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8921ADT

4-CH AUDIO A-D CONVERTER w/DELAY TRACK

Instruction Manual

SOFTWARE VERSION 1.0.0

071820400
OCTOBER 2003

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Preface

About This Manual

This manual describes the features of a specific module of the Gecko 8900 Signal Processing System. As part of this module family, it is subject to Safety and Regulatory Compliance described in the Gecko 8900 Series frame and power supply documentation (see the *8900TX/8900TF/8900TFN Frames Instruction Manual*).

8921ADT 4-Channel Audio A-D Converter with Delay

Introduction

The 8921ADT module offers four independent, audio A-D conversions on a single module. Four channels of analog audio are converted to two digital audio streams. Two forms of delay are provided—a fixed delay and a variable delay based on a signal from a video decoder with a frame synchronizer or from a frame sync card.

The 8921ADT features:

- 24-bit ADC A-to-D conversion,
- >105 dB A weighted signal-to-noise ratio,
- The four channels of audio analog to digital conversion has independent controls for:
  - Channel pairing,
  - Level adjustment,
  - Output swapping, summation, phase inversion,
  - Delay up to 5 seconds for each channel or channel pair, and
  - 400 Hz, 1 k Hz, and 1 kHz channel ID test tones.
- Auto-tracking delay of video frame synchronizers (8900FSS and 8981FS),
- Four inputs, two pairs of balanced High Z analog audio inputs,
- Looping reference input supports NTSC/PAL analog color black, 48 kHz AES Word Clock, and 48 kHz AES3-id DARS.
- Optional 8900-A-CBL package of four breakout cables, to convert 3-pin balanced AES audio to dual 75 Ω BNCs, unbalanced AES audio, and
- Remote control and SNMP alarms with the 8900NET module.

Installation

Installation of the 8921ADT module is a process of:

1. Setting on-board jumpers for desired output formats,
2. Placing the module in the proper audio frame slot, and
3. Cabling and terminating signal ports.

The 8921ADT module can be plugged in and removed from a Gecko 8900 audio frame with power on. When power is applied to the module, LED indicators reflect the initialization process (see *Power Up* on page 14).

