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8977AP-4B/4U

DIGITAL AUDIO PROCESSING MODULES

Instruction Manual

PACKAGE VERSION 1.0.0

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Software Downloads — Download software updates, drivers, and patches.

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Preface

About This Manual

This manual describes the features of the 8977AP 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 infomation 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 Manual* available online on the Thomson Grass Valley web site.

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

8977AP-4B/-4U Digital Audio Processing Modules

Introduction

Two versions of the audio processing modules are available; the 8977AP-4B with balanced audio (with the 8900BA-R rear module) and the 8900AP-4U with unbalanced audio (with the 8900UE-R rear module.)

The 8977AP-4B and the 8977AP-4U modules provide audio processing for four AES audio streams for delay, gain, sample rate conversion, and genlock timing functionality.

Module Features

The 8977AP-4B and 8977AP-4U module features include:

- Up to 4 channels of AES audio streams (balanced or unbalanced depending on the rear module type installed),
- Input audio receiver and output driver stages to restore and drive signals over long coaxial or paired cables,
- Passing of PCM and Non-PCM audio signals (Dolby E),
- Performing sample rate conversion of the PCM audio signals,
- Provides genlock timing for the audio input signals with the 8900GEN-SM submodule to synchronize the audio input signals at 48 kHz,
- Audio delay management (fixed and/or tracking delay),
- Audio gain ensures the tuning of the level of each channel,
- Routing channel and audio processing module performs the selection between two channels before applying dedicated processing,
- Pair routing module determines the allocation of the outputs of each pair, and
- Remote control and monitoring support includes a web interface, a Newton control panel, a NetConfig management system, and SNMP monitoring with an application such as NetCentral.

Installation

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

A 8900GEN-SM genlock submodule can be installed on the front 8977AP module to provide a frame reference timing source.

The 8977AP-4B and the 8977AP-4U front modules 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).

Software Requirements

An 8900NET module with software version 4.0.2 or later is mandatory for configuring the 8977AP-4B and 8977AP-4U modules.

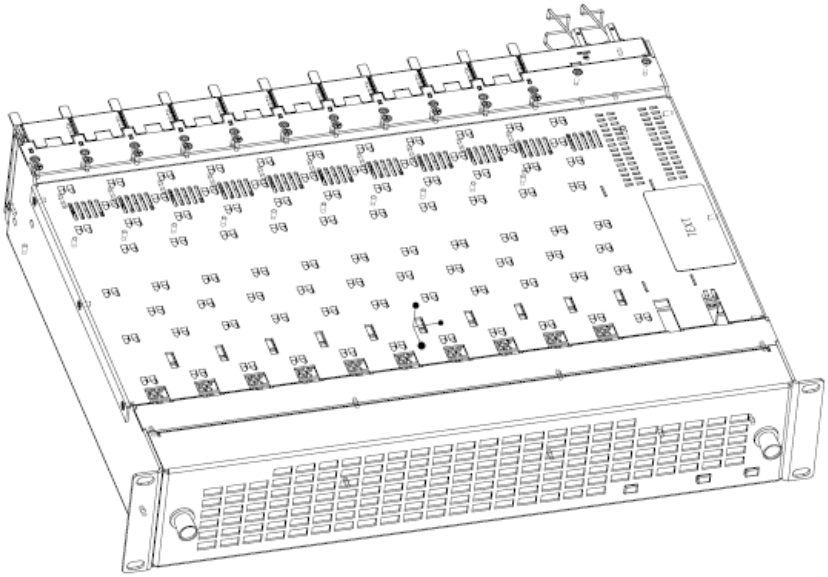
The Grass Valley NetCentral application must be running version 4.1.12.8A or later for proper operation.

Module Placement in the GeckoFlex Frame

There are ten rear and front slot locations in the 2 RU frame to accommodate audio and video modules. The 8977AP-4B and 8977AP-4U modules can be plugged into any one of the GeckoFlex frame slots.

Note Use standard anti-static precautions when handling modules in the frame.

Figure 1. GeckoFlex Frame



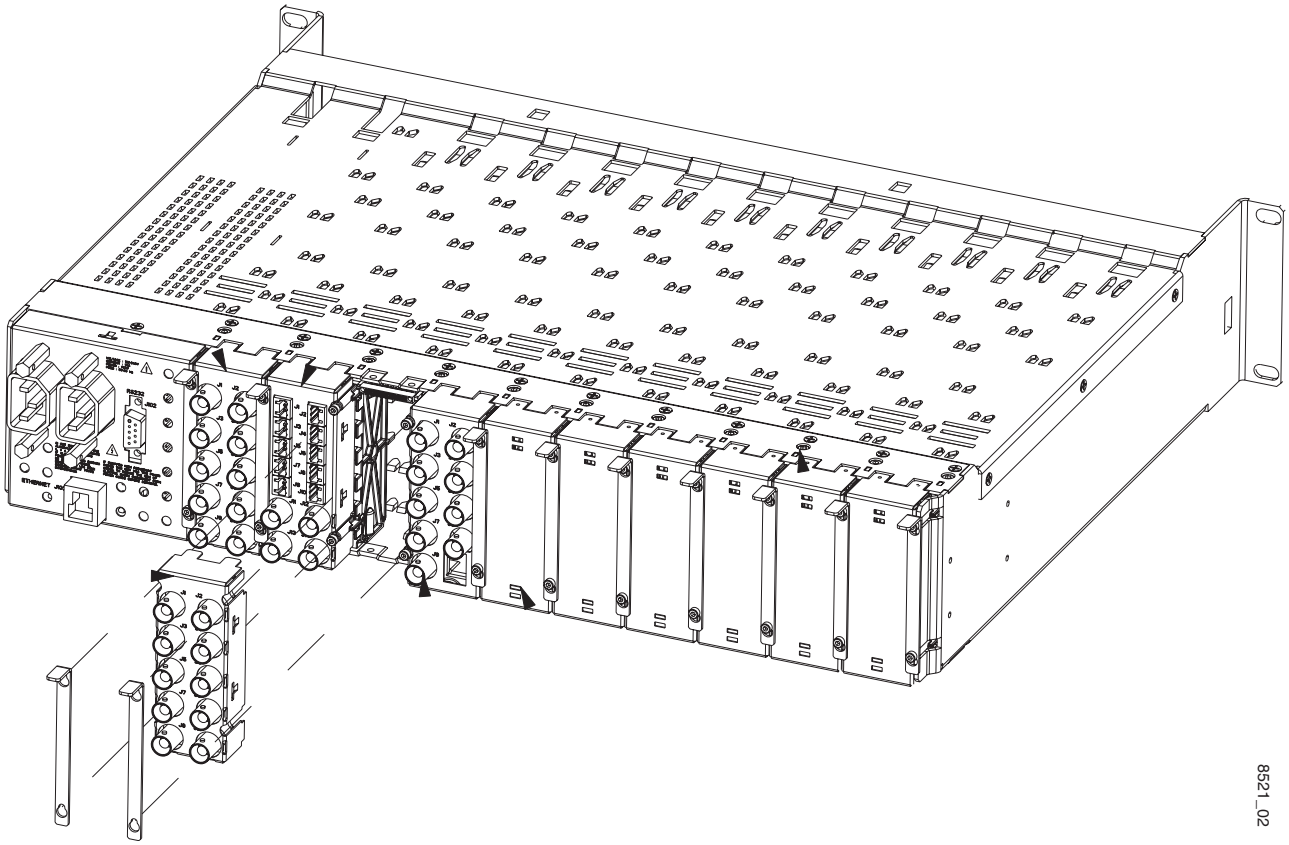
Rear Module Installation

Note Do not completely remove the screws holding the retainer strips as they can fall into other equipment and create a shorting hazard.

To install a rear module into the frame, follow these steps:

1. Unscrew the blank rear adapter cover (without removing the screws), with a 2mm (5/64") hex screwdriver (see Figure 2).
2. Remove the two retainer strips and the blank rear adapter cover using a pair of needlenose pliers.
3. Insert the corresponding rear module in the slot.
4. Replace both retainer strips on each side of the rear module and tighten the screws to secure the rear module.

Figure 2. Frame Rear



Note To extract the rear module, remove the front module first.

8900GEN-SM Genlock Submodule Installation

Conditions

Before installing the 8977AP 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 *8900GEN-SM GeckoFlex Genlock Instruction Manual* available online for a complete overview of using the genlock reference.

In addition to the capability of providing a local external reference to this specific 8977AP module with an 8900GEN-SM submodule installed, slots 1 and 3 of the GeckoFlex Frame have been specifically designed to distribute an independent frame bus reference transmitted from the 8900GEN-SM submodule mounted on another GeckoFlex module with this capability configured for this purpose.

If another module with a genlock submodule installed 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 8977AP module. In this case, the 8977AP module 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 8977AP with an 8900GEN-SM submodule can have a local external reference connected to the corresponding Reference In BNC. This external timing reference will be fed to this specific 8977AP module only.
- Frame Reference 1 or 2 – when an 8977AP 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 Reference In BNC 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.
- Internal – when no 8900GEN-SM submodule is installed on the 8977AP module, the Output Timing can be set to Internal so the output timing will be in an internal freerun mode (delivered by a local oscillator).

Note The internal mode is mainly implemented for test and debug purposes during the system setup of the module or in a standalone configuration where no timing reference is required.

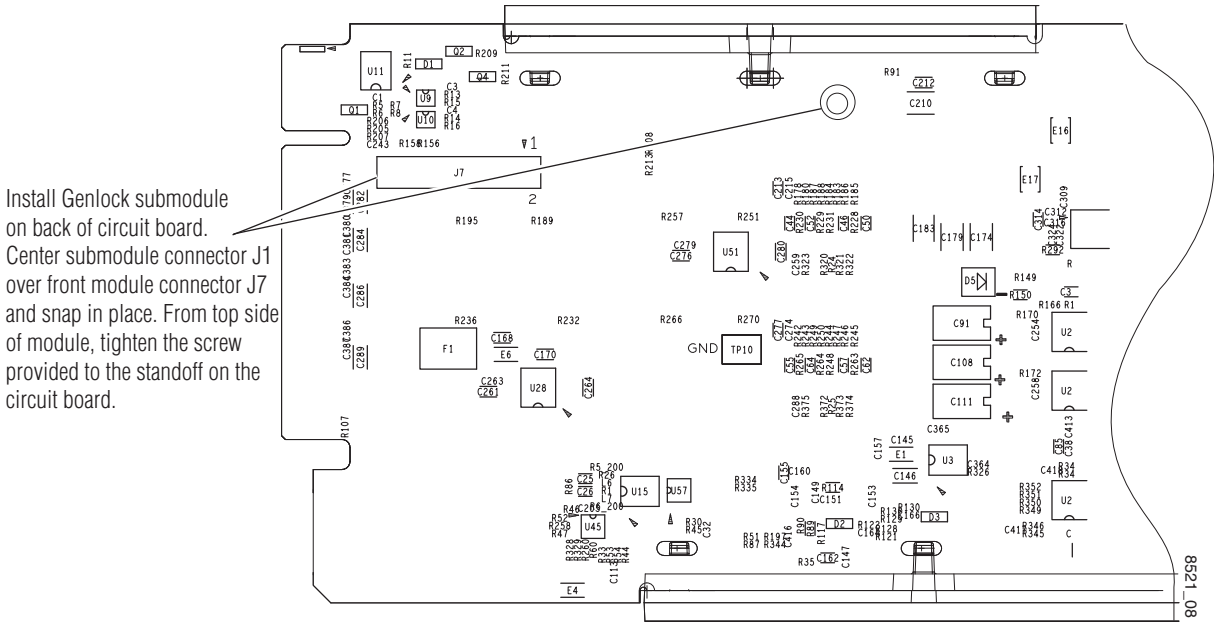
Installation

The 8900GEN-SM 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 J7, on the back side of the 8977AP circuit board (Figure 3).
2. Line up the connector on the submodule, J1, with J7 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 captive screw provided from the top of the front module to the standoff on the submodule circuit board.

Figure 3. Installing 8900GEN-SM Genlock Submodule



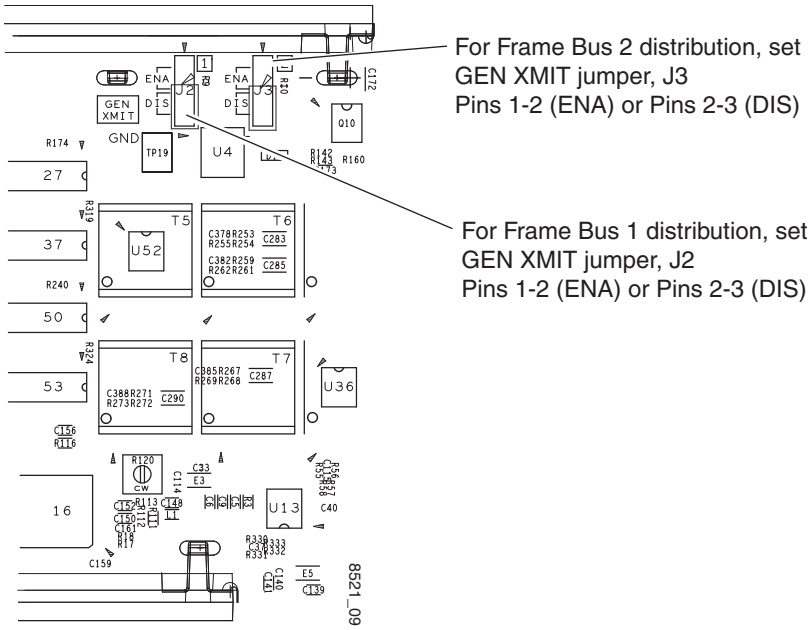
Frame Bus Jumpering

If you will be using this 8977AP module to distribute reference Frame Bus 1 (slot 1) or Frame Bus 2 (slot 3), you must set a jumper (GEN XMIT shown in Figure 4) on the front module circuit board for this purpose before installing the module.

- Frame Bus 1 – to transmit the reference connected to the Reference In BNC on the corresponding rear module on Frame Bus 1, set jumper J2 to **ENA** (pins 1-2). This module must be installed in slot 1 of the frame and configured on the Genlock web page (see the *Genlock Web Page* on page 49) for **Auto** in the Drive Frame Reference Bus pulldown.
- Frame Bus 2 – to transmit the reference connected to the Reference In BNC on the corresponding rear module on Frame Bus 2, set jumper J3 to **ENA** (pins 1-2). This module must be installed in slot 3 of the frame and configured on the Genlock web page (see the *Genlock Web Page* on page 49) 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, J2. The module in slot 3 will only read the status of jumper, J3.

