® Pro or 9000NCP Network Control Panel. VistaLINK® is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame
- Extraction of VITC on SD input and conversion to RP188 ANC Timecode on HD output
- Transcoding and translation of EIA-608 Line 21 captions from the SD input to EIA-708 (SMPTE 334M) ANC captions on the HD output

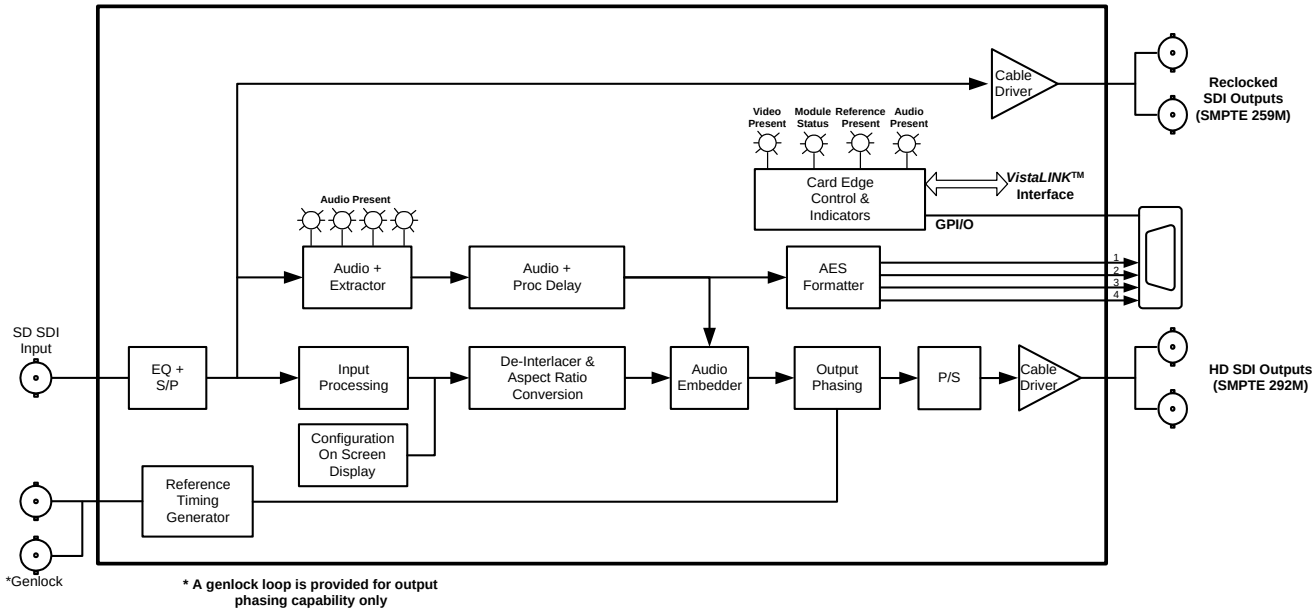


Figure 1-1: 7710UC-HD Block Diagram

2. INSTALLATION

The 7710UC-HD comes with a companion rear plate that occupies two slots in the frame and has 7 BNC connectors, and one female DB9 connector. For information on mounting the rear plate and inserting the module into the frame see section 3 of the 7700FR chapter.

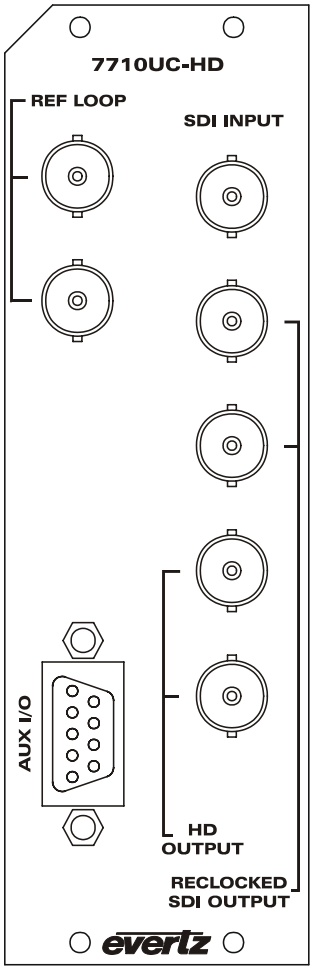


Figure 2-1: 7710UC-HD Rear Panels

2.1. VIDEO CONNECTIONS

SD INPUT: Input BNC connector for 10-bit serial digital video signals compatible with the SMPTE 259M standard. The 7710UC-HD can be set to automatically detect the standard or set to a specific video standard using the on screen menu. See Table 3-1 for a list of the video standards supported.

HD OUTPUT: These two BNC connectors are used to output the upconverted input video as serial component video, compatible with the SMPTE 292M standard.

RECLOCKED SDI OUTPUT: These two BNC connectors are used to output a reclocked version of the input video.

2.2. GENLOCK REFERENCE

For proper synchronization of the output video, the upconverter must be locked to a genlock signal of the output video format.

GENLOCK: These two BNCs form a loop through for connecting a video or tri-level sync reference. The genlock signal may be NTSC or PAL colour black, and is auto-detected by the module. Jumper J9 on the APB3FMTCON sub-module selects whether the reference input is terminated to 75 ohms or higher impedance (default). (See section 7.3). The *Reference* menu item is used to select the correct type of video reference being used. The output video can be timed with respect to the genlock video using the *H Phase Offset* and *V Phase Offset* menu items. (See section 6.3.1) When no Genlock is provided, the output video is timed with respect to the input video.

2.3. AUXILIARY I/O

On the 7710UC-HD a 9 pin D connector labelled **AUX I/O** contains 3 GPI inputs, 1 GPO output and 4 unbalanced AES outputs. The connector pinout is shown in Table 2-1.

Pin #	Name	Description
1	AES1	AES 1 Output
2	GPO	General Purpose Output – Not used at this time
3	Gnd	Signal Ground
4	GPI2	General Purpose Input 2
5	AES4	AES 4 Output
6	GPI3	General Purpose Input 3 – software enabled via the utilities menu
7	AES2	AES 2 Output
8	AES3	AES 3 Output
9	GPI1	General Purpose Input 1

Table 2-1: AUX I/O Connector Pin Definitions

2.3.1. AES Audio Connections

Four unbalanced AES outputs are provided on the 9 pin D connector. These outputs are for unbalanced AES signals conforming to SMPTE 276M. Two groups of embedded audio from the HD input are extracted and re-embedded on the output video. The transferred audio is also output as four AES channels.

2.3.2. General Purpose Inputs and Outputs

3 pins on the 9 pin D connector are used for three General Purpose inputs (GPIs). The GPI1 and GPI2 inputs are used to select user presets 1 and 2 respectively. The GPIs are active low with an internal pull up (3.6k ohm) resistor to +5V or +12V. The user can activate GPIs simply by connecting the GPI input pins to Ground. This can be done with a button, switch, relay or an open collector transistor. See section 7.4 for information on selecting the pull-up voltage. Figure 2-2 shows the input circuit for the General purpose inputs.

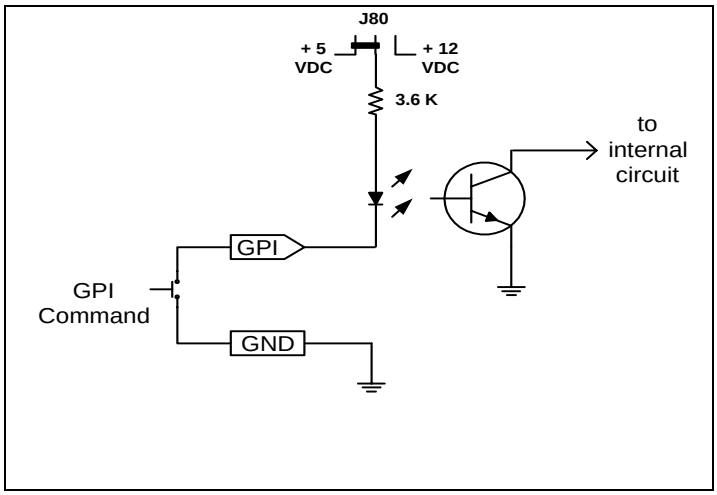


Figure 2-2: GPI Input Circuitry

The GPO is active low with internal pull up (10k Ohm) resistors to +5V. When the output goes low it is able to sink up to 10mA. When high, the signal will go high (+5V). **Do not draw more than 100µA from the output.** Figure 2-3 shows the circuit for the general purpose output. The GPO output is not used at this time.

