TABLE OF CONTENTS

Preliminary

Preliminary

Figures

Tables

Preliminary

REVISION HISTORY

REVISION	DESCRIPTION	DATE
0.1	Preliminary Version	Jan 05
0.2	Fixed typos, corrected specifications, removed features not implemented	Feb 05

Preliminary

Information contained in this manual is believed to be accurate and reliable. However, Evertz assumes no responsibility for the use thereof nor for the rights of third parties, which may be affected in any way by the use thereof. Any representations in this document concerning performance of Evertz products are for informational use only and are not warranties of future performance either express or implied. The only warranty offered by Evertz in relation to this product is the Evertz standard limited warranty, stated in the sales contract or order confirmation form.

Although every attempt has been made to accurately describe the features, installation and operation of this product in this manual, no warranty is granted nor liability assumed in relation to any errors or omissions unless specifically undertaken in the Evertz sales contract or order confirmation. Information contained in this manual is periodically updated and changes will be incorporated into subsequent editions. If you encounter an error, please notify Evertz Customer Service department. Evertz reserves the right, without notice or liability, to make changes in equipment design or specifications.

1. OVERVIEW

The 7710UC-KF is designed to solve the problems of adapting to different HDTV formats, by offering high quality UP conversion of Key and Fill signals.

The 7710UC-KF Key and Fill Up Converter is re-configurable to provide high quality up conversion of your standard definition key and fill signals to common 1.5 Gb/s high definition (SMPTE 292M) video formats

The units occupy two card slots in the 3 RU frame, which will hold up to seven 2 slot modules or one slot in the 1RU frame, which will hold up to three modules.

The units also provide card edge LEDs to indicate signal present and genlock present.

Features:

- High quality SD -> HD up conversion
- Supports standard aspect ratio conversions plus all user definable
- Support all necessary colour space conversions (ITU rec. 601 to ITU rec.709)
- Full video processing functions, GBR gain YCrCb gain and offset and hue adjustment.
- 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
- Output on screen display used to configure the operating modes

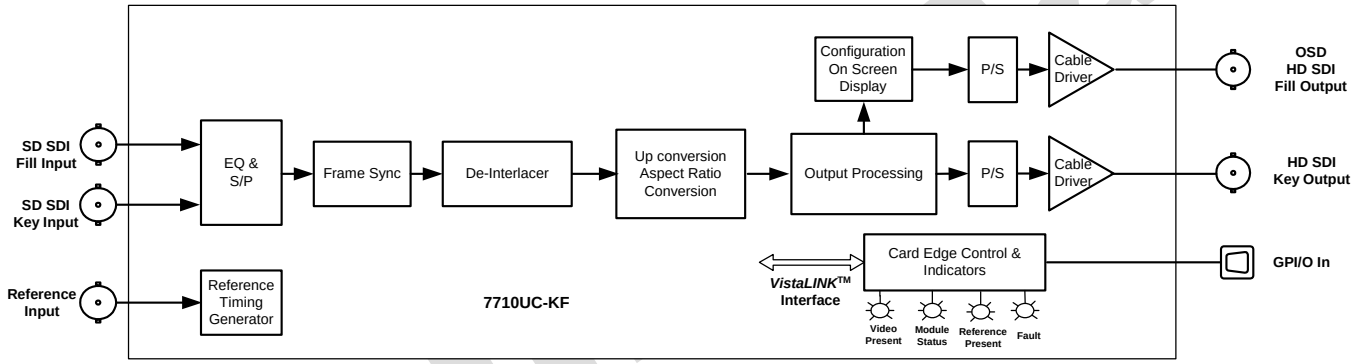


Figure 1: Block Diagram

Preliminary

2. INSTALLATION

The 7710UC-KF comes with a companion rear plate that occupies two slots in the frame. For information on mounting the rear plate and inserting the module into the frame see the 7700FR chapter section 3.

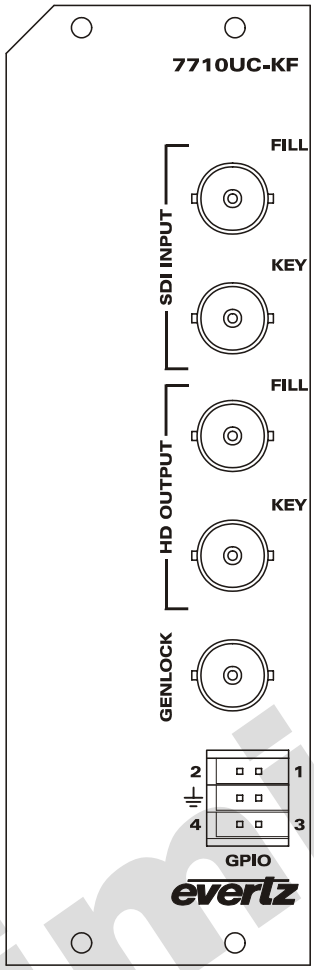


Figure 2: Rear Panel

2.1. VIDEO CONNECTIONS

FILL Input BNC connector for 10-bit serial digital fill signals compatible with the SMPTE 259M standard. The module needs to be set to a specific video input standard using the on screen menu at this current time. See Table 5 for a list of the video standards supported.