Figure 4. Setting Frame Bus Jumpers

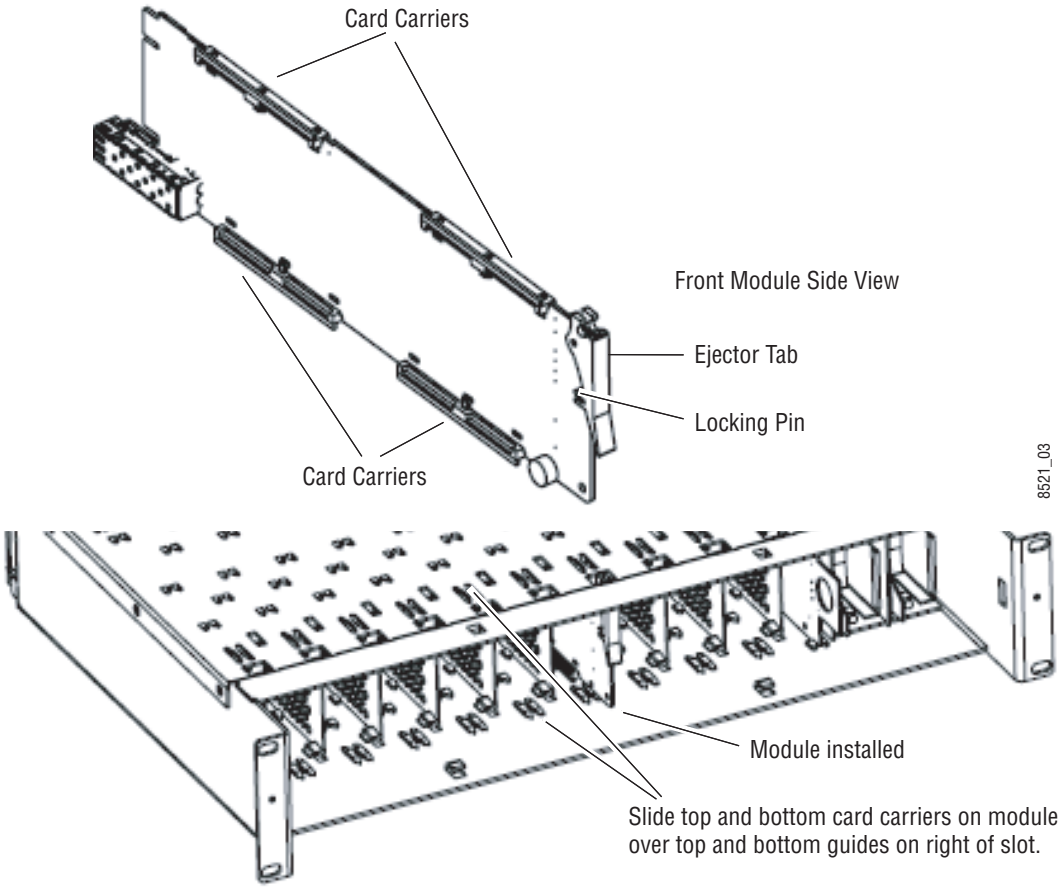


Front Module Installation

After installing the rear module and the 8900GEN-SM Genlock submodule if required, install the front module as follows:

1. Unscrew and remove the front cover.
2. Insert the front module in the guides of the corresponding slot.
3. The module ejector tab (Figure 5) must be locked in its locking pin.

Figure 5. Front Module Ejection



Cabling

Cabling to the 8977AP-4B and 8977AP-4U modules is done on the BNCs of the 8900UE-R rear module or the three pin connectors on the 8900BA-R rear module. Refer to Figure 6 (8900BA-R) and Figure 7 on page 17 (8900UE-R) for a detailed illustration of the rear connections.

The I/O Config web page (Figure 18 on page 31 for the 8977AP-4U and Figure 19 on page 32 for the 8977AP-4B) shows the inputs and the outputs assigned to the different connectors of the rear modules.

The 8977AP-4B and the 8977AP-4U outputs conform to the audio standards listed in the output specifications in Table 3 on page 56.

Figure 6 gives the inputs and the possible audio output connections for the 8977AP-4B modules. Balanced audio pinouts (+/-/ G) are also illustrated.

Note J10 and J12 are not used in this release.

Refer to Figure 7 on page 17 for the 8900UE-R inputs and outputs illustration.

Figure 6. 8900BA-R Rear Module

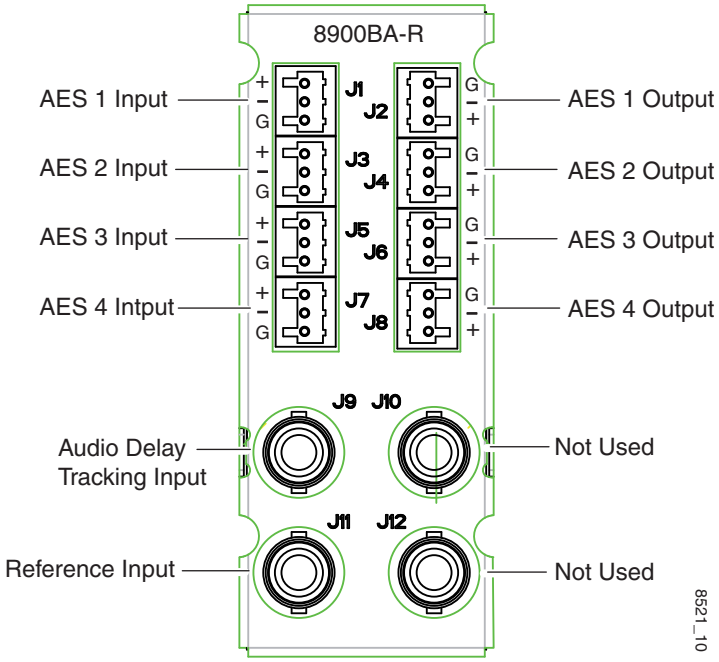
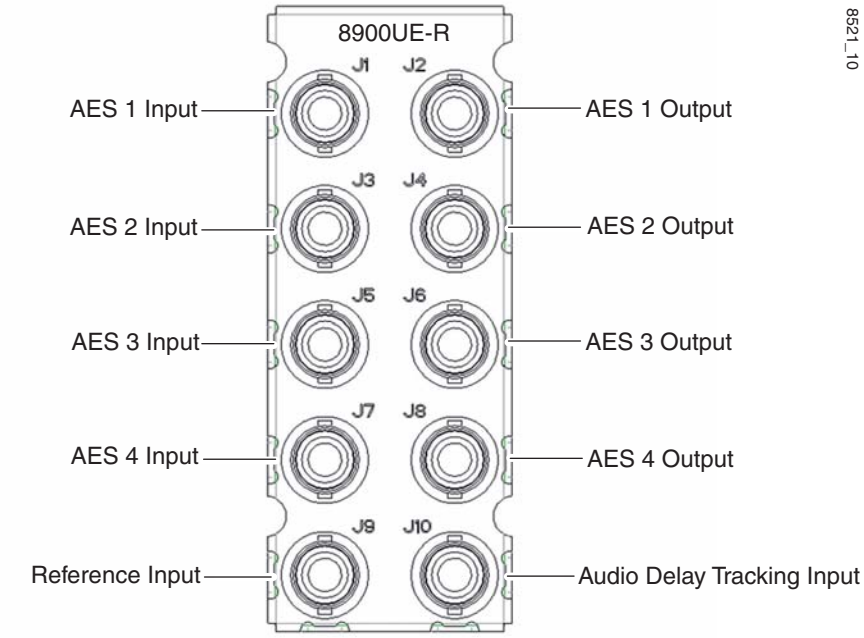


Figure 7. 8900UE-R Rear Module



Power Up

Upon power-up, the green PWR LED should light and the CONFIG, FAULT, and COMM LEDs should illuminate during the module initialization.

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

Operation Indicator LEDs

The on-board LED indicators on the front of the module are illustrated in Figure 8. Refer to Table 1 on page 20 to see a complete list of possible operating conditions and the resulting indicator status of all LEDs.

Figure 8. LED Indicators - Front View of 8977AP Module

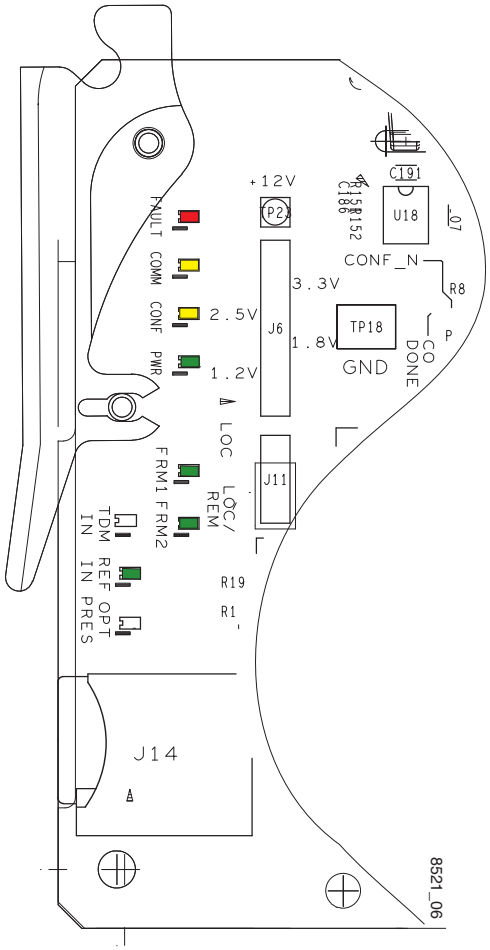
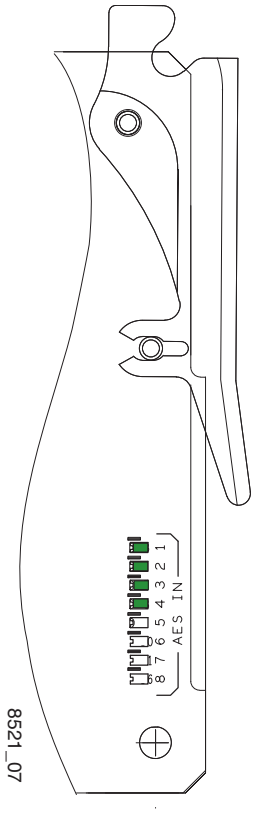


Figure 9 shows the AES IN (1 to 8) LEDs. With a present audio input signal connected, AES-IN (1 to 4) green LEDs should be on.

Note In this version, AES IN (5 to 8) LEDs are not used.

Figure 9. LED Indicators - Back View of the 8977AP module



A red FAULT LED indicates an error situation and, when noted with the other indicator LEDs, can indicate a specific problem area. Table 1 describes signal output and LED indications.

Table 1. LED Indicators

LED	Indication	Condition
FAULT (red)	Off	Normal operation
	On continuously	Module has detected internal fault.
	Flashing	Configuration problems or checking inputs and settings or missing audio
COMM (yellow)	Off	No activity on frame communication bus
	On continuously	Locate Module Command
	Flashing	Activity present on the frame communication bus
CONF (yellow)	Off	Module is in normal operation mode
	On continuously	Module is initializing, changing operating modes, or programming hardware
PWR (green)	Off	No power to module or modules DC/DC converter failed
	On	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
TDM IN	N/A	Not used in this version
REF IN (green)	Off	The frame reference input coax is not present on the BNC Ref In or signal is not locked
	On	The frame reference input coax is present on the BNC Ref In and signal is locked
OPT PRES	N/A	Not used in this version
AES IN 1-4 (green)	Off	No AES input signal detected
	On	One or more AES input signal detected
AES IN 5-8 (green)	N/A	Not used in this version

Remote Configuration

The 8977AP-4B and 8977AP-4U configuration and monitoring is performed using a web browser GUI interface or a networked Newton Control Panel in the GeckoFlex frame (8900FFN). Each of these interfaces is described below.

8900NET Module Information

Refer to the 8900NET Network Interface Module Instruction Manual from 4.0.2 version for information on the 8900NET Network Interface Module and setting up and operating the GeckoFlex 8900 frame network.

Note Upgrade software and instructions for the 8900NET can be downloaded from the Grass Valley web site. Refer to *Contacting Grass Valley* *on page 4*.

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.

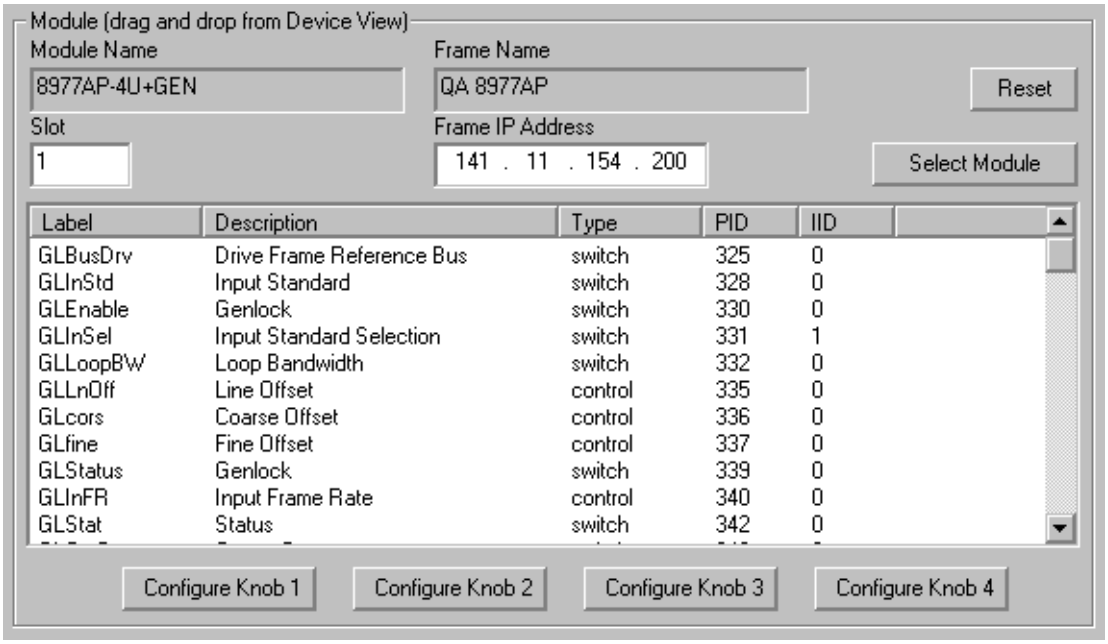
Control panel access offers the following considerations for module configuration and monitoring:

- 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 Some module functions are not available with the Newton Control Panel, such as factory default recalls.

An example of the Newton Configurator is shown in Figure 10.

Figure 10. Newton Configurator Example



Note A table of the Newton parameters is given in the Configuration Parameters appendix on page 61.