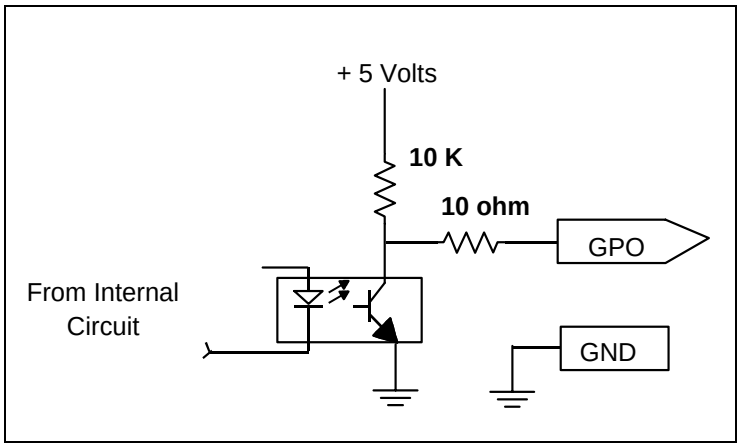


Figure 2-3: GPO Output Circuitry

3. SPECIFICATIONS

3.1. SDI VIDEO INPUTS

Standards: 525 or 625 line SMPTE 259M-C (270Mb/s) with Group 1 SMPTE 272M embedded audio
Number of Inputs: 1
Connector: BNC per IEC 169-8
Input Equalization: Automatic to 300m @ 270Mb/s with Belden 1694 or equivalent cable
Return Loss: >15 dB up to 270MHz

3.2. RECLOCKED SDI VIDEO OUTPUTS

Standard: Same as input
Number of Outputs: 2 Per Card reclocked
Connector: BNC per IEC 169-8
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 740ps nominal
Overshoot: <10% of amplitude
Return Loss: > 15 dB to 270MHz

3.1. HD SERIAL VIDEO OUTPUT

Standard: 1.5 Gb/s SMPTE 292M – DIP switch selectable

Input Format	Output Format	Pixels / Active Lines	Frame Rate	Progressive /Interlace	SMPTE Standard
525i/59.94	1080i/59.94	1920 x 1080	29.97 (30/1.001)	I	274M
625i/50	1080i/50	1920 x 1080	25	I	274M
525i/59.94	720p/59.94	1280 x 720	59.94 (60/1.001)	P	296M
625i/50	720p/50	1280x720	50	P	296M

Table 3-1: Video Output Formats

Number of Outputs: 2 Per Card reclocked
Connector: BNC per IEC 169-8
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 200ps nominal
Overshoot: <10% of amplitude
Return Loss: > 10 dB at 1.5 GHz

3.2. GENLOCK INPUT

Type: NTSC or PAL Colour Black 1 V p-p
Connector: BNC Loop per IEC 169-8
Termination: 75 ohm (jumper selectable)

3.3. AES AUDIO OUTPUTS

Number of Outputs:	4
Standard:	SMPTE 276M, single ended synchronous or asynchronous AES
Connectors:	Female 9 pin D
Resolution:	24 bits
Sampling Rate:	48 kHz
Impedance:	75 Ω
Signal Level:	1 V p-p nominal

3.4. GENERAL PURPOSE INPUTS

Number of Inputs:	3
Type:	Opto-isolated, active low with internal pull-ups to +5 or +12V (jumper settable)
Connector:	2 pins (plus ground) on female 9 pin D
Signal Level:	Closure to ground
Function:	User Preset select

3.5. ELECTRICAL

Voltage:	+12VDC
Power:	26 Watts
EMI/RFI:	Complies with FCC regulations for class A devices Complies with EU EMC directive

3.6. PHYSICAL

Number of slots:

7700 frame mounting:	2
7701 frame mounting:	1

4. STATUS INDICATORS

The 7710UC-HD has 3 LED Status indicators on the main circuit board front card edge to show operational status of the card at a glance. Figure 7-1 shows the location of the LEDs and card edge controls.

Two large LEDS on the front of the board indicate the general health of the module:

LOCAL FAULT: This Red LED indicates poor module health and will be On during the absence of a valid input signal or if a local input power fault exists (i.e.: a blown fuse). The LOCAL FAULT indication can also be reported to the frame through the FRAME STATUS jumper.

MODULE OK: This Green LED indicates good module health. It will be On when a valid input signal is present, and the board power is good.

VIDEO PRESENT: This Green LED will be ON when there is a valid video signal present at the module input.

GENLOCK: This Green LED will be ON when there is a signal present at the module genlock input. This LED does not indicate that a correct signal appropriate for the current video format is present. Refer to Table 5-2 for valid Video format and input Genlock combinations.

4.1. AUDIO STATUS LEDS

Four LEDs located on the lower end of the module (near the card extractor) indicate which audio groups are present in the input video. Audio group LED 1 is located closest to the center of the module.

Audio Group LED	Colour	Audio Group Status
1	Off	No group 1 present on input video.
	Green	Group 1 present on input video.
2	Off	No group 2 present on input video.
	Green	Group 2 present on input video.
3	Off	No group 3 present on input video.
	Green	Group 3 present on input video.
4	Off	No group 4 present on input video.
	Green	Group 4 present on input video.

Table 4-1: Audio Group Status LEDs

5. CARD EDGE CONTROLS

The 7710UC-HD series modules are equipped with an 8 position DIP switch to allow the user to select various functions. All positions are assigned sequentially such that DIP switch 1 is located at the top of the DIP switch (farthest from the card ejector). Table 5-1 gives an overview of the DIP switch functions. Section 5.1 describes the assigned DIP switch functions. The On (closed) position is down, or closest to the printed circuit board. The Off (open) position is up, or farthest from the printed circuit board. There is also a toggle switch and pushbutton which are used to navigate the on screen menu. (See section 6)

DIP Switch	Function
1	Output Video Standard
2	
3	
4	
5	Reserved for future use
6	
7	
8	VistaLINK® Control Enable

Table 5-1: Overview of DIP Switch Functions

5.1. SETTING THE OUTPUT VIDEO STANDARD

DIP switches 1 to 4 set the output video standard.

DIP 1	DIP 2	DIP 3	DIP 4	OUTPUT VIDEO FORMAT
On	Off	Off	Off	1080i/59.94
Off	On	Off	Off	1080i/50
On	Off	On	Off	720p/59.95
On	Off	On	On	720p/50

Table 5-2: Output Video Switch Settings

5.2. SELECTING WHETHER THE MODULE WILL BE CONTROLLED FROM THE LOCAL CONTROLS OR THROUGH THE VISTALINK® INTERFACE

DIP switch 8 selects whether the module will be controlled from the local user controls or through the *Vista*LINK® interface.

DIP 8	VistaLINK® CONTROL
Off	The card functions are controlled through the local menus.
On	The card functions are controlled through the *Vista*LINK® interface. (See section 8)

Table 5-3: VistaLINK® Control Switch Settings

6. ON SCREEN MENUS

6.1. NAVIGATING THE ON SCREEN MENU SYSTEM

A toggle switch and pushbutton allow card edge navigation for a set of on-screen menus used to configure the card. To enter the on-screen menu system, hold the toggle switch in the up or down position and then press and hold the pushbutton for 3 seconds. This will bring you to the main Setup menu where you can use the toggle switch to move up and down the list of available sub-menus. An arrow (➔) moves up and down the left hand side of the menu items to indicate which item you are currently choosing. Once the arrow is on the desired item, press the pushbutton to select the next menu level.

On all menus, there are two extra selectable items: *Back* and *Exit*. Selecting *Back* will take you to the previous menu (the one that was used to get into the current menu) while *Exit* will return the display to its normal operating mode. On the main menu, BACK and EXIT will both take you to the normal operating mode.