KEY Input BNC connector for 10-bit serial digital key signals compatible with the SMPTE 259M standard. The module needs to be set to a specific video input standard using the on screen menu at this current time. See Table 5 for a list of the video standards supported.

FILL OUTPUT This BNC connector is used to output the converted input fill signal as serial component video, compatible with the SMPTE 292M standard and has on screen display menus (OSD) superimposed over the video The module needs to be set to a specific video output standard using the on screen menu at this time.

Preliminary

KEY OUTPUT This BNC connector is used to output the converted input video as serial component video compatible with the SMPTE 292M standard. The module needs to be set to a specific video output standard using the on screen menu at this time.

Note: The Fill and Key Inputs must be of the same video standard, and the Fill and Key Outputs must also be of the same video standard.

2.2. GENLOCK REFERENCE

For proper synchronization of the output video, the Key/Fill Up Converter must be locked to a genlock signal of the output video format.

GENLOCK This BNC is for connecting a bi-level or tri-level sync reference and is auto-detected by the module. Jumper J21 selects whether the reference input is terminated to 75 ohms or high 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. GENERAL PURPOSE INPUTS AND OUTPUTS

On the 7710UC-KF a 6 pin connector labelled **AUX I/O** contains 4 GPI/O inputs. The connector pinout is shown Figure 2. See section 7.4 for information about configuring the GPIO configuration.

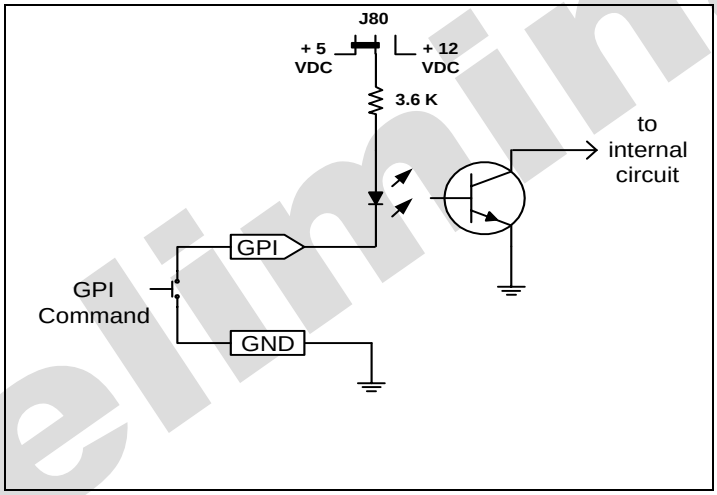


Figure 3: GPI Input Circuitry

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 4 shows the circuit for the general purpose output. The GPO output is not used at this time.

Preliminary

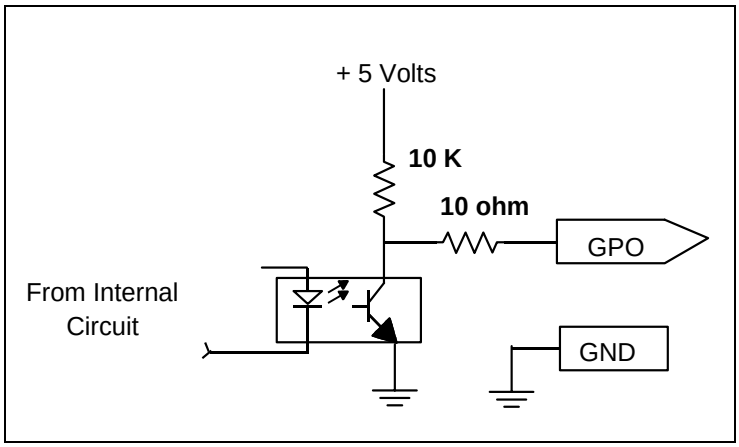


Figure 4: GPO Output Circuitry

3. SPECIFICATIONS

3.1. SERIAL DIGITAL INPUTS

Standards: 270Mb/s SMPTE 259M
Number of Inputs: 1 Key, 1 Fill
Connector: BNC per IEC 60169-8 Amendment 2
Input Equalization: Automatic to 300m @ 270Mb/s with Belden 8281 or equivalent cable.
Return Loss: >15 dB up to 540Mb/s

3.1. SERIAL DIGITAL OUTPUTS

Standard: 1.485 Gb/s SMPTE 292M.
Number of Outputs: 1 Key, 1 Fill
Connector: BNC per IEC 60169-8 Amendment 2
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 200ps nominal
Overshoot: <10% of amplitude
Return Loss: > 15 dB at 1.5 GHz