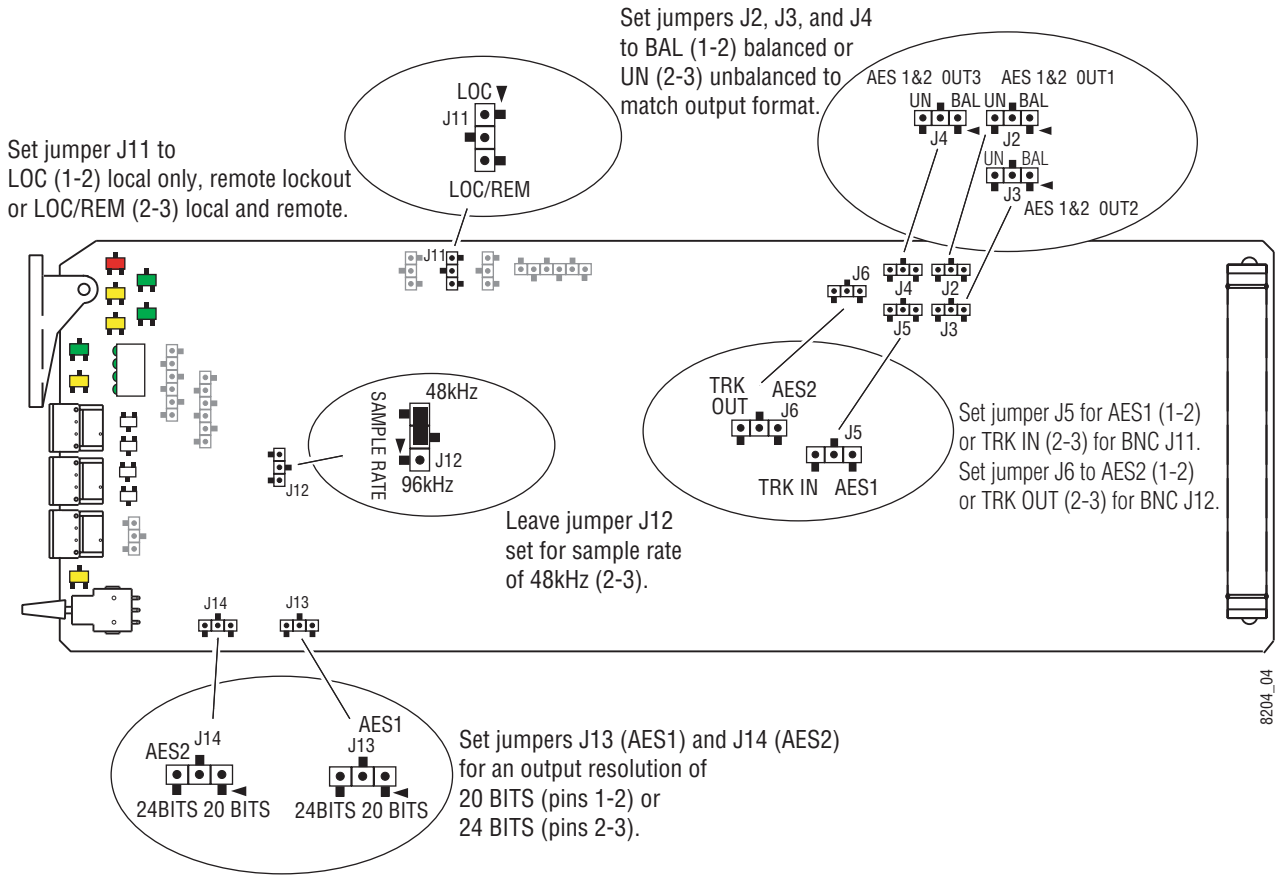
Module On-board Jumper Settings

A number of jumpers must be set on the module to determine module formatting before installing it in the frame. Refer to Table 1 for a summary of each jumper and Figure 1 on page 9 for jumper locations on the module circuit board.

Table 1. 8921ADT Jumper Settings

Jumper	Function	Pins 1-2	Pins 2-3	Notes
J2	AES 1&2 Out 1	BAL (Balanced 110 Ω)	UN (Unbalanced 75Ω)	Set AES outputs to balanced or unbalanced (unbalanced setting requires cable adapter).
J3	AES 1&2 Out 2	BAL	UN	
J4	AES 1&2 Out 3	BAL	UN	
J5	BNC J11	AES 1	TRK IN	Assign BNC function as Tracking In or AES 1 output (unbalanced)
J6	BNC J12	AES 2	TRK OUT	Assign BNC function as Tracking Out or AES 2 output (unbalanced)
J11	Local/Remote	LOCAL	REMOTE	Move jumper to Local to lock out remote control if desired. Shipped from factory with Remote setting.
J12	Sample Rate	–	48 kHZ	Sample rate default is set to 48 KHz for this release.
J13	AES 1 Output Resolution	20 BITS	24 BITS	Set output resolution for AES outputs. These settings can be overridden remotely on the Audio Proc web page or with a control panel.
J14	AES 2 Output Resolution	20 BITS	24 BITS	

Figure 1. On-Board Jumper Locations



Frame Capacity

The 8921ADT module can be installed in all Gecko 8900-A audio frames but with varying maximum quantities determined by frame cooling capacity. Table 2 provides the power capacity, cooling capacity, and maximum module count for each frame type.

Table 2. Video Frame Power Capacity

Capacity Calculated	8900TX Frame	8900TF Frame	8900TFN Frame
Power (W)	100	100	100
Recommended Module Cooling (W)	30	90	90
8921ADT Modules	10	10	10

Note Module capacity figures assume no other modules are in the frame.
X = Not recommended without forced air cooling.

