grass valley

8995UPC/DNC/UDX

SD/HD UP/DOWN/CROSS CONVERTER

Instruction Manual

SOFTWARE VERSION 1.1.0

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Preface

About This Manual

This manual describes the features of the 8995 module series and the corresponding rear modules in the GeckoFlex frame. As part of this family of modular products, it is subject to the Safety and Regulatory Compliance information described in the *GeckoFlex Frames Instruction Manual*.

This manual also has instructions for using the 8900GEN-SM submodule. For more detailed information, refer to the *8900GEN-SM GeckoFlex Genlock Submodule Instruction Manua*l available online on the Thomson Grass Valley web site.

When using any of the fiber optic options, refer to the laser compliance information in the *GeckoFlex Frames Instruction Manual* for safety information.

8995UPC/DNC/UDX Up/Down/Cross Converter Modules

Introduction

This manual covers installation, configuration, and operation for the 8995UPC Up Converter, 8995DNC Down Converter, and 8995UDX Up/Down/Cross Converter modules.

The 8995 modules provide up/down/cross conversion between broadcast quality SD and HD video. A Genlock submodule can be installed for external reference timing for environments requiring video signals to be synchronized with other video sources and processed for video quality.

The following features are available with this module series.

- Two module set including a hot-swappable front and rear module. The rear module requires two rear slots.
- Up to five modules 8995 modules in the same 2 RU GeckoFlex frame.
- An optional Genlock submodule mounted on the 8995 circuit board accepts an external reference (NTSC/PAL color black or Tri-Level Sync) and manages local and frame bus reference timing to the module.
- A fiber optic submodule option provides optical input/output interfaces for all models. One of three different types of single-mode fiber optic submodules can be used:
  - 1310NM-DTL – provides two optical outputs (TX 1 and TX 2)
  - 1310NM-DRL – provides two optical inputs (RX 1 and RX 2).
  - 1310NM-TRL – provides one optical input (RX 2) and one optical output (TX 1).
- Supports both HD or SD formats and provides audio status, reporting, gain, and channel pairing controls for embedded audio present in the incoming video stream.
- Frame Sync (with Genlock submodule from two independent frame buses or for local reference) and Delay mode.

- Full video proc amp functions including RGB and component color controls, video gain, chroma gain, phase (Hue) and black level control, color space conversion (ITU 601, ITU 709).
- Edge enhancement and pixel-level motion adaptive conversion for superb picture quality.
- Color correction controls for RGB gain and offset and gamma settings.
- One auto-tracking output to allow synchronization of audio modules to the Genlock reference.
- Minimum delay (1 frame + 300 pixels conversion) for low latency live applications.
- Fiber ready to accept an option SFP fiber device providing optical input or output.
- SNMP and product health monitoring is supported through the 8900NET module with applications such as NetCentral.
- Software updating using the NetConfig Networking application.

8995UDX Module

The 8995UDX provides the full spectrum of up, down, and cross conversion with all of the functionality listed above. Refer to Table 2 on page 25 for a video conversion summary diagram.

8995UPC Module

The 8995PUPC is fully featured with 8995 series functionality described above. This module up converts SD video to high quality HD video. Refer to Table 3 on page 26 for a video conversion summary diagram.

8995DNC Module

The 8995DNC is fully featured with 8995 series functionality described above. This module down converts HD video to high quality SD video. Refer to Table 4 on page 26 for a video conversion summary diagram.

System Requirements

The following system requirements are necessary for proper operation of the 8995 Series modules:

- 8995 module operation requires the presence of an 8900NET Network Interface module in an 8900FFN GeckoFlex frame running software version 4.0.2 or later for configuration and proper operation. There are no local front edge configuration controls for this module.

  To check your 8900NET software version, link to the Status web page of the 8900FFN frame (Figure 16 on page 34) and check the **Software Version** under **Properties** below the web page graphic.

- Fans in the front cover must be set at maximum speed. Refer to *Set Fan Speed to Maximum* on page 21.

- 8995 Series release 1.1.0 requires version 8 Firmware and version 1 Hardware be installed on the 8900GEN-SM Genlock Submodule if present on any modules. Firmware can be updated with the software update for version 1.1.0 as described in the Release Notes that accompany this manual.

  To check the version of the 8900GEN-SM submodule, link to the Genlock web page and note the **Firmware Version** and **Hardware Revision** reported in the web page header as shown in Figure 46 on page 71.

For software updating information, refer to *Software Updating* on page 80.

Installation

The 8995 models consists of a front and rear module set that can only be installed in a GeckoFlex frame. An optional fiber optic submodule is also available for providing fiber inputs or outputs depending on the type of submodule installed.

Installation of the 8995 module set is a process of:

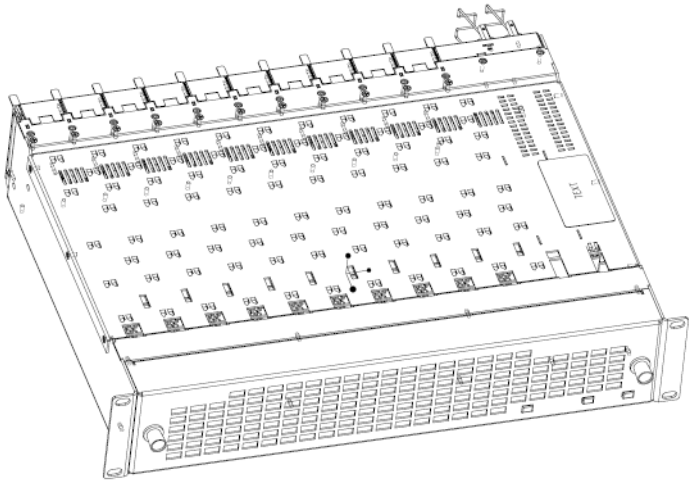
1. Determining the placement of the 8995 module based on genlock timing configuration if required,
2. Placing the 8900UDX-R rear module in a rear frame slot (this rear module requires two adjacent rear slot spaces),
3. Installing the Genlock submodule option on the front module if used,
4. Placing the front module in the corresponding front slot,
5. Installing the optional SFP Fiber Optic submodule in the rear module,
6. Cabling the signal ports, and
7. Setting front cover fan speed on 8900NET module to maximum.

All GeckoFlex front and rear modules can be inserted and removed from an GeckoFlex frame with power on.

Module Placement in the GeckoFlex Frame

There are ten front and rear cell locations in the 2 RU GeckoFlex frame (Figure 1) to accommodate either audio, analog and digital video modules. The 8995 module set uses the 8900UDX-R rear module that requires two adjacent slots, allowing five 8995 modules per frame.

Figure 1. GeckoFlex Frame



8995 Module Placement For Genlock Timing

Before installing the 8995 module, you will first need to determine if and how you want to use a genlock reference or the available frame reference buses. The genlock timing from an 8900GEN-SM submodule can be utilized in several ways. Refer to the *8900GEN-SM GeckoFlex Genlock Instruction Manual* available online for a complete overview of using the genlock reference.

This as well as all other modular product manuals are available online at the following URL on the Thomson Grass Valley web site:

http://www.thomsongrassvalley.com/docs/modular

In addition to the capability of providing a local external reference to this specific 8995 module with an 8900GEN-SM submodule installed, slots 1 and 3 of the Gecko Flex frame have been specifically designed to distribute an independent frame bus reference transmitted from the 8900GEN-SM submodule mounted on an 8995 module (or other GeckoFlex module with this capability) configured for this purpose. The external reference connected to the corresponding Genlock Loop BNCs can be distributed to other modules in the frame that accept a genlock reference.

If another 8995 module has already been configured and installed for frame bus distribution, you may configure this module's output timing to lock to the Frame Bus 1 or Frame Bus 2 reference from the other 8995 module. In this case, the 8995 does not require the use of an additional 8900GEN-SM submodule.

The use of the genlock reference is determined by the setting of the Output Timing on the System Config web page of the module and module placement in the frame and jumper configuration as summarized below.

- Local Reference – the 8995 with an 8900GEN-SM submodule can have a local external reference connected to one of the corresponding Genlock Loop BNCs. This external timing reference will be fed to this specific 8995 module only.
- Frame Reference 1 or 2 – when an 8995 with an 8900GEN-SM submodule is installed in slot 1 and/or slot 3, a frame timing bus can be enabled to distribute the external reference connected to the corresponding Genlock Loop BNCs on the rear module to all modules in the frame that can accept a genlock reference. slot 1 provides Frame Bus 1 and slot 3 provides Frame Bus 2.
- Input Video – when no 8900GEN-SM submodule is installed on the 8995, the Output Timing can be set to Input so the output timing will follow the input to the module.

Rear Module Installation

Each 8900UDX-R rear module requires two adjacent rear frame slots, so the rear module cannot be installed slot 10 of the frame. Each rear module or blank rear adapter cover is held in place by two retainer strips as shown in Figure 2. To install a rear module into the frame, follow these steps:

1. Loosen (but do not remove completely) the two screws holding each retainer strip to the frame with a 2 mm (5/64") hex screwdriver. Pull up on the retainer to remove it, leaving the screws in place.

CAUTION Be careful to leave the screws in place as they can be easily lost or fall into equipment below the frame creating a shorting hazard.

2. Remove the blank rear adapter covers on two adjacent slots by inserting needlenose pliers into the slots in the top and bottom of the blank and pulling it off.

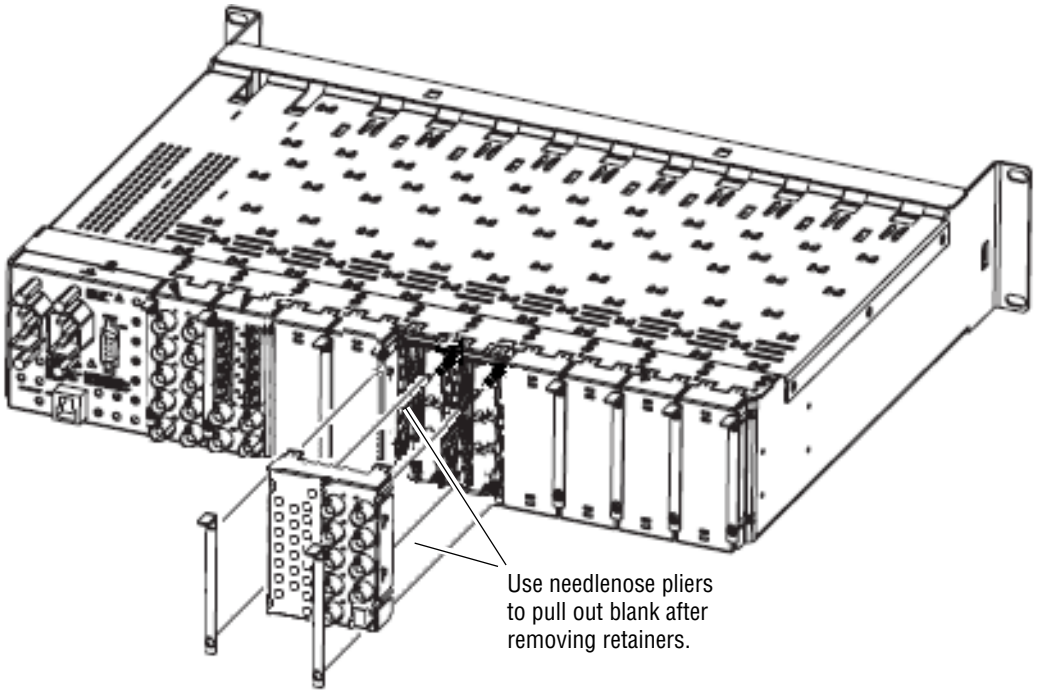
Note To remove a rear module already installed, follow the same steps. It is helpful to first remove the front module so the rear can be pulled out more easily.

3. Insert the rear module into the empty slots.

4. Replace each retainer strip over the two screws on both sides of the module and push down to seat the retainer.

5. Tighten the screws for each retainer just until they are snug. Do not force or torque the screws too tightly.

Figure 2. Installing Rear Module



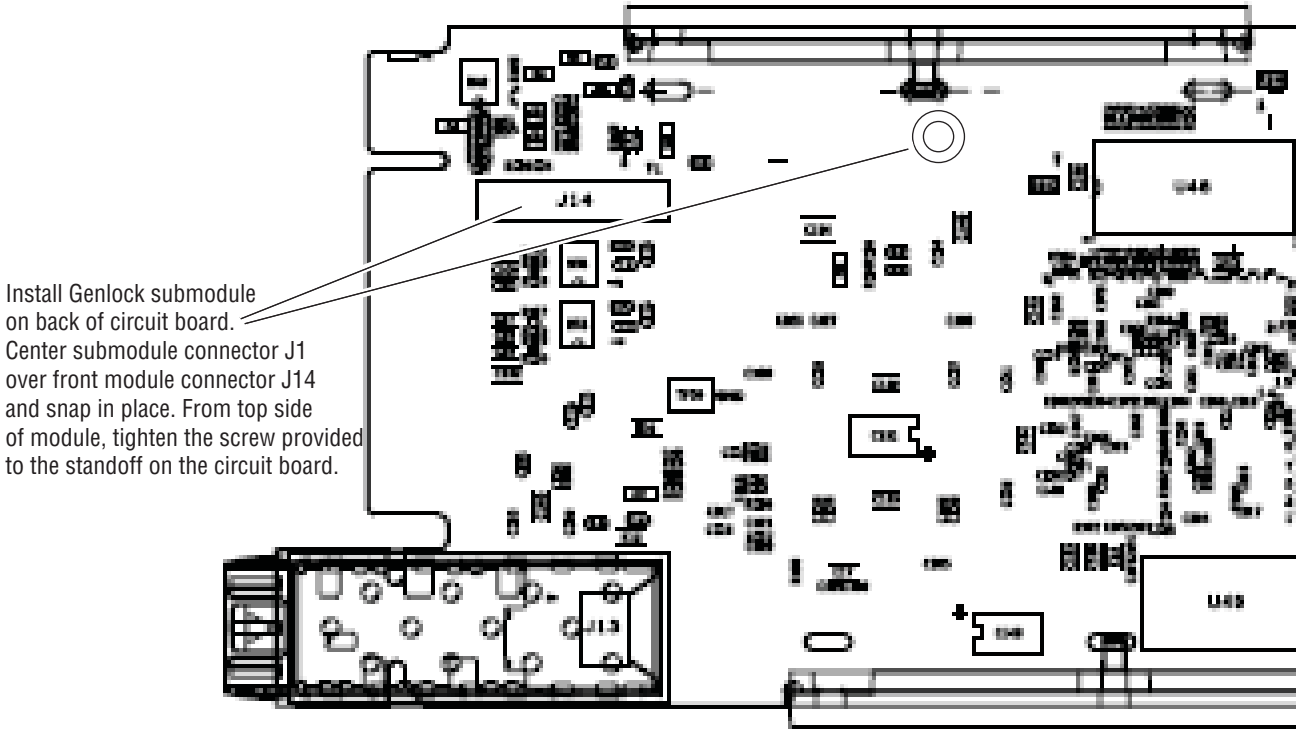
Genlock Submodule Installation

The Genlock submodule will ship in a separate package, not installed on the front module.

To install a Genlock submodule, follow these steps:

1. Locate the Genlock connector J14, on the back side of the 8995 circuit board (Figure 3).
2. Line up the connector on the submodule, J1, with J14 on the front module and snap the submodule into place making sure the holes in each circuit board line up.
3. To hold the submodule in place, attach the screw provided from the bottom of the front module to the standoff on the submodule circuit board.

Figure 3. Installing Genlock Submodule



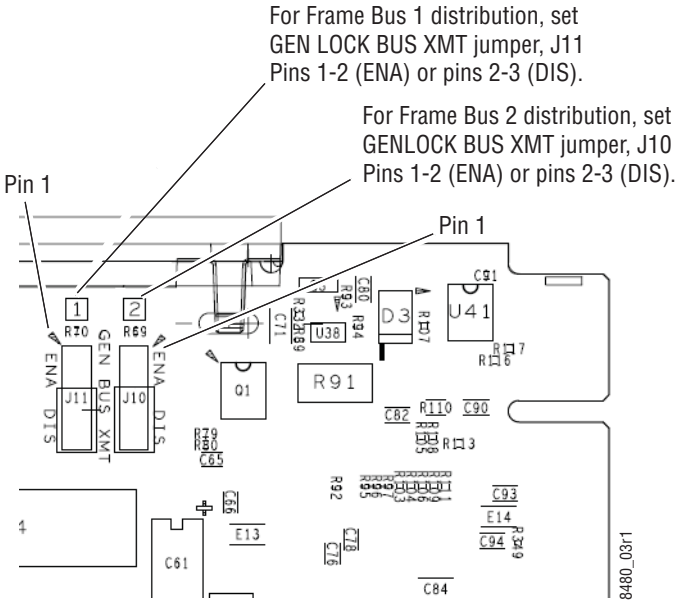
Frame Bus Jumpering

If you will be using this 8995 module to distribute reference Frame Bus 1 (slot 1) or Frame Bus 2 (slot 3), you must set a jumper on the front module circuit board for this purpose before installing the module (Figure 4).

- Frame Bus 1 – to transmit the reference connected to one of the Genlock Loop BNCs on the corresponding rear module on Frame Bus 1, set jumper J11 to **ENA** (pins 1-2). This module must be installed in slot 1 of the frame and configured on the Genlock web page (see *Genlock Web Page* on page 70) for **Auto** in the Drive Frame Reference Bus pulldown.
- Frame Bus 2 – to transmit the reference connected to one of the Genlock Loop BNCs on the corresponding rear module on Frame Bus 2, set jumper J10 to **ENA** (pins 1-2). This module must be installed in slot 3 of the frame and configured on the Genlock web page (see *Genlock Web Page* on page 70) for **Auto** in the Drive Frame Reference Bus pulldown.

Note Both jumpers may be enabled. The module in slot 1 will only read the status of jumper, J11. The module in slot 3 will only read the status of jumper, J10.

Figure 4. Setting Frame Bus Jumpers



Front Module Installation

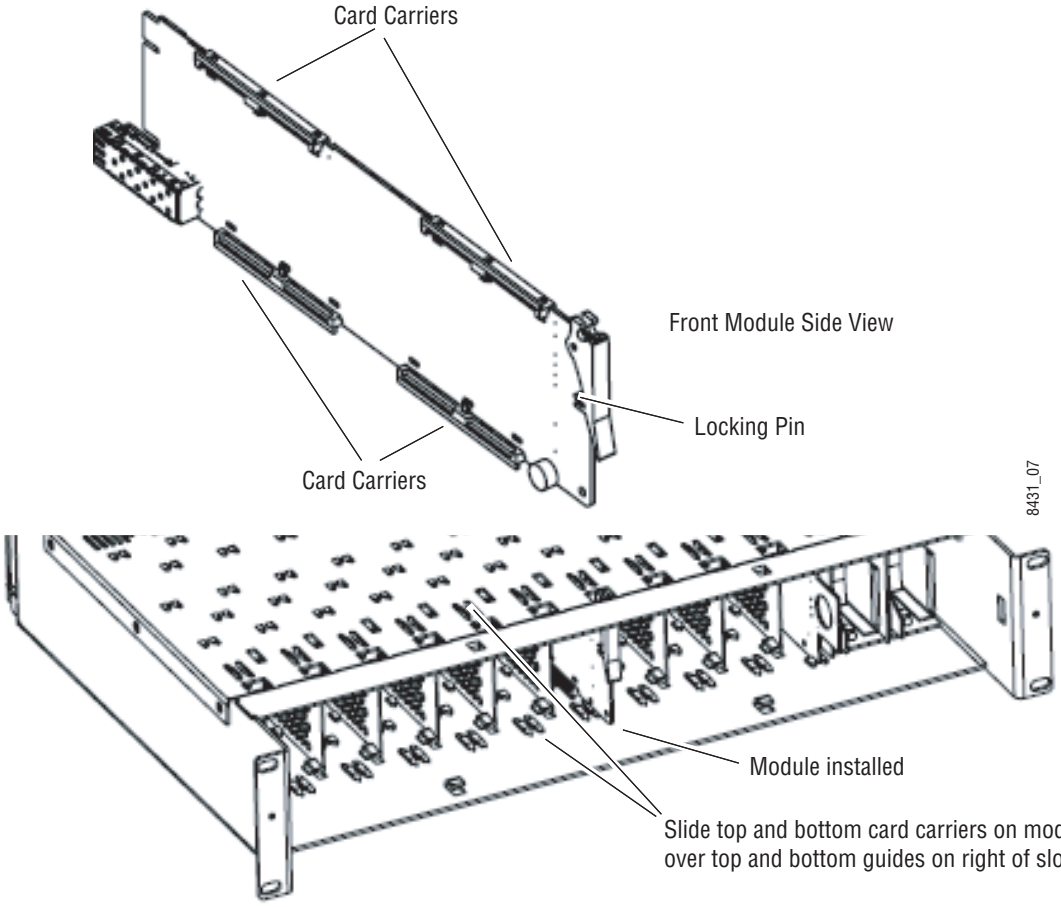
After installing the rear module (and Genlock submodule on the front module if required), install the front module as follows:

Note If using a fiber optic submodule, install it through the rear module according to *Fiber Optics Submodule Installation* on page 18.

1. Remove the front cover of the frame if required.
2. Locate the corresponding front slot.
3. Insert the front module so that the plastic card guides on the module top and bottom edges go over the upper and lower raised rail guides on the right of the top and bottom of the slot(Figure 5).
4. Carefully slide the module into the rear connector.
5. Lock the front module ejector tab into the locking pin.

Note Before removing the front module, first remove the Fiber Optic submodule if present, from the rear module.

Figure 5. Front Module Installation



Fiber Optics Submodule Installation

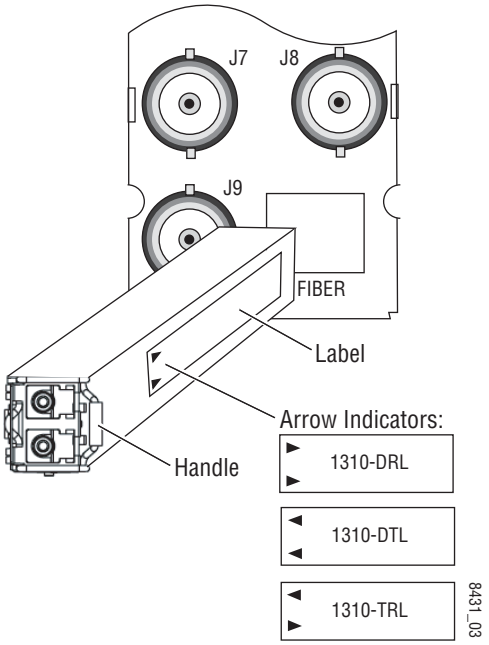
CAUTION The Fiber Optic submodule is static sensitive. Use static handling precautions when installing or removing the submodule. Fiber connections must be cleaned before cabling as described in *Fiber Optic Cleaning Requirement* on page 19.

After the front and rear modules have been installed, install the SFP Fiber Optic submodule option if being used into the rear module metal cage labeled FIBER (Figure 6). The SFP submodule is hot-pluggable and may be installed or removed with power applied to the module.

Note The submodule type is identified by name on the label or can be identified by the direction of the two arrow indicators on the label.

1. Slide the fiber optic device into the metal fiber cage with the label and handle to the right.
2. Push the device in as far as it will go without forcing it. It will not go completely into the cage.
3. Cable the fiber optic connectors according to the instructions given in *Fiber Optic Video Inputs* on page 20 or *Fiber Optic Video Outputs* on page 20 depending on the type of submodule used.

Figure 6. Installing Fiber Optics Submodule



Removing an SFP Submodule

If you need to remove an SFP submodule, snap the handle out and pull the submodule slowly out of the metal cage.

