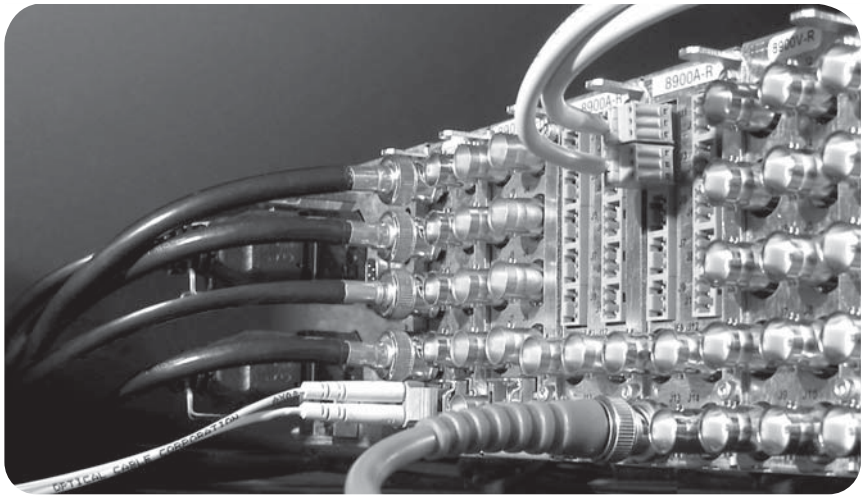
grass valley

8925EMB-B and -U

SD/HD DIGITAL AUDIO EMBEDDER MODULES



Instruction Manual

Software Version 2.1.6

www.grassvalley.com

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MAY 2012

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END-OF-LIFE PRODUCT RECYCLING NOTICE

Grass Valley's innovation and excellence in product design also extends to the programs we've established to manage the recycling of our products. Grass Valley has developed a comprehensive end-of-life product take back program for recycle or disposal of end-of-life products. Our program meets the requirements of the European Union's WEEE Directive, the United States Environmental Protection Agency, and U.S. state and local agencies.

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For further information on the Grass Valley product take back system please contact Grass Valley at + 800 80 80 20 20 or +33 1 48 25 20 20 from most other countries. In the U.S. and Canada please call 800-547-8949, and ask to be connected to the EH&S Department. Additional information concerning the program can be found at: www.grassvalley.com/about/environmental-policy

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Contents

Preface

About This Manual

This manual describes the features of a specific 8900 module in the GeckoFlex Signal Processing System family. As part of this module family, it is subject to Safety and Regulatory Compliance described in the *GeckoFlex Frames 8900FX/FF/FFN Signal Processing System Instruction Manual.*

All Modular product documentation can be found on-line in PDF format at this link:

www.grassvalley.com/docs/modular

8925EMB-B and -U SD/HD Digital Audio Embedder

Introduction

The 8925EMB module is available in two versions: the 8925EMB-B with balanced audio inputs using the 8900BVF-R rear module and the 8925EMB-U with unbalanced audio inputs using the 8900UVF-R rear module. The 8925EMB-B and 8925EMB-U modules perform audio embedding (multiplexing) of up to four groups of audio (each with two streams) from four external AES inputs into an SD/HD SDI video signal.

The two models 8925EMB-B and 8925EMB-U must be installed in a GeckoFlex frame with an 8900NET module (8900FFN). Configuration of the 8925EMB-B and 8925EMB-U modules requires the presence of an 8900NET module installed in the GeckoFlex frame as there are no local on-board configuration controls.

Module Features

The 8925EMB-B and 8925EMB-U module features include:

- One multi-format SD/HD video input and three SD/HD video outputs (BNC or optional fiber optic interface),
- One reclocked loop through video output,
- Up to four balanced external audio inputs (with 8900BVF-R rear) or four unbalanced external audio inputs (with 8900UVF-R rear),
- A fiber optic SFP device option can be installed to provide optical video input/output interfaces for both models depending on the SFP device type Refer to Table 1 on page 14 for the options available.
- Remote control and monitoring support including web pages, Newton control panel, NetConfig management system and NetCentral alarms reporting.

Installation

The front and the rear modules are delivered together as a set. Two choices are available: one for balanced audio inputs with the 8900BVF-R rear module and one for unbalanced audio inputs with the 8900UVF-R rear module.

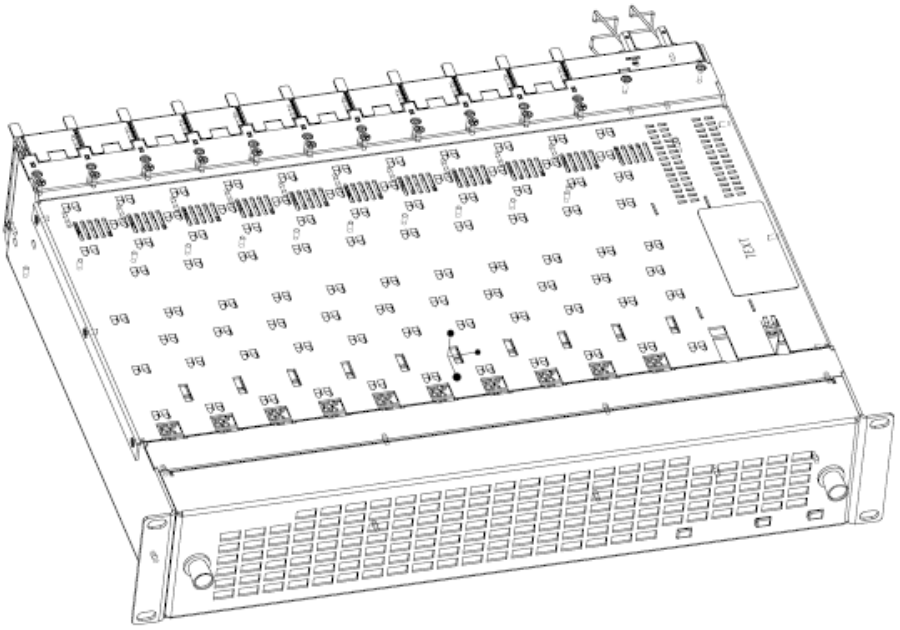
The 8925EMB front module can be plugged in and removed from a GeckoFlex frame with power on without disrupting operation on adjacent running modules. When power is applied to the module, LED indicators reflect the initialization process (see *Power Up* on page 18).

Module Placement in the GeckoFlex Frame

There are ten rear and front slot locations in the 2 RU frame to accommodate audio/video modules (Figure 1). The 8925EMB module set may be plugged into any one of the available GeckoFlex frame slots. The 8925EMB requires a single rear slot.

Note Use anti-static precautions when handling the module. As the module can be changed when the GeckoFlex is powered on, before removing the cover, please put an anti-static bracelet tied to a metal part of the frame.

Figure 1. GeckoFlex Frame



Module Installation Precautions

Please read and follow the precautions listed below before installing the front and rear modules, and any optional fiber optic SFP devices:

- Use standard anti-static procedures during installation. As modules can be installed or removed when the GeckoFlex frame is powered up, before removing the cover, please use an anti-static bracelet or heel strap tied to a metal part of the frame.
- Install the rear module first, then the front module, then the optional optical SFP device (if used).
- When installing or removing a rear module, loosen or tighten the screws holding the retainer clips to the frame manually with the retainer clip tool provided inside the front cover of the frame or use a 2 mm (5/64″) hex screwdriver. Please do not use an electric screwdriver.

Note On newer 751- version GeckoFlex frames, a Rear Retainer Clip removal tool and 2 extra retainer clips and screws for installing them are provided on the inside of the frame cover.

- Make every effort to leave the screws holding the retainer clips in place (do not remove them completely). They are very small and can easily drop into other equipment causing a shorting hazard. (Two turns of the screw should be enough to loosen the screws, 3 turns or more will remove it.)
- When installing a rear module, tighten the screws on the retainer clips just until snug. Do not apply more force than is necessary to seat the rear module. Do not use an electric screwdriver. Refer to the rear retainer screw torque specification in the **Mechanical** section of Table 5 on page 54.
- If using a fiber optic SFP device, handle it carefully, use anti-static precautions, and read the *Fiber Optic Cleaning Requirement* on page 14 before cabling.

Rear Module Installation

To install the rear module, refer to Figure 2 and the instructions below:

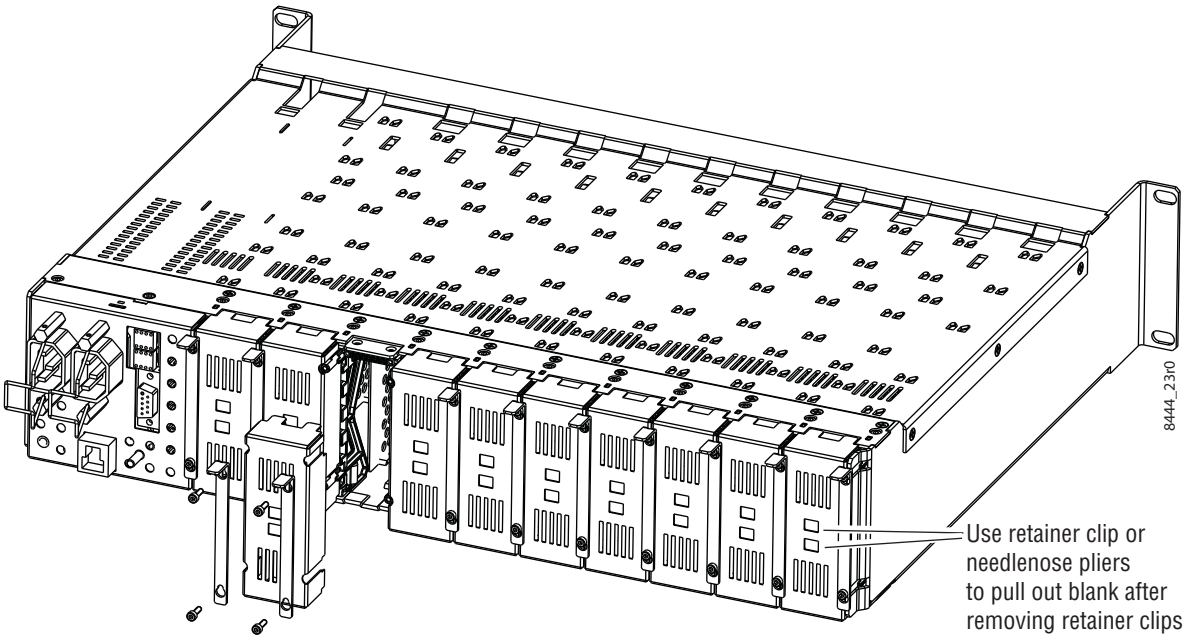
1. To remove a blank rear adapter cover (or a rear module already present), manually loosen the two screws holding each retainer clip on the rear adapter cover or rear module to the frame with the retainer clip tool provided inside the front cover of the frame (newer model frames only) or a 2 mm (5/64") hex screwdriver. Do not remove the screws.

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.

2. After loosening the retainer clip screws, pull up on each retainer and completely remove it, leaving the screws in place.
3. Remove the blank rear adapter cover by inserting needlenose pliers into the slots in the blank cover and pulling it off.
4. Insert the rear module into the empty slot, guiding it carefully.
5. Replace each retainer clip over the two screws on both sides of the module and push down to seat the retainer clip.
6. Tighten the two screws on each retainer clip just until they come into contract with the retainer clip then tighten about a 1/4 turn more (maximum torque is 4-5 inch-lb/0.45-0.6Nm). Do not force or torque the screws too tightly. The clips should not bend or be bowed.

Note All unused rear slots in a GeckoFlex frame should have a blank rear adapter cover installed.

Figure 2. Installing Rear Module (751- Version Frame)



Front Module Installation

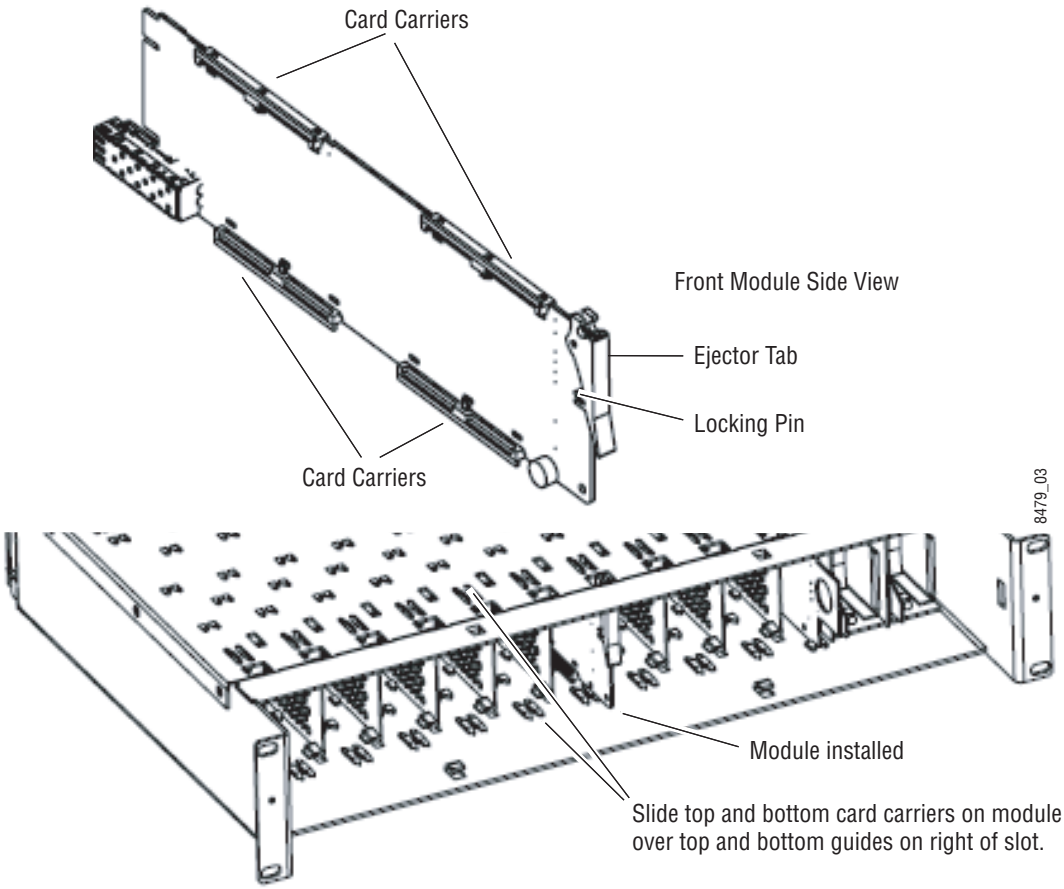
Note Before installing the front module, the rear module must be installed. Also refer to the *Optional Fiber Optic SFP Device Installation* on page 14 if the fiber optic SFP device is present.