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:

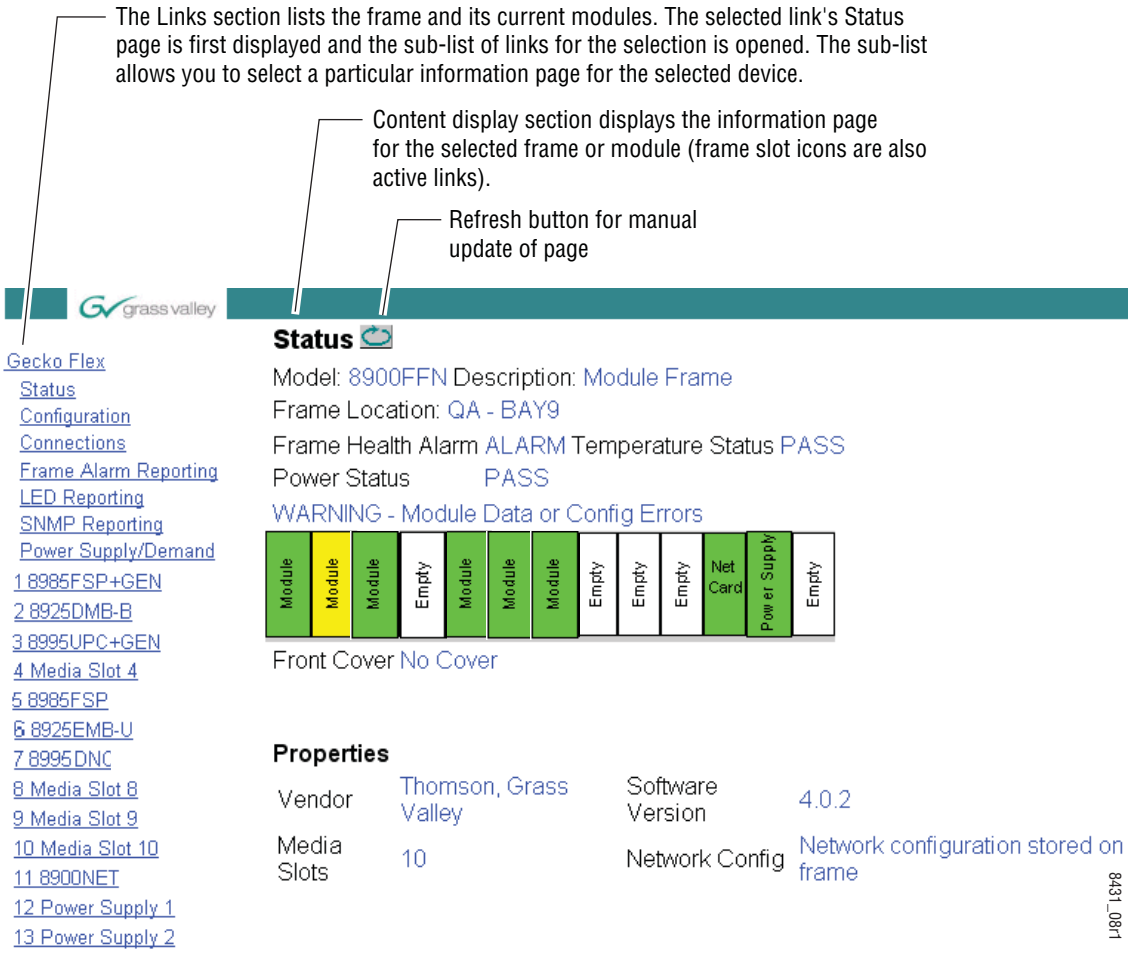
- Provides complete access to all module status and configuration functions, including naming of inputs and outputs, factory parameter and name default recalls, E-MEM functions, slot configurations and SNMP monitoring controls.
- Web access will require some normal network time delays for processing of information.
- Configuration parameter changes may require pressing **Enter**, upload processing time, and a manual screen refresh to become effective.
- Using the Web interface is 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 11. 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 8900NET version 4.0.2.

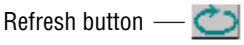
For information on status and fault monitoring and reporting shown on the Status page, refer to the *Status Web Page* on page 28.

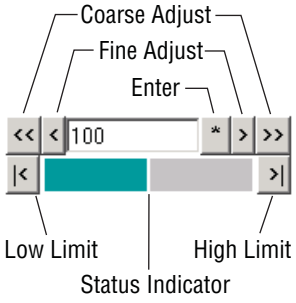
Figure 11. GeckoFlex Frame Status Web Page

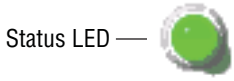


Note The **Refresh** button must be clicked to update the page after any changes.

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 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 (presence of one warning), configuration mismatched or input missing.
  - Red = Fault condition detected (presence of one alarm).
- Graphic and arrow colors used indicate the following:
  - Green = Pass – signal or reference present, no problems detected.
  - Red = Fault – fault condition.
  - Yellow = Warning – signal is absent or has errors.
  - Gray = Not monitored.
  - White = Empty or not present.

- Text colors indicate:
  - Black: Parameter names and information which can be modified.
  - Blue: Read-only information about the module.
  - Red: Warning.

Web Page Headers

Each web page has a Status and Identification Header as shown in Figure 12 (8977AP-4U) and Figure 13 (8977AP-4B) below.

The header information on each web page (except Genlock web page) includes the following:

- **Model** and **Description** are read-only generated by the module.
- **Frame Location** is defined on the GeckoFlex frame configuration web page.
- **Slot** number reports the module's location in the frame.

Figure 12. Status Web Page Header – 8977AP-4U

Figure 13. Status Web Page Header – 8977AP-4B

When an 8900GEN-SM submodule is installed on either module, the header will appear a shown in Figure 14.

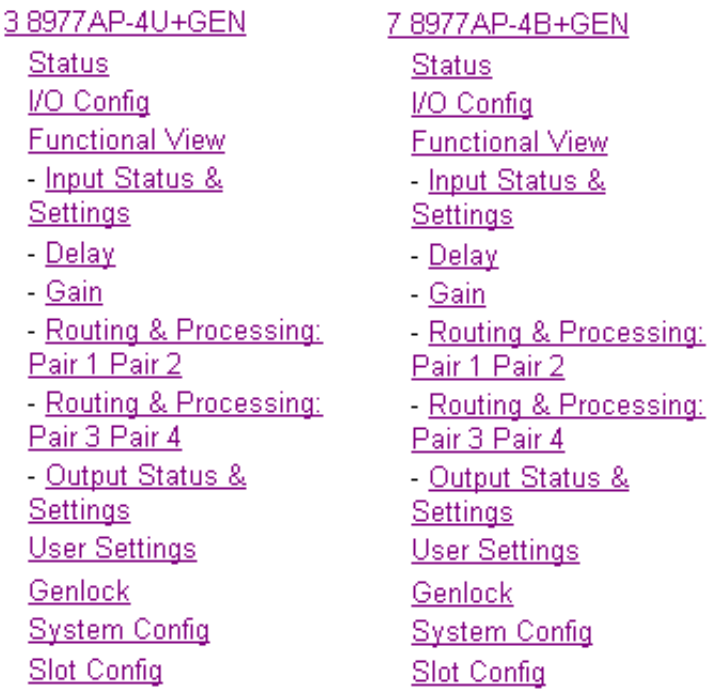
Figure 14. Status Web Page Header – 8977AP-4U+GEN

8977AP-4B and 8977AP-4U Links and Web Pages

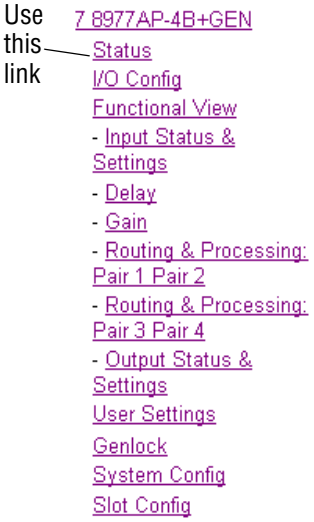
The web interface 8900 GUI provides the following links and web pages for the 8977AP-4B and 8977AP-4U modules (Figure 15 on page 27):

- Status web page – reports input and output signals and frame bus communication status and module information (page 28),
- I/O Config web page – shows the rear module layout and presence of the signals on a specific connector, allows naming of each input and enables or disables the signal reporting (page 31),
- Functional View web page – provides a graphical block diagram of the configuration pages for the module with links to web pages (page 33),
- Input Status & Settings web page – reports information about the audio stream, the delay tracking and the genlock inputs (page 34),
- Delay web page – allows the adjustment of the delay on each stream and/or each audio channel, enables or disables the delay tracking and displays the total delay (page 36),
- Gain web page – allows the adjustment of the audio gain, gives the level of presence and clipping (page 38),
- Routing & Processing Pairs web page – describes the process on the inputs (page 40),
- Output Status & Settings web page – enables or disables the AES CUV bits pass through and sets AES resolution (page 43)
- 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 46),
- Genlock web page – appears only 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 49),
- System Config web page – sets output timing source, Reference Restore parameters and Primary and Secondary Phase Difference (page 52), and
- Slot Config web page – provides Locate Module, Slot Identification and Slot Memory functions along with links to the frame alarm configuration web page (page 54).

Figure 15. 8977AP Web Page Links



Status Web Page



The Status web page (Figure 16 on page 29 for the 8977AP-4U with an 8900GEN-SM submodule installed and Figure 17 on page 30 for the 8977AP-4B with no submodule) shows the signal status of the input signal(s) and communication with the frame bus. Color coding of the display indicates the signal status. Refer to *Web Page Operations and Functional Elements* on page 24 for an explanation of the color coding. The contents of the web page header is explained on page 25.

Module Physical Structure

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

- Audio inputs – indicate the status of the four audio inputs (BNC or 3-pins connectors).
- DT Input – indicates the status of the audio delay tracking input.
- Ref 1 and Ref 2 In (from frame) – the Ref 1 arrow will be green when Frame Bus 1 has been enabled on the module in slot 1. The Ref 2 arrow will be green when Frame Bus 2 has been enabled on the module in slot 3 of the frame.
- Frame Bus – indicates the status of the communication bus to the 8900NET module.
- Genlock Ref In – indicates the status of the external genlock reference signal on the BNC.
- Local Ref – indicates the status of the internally generated genlock reference signal from the 8900GEN submodule to the front module.
- Ref Out – if the module is installed in slot 1, Ref 1 out is directed to the Ref 1 In. If the module is installed in slot 3, Ref 2 out is directed to the Ref 2 In.

On the Status web page any alarm or warning states will cause a warning message to appear in the double bars area below the graphic.

Note The color of the LED status is managed by the 8900NET accordingly to the alarms status.

Status

The front, rear, and Genlock (if present) modules status is given: PASS, WARNING, ERROR or EMPTY.

Front Module

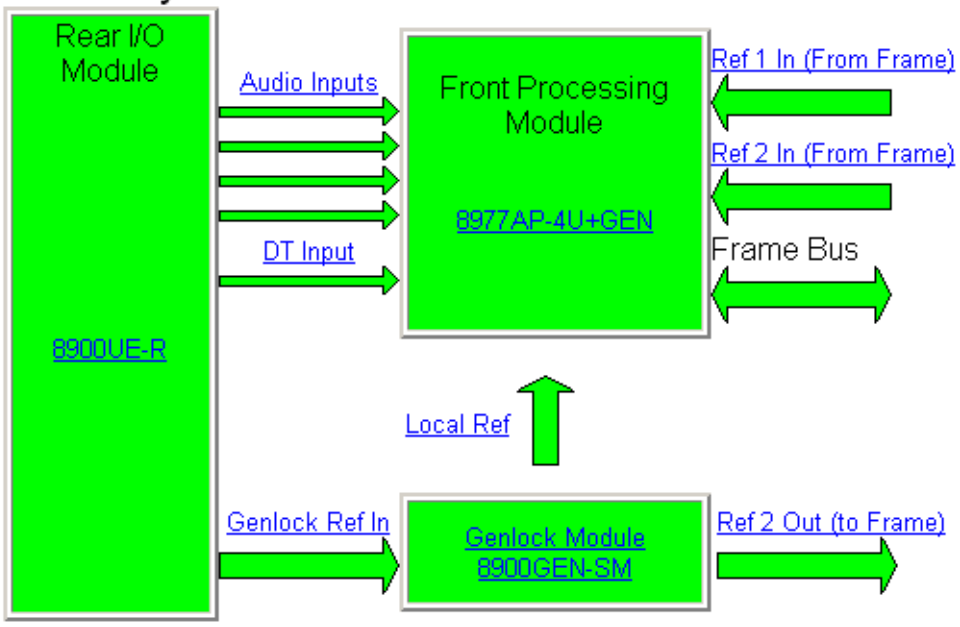
There are information about the module, such as Part Number, Serial Number, Hardware Revision, Package version, Firmware Version, Software Version, Boot Version and Asset Tag number are given in a properties section at the bottom of the Status web page.

Figure 16. Status Web Page for 8977AP-4U + GEN Module

Status

Model: 8977AP-4U+GEN Description: Digital Audio Proc 4 Unbal I/O
Frame Location: not assigned , Slot: 3
Output Timing Source: Ref 2

Module Physical Structure



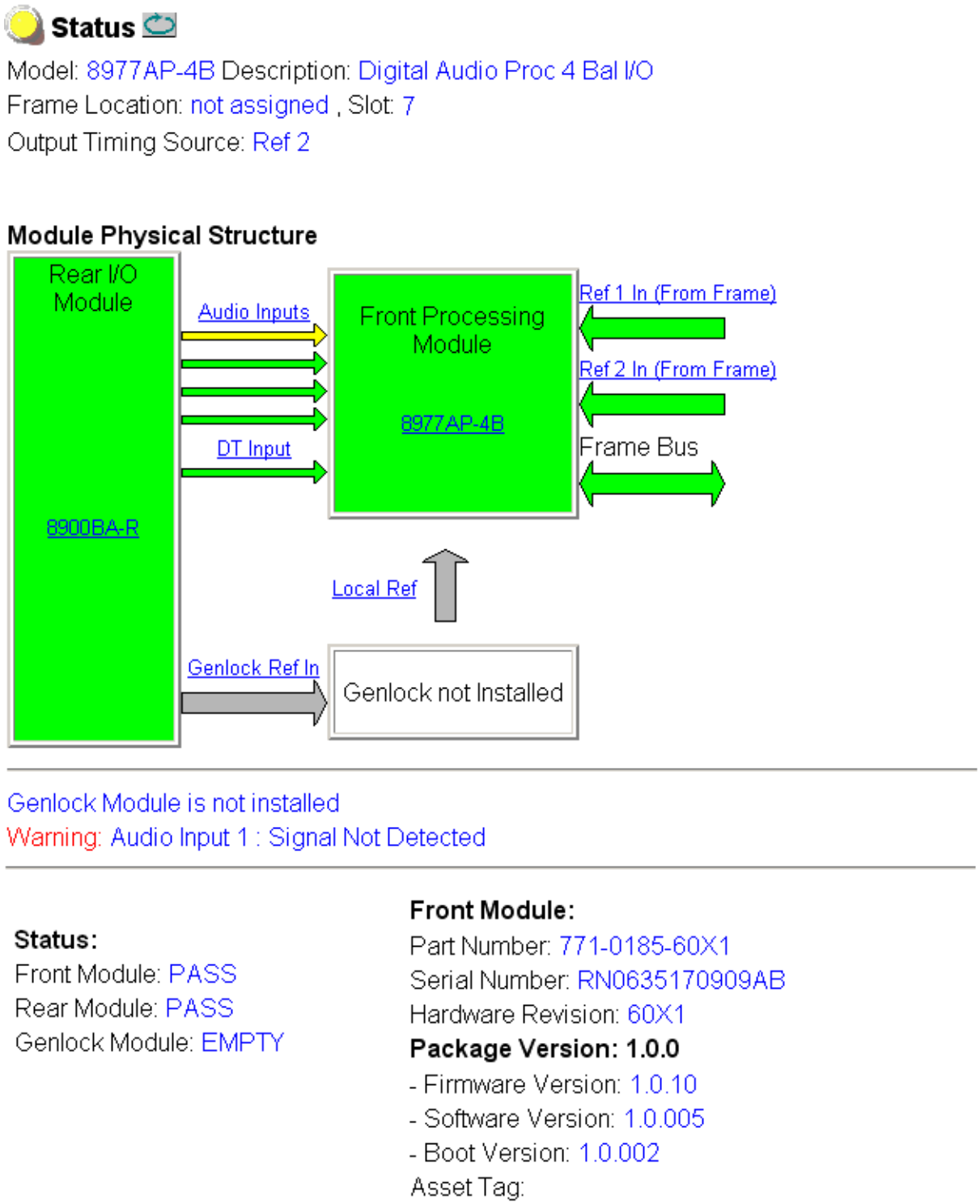
Status:
Front Module: PASS
Rear Module: PASS
Genlock Module: PASS

Front Module:
Part Number: 771-0185-
Serial Number:
Hardware Revision:
Package Version: 1.0.0
- Firmware Version: 1.0.10
- Software Version: 1.0.005
- Boot Version: 1.0.002

Asset Tag:

The Status web page in Figure 17 illustrates the 8977AP-4B with a missing audio input and no submodule installed. Note the message and warning between the double lines below the graphic and the color of the Status LED.