3.2. GENLOCK INPUT

Type: HD Tri-Level sync, NTSC or PAL Colour Black 1 V p-p
Connector: BNC per IEC 60169-8 Amendment 2
Termination: 75 ohm (jumper selectable)

Preliminary

3.3. GENERAL PURPOSE INPUTS AND OUTPUTS

Number: 4 (configurable as inputs or outputs)
Type: Opto-isolated, active low with internal pull-ups to +5 or +12V (jumper settable)
Connector: 6 pin removable terminal block
Signal Level: closure to ground
Function:
Inputs: User Preset select
Outputs:

3.4. ELECTRICAL

Voltage: +12VDC
Power: 20 Watts.
EMI/RFI: Complies with FCC regulations for class A devices.
Complies with EU EMC directive.

3.5. PHYSICAL

Number of slots:
7700 frame mounting: 2
7701 frame mounting: 1

4. STATUS INDICATORS

The 7710UC-KF has 3 LED Status indicators on the main circuit board front card edge to show operational status of the card at a glance. Figure 5 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 are good.

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

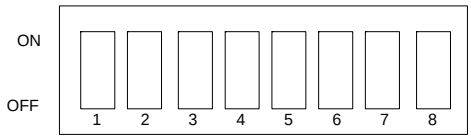
GENLOCK This Green LED will be ON when there is a signal present at the module genlock input. This LED will blink to indicate that an incorrect signal appropriate for the current video format is present.

5. CARD EDGE CONTROLS

The 7710UC-KF is equipped with an 8 position DIP switch to allow the user to select various functions. All positions are assigned sequentially such that the DIP switch 1 is located at the top of the DIP switch

Preliminary

(farthest from the card ejector). Table 1 gives an overview of the DIP switch functions. Sections 5.1 to 5.3 describe the 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	
6	Frame Rate Divisor Selection
7	
8	VistaLINK™ Control Enable

Table 1: Overview of DIP Switch Functions

5.1. SETTING THE OUTPUT VIDEO STANDARD

DIP switches 6 and 7 set the frame rate frequency of operation.

DIP 6	DIP 7	FRAME RATES
Off	Off	Set by Menu or VistaLINK™
On	Off	59.94/29.97/23.98
Off	On	50/25
On	On	Reserved

Table 2: Frame Rate Divisor DIP Switch Settings

Preliminary

5.2. SETTING THE OUTPUT VIDEO STANDARD

DIP switches 1 to 5 set the output video standard. DIP switches 6 and 7 set the exact frame rate divisor. For example to select 1080i/59.94 as the output format set switches 6 and 7 to the Off position (select 59.94) and set switches 1 to 5 to the Off position to select nominal 1080i/60. Interlaced video formats are shown with the number of fields per second. Progressive formats are shown with the number of framers per second.

#	DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	OUTPUT VIDEO FORMAT
0	Off	Off	Off	Off	Off	1080i/59.94 or 1080i/60
1	On	Off	Off	Off	Off	1080p/29.97 or 1080p/30
2	Off	On	Off	Off	Off	1080p/29.97 or 1080p/30sF
3	On	On	Off	Off	Off	1080p/23.98 or 1080p/24
4	Off	Off	On	Off	Off	1080p/23.98 or 1080p/24sF
						Reserved
6	Off	On	On	Off	Off	720p/59.94 or 720p/60
7	On	On	On	Off	Off	720p/29.97 or 720p/30
						Reserved
						Reserved
10	Off	On	Off	On	Off	1080p/25
11	On	On	Off	On	Off	1080p/25sF
12	Off	Off	On	On	Off	1080i/50
13	On	Off	On	On	Off	720p/50

Table 3: Output Video Switch Settings

other DIP switch combinations are reserved for future use

5.3. SELECTING WHETHER MODULE WILL BE CONTROLLED FROM THE LOCAL CONTROLS OR THROUGH THE *VISTA*LINK™ 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 4: VistaLINK™ Control Switch Settings

Preliminary

6. ON SCREEN MENUS

6.1. NAGIVATING THE ON SCREEN MENU SYSTEM

A toggle switch and pushbutton allow card edge navigation of a set of on-screen menus used to configure the card. To enter the on-screen menu system press the pushbutton. 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 6.6 provide detailed descriptions of each of the sub menus. The tables in sections 6.3 to 6.6 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. Note: Some menu items don't appear on all models.

Video	Sets the frame rate, input and output video standards, timing reference select and timing offset for the video output
Scaler	Configuration of the main output picture aspect ratio presets. Configuration of the main scaler filter sharpness, panel colors, user cropping and output picture window size.
Video Proc	Control the main video proc amp functions
Utilities	Card preset management and various debug and maintenance features.