After installing the rear module, install the front module as follows:

1. Unlatch and remove the front cover.
2. Insert the front module in the guides of the corresponding slot as shown in Figure 3.
3. When installed properly, the module ejector tab should be locked in its locking pin.

Note Before extracting the front module, extract the fiber optic SFP device and its cable first from the fiber optic cage on the rear of the frame.

Figure 3. Front Module Installation



Optional Fiber Optic SFP Device Installation

After the front and rear modules have been installed, install the fiber optic SFP device if being used into the rear module metal cage labeled FIBER (Figure 4 on page 15). The SFP device is hot-pluggable and may be installed or removed with power applied to the module.

CAUTION Use anti-static precautions and handle the SFP device carefully when installing and the removing it. Before inserting the fiber cable, it is important to clean all fiber connections as described in *Fiber Optic Cleaning Requirement* below.

Refer to Table 1 for the correct model of SFP device to use with different software versions.

Table 1. Fiber Optic SFP Device Summary

SFP Device	Type	SW 2.1.3 and later	SW 2.1.3 and earlier
SFP-13103G-M1DRX	Dual Receiver	X	–
SFP-13103G-M1DTX	Dual Transmitter	X	–
SFP-13103G-M1TRX	Transceiver	X	–
1310nm-DRL	Dual Receiver	X	X
1310nm-DTL	Dual Transmitter	X	X
1310nm-TRL	Transceiver	X	X

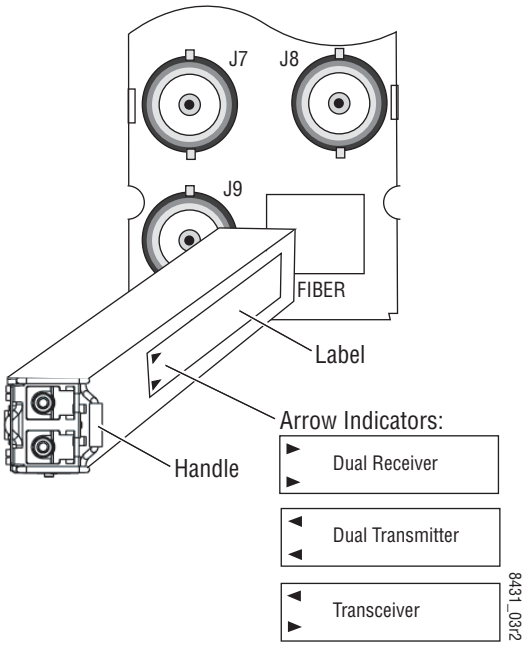
Fiber Optic Cleaning Requirement

Before making any fiber optic cable mating connections, including installation, 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.

To install the fiber optic SFP device:

1. Slide the fiber optic SFP device into the cage connector connected to the front module at the rear of the frame (label on right. See Figure 4.
2. When installed properly, the front end of the SFP device will line up with the rear module BNCs. Do not try to force it in further.
3. Cable the fiber optic connectors according to the instructions given in *Cabling* on page 16 depending on the type of SFP device used.

Figure 4. Fiber Optic SFP Device



To extract the fiber optic SFP device follow the steps below:

1. Remove the fiber cable first.
2. Unlock the module by flipping the handle to the left.
3. Remove the fiber optic SFP device by using its handle.

Cabling

Cabling to the 8925EMB-B or 8925EMB-U module is done on the 8900BVF-R rear module (balanced audio inputs) or the 8900UVF-R rear module (unbalanced audio inputs).

The I/O Config web page shows the inputs and the outputs assigned to the different connectors of the rear modules. Cabling of the rear module depends on what optional fiber optic SFP device is installed as below:

- 8925EMB-B and 8925EMB-U without optional fiber optic SFP device (electrical only),
- 8925EMB-B and 8925EMB-U with SFP-13103G-M1DRX, Dual Receiver Fiber Optic SFP device
- 8925EMB-B and 8925EMB-U with SFP-13103G-M1DTX, Dual Transmitter Fiber Optic SFP device, and
- 8925EMB-B and 8925EMB-U with SFP-13103G-M1TRX, Transceiver Fiber Optic SFP device.

The 8925EMB-B and the 8925EMB-U will accept any of the video standards listed in the input specifications in Table 5 on page 54. Configure the standards accepted by the module on the *System Config Web Page* on page 31.

Table 2 below gives the inputs and the possible video output connections for the 8925EMB rear modules. The cabling is illustrated in Figure 5 on page 17 for the 8900BVF-R rear module and Figure 6 on page 17 for the 8900UVF-R rear module.

Table 2. 8925EMB Rear Cabling

Option	Video Inputs Coax	Audio Inputs	Video Outputs	Reclocked Video Output	Optical Inputs	Optical Outputs
Without optical option	J9	J1, J2, J3, J4	J5, J6, J8	J7	N/A	N/A
With Dual Receiver	J9	J1, J2, J3, J4	J5, J6, J8	J7	Fiber 1 or Fiber 2	N/A
With Dual Transmitter	J9	J1, J2, J3, J4	J5, J6, J8	J7	N/A	Fiber 1 and Fiber 2
With Transceiver	J9	J1, J2, J3, J4	J5, J6, J8	J7	Fiber 1	Fiber 2

Figure 5. 8900BVF-R Rear Module

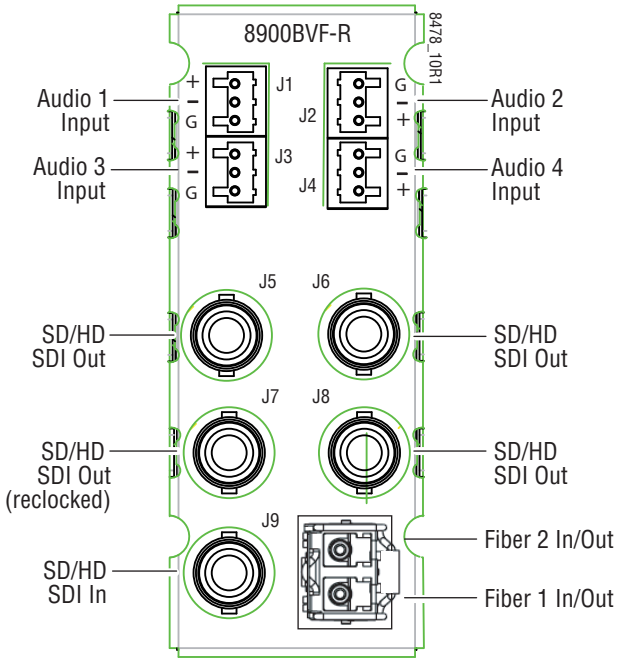
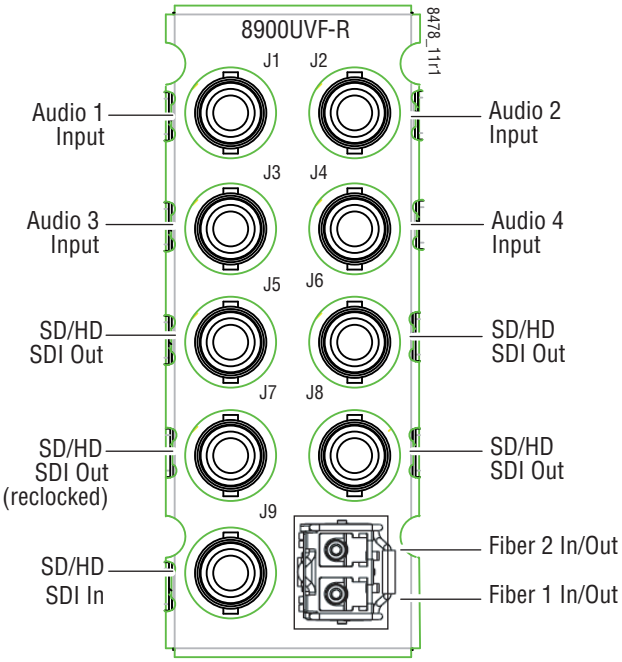


Figure 6. 8900UVF-R Rear Module



Power Up

The on-board LED indicators are illustrated in Figure 7. Upon power-up, the green PWR LED should be on. The CONFIG and FAULT LEDs should briefly light on and the COMM LED should blink during the module initialization.

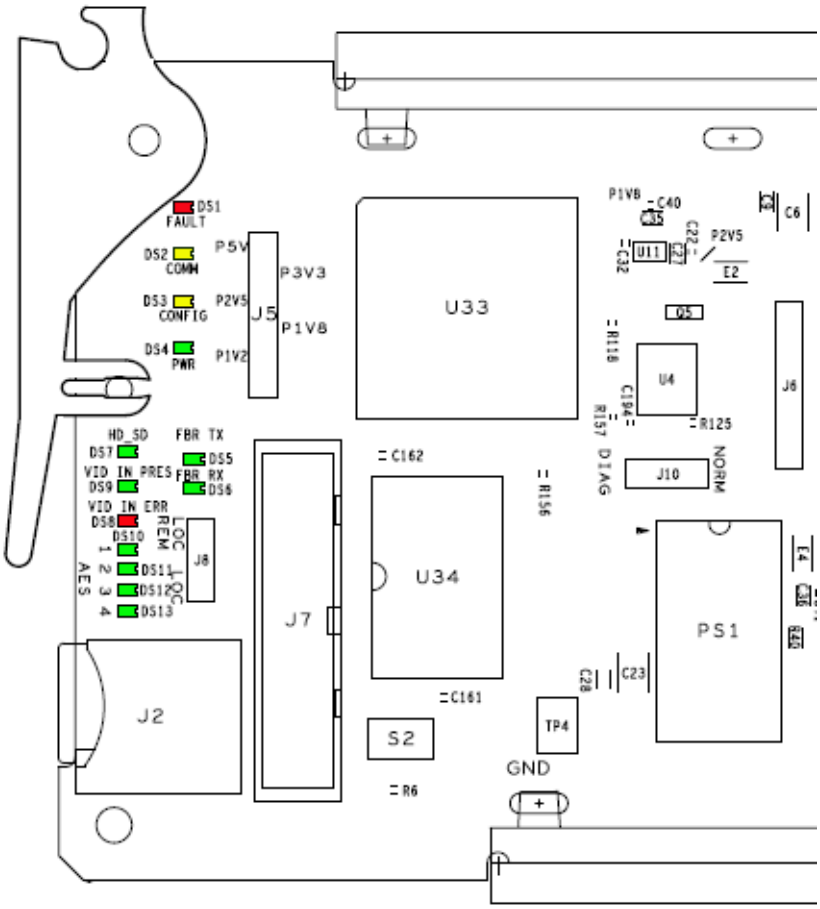
Note When a module is first plugged into a GeckoFlex frame, the 8900NET module (if present) may report a momentary fault. This will clear once the module has booted up.

Operation Indicator LEDs

With a valid input signal is connected, the VID IN PRES LED should be on. Refer to Table 3 on page 19 to see a complete list of possible operating conditions and the resulting indicator status.

Note LED colors are highlighted in Figure 7 for reference only. They are not intended to show the state of the module at power up.

Figure 7. Front LEDs Indicators



A continuous FAULT LED on (red) indicates an error situation and, when noted with the other indicator LEDs, can indicate a specific problem area. Table 3 describes signal output and LED indications for the various input/reference combinations.

Table 3. LED Indicators

LED	Indication	Condition
FAULT (red)	Off	Normal operation
	On continuously	Module has detected internal fault.
	Long flash	Presence of reported warnings
COMM (yellow)	Off	No activity on frame communication bus
	Long flash	Location Module command received by the module from a remote control system
	Short flash	Activity present on the frame communication bus
CONFIG (yellow)	Off	Module is in normal operating mode
	On continuously	Module is initializing, changing operating modes or updating firmware
	Long Flash	Synchronous with COMM led when executing Locate Module command
PWR (green)	Off	No power to module
	On continuously	Normal operation, module is powered
AES 1 (green)	Off	No AES1 input presence
	On	AES 1 input presence
AES 2 (green)	Off	No AES 2 input presence
	On	AES 2 input presence
AES 3 (green)	Off	No AES 3 input presence
	On	AES 3 input presence
AES 4 (green)	Off	No AES 4 input presence
	On	AES 4 input presence
HD_SD (green)	Off	Indicates the video input rate SD
	On	Indicates the video input rate HD
VID IN PRES (green)	Off	No presence of signal
	On	Presence of the signal
VID IN ERR (red)	Off	Normal video input
	On	Video input error, unknown or format mismatch
FBR TX (green)	Off	Indicates the video optical fiber output is disabled
	On	Indicates the video optical fiber output is enabled and an SFP device is present
FBR RX (green)	Off	Indicates the video optical fiber input is disabled
	On	Indicates the video optical fiber input is enabled and an SFP device is present

Remote Configuration

The 8925EMB-B and 8925EMB-U configuration and monitoring must be performed using a web browser GUI interface or a networked Newton Control Panel with an 8900NET Network Interface module with software version 4.3.0 or later present in the GeckoFlex frame (8900FFN). Each of these interfaces is described below. A summary table of all module parameters including defaults, ranges, and Newton Control panel controls is given in Table 13 on page 61.

8900NET Module Information

Refer to the *8900NET Network Interface Module Instruction Manual* (software version 4.3.0) for information on the 8900NET Network Interface Module and setting up and operating the GeckoFlex 8900 frame network. This manual, along with the latest 8900NET Release Notes can be found at the link below:

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

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.