Figure 17. Status Web Page for 8977AP-4B Module



I/O Web Page

Use this link

- 7 8977AP-4B+GEN
- Status
- I/O Config
- Functional View
- Input Status & Settings
- Delay
- Gain
- Routing & Processing: Pair 1 Pair 2
- Routing & Processing: Pair 3 Pair 4
- Output Status & Settings
- User Settings
- Genlock
- System Config
- Slot Config

Use the I/O Config web page for the following:

Rear Module Configuration

All of the input and output connectors on the corresponding 8977AP-4U or 8977AP-4B 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 legend is under the table.
- **Reporting** – raises alarms and warnings. The Status Reporting can be enabled or disabled by selecting or deselecting the corresponding checkbox in the **Reporting** column for each input.

Figure 18 for the 8977AP-4U and Figure 19 on page 32 for the 8977AP-4B show the connectors of the two different rear modules available to cable balanced or unbalanced audios.

Note The outputs are not monitored in this application.

Figure 18. I/O Config Web Page for the 8977AP-4U

I/O Config

Model: 8977AP-4U+GEN Description: Digital Audio Proc 4 Unbal I/O
Frame Location: not assigned , Slot: 3
Output Timing Source: Ref 2

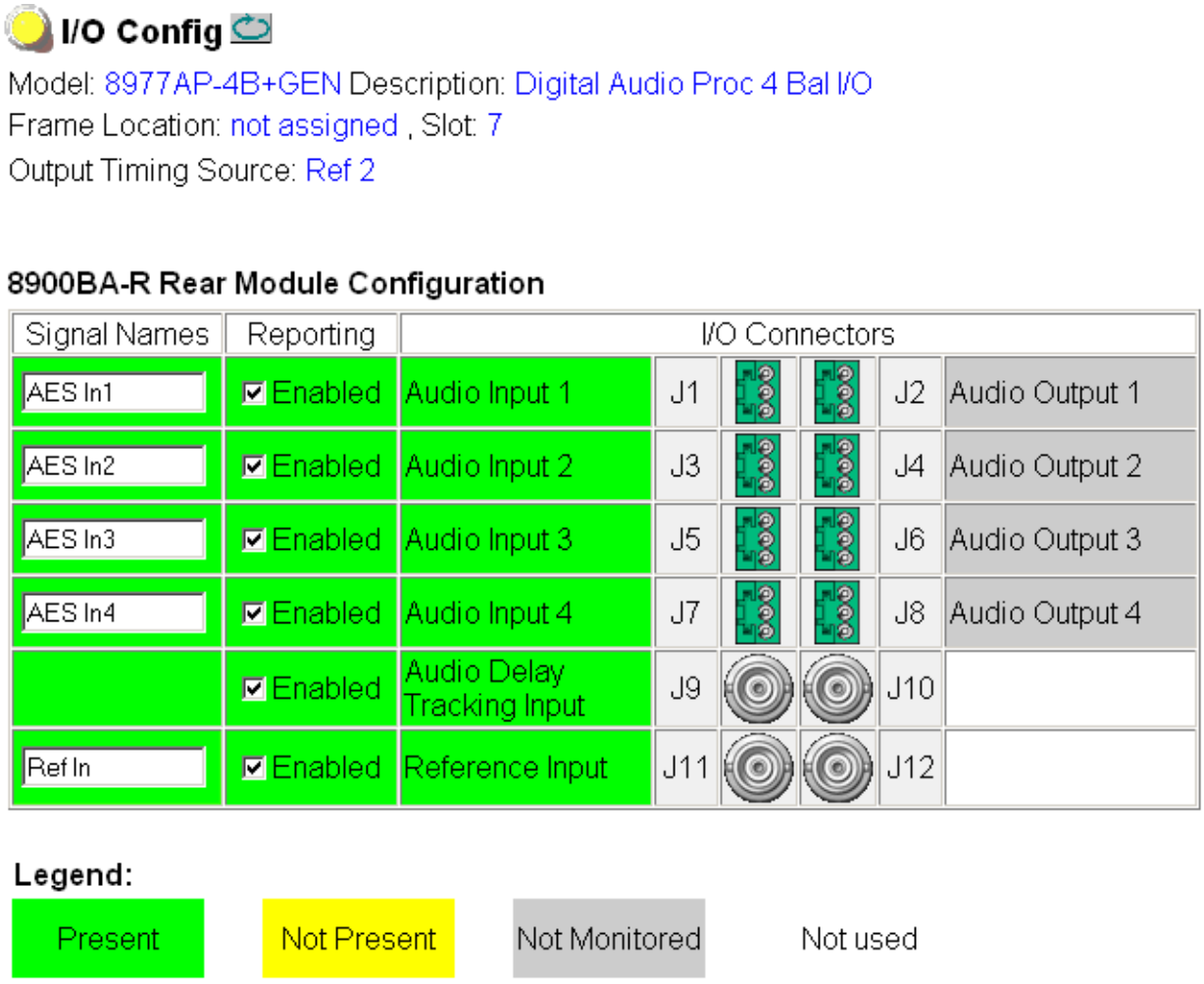
8900UE-R Rear Module Configuration

Signal Names	Reporting	I/O Connectors						Reporting
AES In1	☑ Enabled	Audio Input 1	J1			J2	Audio Output 1	
AES In2	☑ Enabled	Audio Input 2	J3			J4	Audio Output 2	
AES In3	☑ Enabled	Audio Input 3	J5			J6	Audio Output 3	
AES In4	☑ Enabled	Audio Input 4	J7			J8	Audio Output 4	
Ref In	☑ Enabled	Reference Input	J9			J10	Audio Delay Tracking Input	☑ Enabled

Legend:

Present | Not Present | Not Monitored | Not used

Figure 19. I/O Config Web Page for the 8977AP-4B



Functional View Web Page

Use this link

7 8977AP-4B+GEN
Status
I/O Config
Functional View
- Input Status & Settings
- Delay
- Gain
- Routing & Processing: Pair 1 Pair 2
- Routing & Processing: Pair 3 Pair 4
- Output Status & Settings
User Settings
Genlock
System Config
Slot Config

The Functional View web page (Figure 21) illustrates a block diagram of the 8977AP front module showing module functions and signal paths that are active or inactive 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.

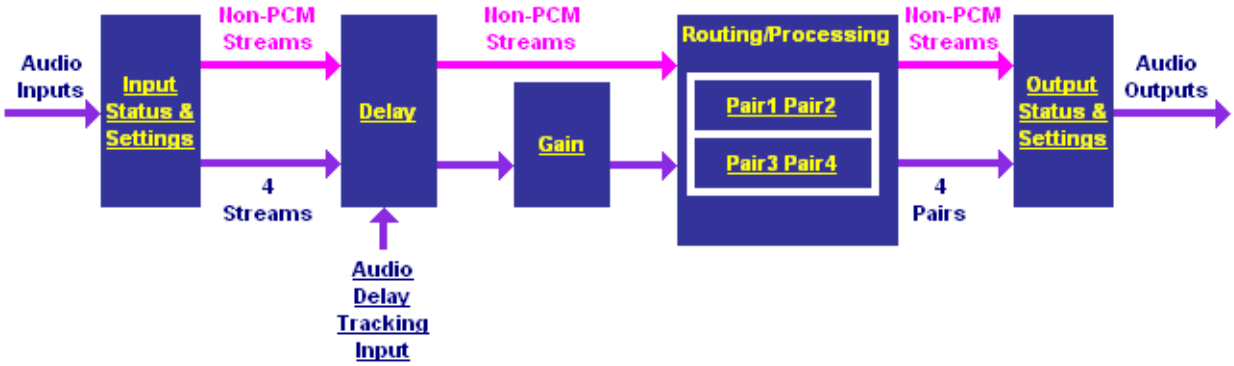
- Color coding indicates active functions and signal flow. Grayed components are inactive due to hardware and/or software constraints. Underlined module functions are links to the web page for that function.
- Use the Functional View to configure the 8977AP modules in the order of the signal flow.
- 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 links to move through the configuration web pages or return to the Functional View web page (Figure 20).

Figure 20. Navigation Links

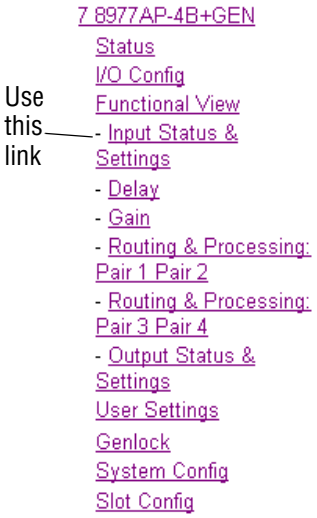
<< Previous | Functional View | Next >>

Figure 21 describes the front module processing as shown on the Functional View web page.

Figure 21. Functional View Web Page



Input Status and Settings Web Page



Use the Input Status and Settings web page (Figure 22 on page 35) for the following:

Audio Inputs

- **Input Stream 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 signal Present or Not Present.
- **Sample Rate** – indicates the rate of the audio input stream.
- **Mode** – reports the number of bits: 16, 20, or 24 bits.
- **Audio Mode Status** – shows the audio mode: PCM or Non-PCM.
- **Force Audio Mode** – chooses the audio mode: PCM (Pulse Code Modulation – a method of storing and transmitting uncompressed digital audio), Non-PCM (non-audio data such as Dolby E or data), or Sync PCM (audio that already has a 48 kHz sample rate).

Note When a Force Audio Mode selection is changed, you must manually set the **AES CUV Bits Pass Through** control to **Enabled** or **Disabled** as desired on the *Output Status and Settings Web Page* on page 43.

- **AES Error Detected** – reports any errors detected since the last time the error status was cleared (**Errors** or **None**).

Delay Tracking Input

- **Name** – this name cannot be modified.
- **Signal State** – this field reports the status of the delay tracking input signal as Present or Not Present.
- **Link** – select this link to go to the Delay web page.

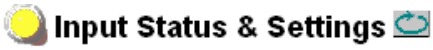
Genlock Input

- **Name** – the genlock input name defined on the I/O Config web page will appear in this field.
- **Signal State** – this field reports the status of the input signal Present, Not Present or Not Supported.
- **Link** – select this link to go to the Genlock web page.

Defaults Button

Select the **Defaults** button to restore the default Input signal source.

Figure 22. Input Status and Settings Web Page



Input Status & Settings

Model: 8977AP-4U+GEN Description: Digital Audio Proc 4 Unbal I/O
Frame Location: not assigned , Slot: 3
Output Timing Source: Ref 2

Audio Inputs

Input Stream Name	Signal State	Sample Rate	Mode	Audio Mode Status	Force Audio Mode	AES Errors Detected	
AES In1	Not Present	----	------	------	PCM	---	Reset
AES In2	Not Present	----	------	------	Non-PCM	---	Reset
AES In3	Present	48kHz	16 Bit	PCM	Sync PCM	Errors	Reset
AES In4	Present	48kHz	16 Bit	PCM	Sync PCM	Errors	Reset
							Reset All

Delay Tracking Input

Name	Signal State	Link
Delay Tracking Input	Present	Delay Page

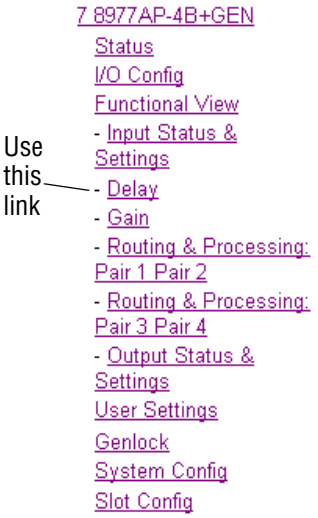
Genlock Input

Name	Signal State	Link
Ref In	Not Present	Genlock Page

Defaults

Functional View | Next >>

Delay Web Page



Use the Delay web page (Figure 23 on page 37) for the following:

- **Input Stream** – name of the input.
- **Input Name** – name given in the I/O Config web page.
- **Delay Adjust** – setting delay adjustments for each channel of the four streams.
- **Delay both ch1&ch2** – setting delay adjustments for both channels together of the four streams.
- **Tracking Delay** – enable or disable the delay tracking. The amount of delay tracking input status will be reported for each audio stream.
- **Total Delay** – the total amount of delay (Delay Adjust + Tracking Delay) will be reported in the Total Delay field for each audio stream.

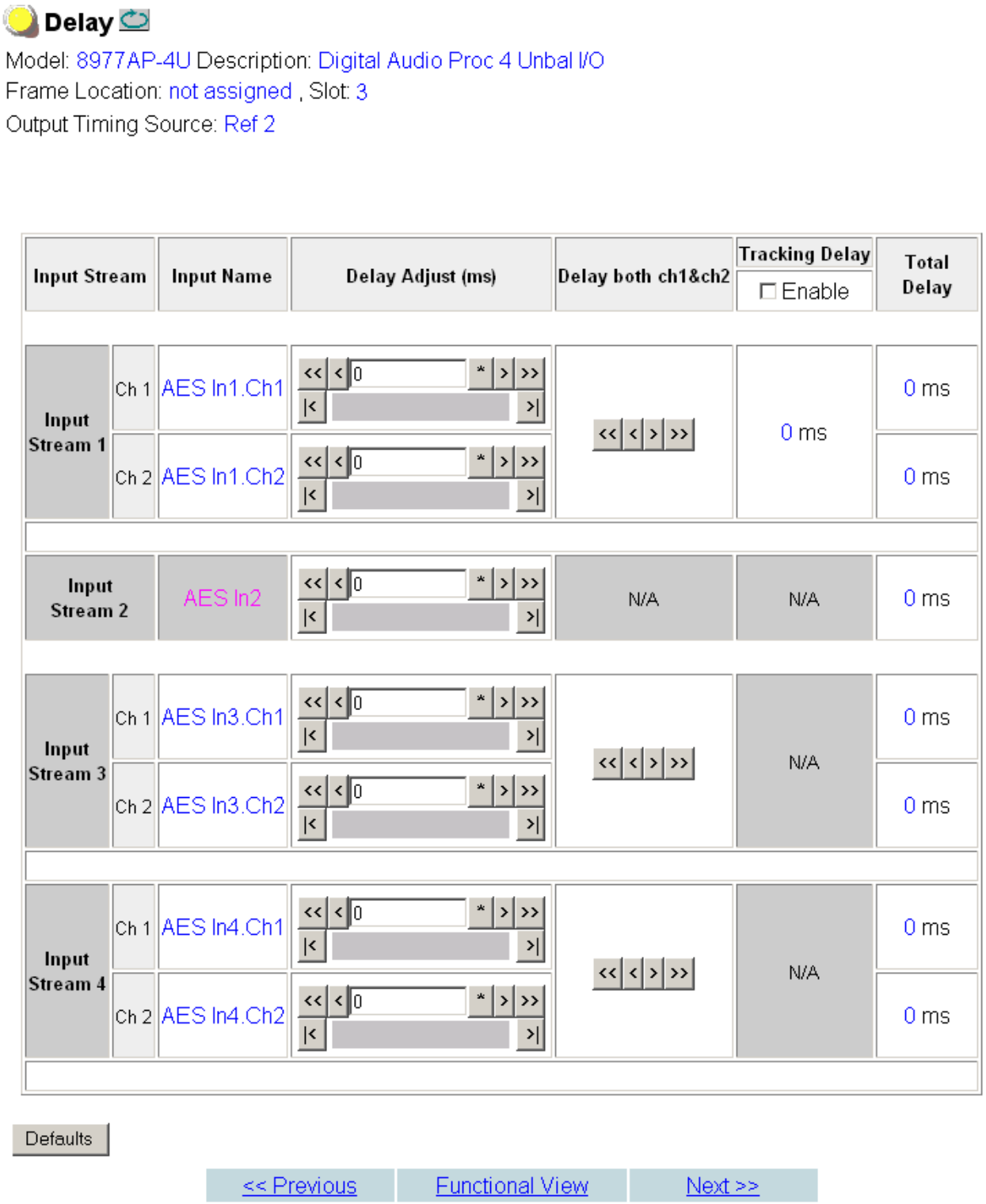
Note When a delay has been applied to a channel on a stream, removing and reinserting the module or disconnecting and reconnecting the audio input may cause a disturbance on the undelayed channel or stream for a period equal to the delay.