Preliminary

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 6.3.1 to 6.3.6 give detailed information about each of the menu items.

Video Frame Rate	Select the video input frame rate
DIP Frame Rate	Displays the video input frame rate set by the DIP switches
Video Standard Input	Selects the video input standard.
Video Standard Output	Selects the video output standard.
DIP Video Out	Displays the video output format set by the DIP switches
Reference Select	Selects internal or video and locking reference
V Phase Offset	Sets the vertical phase of the output signal to the genlock reference input
H Phase Offset	Sets the horizontal phase of the output signal to the genlock reference input

6.3.1. Setting the Video Input and Output Frame rate

Video
- *Frame Rate*
  - *59.94/29.97/23.98*
  - *50/25*

This control selects the group of frame rates that are available on the *Input Standard* menu item. The card does not do temporal processing so converting from one frame rate to another is not possible.

Grayed out frame rates are currently unavailable in this release.

6.3.2. Displays the Video Input and Output Frame rate set by the DIP switches

Video
- *DIP Frame Rate*
  - *59.94/29.97/23.98*
  - *50/25*

This menu item displays the group of frame rates set by DIP switches 6 and 7. Table 2 shows the DIP switch settings to select each of the frame rates.

When DIP switches 6 and 7 are set to the OFF position, the frame rate is set by the *Output Standard Menu* item if DIP switch 8 is set to Off or by VistaLINK™ if DIP switch 8 is set to On.

Preliminary

6.3.3. Setting the Input Video Standard

- *Video*
  - *Input Standard*
    - *Auto*
    - *525i59.94/60*
    - *625i50*

This control selects the input video standard being used. The choice of input standards available is dependent upon the *Frame Rate* menu setting. For example to select 525i59.94/60 as the input format set the *Frame Rate* menu to *59.94/29.97/23.98* and set this menu item to*525i59.94/60*. Interlaced video formats are shown with the number of fields per second.

Grayed out standards are currently unavailable in this release. Table 5 shows the combinations of input and output formats supported.

6.3.4. Setting the Output Video Standard

- *Video*
  - *Output Standard*
    - *1080i59.94/60*
    - *1080p29.97/30*
    - *1080p29.97/30sF*
    - *1080p23.98/24*
    - *1080p23.98/24sF*
    - *720p59.94/60*
    - *720p29.97/30*
    - *1080p25*
    - *1080p25sF*
    - *1080i50*
    - *720p50*

This control selects the output standard desired. The choice of output standards available is dependent upon the *Frame Rate* menu setting.

Grayed out standards are currently unavailable in this release. Table 5 shows the combinations of input and output formats supported.

6.3.5. Displaying the Output Video Standard set by the DIP switches

- *Video*
  - *DIP Output Standard*
    - *1080i59.94/60*
    - *1080p29.97/30*
    - *1080p29.97/30sF*
    - *1080p23.98/24*
    - *1080p23.98/24sF*
    - *720p59.94/60*
    - *720p29.97/30*
    - *1080p25*
    - *1080p25sF*
    - *1080i50*
    - *720p50*

This menu item displays the output standard set by the DIP switches. Table 3 shows the DIP switch settings to select each of the video output formats.

When DIP switches 6 and 7 are set to the OFF position, the output video standard is set by the *Output Standard Menu* item if DIP switch 8 is set to Off or by VistaLINK™ if DIP switch 8 is set to On.

Grayed out standards are currently unavailable in this release. Table 5 shows the combinations of input and output formats supported.

Preliminary

7710UC-KF format support.

. - not supported

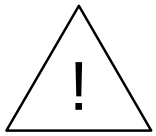
√ - planned support

<-Input	Output-> **Frame rate:** p=progessive I=interlaced sF=segmented	1080													720						
		p30	p30sF	i30	p29.97	p29.97sF	i29.97	p25	p25sF	i25	p24	p24sF	p23.98	p23.98sF	p60	p59.94	p50	p30	p29.97	p24	p23.98
SD rates	i29.97/525	.	.	.	√	√	√	.	.	.	.	.	√	√	.	√	.	.	√	.	√
	i25/625	.	.	.	.	.	.	√	√	√	.	.	.	.	.	.	√	.	.	.	.

Table 5: Valid Input/Output Conversion Combinations

6.3.6. Setting up the Video Output Timing

The output stage of the Key and Fill Up Converter contains a frame buffer so that the output video can be timed with respect to the reference applied to the **GENLOCK** input when the *Reference Select* menu item is set to *External*. In the absence of a genlock signal, or when the *Reference Select* menu item is set to *Video* the output video will be timed with respect to the incoming Video.



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.

6.3.6.1. Selecting the Video Reference Source

Video
Reference Select
Video
External

With this control the reference source of video locking is set.