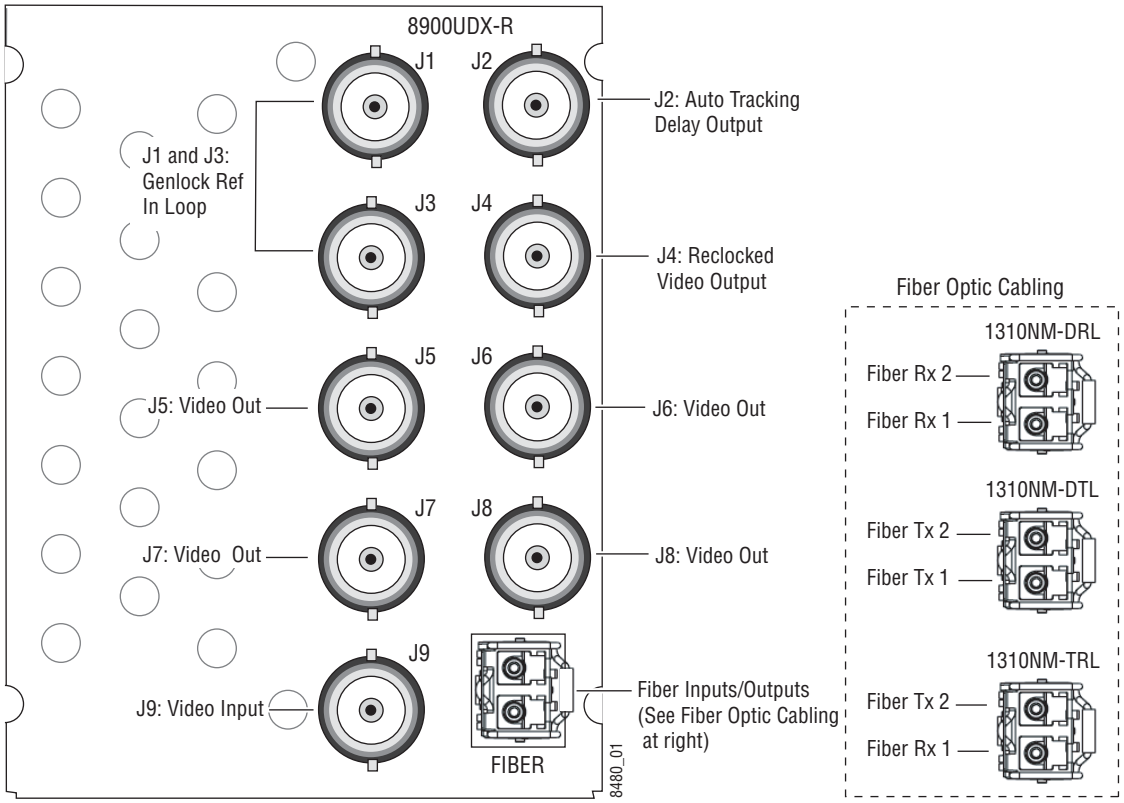
Cabling

Cabling is done on the rear of the 8900UDX-R module illustrated in Figure 7. Inputs and outputs are also illustrated on the I/0 Config web page (*I/O Config Web Page* on page 41).

Fiber Optic Cleaning Requirement

Before making any fiber optic cable mating connections and after every de-mating cycle, use an industry standard fiber optic cleaning kit, including oil-free compressed air, to clean the fiber connectors and the connectorized fiber end faces. This helps ensure optimum performance of the fiber optic interface. Industry standard fiber optic cleaning kits can be purchased on the web and in electronics stores.

Figure 7. 8995UDX Rear Module



Genlock Loop

BNCs J1 and J3 are looping inputs to the optional Genlock submodule on the 8995 module with an external genlock reference (NTSC/PAL color black or Tri-level sync).

Connect an external reference to J1 or J3 and loop the other input to another device or terminate the unused input.

Video Input

The input to the module can be connected to an electrical coax BNC and up to two fiber optic connectors depending on the fiber optic submodule installed. Only one video input can be active at a time and must be selected on the Video Input web page (page 49).

Electrical Video Input

To use an electrical input, connect an HD or SD digital video signal to the Coax input at BNC J9.

Fiber Optic Video Inputs

For fiber optic inputs, the 1310NM-DRL (dual receiver) or 1310NM-TRL (transceiver) SFP optical submodule must be installed. Connect the inputs as illustrated in Figure 7 on page 19. Fiber connections must be cleaned when cabling or after any de-mating cycle. Refer to *Fiber Optic Cleaning Requirement* on page 19.

Video Outputs

There can be up to six video outputs from the module available at one time, four electrical coax and up to two fiber optic outputs depending on the fiber optic submodule used.

Electrical Outputs

There are four electrical coax video outputs at BNCs J5, J6, J7, and J8 always enabled and available.

Fiber Optic Video Outputs

If a 1310NM-TRL SFP optical transceiver submodule is installed, one fiber optic output is available (see Figure 7 on page 19). If a 1310NM-DTL SFP optical dual transmitter submodule is installed, two fiber optic outputs are available. Fiber optic outputs must be enabled on the Fiber Out web page (page 61). Refer to *Fiber Optic Cleaning Requirement* on page 19 for cleaning fiber optic connections before use.

Reclocked Video Output

One reclocked video output of non-processed input video is provided for looping to other equipment. If a fiber input is being used, the reclocked video from this input will also pass to this output.

Auto Tracking Output

BNC J2 output is an auto tracking delay signal that can be fed to audio modules to synchronize the audio delay to match the delay of the 8995 module.

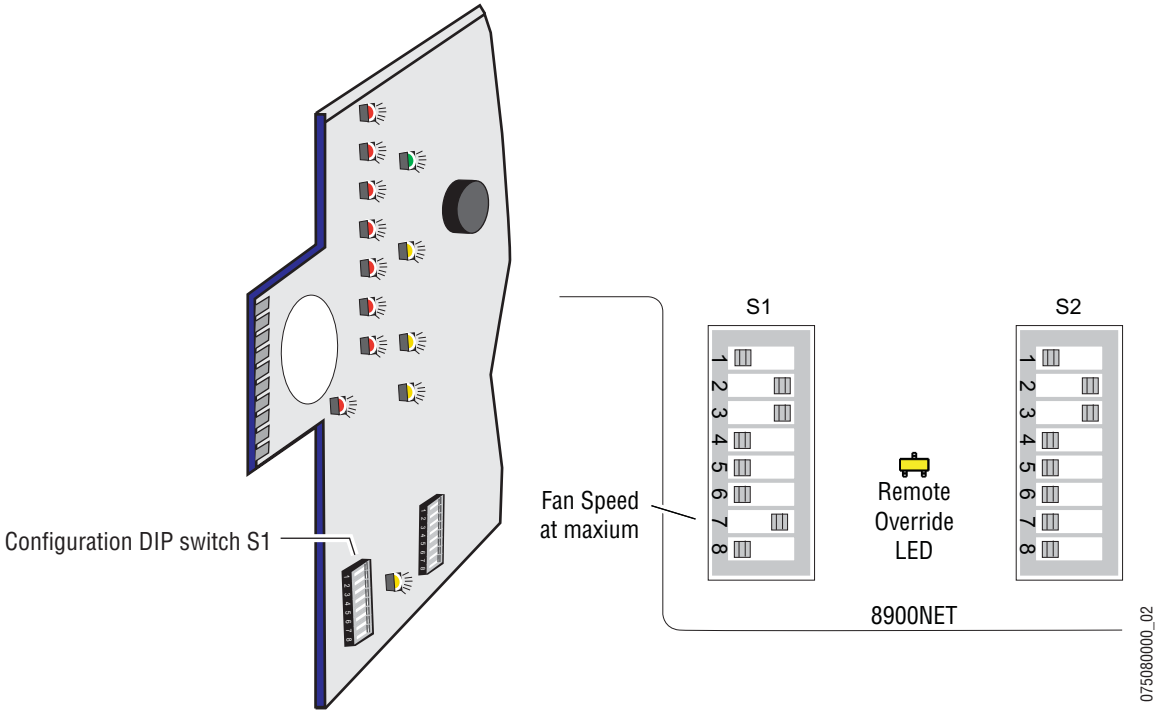
Set Fan Speed to Maximum

Set the front cover fans to maximum speed to maximize the cooling in the frame.

To increase fan cover speed:

1. Remove the front cover of the frame.
2. Remove the 8900NET module (next to the power supplies).
3. Locate Configuration DIP switch S1 (Figure 8).
4. Set position 7 to the right as shown in Figure 8.
5. Return the 8900NET module to the frame and replace the front cover.

Figure 8. Set 8900NET S1 for Maximum Front Cover Fan Speed



Power Up

The front LED indicators and configuration switches are illustrated in Figure 9. Upon power-up, the green PWR LED should light and the yellow CONF LED should illuminate for a few seconds for the duration of module initialization.

Note When a media module is first plugged into a GeckoFlex frame, the 8900NET module (if present) may report a momentary fault. This will clear once the media module has booted up.

Operation Indicator LEDs

With factory default configuration and a valid input signal connected, the green PWR and (Figure 9) on the top side of the module front edge should illuminate (refer to Table 1 on page 23 to see the possible operating indicator combinations).

Figure 9. Front Panel LED Indicators

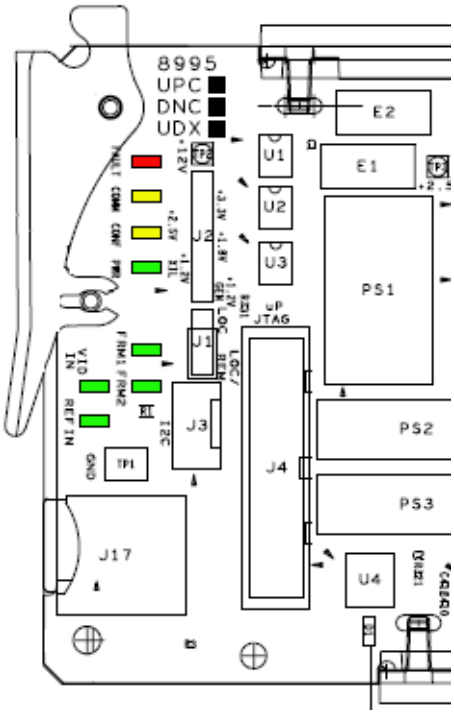


Table 1. Board Edge LED Names and Meaning

LED	Indication	Condition
FAULT (red)	Off	Normal operation.
	On continuously	Module has detected an internal fault.
	Flashing	Configuration problems. Check inputs and settings. Missing video.
COMM (yellow)	Off	No activity on frame communication bus.
	3 Quick Pulses	Locate Module command received by the module from a remote control system.
	Short flash	Activity present on the frame communication bus.
CONF (yellow)	Off	Module is in normal operating mode.
	On continuously	Module is initializing, changing operating modes or programming hardware.
PWR (green)	Off	No power to module or module's DC/DC converter failed.
	On continuously	Normal operation, module is powered.
FRM1 (green)	Off	Reference frame bus is disabled to frame on Genlock web page or no Genlock submodule is installed in slot 1.
	On	Reference frame bus is enabled on Genlock web page and Genlock submodule is installed in slot 1.
FRM2 (green)	Off	Reference frame bus is disabled to frame on Genlock web page or no Genlock submodule is installed in slot 3.
	On	Reference frame bus is enabled on Genlock web page and Genlock submodule is installed in slot 3.
VID IN (green)	Off	Indicates no valid input signal is being detected.
	On	Indicates a valid input signal is being detected.
REF IN (green)	Off	Indicates no valid reference signal is being detected or signal is not locked.
	On	Indicates a valid reference signal is present and locked.

Configuration

The 8995 modules can only be configured remotely using the 8900NET network interface GUI or a networked Newton Control Panel.

Refer to the following sections for configuration instructions:

- Configuration Overview (page 24)
- Remote Control and Monitoring (page 31)
- Configuration Parameter Summary (page 85)

Operation of these control types is explained in detail in their respective sections of this manual.

Configuration Summary

This section provides a brief summary of all parameters that can be configured on the 8995 module. Use this section in conjunction with the specific configuration method instructions for each configuration type. Table 10 on page 85 provides a summary in table format of all parameters and their ranges, default values, and remote, local, and control panel function names and locations for setting each value.

Video Input Selection

The video input source (Coax, RX 1, or RX 2) must be selected on the Video Input web page. Fiber optic inputs available depend on the type of fiber optic submodule installed. All inputs can have connections cabled, but only one input can be used at a time.

Video Timing and Loss of Signal Controls

On a 8995 module with an external Frame Sync genlock timing source selected, the following timing adjustments are available:

- Horizontal Timing – adjusts the horizontal delay of the channel output in pixels
- Vertical Timing – adjusts vertical delay in line increments

Also available on the 8995 module are the following controls for setting the output condition when there is a loss of input signal:

- Auto Blue – when Auto Blue is enabled on a channel, the output will automatically freeze to a blue screen when the input signal is lost on the input.
- Auto Freeze – when Auto Freeze is enabled on a channel, the output will automatically freeze on the last valid field when the input signal is lost on the input.

- A Manual freeze can be performed at any time with the following two choices:
  - Frame
  - Field

Note A field freeze provides less resolution and no motion artifacts in the output. In frame mode, the resolution is higher since both fields are present, but the presentation of the two fields can cause motion artifacts.

Signal Conversion

The 8995UDX module performs three main video conversion functions:

- Up Conversion – allows an SD signal input to be converted to an HD output signal in the same time domain (480i/59.94 to 1080i/59.94 or 576i/50 to 1080i/50 for example).
- Down Conversion – allows an HD signal input to be converted to an SD output signal in the same time domain (1080i/59.94 to 480i/59.94 or 1080i/50 to 576i/50 for example).
- Cross Conversion – allows an HD signal input to be cross converted between progressive signal types and interlaced signal types in the same time domain (720p/59.94 to 1080i/59.94 or 1080i/50 to 720p/50 for example).

The various up, down, and cross conversion possibilities for all input signal to output signal selections are shown in Table 2 for the 8995UDX. Note that all conversions must occur in the same time domain or they will be invalid. Invalid conditions are grayed out.

Table 2. 8995UDX Up, Down, and Cross Conversion

		Output Signal						
		480i (SD/59.94)	**720p (59.94)**	**1080i (59.94)**	**576i (SD/50)**	**720p (50)**	**1080i (50)**	**1080p (23.98)**
Input Signal	**480i (SD/59.94)**	Pass Through	Up Convert	Up Convert				Up Convert
	720p (59.94)	Down Convert	Pass Through	Cross Convert				Cross Convert
	1080i (59.94)	Down Convert	Cross Convert	Pass Through				Cross Convert
	576i (SD/50)				Pass Through	Up Convert	Up Convert	
	720p (50)				Down Convert	Pass Through	Cross Convert	
	1080i (50)				Down Convert	Cross Convert	Pass Through	
	1080p (23.98)	Down Convert	Cross Convert	Cross Convert				Pass Through

Table 3 shows the possible input and output conditions for the 8995UPC Up Converter module.

Table 3. 8995UPC Up Conversion

		Output Signal						
		480i (SD/59.94)	**720p (59.94)**	**1080i (59.94)**	**576i (SD/50)**	**720p (50)**	**1080i (50)**	**1080p (23.98)**
Input Signal	**480i (SD/59.94)**	Pass Through	Up Convert	Up Convert				Up Convert
	720p (59.94)		Pass Through					
	1080i (59.94)			Pass Through				
	576i (SD/50)				Pass Through	Up Convert	Up Convert	
	720p (50)					Pass Through		
	1080i (50)						Pass Through	
	1080p (23.98)							Pass Through

Table 4 shows the possible input and output conditions for the 8995DNC Down Converter module.

Table 4. 8995DNC Down Conversion

		Output Signal						
		480i (SD/59.94)	**720p (59.94)**	**1080i (59.94)**	**576i (SD/50)**	**720p (50)**	**1080i (50)**	**1080p (23.98)**
Input Signal	**480i (SD/59.94)**	Pass Through						
	720p (59.94)	Down Convert	Pass Through					
	1080i (59.94)	Down Convert		Pass Through				
	576i (SD/50)				Pass Through			
	720p (50)				Down Convert	Pass Through		
	1080i (50)				Down Convert		Pass Through	
	1080p (23.98)	Down Convert						Pass Through

Color Correction

Color correction controls are provided for making RGB gain, offset and gamma correction adjustments. Each color channel can be adjusted separately or a total gain or total gamma can be applied to all channels.

Gamma controls brighten and darken the gray intensity of the signal. Raising the gamma above 1.0, brightens the gray intensity. Lowering the gamma below 1.0, darkens the gray intensity.

Video Processing Adjustments

Component level (Y, Cr, Cb) adjustments are provided in the Video processor for video gain and offset, chroma gain, phase control (hue), and color saturation. Each color component can be adjusted separately or the total gain can be adjusted.

Image enhancement controls include a noise reduction control that can be enabled and the level set to reduce any noticeable noise that may occur after conversion. Also included is an edge expansion control for expanding the edge of the video to enhance picture quality.

Audio Processing and Configuration

Audio status for up to eight audio streams in four embedded audio groups present in the input video is monitored and reported. Controls are provided for adjusting gain on individual audio channels in each of the streams (2 streams per group, each stream having a Channel A and Channel B) and re-pairing audio channels into the four output groups as desired (or forcing to Silence) and reinserting the processed audio into the video output. Refer to the *Functional View Web Page* on page 48.

Aspect Ratio Selection

When a signal is up or down converted, the aspect ratio of the output can be set for different applications on the output. The resulting output will depend on the original format of the material and whether it has been up or down converted.

Four standard aspect ratio conversion settings are provided on this module:

- Full Width – this mode will stretch a down converted image to fit the screen with top and bottom margins. An image set to this mode will appear centered horizontally in a 16:9 display with black bars on the top and bottom of the screen (letterbox) as illustrated in Figure 10. The image can be aligned with the aspect ratio controls and the matte color of the background can be changed.

Figure 10. Full Width Aspect Ratio

Full Width

Complete picture appears in Full Width format with top and bottom margins.
Position picture vertically with alignment controls and crop vertical lines.
Set matte color of top and bottom margins.

- Full Height – this mode, also known as Center Cut, presents the entire picture with horizontal cropping. An image set to this mode will appear centered vertically in a 16:9 display with some cropping on either side as shown in Figure 11. The image can be adjusted with the horizontal aspect ratio controls.

Figure 11. Full Height Aspect Ratio

Full Height (Center Cut)

Complete picture appears in Full Height format with horizontal cropping.
Also known as Center Cut mode.
Position picture with horizontal alignment and croppping controls.

- Anamorphic – this mode is designed to be used with material originally captured with an anamorphic lens. It ensures that the top and bottom edges of the input aspect ratio match the top and bottom edges of the output aspect ratio. When used with standard 4:3 material, it will have the effect of stretching the material horizontally as illustrated in Figure 12. This results in a distortion of the geometry of the image, particularly causing circles to appear as ovals when present in the image if the input image was not recorded with an anamorphic lens.

Figure 12. 16:9 Anamorphic Mode

Anamorphic Aspect Ratio

Displays all pixels, no loss of picture, but stretches image height. Circles will appear as ovals. No positioning controls are used.

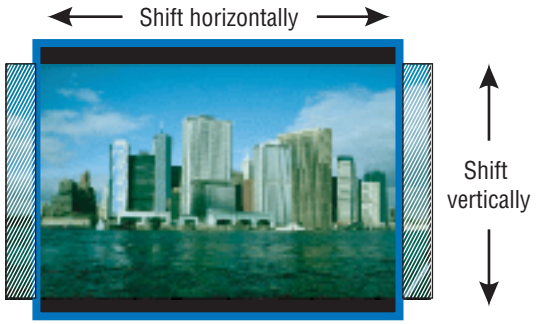
- 14 x 9 SP – this mode minimizes the left and right cropping of the image and stretches it leaving the result for both down and up conversion as shown in Figure 13. The image can be aligned with the aspect ratio controls and the matte color of the background can be changed.

Figure 13. 14 x 9 SP Aspect Ratio

14x9 SP: Down Conversion

Minimized left and right cropping of picture with top and bottom margins. Position picture vertically and horizontally with alignment controls and crop vertical lines. Set matte color of top and bottom margins.

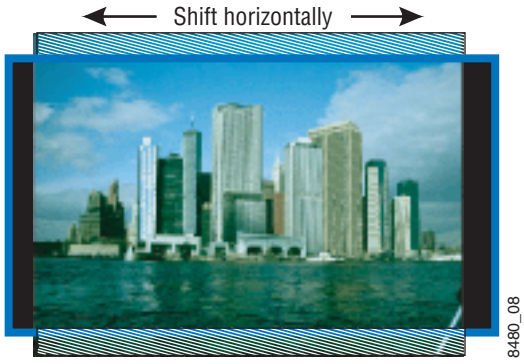
= lost picture



14x9 SP: Up Conversion

Top and bottom cropping; Position left, center, or right

= lost picture



Transcoding

Controls are provided for enabling the following types of transcoding:

- Audio – when enabled allows embedded audio to be transcoded to the output with no change.
- Closed Captioning – enabling closed captioning (CC) encoding Use the allows you to select what type of closed captioning transcoding is required on both the input and output signal.
- VITC – enabling VITC transcoding to select what type of vertical interval time code (digital or analog) is required on both the input and output signal.

User Settings

Module default parameters and default signal names can be recalled at any time for the entire module or subsets of parameters such as the color corrector or video processor.

On the web pages, a **Defaults** button at the bottom of each applicable web page is available to return the parameters on that page to the factory defaults.

Save and load module configuration to/from a file are also provided on this web page.

Fiber Optic Outputs

When there is a 1310NM-DTL (2 outputs) or 1310NM-TRL (1 output) fiber optic submodule installed, one or both fiber outputs can be enabled for operation. Be sure to follow the instructions for preparing the fiber given in *Fiber Optic Cleaning Requirement* on page 19.

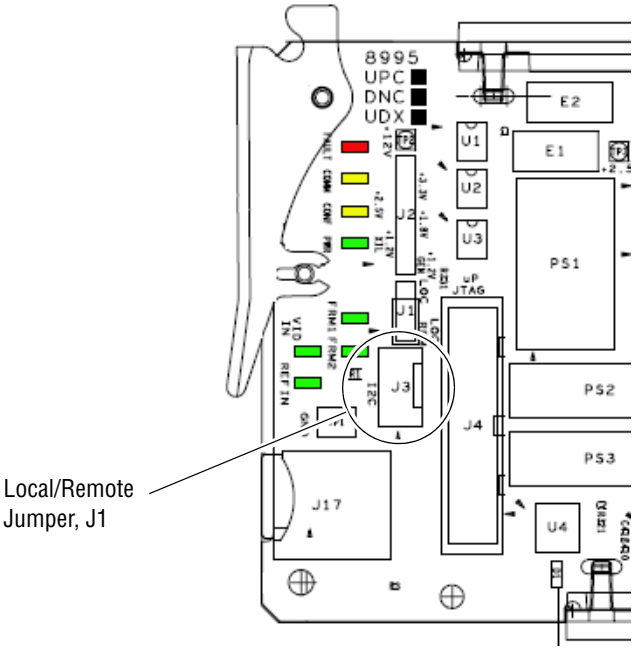
Remote Configuration and Monitoring

8995 module configuration and monitoring can only be performed using a web browser GUI interface or a networked Newton Control Panel when the 8900NET Network Interface module is present in the GeckoFlex frame. Each of these interfaces is described below.

Local/Remote Jumper

The on-board jumper Local/Remote jumper, J1, (Figure 14) must be set for local and remote (LOC/REM position, pins 2-3) for remote control or set to (LOC position, pins 1-2) to lock out remote control.

Figure 14. Module Configuration Switches and LEDs



8900NET Module Information

Refer to the *8900NET Network Interface Module Instruction Manual* for information on the 8900NET Network Interface module and setting up and operating the GeckoFlex frame network.

Note The 8900NET module in the GeckoFlex frame must be running software version 4.0.0 or higher for proper remote and control panel operation. Upgrade software and instructions for the 8900NET can be downloaded from the Grass Valley web site.

Newton Control Panel Configuration

A Newton Control Panel (hard or soft version) can be interfaced to the GeckoFlex frame over the local network. Refer to the documentation that accompanies the Newton Modular Control System for installation, configuration, and operation information.