In the case of a Non-PCM audio (input stream 2 as shown in Figure 23 on page 37), a delay may only be applied on the stream. Channel delay shift is not available. The input name is reported in pink.

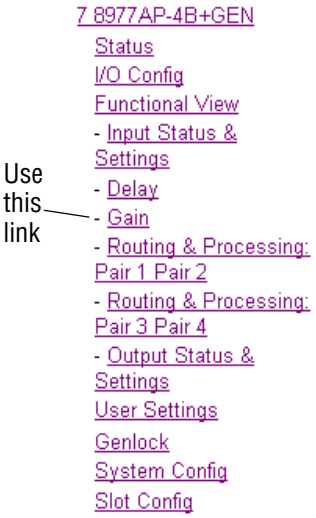
In the case of Sync PCM audio (input streams 3 and 4 in Figure 23 on page 37), no tracking delay is applied and the function is grayed out.

Note If a Non-PCM audio signal is detected and another audio mode is forced, a warning “Input Stream is detected as Non-PCM” appears between the input streams (not shown).

Figure 23. Delay Web Page



Gain Web Page



Use the Gain web page (Figure 24 on page 39) for the following:

- **Input Stream** – name of the input stream.
- **Input Name** – name given in the I/O Config web page.
- **Gain Adjust** – adjustment for the selected channel.

Note Gain cannot be adjusted for channels set as Non-PCM.

- **Gain both ch1&ch2** – adjusts both channels in a stream for the same amount of gain.
- **Presence** – the level status of each audio channel is reported as True or False in the read-only channel status displays. If the level is > -40dBFS, the presence will be reported as **True**.
- **Clip** – the clipping of each audio channel is reported as **True** or **False** in the read-only channel status displays. If the level is > -0.5dBFS, the clipping will be reported as **True**.

Figure 24. Gain Web Page

Gain

Model: 8977AP-4U Description: Digital Audio Proc 4 Unbal I/O
Frame Location: not assigned , Slot: 3
Output Timing Source: Ref 2

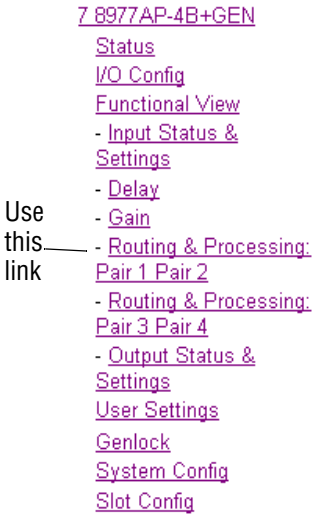
Input Stream		Input Name	Gain Adjust (dB)	Gain both ch1&ch2	Presence	Clip
Input Stream 1	Ch 1	AES In1.Ch1	0.0		False	False
	Ch 2	AES In1.Ch2	0.0		False	False
Input Stream 2		AES In2	N/A	N/A	N/A	N/A
Input Stream 3	Ch 1	AES In3.Ch1	0.0		False	False
	Ch 2	AES In3.Ch2	0.0		False	False
Input Stream 4	Ch 1	AES In4.Ch1	0.0		False	False
	Ch 2	AES In4.Ch2	0.0		False	False

Note: Presence (True) is > -40 dBFS, Clip (True) is > -0.5 dBFS

Defaults

<< Previous | Functional View | Routing & Processing: Pair 1 Pair 2 >>
Routing & Processing: Pair 3 Pair 4 >>

Routing & Processing Pairs Web Page



Use the Routing & Processing Pairs web pages (Figure 25 on page 41 for Pair 1 and Pair 2 and Figure 26 on page 42 for Pair 3 and Pair 4) for the following:

- **Input Channel Selection** – name assigned on the I/O Config web page.
- **Processing** – set the output processing for each channel (A and B) for each audio pair (Pair 1 to 4) with the Processing pulldown to one of the following output conditions:
  - A - selects the audio present on A as the channel output.
  - -A - inverts the audio present on A as the channel output.
  - B - selects the audio present on B as the channel output.
  - -B - inverts the audio present on B as the channel output.
  - A + B - audio present on A and B are added together as the channel output.
  - -(A + B) - audio present on A and B are added together then inverted as the channel output.
  - A - B - audio present on B is subtracted from audio on A as the channel output.
  - - (A-B) - audio present on B is subtracted from audio on A then inverted as the channel output.
  - 1 kHz - places a 1 kHz (at -20 dBFS) tone on the channel output.
  - 400 Hz - places a 400 Hz (at -20dBFS) test tone on the channel output.
  - Silence - forces the channel output to silence.
  - ID - identifies Channels A and B with a 1 kHz tone at a -20dBFS level that switches between Channel A and Channel B with a repeating cadence of 1 second on Channel A (left) followed by a 3 second tone on Channel B. Each pair from 1-4 is indicated by that number of bursts of 400 Hz at an 8 Hz rate when the 1 kHz tone starts on a new channel.

Note An output processing mode cannot be selected on a channel with Non-PCM audio and processing will be forced to bypass as shown in Figure 25 on page 41.

- **Output Pairs** – Output names.

Figure 25. Routing & Processing Pairs Web Page – Pair 1 and Pair 2

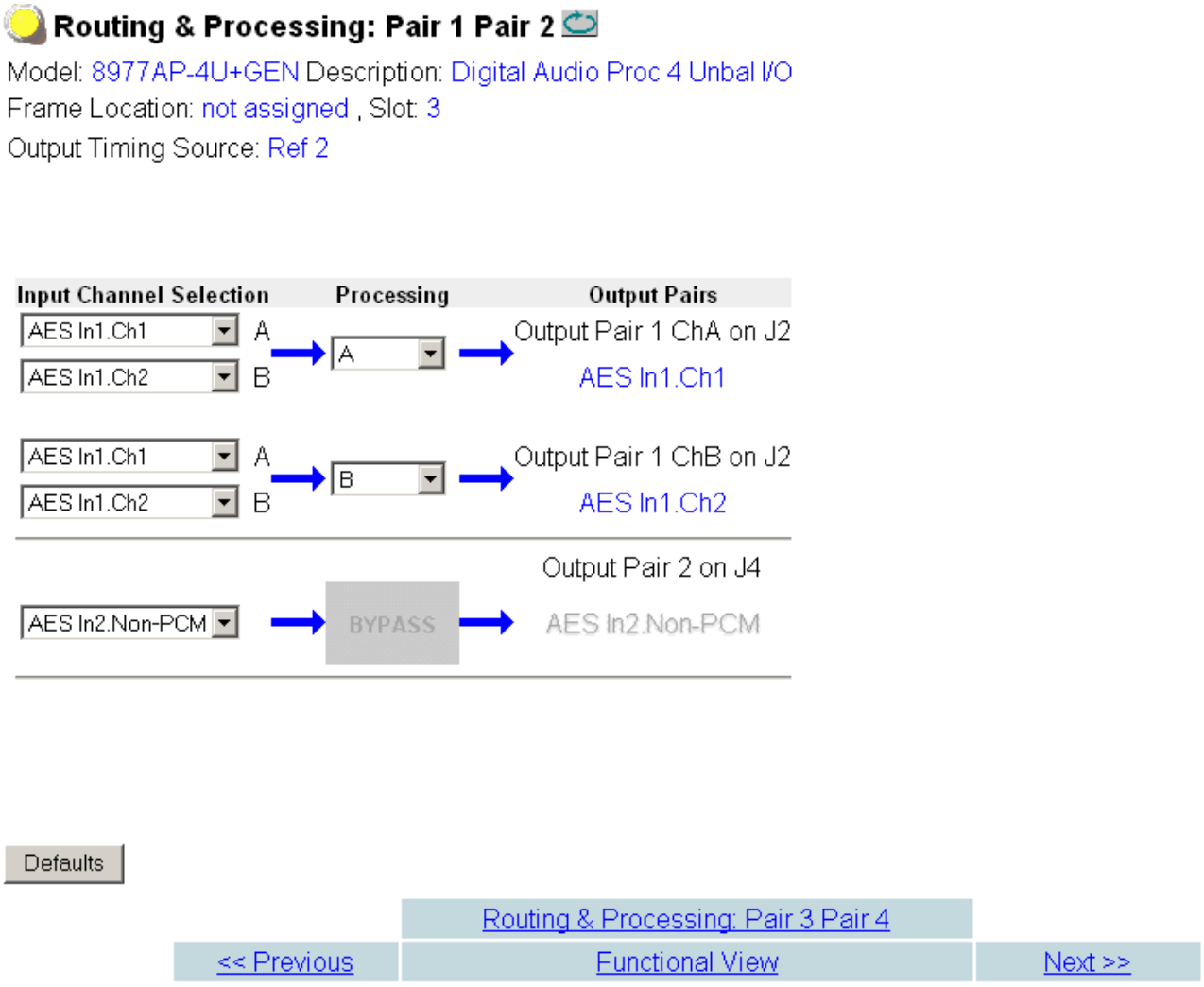
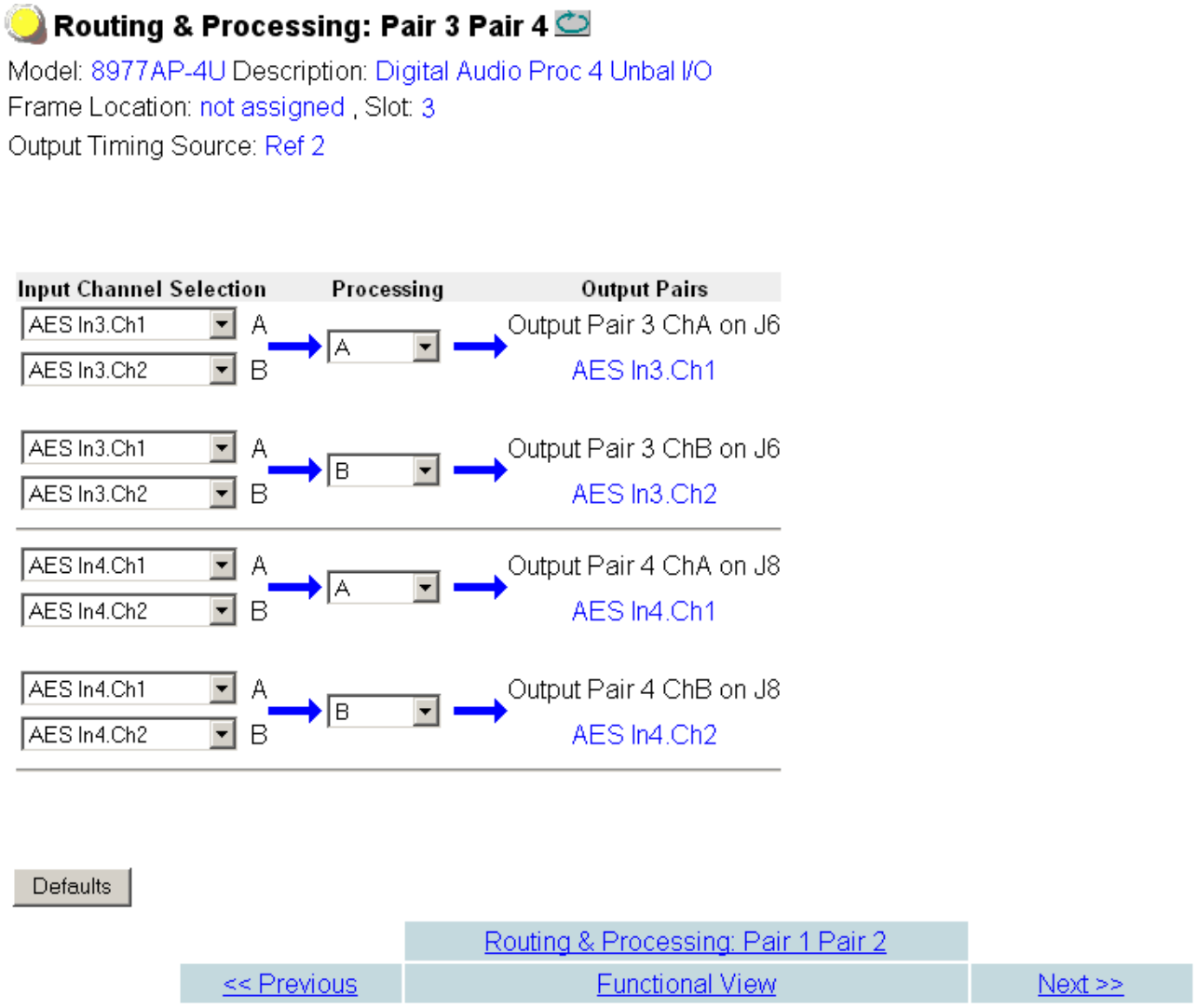
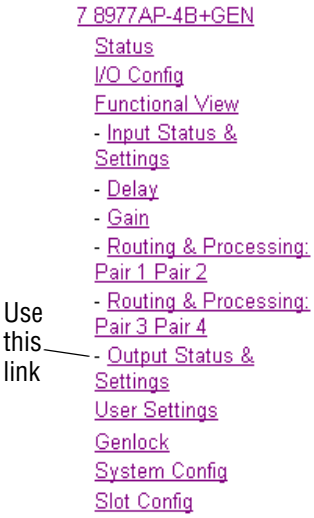


Figure 26. Routing & Processing Pairs Web Page – Pair 3 and Pair 4



Output Status and Settings Web Page



Use the Output Status and Settings web page (Figure 27 on page 45) to monitor the audio outputs and to set the **AES CUV Bits Pass Through** and the **AES Resolution** controls.