Once in a sub-menu, there may be another menu layer, or there may be a list of parameters to adjust. If there is another set of menu choices, use the toggle switch to select the desired menu item and press the pushbutton.

To adjust any parameter, use the toggle switch to move up or down to the desired parameter and press the pushbutton. The arrow will move to the right hand side of the line (➔) indicating that you can now adjust the parameter. Using the toggle switch, adjust the parameter to its desired value. If the parameter is a numerical value, the number will increase if you lift the toggle switch and decrease if you push down on the toggle switch.

When you have stopped at the desired value, depress the pushbutton. This will update the parameter to the selected value and move the arrow back to the left side of the parameter list (➔). Continue selecting and adjusting other parameters or use the BACK or EXIT commands.

6.2. ON SCREEN DISPLAY – MAIN MENU

The OSD menu is arranged in a layered structure that groups similar configuration items together. The following section gives a brief description of the first level of menus that appear when you enter the OSD screens. Selecting one of these items will take you to the next menu level. Sections 6.3 to 6.9 provide detailed descriptions of each of the sub-menus. The tables in sections 6.3 to 6.9 are arranged in an indented structure to indicate the path taken to reach the control. Menu items or parameters that are underlined indicate the factory default values.

Video	Sets the input and output video standards and timing for the video output.
Output Picture	Configuration of the output picture aspect ratio, action on loss of input, panel colours, and other items related to the output picture.
Deinterlacer	Configuration of the deinterlacer modes.
Scaler	Configuration of the scaler filter sharpness.
VITC Line Select	Controls the vertical interval time code reader lines.
Audio	Sets the Audio groups.
Utilities	Card preset management and various debug and maintenance features.

6.3. CONFIGURING THE VIDEO CONTROLS

The *Video* menus are used to configure parameters associated with the input and output video standards and output video timing. The chart below shows the items available in the *Video* menu. Sections 6.3.3.1 to 6.3.3.3 give detailed information about each of the menu items.

Line 21 CC	Determines if line 21 will be blanked prior to upconversion
Reference Select	Sets the source of the genlock reference input
1080i/59.94 V Phase Offset	Sets the vertical phase of the output signal to the genlock reference input - 1080i/59.94 output video
1080i/59.94 H Phase Offset	Sets the horizontal phase of the output signal to the genlock reference input - 1080i/59.94 output video
1080i/50 V Phase Offset	Sets the vertical phase of the output signal to the genlock reference input - 1080i/50 output video
1080i/50 H Phase Offset	Sets the horizontal phase of the output signal to the genlock reference input - 1080i/50 output video
720p/59.94 V Phase Offset	Sets the vertical phase of the output signal to the genlock reference input - 720p/59.94 output video
720p/59.94 H Phase Offset	Sets the horizontal phase of the output signal to the genlock reference input - 720p/59.94 output video
720p/50 V Phase Offset	Sets the vertical phase of the output signal to the genlock reference input - 720p/50 output video
720p/50 H Phase Offset	Sets the horizontal phase of the output signal to the genlock reference input - 720p/50 output video

6.3.1. Blanking Line 21 Captions

Video
Line 21 CC Blanking
Blank
Pass

With this control, you can blank line 21 (where closed caption information may be present) prior to upconverting the signal.

6.3.2. Reference Select

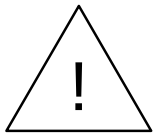
Video
Reference Select
external
video

With this control, you can select the genlock reference to be from an external source or the video signal.

6.3.3. Setting up the Video Output Timing

The output stage of the upconverter contains a frame buffer and a line buffer so that the output video can be timed with respect to the reference applied to the **GENLOCK** input loop. In the absence of a genlock signal the output video will be timed with respect to the incoming SD Video.

There are separate controls to adjust the horizontal and vertical timing of the output video for each video standard. For the sake of simplicity in the manual, only the menu items for the 1080i/59.94 output standard will be shown.



The *V Phase Offset* and *H Phase Offset* adjustments are REAL TIME ADJUSTMENTS and will affect the output video timing immediately. These settings should not be adjusted when the output video is in the broadcast chain.

6.3.3.1. Calculating the Delay through the Upconverter

The delay through the upconverter is dependent on the video input format, the upconverter processing mode and the H and V phase settings. There are separate settings of *H and V phase* offset for each output video type. Table 6-1 shows the default and maximum and minimum delays for each video standard.

The default delay will be when the *V Phase Offset* and *H Phase Offset* parameters are set to zero. When increasing the *V Phase Offset* value causes it to go beyond the limit of the frame buffer (the line value shown in the maximum delay column), the *V Phase Offset* will wrap to the beginning of the frame buffer, resulting in a loss of one frame of throughput delay between the HD input and the video output. When increasing the *H Phase Offset* value causes it to go beyond the limit of the line buffer (the sample value shown in the maximum delay column), the *H Phase Offset* will wrap to the beginning of the line buffer, resulting in a loss of one whole line of throughput delay between the HD input and the video output. Thus, the minimum delay is achieved when both the *V Phase Offset* and *H Phase Offset* wrap to the beginning of the frame and line buffers and will occur when the *V Phase Offset* is set to the line value shown and the *H Phase Offset* is set to the sample value shown in the minimum delay columns. The maximum delay is achieved one line before the *V Phase Offset* wraps to the beginning of the frame buffer and one sample before the *H Phase Offset* wraps to the beginning of the line buffer. This will occur when the *V Phase Offset* is set to the line value shown and the *H Phase Offset* is set to the sample value shown in the maximum delay columns.

Note: The delay is counted in the lines and pixels of the output standard and is calculated from input field 0 start to output field 0 start.

	Default Delay	Maximum Delay			Minimum Video Delay		
	Frames	Frames	Lines	Samples	Frames	Lines	Samples
1080i/59.94 Frame	2	2	576	1759	1	576	1759
1080i/50 Frame	2	2	575	1519	1	575	1519
720p/59.94	4	4	232	643	2	232	643
720p/50	4	4	232	643	2	232	643

Table 6-1: 7710UC-HD Video Delay

6.3.3.2. Setting the Vertical Phase of the Output Video

Video
1080i/59.94 V Phase Offset
0 to Max Lines
0

With this control, you can set the vertical timing of the output video with respect to the genlock reference input. There are separate settings of V phase offset for each output video type. Setting this control to 0 keeps the output video in time with the Genlock reference or incoming video if genlock is missing.

Increasing the value will delay the output video in one-line increments of the output video standard. In order to advance the vertical timing of the output video with respect to the genlock video, set the control to the maximum total number of lines of the output video minus the number of lines that you wish to advance the output video. (E.g. for 1080i/59.94 output video the total number of lines is 1125, so to advance the output video 5 lines set the value to 1120.) When increasing the *V Phase Offset* value causes it to go beyond the limit of the frame buffer, the *V Phase Offset* will wrap to the beginning of the frame buffer, resulting in a change of one frame of throughput delay between the SD input and the video output. See Table 6-1 for the minimum and maximum delays possible.

6.3.3.3. Setting the Horizontal Phase of the Output Video

Video
1080i/59.94 H Phase Offset
0 to Max samples
0

With this control, you can set the horizontal timing of the output video with respect to the genlock reference input. There are separate settings of V phase offset for each output video type. Setting this control to 0 keeps the output video in time with the Genlock reference.

Increasing the value will delay the output video in one-sample increments. In order to advance the horizontal timing of the output video with respect to the genlock video, set the control to the maximum number of samples per line for the output video standard minus the number of samples that you wish to advance the output video. (E.g. for 1080i/59.94 output video the total number of samples per line is 2200, so to advance the output video 5 samples set the value to 2195.) See Table 6-1 for the minimum and maximum delays possible.

6.4. CONFIGURING THE OUTPUT PICTURE

The *Output Picture* menus are used to configure parameters associated with the output picture. The chart below shows the items available in the *Output Picture* menu. Sections 0 to 6.4.3 give detailed information about each of the menu items.