Select *External* to lock the output video to the reference video applied to the **GENLOCK** BNC. If the genlock reference disappears or is not valid, the card will lock to incoming video.

Select *Video* to will lock the output video to the input video. When there is no input video the output video will free run.

6.3.6.2. Calculating the Delay through the Key/Fill Up Converter.

The delay through the Key/Fill Up Converter is dependent on the video input format, the Key and Fill Up Converter processing mode and the *V Phase Offset* and *H Phase Offset* settings. There are separate settings of *H and V phase* offset for each output video type. Table 6 shows the default and maximum and minimum delays for each video standard.

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.

Preliminary

	Default Delay	Maximum Delay			Minimum Video Delay		
	Frames	Frames	Lines	Samples	Frames	Lines	Samples

Table 6: 7710UC-KF Video Delay

6.3.6.3. Setting the Vertical Phase of the Output Video

Video
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 reference input set by the *Reference Select* menu item. 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 for the minimum and maximum delays possible.

6.3.6.4. Setting the Horizontal Phase of the Output Video

Video
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 reference input set by the *Reference Select* menu item. There are separate settings of V phase offset for each input 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 for the minimum and maximum delays possible.

Preliminary

6.4. CONFIGURING THE SCALER

The Key/Fill Up Converter scaler uses a process of filtering in order to increase or reduce the resolution during up conversion. 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. Sections 6.4.1 to 6.4.5 give detailed information about the menu items.

H Filter Cutoff	Sets the type of the horizontal filter in the scaler
V Filter Cutoff	Sets the type of the vertical filter in the scaler
H Rate Limit	Enable a rate limit on the horizontal edges.
V Rate Limit	Enable a rate limit on the vertical edges.
ARC	Selects the aspect ratio conversion to be performed
Panel Colors Red	Sets the color of the letterbox panels.
Panel Colors Green	Sets the color of the letterbox panels.
Panel Colors Blue	Sets the color of the letterbox panels.
Input H Start	Sets the left side crop position for custom aspect ratios
Input H Stop	Sets the right side crop position for custom aspect ratios
Input V Start	Sets the top crop position for custom aspect ratios
Input V Stop	Sets the bottom crop position for custom aspect ratios
Output H Start	Sets the left side of the output image for custom aspect ratios
Output H Stop	Sets the right side of the output image for custom aspect ratios
Output V Start	Sets the top of the output image for custom aspect ratios
Output V Stop	Sets the bottom of the output image for custom aspect ratios

Preliminary

6.4.1. 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
Auto
1 to 64

With this control, you can set the cutoff frequency of the horizontal filter. Set to either Auto or select 1 of 64 filters 1 thru 64, which are full bandwidth to 1/64th the bandwidth of the input signal.

Scaler
V Filter Cutoff
Auto
1 to 64

With this control, you can set the cutoff frequency of the horizontal filter. Set to either Auto or select 1 of 64 filters 1 thru 64, which are full bandwidth to 1/64th the bandwidth of the input signal.

6.4.2. Setting The Rate Limit Contols

There are two controls that adjust the horizontal and vertical rate limit pre-processors for the scaler. Some video content has excessive edge rates that do not conform to bandwidth limits so these control will apply a rate limit to edges it detects exceed the normal bandwidth so that the scaling filters will not ring excessively.

Scaler
H Rate Limit
Disable
Enable

With this control, you can enable or disable the horizontal rate limit function.

Scaler
V Rate Limit
Disable
Enable

With this control, you can enable or disable the vertical rate limit function.

Preliminary

6.4.3. Setting the Aspect Ratio of the Output Picture

The *Aspect Ratio* menu presets the user image conversion parameter to build it presets. Once selected the user can fine adjust the picture parameters via the input and output H and V stop and stop menus. Note: In order to save any modified state as a preset the *Aspect Ratio* needs to be set to *User Aspect*.

Scaler *ARC* *Full raster*	*Full Raster* - converts the full input raster to full output raster. If the input and output aspect ratios are not equivalent there will be aspect distortion.
User Aspect	*User Aspect* – converts the region of the input raster defined by the *Input H & V Start* and *Stop* values to the region of the output raster defined by the *Output H & V Start* and *Stop* values with coloured side panels.
4:3 Side Panel to 16:9 TB Cut *13:9 Letter Box to 16:9 TB Cut* *14:9 Letter Box to 16:9 TB Cut* *13:9 Stretch to 16:9 TB Cut* *14:9 Stretch to 16:9 TB Cut* *16:9 Stretch to 16:9 TB Cut*	These settings convert the input picture to 16:9 top and bottom cuts.
13:9 Stretch to 4:3 Side Panel *14:9 Stretch to 4:3 Side Panel* *16:9 Stretch to 4:3 Side Panel*	These settings squeeze common stretched input video back to 4:3 side panel images on a 16:9 aspect raster.
4:3 to 4:3 Side Panel on 16:9 *4:3 to 13:9 Stretch on 16:9* *4:3 to 14:9 Stretch on 16:9* *4:3 to 16:9 Stretch on 16:9* *4:3 to 13:9 Crop on 16:9* *4:3 to 14:9 Crop on 16:9* *4:3 to 16:9 Crop on 16:9*	These settings are common up converter settings for converting 4:3 aspect ratio images to common 16:9 formats.