- **Processed Stream Name** – displays the name for each channel.
- **AES CUV Bits Pass Through** – the control bits that are part of each subframe of AES data are defined as C (Channel status), U (User), and V (Valid) bits and the Z bit, which carries the AES block frame position block start. For the control and status bits in the CUV positions of each audio channel, and the Z marker for each stream (pair of channels), there is a buffer on the module that handles the asynchronous timebase slips between the input and output AES stream frequency.

  This buffer will drop or repeat an entire block (occurring every 192 samples) of CUV bits when the two timebases cross a block boundary rather than drop or repeat individual bits from the block.

  A control is provided on the AES Outputs web page for enabling or disabling the controls bits in an AES signal called the **AES C/U/V Bit Pass Through** (Figure 27 on page 45). These bits may be generated locally at the AES output of the module (Pass Through disabled) or taken from the AES stream coming from an audio input.

  - If the box is checked, refer to Table 2 on page 44.
  - If the box is not checked, the C bit is calculated.

Note When a Force Audio Mode selection is changed on the *Input Status and Settings Web Page* on page 34, you must manually set the **AES CUV Bits Pass Through** control to **Enabled** or **Disabled** as desired.

- **AES Resolution** –
  - If the **AES CUV Pass Through** box is checked, the AES Resolution is displayed **Non-Applicable** and the AES resolution is 24 bits.
  - If the **AES CUV Pass Through** box is not checked, the resolution can be chosen between 20 and 24 bits.

The module complies with all of the requirements listed below:

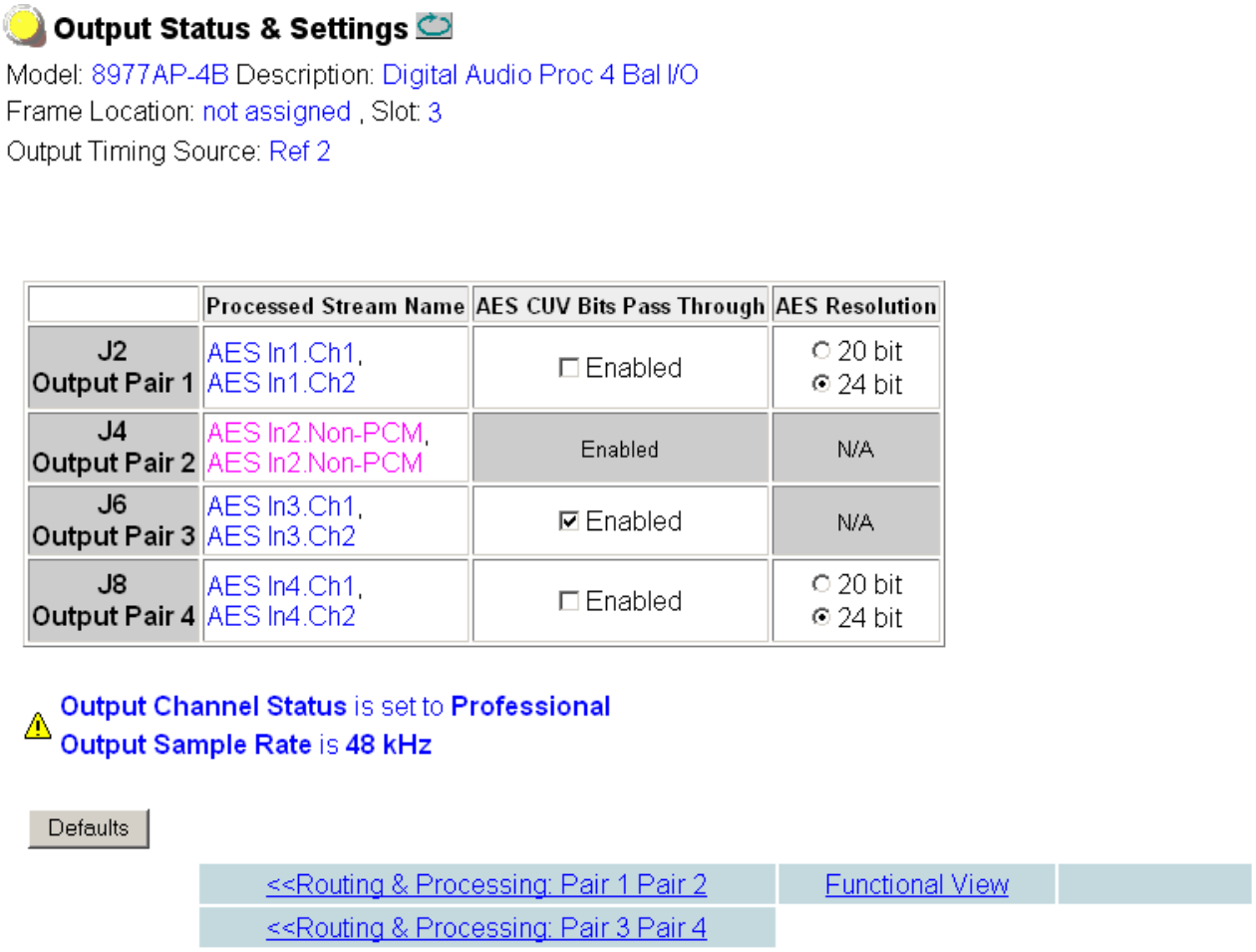
- When an audio input stream is processed and routed at the channel level, the CUV bit pass through mode is automatically disabled because the consistency of the channel status data cannot be ensured.
- The module always sets the Output channel status to PROFESSIONAL.
- The module always delivers a signal at an output sample rate of 48 kHz.

Table 2 reports the configuration capability and some channel status data fields related to configuration.

Table 2. AES Output Settings: Channel Status Data Handling

	PCM Mode 32 kHz	**PCM Mode 44.1 kHz**	**PCM Mode 48 kHz**	**PCM Mode 96 kHz**	**Non-PCM 48 kHz**	**Synchronous PCM 48 kHz**
Default Channel Status Data mode	CUV Bit Pass Though **Disable** AES Resolution **24 bits**	CUV Bit Pass Though **Disable** AES Resolution **24 bits**	CUV Bit Pass Though **Disable** AES Resolution **24 bits**	CUV Bit Pass Though **Disable** AES Resolution **24 bits**	CUV Bit Pass Though **Enable** AES Resolution **24 bits**	CUV Bit Pass Though **Disable** AES Resolution **24 bits**
Channel Status Data Setup	CUV Bit Pass Through **Enable/Disable** AES Resolution **20/24 bits**	CUV Bit Pass Through **Enable/Disable** AES Resolution **20/24 bits**	CUV Bit Pass Through **Enable/Disable** AES Resolution **20/24 bits**	CUV Bit Pass Through **Enable/Disable** AES Resolution **20/24 bits**	**Not Applicable**	CUV Bit Pass Through **Enable/Disable** AES Resolution **20/24 bits**
AES CUV Bit Pass Through **Enable** Output Channel status is **Consumer** in the incoming signal	Output channel status is Professional Output Sampling Frequency 32 kHz	Output channel status is Professional Output Sampling Frequency 44.1 kHz	Output channel status is Professional Output Sampling Frequency 48 kHz	Output channel status is Professional Output Sampling Frequency 96 kHz	Output channel status is Professional Output Sampling Frequency 48 kHz	Output channel status is Professional Output Sampling Frequency 48 kHz
AES CUV Bit Pass Through **Enable** Output Channel status is **Professional** in the incoming signal	Output channel status is Professional Output Sampling Frequency 32 kHz	Output channel status is Professional Output Sampling Frequency 44.1 kHz	Output channel status is Professional Output Sampling Frequency 48 kHz	Output channel status is Professional Output Sampling Frequency 96 kHz	Output channel status is Professional Output Sampling Frequency 48 kHz	Output channel status is Professional Output Sampling Frequency 48 kHz
AES CUV Bit Pass Through **Disable** Output Channel status is **Professional** in the incoming signal	Output channel status is Professional Output Sampling Frequency 48 kHz	Output channel status is Professional Output Sampling Frequency 48 kHz	Output channel status is Professional Output Sampling Frequency 48 kHz	Output channel status is Professional Output Sampling Frequency 48 kHz	Output channel status is Professional Output Sampling Frequency 48 kHz	Output channel status is Professional Output Sampling Frequency 48 kHz

Figure 27. Output Status and Settings Web Page



Output Status & Settings

Model: 8977AP-4B Description: Digital Audio Proc 4 Bal I/O
Frame Location: not assigned , Slot: 3
Output Timing Source: Ref 2

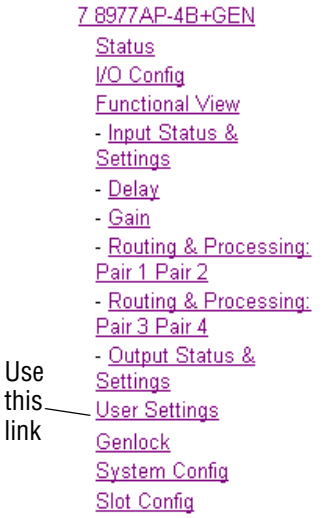
	Processed Stream Name	AES CUV Bits Pass Through	AES Resolution
J2 Output Pair 1	AES In1.Ch1, AES In1.Ch2	☐ Enabled	○ 20 bit ◉ 24 bit
J4 Output Pair 2	AES In2.Non-PCM, AES In2.Non-PCM	Enabled	N/A
J6 Output Pair 3	AES In3.Ch1, AES In3.Ch2	☑ Enabled	N/A
J8 Output Pair 4	AES In4.Ch1, AES In4.Ch2	☐ Enabled	○ 20 bit ◉ 24 bit

⚠ **Output Channel Status** is set to **Professional**
Output Sample Rate is **48 kHz**

Defaults

<<Routing & Processing: Pair 1 Pair 2 | Functional View
<<Routing & Processing: Pair 3 Pair 4

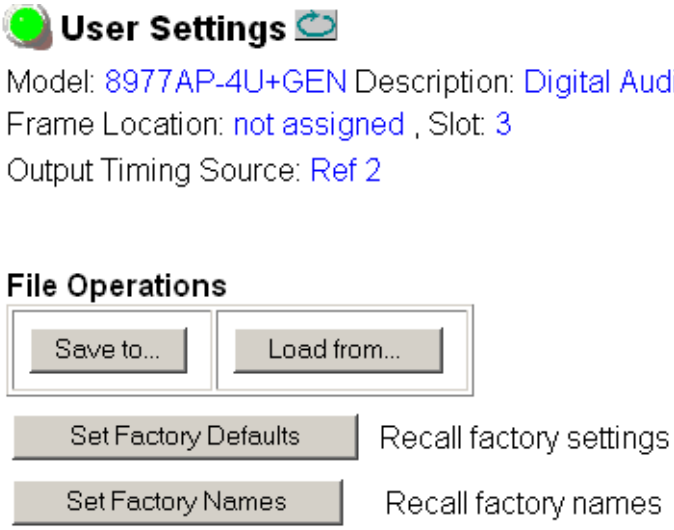
User Settings Web Page



The User Settings web page (Figure 28) 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 28. User Settings Web Page



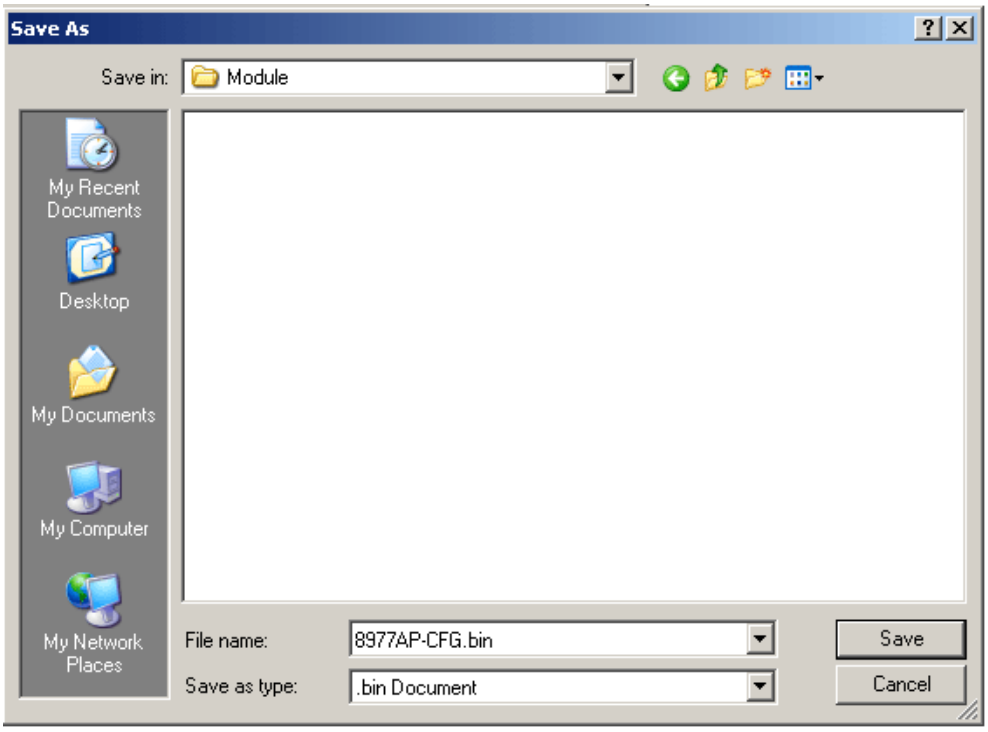
File Operations

Configuration files from the 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 29 on page 47.
4. Enter a name in the File name field. This file is saved as a .bin type.

Figure 29. Save Module Configuration.

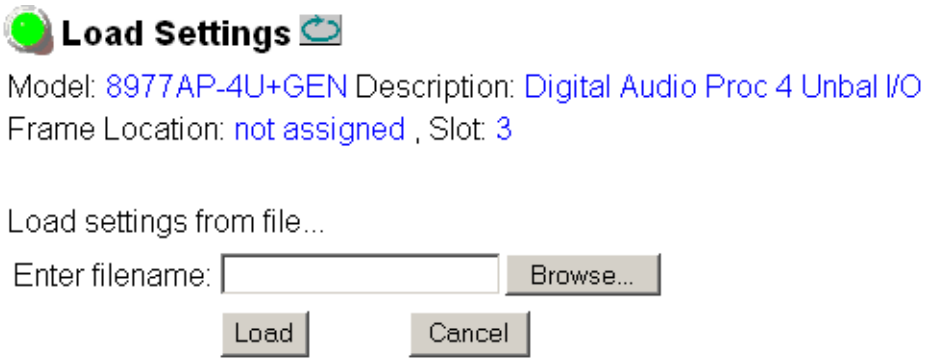


To load and recall a file, do the following:

1. Selecting the **Load From...** button on the User Settings web page (Figure 28 on page 46) which will bring up the Load Settings web page shown in Figure 30.