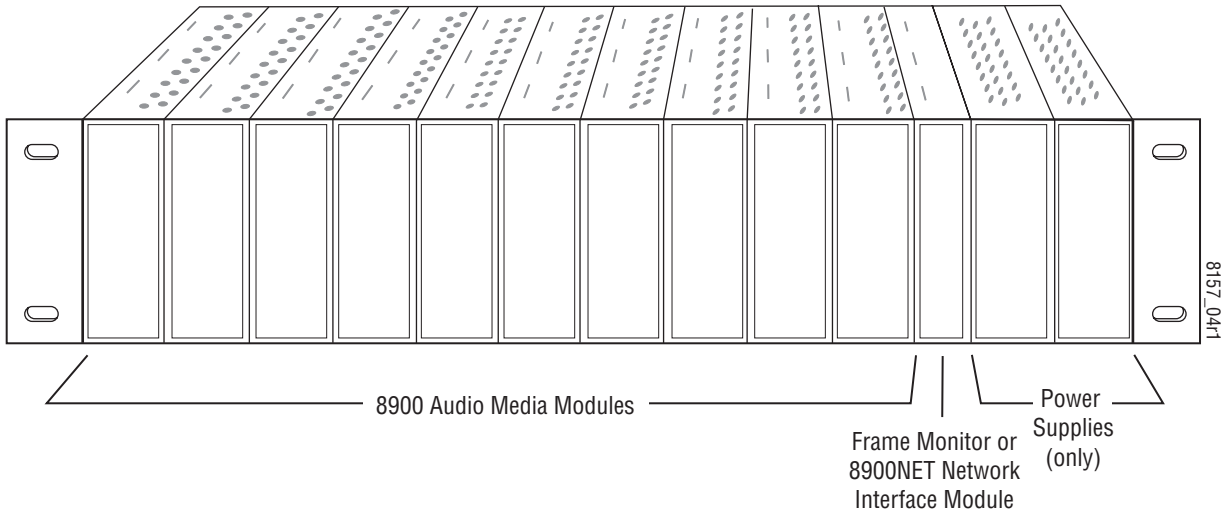
Module Placement in the Gecko 8900-A Audio Frame

There are ten cell locations in the audio frame to accommodate audio modules. These are the left ten locations. Refer to Figure 2.

The two cells on the right are allocated for the power supplies. For additional information concerning the Power Supply module, refer to the 8900 Power Supply manual.

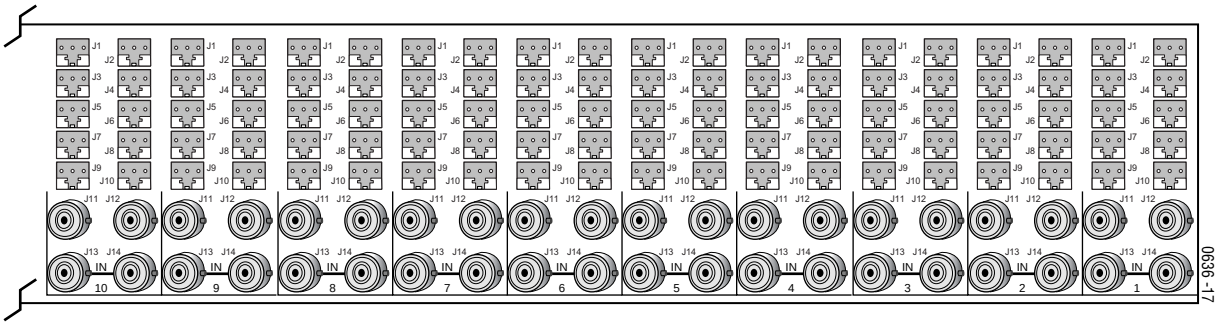
The third cell from the right is allocated for the Frame Monitor or 8900NET Network Interface module. These modules provide health monitoring and control options.

Figure 2. Gecko 8900 Series Frame



8900 module slots are interchangeable within the frame. There are audio connectors and BNCs in each slot's I/O group. The functional assignment of each connector in a group is determined by the module that is placed in that slot. The maximum number of modules a Gecko 8900 audio frame can accept is ten. Figure 3 illustrates the rear connector plate for a Gecko 8900 audio frame. A detail of the audio connector is given in Figure 4 on page 13.

Figure 3. Gecko 8900 Series Audio Frame Rear Connector



To install a module in the frame:

1. Insert the module, connector end first, with the component side of the module facing to the right and the ejector tab to the top.
2. Verify that the module connector seats properly against the backplane.
3. Press in the ejector tab to seat the module.

Cabling

Cabling to and from the module is done at the back of the Gecko 8900 audio frame as described below. A number of jumpers on the module circuit board must first be set to assign connectors for the desired outputs (see *Module On-board Jumper Settings* on page 8).