Aspect Ratio	Selects the aspect ratio of the output picture.
Loss of Video	Selects the action to take when the input video is missing.
Panel Colours	Sets the colour of the letterbox panels.
Custom Panel Colour Red	Sets the red colour component of the custom letterbox panel colour.
Custom Panel Colour Green	Sets the green colour component of the custom letterbox panel colour.
Custom Panel Colour Blue	Sets the blue colour component of the custom letterbox panel colour.
525 Input H Start	Sets the left side crop position for custom aspect ratios – 525 Input Video
525 Input H Stop	Sets the right side crop position for custom aspect ratios – 525 Input Video
525 Input V Start	Sets the top crop position for custom aspect ratios – 525 Input Video
525 Input V Stop	Sets the bottom crop position for custom aspect ratios – 525 Input Video
625 Input H Start	Sets the left side crop position for custom aspect ratios – 625 Input Video
625 Input H Stop	Sets the right side crop position for custom aspect ratios – 625 Input Video
625 Input V Start	Sets the top crop position for custom aspect ratios – 625 Input Video
625 Input V Stop	Sets the bottom crop position for custom aspect ratios – 625 Input Video
1080i/59.94 Output H Start	Sets the left side of the output image for custom aspect ratios – 1080i/*59.94* Output Video
1080i/59.94 Output H Stop	Sets the right side of the output image for custom aspect ratios – 1080i/*59.94* Output Video
1080i/59.94 Output V Start	Sets the top of the output image for custom aspect ratios – 1080i/*59.94* Output Video
1080i/59.94 Output V Stop	Sets the bottom of the output image for custom aspect ratios – 1080i/*59.94* Output Video
1080i/50 Output H Start	Sets the left side of the output image for custom aspect ratios – 1080i/*50* Output Video
1080i/50 Output H Stop	Sets the right side of the output image for custom aspect ratios – 1080i/*50* Output Video
1080i/50 Output V Start	Sets the top of the output image for custom aspect ratios – 1080i/*50* Output Video
1080i/50 Output V Stop	Sets the bottom of the output image for custom aspect ratios – 1080i/*50* Output Video

720p/59.94 Output H Start	Sets the left side of the output image for custom aspect ratios – 720p/*59.94* Output Video
720p/59.94 Output H Stop	Sets the right side of the output image for custom aspect ratios – 720p/*59.94* Output Video
720p/59.94 Output V Start	Sets the top of the output image for custom aspect ratios – 720p/*59.94* Output Video
720p/59.94 Output V Stop	Sets the bottom of the output image for custom aspect ratios – 720p/*59.94* Output Video
720p/50 Output H Start	Sets the left side of the output image for custom aspect ratios – 720p/*50* Output Video
720p/50 Output H Stop	Sets the right side of the output image for custom aspect ratios – 720p/*50* Output Video
720p/50 Output V Start	Sets the top of the output image for custom aspect ratios – 720p/*50* Output Video
720p/50 Output V Stop	Sets the bottom of the output image for custom aspect ratios – 720p/*50* Output Video

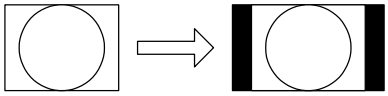
6.4.1. Setting the Aspect Ratio of the Output Picture

The *Aspect Ratio* menu allows the user to select how the 4:3 aspect ratio standard definition image will be converted to the 16:9 aspect ratio high definition image.

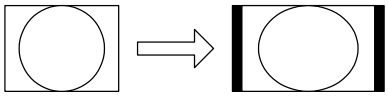
- *Output Picture*
  - *Aspect Ratio*
    - *4:3 Side Panel*
    - *13:9 Stretch*
    - *14:9 Stretch*
    - *16:9 Stretch*
    - *13:9 Crop*
    - *14:9 Crop*
    - *16:9 Crop*
    - *User defined*

When the Output video standard is set to one of the 1080i, or 720p formats (see section 5.1) there are 7 output aspect ratio choices available.

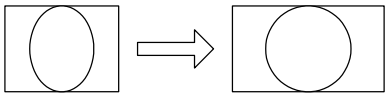
Select *4:3 Side Panel* if the input image is a conventional 4:3 image filling the complete raster. Images will normally be upconverted so that the 4:3 image sits in the center of the 16:9 HD raster with side panels. The position of the image can be set by the *4:3 POSITION* menu item.



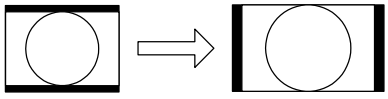
13:9 Stretch and *14:9 Stretch* are like the *4:3 Side panel* above except that they are stretched horizontally to fill more of the raster. 4:3 is equivalent to 12:9 so 13:9 stretches the image by 8% and 14:9 stretches the image 12%.



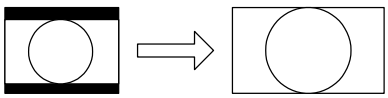
Select *16:9 Stretch* if the input image is a 16:9 image that has been squeezed to fit into the 4:3 raster (often referred to as anamorphic). Images will be upconverted so that the 16:9 image width is stretched to fill the complete 16:9 HD raster.



Select *13:9 Crop* or *14:9 Crop* if the input image is a letterboxed 13:9 or 14:9 in the 4:3 raster. Images will be upconverted so that the letterboxed image height is enlarged to fill the complete 16:9 HD raster height. The top and bottom of the image will be cropped and the output image will have side panels.



Select *16:9 Crop* if the input image is a letterboxed 16:9 in the 4:3 raster. Images will be upconverted so that the letterboxed image width is enlarged to fill the complete 16:9 HD raster width. The top and bottom of the image will be cropped.



Select *User Defined* if you want to create a custom input and output picture position and cropping. See section 6.4.3.1 for more information.

6.4.2. Setting the Action to Take when Input Video Is Missing

Output Picture
Loss of Video
Black
Blue
Pass

The user can set the output to go to black, go to blue or pass the input with this control. DIP switches 1 to 4 set the video standard of the output. (See section 5.1)

When set to *Pass* the output video will be incoherent when the video input is missing.

6.4.3. Setting the Colour of the Letterbox Panels

Output Picture
Panel Colours
Black
Blue
Red
White
Custom

The user can set the colour of the letterbox and side panels with this control. You can choose from one of the predefined colours or the user can define a custom colour.

6.4.3.1. Selecting a Custom Colour for the Letterbox Panels

There are three menu items used to set the custom colour. The menu item for each colour component works in the same way so for simplicity only the menu item for the *Red* component will be shown in the manual.

Output Picture
Custom Panel Colour Red
0 to 255

This control defines one of the component colours for a custom colour for the side panels. Set the R, G or B value for the custom side panel colour that you want.

Hint you can use a standard colour picker such as is available in Microsoft Paint to determine the colour values that you want to use.

6.4.4. Setting a User Aspect Ratio

There are four registers for each input video standard that set the portion of the input picture that will be upconverted. For the sake of clarity only the menu items for the 525 input video standard are shown in the manual. These register settings do not have any effect when the pre-defined aspect ratios are used.

Output Picture
525 Input H Start
525 Input H Start = 0

The *Input H Start* and *Input H Stop* define the horizontal portion of the input image to process to the output. Note that the input image number of pixels must be equal or smaller than the output number of pixels set by the *Output H Start* and *Output H Stop* registers. The range of values is 0 to 719 pixels for 525 input video and 0 to 575 for 625 input video.

Output Picture
525 Input V Start
525 Input V Start = 0

The *Input V Start* and *Input V Stop* define the vertical portion of the input image to process to the output. Note that the input image number of lines must be equal or smaller than the output number of lines set by the *Output V Start* and *Output V Stop* registers. The range of values is 0 to 484 for 525 input video and 0 to 575 for 625 input video.

There are four registers for each output video standard that define the size of the output image and how to place the resulting image on the output video raster. For the sake of clarity, only the menu items for the 1080i/59.94 output video standard are shown in the manual.