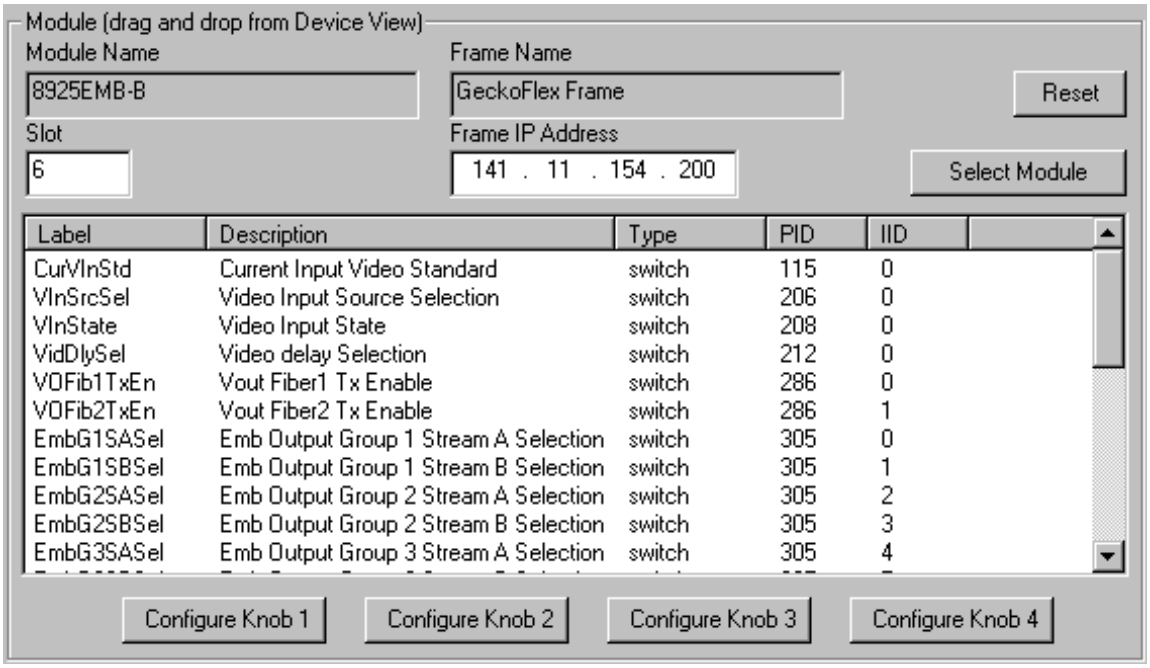
Control panel access offers the following considerations for module configuration and monitoring:

- 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.
- 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 factory default recalls.

An example of the Newton Configurator is shown in Figure 8.

Figure 8. 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 (some functions depend on individual module functionality):

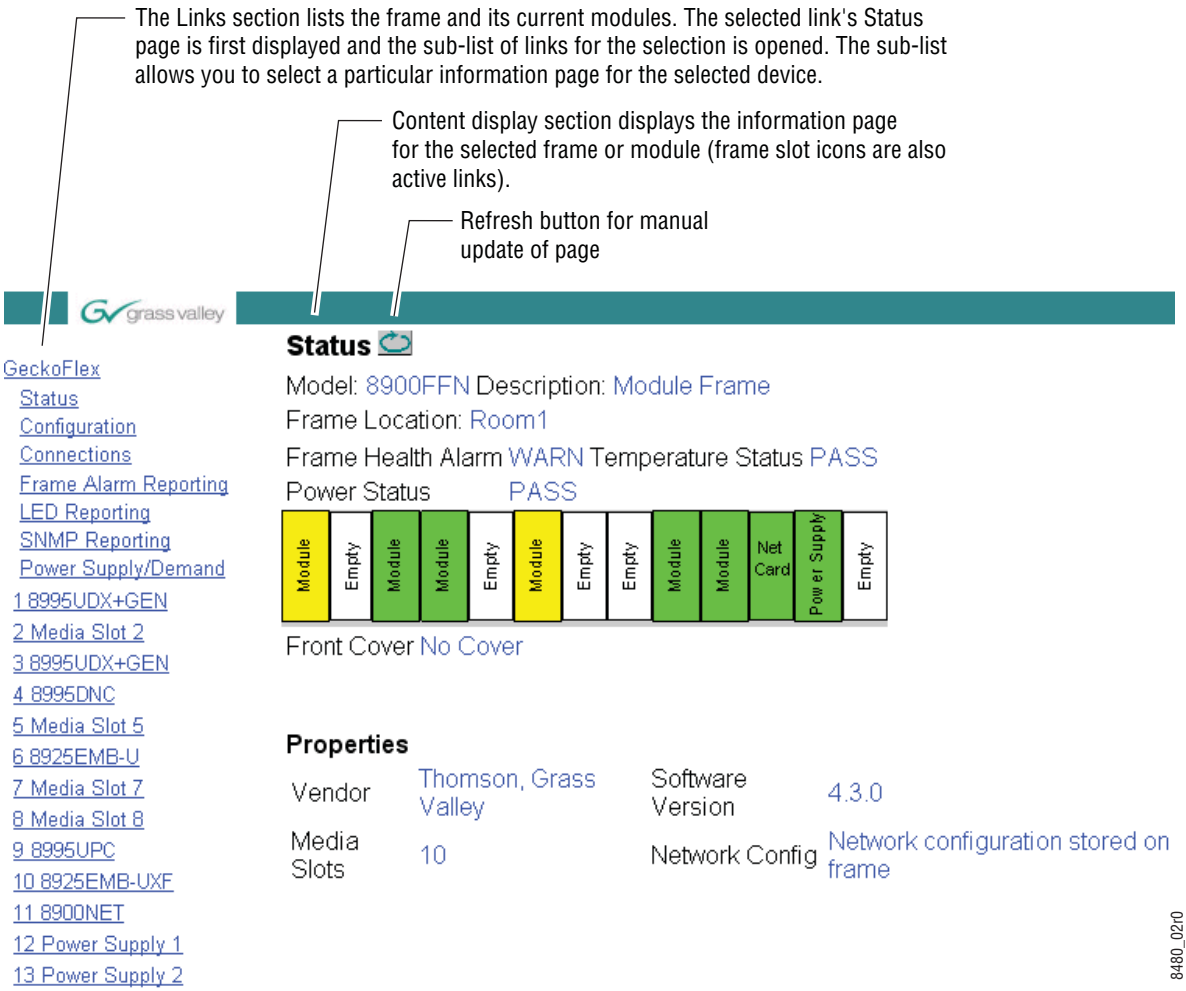
- Provides complete access to all module status and configuration functions, including naming of inputs and outputs, factory parameter and name default recalls, Save/Load module configuration functions, slot configurations, and SNMP monitoring controls.
- Web access will require some normal network time delays for processing of information.
- Configuration parameter changes may require pressing **Apply** button or **Enter**, upload processing time. A manual screen refresh is recommended after changing parameters.
- Web interface recommended for setting up module signal and slot names, and reporting status for SNMP and monitoring.

Refer to the Status web page shown in Figure 9 on page 22. The 8900 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.

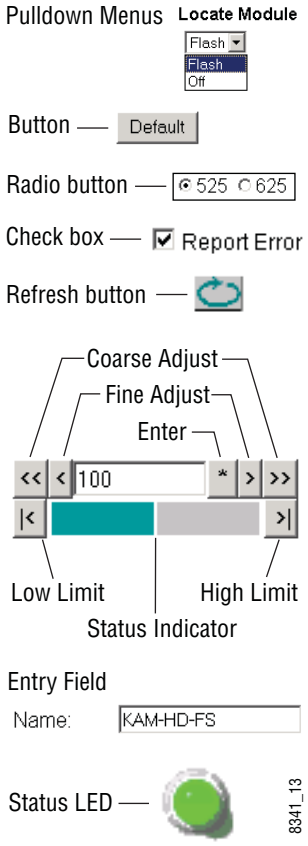
Note The physical appearance of the graphics on the web pages shown in this manual represent the use of a particular platform, browser and version of 8900NET module software. They are provided for reference only. Web pages will differ depending on the type of platform and browser you are using and the version of the 8900NET software installed in your system. This manual reflects an 8900NET module with software version 4.3.0, using Internet Explorer, the recommended web browser, and Windows XP operating system.

For information on status, fault monitoring and reporting shown on the module Status web page, refer to *Status Web Page* on page 26.

Figure 9. Frame Status Web 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 4.3.0):

- 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 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.

  After a parameter has been changed, it will take approximately 10 seconds for the change to be entered into the module backup memory. Allow the module enough time to update the change before removing the module from its slot.
- An entry field allows naming of various module functions such as input or output signals, asset tag, and slot identification.
- The **Status** LED icon indicates module status and is a link to the module Status web page where status is reported.

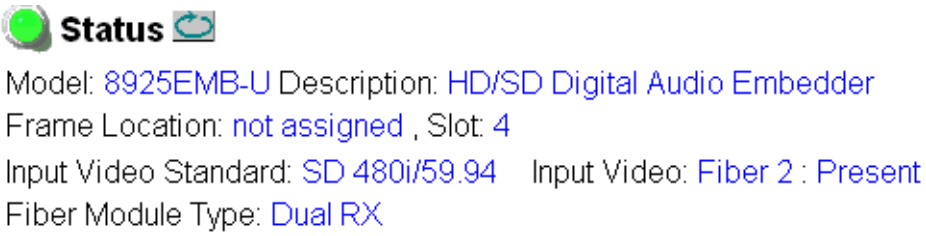
  LED colors indicate:

  - Green = Pass – no problems detected
  - Yellow = Configuration error warning
  - Red = Fault condition detected (presence of at least one alarm)

Web Page Headers

Each configuration web page has a Status and Identification Header as shown in Figure 10 below.

Figure 10. Web Page Header

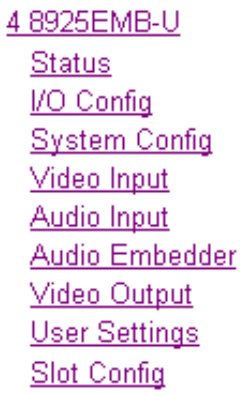


The header information on each web page includes the following:

- **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 detected by the module.
- **Input Video** reports the status of the video input to the module.
- **Fiber Module Type** reports (on the Status, I/O Config, Video Input, and Video Output web pages) the status or type of the fiber optic SFP device with one of the following four messages:
  - Not Installed,
  - RX/TX, 1310 nm,
  - Dual RX, or
  - Dual TX, 1310/1310 nm.

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. Default values for all parameters are listed in Table 13 on page 61.

8925EMB-B and 8925EMB-U Links and Web Pages

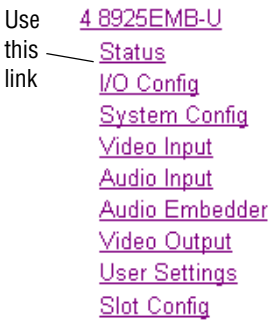


The web interface 8900 GUI provides the following links and web pages for the 8925EMB-B and 8925EMB-U modules (shown at left):

- Status web page – reports input and output signal status, frame bus communication status, module status and information, warnings and errors (page 26),
- I/O Config web page – shows the presence of the signals on a specific connector, allows naming of each input and enables or disables the signal reporting (page 29),
- System Config web page – set input video rate and line standards to be accepted by the module (page 31),
- Video Input web page – allows selection of the video input source (coax or fiber) and provides the status of all sources, including optional fiber optic SFP devices inputs, indicates status of the audio available for embedding, and provides a Video Delay control for minimizing video delay or offset in relation to the embedded audio (page 33),
- Audio Input web page – reports the audio input status of the audio sources to the module and provides a Low Delay control used in conjunction with the Video Delay controls to improve audio quality and an Audio Input Warnings section allowing individual muting of each of the four AES audio streams based on the type of warning or error condition being reported (page 37),
- Audio Embedder web page – lists the audio streams and their status available for embedding into the four audio groups in the video output signal and allows selection of bit rate for each audio stream (page 40),
- Video Output web page – enables/disables the fiber optic video output when a fiber optic SFP device is installed (page 42),
- User Settings web page – allows recalling of factory defaults for all module parameters or factory signal names and provides a save/load configuration file function (page 43),
- Slot Config web page – provides Locate Module, Slot Identification, and Slot Memory functions along with links to the SNMP, LED Reporting, and Frame Alarm configuration 8900NET web pages (page 46).

A summary table of all module parameters including defaults, ranges, and Newton Control panel controls is given in Table 13 on page 61.

Status Web Page



The Status web page (Figure 11 on page 28) reports information and status about the front media and rear modules and any SFP devices present (if applicable for the module) in both graphical (using color to indicate status) and textual formats. It also reports the status of the input and reference video signals to the module and SFP devices, and the Frame Bus status. Video and reference signal reporting can be enabled and disabled at the module level on the I/O Config web page (page 29).

In general, graphics and text colors used for status indication are 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.

Note Always refresh the page first with the **Refresh** button at the top of the page (shown at left) to update the current status of the web page.

Web Page Header

The content of the web page header for the module is described in detail in *Web Page Header* on page 26.

Module Physical Structure

Status is reported for the front, rear, and optional fiber optic SFP devices as follows:

- Rear Module – the presence, name, and internal status of the rear module is reported in the graphic on the left. If the rear module is the wrong type or missing, the graphic will indicate the status by color and text within the graphic.
- Front Processing Module – the presence, name, and internal status of the front processing module is reported in the graphic on the right. The graphic will indicate the status of the front module by color and text within the graphic.
- Fiber Module – the optional fiber optic SFP device status will be shown in the box on the front module graphic. When a fiber optic SFP device is installed, the type will be reported in the top header and the Status text below the graphic on the right.

Status is reported for each of the following audio and video signals:

- Video inputs indicate the status of the video inputs incoming on the BNC connectors, one of two possible fiber optic inputs (depending on the type of the fiber optic SFP device installed),
- Video outputs are always gray as the outputs are not monitored,
- Audio inputs indicate the status of the audio inputs,
- Frame bus indicates the status of the communication bus to the 8900NET module, and
- Fiber module shows if a fiber module is installed. When not installed, the graphic will be white and report **Fiber Module not Installed**.

Note On the 8925EMB modules, input signals are represented by up to five input signal arrows.

Warning/Fault/Message Reporting

Faults, warnings, and informational messages from the module are displayed between the double bars below the graphic.