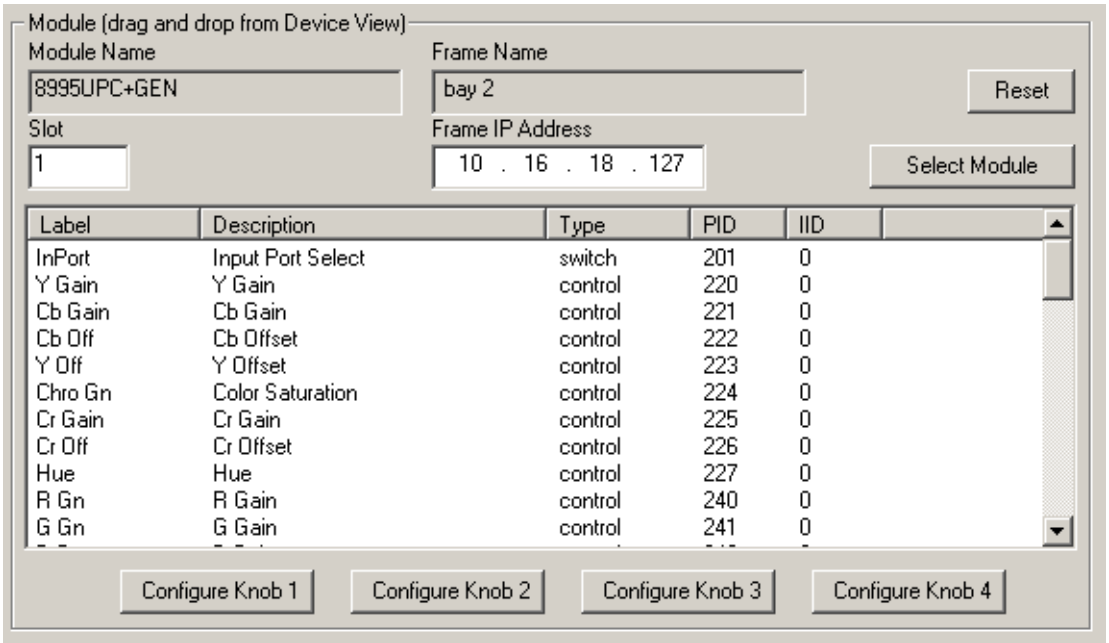
Control panel access offers the following considerations for module configuration and monitoring:

- Ability to separate system level tasks from operation ones, minimizing the potential for on-air mistakes.
- Ability to group modular products—regardless of their physical locations—into logical groups (channels) that you can easily manipulate with user-configured knobs.
- Update software for applicable modules and assign frame and panel IP addresses with the NetConfig Networking application.
- Recommended for real-time control of module configuration parameters, providing the fastest response time.

Note Not all module functions are available with the control panel, such as E-MEM and factory default recalls. The available control panel controls for the 8995 modules are listed in Table 10 on page 85.

An example of the Newton Configurator is shown in Figure 15.

Figure 15. Newton Configurator Example



Web Browser Interface

The web browser interface provides a graphical representation of module configuration and monitoring.

Use of the web interface offers the following considerations:

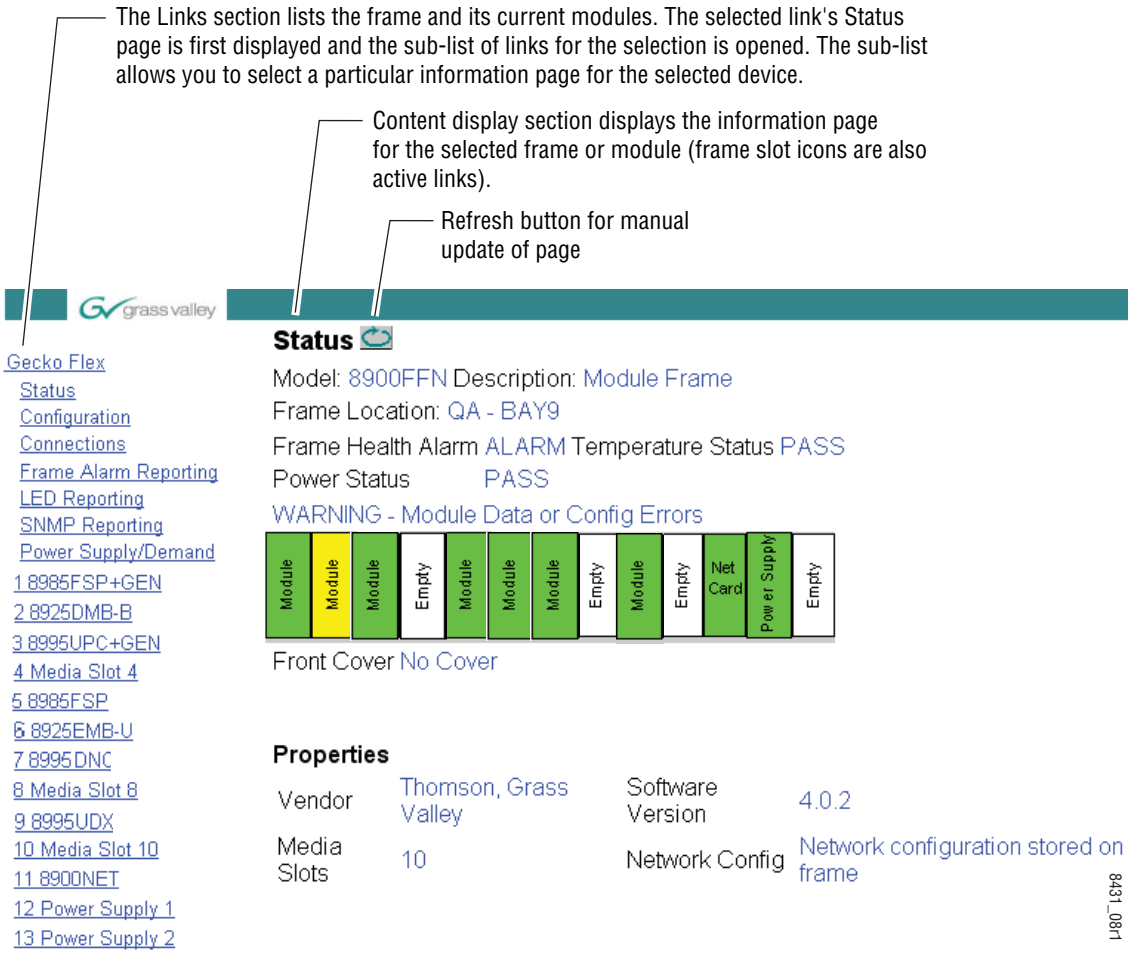
- Provides complete access to all module status and configuration functions, including naming of inputs and outputs, factory parameter and name default recalls, E-MEM functions, slot configuration, and SNMP monitoring controls.
- Web access will require some normal network time delays for processing of information.
- Configuration parameter changes may require pressing **Apply** button or **Enter**, upload processing time, and a manual screen refresh to become effective.
- Web interface recommended for setting up module signal and slot names, E-MEMS, and reporting status for SNMP and monitoring.

Refer to the Frame Status page shown in Figure 16 on page 34. The modules can be addressed by clicking either on a specific module icon in the frame status display or on a module name or slot number in the link list on the left.

Note The physical appearance of the menu displays on the web pages shown in this manual represent the use of a particular platform, browser and version of 8900NET module software. They are provided for reference only. Displays will differ depending on the type of platform and browser you are using and the version of the 8900NET software installed in your system. This manual reflects 8900NET software version 4.0.2 required for this frame and module.

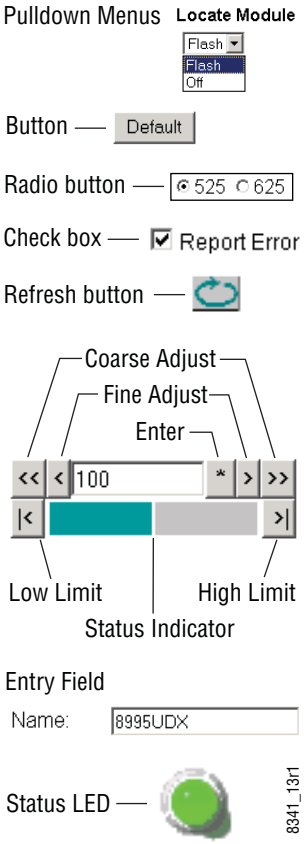
For information on status and fault monitoring and reporting shown on the Status page, refer to *Status Monitoring* on page 80.

Figure 16. GeckoFlex Frame Status Page



Web Page Operations and Functional Elements

The following conventions and functional elements (shown at left) are used in GeckoFlex web page operations. (The examples shown throughout this manual represent 8900NET software version 4.0.2 or later):



- Pulldown menus allow you to choose selections from a list.
- Clicking on a button performs an immediate action such as recall of defaults, clearing of states, learning configurations, and selecting all or none of a selection.
- Radio buttons are used to make a choice of one parameter in a group.
- Check boxes are used when a selection can be enabled or included in a group. Multiple check box selections or enables can be made for some parameters.
- A **Refresh** button (circular arrow) is provided at the top of each web page for manual refresh to view and update recently changed parameters.
- Each numerical adjustment control has a **Coarse** adjust button (left and right top double arrows) which increases or decreases the step value by a factor of 10. The **Fine** adjust button (left and right inside single arrows) increases or decreases the step value by 1.

  To change a value, use the arrow button controls or enter a value into the number field and select the **Enter** button (*) or use the **Enter** key on your keyboard. The Status Indicator bar will follow the value selected.

  Use the **Low** and **High Limit** buttons to go directly to the lowest and highest limits for the parameter.
- An entry field allows naming of various module functions such as input or output signals, asset tag, and slot identification.
- The **Status** LED icon reports communication status for the frame slot and is a link to the module Status web page where Warnings and Faults are displayed.

  LED colors indicate:

  - Green = Pass – no problems detected
  - Yellow = Configuration error warning
  - Red = Fault condition detected

Web Page Headers

Each configuration web page has a Status and Identification Header as shown in Figure 17 for the 8995UPC, Figure 18 for the 8985UNC, and Figure 19 for the 8995UDX.

Figure 17. 8985UPC Status /ID Header

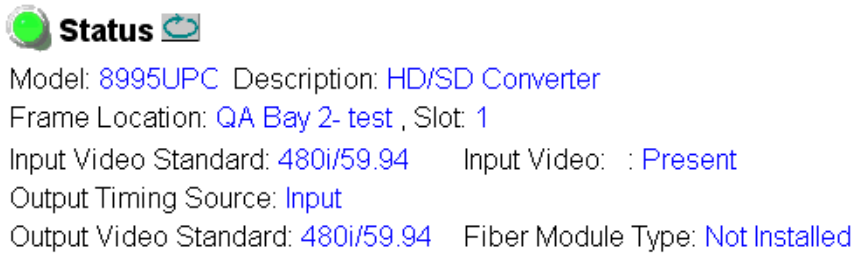


Figure 18. 8985DNC Status /ID Header

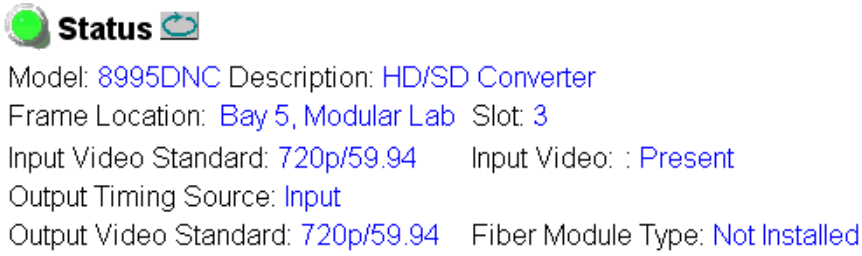
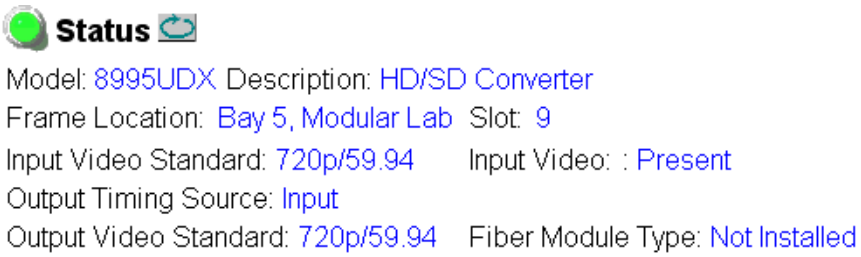
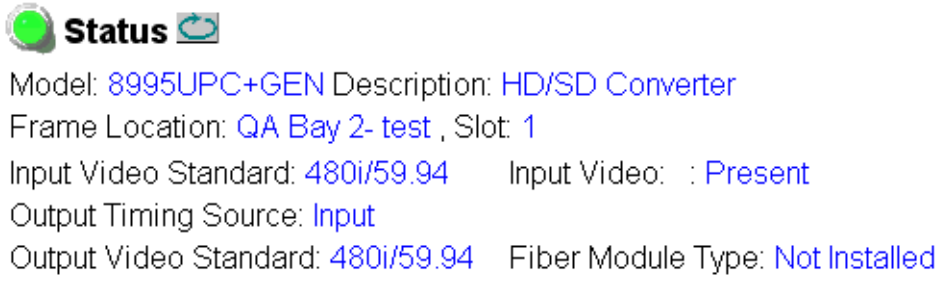


Figure 19. 8995UDX Status/ID Header



When any of the 8995 modules have an 8900GEN submodule installed, the header shows the addition of the Genlock with + GEN (Figure 20).

Figure 20. 8995UPC + GEN Status Web Page



The header information on each web page includes the following:

- **Model** and **Description** are read-only generated by the module.
- **Frame Location** is defined on the 8900 Series GeckoFlex Frame Configuration web page.
- **Slot** number reports the module's location in the frame.
- **Input Video Standard** reports the input video type and rate selected on the System Config web page.
- **Input Video** reports the status of the video input to the module.
- **Output Timing Source** reports the output timing source (Local, Ref 1, Ref 2 or Input) chosen on the System Config web page.
- **Output Video Standard** reports the current output video format selected.
- **Fiber Module Type** reports the type of SFP fiber module installed or **Not Installed.**

Web pages with configuration parameters each have a **Defaults** button at the bottom of the page to allow resetting of default parameters for only that page.

Web Page Links

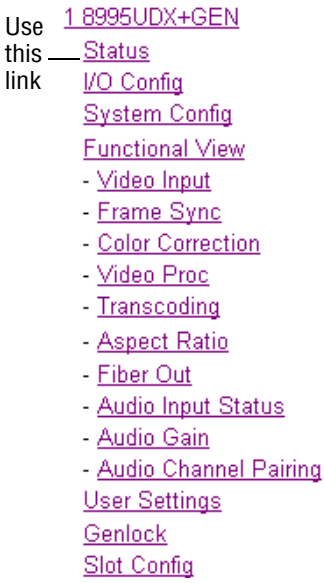
The web interface GUI provides the following links and web pages for the 8995 modules (Figure 21 on page 38):

- Status – reports input video and reference signal status, presence of Fiber Optic and Genlock option submodules, and module hardware and software version information (page 39),
- I/O Config – shows a graphic representation of inputs and outputs to the module and allows naming of each input and enabling and disabling of signal reporting (page 41),
- System Config – set the I/O standard for the input and output of the module, the output timing source, colorbars test output, and Reference Restore parameters (page 42),
- Functional View – provides a graphical block diagram of the configuration pages for the module with links to each web page (page 48),
- Video Input – allows selection of the video input source (Coax or fiber) and provides the status of all sources, including fiber optic submodule option inputs (page 49),
- Frame Sync – provides horizontal and vertical timing and loss of signal controls for the 8995 module (page 50),
- Color Correction – provides RGB gain, offset and gamma correction adjustments (page 55),

- Video Proc – provides overall video processing for the HD or SD signal and image enhancement controls for noise reduction and edge expansion (page 56),
- Transcoding – enable the Audio, Closed Captioning, and VITC transcoding functions and set parameters for analog controls (page 58),
- Aspect Ratio – set the desired aspect ratio, cropping, and matte color for the output video (page 60),
- Fiber Out – enable or disable the fiber optic outputs when a dual transmitter or transceiver fiber optic submodule is installed (page 61),
- Audio Input Status – reports the input status of embedded audio on the video input signal (page 62),
- Audio Gain – allows setting gain on Channel A and B of each audio stream (page 63),
- Audio Channel Pairing – allows recombining of audio channels within the four audio output groups (page 65),
- User Settings – allows recalling of factory defaults for all module parameters or factory signal names, and provides a save/load configuration file function (page 67),
- Genlock – appears only on module links when the optional 8900GEN-SM submodule is installed on the module. This web page provides status reporting for the external genlock reference and controls for enabling the Genlock, matching the reference input to a selection standard, and setting reference signal delay (page 70), and
- Slot Config – provides Locate Module and Slot Memory functions along with links to the SNMP, LED Reporting, and Frame Alarm configuration web pages (page 74).

Figure 21. 8995UDX/UPC/DNC Web Page Links

Status Web Page



The Status web page (Figure 22 on page 40 shows an example of the 8995UDX) reports the input signal status of each of the video and the reference inputs and outputs in both graphical and textual formats. It also provides status reporting for the optional Genlock and Fiber Optic submodules. Color coding of the display and the Status LED indicates the signal status. Refer to *Status Monitoring* on page 80 for a complete explanation of the color coding.

Module Physical Structure

Status is reported for each of the following video or reference signals:

- Video In – indicates the status of the video input to the module from the coax BNC, or one of two possible fiber optic inputs (depending on the type of fiber optic connector installed).
- Video Out – not monitored in this application.
- Genlock Ref In – indicates the status of the external genlock reference signal at BNCs J1 and J3 (Genlock Loop).
- Local Ref – indicates the status of the internally generated genlock reference signal from the 8900GEN submodule to the front module.
- Frame Bus – indicates the status of the communication bus to the 8900NET module.
- Ref 1 and Ref 2 In (From Frame) – the Ref 1 arrow will be present when Frame Bus 1 has been enabled on the module in slot 1. The Ref 2 arrow will be present when Frame Bus 2 has been enabled on the module in slot 3 of the frame.

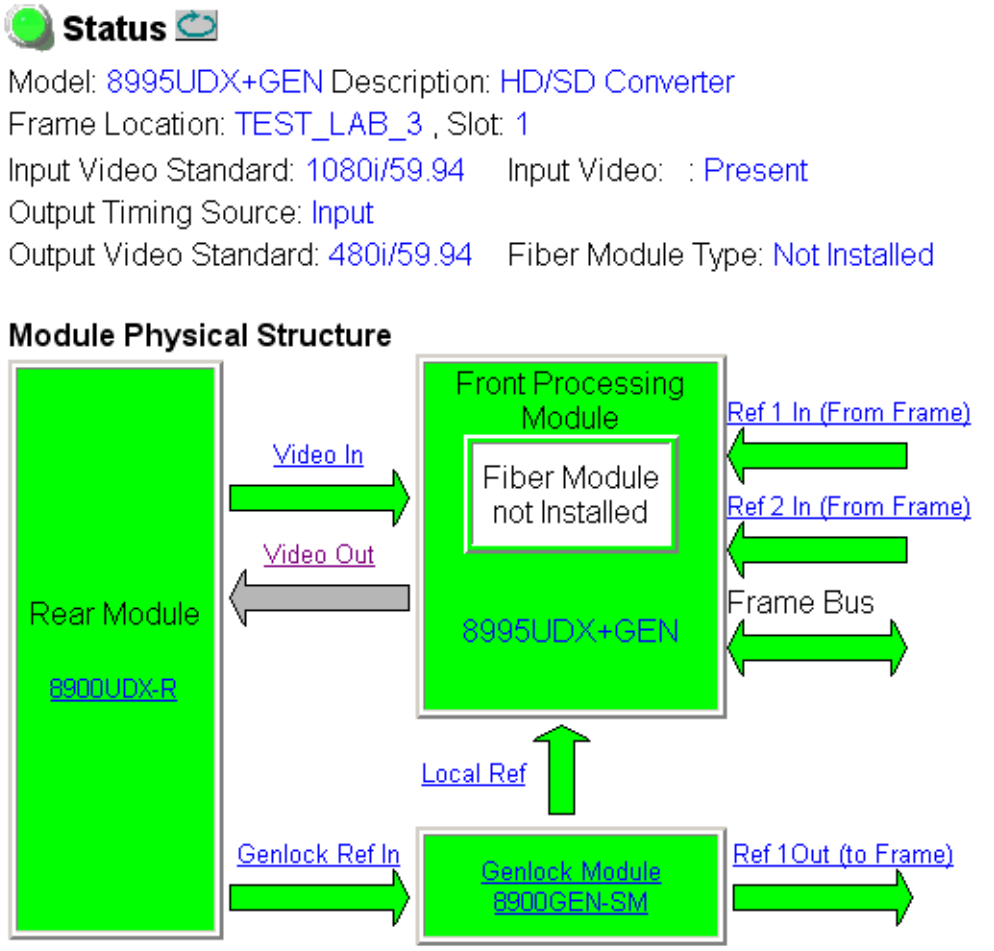
When the module detects an error, a warning messages, such as signal or reference not present, will appear between the lines below the status graphic as illustrated in Figure 22 on page 40. Refer to the *I/O Config Web Page* on page 41 for information on disabling the status reporting.

Note Many of these warnings are informational only and concern frame rate compatiblilty. Pay close attention to the frame rate compatibility explanations and tables in this manual.

The installation status of the Genlock Module or Fiber Optic submodule will also be reported here as well as being shown in the graphic.

Information about the module, such as part number, serial number, hardware revision and software and firmware versions, and asset tag number (assigned on the Slot config web page) are given in a read-only section at the bottom of the display.

Figure 22. 8985UDX Status Web Page



I/O Config Web Page

Use this link

1 8995UDX+GEN
Status
I/O Config
System Config
Functional View
- Video Input
- Frame Sync
- Color Correction
- Video Proc
- Transcoding
- Aspect Ratio
- Fiber Out
- Audio Input Status
- Audio Gain
- Audio Channel Pairing
User Settings
Genlock
Slot Config

Use the I/O Config web page (Figure 23) for the following:

Rear Connectors

All of the input and output connectors on the corresponding 8995UDX-R rear module are illustrated on the I/O Config web page. The inputs can be configured with the following controls:

- **Signal Naming** – use the factory default signal names or type the desired input name (up to 11 characters) into the corresponding boxes for each input. The status of each input is indicated by the color of the display.
- **Reporting Enabling** – status reporting of each input type can be enabled or disabled by selecting or deselecting the corresponding checkbox in the **Reporting Enabled** column for each input type. You may disable reporting for inputs not being used if desired to avoid error messages. Status color of the signal will not change. The **Reporting Enabled** column used with an SNMP monitoring application such as NetCentral.

  Refer to *Status Monitoring* on page 80 for an explanation of the color coding and using an SNMP monitoring application.

Note Outputs are not monitored in this application.

Figure 23. I/O Config Web Page with Factory Default Signal Names

I/O Config

Model: 8995UDX+GEN Description: HD/SD Converter
Frame Location: TEST_LAB_3 , Slot: 1
Input Video Standard: 1080i/59.94 Input Video: : Present
Output Timing Source: Input
Output Video Standard: 480i/59.94 Fiber Module Type: Not Installed

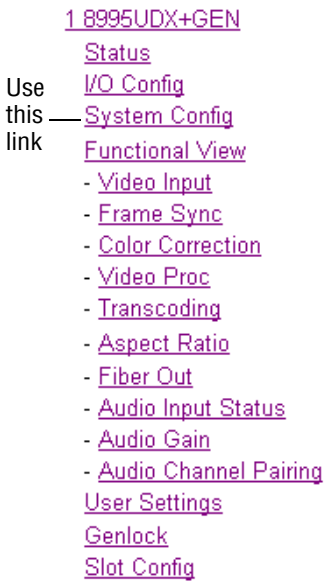
8900UDX-R Rear Connections

Signal Names	Reporting Enabled							Reporting Enabled	Signal Names
Ref Input	☑	Genlock Ref In Loop	J1			J2	Audio Tracking Delay	.	.
			J3			J4	Reclocked Video Output	.	.
.	.	Video Output	J5			J6	Video Output	.	.
.	.	Video Output	J7			J8	Video Output	.	.
Coax Input	☑	COAX Video Input	J9		Fiber		Fiber Video In/Out 2	☑	Fiber 2
							Fiber Video In/Out 1	☑	Fiber 1

Legend:

Present | Not Present | Not Monitored

System Config Web Page



Use the System Config web page (Figure 25 on page 43) to set the system configuration parameters for the module. For a complete list of module parameters, refer to the summary table in the *Configuration Summary Table* on page 85

Test Output

Enable the colorbars test signal on the module output with the **Enabled** button.