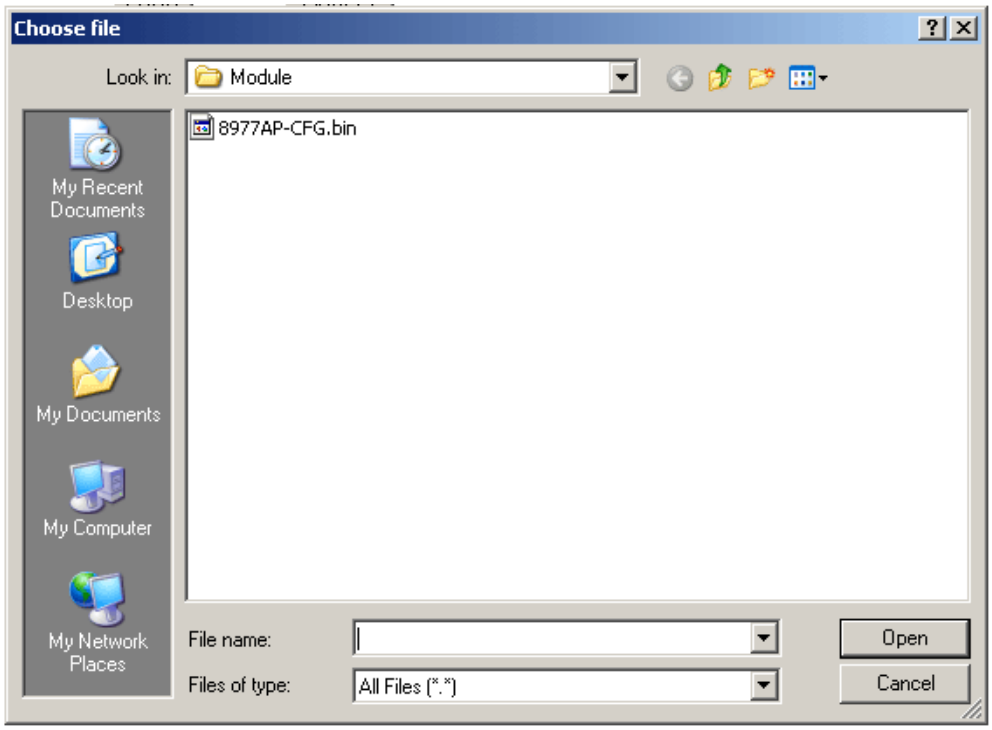
2. Enter a path and file name or select **Browse...** to locate the directory where the files have been saved.

Figure 30. Load Module Configuration.



3. This will bring up the Choose File screen shown in Figure 31.

Figure 31. Choose File Screen



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

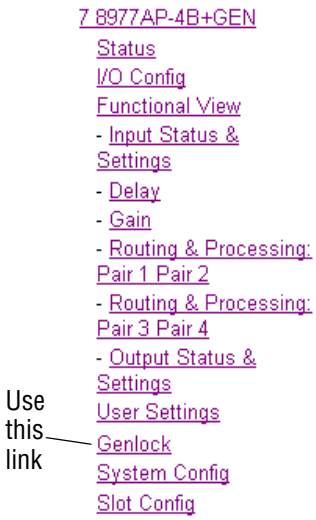
5. Press the **Load** button in the Load From... web page (Figure 30 on page 47) to load the file to the module.

Recall Factory Defaults and Names

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 5 on page 61.
- **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 18 on page 31 and Figure 19 on page 32.

Genlock Web Page



The Genlock web page (Figure 32 on page 51) is present on 8977AP 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 8977AP module.
- **Hardware Revision** – reports the hardware revision of the 8900GEN-SM submodule installed on this 8977AP module.
- **Ref Input Standard** – reports the reference input standard as detected by the 8900GEN-SM submodule that is connected to the Genlock BNC on the rear module.

  The input standards are NTSC, PAL, 1080i/59.94, 720p/59.94, 1080i/50, 720p/50, 1080p/24, 1080sF/24, AES 48K, AES 96K, Word Clock 48K, or Work Clock 96K.
- **Output Bus Frame Rate** – reports the frame rate being output on the frame bus.

Note The Output Bus Frame Rate is always reported as an SD frame rate for all input reference standards including audio.

- **Output Bus** – reports the reference bus (Ref Bus 1 or Ref Bus 2) being output from the submodule.

Genlock Control

The Genlock submodule may be configured with the following controls:

- **Genlock** – select one of the radio buttons to **Enable** or **Freerun** (not locked to external reference).
- **Input Standard Selection** – use this control to set the input standard needed for the reference input.
- **Loop Bandwidth** – set the loop bandwidth to **Low Jitter** or **Fast Lock** depending on the type of reference input.

  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 Bus 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 steps up to 37 ns.
- **Fine Offset** – provides fine adjustment of the reference timing stream by steps up to 37 ns.

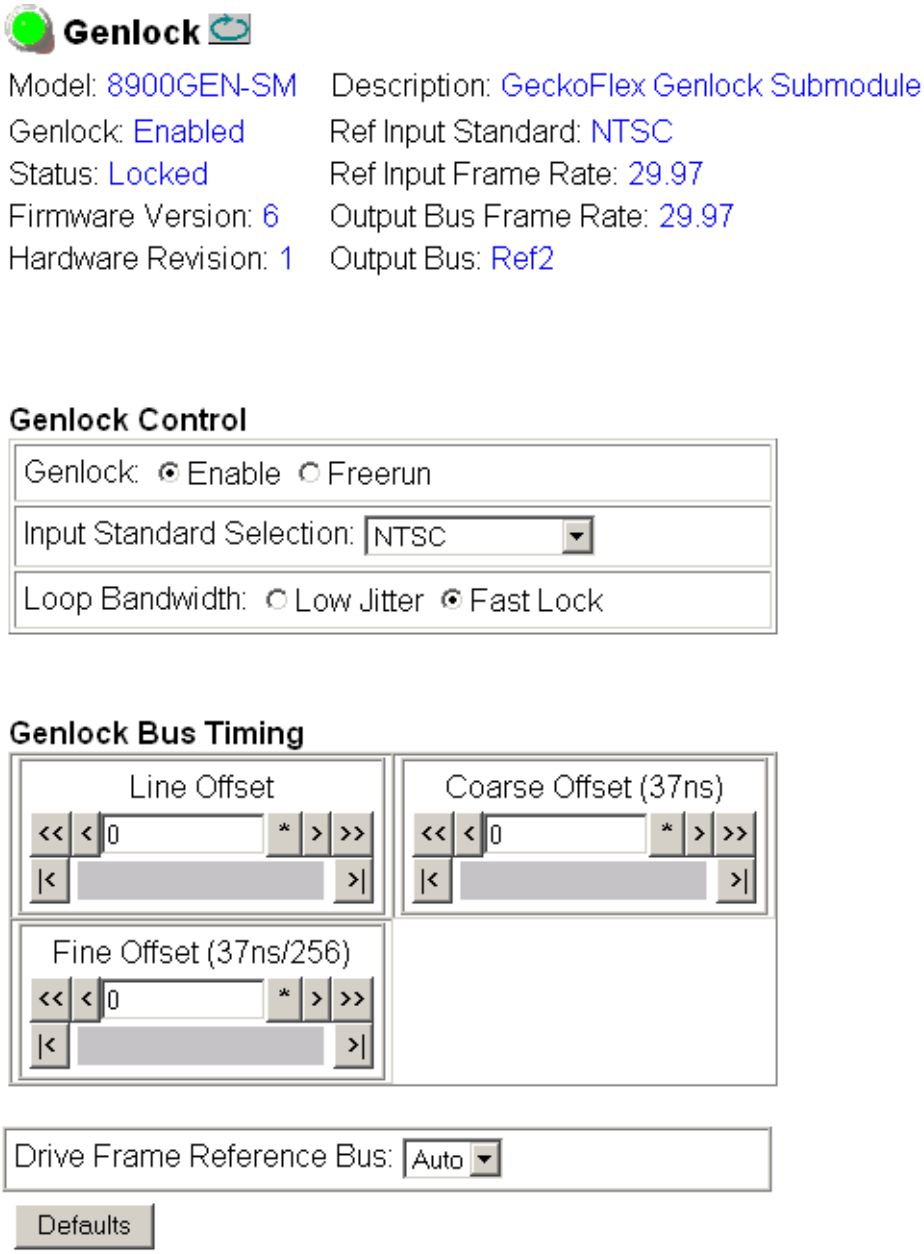
Drive Frame Reference Bus – Set to **Auto** or **Off**. If **Auto** is selected, Ref 1 or Ref 2 is provided if it is locked.

If **Off** is selected, the reference on the frame bus is not sent out.

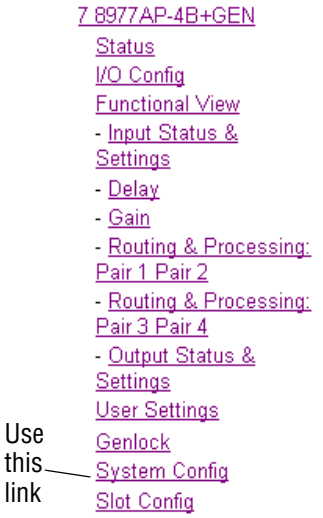
Defaults Button

Select the **Defaults** button to restore the default genlock parameters.

Figure 32. Genlock Web Page



System Config Web Page



Use the System Config web page (Figure 33 on page 53) to perform the following functions on the module:

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 1** (8900GEN-SM submodule is mounted on module in slot 1 and jumpered for outputting a Ref 1 frame bus), **Ref 2** (8900GEN-SM submodule is mounted on module in slot 3 and jumpered for outputting a Ref 2 frame bus) or **Internal** (local oscillator). The signal and genlock status of each reference source will be reported in the Status and Genlock columns.

Note The internal mode is mainly implemented for test and debug purposes during the system setup of the module or in a standalone configuration where no timing reference is required.

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 *8900GEN-SM Genlock Submodule Installation* on page 12 for an overview of using the 8900GEN-SM submodule for reference timing. Also refer to the *8900GEN-SM Installation Manual* available online for complete details 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.

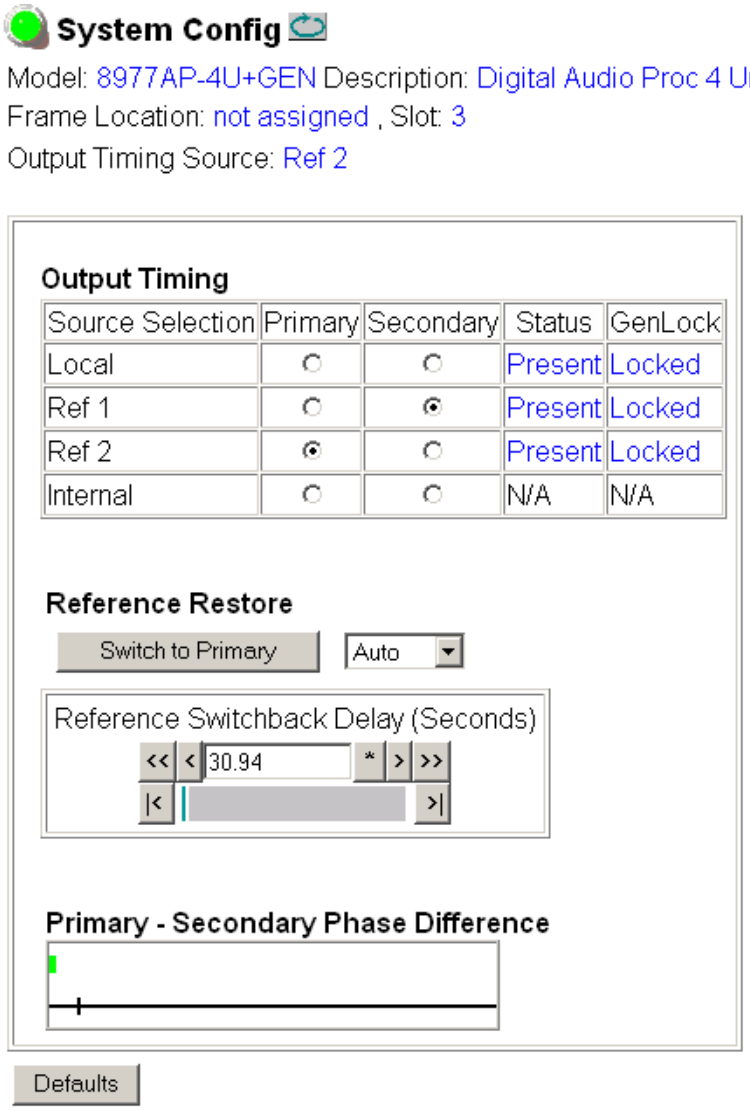
- **Switch to Primary** – set this control to **Manual** if you wish to manually return to the Primary reference when it becomes valid or locked again or **Auto** to allow the module to switch back to the Primary reference.
- **Reference Switchback Delay** – When the control above is set for Auto, set 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 approximately 30 seconds to assure that the Primary is locked and valid before the module switches back to that source.

Primary - Secondary Phase Difference

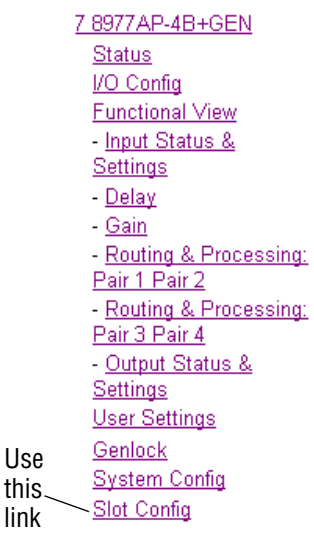
This graphic is provided to show the total phase difference between the Primary and Secondary reference signals. When the bar is green and remains in the area before the horizontal indicator, the two references are in a range where switching between the two will show no measurable disturbance in the 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. 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 approximative 1 microsecond.

Figure 33. System Config Web Page



Slot Config Web Page



Use the Slot Config web page (Figure 34 on page 55) to perform the following functions on the module:

- **Locate Module** – selecting the **Flash** selection in the pulldown button flashes the yellow COMM LED 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 up to 31 characters. This will appear on the module Status web page and in the NetConfig inventory report.
- **Slot Memory** – the slot configuration for each 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 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.

Note Allow at least 5 seconds before inserting the new module into the slot.

  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.
- **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** – This link appears when the 8900NET module has software version 4.0.2 or later installed. When the link is selected, a read-only status report of the 8900NET Hardware Switch state is given. In the LED Reporting section of the web page, LED Reporting on the 8900NET module can be enabled or disabled as desired.

- **SNMP Trap Reports** – 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 *8900NET Instruction Manual* for more details on these links.