Module Status

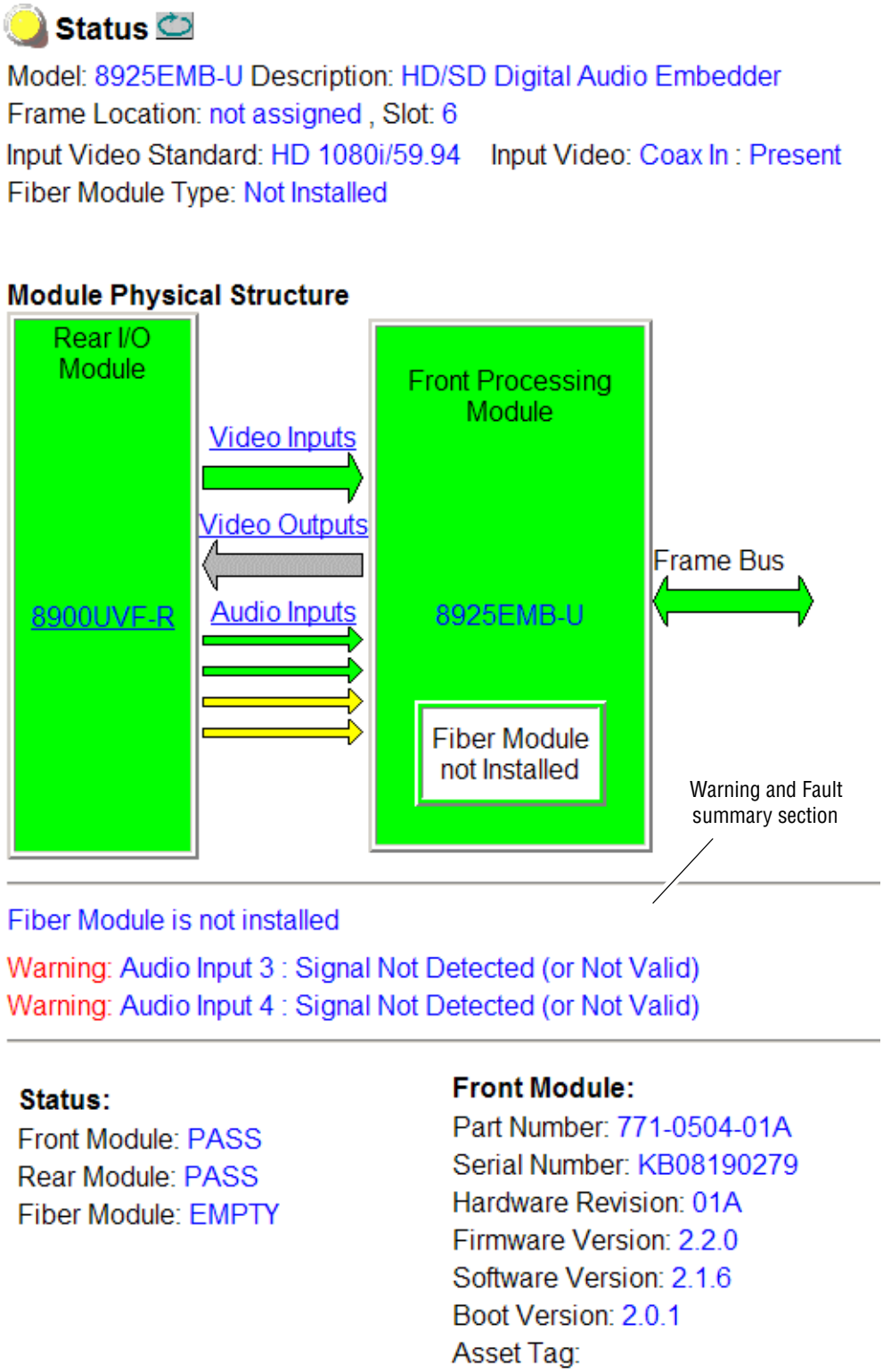
Module status for the front and rear modules (and any SFP devices if applicable) are reported as PASS, WARNING, ERROR, or EMPTY on the right at the bottom of the display.

Front Module Information

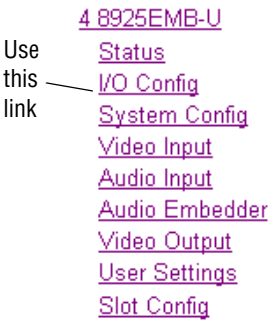
Information about the module, such as part number, serial number, hardware revision and software, firmware, and boot versions, and asset tag number (assigned on the *Slot Config Web Page* on page 46) are given on the left at the bottom of the display.

Figure 11 illustrates the inputs and outputs on an 8925EMB-U module.

Figure 11. Status Web Page for 8925EMB-U Module



I/O Config Web Page



Use the I/O Config web page (Figure 12 for the 8900UVF-R rear module and Figure 13 on page 30 for the 8900BVF-R rear module) for the following:

8900UVF-R Rear Module Configuration

All of the input and output connectors on the corresponding 8925EMB-B or 8925EMB-U rear module are illustrated on the I/O Config web page. The inputs can be configured with the following controls:

- **Signal Names** – type of the desired input name (up to 12 characters) into the corresponding boxes for each input. The status of each input is indicated by the color of the display. The color legend is under the table.

Note The status color yellow can also indicate that the input is invalid.

- **Reporting** – the status reporting of the input can be enabled or disabled at the module level by selecting or deselecting the corresponding checkbox in the **Reporting** column for each input.

Figure 12. I/O Config Web Page – 8900UVF Rear

I/O Config

Model: 8925EMB-U Description: HD/SD Digital Audio Embedder
Frame Location: not assigned , Slot: 4
Input Video Standard: SD 480i/59.94 Input Video: Fiber 2 : Present
Fiber Module Type: Dual RX

8900UVF-R Rear Module Configuration

Signal Names	Reporting	I/O Connectors						Reporting	Signal Names
AES In1	☑ Enabled	Audio Input 1	J1			J2	Audio Input 2	☑ Enabled	AES In2
AES In3	☑ Enabled	Audio Input 3	J3			J4	Audio Input 4	☑ Enabled	AES In4
.	.	Video Output	J5			J6	Video Output	.	.
.	.	Reclocked Video Output	J7			J8	Video Output	.	.
Coax In	☑ Enabled	Coax Video Input	J9		Fiber		Fiber 2 Video Input	☑ Enabled	Fiber 2
							Fiber 1 Video Input	☑ Enabled	Fiber 1

Legend:

Present | Not Present | Not Monitored | Not Available

Note The outputs are not monitored in this application.

Figure 13. I/O Config Web Page – 8900BVF Rear

I/O Config

Model: 8925EMB-B Description: HD/SD Digital Audio Embedder
Frame Location: not assigned , Slot: 6
Input Video Standard: HD 1080i/59.94 Input Video: Coax In : Present
Fiber Module Type: Not Installed

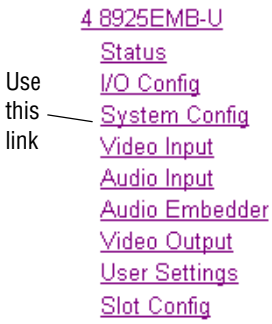
8900BVF-R Rear Module Configuration

Signal Names	Reporting	I/O Connectors						Reporting	Signal Names
AES In1	☑ Enabled	Audio Input 1	J1			J2	Audio Input 2	☑ Enabled	AES In2
AES In3	☑ Enabled	Audio Input 3	J3			J4	Audio Input 4	☑ Enabled	AES In4
.	.	Video Output	J5			J6	Video Output	.	.
.	.	Reclocked Video Output	J7			J8	Video Output	.	.
Coax In	☑ Enabled	Coax Video Input	J9		Fiber		Fiber 2 Video In/Out	☑ Enabled	Fiber In2
							Fiber 1 Video In/Out	☑ Enabled	Fiber In1

Legend:

Present | Not Present | Not Monitored | Not Available

System Config Web Page



Use the System Config web page (Figure 14 on page 32) to set the video input standards accepted by the module.

Input Standard Selection

Select any of the following input standards to be accepted by the module:

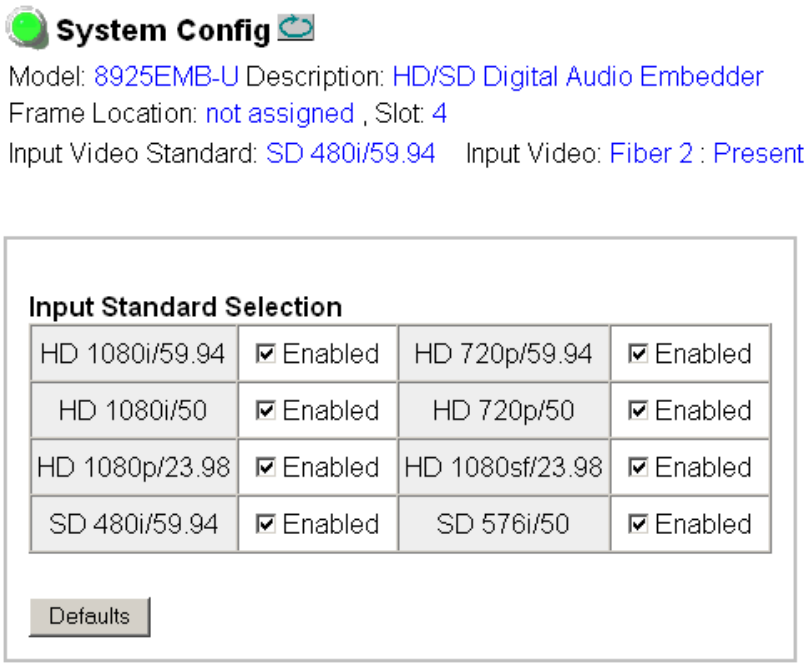
- HD 1080i/59.94,
- HD 1080i/50,
- HD 1080p/23.98,
- HD 1080sf/23.98,
- HD 720p/59.94,
- HD 720p/50,
- SD 480i/59.94, and
- SD 576i/50.

When a video format is input to the module it will be automatically detected. If the standard matches the user selection it will be declared as valid or it will generate an **Invalid Format** error.

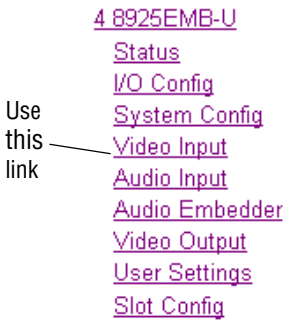
Defaults Button

Select the **Defaults** button to restore the default setting (all standards selected).

Figure 14. System Config Web Page



Video Input Web Page



Use the Video Input web page (Figure 15 on page 35) 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 one of the following input sources. Only one source can be enabled at a time.
  - **Coax** – select the electrical input at BNC J9 as the video input.
  - **Fiber RX1** – check the **Enabled** checkbox to enable the Fiber RX1 input as the input video (SFP-13103G-M1DRX or SFP-13103G-M1TRX SFP device must be installed).
  - **Fiber RX2** – check the **Enabled** checkbox to enable the output (SFP-13103G-M1DRX SFP device must be installed).
- **Signal Name** – the signal name defined on the I/O Config web page will appear in this field.
- **Signal State** – this field reports the status of the input video signal as Present, Not Present, Not Supported (in the case of no fiber SFP device installed) or Invalid format.

Video Delay

Controls are provided for two different settings to accommodate the additional electrical length of audio processing. Set the Video delay control to one of the following according to the type of audio and the delay requirements of the video:

- **Minimize Video Delay** – checking this box enables a mode that bypasses an internal video delay that is meant to match the AES input audio delay when bypassing the Sample Rate Converter (SRC). This box should normally be unchecked because audio/video delay matching is more important than minimizing video delay in most cases.

  When the shortest video delay is the most important criteria for the module, use this setting. As the audio embedding processing has a longer electrical length than the video delay, the module produces an audio/video offset, especially when Audio Sample Rate Conversion is enabled with non-synchronous audio. This mode is not recommended for Dolby E signals.

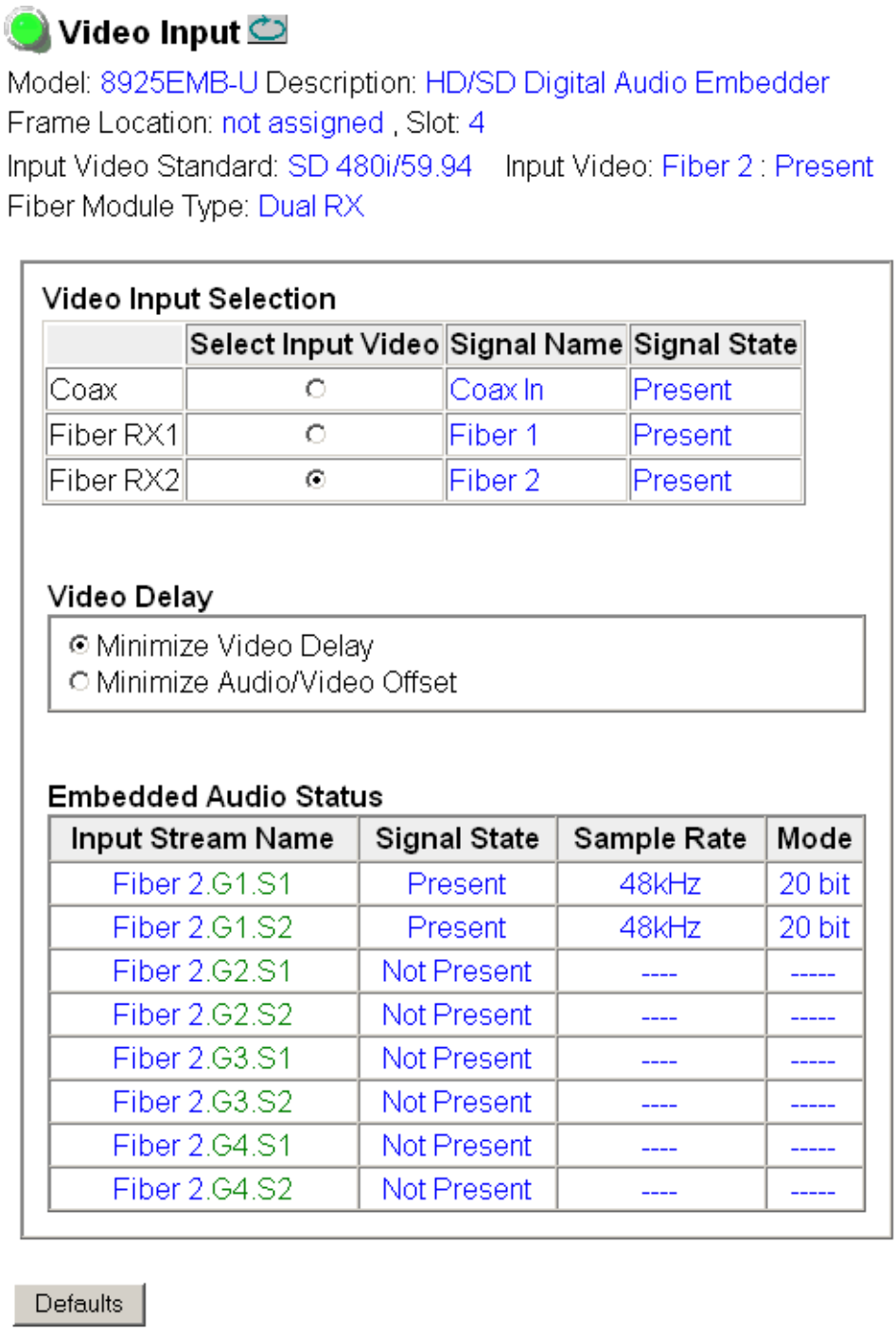
  When in this mode, the video electrical length of the module will be the specific length as reported in Table 9 on page 57.

- **Minimize Audio/Video Offset** – checking this box enables a mode that adds an internal video delay that matches the delay when bypassing the SRC. When non PCM audio is detected on some of the AES input channels, the SRC's for those channels are automatically bypassed. If **Low Delay** is selected on all channels, all SRC's are forcibly bypassed and the video delay matches the audio delay.