Video I/O Configuration

The following controls are available in this section:

- **Ref Input** – displays the reference input standard connected to the Genlock Loop through BNCs on the rear module. Refer to Table 5 on page 46 for a listing of output standards and compatible frame references.
- **Input Standard** – choose the desired input standard from the pulldown choices or use the **Auto** selection. The signal input type selected will be reported in the web page header as the Input Video Standard. When **Auto** is selected, the input signal type detected on BNC J9 will be reported.
- **Output Standard** – choose the desired input standard from the pulldown choices. This will determine what action the module will perform, up conversion, down conversion, or cross conversion.

Refer to *Signal Conversion* on page 25 for an explanation of the conversion types and valid and invalid conditions.

When a new configuration has been selected with the Input and Output Standard pulldowns, such as a up conversion operation shown in Figure 24, a message will appear indicating **Changes Pending: Click Apply Settings button to commit changes.**

Figure 24. Changes Pending Message

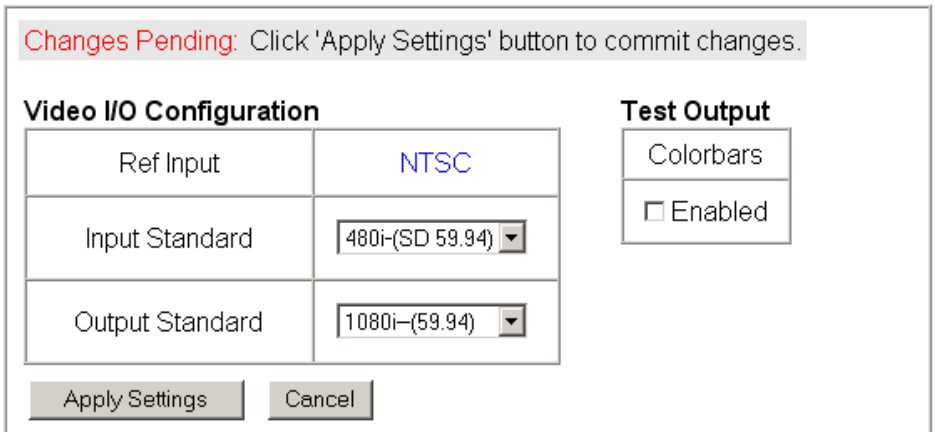
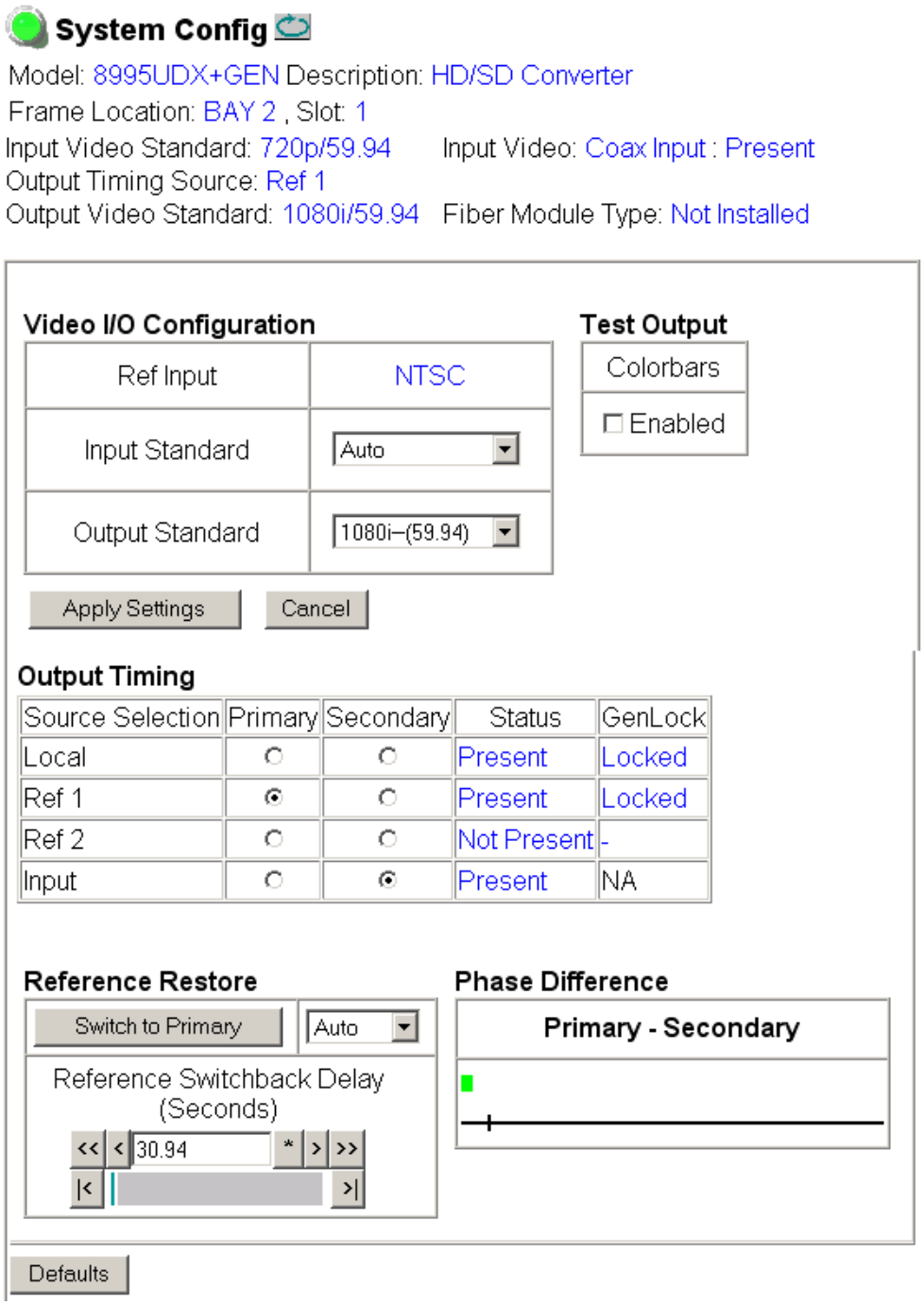


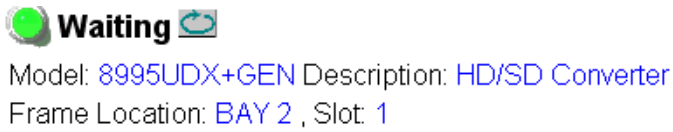
Figure 25. System Config Web Page



Select the **Apply Settings** button to perform the action. Some conversions (typically up and down conversion) require a reconfiguring of parameters on the module and a **Please standby … reconfiguring** message (Figure 26) will appear while the operation is performed.

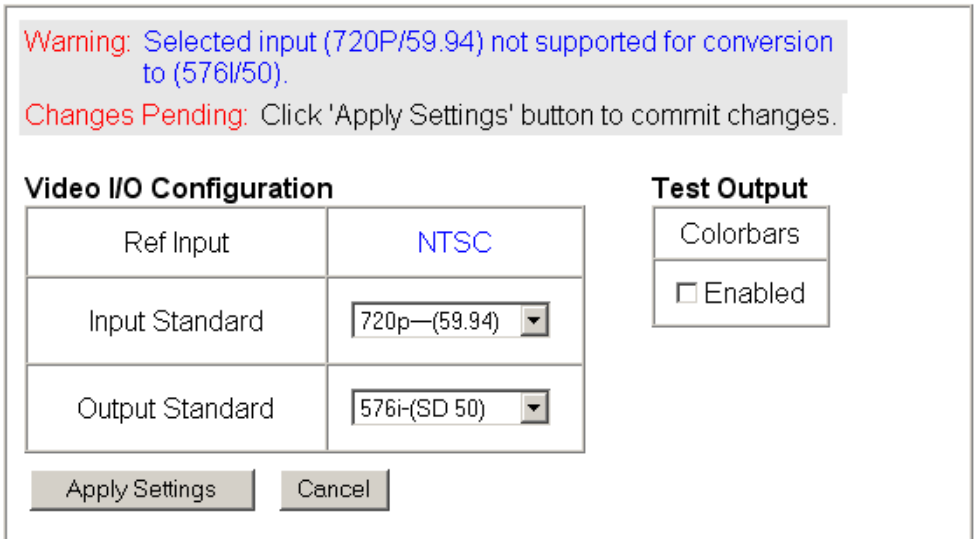
Note Once the web page reappears, it may be necessary to use the **Refresh** button to update the page to show the correct values now configured.

Figure 26. Please Stand By Message



When the module detects an invalid condition relating to input/output conversion (such as down converting between different line rates 59.94 and 50 for example), a warning message will appear similar to the one shown in Figure 27. The warning message will indicate why this operation is not supported.

Figure 27. Invalid Signal Conversion Warning Message



When a reference mismatch error is detected between the output video standard and the reference input to the module, a message similar to Figure 28 will appear.

Figure 28. Output Standard and Frame Reference Error

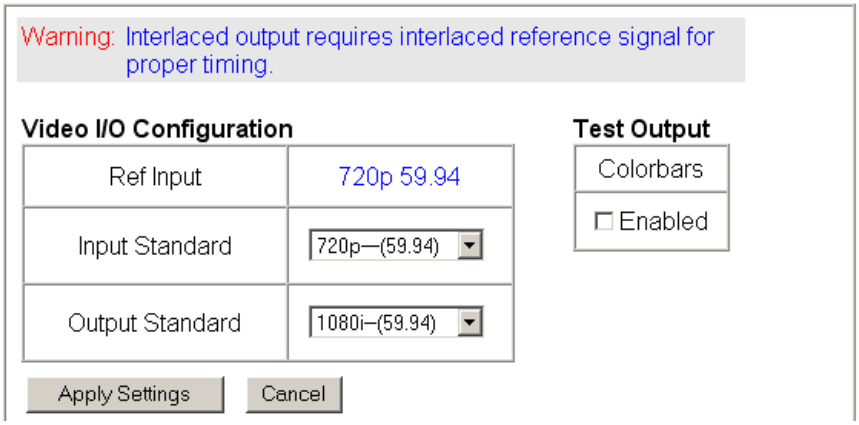


Table 5 give the various output video standards and the frame references that are compatible with each type.

Table 5. Output Video and Frame Reference Compatibility

Video Output Standard	Reference Detected	Mismatch Warning
480i	NTSC	None
	1080i 59.94 TLS	None
	720p 59.94	Yes[1]
576i	PAL	None
	1080i 50 TLS	None
	720p 50 TLS	Yes[1]
1080i 59.94	1080i 59.94 TLS	None
	NTSC	None
	720p 59.94 TLS	Yes[1]
720p 59.94	720p 59.94 TLS	None
	NTSC	None
	1080i 59.94 TLS	None
1080i 50	1080i 50 TLS	None
	PAL	None
	720p 50 TLS	Yes[1]
720p 50	720p 50 TLS	None
	PAL	None
	1080i 50 TLS	None
1080p 23.98	720P 59.94 TLS	Yes[1]
	1080i 59.94 TLS	Yes[1]
	NTSC	Yes or No [2]
	1080p 23.98 TLS	Yes [3]

[1] No multi-frame indexing is present on these reference signals to handle the 5:4 ratio between the 59.94 and 23.98 Hz frame rates.

[2] Only an NTSC reference with SMPTE 318-M-1999 10-field marker will ensure frame synchronization of the 1080p/23/98 video.

[3] The 23.98 reference is converted to 59.94 Hz reference signals inside the GeckoFlex frame (Local, Ref 1, or Ref 2). Any two modules using the same internal reference signal will have identical frame sync phase in the output video. Any two modules using separately decoded internal references will not produce the same frame sync phase in the output video.

Output Timing

Select the Primary and Secondary output timing source for the module as either **Local** (external reference from the 8900GEN-SM submodule mounted on this module), **Ref Bus 1** (8900GEN-SM submodule is mounted on module in slot 1 and jumpered for outputting a Ref 1 frame bus), **Ref Bus 2** (8900GEN-SM submodule is mounted on module in slot 3 and jumpered for outputting a Ref 2 frame bus), or **Input**, the reference is taken from the input video. The signal and genlock status of each reference source will be reported in the Status and Genlock columns.

When a Secondary reference source is selected that is different than the Primary, the module can be configured to switch automatically to the Secondary selected if the Primary is lost or becomes unlocked or invalid. If you do not want this action of switching to a secondary, set the Primary and Secondary sources to the same source.

Refer to the *8900GEN-SM Installation Manual* available online for complete details for using this submodule for timing applications.

Reference Restore

If the Primary source has failed and a Secondary source is selected and valid, the following controls allow you to set the module to switch back to the Primary automatically or manually and determine the amount of time before the Primary is restored.

- **Switch to Primary** – set this control to **Manual** if you wish to manually return to the Primary reference when it becomes valid or locked again or **Auto** to allow the module to switch back to the Primary reference.
- **Reference Switchback Delay** – when the control above is set for **Auto**, set the amount of time to allow between switching from the Secondary reference back to the restored Primary. The switchback time has a minimum recovery time of 30 seconds to assure that the Primary is locked and valid before the module switches back to this source.

Primary – Secondary Phase Difference

This graphic is provided to show the total phase difference between the Primary and Secondary reference signals. When the bar is green and remains in the area before the horizontal indicator, the two references are in a range where switching between the two will show no measurable disturbance in the output video (approximately 72 ns).

When the phase difference is larger than the recommended amount, the bar will indicate by showing a second red bar. This indicates that the phase difference is now such that switching between the two references will show a disturbance in the output video. This can be caused by a loss of one of the references or a mis-adjustment in the reference output delay of either reference. The total phase error shown in this graphic represents approximately 1 us.

Functional View Web Page

Use this link

1 8995UDX+GEN
Status
I/O Config
System Config
Functional View
- Video Input
- Frame Sync
- Color Correction
- Video Proc
- Transcoding
- Aspect Ratio
- Fiber Out
- Audio Input Status
- Audio Gain
- Audio Channel Pairing
User Settings
Genlock
Slot Config

The Functional View web (Figure 30) page illustrates a block diagram of the 8995 front media modules showing module functions and active signal paths in the current configuration. It can be used as a link map for configuring module functions. Each block has a link to the configuration page for that function.

- Color coding indicates active functions and signal flow. Grayed components are inactive due to hardware and/or software constraints. Underlined module functions are links to the web page for that function.
- Use the Functional View to configure the 8995 modules in the order of the signal flow.
- Each web page shown in the Functional View will have links to the **<< Previous** web page, the **Functional View** web page, and the **Next >>** web page at the bottom of the web page.
- Use the **<< Previous**, **Functional View**, and **Next >>** links (Figure 29) at the bottom of the web pages under the Functional View to move through the configuration web pages or return to the Functional View web page.

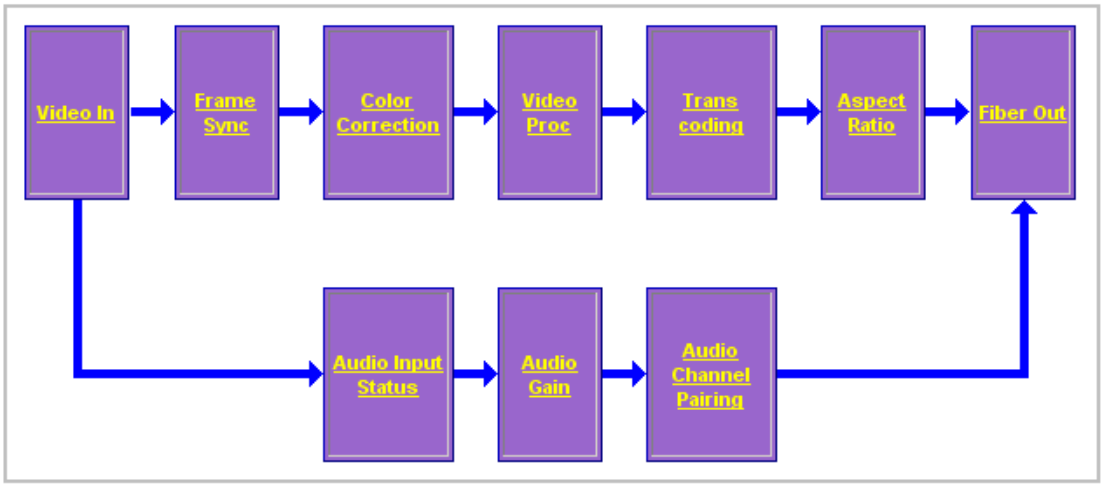
Figure 29. Functional View Web Links

<< Previous | Functional View | Next >>

Figure 30. Functional View Web Page

Functional View

Model: 8995UDX+GEN Description: HD/SD Converter
Frame Location: TEST_LAB_3 , Slot: 1
Input Video Standard: 1080i/59.94 Input Video: : Present
Output Timing Source: Input
Output Video Standard: 480i/59.94 Fiber Module Type: Not Installed



Video Input Web Page

Use this link

- 1 8995UDX+GEN
  - Status
  - I/O Config
  - System Config
  - Functional View
  - - Video Input
  - - Frame Sync
  - - Color Correction
  - - Video Proc
  - - Transcoding
  - - Aspect Ratio
  - - Fiber Out
  - - Audio Input Status
  - - Audio Gain
  - - Audio Channel Pairing
  - User Settings
  - Genlock
  - Slot Config

Use the Video Input web page (Figure 31) to select and monitor the video input source to the module with the following:

Video Input Selection

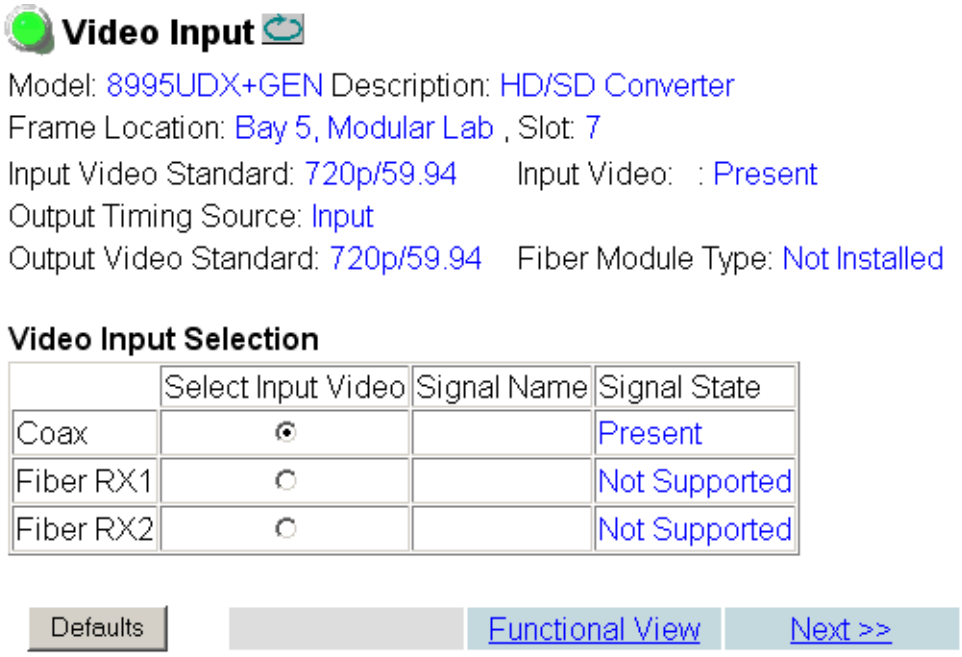
This section provides the following for the video input signal:

- **Select Input Video** – select the input source from the rear module as either **Coax**, **Fiber RX 1**, or **Fiber RX 2**.

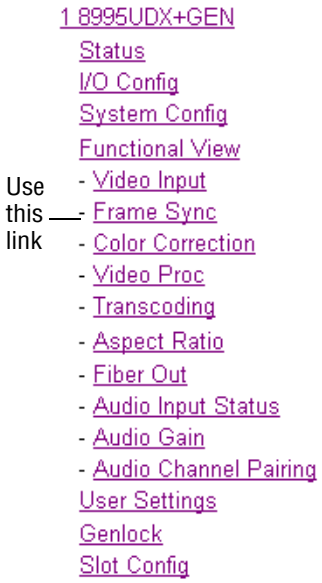
Note Fiber optic inputs require the presence of a fiber optic submodule. See *Fiber Optic Video Inputs* on page 20.

- **Signal Name** – the signal name defined on the I/O Config web page will appear in each field.
- **Signal State** – this field reports the status of the input video signal as **Present**, **Not Present**, or **Not Supported** (no fiber submodule installed).

Figure 31. Video In Web Page



Frame Sync Web Page



The Frame Sync web page (Figure 32 on page 53 for Input reference and Figure 33 on page 54 for Local, Ref 1, or Ref 2 reference) provides horizontal and vertical timing and loss of signal controls for the 8995 modules.

Note The controls available on the Frame Sync page depend on the Output Timing Source selected on the System Config web page.

Timing Adjustment

When the Frame Sync option is present and the **Local**, **Ref 1**, or **Ref 2** output timing source is selected, horizontal and vertical timing adjustments can be made on the output video as required relative to the external reference with the controls described below. Refer to Table 6 on page 52 for the list of frame sync pixel and line timing adjustment ranges for input to output video combinations.

- **H Timing (Pixels)** – the horizontal timing can be adjusted in pixels relative to the external reference.
- **V Timing (Lines)** – the vertical timing can be adjusted in lines relative to the external reference.
- **Multi-Frame Delay** – this control allows you to add up to 6 frames of delay. When the H and V Timing controls are set to maximum, the total delay of the module will be 8 frames (when **Minimum Delay Mode** is not selected).

Minimum Delay Mode

A minimum delay can be enabled to bypass portions of the frame sync memory to allow an absolute minimum amount of delay through the module. To enable this mode, check the **Enabled** checkbox. Refer to Table 8 on page 77 for the delay values for each format.

Loss of Signal Operation

Set the operation to be performed by the module upon loss of input signal when a Local external reference is present (**Auto Blue**, **Auto Freeze**, or **Pass**).

When there is no external reference (output timing set to Input), the module will default to pass the signal to the output.

Manual Freeze Mode

Select one of the radio buttons (**Frame** or **Field**) to perform a manual freeze on the output.

Delay Wrap Position

This indicator will display with a blue bar, the fraction of the final frame of actual video delay through the frame sync. It will not indicate if multiple frames have been selected with the Multi-Frame Delay control.

For example, with 1080i video and Minimum Delay Mode not selected, if 600 lines plus 5 frames of delay is entered by the user, that actual delay through the module will be anywhere from about 6 to 7 frames depending on the following conditions:

a. If the module is in Delay (Input-Timed) Mode, the delay through the module will be about 6.5 frames, and the Delay Wrap Position will be at about 50% of full scale.

b. If the module is in Frame Sync (Genlock) Mode, the delay through the module will be about 6.5 frames if the input video has zero delay with respect to the genlock reference frame position, and the Delay Wrap Position will be at about 50% of full scale. As this input video delay with respect to the genlock reference frame position is changed from -0.5 to +0.5 frame periods, the delay through the module will change from about 6 to 7 frame periods, with the Delay Wrap Position changing from about 0 to 100% of full scale.

In summary, the Electrical Length of the module can be estimated as the following:

- 1 frame minus 5 lines (Minimum Delay Mode not selected), or
- 150 pixels (Minimum Delay Mode selected) + Multi-Frame Delay + Delay Wrap Position (% of full scale) X (1 frame period).