Figure 34. Slot Config Web Page

Specifications

Table 3. 8977AP Specifications

Parameter	Value	
Environmental / Miscellaneous		
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
Power consumption	6 Watts + 0.7 Watts with 8900GEN-SM submodule	
Digital Audio Inputs		
	Balanced Inputs	**Unbalanced Inputs**
Digital audio input signal	AES3-2003, Tech 3250-E	AES3-id-2001
Number of inputs	Up to 4	Up to 4
Input names	AES 1, 2, 3, 4	AES 1, 2, 3, 4
Connector type	Three-pin terminal block	BNC
Common range mode	+/- 10V, 50Hz to 20kHz	N/A
Differential voltage range	200mV to 10V p-p	200mV to 2V p-p
Input return loss	> 20dB (100kHz - 128FS)	> 20dB (100 kHz - 128FS)
Input impedance	110 Ohms +/- 20 %	75 Ohms +/- 20 %
Sampling rates supported (FS)	32 kHz, 44.1 kHz, 48 kHz, 96 kHz	32 kHz, 44.1 kHz, 48 kHz, 96 kHz
Sampling rate accuracy	+/-100ppm	+/-100 ppm
Resolution supported	16 bits, 20 bits, 24 bits	16 bits, 20 bits, 24 bits

Table 3. 8977AP Specifications

Parameter	**Value**	
Digital Audio Outputs		
	Balanced Outputs	**Unbalanced Outputs**
Digital audio output signal	AES3-2003, Tech 3250-E	AES3-id-2001
Number of outputs	Up to 4	
Output names	AES 1, 2, 3, 4	
Connector type	Three-pin terminal block	BNC
Data jitter	+/- 20ns	
Output rise / fall time	5ns to 30ns @ 110 Ohms	37ns +/- 7ns @ 75 Ohms
Differential voltage range	2 to 7V @ 110 Ohms	1V +/- 20% @ 75 Ohms
Output return loss	> 15dB (100 kHz - 128FS)	
Output impedance	110 Ohms +/- 20 %	75 Ohms +/- 20 %
Sampling rates (FS)	48 kHz	
Output resolution	20 or 24 bits	
DT Input (Audio Delay Tracking)		
Audio delay tracking input	Conforming to Tektronix 118AS Interface	
Number of inputs	1	
Connector type	BNC	
Electrical interface	One wire serial (RS232 type) interface	
RS232 characteristics	BAUD = 1200 Parity = Even Bits/words = 7 Stop bits = 1	
Electrical Length (Delay)		
Sync-PCM/Non-PCM throughput	280 microseconds	
PCM mode throughput	32 kHz: 44.1 kHz: 48 kHz: 96 k Hz:	3.2 ms 3.3 ms 3.9 ms 1.7 ms
Other Parameters		
Maximum delay	10s in 1ms steps	
Gain	(40; +6dB) in 0.1dB steps	
Output processing modes	Silence, A, -A, B, -B, A+B, -(A+B), A-B, -(A-B), 1 kHz, 400 Hz, ID tone	

Service

The 8977AP 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 trouble-shoot. Return the unit to Grass Valley (see *Module Repair* on page 59).

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 contact Grass Valley Customer Service with the contacts given on page 4.

Table of Alarms

Table 4 describes the different type of alarms generated on the module.

Table 4. List of Alarms for 8977AP Module

Alarm type	Web Page Description	LED Status	Comments	Status reported to the 8900Net &SNMP
Pass	Genlock module is not installed	Green	Genlock missing	No
Fault	Genlock submodule failed, replace	Red	Genlock Failure	No
Fault	Power supply bad	Red	Problem of power supply	Yes
Fault	FPGA failure	Red	FPGA not loaded	Yes
Warning	Wrong Rear Module (incompatible with 8977AP-4U)	Yellow	Rear module is different of 8900UE-R	Yes
Warning	Wrong Rear Module (incompatible with 8977AP-4B)	Yellow	Rear module is different of 8900BA-R	Yes
Warning	Ref 1 is Not Present	Yellow	Ref 1 from FrameRef 1 is missing	Yes
Warning	Ref 2 is Not Present	Yellow	Ref 2 from FrameRef 2 is missing	Yes
Warning	Local Ref is Not Present	Yellow	Input ref is not detected	Yes
Warning	Redundant Ref in Not Present	Yellow	The second ref selected is missing	Yes
Warning	Audio Input: AES 1 Input Signal Not Detected	Yellow	No AES 1 input detected	Yes
Warning	Audio Input: AES 2 Input Signal Not Detected	Yellow	No AES 2 input detected	Yes
Warning	Audio Input: AES 3 Input Signal Not Detected	Yellow	No AES 3 input detected	Yes

Table 4. List of Alarms for 8977AP Module

Alarm type	Web Page Description	LED Status	Comments	Status reported to the 8900Net &SNMP
Warning	Audio Input: AES 4 Input Signal Not Detected	Yellow	No AES 4 input detected	Yes
Warning	Audio Delay Tracking Input: Signal Not Detected	Yellow	No audio delay tracking input detected after 30 seconds	Yes
Pass	Audio Mode: AES 1 Mismatch Mode (audio PCM/Non-PCM mode detected different of mode selected)	Green	PCM on AES 1 status is different of the PCM setting	No
Pass	Audio Mode: AES 2Mismatch Mode (audio PCM/Non-PCM mode detected different of mode selected)	Green	PCM on AES 2 status is different of the PCM setting	No
Pass	Audio Mode: AES 3 Mismatch Mode (audio PCM/Non-PCM mode detected different of mode selected)	Green	PCM on AES 3 status is different of the PCM setting	No
Pass	Audio Mode: AES 4 Mismatch Mode (audio PCM/Non-PCM mode detected different of mode selected)	Green	PCM on AES 4 status is different of the PCM setting	No

Note Please refer to the Figure 8 on page 18, Figure 9 on page 19, and Table 1 on page 20 for the status meaning and the color of the LEDs.

Module Repair

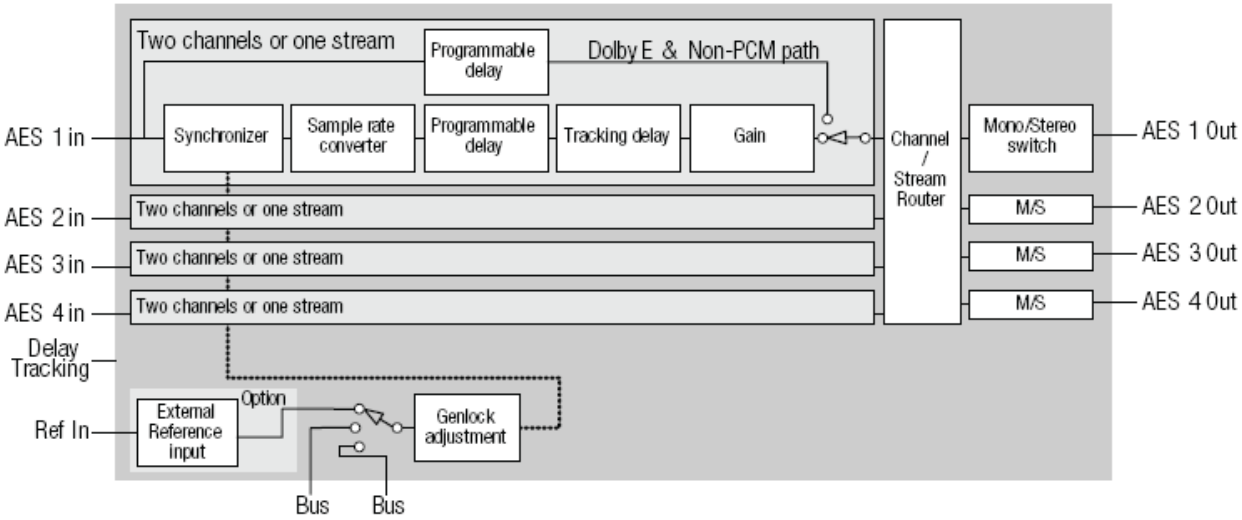
If the module is still not operating correctly, replace it with a known good spare and return the faulty module to a designated Grass Valley repair depot. Call your Grass Valley representative for depot location.

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

Functional Description

A block diagram of the 8977AP is shown in Figure 35.

Figure 35. 8977AP Block Diagram



Configuration Parameters

This appendix provides a complete summary of the 8977AP functions and a comparison of the functionality available with the web page and Newton control panel control type along with the ranges and default values for each parameter in Table 5.

Table 5. 8977AP Configuration Parameters

Description	Default	Range/choices resolution	Web Page / Function Name	Newton Control Panel
Drive Frame Reference Bus	Auto	Auto/OFF	Genlock	GLBusDrv
Input Standard	Status	NTSC, PAL, 1080i/59.94, 1080i/50, 720p/50, 720p/59.94, 1080p/24, 1080sf/24, AES48K, AES96K, Word Clock 48K, Word Clock 96K	Genlock	GLInStd
Genlock	Enable	Enable or Freerun	Genlock	GLEnable
Input Standard Selection	NTSC	NTSC, PAL, 1080i/59.94, 1080i/50, 720p/50, 720p/59.94, 1080p/24, 1080sf/24, AES48K, AES96K, Word Clock 48K, Word Clock 96K	Genlock	GLInSEl
Loop Bandwidth	Fast Lock	Fast Lock / Low Jitter	Genlock	GLLoopBW
Line Offset	0	[0 - 624]	Genlock	GLLnOff
Coarse Offset	0	[0 - 1727]	Genlock	GLcors
Fine Offset	0	[0 - 255]	Genlock	GLfine
Genlock	Status	Freerun / Enabled	Genlock	GLstatus
Input Frame Rate	Status	29.97 / 25 / 24 / 48 / 0 / 96	Genlock	GLInFR
Status	Status	Freerun / Invalid / Locked	Genlock	GLStat
Output Bus	Status	Ref 2 / Ref 1 / Local	Genlock	GLOutBus
Output Frame Rate	Status	29.97 / 25 / 0	Genlock	GLOutFR
Switch to Primary Ref	-	Switching	System Config	Sw2PriRef
Switch Back After Primary Restored	Auto	Auto / Manual	System Config	RefSwBk

Table 5. 8977AP Configuration Parameters

Description	Default	Range/choices resolution	Web Page / Function Name	Newton Control Panel
Reference Switchback Delay	30.94	(30 -93.97seconds)	System Config	RefSwDly
Delay Stream 1 Channel 1	0	[0-10000ms]	Delay	Delay 1-1
Delay Stream 1 Channel 2	0		Delay	Delay 1-2
Delay Stream 2 Channel 1	0		Delay	Delay 2-1
Delay Stream 2 Channel 2	0		Delay	Delay 2-2
Delay Stream 3 Channel 1	0		Delay	Delay 3-1
Delay Stream 3 Channel 2	0		Delay	Delay 3-2
Delay Stream 4 Channel 1	0		Delay	Delay 4-1
Delay Stream 4 Channel 2	0		Delay	Delay 4-2
Delay Stream 1 Both Ch1 Ch2	0		Delay	Delay 1
Delay Stream 2 Both Ch1 Ch2	0		Delay	Delay 2
Delay Stream 3 Both Ch1 Ch2	0		Delay	Delay 3
Delay Stream 4 Both Ch1 Ch2	0		Delay	Delay 4
Gain Stream 1 Both Ch1 Ch2	0	[-40dB - +6dB]	Gain	Gain 1
Gain Stream 2 Both Ch1 Ch2	0		Gain	Gain 2
Gain Stream 3 Both Ch1 Ch2	0		Gain	Gain 3
Gain Stream 4 Both Ch1 Ch2	0		Gain	Gain 4
Gain Stream 1 Channel 1	0		Gain	Gain 1-1
Gain Stream 1 Channel 2	0		Gain	Gain 1-2
Gain Stream 2 Channel 1	0		Gain	Gain 2-1
Gain Stream 2 Channel 2	0		Gain	Gain 2-2
Gain Stream 3 Channel 1	0		Gain	Gain 3-1
Gain Stream 3 Channel 2	0		Gain	Gain 3-2
Gain Stream 4 Channel 1	0		Gain	Gain 4-1
Gain Stream 4 Channel 2	0		Gain	Gain 4-2
Level Detect Stream 1 Channel 1	Status	True/False	Gain	1-1 LVL DETECT
Level Detect Stream 1 Channel 2	Status		Gain	1-2 LVL DETECT
Level Detect Stream 2 Channel 1	Status		Gain	2-1 LVL DETECT
Level Detect Stream 2 Channel 2	Status		Gain	2-2 LVL DETECT
Level Detect Stream 3 Channel 1	Status		Gain	3-1 LVL DETECT
Level Detect Stream 3 Channel 2	Status		Gain	3-2 LVL DETECT
Level Detect Stream 4 Channel 1	Status		Gain	4-1 LVL DETECT
Level Detect Stream 4 Channel 2	Status		Gain	4-2 LVL DETECT

Table 5. 8977AP Configuration Parameters

Description	Default	Range/choices resolution	Web Page / Function Name	Newton Control Panel
Level Clip Stream 1 Channel 1	Status	True/False	Gain	1-1 Clip
Level Clip Stream 1 Channel 2	Status		Gain	1-2 Clip
Level Clip Stream 2 Channel 1	Status		Gain	2-1 Clip
Level Clip Stream 2 Channel 2	Status		Gain	2-2 Clip
Level Clip Stream 3 Channel 1	Status		Gain	3-1 Clip
Level Clip Stream 3 Channel 2	Status		Gain	3-2 Clip
Level Clip Stream 4 Channel 1	Status		Gain	4-1 Clip
Level Clip Stream 4 Channel 2	Status		Gain	4-2 Clip
Processing for Output Pair 1 ChA	A	Silence, A, -A, B, -B, A+B, -(A+B), A-B, -(A-B), 1 kHz, 400 Hz, ID tone	Routing & Processing Pairs	Proc 1A
Processing for Output Pair 1 ChB	B		Routing & Processing Pairs	Proc 1B
Processing for Output Pair 2 ChA	A		Routing & Processing Pairs	Proc 2A
Processing for Output Pair 2 ChB	B		Routing & Processing Pairs	Proc 2B
Processing for Output Pair 3 ChA	A		Routing & Processing Pairs	Proc 3A
Processing for Output Pair 3 ChB	B		Routing & Processing Pairs	Proc 3B
Processing for Output Pair 4 ChA	A		Routing & Processing Pairs	Proc 4A
Processing for Output Pair 4 ChB	B		Routing & Processing Pairs	Proc 4B
Output 1 AES CUV bits pass through	Enable	Enabled / Disabled	Output Status & Settings	Out CUV 1
Output 2 AES CUV bits pass through	Enable		Output Status & Settings	Out CUV 2
Output 3 AES CUV bits pass through	Enable		Output Status & Settings	Out CUV 3
Output 4 AES CUV bits pass through	Enable		Output Status & Settings	Out CUV 4
Output 1 AES Resolution	N/A	20 bits, 24 bits, N/A	Output Status & Settings	Out Res 1
Output 2 AES Resolution	N/A		Output Status & Settings	Out Res 2
Output 3 AES Resolution	N/A		Output Status & Settings	Out Res 3
Output 4 AES Resolution	N/A		Output Status & Settings	Out Res 4
Output Timing Source	Internal	Ref1, Ref2, Local, Internal	System Config	OutClk
Input Stream Signal State 1	Status	Present / Not Present	Input Status & Settings	1 State
Input Stream Signal State 2	Status		Input Status & Settings	2 State
Input Stream Signal State 3	Status		Input Status & Settings	3 State
Input Stream Signal State 4	Status		Input Status & Settings	4 State
Force Audio Mode Input Stream 1	Status	PCM / Non-PCM / Sync-PCM	Input Status & Settings	Mode 1
Force Audio Mode Input Stream 2	Status		Input Status & Settings	Mode 2
Force Audio Mode Input Stream 3	Status		Input Status & Settings	Mode 3
Force Audio Mode Input Stream 4	Status		Input Status & Settings	Mode 4

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