  Refer to Table 9 on page 57 for specific lengths when using this mode. This mode is most useful when the Sample Rate Conversion on the AES input is bypassed which happens automatically when embedding a Non-PCM (such as Dolby E) audio stream synchronous with the video. This mode should be used when handling Dolby E streams.

  Use this mode in conjunction with the Low Delay control for Sync PCM audio on the Audio Input web page (*Audio Input Web Page* on page 37) to reduce the audio processing delay (and audio/video offset).

Figure 15. Video Input Web Page



Embedded Audio Status

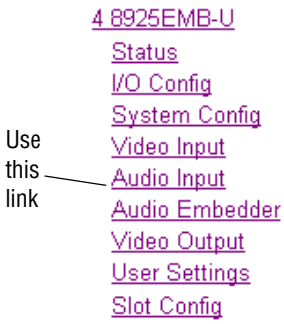
This section gives the name and the state of the incoming embedded audio streams.

- **Input Stream Name** – name entered in the I/O Config web page with the extension which indicates the group and the stream number (for example Coax In.G1.S2 means Stream 2 of the Group 1),
- **Signal State** – indicates the incoming embedded audio streams presence,
- **Sample Rate** – indicates the frequency of the audio,
- **Mode** – means the maximum audio resolution which can be 20 or 24 bits. It is only indicated in SD format.

Defaults Button

Select the **Defaults** button to restore the default Video Input Source (Coax) and Video Delay (Minimize Video Delay).

Audio Input Web Page



Use the Audio Input web page (Figure 16 on page 39) to select and monitor the audio input status of the external audio sources to the module. Controls are also provided for enabling or disabling muting of each individual audio stream based on certain error criteria.

Audio Input Status

This section provides the following status monitoring fields for the audio inputs:

- **Stream Name** – reports the name defined for the audio streams on the I/O Config web page.
- **Stream State** – this field reports the presence of the audio stream as Present or Not Present (indicating not present or not valid).
- **Sample Rate** – this field reports the sample rate of the audio stream.
- **Mode** – reports if the audio stream is 20 bit or 24 bit.
- **Audio Mode Source** – this field reports if the audio stream is a PCM or Non-Audio signal.
- **Sync PCM, Low Delay** – the Low Delay control can be enabled to further reduce the audio processing delay (and audio/video offset) when an audio input is fully synchronous to the video and has a 48kHz Sample Rate. Using this control will improve audio quality since the Sample Rate Converter is bypassed in this state.

  When this control is used in conjunction with the Minimize Audio/Video Offset control on the Video Input web page (*Video Input Web Page* on page 33) it is possible to maintain the audio/video delay close to its initial delay.
- **AES Errors Detected** – when AES errors are detected on the incoming audio stream, an **Errors** message will be reported in red for the affected audio stream. Use the **Reset** button to reset the audio error log.

  The audio stream may be muted depending on the settings made in the **Audio Input Warnings** section as shown in Figure 16 on page 39. The 8925EMB mutes the audio stream when errors are detected to reduce as much as possible, embedding distorted audio data that may be audible.

  When an AES signal stream is not detected or when errors are detected and the audio is muted, an alarm will be also raised on the Status web page **(Audio Input X: Signal Not Detected {or Not Valid})**.

Audio Input Warnings

The **Audio Input Warning** controls allow the user to define audio muting for the four AES audio input streams for each type of audio warning detected by the module. When an audio warning is detected and muting is enabled for that condition, the module will mute audio streams 1-4 and an error will be logged into the AES Errors Detected section of the Audio Input web page (Figure 16 on page 39).

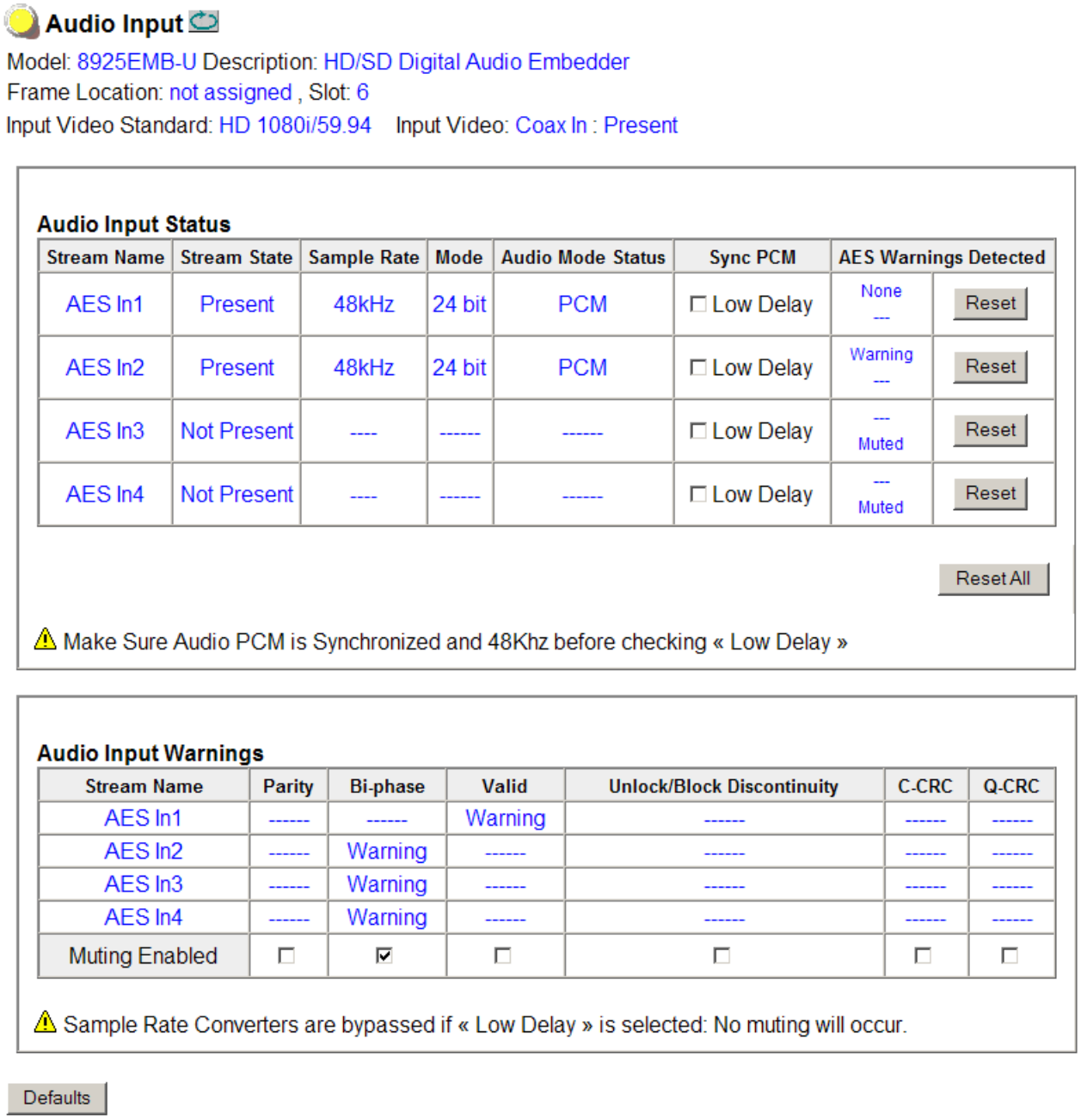
Note When the **Low Delay** checkbox is selected for an audio stream in the Audio Input Status section (SRC bypassed), the auto-mute function is disabled.

Each type of audio warning listed below can be enabled or disabled for muting audio streams 1-4 when this conditions occur:

- Parity – warning indicates a parity error.
- Bi-phase – warning indicates a coding error in the data stream.
- Valid – warning indicates an invalid video sample.
- Unlock/Block Discontinuity – warning occurs when the phase lock loop is not locked.
- C-CRC – warning indicates a Cyclic Redundancy Check (CRC) channel status error.
- Q-CRC – warning indicates a Cyclic Redundancy Check (CRC) subcode data (digital information data multiplexed with the digital audio) error.

Many of these warnings occur when the audio is affected by devices upstream of the audio inputs. This function allows reducing or increasing sensitivity of the audio error detection to meet the needs of the customer. The module default condition is muting enabled for Bi-Phase errors only.

Figure 16. Audio Input Web Page



Audio Input

Model: 8925EMB-U Description: HD/SD Digital Audio Embedder
Frame Location: not assigned , Slot: 6
Input Video Standard: HD 1080i/59.94 Input Video: Coax In : Present

Audio Input Status

Stream Name	Stream State	Sample Rate	Mode	Audio Mode Status	Sync PCM	AES Warnings Detected	
AES In1	Present	48kHz	24 bit	PCM	☐ Low Delay	None ---	Reset
AES In2	Present	48kHz	24 bit	PCM	☐ Low Delay	Warning ---	Reset
AES In3	Not Present	----	------	------	☐ Low Delay	--- Muted	Reset
AES In4	Not Present	----	------	------	☐ Low Delay	--- Muted	Reset

Reset All

⚠ Make Sure Audio PCM is Synchronized and 48Khz before checking « Low Delay »

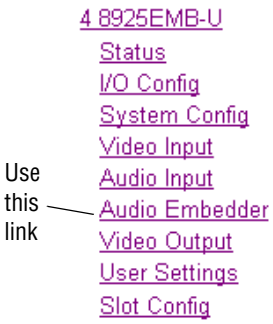
Audio Input Warnings

Stream Name	Parity	Bi-phase	Valid	Unlock/Block Discontinuity	C-CRC	Q-CRC
AES In1	------	------	Warning	------	------	------
AES In2	------	Warning	------	------	------	------
AES In3	------	Warning	------	------	------	------
AES In4	------	Warning	------	------	------	------
Muting Enabled	☐	☑	☐	☐	☐	☐

⚠ Sample Rate Converters are bypassed if « Low Delay » is selected: No muting will occur.

Defaults

Audio Embedder Web Page



Use the Audio Embedder web page (Figure 17 on page 41) to set the audio to be embedded into which group and stream with the following controls:

Output – gives the name of the audio groups and streams to be processed in the incoming video signal.

Stream Selection – select one type of processing for each audio Group and Stream from the choices below.

- Replace with:
  - Audio Input 1,
  - Audio Input 2,
  - Audio Input 3,
  - Audio Input 4, or
  - Silence.
- Pass Group
- Delete Group

Stream Name – displays the name of the audio stream as defined on the I/O Config web page or the factory default names.

Resolution – set the pulldown to **Auto** or force to **20 bit** or **24 bit** (this control does not appear when **Pass Group** is selected).

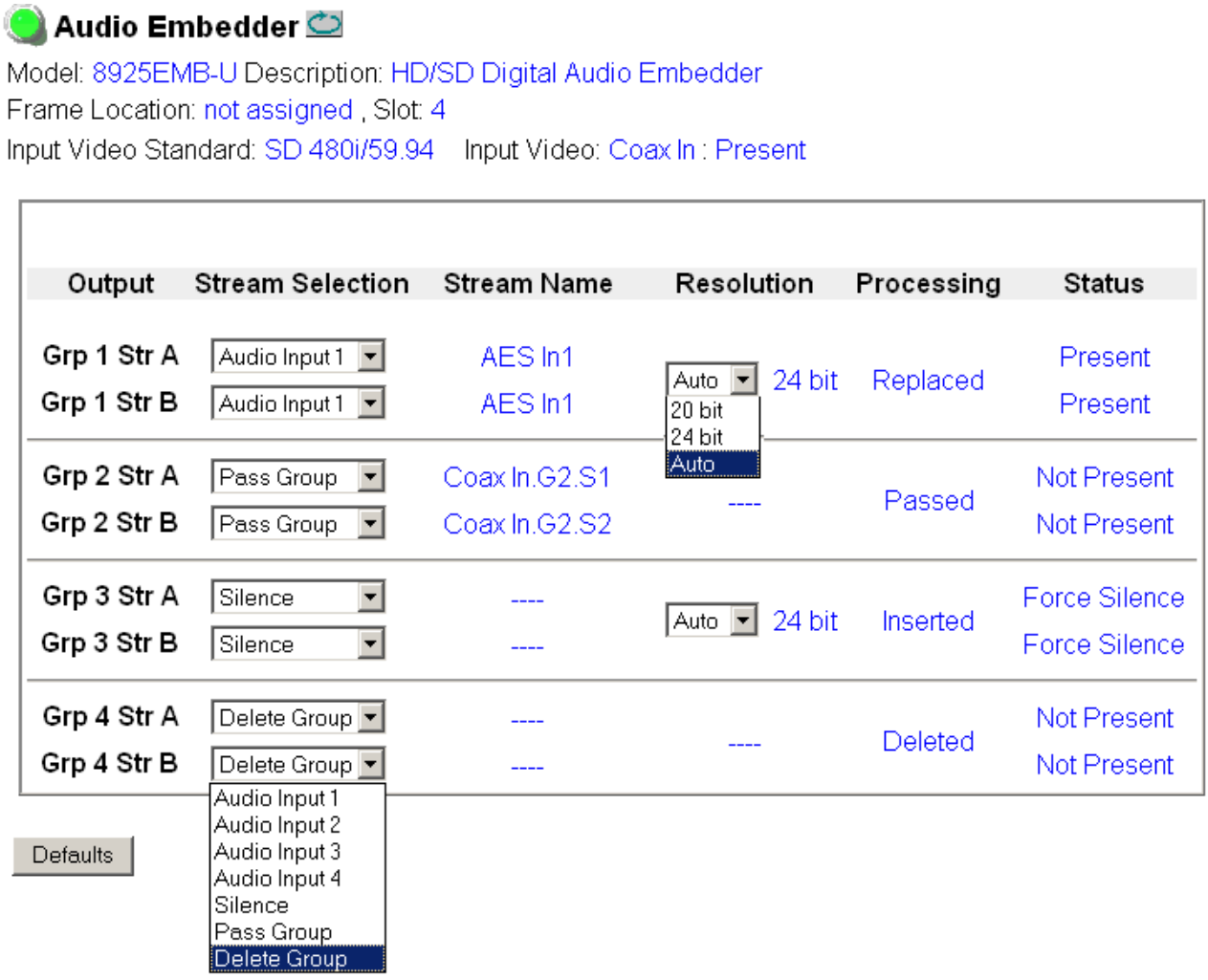
Processing – reports the audio function performed as **Replaced**, **Passed**, **Inserted**, or **Deleted**.

Status – reports the status of the processed audio as **Present**, **Not Present**, or **Forced Silence**.