Output Picture *1080i/59.94 Output H Start* *1080i/59.94 Output H Start = 0*	The *Output H Start* and *Output H Stop* define how to scale the cropped input image horizontally and where to place it horizontally on the output raster. The image will be stretched to fill the width. Note that the output image number of pixels must be equal or larger than the input number of pixels set by the *Input H Start* and *Input H Stop* registers. The range of values for 1080i output is 0 to 1919. The range of values for 720p output is 0 to 1279.
Output Picture *1080i/59.94 Output V Start* *1080i/59.94 Output V Start = 0*	The *Output V Start* and *Output V Stop* define how to scale the cropped input image vertically and where to place it vertically on the output raster. The image will be stretched to fill the height. Note that the output image number of lines must be equal or larger than the input number of lines set by the *Input V Start* and *Input V Stop* registers. The range of values for 1080i output is 0 to 539. The range of values for 720p output is 0 to 719.

6.5. CONFIGURING THE DEINTERLACER

The *Deinterlacer* menus are used to configure parameters associated with the de-interlacer hardware. The chart below shows the items available in the *Deinterlacer* menu. Section 6.5.1 gives detailed information about each of the menu items.

Deinterlacer Mode	Selects whether the module will perform field or frame based down conversion.
Freeze Frame Threshold	Sets number of frames before frozen video is detected.
Noise Reduction Resolution	Sets resolution of the Noise reduction control.
Noise Reduction Level	Sets level of the Noise reduction control.
Detail Enhancement Resolution	Sets resolution of the Detail Enhancement control.
Detail Enhancement Level	Sets level of the Detail Enhancement control.
Edge Detection Threshold	Sets the Edge Detection Threshold used by the Edge Enhancement controls.
H Edge Enhancement	Sets the Horizontal Edge Enhancement control.
V Edge Enhancement	Sets the Vertical Edge Enhancement control.
Motion Detection Threshold	Sets the Motion Detection Threshold used by the Edge Enhancement controls.
Interfield Weighting Factor	Sets the Interfield Weighting factor used by the deinterlacer.

6.5.1. Setting the Deinterlacer Mode

De-interlacing is used in order to restore motion dependent elements to their correct positions in the raster prior to upconversion. In interlaced standard definition television signals, the second active line of the picture commences one field time after the start of the first active line 1. Any significant movement on line 2 will be displaced in time, because of the delay in scanning field 2 after the scanning of field 1 has been completed. This will cause motion related artifacts. For interlaced material, it is therefore desirable to provide compensation for horizontally and vertically displaced motion. Selecting the frame based mode of the upconverter enables these corrections. In the *frame* based mode, the signal is de-interlaced and both horizontal and vertical motion adaptive interpolators are employed to correct the motion displacement. The de-interlacing process converts each field into a full progressive image before upconversion. The upconverted signal is subsequently re-interlaced if required into the new HDTV output format, with significantly reduced motion artifacts.

Deinterlacer
Deinterlacer Mode
Field *Frame*

With this control, you can set whether the module will perform field or frame based down conversion.

In *Field* mode the upconverter works on a field by field basis. This mode is recommended for 3:2 pulldown content on interlaced video formats but gives a softer vertical up conversion. This mode is applicable to interlaced input video formats only. If *Field* mode is selected for progressive input video formats the up-converter will operate in *Frame* mode. Currently *Field* mode is not supported

In *Frame* mode the upconverter works on a complete frame basis thus providing a crisper image. It is a good choice for interlaced images that do not contain 3:2 pulldown or for progressively scanned video. This mode is the only mode available for progressive input video formats.

6.5.2. Setting the Freeze Frame Threshold

Deinterlacer
Freeze Frame Threshold
16 *0 to 31*

With this control, you can set the number of frames before frozen/missing video is detected.

The level value ranges from 0 to 31.

6.5.3. Setting the Noise Reduction

Two controls allow you to control the deinterlacer noise reduction.

Deinterlacer
Noise Reduction Resolution
1 *0 to 7*

With this control, you can set the resolution for the *Noise Reduction Level* control. Larger numbers mean coarser steps in the level control.

The level value ranges from 0 to 7.

Deinterlacer *Noise Reduction Level* *0* *0 to 31*	With this control, you can set *Noise Reduction Level* control. Larger numbers mean more noise reduction will be applied. The step sizes for the level control are set using the *Noise Reduction Resolution* control. The level value ranges from 0 to 31.

6.5.4. Setting the Detail Enhancement

Two controls allow you to control the deinterlacer detail enhancement.

Deinterlacer *Detail Enhancement Resolution* *1* *0 to 5*	With this control, you can set the resolution for the *Detail Enhancement Level* control. Larger numbers mean coarser steps in the level control. The value ranges from 0 to 5.
Deinterlacer *Detail Enhancement Level* *0* *0 to 31*	With this control, you can set *Detail Enhancement Level* control. Larger numbers mean more detail enhancement will be applied. The step sizes for the level control are set using the *Detail Enhancement Resolution* control. The level value ranges from 0 to 31.

6.5.5. Setting the Edge Enhancement Controls

Three controls allow you to set the Edge enhancement controls:

Deinterlacer *Edge Detection Threshold* *4* *0 to 15*	With this control, you can set the *Edge Detection Threshold* control. The threshold value ranges from 0 to 15.
Deinterlacer *H Edge Enhancement* *50* *0 to 255*	With this control, you can set the *Horizontal Edge Enhancement* control. The value ranges from 0 to 255.
Deinterlacer *V Edge Enhancement* *30* *0 to 255*	With this control, you can set the *Vertical Edge Enhancement* control. The value ranges from 0 to 255.

6.5.6. Setting the Motion Detection Controls

Two controls allow you to set the Motion Detection controls:

Deinterlacer *Motion Detection Threshold* *4* *0 to 15*	With this control, you can set the *Motion Detection Threshold* control. The threshold value ranges from 0 to 15.

Deinterlacer *Interfield Weighting Factor* *40* *0 to 255*	With this control, you can set the *Interfield Weighting Factor* control. The value ranges from 0 to 15.

6.6. CONFIGURING THE SCALER

The 7710UC-HD scaler chip uses a process of filtering in order to increase the resolution from 720 x 480 (or 720 x 576) to 1920 x 1080 (or 1280 x 720). The *Scaler* menus are used to configure the cut-off frequencies of the filters associated with the scaler hardware. The chart below shows the items available in the *Scaler* menu. Section 6.6.1 gives detailed information about the menu items.

H Filter Cutoff	Sets the cutoff frequency of the horizontal filter in the scaler.
V Filter Cutoff	Sets the cutoff frequency of the vertical filter in the scaler.

6.6.1. Setting the Scaler Filter Sharpness

There are two controls that adjust the horizontal and vertical filters for the scaler. For the sake of clarity only the menu item for the horizontal filter control is shown in the manual.

Scaler *H Filter Cutoff* *Soft cg* *Soft 0.5* *Soft 0.75* *Soft 0.9* *flat* *Mid boost 2* *Mid boost 1* *Enhanced 2* *Enhanced 1*	With this control, you can set the sharpness of the horizontal filter used during the up conversion process. There is a choice of eight filters. The vertical filters exhibit a similar response to the horizontal filters. Select *Soft cg* to provide a soft filter to minimize ringing in cg signals. Select *Soft 0.5* to provide a linear roll off starting at 2.5 MHz. The filter provides a –3 dB roll off at 3.78 MHz. Select *Soft 0.75* to provide a linear roll off starting at 3.75 MHz. The filter provides a –3 dB roll off at 4.4 MHz. Select *Soft 0.9* to provide a linear roll off starting at 4.5 MHz. The filter provides a –3 dB roll off at 4.875 MHz. Select *flat* to pass the image through as given. Select *Mid boost 2* to boost the mid frequencies (centered at 3.375 MHz) by 2 dB. Select *Mid boost 1* to boost the mid frequencies (centered at 3.375 MHz) by 1 dB. Select *Enhanced 2* to give a linear boost across the bandwidth peaking by 2 dB at approximately 4.5 MHz. Select *Enhanced 1* to give a linear boost across the bandwidth peaking by 1 dB at approximately 4.5 MHz.