Table 6. Frame Sync Timing Adjustment Ranges

Input Video	Output Video	Pixels	Lines	Notes
480i/59.94	480i/59.94	0 to 857	0 to 524	
	1080i/59.94	0 to 2199	0 to 1124	
	720p/59.94	0 to 1649	0 to 1499	Two frames of 720p span one frame of 480i
	1080p/23.98	0 to 2749	0 to 1124	Spans 1.25 frames of input video
1080i/59.94	480i/59.94	0 to 857	0 to 524	
	1080i/59.94	0 to 2199	0 to 1124	
	720p/59.94	0 to 1649	0 to 1499	Two frames of 720p span one frame of 1080i
	1080p/23.98	0 to 2749	0 to 1124	Spans 1.25 frames of input video
720p/59.94	480i/59.94	0 to 857	0 to 524	Must span two frames of input video as genlock reference does
	1080i/59.94	0 to 2199	0 to 1124	Must span two frames of input video as genlock reference does
	720p/59.94	0 to 1649	0 to 749	
	1080p/23.98	0 to 2749	0 to 1124	Spans 2.50 frames of input video
576i/50	576i/50	0 to 863	0 to 624	
	1080i/50	0 to 2639	0 to 1124	
	720p/50	0 to 1979	0 to 1499	Two frames of 720p span one frame of 480i
1080i/50	576i/50	0 to 863	0 to 624	
	1080i/50	0 to 2639	0 to 1124	
	720p/50	0 to 1979	0 to 1499	Two frames of 720p span one frame of 480i
720p/50	576i/50	0 to 863	0 to 624	Must span two frames of input video as genlock reference does
	1080i/50	0 to 2639	0 to 1124	Must span two frames of input video as genlock reference does
	720p/50	0 to 1979	0 to 749	
1080p/23.98	480i/59.94	0 to 857	0 to 656	Must span input video frame period
	1080i/59.94	0 to 2199	0 ti 1406	Must span input video frame period
	720p/59.94	0 to 1649	0 to 1874	Must span input video frame period

Figure 32. Frame Sync Web Page – Input Reference

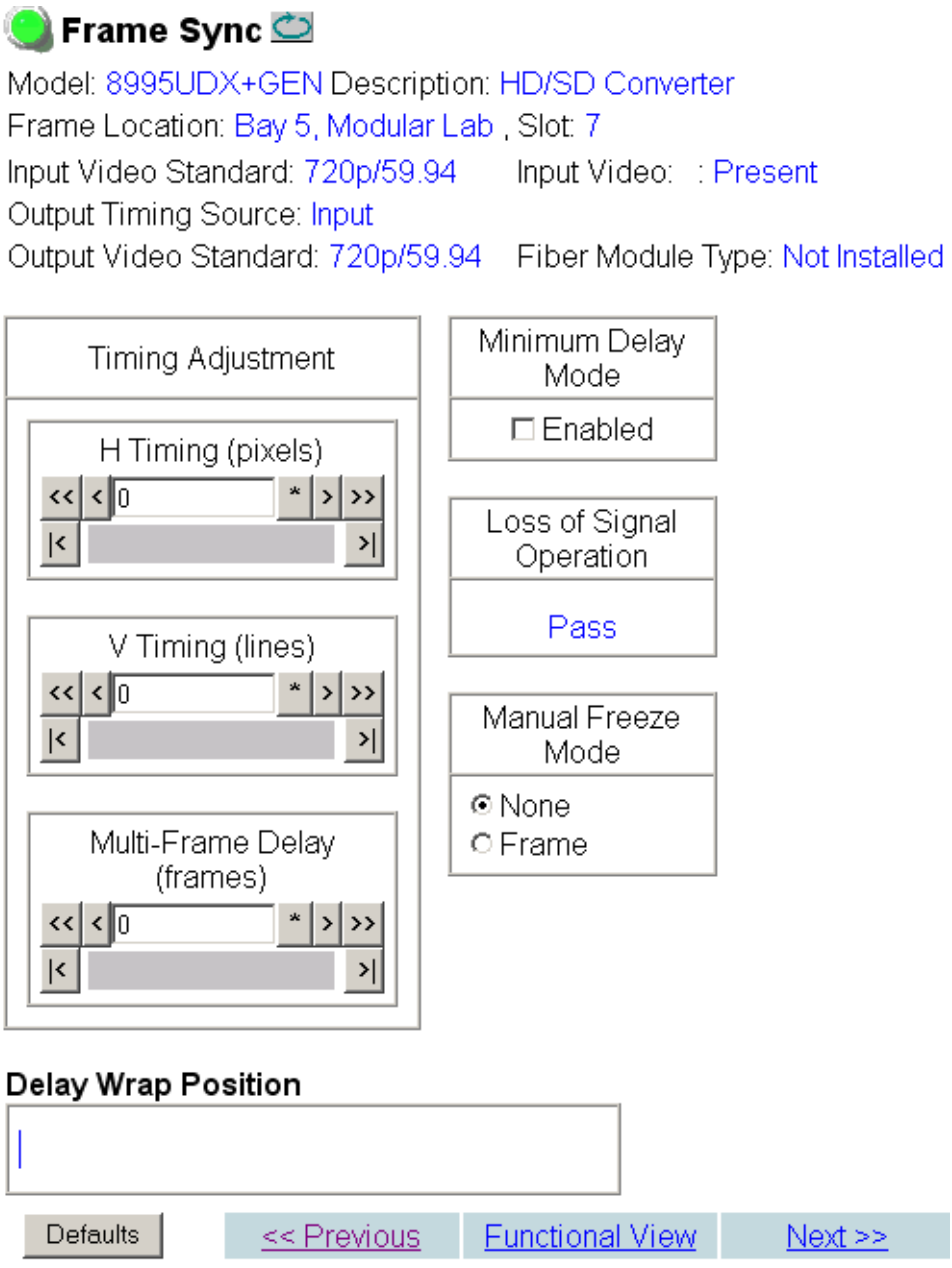
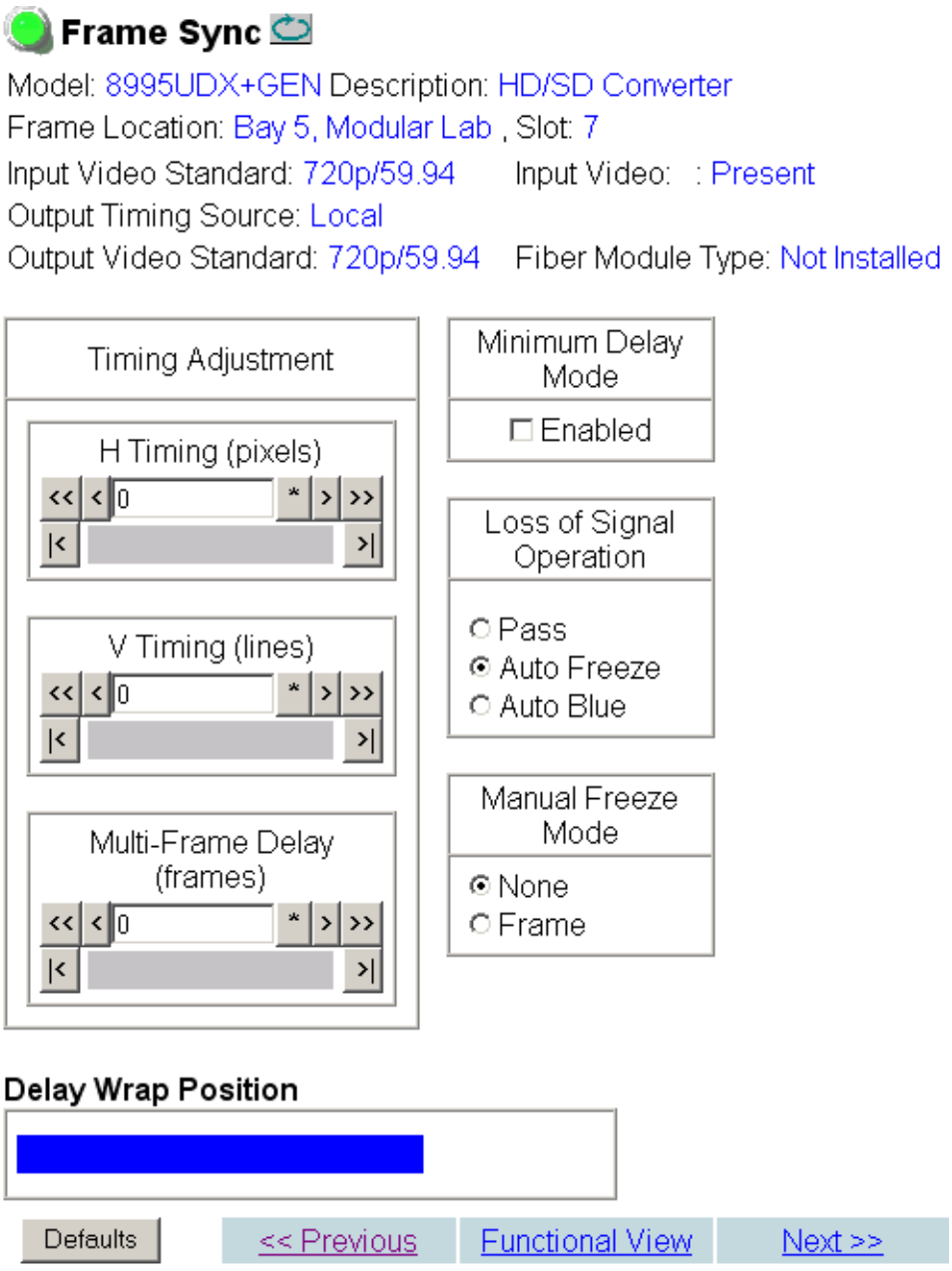
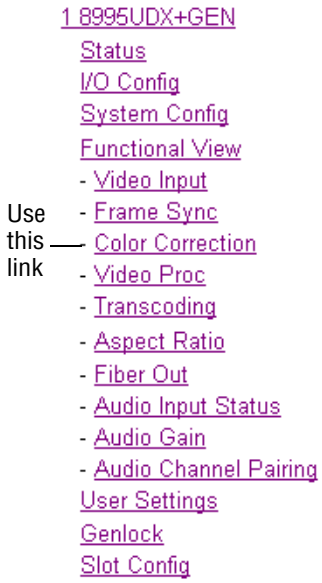


Figure 33. Frame Sync Web Page – Local Reference



Color Correction Web Page

Use the Color Correction web page (Figure 34) to make RGB gain, offset and gamma correction adjustments.

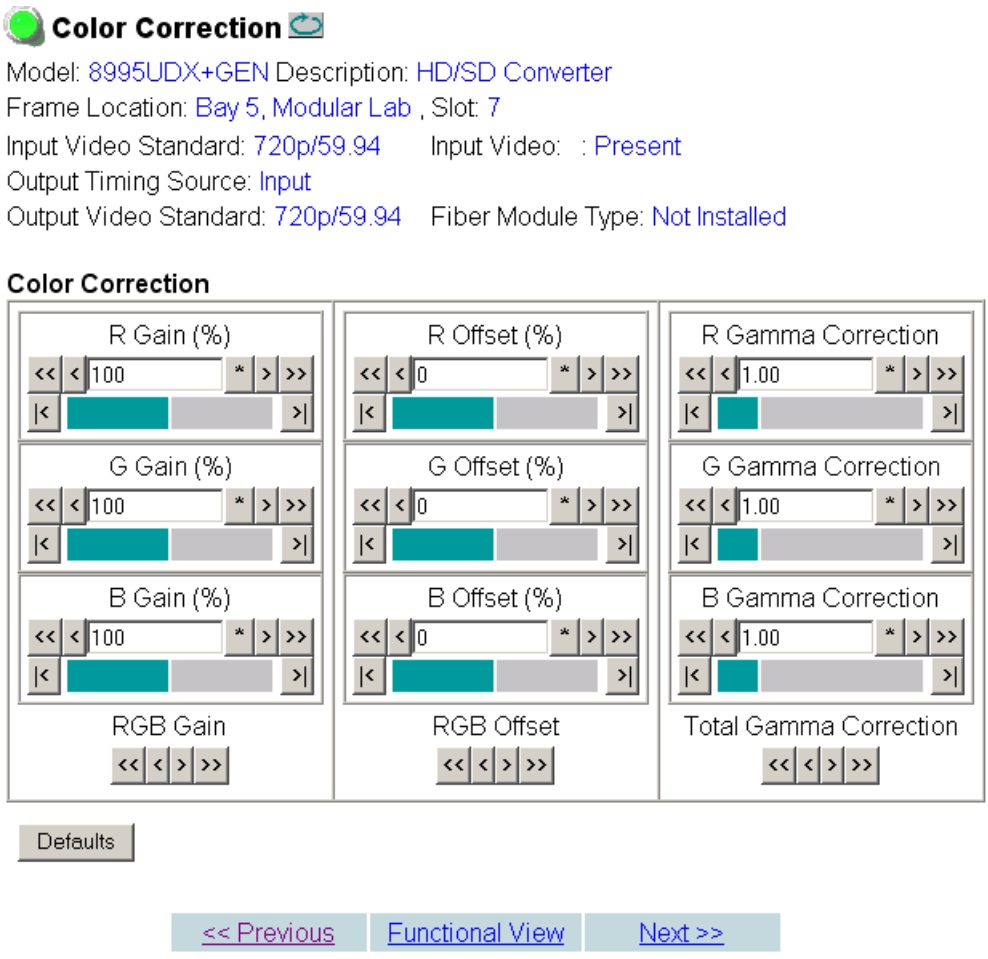


Color Correction

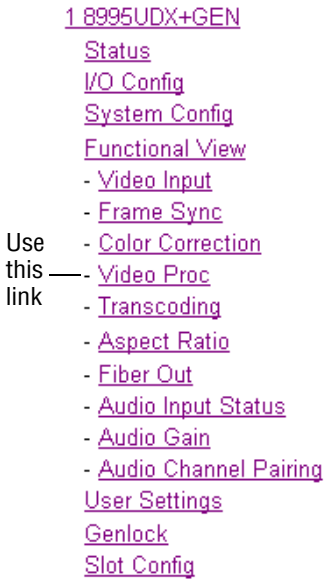
The Color Correction section provides the following RGB controls:

- **Gain Adjustments** – set the gain from 0 to 200% for the R, G, and/or B channel with the corresponding control or adjust all of the gains together by adjusting the **RGB Gain** control.
- **Offset Adjustments** – set the offset from ± 100% for the R, G, or B channel with the corresponding control or adjust all of the offsets together by adjusting the **RGB Offset** control.
- **Gamma Correction** – set gamma correction with the **R Gamma Correction**, **G Gamma Correction**, and/or **B Gamma Correction** or adjust all channels together using the **Total Gamma Correction** control. Raising the gamma above 1.0, brightens the gray intensity. Lowering the gamma below 1.0, darkens the gray intensity.

Figure 34. Color Correction Web Page



Video Proc Web Page



The Video Proc web page (Figure 35 on page 57) provides overall video processing for the HD or SD signal and image enhancement controls.

Video Processing Controls

The following controls are provided for video processing:

- **Y/Cb/Cr Gain** – set the gain for the Y, Cb, or Cr channel from 0 to 200% with the corresponding control or adjust all gains together by using the **Total Gain** control.
- **Y/Cb/Cr Offset** – set the offset ± 100% for the Y, Cb, and Cr channels with the corresponding control.
- **Color Saturation** – adjust the percentage of color saturation relative to 100%.
- **Hue** – adjust the hue ± 180 degrees.

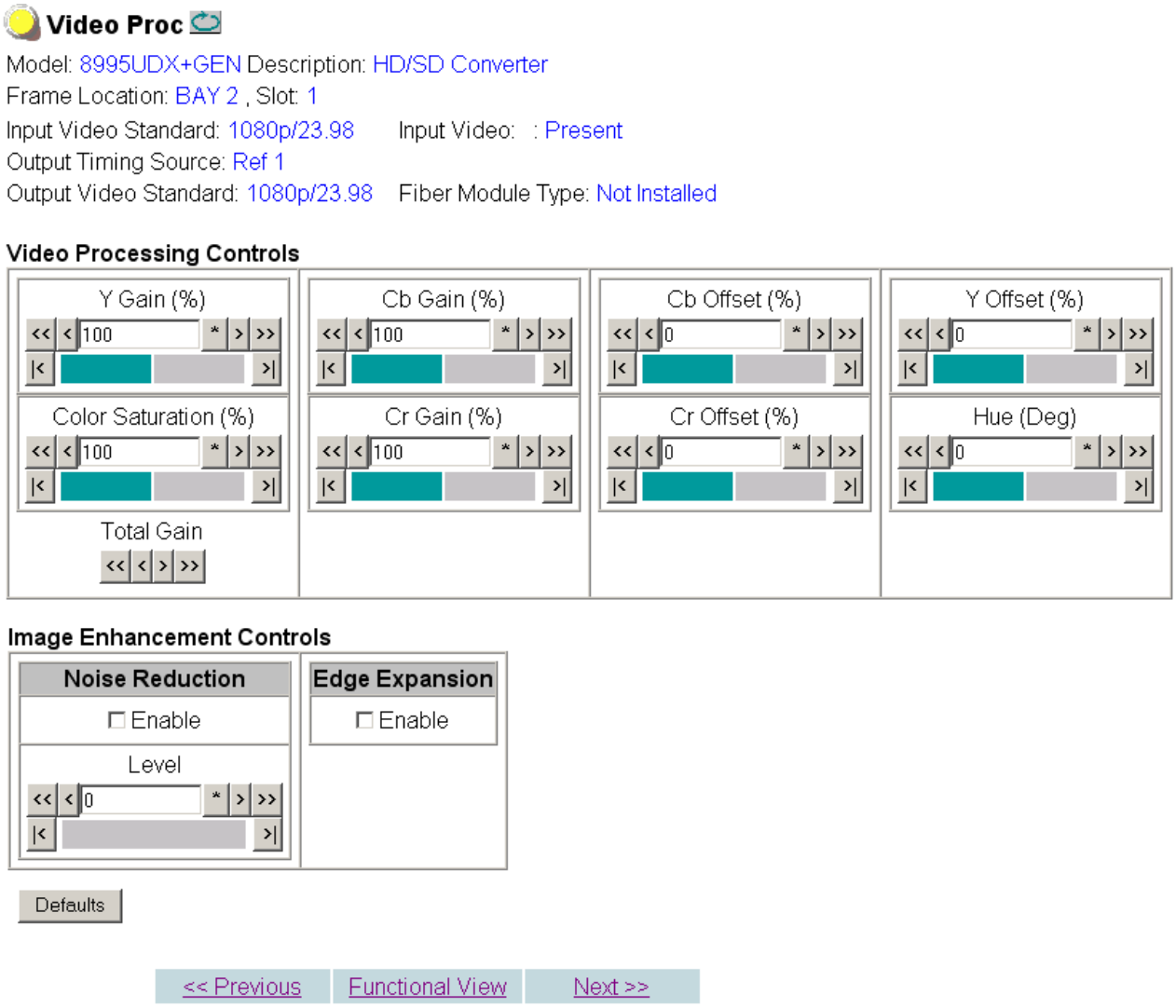
Image Enhancement Controls

The following controls are provided for image enhancement:

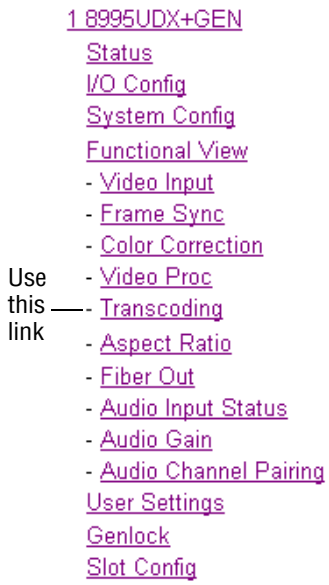
- **Noise Reduction** – select the **Enable** control to enable the Noise Reduction function. This allows reduction of low level noise in the output signal which may occur during the conversion process.
- **Level** – when Noise Reduction is enabled, control the level of noise reduction with the Level control from a very low level (0) to a high level (63).
- **Edge Expansion** – select the **Enable** control to turn on the Edge Expansion function. This can be used to enhance the visual appearance of the edges of the image.

Note Edge expansion is not function with 1080p 23.98 at this time.

Figure 35. Video Proc Web Pager



Transcoding Web Page



Use the Transcoding web page to set non-active picture transcoding parameters.

Audio Transcoding

Check the **Enable** button to turn on audio transcoding. Any embedded audio in the signal will be transcoded to the output with no change.

CC Transcoding

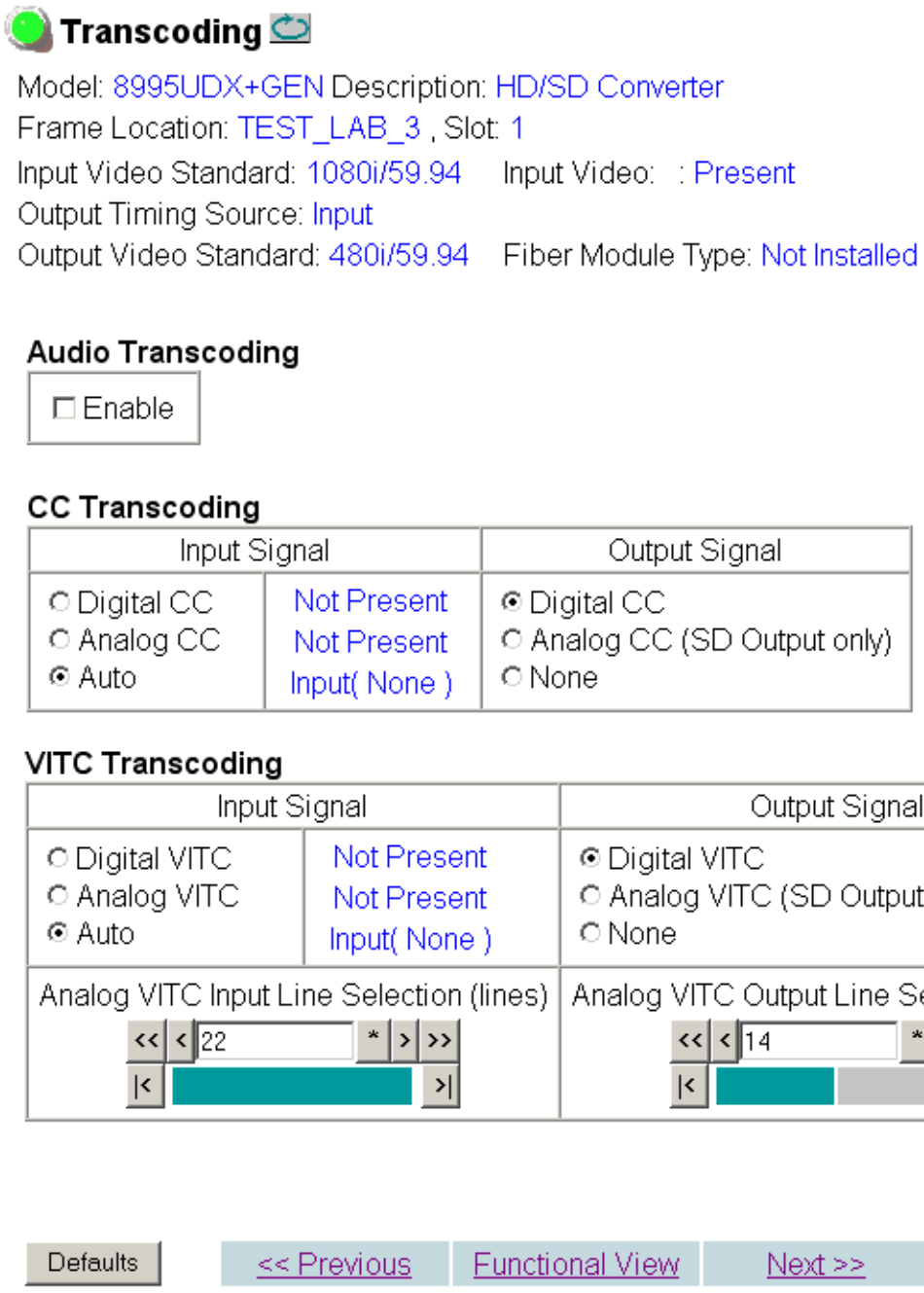
Use the **CC Transcoding** controls to select what type of closed captioning transcoding is required on both the input and output signal. The selection will depend on if whether you are up, down, or cross converting or passing the signal through with no conversion. HD signals should be set to **Digital CC** and SD signals to **Analog CC**. Set to **Auto** to allow the module to detect the input type. You may also eliminate the closed captioning on the output by selecting **None**.