Analog Audio Inputs

Four balanced analog audio inputs are provided at 3-pin mini-terminal strip audio connectors J7, J8, J9 and J10. Plastic strain reliefs are provided for connecting balanced audio connections. Refer to Figure 4 on page 13.

Note Operation with unbalanced analog audio requires single-ended audio with the negative side and shield tied together with a signal level of < +30 dBu.

Inputs can be routed to any of the four output streams in configuration. Refer to *Audio Channel Pairing* on page 17.

Digital AES Audio Outputs

The digital AES audio outputs can be balanced or unbalanced. Each audio pair must be jumpered on the circuit board for the correct output format. An optional cable kit is available with four 3-terminal to dual BNC cables to allow conversion of one balanced output to two unbalanced BNC outputs. Another unbalanced output for each channel can also be accessed on BNCs J11 (AES 1) and J12 (AES 2) by jumpering the module as explained in *Unbalanced Outputs* below.

Balanced Outputs

Three balanced 110 Ω AES outputs are available with standard 3-pin mini-terminal strip connectors for each AES output stream. Balanced AES 1&2 Out 1 are available at rear connectors J1/J2, AES 1&2 Out 2 at J3/J4, and AES 1&2 Out 3 at J5/J6. Plastic strain reliefs are provided for connecting balanced audio connections. See Figure 4 on page 13.

For a balanced output (the factory default), set the following jumpers to balanced (**BAL**, pins 1-2) as shown in Figure 1 on page 9:

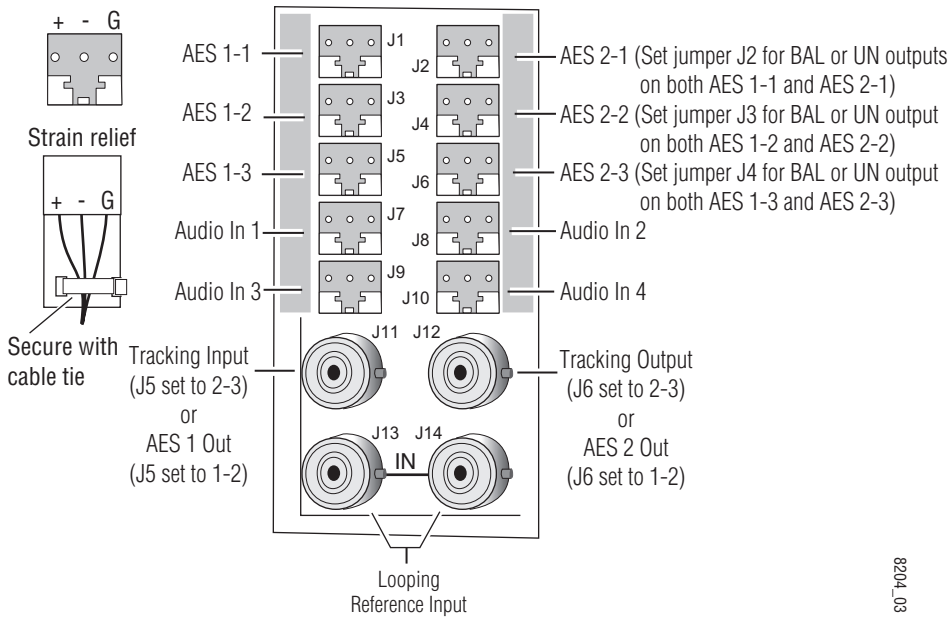
- J2 (AES 1&2 Out 1)
- J3 (AES 1&2 Out 2)
- J4 (AES 1&2 Out 3)

Unbalanced Outputs

Each balanced audio output pair can be converted to unbalanced by connecting an optional 3-terminal to dual-BNC breakout cable (8900-A-CBL) to the balanced connector and setting the jumpers described in Table 1 on page 8 to unbalanced (**UN**, pins 2-3).

To use J11 and J12 as unbalanced audio outputs if a tracking input or output is not required, jumper J5 to pins 1-2 (AES1) and J6 to pins 1-2 (AES2). Refer to Figure 1 on page 9 and *Tracking Input/Output* on page 13.