6.4.4. Set the Colour of the Letterbox Panels.

There are three menu items used to set the panel 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.

Scaler *Panel Colour Red* *0 to 255*	This control defines one of the component colours for the colour of the side panels. Set the R, G or B value for the 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.

Preliminary

6.4.5. User aspect ratio setting.

There are four registers for each input video standard that set the portion of the input picture that will be converted. These register settings do not have any effect when the pre-defined aspect ratios are used.

Scaler
Input H Start
Input H Stop

The *Input H Start* and *Input H Stop* define the horizontal portion of the input image to process to the output

Scaler
Input V Start
Input V Stop

The *Input V Start* and *Input V Stop* define the vertical portion of the input image to process to the output

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.

Scaler
Output H Start
Output H Stop

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. The range of values for 1080i output is 0 to 1919. The range of values for 720p output is 0 to 1279.

Scaler
Output V Start
Output V Stop

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. The range of values for 1080i output is 0 to 1079. The range of values for 720p output is 0 to 719.

6.5. CONFIGURING THE VIDEO PROCESSING FUNCTIONS

The *Video Proc* menus are used to configure parameters associated with the video processing functions of the key and fill up converter. The chart below shows the items available in the *Video Proc* menu. Sections 6.5.1 to 0 give detailed information about each of the menu items.

ALL of these parameters affect the video in real time. H&V frequency bands will cause hits to the video while a new filter is loaded.

Preliminary

Y Gain	Sets the Source Y Gain
Y Offset	Sets the Source Y Offset
Cr Gain	Sets the Source Cr Gain
Cr Offset	Sets the Source Cr Offset
Cb Gain	Sets the Source Cb Gain
Cb Offset	Sets the Source Cb Offset
Hue	+/- 10 degrees 0.1 degree steps
R Gain	Sets the Gain in RGB Domain
G Gain	Sets the Gain in RGB Domain
B Gain	Sets the Gain in RGB Domain

6.5.1. Setting the Gain Levels

There are six controls that set the gain of the video. For simplicity, only one control will be shown in the manual.

Video Proc *Y Gain* *+/- 10%*	With these controls the user can adjust the gain of the 3 components in either the Y Cr Cb domain or the R G B domain over a range of +/-10% in 0.1% steps. Gain adjustments in the Y, Cb, Cr domain are made first, then gain adjustments in the RGB domain. Illegal values are clipped after gain adjustments

6.5.2. Setting the DC Offset

There are three controls that set the DC Offset of each component of the video. For simplicity, only one control will be shown in the manual.

Video Proc *Y Offset* *+/- 100*	With these controls the user can adjust the DC offset of the 3 components in the Y Cr Cb domain in +/- 100 quantizations levels.

Preliminary

6.5.3. Setting the Hue

Video Proc *Hue* *+/- 10*	With this control the user can adjust the Hue or color of components +/- 10 degrees

6.6. 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 6.6.1 to 6.6.6 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.
Auto Preset Recall	Used to enable or disable the default parameter recall
GPIO 1	Selects the function of GPIO1 - Recall Preset 1-10/OFF
GPIO 2	Selects the function of GPIO2 - Recall Preset 1-10/OFF
GPIO 3	Selects the function of GPIO3 - Recall Preset 1-10/OFF
GPIO 4	Selects the function of GPIO4 - Recall Preset 1-10/OFF
Upgrade	Used to upgrade the firmware in the module.
Status WIndow	Enable or Disable display of the status screen
About…	Shows the firmware version of the module.

6.6.1. Storing and Recalling Configurations to the User Presets or the Factory Preset

The converter modules provide ten user preset areas to store the complete set of controls from the on screen menu.

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.

Preliminary

6.6.1.1. Recalling Configurations from the User Presets

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.

Use the toggle switch to select the preset location where you want to recall 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.

6.6.1.2. Storing Configurations from the User Presets

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.

6.6.2. Disabling Preset Recall when the Video Input/Output Standards Change

Utilities
Auto Preset Recall
Enable
Disable

This control is used to enable or disable the recall of parameter store with each input and output combination. Each input and output combination stores all the card parameters. During any standard change the set is recalled. For a preset recall this causes a conflict is which parameter sets have priority. Disabling this ensure all the preset recall parameters take effect.