VITC Transcoding

Use the **VITC Transcoding** controls to select what type of vertical interval time code is required on both the input and output signal. The selection will depend on if whether you are up, down, or cross converting or passing the signal through with no conversion. HD signals should be set to **Digital VITC** and SD signals to **Analog VITC**. Set to **Auto** to allow the module to detect the input type. You may also eliminate the time code on the output by selecting **None.**

For an SD signal on either the input or output, use the Analog VITC Input and Output Line selection controls to set the line number for VITC placement. VITC will be indicated as **Not Present** if the input line number does not have a valid VITC signal.

Figure 36. Transcoding Web Page



Aspect Ratio Web Page

Use the Aspect Ratio web page to set the desired aspect ratio for the output video signal. Controls are also provided for alignment, cropping, and matte color. Refer to the discussion and illustration for each of the aspect ratio modes in *Aspect Ratio Selection* on page 28.

Use this link

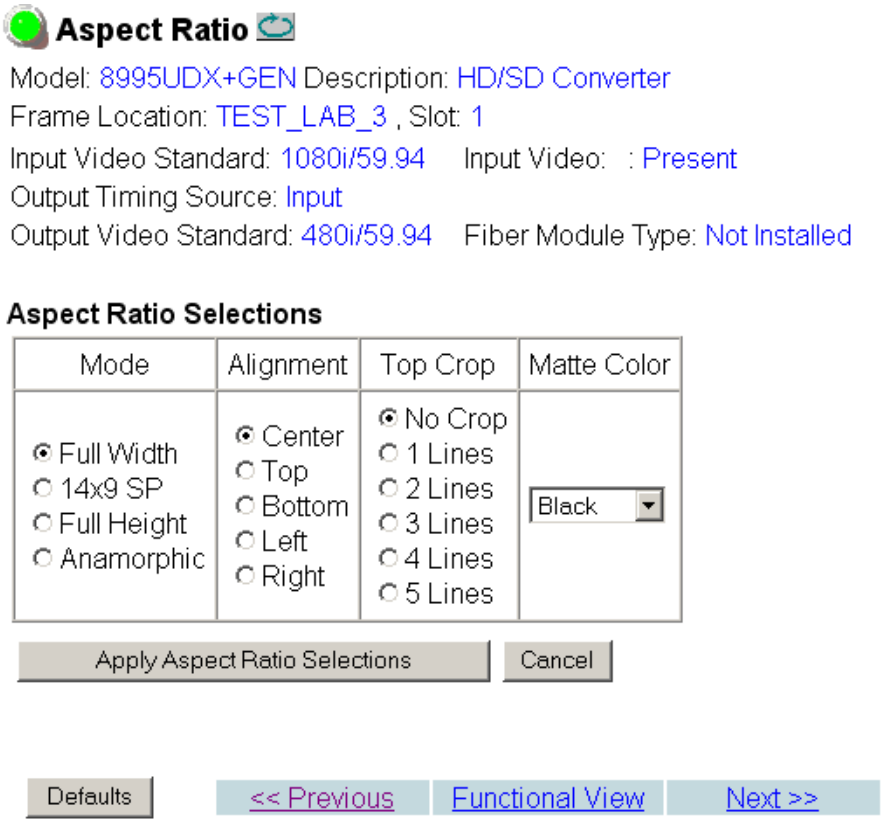
- 1 8995UDX+GEN
  - Status
  - I/O Config
  - System Config
  - Functional View
  - Video Input
  - Frame Sync
  - Color Correction
  - Video Proc
  - Transcoding
  - Aspect Ratio
  - Fiber Out
  - Audio Input Status
  - Audio Gain
  - Audio Channel Pairing
  - User Settings
  - Genlock
  - Slot Config

Aspect Ratio Selections

This section provides the following for the aspect ration of the video output signal:

- **Mode** – set the desired aspect ratio for the output video.
- **Alignment** – align the output video image depending on the mode selected using one of the radio buttons.
- **Top Crop** – crop the top of the image if desired when applicable depending on the mode selected.
- **Matte Color** – select the color of the matte blanking margins when present in the video image. Matte colors are at 75% of color bar colors. Gray Mattes are Gray 1– darkest to Gray 6 – lightest.
- Click the **Apply Aspect Ratio Selections** button to apply the settings or use the **Cancel** button to return to the previous selections.

Figure 37. Aspect Ratio Web Page



Fiber Out Web Page

Use the Fiber Out web page to enable or disable the SFP Fiber Optic sub-module outputs when present.

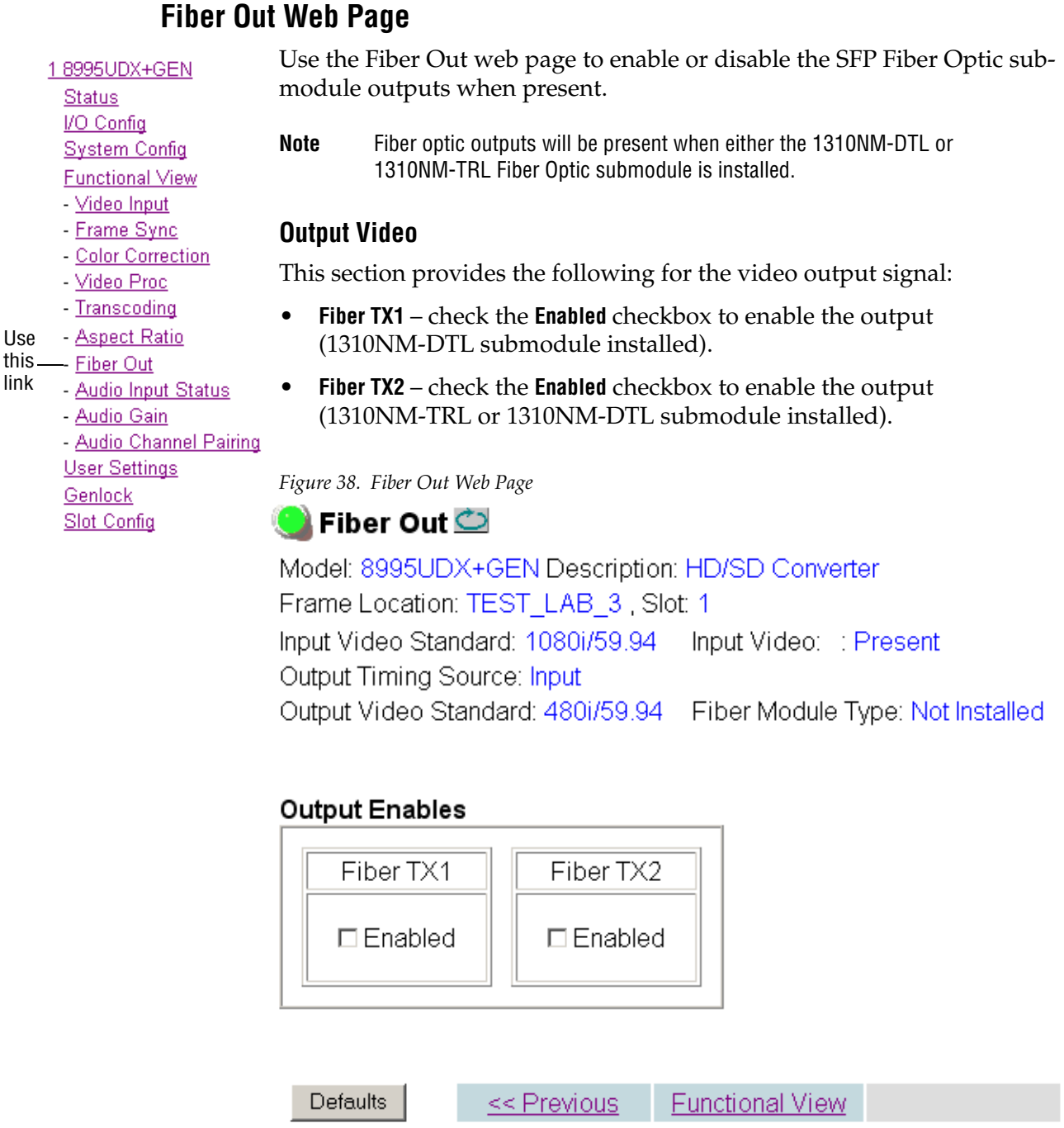
Note Fiber optic outputs will be present when either the 1310NM-DTL or 1310NM-TRL Fiber Optic submodule is installed.

Output Video

This section provides the following for the video output signal:

- **Fiber TX1** – check the **Enabled** checkbox to enable the output (1310NM-DTL submodule installed).
- **Fiber TX2** – check the **Enabled** checkbox to enable the output (1310NM-TRL or 1310NM-DTL submodule installed).

Figure 38. Fiber Out Web Page



Audio Input Status Web Page

1 8995UDX+GEN
Status
I/O Config
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Slot Config

Use this link → Audio Input Status

The Audio Input Status web page (Figure 39) reports the following for embedded audio in the video input signal:

- **Input Stream Name** – identifies the Group and Stream number of the embedded audio in the input video
- **Signal Present** – reports whether the stream within the audio group contains an audio signal.
- **Mode** – reports whether the reported audio is 20 or 24 bits.
- **Audio Mode** – identifies the reported audio as Audio or Non-audio.

Figure 39. Audio Input Status Web Page

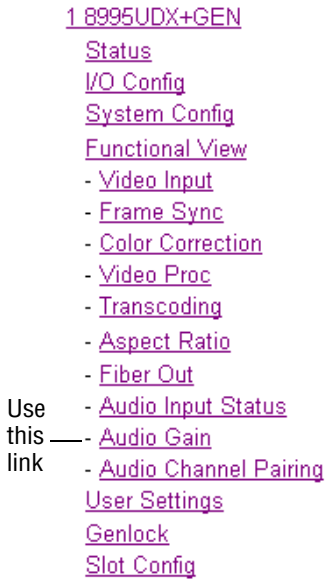
Audio Input Status

Model: 8995UDX+GEN Description: HD/SD Converter
Frame Location: TEST_LAB_3 , Slot: 1
Input Video Standard: 1080i/59.94 Input Video: : Present
Output Timing Source: Input
Output Video Standard: 480i/59.94 Fiber Module Type: Not Installed

Input Stream Name	Signal Present	Mode	Audio Mode
SDI Input.G1.S1	Present	20 Bit	Audio
SDI Input.G1.S2	Present	20 Bit	Audio
SDI Input.G2.S1	Not Present	------	------
SDI Input.G2.S2	Not Present	------	------
SDI Input.G3.S1	Not Present	------	------
SDI Input.G3.S2	Not Present	------	------
SDI Input.G4.S1	Not Present	------	------
SDI Input.G4.S2	Not Present	------	------

Functional View | Next >>

Audio Gain Web Page



The Audio Gain web page allows selection of the eight audio streams in the four audio groups for gain adjustment in Channel A and Channel B.

View Select

Select the audio streams to view and adjust for gain by selecting one of the following buttons:

- Streams (1-2)
- Streams (3-4)
- Streams (5-6)
- Streams (7-8)

Stream (1-2) is illustrated in Figure 40 on page 64. Under each stream, the Channel A and Channel B group and stream numbers will be reported.

Gain

Use the Gain controls for Channel A and Channel B to adjust the individual channel gain from -40 to + 6 dB.

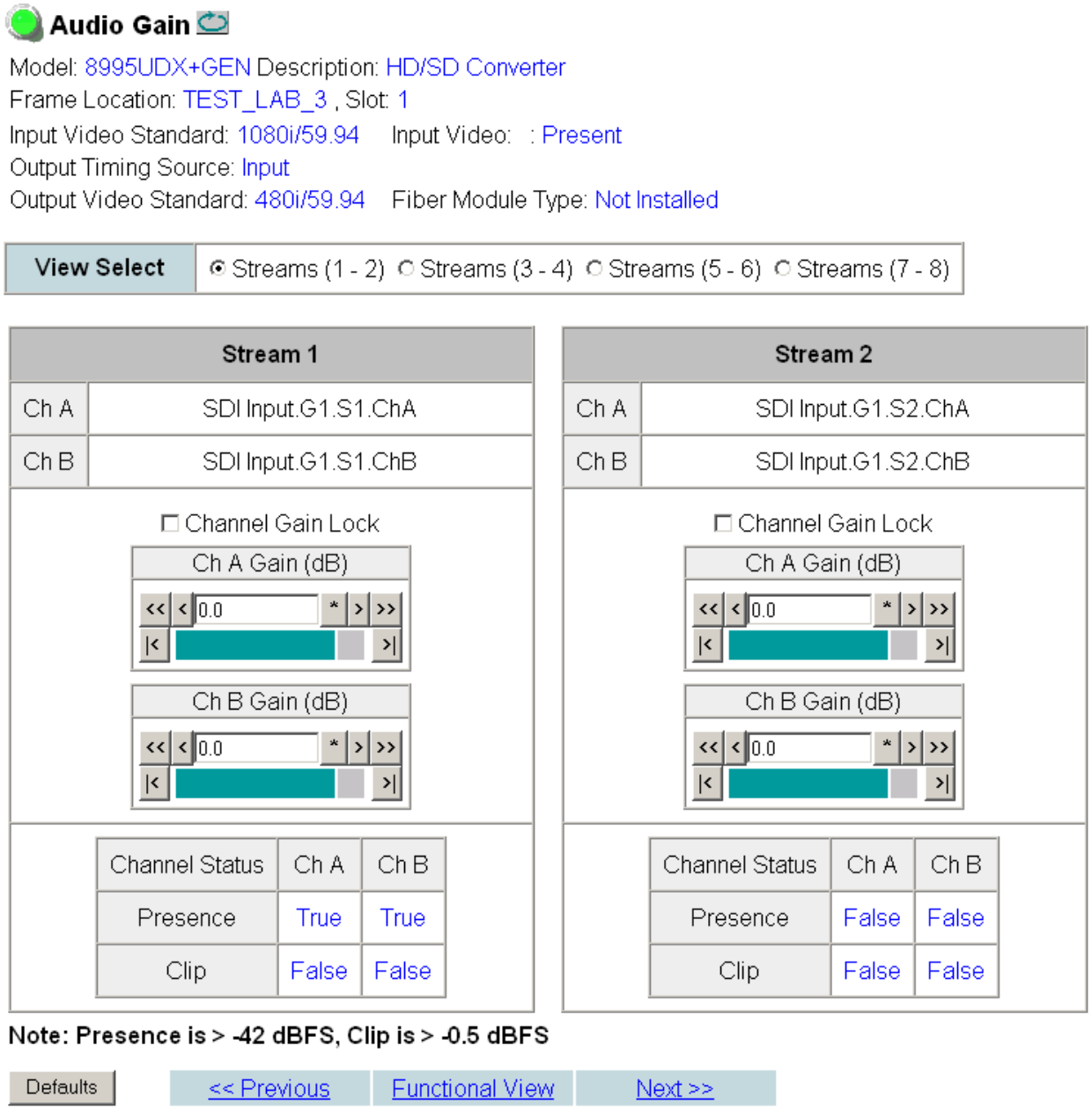
To lock the channel gains together, select the **Channel Gain Lock** checkbox.

Channel Status

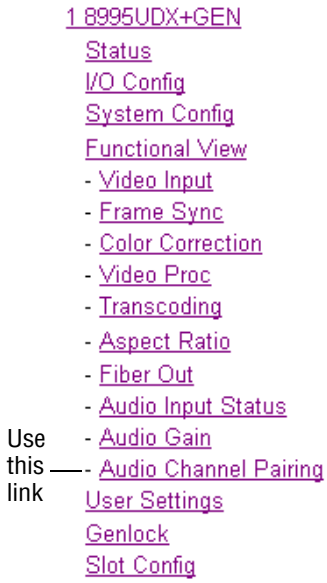
The following status items are reported for Channel A and Channel B for each stream in a table under the Gain controls:

- Under **Presence**, A report of **True** indicates that an audio signal of > -42 dBFS is present. **False** indicates the signal exceeds this level or is not present.
- Under **Clip**, a report of **True** indicates that the signal is clipping above -0.5dBFS. **False** indicates the signal is > -0.5 dBFS.

Figure 40. Audio Gain Web Page



Audio Channel Pairing Web Page



The Audio Channel Pairing web page (Figure 41 on page 66) allows Channel A and Channel B in each audio stream (1-8) of each audio group (1-4) to be passed through with no re-pairing or recombined into new pairs, streams, and groups.

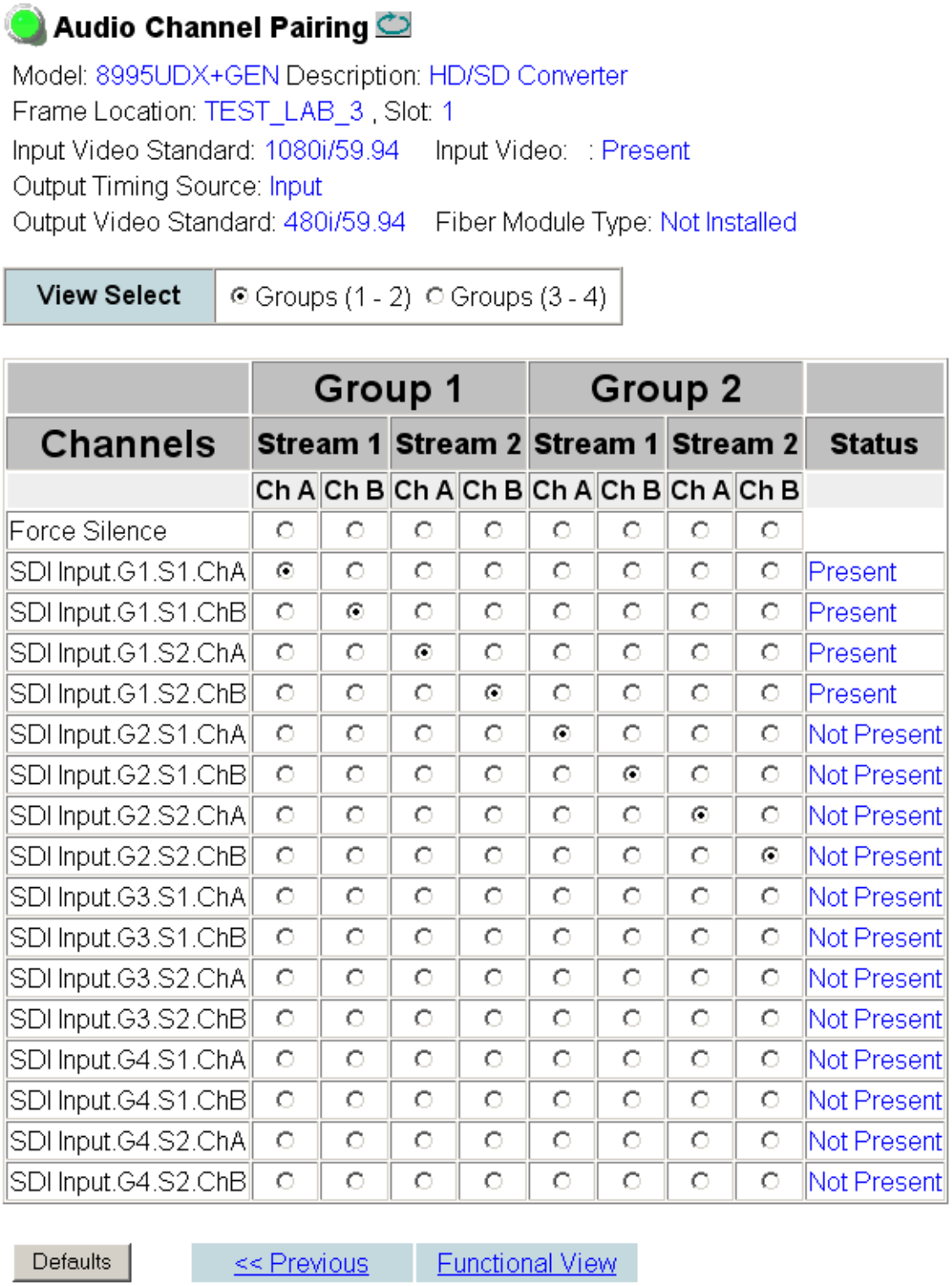
The rows represent the audio input channels and the columns represent the audio output pairs. The columns are grouped together into four different pairs.

Status of each audio stream is given a **Present** or **Not Present**.

Use the **Groups (1-2)** and **Groups (3-4)** View Select radio buttons to select which audio pairs to define.

The resulting choices will be the embedded audio configuration in the video output signal.

Figure 41. Audio Channel Pairing Web Page



Audio Channel Pairing

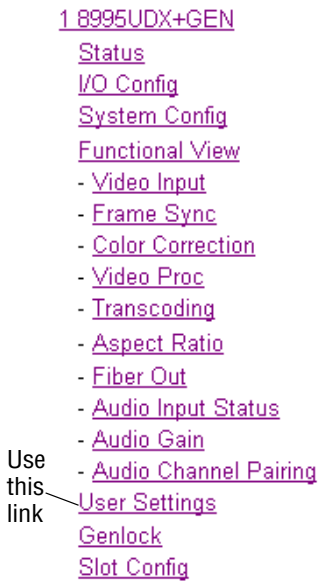
Model: 8995UDX+GEN Description: HD/SD Converter
Frame Location: TEST_LAB_3 , Slot: 1
Input Video Standard: 1080i/59.94 Input Video: : Present
Output Timing Source: Input
Output Video Standard: 480i/59.94 Fiber Module Type: Not Installed

View Select | Groups (1 - 2) | Groups (3 - 4)

	Group 1				Group 2				
Channels	Stream 1		Stream 2		Stream 1		Stream 2		Status
	Ch A	Ch B	Ch A	Ch B	Ch A	Ch B	Ch A	Ch B	
Force Silence	○	○	○	○	○	○	○	○	
SDI Input.G1.S1.ChA	●	○	○	○	○	○	○	○	Present
SDI Input.G1.S1.ChB	○	●	○	○	○	○	○	○	Present
SDI Input.G1.S2.ChA	○	○	●	○	○	○	○	○	Present
SDI Input.G1.S2.ChB	○	○	○	●	○	○	○	○	Present
SDI Input.G2.S1.ChA	○	○	○	○	●	○	○	○	Not Present
SDI Input.G2.S1.ChB	○	○	○	○	○	●	○	○	Not Present
SDI Input.G2.S2.ChA	○	○	○	○	○	○	●	○	Not Present
SDI Input.G2.S2.ChB	○	○	○	○	○	○	○	●	Not Present
SDI Input.G3.S1.ChA	○	○	○	○	○	○	○	○	Not Present
SDI Input.G3.S1.ChB	○	○	○	○	○	○	○	○	Not Present
SDI Input.G3.S2.ChA	○	○	○	○	○	○	○	○	Not Present
SDI Input.G3.S2.ChB	○	○	○	○	○	○	○	○	Not Present
SDI Input.G4.S1.ChA	○	○	○	○	○	○	○	○	Not Present
SDI Input.G4.S1.ChB	○	○	○	○	○	○	○	○	Not Present
SDI Input.G4.S2.ChA	○	○	○	○	○	○	○	○	Not Present
SDI Input.G4.S2.ChB	○	○	○	○	○	○	○	○	Not Present

Defaults << Previous Functional View

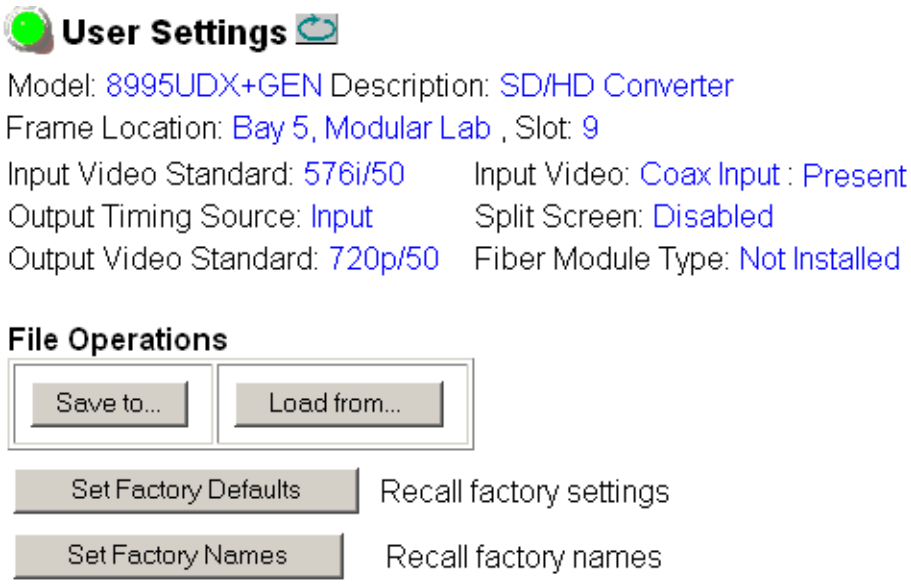
User Settings Web Page



The User Settings web page (Figure 42) provides the following File Operations for saving and recalling user settings and factory defaults:

- Save to... and Load from... functions are provided for saving the current module configuration to a file or loading a previously saved file, and
- Factory recall for default settings and default signal names.