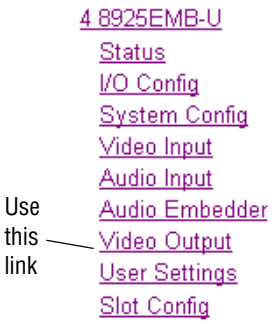
Defaults Button

Select the **Defaults** button to restore the default Audio Embedder parameters (Pass Group).

Figure 17. Audio Embedder Web Page



Video Output Web Page



Use the Video Output web page to enable or disable the fiber optic SFP device outputs when present.

Fiber Video Output

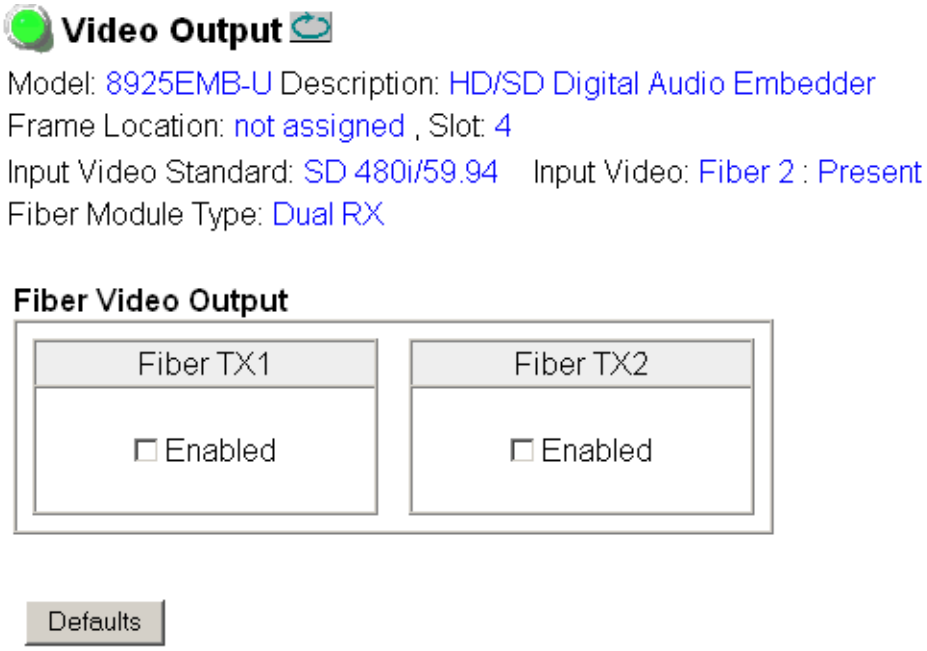
This section allows enabling of the fiber video output signals. Both outputs can be enabled at the same time.

- **Fiber TX1** – check the **Enabled** checkbox to enable the output (SFP-13103G-M1DTX SFP device must be installed).
- **Fiber TX2** – check the **Enabled** checkbox to enable the output (SFP-13103G-M1DTX or SFP-13103G-M1TRX SFP device must be installed).

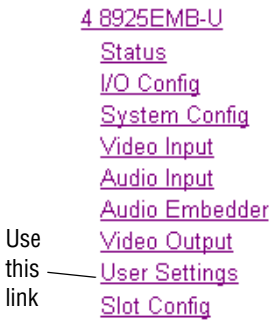
Defaults Button

Select the **Defaults** button to restore the default Video Output parameters (Fiber Outputs disabled).

Figure 18. Video Output Web Page



User Settings Web Page



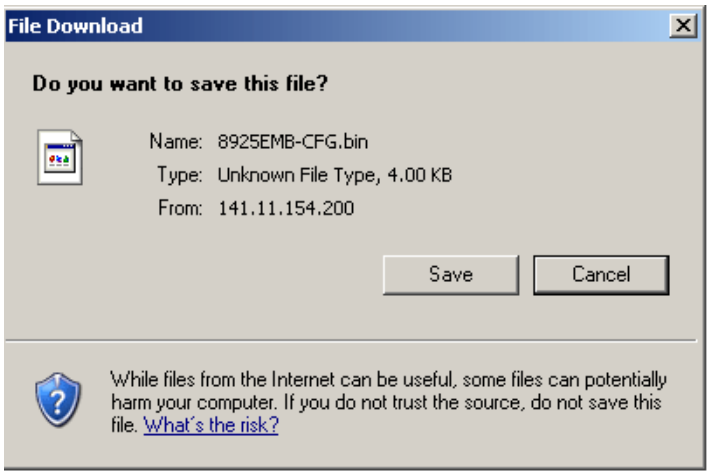
The User Settings web page (Figure 19) provides a File Operations section to save/load configuration files to an external location and buttons to recall factory default parameters and signal names for the entire module.

Figure 19. User Setting Web Page

File Operations

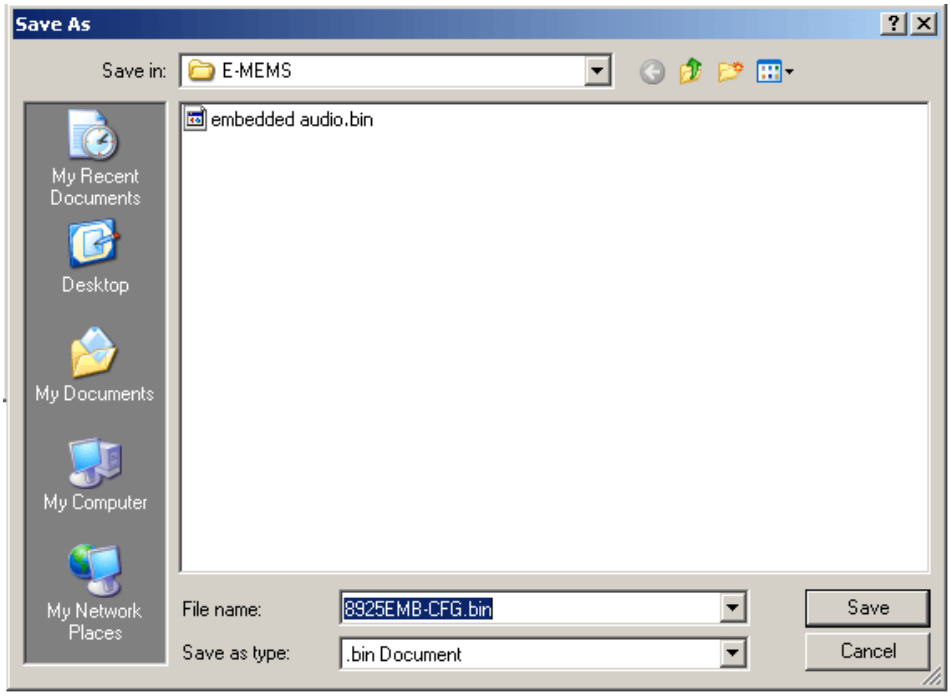
- **Save To…** – selecting the **Save To..** button will bring up the screen shown in Figure 20. Select **Save** to bring up the **Save As** screen shown in Figure 21 on page 44.

Figure 20. File Download Screen



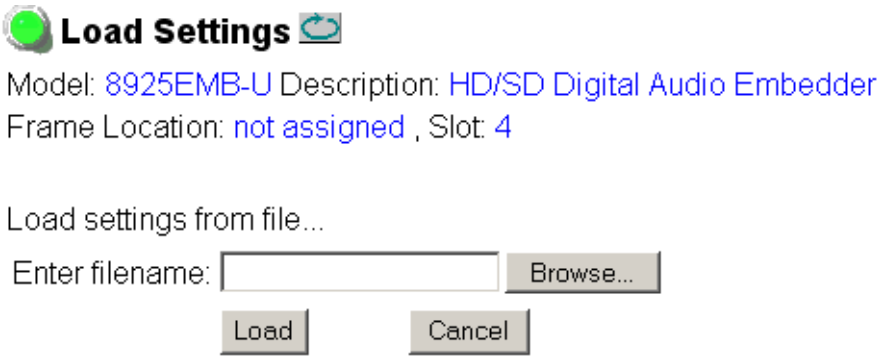
In the **Save As** screen (Figure 21), select or create a directory in which to store your files. Type in a file name for the current module configuration and select **Save**.

Figure 21. Save As Screen



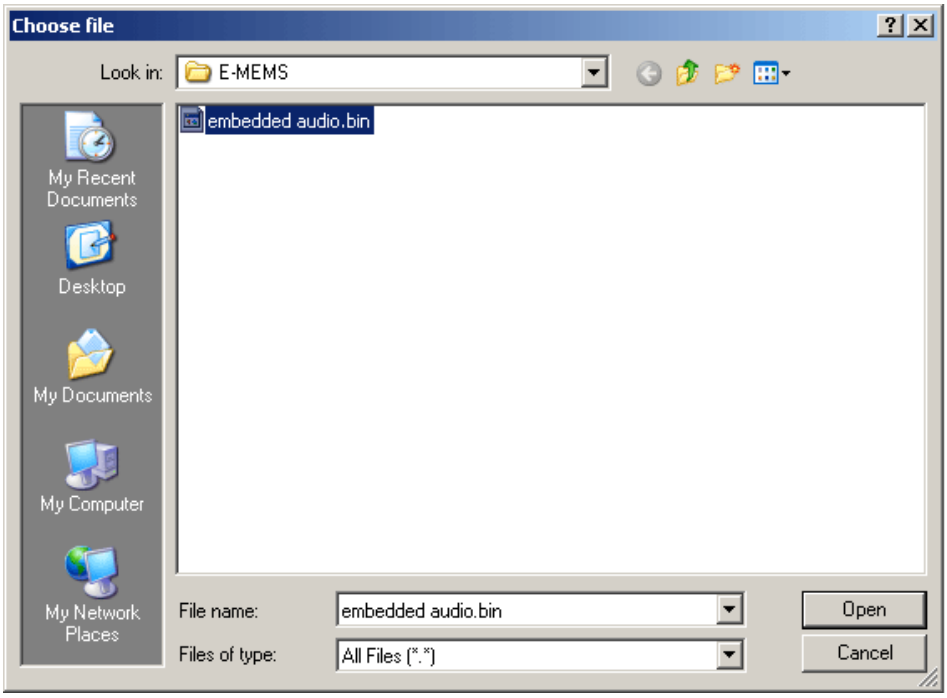
- **Load From…** – selecting the **Load From…** button in the User Settings web page will bring up the Load Settings web page shown in Figure 22.

Figure 22. Load Settings Web Page



Select the **Browse** button to bring up the **Choose File** screen shown in Figure 23 on page 45 or enter a path and file name into the **Enter filename** field.

Figure 23. Choose File Screen



Click on the file you wish to load and select the **Open** button. This will place the file in the Load Settings web page **Enter filename** field.

Select the **Load** button on the Load Settings web page (Figure 22 on page 44) to load this file configuration into the module.

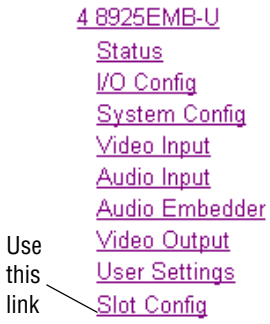
Set Factory Defaults Button

Select the **Set Factory Defaults** button to recall factory settings to the entire module. Refer to the Configuration Summary table on Table 13 on page 61 for a complete list of parameter defaults and ranges.

Set Factory Names Button

Select the **Set Factory Name**s 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 12 on page 29 and Figure 13 on page 30.

Slot Config Web Page



Use the Slot Config web page shown in Figure 24 on page 47 to perform the following functions on the module.

Note This Slot Config web page reflects the use of 8900NET (Net Card) software version 4.3.0.

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 polled and refreshed periodically (about every 50 minutes) by the 8900NET module when the **Always Slot Refresh** checkbox on the 8900NET Configuration web page (with 4.3.0 software) and/or the **Restore upon Install** checkbox on any media module Slot Config web page is selected.

When the **Restore upon Install** checkbox on any media module Slot Config web page has been selected, the current configuration from that module is saved in slot memory on the 8900NET module. This allows the current module to be removed and when another module of the same part number, and software version is installed, the configuration saved to the 8900NET module will be downloaded to the installed module. The **Restore upon Install** checkbox must be selected before the current module with the saved configuration is removed.

Note Make sure all modules of the same model type are running the same software version and have the same part number silk-screened on the printed circuit board. Downloading a configuration to a module with a different software version or part number can produce unexpected results.

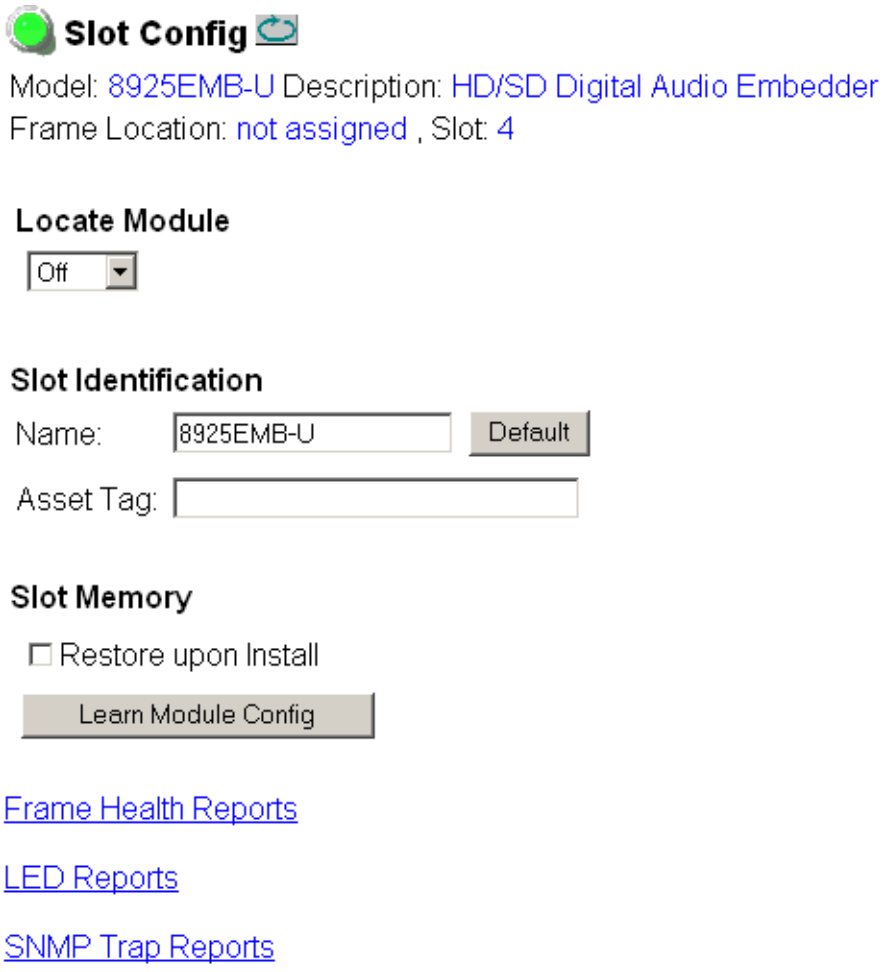
If a different type of module is installed in this slot, a warning message will state that the original module type has been replaced with another module type. In this case, a **Clear** button will appear allowing you to clear the stored configuration from the previous module.