6.7. CONFIGURING THE VITC READER LINES

The *VITC Line Select* menus are used to configure the lines that the vertical interval time code (VITC) reader will read. The chart below shows the items available in the *VANC Data Processing* menu. Sections 6.7.1 to 6.7.2 give detailed information about each of the menu items.

525 VITC Line	Sets VITC reader line on 525 line video inputs.
625 VITC Line	Sets VITC reader line on 625 line video inputs.

6.7.1. Setting the VITC Reader Line for 525 Line Video Inputs

VITC Line Select *525 VITC Line* *14* *10 to 20*	This control determines the line number where VITC will be read in 525 line video. The value ranges from 10 to 20.

6.7.2. Setting the VITC Reader Line for 625 Line Video Inputs

VITC Line Select *625 VITC Line* *19* *6 to 22*	This control determines the line number where VITC will be read in 625 line video. The value ranges from 6 to 22.

6.8. CONFIGURING THE AUDIO PROCESSING

The SMPTE 299M standard permits up to 4 groups of 4 audio channels to be embedded into the 1.5 Gb/s video bitstream. The 7710UC-HD de-embeds two groups of audio from the incoming SDI that are the source for re-embedding on the HD SDI output video. The *Audio* menus are used to configure the de-embedder and embedder groups. The chart below shows the items available in the *Audio* menu. Sections 6.8.1 to 6.8.2 give detailed information about each of the menu items.

De-embedder A	Sets the audio group source for de-embedder A
De-embedder B	Sets the audio group source for de-embedder B
Embedder A	Sets the audio group destination for embedder A
Embedder B	Sets the audio group destination for embedder B
Audio Delay	Adjusts the audio delay from the nominal video delay
Embedder A ch 1	Sets the audio channel source for channel 1 of embedder A
Embedder A ch 2	Sets the audio channel source for channel 2 of embedder A
Embedder A ch 3	Sets the audio channel source for channel 3 of embedder A
Embedder A ch 4	Sets the audio channel source for channel 4 of embedder A
Embedder B ch 1	Sets the audio channel source for channel 1 of embedder B
Embedder B ch 2	Sets the audio channel source for channel 2 of embedder B
Embedder B ch 3	Sets the audio channel source for channel 3 of embedder B
Embedder B ch 4	Sets the audio channel source for channel 4 of embedder B

6.8.1. Selecting the Audio Groups That Will Be De-Embedded

There are two controls that set the source groups for the two de-embedders. For simplicity, only one control will be shown in the manual.

Audio *De-embedder A* *Group 1* *Group 2* *Group 3* *Group 4*	With these controls, you can set the source group for De-embedder A and B. Under normal conditions the settings for De-embedder A and B should be different otherwise the audio will be repeated on the HD SDI output. The default group for de-embedder A is group 1 and the default group for de-embedder B is group 2.

6.8.2. Selecting the Audio Groups That Will Be Embedded

The 7710UC-HD has two embedders that each insert one group of audio on the HD-SDI output. There are two controls that set the audio groups where the embedders will put the audio on the HD SDI output. For simplicity, only one control will be shown in the manual.

Audio	
Embedder A	
	Off
	Follow A
	Group 1
	Group 2
	Group 3
	Group 4

With these controls, you can set the destination group for Embedder A and B.

When set to *Off*, the embedder will be disabled.

When set to *Follow A*, or *Follow B*, the embedder destination will follow the setting of the respective De-embedder. (See section 6.8.1)

Otherwise the embedder destination can be set to a specific group.

The group for Embedder A must be different from Embedder B. If the user sets them the same then the next higher group number will be used for Embedder B.

6.8.3. Selecting the Audio Channels That Will Be Embedded

The 7710UC-HD allows for specific audio channel re-insertion of upstream-embedded audio. The following control provides this audio routing capability. For simplicity, only one control will be shown in the manual.

Audio	
Embedder A ch 1	
	De-embedder A, ch1
	De-embedder A, ch2
	De-embedder A, ch3
	De-embedder A, ch4
	De-embedder B, ch1
	De-embedder B, ch2
	De-embedder B, ch3
	De-embedder B, ch4
	Mute

With these controls, you can map the re-insertion of upstream embedded audio into a specific audio channel.

For example: if *De-embedder B, ch3* is selected then audio channel 3 from de-embedder B will re-inserted by embedded A into channel 1.

6.9. UTILITIES

The *Utilities* menus are used to list the module firmware version, upgrade the firmware, and manage the user presets. The chart below shows the items available in the *Utilities* menu. Sections 6.9.1 to 6.9.6 give detailed information about each of the parameters.

Recall Preset	Used to recall the current module configuration from one of the user presets or to reset the module to its factory preset condition.
Store Preset	Used to store the current module configuration to one of the user presets.
Upgrade	Used to upgrade the firmware in the module.
Status Window	Used to enable or disable the on screen status window.
GPI 3 enable	Used to enable or disable support for GPI 3.
About…	Selecting *About* displays the firmware version of the module.

6.9.1. Recalling Configurations to the User Presets or the Factory Preset

The 7710UC-HD modules provide ten user preset areas to store the complete set of controls from the on screen menu.

Utilities
  Recall preset
  Cancel
  Factory
  1 to 10
	This control is used to initiate a recall of the current card configuration from one of the user presets or from the factory preset.
	
	Use the toggle switch to select the preset you wish to recall. After selecting the preset, you must press the pushbutton before the recall will take place. You can abort the operation by pressing the pushbutton when *Cancel* is displayed.

The current state of the card will be forgotten if it has not been saved to a preset before a recall is performed.

There will be a slight disturbance in the operation of the card and the on-screen display while the new preset is being recalled.

6.9.2. Saving Configurations to the User Presets

The 7710UC-HD modules provide ten user preset areas to store the complete set of controls from the on screen menu.

Utilities
Store Preset
Cancel
1 to 10

This control is used to initiate a store of the current card configuration into one of the user presets.

Use the toggle switch to select the preset location where you want to store the module configuration. After selecting the preset, you must press the pushbutton before the store will take place. You can abort the operation by pressing the pushbutton when *Cancel* is displayed.

6.9.3. Initiating a Software Upgrade

Utilities
Upgrade
Cancel
Upgrade

This control is used to initiate an upgrade of the module software.

In addition to the software upgrade support detailed in the *Upgrading Firmware* chapter in the front of the binder, you can initiate an upgrade with this control. This will allow you to upgrade the software without unplugging the card and changing the upgrade jumper.

After selecting the upgrade operation, you must change the command to *Upgrade* and press the pushbutton before the upgrade can take place. Follow the remainder of the instructions in the *Upgrading Firmware* chapter. You can abort the operation by pressing the pushbutton when *Cancel* is displayed.

After the upgrade has finished, the unit will automatically restart and run in normal operating mode.

6.9.4. Enabling the Status Window

Utilities
Status Window
Disable
Enable

This control is used to enable or disable the on screen status window.

When set to *Enable* the following status parameters will be enabled:

Video Conversion
Video Delay
Genlock
Audio Group 1
Audio Group 2
Audio Group 3
Audio Group 4
Time Code
Closed Captions

6.9.5. Enabling GPI 3

Utilities *GPI 3 enable* *disable* *enable*	This control is used to enable GPI 3. By default this control will be disabled. If the user requires GPI 3 support, this control must be enabled.

6.9.6. Accessing Information About this Module and its Firmware

Utilities *About…*	This control lists features about the module and the firmware residing within it. It gives quick access to information about revisions that can be used to determine when upgrades are required.