Figure 4. 8921ADT Rear Input/Output Connectors



Tracking Input/Output

A Tracking Input is provided at BNC J11. Connect an RS-232 level auto tracking signal from a video frame synchronizer (such as an 8900FSS or 8981FS) to this BNC and set jumper J5 (Figure 1 on page 9) to TRK IN (pins 2-3).

If you need to loop the tracking input signal to another destination, a buffered looping output is available at BNC J12. To make this Tracking Output available, jumper J6 (Figure 1 on page 9) to pins 2-3 (TRK OUT).

If no input and/or output audio tracking is needed, these BNCs can be jumpered to provide additional unbalanced AES 1 and AES 2 BNC outputs as described in *Digital AES Audio Outputs* on page 12.

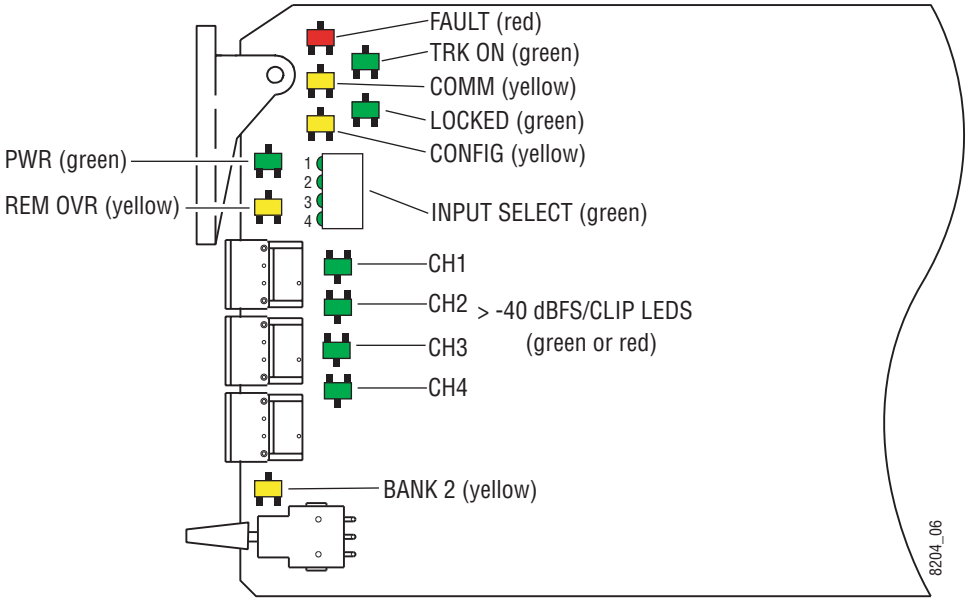
Reference Loop-through Input

Connect an NTSC/PAL analog color black reference, AES 48 kHz Word Clock signal, or 48 KHz AES3-id DARS signal to one of the loop-through reference connectors, J13 or J14. Terminate the unused connector into 75 Ω if the signal is not looped to other equipment.

Power Up

The front LED indicators and configuration switches are illustrated in Figure 5. Upon power-up, the green PWR LED should light and the yellow CONF LED should illuminate for a few seconds for the duration of module initialization.

Figure 5. LEDs and Configuration Switches



Operation Indicator LEDs

Refer to Figure 5 and Table 3 for the name and meaning of each of the board edge operating indicators on the module circuit board.

Table 3. Board Edge LED Names and Meaning

LED	Indication	Condition
FAULT (red)	Off	Normal operation.
	On continuously	Module has detected an internal fault. (Refer to *Functional Description* on page 48.)
	Long Flash	User configuration problems. Reference input missing or not locked. Processor failed to load/configure or diagnostics failed on one or more devices.
COMM (yellow)	Off	No activity on frame communication bus.
	3 Quick Pulses	Locate Module command received by the module from a remote control system.
	Short flash	Activity present on the frame communication bus.
CONFIG (yellow)	Off	Module is in normal operating mode.
	On continuously	Module is initializing, changing operating modes or programming hardware.
	3 Quick Pulses	Locate Module command received by the module from a remote control system.
PWR (green)	Off	No power to module or module's DC/DC converter failed.
	On continuously	Normal operation, module is powered.
REM OVR (yellow)	Off	Parameter settings match those set on module switches and jumpers.
	On	A setting on the module circuit board switches or jumpers is being overridden by remote control system.
TRK ON (green)	Off	No delay tracking. Tracking signal not received.
	On	Auto delay is receiving a tracking delay input.
LOCKED (green)	Off	No reference is present or reference is present but not locked.
	On	Module is timed to the reference input.
BANK 2 (yellow)	Off	Bank 1 of Control rotary switch is active.
	On	Bank 2 of Control rotary switch is active.
INPUT 1-4 (green)	Off	Indicated input is not selected for AES output channel selected with CONTROL rotary switch.
	On	Indicated input is selected for AES output channel selected with CONTROL rotary switch.
> –40 dBFS/CLIP CH 1-4 (green/red)	Off	Input level is less than –40dBFS and not clipping.
	Green	Input level is greater than –40dBFS and not clipping.
	Red	Input level is greater than –40dBFS and clipping.