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 no **Restore upon Install** checkboxes on any of the media module Slot Config web pages are selected and the **Always Slot Refresh** checkbox on the 8900NET Configuration web page is unchecked, the slot refresh polling function on the 8900NET module will be disabled. See the **Always Slot Refresh** checkbox description in the *8900NET (Net Card) Network Interface Module Instruction Manual* for more details.

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

Figure 24. Slot Config Web Page



Frame Health Reporting

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. Refer to *8900NET Instruction Manual* for more details.

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 and other components (power supplies, fans) 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.

Software Updating

Software updating of the 8925EMB modules is done using the NetConfig Networking Application PC option available free of charge from Grass Valley or the microSD method using a memory card and adapter provided by the customer.

The procedures for updating software are given in the 8925EMB-B and 8925EMB-U Release Notes when software updates become available. All modular product documentation can be found in PDF format on the Grass Valley web site at this link:

www.grassvalley.com/docs/modular

Status Monitoring

There are a number of ways to monitor frame and module status. These methods are summarized here. For more detailed information, refer to the *8900NET (Net Card) Network Interface Module Instruction Manual* and the *8900 Gecko* or *8900 GeckoFlex Frame Instruction Manuals.*

All modular product documentation is available on-line in PDF format at this link*:*

www.grassvalley.com/docs/modular

The main status monitoring methods include the following:

- External frame alarm output on the rear of the 8900 frame with reporting from the Module Health Bus and other frame status alarm reports,
- LEDs on the Frame, 8900NET module, and individual frame media modules,
- Web browser status reporting for each frame component, and
- SNMP traps, captured by Grass Valley's NetCentral or another SNMP Manager Application.

Note SNMP trap information is only available when an SNMP Agent has been installed and configured.

External Frame Alarm

An external Frame Alarm output is available on pins 8 and 9 of the RS-232 connector on the rear of the frame. The Frame Alarm outputs a voltage level indicating there is an alarm condition on the Module Health Bus or one of the other frame components reported to the Frame Monitor module in a Gecko 8900TF or GeckoFlex 8900FF frame or the 8900NET module in an 8900TFN and GeckoFlex 8900FFN frame.

- The Module Health bus is a separate line on the frame motherboard that provides a means for older or less capable modules (such as DAs with no microprocessor) that cannot communicate over the Frame (serial) bus to report warning and alarm conditions to the external Frame Alarm. All media modules in the frame report a voltage level to this line when a warning condition occurs on the module. The specific warning or module location is not reported, only an indication that an warning condition has occurred.
- Frame alarm reporting from other frame components can be enabled and disabled using DIP switches on the Frame Monitor and 8900NET module. For frames with an 8900NET module, the Frame Alarm Reporting web page allows configuration of the alarms and warnings that are reported to this external Frame Health Alarm.

LED Reporting

LEDs on the front of media modules, the Frame Monitor or 8900NET modules, and the front covers of the 8900TF/TFN and GeckoFlex FF/FFN frames indicate status of the frame and the installed power supplies, fans in the front covers, and module status. (The 8900TX-V/A and GeckoFlex 8900FX frames have no LED indicators on the front cover.)

- LED reporting from the modules in the frame to the 8900NET module is configurable using the 8900NET LED Reporting web page.
- The Status LEDs for this module are described in *Operation Indicator LEDs* on page 18. LEDs for the 8900NET module are described in the *8900NET (Net Card) Network Interface Instruction Manual*.

Web Browser Interface

The 8900NET module controls a web browser GUI that indicates frame and module status on the following web pages:

- Frame Status web page – reports overall frame and module status in colored graphical and text formats. Refer to Figure 9 on page 22 for an example.
- Module Status web page (Figure 11 on page 28) – shows specific input and reference signal configuration error status to the module along with module status and information (part number, serial number, hardware version, software/firmware/boot versions, and Asset number (as assigned on the Slot Config web page).
- A Status LED icon on each web page reflects the module status on the module Status web page where warnings and faults are displayed and is a link to the module Status web page.

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.

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.

Service

The 8925EMB modules make extensive use of surface-mount technology and programmed parts to achieve compact size and adherence to demanding technical specifications. Circuit modules should not be serviced in the field unless otherwise directed by Customer Service.

Power-up Diagnostics Failure

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

Troubleshooting

Electronic Circuit Breaker

The electronic circuit breaker works during a fault condition or an overcurrent which stops the module.

Remove the module and replace it in the frame. If the problem persists, please refer to 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 representative for depot location.

Contacting Grass Valley

If you need to contact Grass Valley for any module issues, refer to *Contacting Grass Valley* on page 4 at the front of this document for the Grass Valley Customer Service Information number.

Table of Alarms

Table 3 below describes the different type of alarms reported by the module to the upper level devices, such as the 8900NET module.

Table 4. Summary of Alarms for 8925EMB-U/-B Module

Alarm Type	Web Page Text Description	FAULT LED	VID IN ERR LED	Comments	Status Reported to 8900Net & SNMP
Fault	Firmware failure	On	Off	Firmware configuration failure	Yes
Fault	Firmware DCM Not Locked	On	N./A[1]	Firmware internal system clock failure	Yes
Fault	Bad firmware image	On		A wrong firmware Image has been down-loaded	Yes
Fault	Wrong rear module (incompatible with 8925EMB)	On			Yes
Fault	Fiber module failed, replace	On			Yes
Fault	Power supply failure	On			Yes
Warning	Coax video input signal not detected	Flashing	Off		Yes
Warning	Coax video input is invalid or wrong format	Flashing	On		Yes
Warning	Fiber 1 video input signal not detected	Flashing	Off		Yes
Warning	Fiber 1 video input is invalid or wrong format	Flashing	On		Yes
Warning	Fiber 1 video input not supported by hardware	Flashing	Off	The fiber module does not allow Fiber 1 input	No
Warning	Fiber 2 video input signal not detected	Flashing	Off	Video Input Fiber 2 is selected	Yes
Warning	Fiber 2 video input is invalid or wrong format	Flashing	On		Yes
Warning	Fiber 2 video input not supported by hardware	FLASH	Off		Yes
Warning	Hardware configuration does not support selected fiber video output	Off	Off	Fiber module is a RX/TX and user chooses to enable fiber TX1 or fiber is dual RX	Yes
Warning	Audio Input 1 signal not detected.	Flashing	N/A[1]	Audio Input 1 Monitored but Not Present	Yes
Warning	Audio Input 2 signal not detected.	Flashing		Audio Input 2 Monitored but Not Present	Yes
Warning	Audio Input 3 signal not detected.	Flashing		Audio Input 3 Monitored but Not Present	Yes
Warning	Audio Input 4 signal not detected.	Flashing		Audio Input 4 Monitored but Not Present	Yes
Warning	Audio integrity lost, please delete all HANC inputs	Flashing		User chose to embed a stream without delete all HANC inputs	Yes
Warning	Coax Video Standard does not match with selection	Flashing	On	Current Coax Video input is not in the Input Standard Selection table	Yes
Warning	Fiber 1 Video Standard does not match with selection	Flashing	On	Current Fiber 1 Video input is not in the Input Standard Selection table	Yes
Warning	Fiber 2 Video Standard does not match with selection	Flashing	On	Current Fiber 2 Video input is not in the Input Standard Selection table	Yes

Table 4. Summary of Alarms for 8925EMB-U/-B Module

Alarm Type	Web Page Text Description	FAULT LED	VID IN ERR LED	Comments	Status Reported to 8900Net & SNMP
Information	Fiber module is not installed	Off	N/A[1]	Fiber Input and Output are not selected	No
Information	Coax video input signal not detected	Off		Video coax input not present, but not selected	No
Information	Fiber 1 video input signal not detected	Off		Video fiber 1 input not present, but not selected	No
Information	Fiber 2 video input signal not detected	Off		Video fiber 2 input not present, but not selected	No
Information	Audio Input 1 signal not detected	Off		Audio Input 1 Not Present, but not Monitored	No
Information	Audio Input 2 signal not detected	Off		Audio Input 2 Not Present, but not Monitored	No
Information	Audio Input 3 signal not detected	Off		Audio Input 3 Not Present, but not Monitored	No
Information	Audio Input 4 signal not detected	Off		Audio Input 4 Not Present, but not Monitored	No

[1] N/A: Not Applicable indicates the state of the LED depends on other inputs or internal parameters, it can be On or Off.

Note Please refer to the *Operation Indicator LEDs* on page 18 and *Web Page Operations and Functional Elements* on page 23 for the status and the color of the LEDs.

Specifications

Table 5. Main Features

Main Features			
HD/SD video format supported by SMPTE 274M, SMPTE 296M, and SMPTE 259M-C	SMPTE 274M:	SMPTE 296M:	SMPTE 259M-C:
	1080i/59.94	720p/59.94	480i/59.94
	1080i/50	720p/50	576i/50
	1080p/23.98		
	1080sF/23.98		
Video processing	• EDH/CRC insertion, detection and reporting • Video Input Status including incoming embedded audio status • Video Standard Selection		
Embedding processing: SMPTE 299M SMPTE 272M Level A, C SMPTE 337M (no ZCUV bit pass-through)	• Up to four selectable audio groups • 48 kHz support • 20 or 24 bit mode or Auto mode • Auto control packet insertion		
Audio processing	• Sample Rate Conversion • 32 to 96 kHz input rate to 48 kHz output rate • Synchronous 48 kHz Non PCM format supported (SRC bypass) • Automatic Dolby E detection and low A/V delay pass-through • AES input status (presence, error, rate, audio/non-audio)		
Maximum power consumption	7.7 Watts/642 mA @ +12V		
Video delay from input to output	Refer to Table 9 on page 57 and Table 10 on page 58 for specific lengths		
Audio Min. Delay from Input to output Audio PCM			
Audio Min. Delay from Input to Output Audio Non PCM (Dolby E)			
HD/SD Multi-format Auto Detection			
Auto sensing and locking time, from loss of signal or format change to correct signal at output end	< 0.5 seconds Note: if it is a switch between HD/HDM formats (HD 50Hz/HD 59.94Hz) it may be longer: < 1 seconds		
Operational frequency range of HD/SD SDI input	Nominal rate ±110 ppm		
Mechanical			
Frame type	GeckoFlex		
Number of frame slots required	1 slot		
Rear module type			
8925EMB-B	8900BVF-R		
8925EMB-U	8900UVF-R		
Rear module retainer maximum screw torque	4-5 inch-lb./0.45-0.6Nm		

Table 6. Environmental and Miscellaneous Specifications

Environmental / Miscellaneous		
Frame temperature range		Refer to GeckoFlex Frames 8900FX/FF/FFN Signal Processing Systems Instruction Manual at: www.grassvalley.com/docs/modular
Operating humidity range		
Non-operating temperature		
Safety	ANSI/UL60950-1	Safety of Information Technology Equipment, including Electrical Business Equipment (2003).
	CAN/CSA C22.2, No. 60950-01	Safety of Information Technology Equipment, including Electrical Business Equipment.
	cULus certification	File number: E300838
	IEC 60950-1	Safety of Information Technology Equipment, including Electrical Business Equipment (2003).
	EN60950-1	Safety of Information Technology Equipment, including Electrical Business Equipment (2001).
	73/23/EEC Low voltage directive	(19/02/73) amended by 93/68/EEC (22/07/93)
	89/336/EEC directive	(05/05/89) amended by 93/68/EEC (22/07/93)
EMC	FCC Class A	CISPR Pub. 22 (1985)
	EN55103-1	(1997)
	EN55103-2	(1997)
EU marking	93/68/EEC	(22/07/93)
Climatic specifications	ETS 300 019-1-3 class 3.1 (Feb. 1992)	Operating temperature (for 8900FFN model): + 0°C to + 45°C Operating humidity: 10% to 95% non-condensing
	ETS 300 019-1-1 class 1.1 (Feb. 1992)	Storage temperature: - 10 °C to 70°C
MTBF at 40°C		
	8925EMB front module	653,000 hours
	8900UVF/BVF-R rear module	26,385,000 hours

Table 7. Digital Video Specifications

Digital Video Input	
Serial digital video input signal	SMPTE 292M (HD) and SMPTE 259M-C (SD) compliant
Number of inputs	1 HD/SD (J9)
Connector type	BNC
Jitter tolerance	RP184-1996 compliant
Input return loss	>15dB (5 MHz - 1.485 MHz)
Input impedance	75 ohms
Maximum cable length equalization	HD: 120m Belden 1694A, SD: 320m Belden 1694A
Digital Video Outputs	
Serial digital video output signal	SMPTE 292M (HD) and SMPTE 259M-C (SD) compliant
Active loop through output	1 reclocking output (J7)
Number of outputs, names	3 HD/SD outputs (J5, J6, J8)
Connector type	BNC
Signal level	800 mV ± 10%
Equalization	If coax input selected

Table 7. Digital Video Specifications

Reclocking	Yes	
Reclocked SDI output electrical length	4T (SD); 5T (HD); T = 1/2 pixel rate	
Timing jitter (HPF 10 Hz)	HD/SD: < 1UI/< 0.2UI	
Alignment jitter	HD/SD: < 0.2UI (HPF 100 kHz) / < 0.2UI (HPF 1kHz)	
Output return loss	>15dB (5 MHz - 1.485 MHz)	
Output impedance	75 ohms	
Digital Audio Inputs		
	Balanced Inputs	Unbalanced Inputs
Digital audio input signal	AES3-1997, Tech 3250-E	AES3-id-2001, IEC 60958
Number of inputs	4	4
Input names	AES 1, 2, 3, 4	AES 1, 2, 3, 4
Connector type	Three pin terminal block	BNC
Common mode range	± 10V	N/A
Differential voltage range	200 mV to 10V pk-pk	200 mV to 2V pk-pk
Input return loss	> 20 dB (100kHz - 128 FS)	> 20 dB (100kHz - 128 FS)
Output impedance	110 Ohms ± 20%	75 ohms ± 20%
Sampling rates supported	32 kHz to 96 kHz	32 kHz to 96 kHz
Audio data format	PCM or non-PCM (SMPTE 337M-2000)	

Table 8. Electrical Length (Latency in ns)

		3G		HD		SD	
Channel	**Input to Output**	**Reclock**	**Bypass**	**Reclock**	**Bypass**	**Reclock**	**Bypass**
CH1	J9 to J1 (8943RDA) J9 to J1 (8943RDA-D) J10 to J1 (8943RDA-DFR)	3.8 ns	3.55 ns	4.0 ns	3.6 ns	6.0 ns	4.0 ns
CH2	J10 to J1 (8943RDA-D) J8 to J1 (8943RDA-DFR)	4.0 ns	3.75 ns	4.1 ns	3.7 ns	6.2 ns	4.25 ns
CH3	F2 to F1 (8943RDA-DFR with SFP Transceiver)	6.0 ns	5.7 ns	6.0 ns	5.7 ns	11.25 ns	9.25 ns

Table 9 below (Version 2.x) and Table 10 on page 58 (Version 1.x) provide all video and audio electrical lengths and Audio/Video offset data according to the Audio/Video delay management controls on the Video Input web page (page 33) and the Audio Embedder web page (page 40).