7. JUMPERS

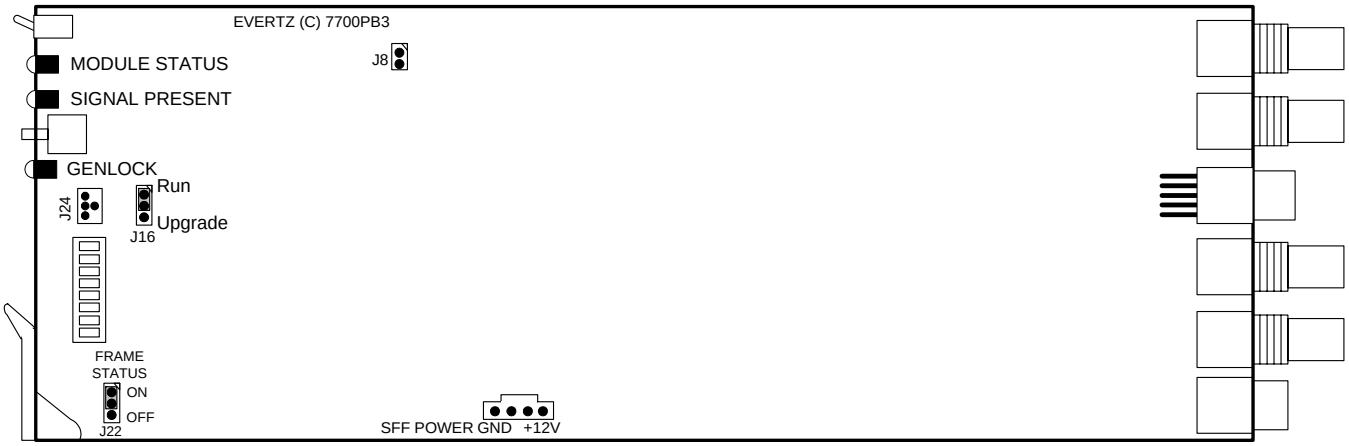


Figure 7-1: Location of Jumpers – Main Module

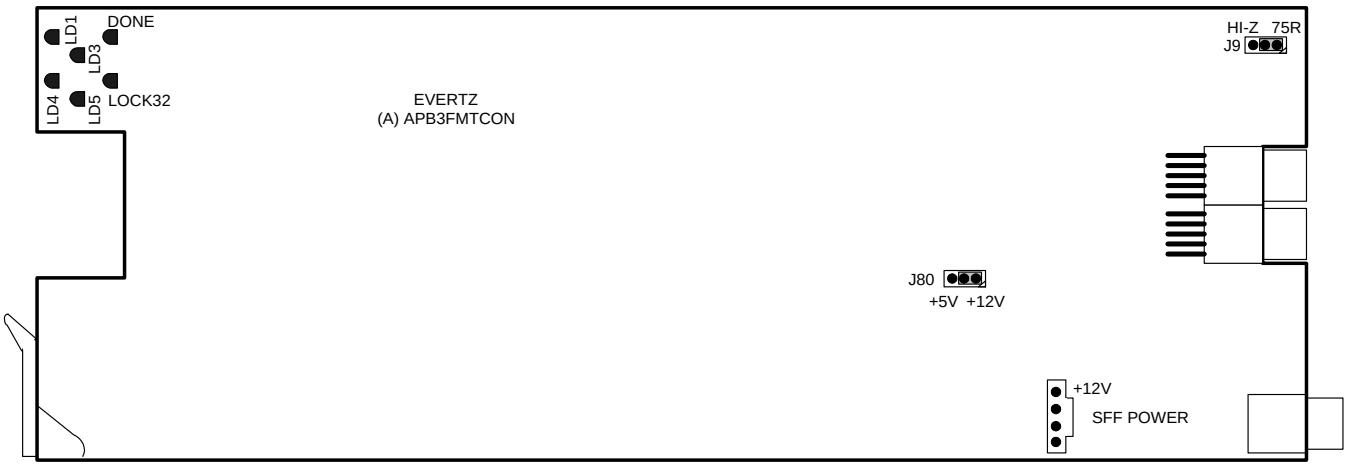


Figure 7-2: Location of Jumpers – Sub Module

7.1. SELECTING WHETHER LOCAL FAULTS WILL BE MONITORED BY THE GLOBAL FRAME STATUS

FRAME STATUS: The FRAME STATUS jumper J22 located at the front of the main module determines whether local faults (as shown by the Local Fault indicator) will be connected to the 7700FR frame's global status bus.

To monitor faults on this module with the frame status indicators (on the PS FRAME STATUS LED's and on the Frame's Fault Tally output) install this jumper in the On position. (Default)

When this jumper is installed in the Off position, local faults on this module will not be monitored.

7.2. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

Firmware updates can be performed using the *Upgrade* menu item on the *Utilities* menu (see section 6.9.3) or using the **UPGRADE** jumper.

UPGRADE: The UPGRADE jumper J16 located at the front of the main module is used when firmware upgrades are being done to the module. For normal operation it should be installed in the *RUN* position. See the *Upgrading Firmware* chapter in the front of the binder for more information.

To upgrade the firmware in the module unit pull it out of the frame. Move Jumper J16 into the *UPGRADE* position. Install the Upgrade cable provided (located in the vinyl pouch in the front of this manual) onto header J24 at the card edge. Re-install the module into the frame. Run the upgrade as described in the *Upgrading Firmware* chapter. Once the upgrade is complete, remove the module from the frame, move J16 into the *RUN* position, remove the upgrade cable and then re-install the module. The module is now ready for normal operation.

7.3. SELECTING WHETHER THE GENLOCK REFERENCE INPUT IS TERMINATED

TERM: The TERM jumper J9 located at the rear of the APB3FMTCON sub-module is used to terminate the genlock loop input. Then it is in the 75R position a 75 ohm terminating resistor will connect the input to ground. When it is in the HI-Z position the genlock loop input will be high impedance.

7.4. SELECTING THE GPI PULL-UP VOLTAGE

The GPI jumper J80, located near the rear of the APB3FMTCON sub-module, selects whether the general purpose inputs will be pulled up to +5 volts or +12 Volts. Figure 7-3 shows the jumper configuration and the GPI input schematic.

GPI: To set the pull-up voltage to +5 volts set the jumper to the +5V position.

To set the pull-up voltage to +12 volts set the jumper to the +12V position.

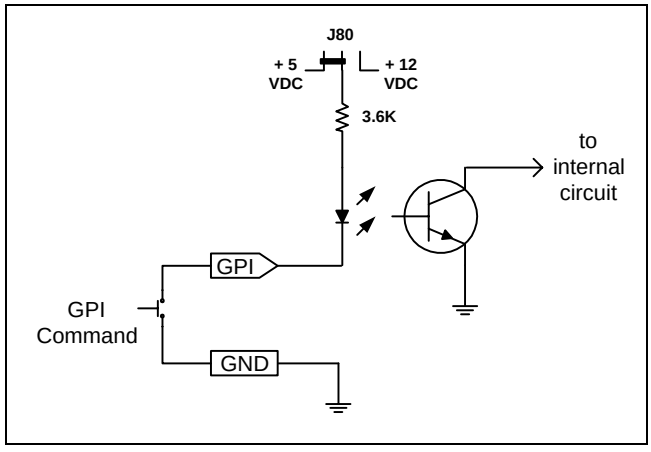


Figure 7-3: Setting the GPI Input Pullup Voltage

8. *VISTA*LINK® REMOTE MONITORING/CONTROL

8.1. WHAT IS *VISTA*LINK®?

VistaLINK® is Evertz's remote monitoring and configuration platform which operates over an Ethernet network using Simple Network Management Protocol (SNMP). SNMP is a standard computer network protocol that enables different devices sharing the same network to communicate with each other. VistaLINK® provides centralized alarm management, which monitors, reports, and logs all incoming alarm events and dispatches alerts to all the VLPro Clients connected to the server. Card configuration through VistaLINK® PRO can be performed on an individual or multi-card basis using simple copy and paste routines, which reduces the time to configure each module separately. Finally, VistaLINK® enables the user to configure devices in the network from a central station and receive feedback that the configuration has been carried out.

There are 3 components of SNMP:

1. An SNMP manager also known as a Network Management System (NMS) is a computer running special software that communicates with the devices in the network. Evertz *Vista*LINK® Pro Manager graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz *Vista*LINK® enabled fiber optic products.

2. Managed devices (such as 7707MB), each with a unique address (OID), communicate with the NMS through an SNMP Agent. Evertz VistaLINK® enabled 7700 series modules reside in the 3RU 7700FR-C MultiFrame and communicate with the manager via the 7700FC VistaLINK® frame controller module, which serves as the Agent.