Configuration

The 8921ADT can be configured locally using onboard switches or remotely using the 8900NET network interface GUI or a networked control panel. Operation of these control types is explained in detail in their respective sections of this manual.

Refer to the following sections for configuration instructions:

- Configuration Summary (page 16)
- Local Onboard Module Configuration (page 25)
- Remote Control and Monitoring (page 28)
- Control Panel Configuration (page 45)

Configuration Summary

This section provides a summary of all parameters that can be configured on the 8921ADT module. Use this section in conjunction with the specific configuration method instructions for each configuration type. Table 4 on page 22 provides a summary in table format of all parameters and their ranges, default values, and remote, local, and control panel function names and locations for setting each value.

For a functional block diagram and an overview of the module stages, refer to the *Functional Description* on page 48.

Analog Audio Inputs

The maximum signal level of the analog inputs (before clipping and distortion occur) should be set for full-scale digital outputs (0 dBFS). This level can be adjusted from 0 to +30 dBu. Each input can be adjusted individually or locked together in two groups, Inputs 1 and 2, and Inputs 3 and 4. When locked together, any gain offsets are preserved between channels.

It is helpful before making any input level adjustments to have the module set up for factory default audio values. This will assure that no summing, phase inversion, or channel swapping is occurring on the outputs and will set the module with the following factory defaults:

- Maximum input levels to + 24 dBu = 0 dBFS.
- Output gains to 0 dB
- Delay to 0 sec
- Input mapping to Inputs 1, 2 = AES 1 A, B, Inputs 3, 4 to AES 2 C, D

To quickly access these defaults, select position F on the front panel Control rotary switch on Bank 2 then activate the paddle switch in the up direction.

If you know the maximum signal level of your audio inputs, you can enter the value directly into the web page level adjustment fields. Refer to *Analog Audio Inputs Page* on page 35.

For local control (no 8900NET module), you can adjust maximum input levels by metering the corresponding output with a digital audio meter. To correctly adjust the input levels for your digital application, use one of the methods below:

- Apply a signal at – 1 dB below your maximum signal level to the analog input and monitor the corresponding AES output with a meter that indicates digital level in dBFS. Adjust each output until the meter indicates – 1 dBFS.
- Apply an input audio level that is -20 dB below the maximum level, (+4 dBu for the default, +24 dBu -20 dB = +4 dBu) and adjust the level as indicated on a digital audio meter to -20 dBFS.

Audio Channel Pairing

The four analog input channels can be routed to any of the left and right channel outputs of AES 1 and AES 2.

Audio Delay

The audio outputs can be delayed manually or synchronized to an external auto-tracking input signal such as an input from an 8960DEC with 8900FSS or 8981FS.

Each output channel can be delayed individually or locked together in two groups, AES 1 Ch A and B, and AES 2 Ch C and D.

Audio Processing

Audio processing can be performed on the outputs of AES 1 and AES 2 to set the output processing mode, the output resolution, gain of each output stream, and the output sample rate with the Audio Proc controls.