Figure 42. User Settings Web Page



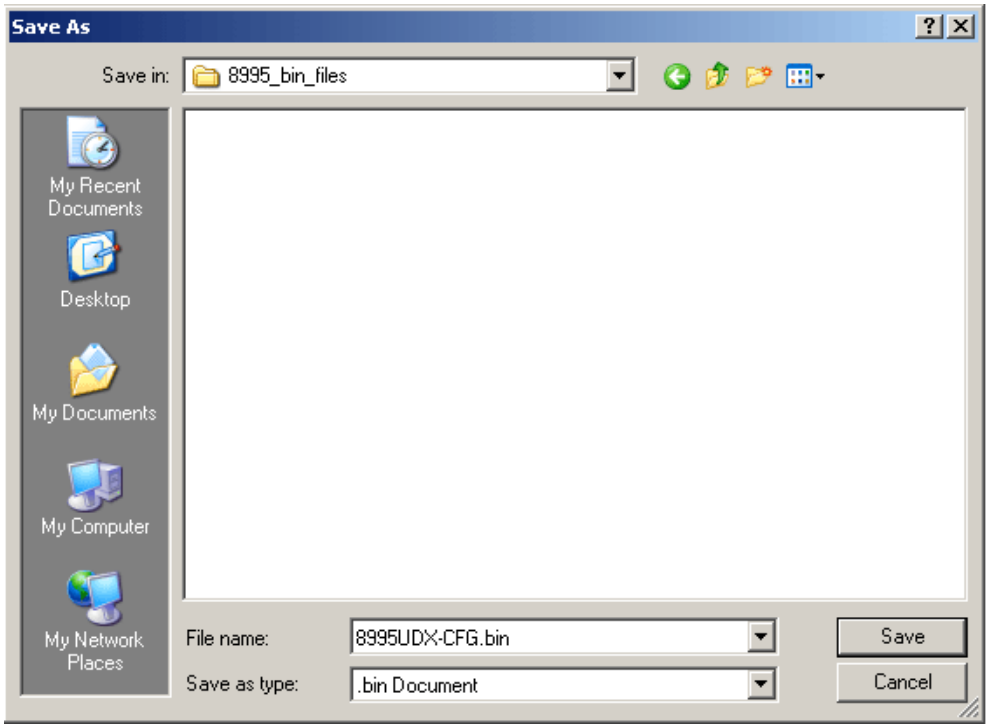
File Operations

Configuration files from the 8995 module may be saved to a file and stored offline for later recall.

To save a file, do the following:

1. Save the current configuration on the module to a file by selecting the **Save to...** button which will bring up the File Download screen (not shown).
2. In the File Download screen select **Save**.
3. This will bring up the Save As screen shown in Figure 43 on page 68.
4. Enter a name in the File name field. This file is saved as a .bin type.

Figure 43. Save Module Configuration.

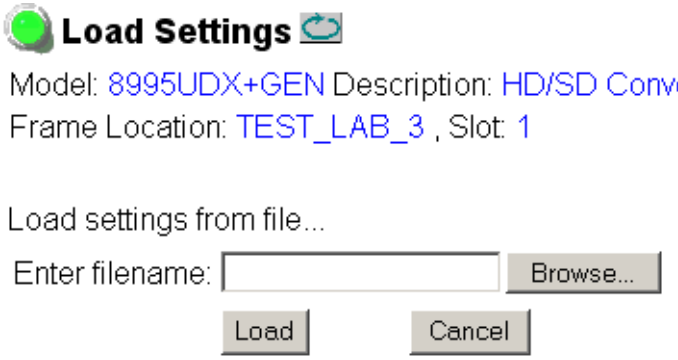


To load and recall a file, do the following:

1. Selecting the **Load From...** button on the User Settings web page (Figure 42 on page 67) which will bring up the Load Settings web page shown in Figure 44.

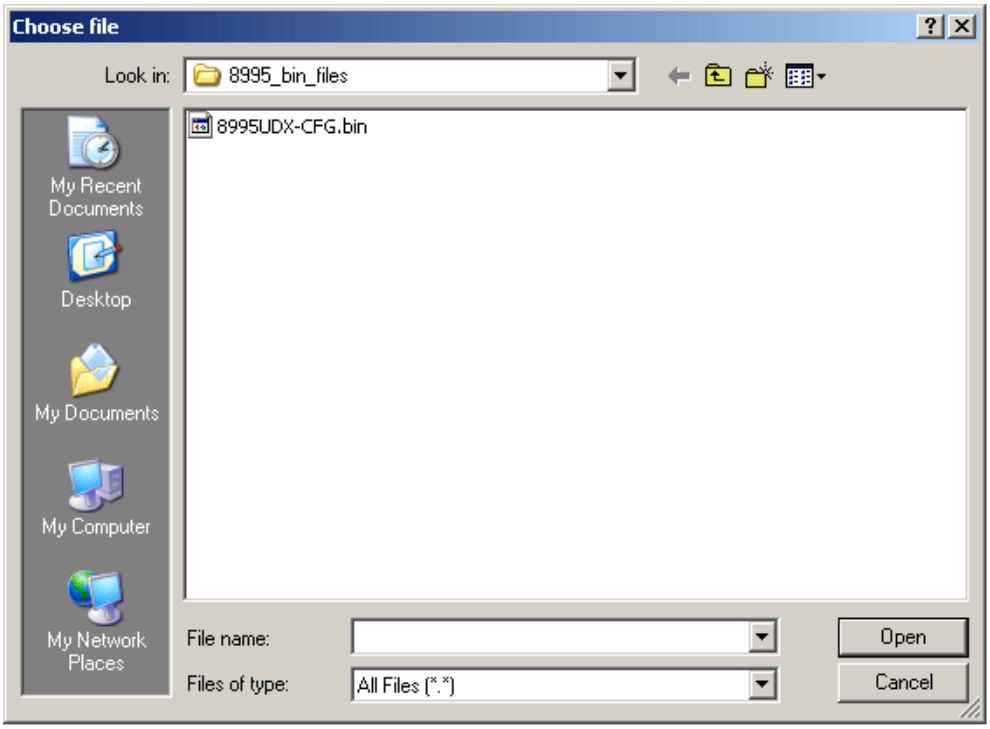
2. Enter a path and file name or select **Browse...** to locate the directory where the files have been saved.

Figure 44. Load Settings Configuration.



3. This will bring up the Choose File screen shown in Figure 45.

Figure 45. Choose File Screen



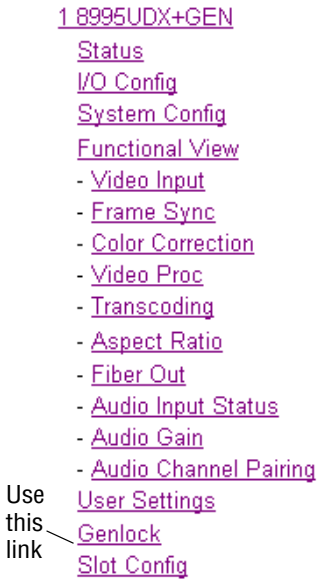
4. Select a file to load and then press **Open** to bring the file into the filename field.

5. Press the **Load** button in the Load From... web page (Figure 44 on page 68) to load the file to the module.

Use the two buttons at the bottom of the web page to do the following:

- **Set Factory Defaults** – select the **Set Factory Defaults** button to recall factory settings to the module. Defaults for all module parameters are listed in Table 10 on page 85.
- **Set Factory Names** – select the **Set Factory Names** button to recall factory signal names to the module. Defaults for all signal names are displayed on the I/O Config web page shown in Figure 23 on page 41.

Genlock Web Page



The Genlock web page (Figure 46 on page 71) is present on 8995 controls when an 8900GEN-SM submodule is installed on the module.

Refer to the *8900GEN-SM Installation Manual* available online for complete details for configuring the 8900GEN-SM submodule.

This web page provides reporting status for the following genlock status items:

- Genlock – reports status of Genlock function as **Enabled** or **Freerun**.
- Status – reports whether the reference input is **Locked** or **Not Locked**.
- Firmware Version – reports the firmware version of the 8900GEN-SM submodule installed on this 8995 module.
- Hardware Revision – reports the hardware version of the 8900GEN-SM submodule installed on this 8995 module.
- Ref Input Standard – reports the reference input standard as detected by the 8900GEN-SM submodule that is connected to the Genlock Loop on the 8900GFR-R rear module.
- Ref Input Frame Rate – reports the frame rate of the reference input as detected by the submodule.
- Output Bus Frame Rate – reports the frame rate being output on the frame bus.
- Output Bus – reports the reference bus (Ref Bus 1 or Ref Bus 2) being output from the submodule.

Genlock Control

The following controls are available for configuring the Genlock submodule:

- **Enable** or **Freerun** – select one of the radio buttons to enable the Genlock submodule or allow the reference to freerun.
- **Input Standard Selection** – use this control to set the input standard needed for the reference input. Refer to
- **Loop Bandwidth** – set this control for either fast locking (**Fast Lock**) to the reference or for the lowest jitter performance (**Low Jitter**) depending on the stability of the reference signal being used.

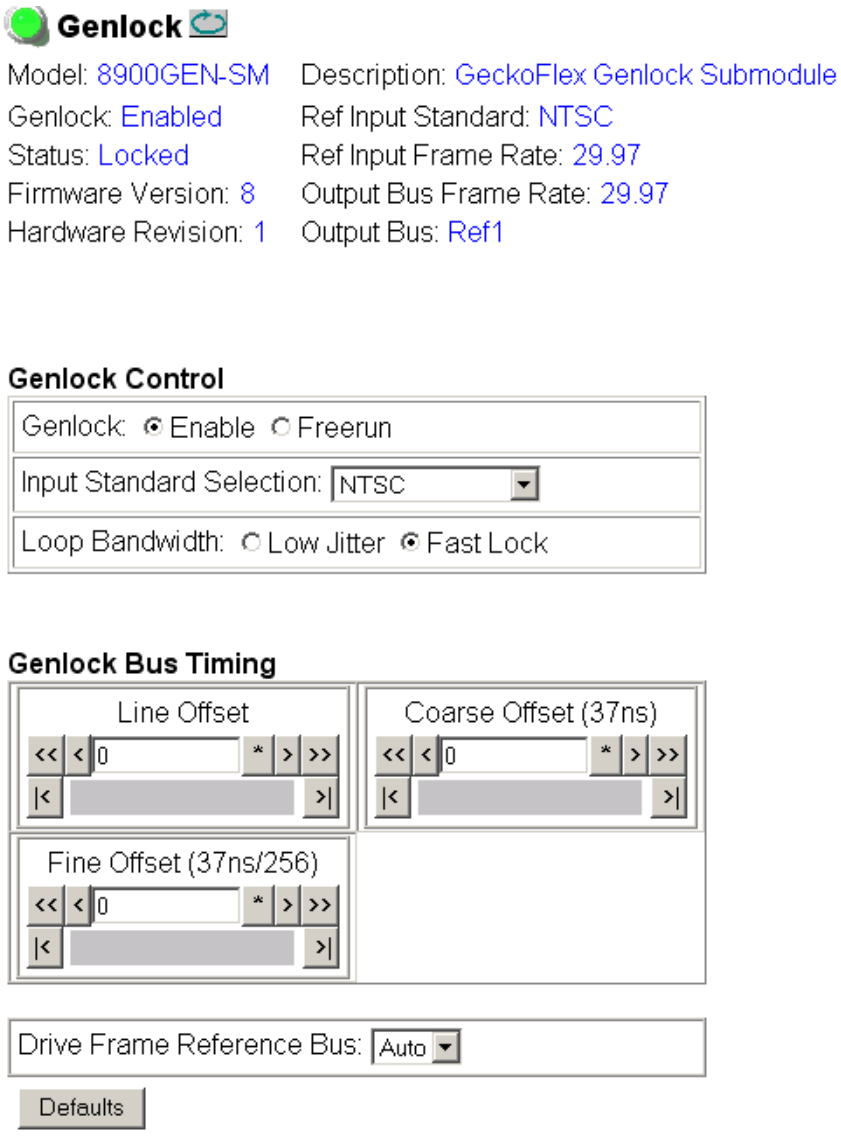
  For example, if Low Jitter is selected and the Status is still **Invalid** after one minute has passed, the input reference has excessive wander that cannot be tracked in Low Jitter mode. Switch to **Fast Lock** and verify Status is **Locked** after about 10 seconds.

Genlock Timing

Use the following controls to adjust the output timing of the genlock reference signal from this submodule:

- **Line Offset** – adjust the reference timing stream by standard definition line steps up to one full frame.
- **Coarse Offset** – provides coarse adjustment of the reference timing stream by 37 ns steps up to one line.
- **Fine Offset** – provides fine adjustment of the reference timing stream by steps up to 37 ns.

Figure 46. Genlock Web Page



The external reference fed to the Genlock submodule must be configured to one of the frame rates in the reference Input Standard Selection pulldown on the Genlock web page. Table 7 lists the available frame rates in the pulldown and the compatible reference inputs that will report a locked condition on the Genlock web page.

Note If the Input Selection Standard selected on the Genlock web page does not match the reference input exactly, a warning will be generated.

Table 7. Reference Frame Rate Compatibility

Input Standard Selection (Genlock web page)	Reference Detected	Mismatch Warning
NTSC	NTSC	None
	1080i 59.94 TLS	Yes[1]
	720p 59.94	Yes[1]
PAL	PAL	None
	1080i 50 TLS	Yes[1]
	720p 50 TLS	Yes[1]
1080i 59.94 TLS	1080i 59.94 TLS	None
	NTSC	Yes[1]
	720p 59.94 TLS	Yes[1]
720p 59.94 TLS	720p 59.94 TLS	None
	NTSC	Yes[1]
	1080i 59.94 TLS	Yes[1]
1080i 50 TLS	1080i 50 TLS	None
	PAL	Yes[1]
	720p 50 TLS	Yes[1]
720p 50 TLS	720p 50 TLS	None
	PAL	Yes[1]
	1080i 50 TLS	Yes[1]
1080p 24 TLS	1080p 24 TLS	Not used in this release
	1080sf 24 TLS	
	PAL	
	1080i 50 TLS	
	720p 50 TLS	
1080 sf 24 TLS	1080p 24 TLS	Not used in this release
	1080sf 24 TLS	
	PAL	
	1080i 50 TLS	
	720p 50 TLS	

Table 7. Reference Frame Rate Compatibility

Input Standard Selection (Genlock web page)	Reference Detected	Mismatch Warning
1080p 23.98 TLS	1080p 24 TLS	None
	1080sf 24 TLS	Yes[1]
	PAL	Yes[1]
	1080i 50 TLS	Yes[1]
	720p 50 TLS	Yes[1]
AES 48K	AES 48K	None
	AES 96K	Yes[1]
	Word Clock 48K	Yes[1]
	Work Clock 96K	Yes[1]
AES 96K	AES 96K	None
	AES 48K	Yes[1]
	Word Clock 48K	Yes[1]
	Work Clock 96K	Yes[1]
Word Clock 48K	Word Clock 48K	None
	AES 48K	Yes[1]
	AES 96K	Yes[1]
	Work Clock 96	Yes[1]
Word Clock 96K	Word Clock 96K	None
	AES 48K	Yes[1]
	AES 96K	Yes[1]
	Work Clock 48K	Yes[1]

[1] This input standard will lock but will generate a Warning on both the Genlock and Status web pages but will not affect the locked condition.

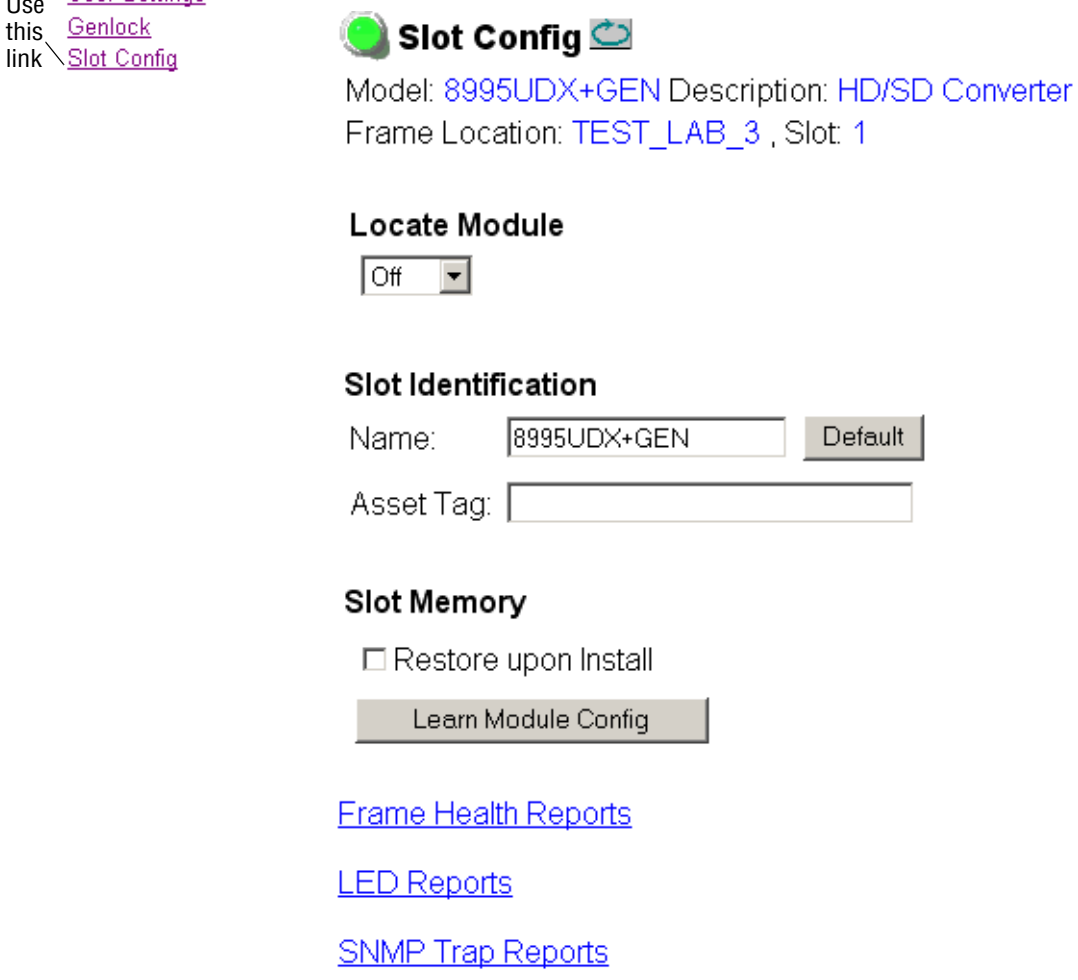
Slot Config Web Page

Use the Slot Config web page shown in Figure 47 to perform the following functions on the module:

- Locate Module
- Slot Identification
- Slot Memory
- Frame Health Reporting
- LED Reports
- SNMP Trap Reporting

Each of these functions is described in detail below.

Figure 47. Slot Config Web Page



Locate Module

Selecting **Flash** from the **Locate Module** pulldown flashes the yellow COMM and CONF LEDs on the front of the module so it can be located in the frame.

Slot Identification

You may identify the module by typing a specific name in the **Name** field. The assigned name is stored on the 8900NET module and travels with the 8900NET module if it is moved to another frame. Select **Default** to enter the factory default module name.

An asset identification may be entered in the **Asset Tag** field. This will appear on the module Status web page and in the NetConfig inventory report.

Slot Memory

The slot configuration for each media module is automatically saved periodically (once an hour) to the 8900NET module in that frame. You may also select the **Learn Module Config** button at any time to save the current configuration for this slot. The configuration is saved on the 8900NET module. If the 8900NET module is removed or powered down, the stored configurations are not saved.

When the **Restore upon Install** box has been checked, the current configuration saved to this slot is saved as slot memory. When the current module is removed and another module of the same type and software version is installed, the configuration saved to the 8900NET module will be downloaded to the new module. The box must be checked before the current module with the saved configuration is removed.

Only the same module type, with the same version software should be installed in this slot. Inserting a similar module with a different version software can cause unexpected results.

If a different type of module is installed in this slot, a warning message will state that the original module type has been replaced with another module type. In this case, a **Clear** button will appear allowing you to clear the stored configuration from the previous module.

Note Uncheck the **Restore Upon Install** button before downloading new software.

Frame Health Reports Link

Select the Frame Health Reports link to open the 8900NET module Frame Alarm Reporting web page. This web page allows configuration of the alarms and warnings that are reported to the external Frame Health Alarm connector on the rear of the GeckoFlex frame.

LED Reports Link

Select the LED Reports link to open the 8900NET LED Reporting web page. Normally, every module in the frame will report to the 8900NET module any Fault, Signal Loss, Reference Loss, or Config Error conditions. These conditions will be reflected by the status LEDs on the 8900NET module. Using this web page, any of these conditions can be disabled from being reported to the 8900NET module for each individual module in the frame

SNMP Trap Reports Link

Select the SNMP Trap Reports link to open the 8900NET SNMP Reporting web page. This link will only be present when SNMP Agent software has been installed on the 8900NET module. This web page allows configuration of which alarms and warnings that are reported to the SNMP management software.

Refer to the *8900NET Instruction Manual* for complete details on using the 8900NET web pages.