3. A virtual database known as the Management Information Base (MIB) lists all the variables being monitored, which both the Manager and Agent understand. Please contact Evertz for further information about obtaining a copy of the MIB for interfacing to a third party Manager/NMS.

For more information on connecting and configuring the *Vista*LINK® network, see the 7700FC Frame Controller chapter.

8.2. *VISTA*LINK® MONITORED PARAMETERS

The following parameters can be remotely monitored through the *Vista*LINK® interface.

Parameter	Description
Input Video Present	Indicates the presence of a valid video input signal. (The state of the VIDEO PRESENT LED)
Input Video Standard	Indicates video standard of input signal.
Gen Lock Present	Indicates the presence of a valid genlock reference signal. (The state of the GENLOCK LED)
Gen Lock Standard	Indicates video standard of genlock reference signal.
GPI1 State	Indicates the state of the GPI1 input.
GPI2 State	Indicates the state of the GPI2 input.
GPO1 State	Indicates the state of the GPO1 output.
Audio Group 1 Present	Indicates the presence of embedded audio in group 1. (The state of the Group 1 present LED)
Audio Group 2 Present	Indicates the presence of embedded audio in group 2. (The state of the Group 2 present LED)
Audio Group 3 Present	Indicates the presence of embedded audio in group 3. (The state of the Group 3 present LED)
Audio Group 4 Present	Indicates the presence of embedded audio in group 4. (The state of the Group 4 present LED)
Time Code Present	Indicates the presence of VITC time code on the input video.
Closed Captions Present	Indicates the presence of EIA-608 closed captions on the input video.
Local Remote Mode	Indicates whether the 7710UC-HD is under local control or *Vista*LINK® control. (The state of DIP switch 8)

Table 8-1: *Vista*LINK® Monitored Parameters

8.3. *VISTA*LINK® CONTROLLED PARAMETERS

Parameter	Description
Output Video Standard	A range of values indicating the video output standards.
1080i/59.94 V Phase Offset	Vertical phase offset from Genlock reference - 1080i/59.94
1080i/59.94 H Phase Offset	Horizontal phase offset from Genlock reference - 1080i/59.94
1080i/50 V Phase Offset	Vertical phase offset from Genlock reference - 1080i/50
1080i/50 H Phase Offset	Horizontal phase offset from Genlock reference - 1080i/50
720p/59.94 V Phase Offset	Vertical phase offset from Genlock reference – 720p/59.94
720p/59.94 H Phase Offset	Horizontal phase offset from Genlock reference – 720p/59.94
Output Aspect Ratio	A range of values indicating the aspect ratio format of the output picture.
Loss of Video	Action on loss of video.
Panel Colours	Letterbox panel colours.
525 Input H Start	Left edge of input image to process – user defined aspect ratio 525 line input video.
525 Input H Stop	Right edge of input image to process – user defined aspect ratio 525 line input video.
525 Input V Start	Top edge of input image to process – user defined aspect ratio 525 line input video.
525 Input V Stop	Bottom edge of input image to process – user defined aspect ratio 525 line input video.
625 Input H Start	Left edge of input image to process – user defined aspect ratio 625 line input video.
625 Input H Stop	Right edge of input image to process – user defined aspect ratio 625 line input video.
625 Input V Start	Top edge of input image to process – user defined aspect ratio 625 line input video.
625 Input V Stop	Bottom edge of input image to process – user defined aspect ratio 625 line input video.
1080i/59.94 Output H Start	Left edge of output image – user defined aspect ratio 1080i/59.94 output video.
1080i/59.94 Output H Stop	Right edge of output image – user defined aspect ratio 1080i/59.94 output video.
1080i/59.94 Output V Start	Top edge of output image – user defined aspect ratio 1080i/59.94 output video
1080i/59.94 Output V Stop	Bottom edge of output image – user defined aspect ratio 1080i/59.94 output video.
1080i/50 Output H Start	Left edge of output image – user defined aspect ratio 1080i/50 output video.
1080i/50 Output H Stop	Right edge of output image – user defined aspect ratio 1080i/50 output video.
1080i/50 Output V Start	Top edge of output image – user defined aspect ratio 1080i/50 output video.

1080i/50 Output V Stop	Bottom edge of output image – user defined aspect ratio 1080i/50 output video.
720p/59.94 Output H Start	Left edge of output image – user defined aspect ratio 720p/59.94 output video.
720p/59.94 Output H Stop	Right edge of output image – user defined aspect ratio 720p/59.94 output video.
720p/59.94 Output V Start	Top edge of output image – user defined aspect ratio 720p/59.94 output video.
720p/59.94 Output V Stop	Bottom edge of output image – user defined aspect ratio 720p/59.94 output video.
Deinterlacer mode	Deinterlacer mode.
Freeze Frame Threshold	Number of frames before frozen video is detected.
Noise Reduction Resolution	Noise reduction resolution control.
Noise Reduction Level	Noise reduction level control.
Detail Enhancement Resolution	Detail enhancement resolution control.
Detail Enhancement Level	Detail enhancement level control.
Edge Detection Threshold	Edge detection threshold control.
H Edge Enhancement	H edge enhancement control.
V Edge Enhancement	V edge enhancement control.
Motion Detection Threshold	Motion detection threshold control.
Interfield Weighting Factor	Interfield weighting factor control.
H Filter Cutoff	Cutoff frequency of scaler horizontal filter.
V Filter Cutoff	Cutoff frequency of scaler vertical filter.
525 VITC Line	Sets VITC reader line number for 525 video.
625 VITC Line	Sets VITC reader line number for 625 video.
Audio De-embedder A Source	Sets source group for de-embedder A.
Audio De-embedder B Source	Sets source group for de-embedder B.
Audio Embedder A Group	Sets destination group for embedder A.
Audio Embedder B Group	Sets destination group for embedder B.

Table 8-2: *Vista*LINK® Controlled Parameters

8.4. *VISTA*LINK® TRAPS

There are currently no traps for the 7710UC-HD.

9. MENU QUICK REFERENCE

Video

- Line 21 CC
- Reference Select
- 1080i/59.94V Phase Offset
- 1080i/59.94 H Phase Offset
- 1080i/50 V Phase Offset
- 1080i/50 H Phase Offset
- 720p/59.94 V Phase Offset
- 720p/59.94 H Phase Offset
- 720p/50 V Phase Offset
- 720p/50 H Phase Offset

Output Picture

- Aspect Ratio
- Loss of Video
- Panel Colours
- Custom Panel Colour Red
- Custom Panel Colour Green
- Custom Panel Colour Blue
- 525 Input H Start
- 525 Input H Stop
- 525 Input V Start
- 525 Input V Stop
- 625 Input H Start
- 625 Input H Stop
- 625 Input V Start
- 625 Input V Stop
- 1080i/59.94 Output H Start
- 1080i/59.94 Output H Stop
- 1080i/59.94 Output V Start
- 1080i/59.94 Output V Stop
- 1080i/50 Output H Start
- 1080i/50 Output H Stop
- 1080i/50 Output V Start
- 1080i/50 Output V Stop
- 720p/59.94 Output H Start
- 720p/59.94 Output H Stop
- 720p/59.94 Output V Start
- 720p/59.94 Output V Stop
- 720p/50 Output H Start
- 720p/50 Output H Stop
- 720p/50 Output V Start
- 720p/50 Output V Stop

Deinterlacer

- Deinterlacer Mode
- Freeze Frame Threshold
- Detail Enhancement Resolution
- Detail Enhancement Level
- Motion Detection Threshold
- Interfield Weighting Factor

Scaler

- H Filter Cutoff
- V Filter Cutoff

VITC Line Select

- 525 VITC Line
- 625 VITC Line

Audio

- De-embedder A
- De-embedder B
- Embedder A
- Embedder B
- Audio Delay
- Embedder A ch 1
- Embedder A ch 2
- Embedder A ch 3
- Embedder A ch 4
- Embedder B ch 1
- Embedder B ch 2
- Embedder B ch 3
- Embedder B ch 4

Utilities

- Recall Preset
- Store Preset
- Upgrade
- Status Window
- GPI 3 enable
- About…