Table 9. Audio/Video Delay Management – Version 2.X

Version 2.x	Video Format	Video Latency [1]		Audio Latency [2]		Audio/Video Offset	
		Minimize Video Delay	Minimize Audio/Video Offset	SRC Enabled	SRC Bypassed	Max[3]	Min[4]
SD	480i_59.94	346 T (12.8 µs)	14093 T (521.9 µs)	165 AS (3.44 ms)	27 AS (562 µs)	3.43 ms	40 µs
	576i_50	348 T (12.9 µs)	14093 T (521.9 µs)	165 AS (3.44 ms)	27 AS (562 µs)	3.43 ms	40 µs
HD	1080i_59.94	959 T (6.5 µs)	12407 T (83.6 µs)	145 AS (3.02 ms)	7 AS (146 µs)	3.01 ms	62 µs
	1080i_50	1839 T (12.38 µs)	12419T (83.6 µs)	145 AS (3.02 ms)	7 AS (146 µs)	3.00 ms	62 µs
	1080p_23.98	2819 T (19.07 µs)	12407 T (83.6 µs)	145 AS (3.02 ms)	7 AS (146 µs)	3.01 ms	62 µs
	1080sF_23.98	2829T (19.07 µs)	12407 T (83.7 µs)	145 AS (3.02 ms)	7 AS (146 µs)	3.01 ms	62 µs
	720p_59.94	1179 T (7.95 µs)	12407 T (83.7 µs)	145 AS (3.02 ms)	7 AS (146 µs)	3.01 ms	62 µs
	720p_50	2059 T (13.86 µs)	12419 T (83.7 µs)	145 AS (3.02 ms)	7 AS (146 µs)	3.00 ms	62 µs

[1] T = half video pixel period; typical data with accuracy +/- 1T/ +/ - 2t (SD/HD)

[2] AS = Audio Sample period @ 48kHz; typical data with accuracy +/- 1 AS

[3] Minimize Video Delay on Video Input control enabled and SRC enabled.

[4] Minimize Audio/Video Offset on Video Input control enabled and SRC bypassed.

Table 10. Audio/Video Delay Management – Version 1.X

Version 1.x	Video Format	Video Latency [1]	Audio Latency [2]		Audio/Video Offset	
			SRC Enabled	SRC Bypassed	Max[3]	Min[4]
SD	480i_59.94	49 T (1.8 µs)	165 AS (3.44 ms)	27 AS (562 µs)	3.44 ms	561 µs
	576i_50	49 T (1.8 µs)	165 AS (3.44 ms)	27 AS (562 µs)	3.44 ms	561 µs
HD	1080i_59.94	61 T (445 ns)	145 AS (3.02 ms)	7 AS (146 µs)	3.02 ms	146 µs
	1080i_50	61 T (411 ns)	145 AS (3.02 ms)	7 AS (146 µs)	3.02 ms	146 µs
	1080p_23.98	N/A	N/A	N/A	N/As	N/A
	1080sF_23.98	N/A	N/A	N/A	N/As	N/A
	720p_59.94	61 T (411 ns)	145 AS (3.02 ms)	7 AS (146 uS)	3.02 ms	146 µs
	720p_50	61 T (411 ns)	145 AS (3.02 ms)	7 AS (146 uS)	3.02 ms	146 µs

[1] T = half video pixel period; typical data with accuracy +/- 1T/ +/ - 2t (SD/HD)

[2] AS = Audio Sample period @ 48kHz; typical data with accuracy +/- 1 AS

[3] Minimize Video Delay on Video Input control enabled and SRC enabled.

[4] Minimize Audio/Video Offset on Video Input control enabled and SRC bypassed.

Table 11. SFP Receiver/Transceiver Fiber Optic SFP Device Specifications

Model Number	**SFP-13103G-M1DRX**	**SFP-13103G-M1TRX**
Low wavelength	1260nm	1260nm
High wavelength	1620nm	1620nm
Receiver channels	2	1
Connector type	LC	
Fiber support	Single mode	
Data rate	50Mb/s to 3Gb/s	
Maximum distance @ 3Gb/s	10km	
Minimum distance	30km	

Table 12. SFP Transmitter/Transceiver Fiber Optic SFP Device Specifications

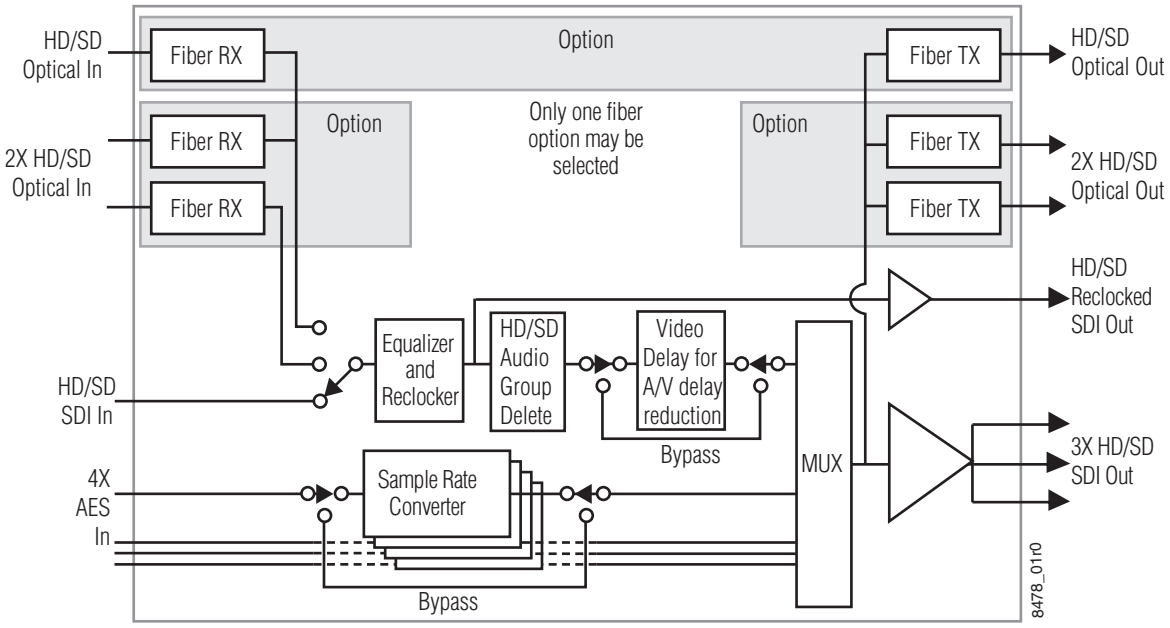
Model Number	**SFP-13103G-M1DTX**	**SFP-13103G-M1TRX**
Wavelength 1	1310 nm	1310 nm
Wavelength 2	1310 nm	N/A
Transmit channels	2	1
Connector type	LC	
Fiber support	Single-mode	
Data rate	143 Mb/s to 2.97 Gb/s	
Power output	-5 to 0 dBm (-2dBm typical)	
Maximum distance	10 km[1]	
Maximum distance	20 km	

[1] The 1310 nm Dual Transmitter (SFP-13103G-M1DTX) and Transceiver (SFP-13103G-M1TRX) require no attenuation between fiber transmitter and receiver connections at any length.

Functional Description

A block diagram of the 8925EMB front module with optical capabilities is shown in Figure 25.

Figure 25. 8925EMB Front Module Block Diagram



Configuration Summary Table

Table 13 provides a complete summary of the 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 13. Summary of Configuration Functions

Function Type	Default	Range/Choices Resolution	Web Page/ Function Name	Newton Control Panel
Coax Video Input signal loss reporting	Enable	Enable or Disable	I/O Config/ Coax Video Input Reporting Enabled checkbox	N/A
Fiber 1 Input submodule video input signal loss reporting (SFP-13103G-M1DRX or SFP-13103G-M1TRX option required for Fiber RX1)	Enable	Enable or Disable	I/O Config/ Fiber 1 Video Input Reporting Enabled checkbox	N/A
Fiber 2 Input submodule video input signal loss reporting (SFP-13103G-M1DRX option required for Fiber RX 2)	Enable	Enable or Disable	I/O Config/ Fiber 2 Video Input Reporting Enabled checkbox	N/A
Audio Input 1 signal loss reporting	Enable	Enable or Disable	I/O Config/ Audio Input 1 Reporting Enabled checkbox	N/A
Audio Input 2 signal loss reporting	Enable	Enable or Disable	I/O Config/ Audio Input 2 Reporting Enabled checkbox	N/A
Audio Input 3 signal loss reporting	Enable	Enable or Disable	I/O Config/ Audio Input 3 Reporting Enabled checkbox	N/A
Audio Input 4 signal loss reporting	Enable	Enable or Disable	I/O Config/ Audio Input 4 Reporting Enabled checkbox	N/A
Input Standard Selection	All standards enabled	HD 1080i/59.94, 720p/59.94, HD 1080i/50, HD 720p/50, HD 1080p/23.93, HD 1080sf/23.98, 480i/59.94, and 576i/50	System Config/ Input Standard Selection Input Standard checkboxes	N/A
Video Input Select (select source for input video)	Coax	Coax, Fiber RX1, or Fiber RX2	Video Input/ Input Standard Selection Select Input Video radio button	VinSrcSel
Video Delay Selection	Minimize Video Delay	Minimize Video Delay or Minimize Audio/video Offset	Video Input/ Video Delay Video delay radio button	VidDlySel
Reset Audio Input 1-4 Detected Errors	–	–	Audio Input/ Audio Input Status AES Errors Detected AES 1-4 Reset buttons	N/A

Table 13. Summary of Configuration Functions

Function Type	Default	Range/Choices Resolution	Web Page/ Function Name	Newton Control Panel
AES Stream1 Sync PCM Low Delay Selection	Disable	Enable or Disable	Audio Input/ Audio Input Status AES In1 Sync PCM Low Delay checkbox	AudIn1Sync
AES Stream 2 Sync PCM Low Delay Selection	Disable	Enable or Disable	Audio Input/ Audio Input Status AES In2 Sync PCM Low Delay checkbox	AudIn2Sync
AES Stream 3 Sync PCM Low Delay Selection	Disable	Enable or Disable	Audio Input/ Audio Input Status AES In3 Sync PCM Low Delay checkbox	AudIn3Sync
AES Stream 1 Sync PCM Low Delay Selection	Disable	Enable or Disable	Audio Input/ Audio Input Status AES In4 Sync PCM Low Delay checkbox	AudIn4Sync
Audio Input Warning Enable Muting for AES In1-In4 for **Parity** warning	Muting Disabled	Muting Enabled or Disabled	Audio Input/ Audio Input Warnings AES In1-In4 Enable Muting checkbox for Parity Warning	N/A
Audio Input Warning Enable Muting for AES In1-In4 for **Bi-phase** warning	Muting Enabled	Muting Enabled or Disabled	Audio Input/ Audio Input Warnings AES In1-In4 Enable Muting checkbox for Bi-phase Warning	N/A
Audio Input Warning Enable Muting for AES In1-In4 for **Valid** Warning	Muting Disabled	Muting Enabled or Disabled	Audio Input/ Audio Input Warnings AES In1-In4 Enable Muting for Valid Warning	N/A
Audio Input Warning Enable Muting for AES In1-In4 for **Unlock/Block Discontinuity** Warning	Muting Disabled	Muting Enabled or Disabled	Audio Input/ Audio Input Warnings AES In1-In4 Enable Muting checkbox for Unlock/Block Discontinuity Warning	N/A
Audio Input Warning Enable Muting for AES In1-In4 for **C-CRC** Warning	Muting Disabled	Muting Enabled or Disabled	Audio Input/ Audio Input Warnings AES In1-In4 Enable Muting checkbox for C-CRC Warning	N/A
Audio Input Warning Enable Muting for AES In1-In4 for **Q-CRC** Warning	Muting Disabled	Muting Enabled or Disabled	Audio Input/ Audio Input Warnings AES In1-In4 Enable Muting checkbox for Q-CRC Warning	N/A
Group 1 Stream A Stream Selection Group 1 Stream B Stream Selection Group 2 Stream A Stream Selection Group 2 Stream B Stream Selection Group 3 Stream A Stream Selection Group 3 Stream B Stream Selection Group 4 Stream A Stream Selection Group 4 Stream B Stream Selection	Pass Group	Audio input 1, Audio Input 2, Audio Input 3, Audio Input 4, Silence, Pass Group, or Delete Group.	Audio Embedder/ Grp 1-4 Str A and Grp 1-4 Str B Stream Selection pulldown	EmbG1SASel EmbG1SBSel EmbG2SASel EmbG2SBSel EmbG3SASel EmbG3SBSel EmbG4SASel EmbG4SBSel

Table 13. Summary of Configuration Functions

Function Type	Default	Range/Choices Resolution	Web Page/ Function Name	Newton Control Panel
Group 1 Stream A and B Resolution Group 2 Stream A and B Resolution Group 3 Stream A and B Resolution Group 4 Stream A and B Resolution (this control not present when Pass Group stream selection is made)	Auto	Auto, 20 bit, or 24 bit	Audio Embedder/ Grp 1-4 Str A and Str B Resolution pulldown	G1OResSel G2OResSel G3OResSel G4OResSel
Enable Fiber TX1 output (SFP-13103G-M1DTX option required for Fiber TX1)	Disable	Enable or Disable	Video Output Fiber Video Output Fiber TX1 Enabled checkbox	N/A
Enable Fiber TX 2 output (SFP-13103G-M1DTXor SFP-13103G-M1TRX option required for Fiber TX 2))	Disabled	Enabled or Disabled	Video Output Fiber Video Output Fiber TX2 Enabled checkbox	N/A
Recall factory default parameters	–	–	User Settings/ Set Factory Defaults button	N/A
Recall factory names	–	–	User Settings/ Set Factory Names button	N/A

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