6.6.3. Recall presets via GPIs

The converter modules provide ten user preset areas which can be recalled via external GPI inputs. There are four controls that are used to set functions of the GPI inputs. For simplicity, only one control will be shown in the manual.

Utilities
GPIO 1
OFF
1-10

This control is used to set which preset will be recalled by the respective GPI input is closed to ground. To disable a GPI input set it to *Off.*

6.6.4. Displaying the Status Window on the OSD Output

Utilities
Status Window
Disable
Enable

This control is used enable the active display of various video parameters on the OSD output when the menus are not being displayed.

Preliminary

6.6.5. 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.

6.6.6. Accessing Information About this Module and its Firmware

Utilities
About…

This control lists the particulars about this 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

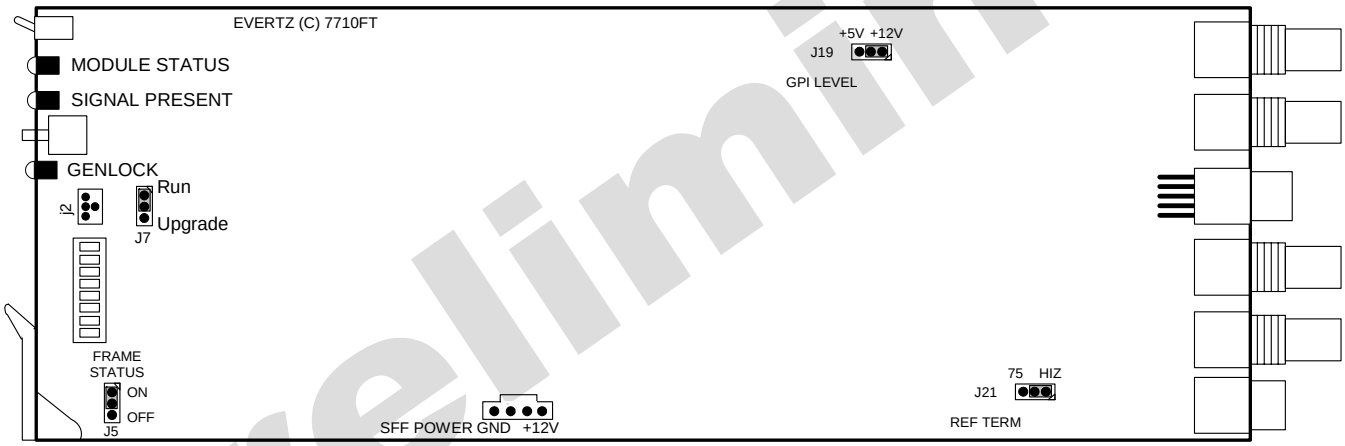


Figure 5: Location of Jumpers – Rev D Main Module

Preliminary

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

FRAME STATUS The FRAME STATUS jumper J5 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 6.6.4) or using the **UPGRADE** jumper.

UPGRADE The UPGRADE switch is located on the back side of the main module (On the rear of the J7 jumper location near the front card edge) and is used when firmware upgrades are being done to the module. For normal operation it should be switched to the *RUN* position as shown in the diagrams above. See the *Upgrading Firmware* chapter in the front of the binder for more information.

The silkscreen on the front side of the board for J7 is incorrect. The correct orientation of the switch is shown in Error! Reference source not found. **and** Figure 5

To upgrade the firmware in the module unit pull it out of the frame. Move Jumper J7 into the *UPGRADE* position. (Install the Upgrade cable provided (located in the vinyl pouch in the front of this manual) onto header J2 at the card edge. Re-install the module into the frame. Run the upgrade as described in *Upgrading Firmware* chapter. Once the upgrade is completed, remove the module from the frame, move J7 into the *RUN* position, remove the upgrade cable and 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 J21 located at the rear of the 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 input will be high impedance.

Preliminary

7.4. SELECTING THE GPI PULLUP VOLTAGE

The GPI jumper J19, located near the rear of the module, selects whether the general purpose inputs will be pulled up to +5 volts or +12 Volts. Figure 6 shows the jumper configuration and the GPI input schematic.

GPI LEVEL 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,

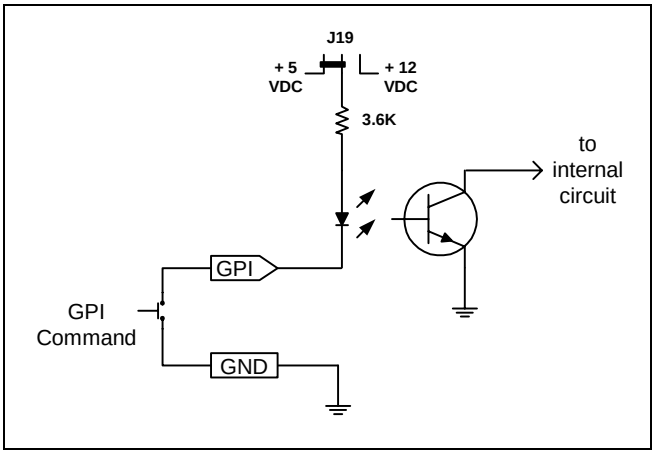


Figure 6: Setting the GPI Input Pullup Voltage

8. *VISTA*LINK™ REMOTE MONITORING/CONTROL (NOT IMPLEMENTED AT THE TIME OF WRITING)