Specifications

Table 8. 8995 Specifications

Parameter	Value
Serial Digital Input	
Number and type of input	1 non-isolated terminating BNC
Input impedance	75 ohm
Input return loss	> 15 dB from 5 MHz to 1.5 GHz
Input DC tolerance	+/- 0.25 V maximum
Serial mode hum voltage	1 V p-p to 60 Hz maximum
Auto equalization	325 meters of Belden 1694A or 270 Mb/s 125 meters of Belden 1694A for 1.5 Gb/s
Reclocking	Yes
Input lock range	+/- 100 PPM
Input signal type	480i-(SD 59.94) 720p-(59.94 1080i-(59.94) 576I-(SD 50) 720p-(50) 1080i-(50) 1080p-(23.98)
Input auto sensing	Yes
Reference Signal Input (8900GEN-SM Genlock Submodule Installed)	
Signal Type:	
Analog color black	525i/59.9(NTSC); 625i/50(PAL-B); SMPTE318M (NTSC with 10 field AES ID)
Tri-level sync	720p59.94; 1080i59.94, 720p50, 1080i50, 1080p23.98
4 V composite sync	Not supported
Active video	Not supported due to effects on timing
Reference signal level	300 mV p-p +/- 6 dB
Reference signal to noise ratio (S/N)	> 46 dB S/N
Serial Digital Outputs	
Connector type	Coax BNC, optional fiber optic SFP
Number of outputs	4
Output impedance	75 ohm
Return loss	> 15 dB 5 MHz-270 MHz > 15 dB typical 270 MHz - 1.5 GHz
Output signal level	SDI 800 mV p-p, +/- 10%
Rise/fall time (20-80%)	140 ps for HD 500 ps for SD
Output jitter (FS mode, in low jitter mode)	< 0.2 UI > 100KHz for HD < 1.0 UI 10 Hz-100KHz for HD < 0.2 UI 10 Hz and up for SD

Table 8. 8995 Specifications

Parameter	Value
Electrical Length	
Input to output delay: Default with zero user input delay	
In delay mode or in genlock mode with zero input video delay with respect to genlock frame position (see Table 9 on page 79)	
Full-frame mode	2 frame periods in all formats
Minimum delay mode	1 frame + 300 pixels in all formats
Input to output delay: User input delay in pixel steps ranging from 0 to 7 frames[1]	
In delay mode or in genlock mode with any input video delay with respect to genlock frame position	
Full-frame mode	2 frames minus 5 lines to 9 frames minus 5 lines[2]
Minimum delay mode	1 frame to 8 frames[3]
Optical Video Receiver/Transmitter (1310NM-DRL, 1310NM-DTL, and 1310NM-TRL)	
Optical fiber interface	Compliant with SMPTE 291M-1998 and SMPTE 297M-2000
Input/Output configuration	2 inputs (DRL) or 1 input and 1 output (TRL) or 2 outputs (DTL)
Optical wavelength	1310 nm +/- 40 nm
Minimum/maximum output power (Tx)	-12 dBm < or equal to Pw TX < or equal to -7.5 dBm
Maximum reflected power	4%
Transmission circuit fiber	Single mode
Minimum/maximum input power (Rx)	-12 dBm < or equal to Pw TX < or equal to -7.5 dBm
Detector threshold	+ 1 dBm
Power	
Power dissipation	18.5 W (with Genlock and fiber optic submodules)
Environmental	
Frame type	GeckoFlex
Frame temperature range	See GeckoFlex frame specification
Operating humidity range	
Non-operating temperature	

[1] The User input delay is specified as 0 to 6 full frames. plus one frame in pixels and lines. The Delay Wrap Position on the Frame Sync web page roughly indicates what fraction of that last frame of adjustable delay is being used. Because the input video delay with respect to genlock frame position can vary, the Delay Wrap Position with respect to User Input Delay will vary.

[2] Full Frame Mode always has at least 2 frames minus 5 lines of electrical length.

[3] Video distortion can occur with User Input Delay that gives less than 1 frame of electrical length. Increase the delay to give a total of 1 frame of electrical length for the optimum minimum delay setting.

The frame phase relationship between the SDI video stream and the analog reference signal is established according to SMPTE RP 168-2002. This defines the SDI video frame start occurring *N* pixel periods before the frame start of the analog video reference signal. *N* is defined for each video format in Table 9.

Table 9. Frame Phase Relationship

Format	Standard	*N*
408i59.94	SMPTE 125M-1995	16
576i50	Rec. ITU-R BT.656-4	12
1080i59.94	SMPTE 274M-1998	88
720p59.94	SMPTE 296M-2001	110
1080i50	SMPTE 274M-1998	528
720p50	SMPTE 296M-2001	440
1080sF24	Not used in this release	
1080p24	Not used in this release	
1080p23.98	SMPTE 274-1998	638

Software Updating

Software updating of the 8995 modules is done using either an SD Micro card or the NetConfig Networking Application PC option. The SD Micro card method is recommended for speed of upload but parts required for this method must be purchased by the customer.

The NetConfig application is available free of charge from the Thomson Grass Valley web site. Uploading new software with NetConfig is a considerably longer process.

The procedure for using both methods is given in the 8995 Release Notes when software updates become available. Check the Thomson Grass Valley web site for update information. Refer to *Contacting Grass Valley* *on page 4* for more information.

Note After a software update, the module will need to be reset to Factory Defaults to load the correct new functionality. This will require reconfiguration of the module.

Status Monitoring

This section provides a summary of status monitoring and reporting for a GeckoFlex system. It also summarizes what status items are reported and how to enable/disable reporting of each item. There are a number of ways to monitor status of modules, power supplies, fans and other status items depending on the method of monitoring being used.

8900 Frame status will report the following items:

- Power supply health
- Status of fans in the frame front cover
- Temperature,
- Module health
- Frame bus status

Module health status will report the following items:

- Internal module state (and state of submodule or options enabled) including configuration errors (warning), internal faults, and normal operation (Pass).
- Signal input states including valid/present (pass), not present or invalid (warning), not monitored, and not available (no signal inputs).
- Reference input states including locked/valid (pass), not locked/invalid (warning), and not monitored.

LEDs

LEDs on modules in the frame and on the front of the 8900TF/TFN and Gecko Flex frames indicate status of the frame and the installed power supplies, fans in the front covers, and modules. (The 8900TX-V/A frames have no LED indicators on the front cover.)

When a red FAULT LED is lit on a frame front cover, the fault will also be reported on the 8900NET or Frame Monitor module. The LEDs on the front of these modules can then be read to determine the following fault conditions:

- Power Supply 1 and 2 health
- Fan rotation status
- Frame over-temperature condition
- Frame Bus fault (8900NET only)
- Module health bus

In general, LED colors used on the frame and modules indicate:

- Green = normal operation, (Pass) or signal present, module locked.
- Red – On continuously = fault condition, flashing = configuration error.
- Yellow – On continuously = active condition (configuration mode or communication), flashing in sequence = module locator function.

Status LEDs for this module are described in *Operation Indicator LEDs* on page 22. LEDs for the 8900NET module are described in the *8900NET Network Interface Instruction Manual*.

Frame Alarm

A Frame Alarm connection is available on pins 8 and 9 of the RS-232 connector on the rear of GeckoFlex frame (Frame Monitor or 8900NET Network Interface module required). This will report any of the status items enabled with the 8900NET or Frame Monitor module configuration DIP switch. Connection and use of the Frame Alarm is covered in detail in the *8900NET Network Interface Instruction Manual.*

Web Browser Interface

When the 8900NET module is installed in the frame, a web browser GUI can indicate frame and module status on the following web pages:

- Frame Status web page – reports overall frame and module status in graphical and text formats.
- Module Status web page – shows specific input and reference signal status to the module along with module versions.
- A Status LED icon on each web page to report communication status for the frame slot and acts as a link to the Status page where warnings and faults are displayed (8900NET version 3.0 or later).

In general, graphics and text colors used indicate the following:

- Green = Pass – signal or reference present, no problems detected.
- Red = Fault – fault condition.
- Yellow = Warning – signal is absent, has errors, or is mis-configured.
- Gray = Not monitored (older 8900 module).
- White = Not present.

Status reporting for the frame is enabled or disabled with the configuration DIP switches on the 8900NET module. Most module status reporting items can be enabled or disabled on individual configuration web pages.

SNMP Reporting

The Gecko 8900 Series system uses the Simple Network Monitoring Protocol (SNMP) internet standard for reporting status information to remote monitoring stations. When SNMP Agent software is installed on the 8900NET module, enabled status reports are sent to an SNMP Manager such as the Grass Valley's NetCentral application.

There are both hardware and software report enable switches for each report. Both must be enabled for the report to be sent. Software report switches are set on the 8900NET Configuration page for the Frame, the 8900NET module, and each module slot. Refer to the *8900NET Network Interface Instruction Manual* for installation instructions.

Service

The 8995 modules make extensive use of surface-mount technology and programmed parts to achieve compact size and adherence to demanding technical specifications. Circuit boards should not be serviced in the field unless directed otherwise by Customer Service.

Power-Up Diagnostic Failure

If the module has not passed self-diagnostics, do not attempt to trouble-shoot. Return the unit to Grass Valley (see *Module Repair*).

Troubleshooting

Electronic Circuit Breaker

An electronic circuit breaker on the module works during a fault condition or an overcurrent to cut off power to the module in place of a fuse.

If power has been cut off to module, remove the module and replace it in the frame to reset. If the problem persists contact Grass Valley Customer Service.

Module Repair

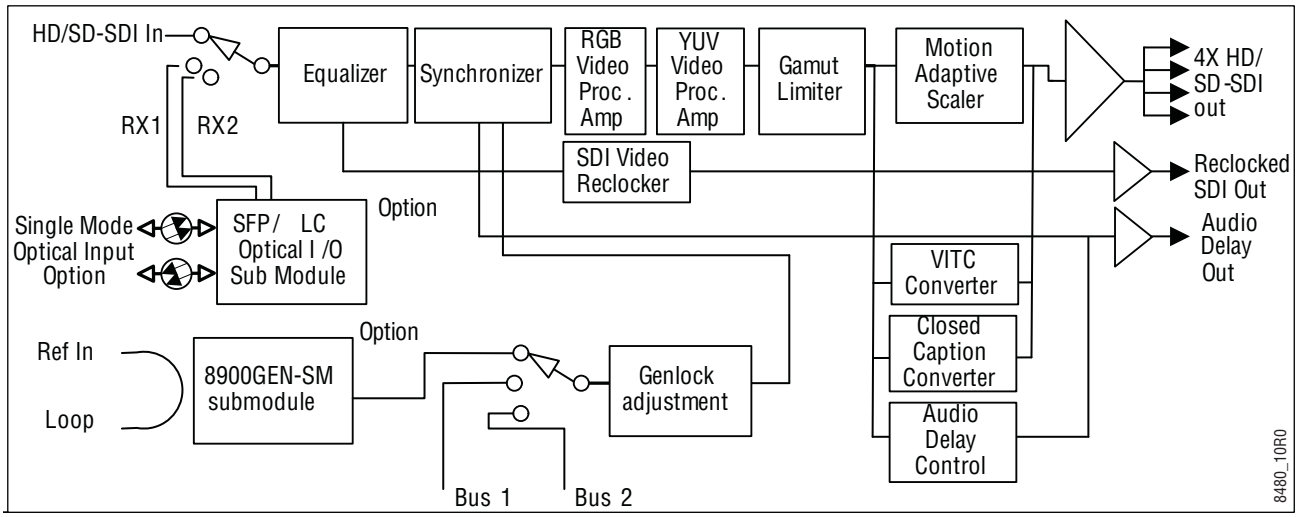
If the module is still not operating correctly, replace it with a known good spare and return the faulty module to a designated Grass Valley repair depot. Call your Grass Valley Customer Service representative for depot locations.

Refer to *Contacting Grass Valley* *on page 4* at the front of this document for the Grass Valley Customer Service contact information.

Functional Description

Figure 48 illustrates a block diagram of the 8995UDX/UPC/DNC modules.

Figure 48. 8995UDX/UPC/DNC Block Diagram



Configuration Summary Table

Table 10 provides a complete summary of the 8995 module functions and a comparison of the functionality available with each control type along with the ranges and default values for each parameter and notes on each control.

Table 10. Summary of 8995UPC/DNC Configuration Functions

Function Type	Default	Range/Choices Resolution	Web Page/ Function Name	Newton Control Panel
Reference Signal Loss Reporting	On	On or Off	I/O Config/ Genlock Ref In Loop Reporting Enabled checkbox	N/A
Coax Input Signal Loss Reporting	On	On or Off	I/O Config/ COAX In Reporting Enabled checkbox	N/A
Fiber Input 1 and 2 Signal Loss Reporting	On	On or Off	I/O Config/ Fiber 1 and Fiber 2 Reporting Enabled checkbox	N/A
Reference input (read-only)	Reports reference input standard selected on Genlock web page			N/A
Input video standard	Auto	Auto, 480i-(59.94), 720p-(59.94), 1080i-(59.94), 576i-(50), 720p-(50), 1080i-(50), or 1080i-(23.98)	System Config/ Video I/O Configuration/ Input Standard pulldown	InVidStd
Output video standard		480i-(59.94), 720p-(59.94), 1080i-(59.94), 576i-(50), 720p-(50), 1080i-(50), or 1080i-(23.98)	System Config/ Video I/O Configuration/ Output Standard pulldown	OutVidStd
Test Output Color Bars signal	Disabled	Enable or Disable	System Config/ Test Output/ Colorbars Enabled checkbox	ClrBars
Select primary output timing source	Local	Local, Ref 1, Ref 2, or Input	System Config/ Output Timing Primary Source Selection radio button	RefPri
Select secondary output timing source	Local	Local, Ref 1, Ref 2, or Input	System Config/ Output Timing Secondary Source Selection radio button	RefSec
Select switch to primary source method	Auto	Auto or Manual	System Config/ Reference Restore Switch to Primary pulldown	RefSwBk

Table 10. Summary of 8995UPC/DNC Configuration Functions

Function Type	Default	Range/Choices Resolution	Web Page/ Function Name	Newton Control Panel
Select amount of delay for switching back to primary	30 seconds	30 to 93.97 seconds	System Config/ Reference Restore Reference Switchback Delay (Seconds)	RefSwDly
Video Input Selection	COAX	COAX, Fiber RX 1, or Fiber RX 2	Video Input/ Video Input Select Video Input Selection radio button	N/A
Horizontal Timing control	0	See Table 6 on page 52	Frame Sync/ Timing Adjustment/ Horizontal Timing (pixels)	HTiming
Vertical Timing control	0	see Table 6 on page 52	Frame Sync/ Timing Adjustment Vertical Timing (lines)	VTiming
Multi-Frame Delay control	0	0 to 6 Frames	Frame Sync/ Timing Adjustment Multi-Frame Delay (Frames)	MultFrmDly
Minimum Delay Mode enable	Disabled	Enable or Disable	Frame Sync/ Minimum Delay Mode Enable checkbox	MinDly
Loss of signal operation (Output timing set to Local, Ref 1, or Ref 2)	AutoBlue	Pass Auto Freeze, or Auto Blue	Frame Sync/ Loss of Signal Operation radio button	LOS Oper
Manual freeze mode	None	None, Frame, or Field	Frame Sync/ Manual Freeze Mode radio button	ManFrzMode
Adjust R gain	100%	0 to 200% (1% steps)	Color Correction/ R Gain (%)	R Gn
Adjust G gain	100%	0 to 200% (1% steps)	Color Correction/ G Gain (%)	G Gn
Adjust B gain	100%	0 to 200% (1% steps)	Color Correction/ B Gain (%)	B Gn
Adjust total gain	100%	0 to 200% (1% steps)	Color Correction/ RGB Gain	RGB Gn
Adjust R offset	0	± 100% (1% steps)	Color Correction/ R Offset (%)	R Off
Adjust G offset	0	± 100% (1% steps)	Color Correction/ G Offset (%)	G Off
Adjust B offset	0	± 100% (1% steps)	Color Correction/ B Offset (%)	B Off
Adjust total offset	0	0 to 200% (1% steps)	Color Correction/ RGB Offset	RGB Off
Adjust R gamma	1.0	0.25 to 4.00 (0.01 unit steps)	Color Correction/ R Gamma Correction	RGmC
Adjust G gamma	1.0	0.25 to 4.00 (0.01 unit steps)	Color Correction/ G Gamma Correction	GGmC
Adjust B gamma	1.0	0.25 to 4.00 (0.01 unit steps)	Color Correction/ B Gamma Correction	BGmC
Adjust total gamma	100	0.25 to 4.00 (0.01 unit steps)	Color Correction/ Total Gamma Correction	RGBGmC

Table 10. Summary of 8995UPC/DNC Configuration Functions

Function Type	Default	Range/Choices Resolution	Web Page/ Function Name	Newton Control Panel
Adjust Y gain (contrast)	100%	0 to 200% (1% steps)	Video Proc/ Video Processing Controls Y Gain (%)	Y Gain
Adjust color saturation (chroma gain)	100%	0 to 200% (1% steps)	Video Proc/ Video Processing Controls Color Saturation (%)	Chro Gn
Adjust total gain	100%	0 to 200% (1% steps)	Video Proc/ Video Processing Controls Total Gain	VPA Gain
Adjust Cb gain	100%	0 to 200% (1% steps)	Video Proc/ Video Processing controls Cb Gain (%)	Cb Gain
Adjust Cr gain	100%	0 to 200% (1% steps)	Video Proc/ Video Processing Controls Cr Gain (%)	Cr Gain
Adjust Cb offset	0	± 100% (1% steps)	Video Proc/ Video Processing Controls Cb Offset (%)	Cb Off
Adjust Cr offset	0	± 100% (1% steps)	Video Proc/ Video Processing Controls Cr Offset (%)	Cr Off
Adjust Y Offset (brightness)	0	± 100% (1% steps)	Video Proc/ Video Processing Controls Y Offset (%)	Y Off
Adjust hue	0	-180 to +179 degrees (1 degree steps)	Video Proc/ Video Processing Controls Hue (Deg)	Hue
Enable noise reduction	Disable	Enable or Disable	Video Proc/ Image Enhancement Controls Noise Reduction Enable checkbox	NREnable
Noise level control	0	0 to 63	Video Proc/ Image Enhancement Controls/ Noise Reduction Level control	NRLevel
Edge expansion	Disable	Enable or Disable	Video Proc/ Image Enhancement Controls/ Edge Expansion Enable checkbox	EdgeExp
Enable audio transcoding	Enabled	Enabled or Disabled	Transcoding/ Audio Transcoding checkbox	AudXcode
CC (closed captioning) transcoding input signal	Auto	Digital CC, Analog CC, or Auto.	Transcoding/ CC Transcoding/ Input Signal radio buttons	CCIn
CC (closed captioning) transcoding output signal	None	Digital CC, Analog CC, or None.	Transcoding/ CC Transcoding/ Output Signal radio buttons	CCOut
VITC (Vertical Interval Time Code) transcoding input signal	Auto	Digital VITC, Analog VITC, or Auto.	Transcoding/ VITC Transcoding/ Input Signal radio buttons	VITCIn

Table 10. Summary of 8995UPC/DNC Configuration Functions

Function Type	Default	Range/Choices Resolution	Web Page/ Function Name	Newton Control Panel
VITC (Vertical Interval Time Code) transcoding output signal	None	Digital VITC, Analog VITC (SD Output Only), or None.	Transcoding/ VITC Transcoding/ Output Signal radio buttons	VITCOut
Analog VITC Input Line selection	Line 14	Line 6 to Line 22	Transcoding/ VITC Transcoding/ Input Signal/ Analog VITC Input Line Selection (Lines)	TCInLnSel
Analog VITC Output Line selection	Line 14	Line 6 to Line 22	Transcoding/ VITC Transcoding/ Output Signal/ Analog VITC Output Line Selection (Lines)	TCOutLnSel
Aspect ratio mode on video output	Full Height	Full Width, 14x9 SP, Full Height, or Anamorphic	Aspect Ratio/ Aspect Ratio Selections Mode radio buttons	ArMode
Aspect ratio alignment of video output image	Center	Center, Top, Bottom, Left, or Right	Aspect Ratio/ Aspect Ratio Selections Alignment radio buttons	PicAlgn
Select amount of cropping of top of output image	No Crop	No Crop, 1 Line, 2 Lines, 3 Lines, 4 Lines, or 5 Lines	Aspect Ratio/ Aspect Ratio Selections Top Crop radio buttons	TopCrop
Aspect ratio alignment of video output image	Black	Black, Gray 1, Gray 2, Gray 3, Gray 4, Gray 5, Gray 6 White, Yellow, Cyan, or Green	Aspect Ratio/ Aspect Ratio Selections Matte Color pulldown	MatteClr
Enable Fiber TX1 output	Not Enabled	Enabled or Not Enabled	Fiber Out/ Fiber TX1 Enabled Checkbox	N/A
Enable Fiber TX2 output	Not Enabled	Enabled or Not Enabled	Fiber Out/ Fiber TX2 Enabled Checkbox	N/A
Choose embedded audio streams to view and adjust	Streams (1-2)	Streams (1-2), Streams (3-4), Streams 5-6), or Streams (7-8)	Audio Gain/ View Select Streams (1-2), Streams (3-4), Streams 5-6), Streams (7-8) radio buttons	N/A
Lock Channels A and B together for gain adjustment (stereo)	Unlocked	Lock or Unlock	Audio Gain/ Channel A and Channel B Gain Lock checkbox	AudChLk1-8
Set audio gain for Channel A and Channel B in Streams 1-8 in Groups1-4	0 dB	-40 to +6 dB	Audio Gain/ Channel A Gain control Channel B Gain control	AudChGn1-16

Table 10. Summary of 8995UPC/DNC Configuration Functions

Function Type	Default	Range/Choices Resolution	Web Page/ Function Name	Newton Control Panel
Select Audio groups for channel pairing	Groups (1-2)	Groups (1-2) Groups (3-4)	Audio Channel Pairing/ View Select Groups (1-2) and Groups (3-4) radio buttons	N/A
Define audio Groups 1-4, Streams 1-2 or each group, Ch A and Ch B in each audio stream	(See column at right) Group 1.St1.ChA Group 1.St1.ChB Group 1.St2.ChA Group 1.St2.ChB Group 2.St1.ChA Group 2.St1.ChB Group 2.St2.ChA Group 2.St2.ChB Group 3.St1.ChA Group 3.St1.ChB Group 3.St2.ChA Group 3.St2.ChB Group 4.St1.ChA Group 4.St1.ChB Group 4.St2.ChA Group 4.St2.ChB	Force Silence SDI Input G1.S1.ChA SDI Input G1.S1.ChB SDI Input G1.S2.ChA SDI Input G1.S2.ChB SDI Input G2.S1.ChA SDI Input G2.S1.ChB SDI Input G2.S2.ChA SDI Input G2.S2.ChB SDI Input G3.S1.ChA SDI Input G3.S1.ChB SDI Input G3.S2.ChA SDI Input G3.S2.ChB SDI Input G4.S1.ChA SDI Input G4.S1.ChB SDI Input G4.S2.ChA SDI Input G4.S2.ChB	Audio Channel Pairing/ Group 1-4 Streams 1-2 for each group Channel A and Channel B for each stream radio buttons	AudOut1-16
Genlock Enable	Enable	Enable or Freerun	Genlock/ Genlock Control Enable or Freerun radio button	GLEnable
Genlock Input Standard Selection	NTSC	NTSC, PAL, 1080i 59.95, 720p 59.94, 1080i 50, 720p 50, 1080p 24, 1080sF 24, 1080p 23.98, AES 48K, AES 96K, Word Clock 48K, or Work Clock 96K	Genlock/ Genlock Control Input Standard Selection pulldown	GLInSel
Select loop bandwidth	Fast Lock	Low Jitter or Fast Lock	Genlock/ Genlock Control Loop Bandwidth radio button	GLLoopBW
Set Line offset for Genlock timing	0	525 rates: 0 to 524 625 rates: 0 to 624	Genlock/ Genlock bus Timing Line Offset control	GLLnOff
Set Coarse Offset for Genlock timing	0	525 rates: 0 to 1715 625 rates: 0 to 1727	Genlock/ Genlock bus Timing Coarse Offset (37ns) control	GLcors

Table 10. Summary of 8995UPC/DNC Configuration Functions

Function Type	Default	Range/Choices Resolution	Web Page/ Function Name	Newton Control Panel
Set genlock fine offset timing	0	0 to 255	Genlock/ Genlock bus Timing Fine Offset (37ns/256) control	GLfine
Set audio frame offset timing	0	0 to 4	Genlock/ Genlock Bus Timing Audio Frame Offset control	GLAESFrm
Select drive frame reference bus	Auto	Off or Auto	Genlock/ Drive Frame Reference Bus pulldown	GLBusDr
Recall factory default parameters	N/A	See Defaults column	User Settings/ Recall Factory Defaults Set Factory Defaults button	N/A
Recall factory names	N/A	See I/O Config web page	User Settings/ Recall Factory Defaults Set Factory Names button	N/A

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