8.1. WHAT IS *VISTA*LINK™?

*Vista*LINK™ is Evertz's remote monitoring and control capability 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. For monitoring there needs to be a detecting device that automatically reports all errors to a central alarm and error logging station. We also need to be able to interrogate individual detector devices from the central station to determine the status of individual channels. Finally, we need to be able to configure devices in the network from the 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 7710UC-KF), each with a unique address (OID), communicate with the NMS through an SNMP Agent. Evertz VistaLINK™ enabled 7700 series modules reside in the 3RU

Preliminary

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 and 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.

Preliminary

8.2. *VISTA*LINK™ MONITORED PARAMETERS

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

Parameter	Description
Fill Input Present	Indicates the presence of a valid fill input signal. (the state of the VIDEO PRESENT LED)
Key Input Present	Indicates the presence of a valid key input signal. (the state of the VIDEO PRESENT LED)
Input Video Standard	Indicates video standard of input signals
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
GPI3 State	Indicates the state of the GPI1 input
GPI4 State	Indicates the state of the GPI2 input
Video Delay	Video Delay
Local Remote Mode	Indicates the whether the 7710UC-KF is under local control or *Vista*LINK™ control (. (the state of DIP switch 8)

Table 7: *Vista*LINK™ Monitored Parameters

8.3. *VISTA*LINK™ CONTROLLED PARAMETERS

Parameter	Description
Video Frame Rate	Select the video input frame rate
Video Standard Input	Selects the video input standard.
Video Standard Output	Selects the video output standard.
Reference Select	Set video or external genlock for card locking
V Phase Offset	Sets the vertical phase
H Phase Offset	Sets the horizontal phase
H Filter Cutoff	Sets the type of the horizontal filter in the scaler
V Filter Cutoff	Sets the type of the vertical filter in the scaler
H Rate Limit	Enable a rate limit on the horizontal edges.
V Rate Limit	Enable a rate limit on the vertical edges.
Aspect Ratio	Selects the aspect ratio of the output picture.
Panel Colours Red	Sets the Red colour of the panels.
Panel Colours Green	Sets the Green colour of the panels.
Panel Colours Blue	Sets the Blue colour of the panels.
Input H Start	Sets the left side crop positions
Input H Stop	Sets the right side crop position
Input V Start	Sets the top crop position
Input V Stop	Sets the bottom crop position

Preliminary

Output H Start	Sets the left side of the output
Output H Stop	Sets the right side of the output
Output V Start	Sets the top of the output image
Output V Stop	Sets the bottom of the output image
Y Gain	Varies the Source Y
Y Offset	Varies the Source Y
Cr Gain	Varies the Source Cr
Cr Offset	Varies the Source Cr
Cb Gain	Varies the Source Cb
Cb Offset	Varies the Source Cb
Hue	+/- 10 degrees 0.1 degree steps
R Gain	Varies the Gain in RGB Domain
G Gain	Varies the Gain in RGB Domain
B Gain	Varies the Gain in RGB Domain
Recall Preset	Used to recall the current module configuration.
Store Preset	Used to store the current module configuration
GPIO 1	Selects the function of GPIO1
GPIO 2	Selects the function of GPIO2
GPIO 3	Selects the function of GPIO3
GPIO 4	Selects the function of GPIO4

Table 8: *Vista*LINK™ Controlled Parameters

8.4. *VISTA*LINK™ TRAPS

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

Preliminary

9. MENU QUICK REFERENCE

Video

- Video Frame Rate
- Video Standard Input
- Video Standard Output
- Reference Select
- V Phase Offset
- H Phase Offset

Scaler

- H Filter Cutoff
- V Filter Cutoff
- H Rate Limit
- V Rate Limit
- Aspect Ratio
- Panel Colours Red
- Panel Colours Green
- Panel Colours Blue
- Input H Start
- Input H Stop
- Input V Start
- Input V Stop
- Output H Start
- Output H Stop
- Output V Start
- Output V Stop

Video Proc

- Y Gain
- Y Offset
- Cr Gain
- Cr Offset
- Cb Gain
- Cb Offset
- Hue
- R Gain
- G Gain
- B Gain

Utilities

- Recall Preset
- Store Preset
- GPIO 1
- GPIO 2
- GPIO 3
- GPIO 4
- Upgrade
- Status WIndow
- About…

Preliminary

This page left intentionally blank