Output Processing Modes

The AES 1 output can be set to one of the following output modes:

- A, B (Pass) – the inputs selected for A and B appear at the AES output unmodified.
- – A, – B (both phase inverted) – the inputs selected for A and B are both inverted at the AES output.
- – A, B (A Phase Inverted) – the input selected for the A channel is inverted while the B channel is non-inverted at the AES output.
- A, – B (B Phase Inverted) – the input selected for the A channel is not inverted while the B channel is inverted at the AES output.
- A + B, (monaural sum) – the inputs selected for the A and B channels are reduced in level by 6 dB, summed together, and output on both channels at the AES output.
- A + B, A–B (MD D/E) – will be a – 6 dB mono sum to A and – 6 dB difference decode/encode to B.
- – (A + B) (A + B to Both and Phase Invert) – the inputs selected for the A and B channels are reduced in level by 6 dB, summed together, inverted, and output on both channels at the AES output.
- 1 kHz (Tone) – a 1 kHz tone is put on both channels at the AES output with a – 20 dBFS level.
- 400 Hz (Tone) – a 400 Hz tone is put on both channels at the AES output with a – 20 dBFS level.
- Silence – digital silence is placed on both channels at the AES output.
- A + B, C – the two channels chosen for AES 1 A and B are reduced in level by 6 dB, summed and sent to the A output. The Ch C audio from AES 2 will be put on both sides of the Ch B output. In this mode, AES 2 will pass its inputs for C and D as selected with the output processing control for AES 2.
- A + B, D – the two channels chosen for AES 1 A and B are reduced in level by 6 dB, summed and sent to the A output. The Ch D audio from AES 2 will be put on both sides of the Ch B output. In this mode, AES 2 will pass its inputs for C and D as selected with the output processing control for AES 2.
- A/B ID – A/B identification tone. A 1 kHz continuous tone with a – 20 dBFS level for 1 second on Ch A followed by a 3 second continuous tone on the Ch B (keeps repeating).

The AES 2 output can be set to one of the following output modes:

- C, D (Pass) – the inputs selected for C and D appear at the AES output unmodified.
- – C, – D (both phase inverted) – the inputs selected for C and D are both inverted at the AES output.
- – C, D (C Phase Inverted) – the input selected for the C channel is inverted while the D channel is non-inverted at the AES output.
- C, – D (D Phase Inverted) – the input selected for the C channel is not inverted while the D channel is inverted at the AES output.
- C + D, (monaural sum) – the inputs selected for the C and D channels are reduced in level by 6 dB, summed together, and output on both channels at the AES output.
- C + D, C–D (MD D/E) – will be a – 6 dB mono sum to C and – 6 dB difference decode/encode to D.
- – (C + D) (C + D to Both and Phase Invert) – the inputs selected for the C and D channels are reduced in level by 6 dB, summed together, inverted, and output on both channels at the AES output.
- 1 kHz (Tone) – a 1 kHz tone is put on both channels at the AES output with a – 20 dBFS level.
- 400 Hz (Tone) – a 400 Hz tone is put on both channels at the AES output with a – 20 dBFS level.
- Silence – digital silence is put on both channels at the AES output.
- C/D ID – C/D identification tone. A 1 kHz continuous tone with a – 20 dBFS level for 1 second on Ch C followed by a 3 second continuous tone on the Ch D (keeps repeating).

Gain Adjustments

Once the output mode for each AES output has been selected, the gain of the outputs can be adjusted from – 40 to + 6 dB in the audio processor as required. Each output can be adjusted individually or locked together in two groups, AES 1 A and B, and AES 2 C and D.

AES Output Resolution

The output resolution for AES 1and AES 2 can be set to either 20 or 24 bits. This is set locally during installation with on-board jumpers J13 (AES 1) and J14 (AES 2). The jumper settings can be overridden with the remote controls.

Output Sample Rate

The output sample rate for both AES 1and AES 2 will always default to 48 kHz for this release.

Auto Tracking

If an external tracking signal is connected to the module, the TRK IN BNC, J11, must be jumpered on the module as an input with jumper J5 (see *Module On-board Jumper Settings* on page 8). Auto tracking must also be enabled with local or remote controls.

Reference Source

The module can lock to an external reference or free run. The reference source can be selected with local or remote controls. If a reference signal is connected to the loop-through input, the reference source should be set to **Reference In**. If no external reference is used, or you don not wish to have the module lock to its reference input, set the module to **Free Run**.

Recalling Factory Defaults

When the factory defaults are recalled with either the local controls or the remote control from the web page, the module will revert to the following values:

- Maximum input levels to + 24 dBu
- Output gains to 0 dB
- Delay to 0 sec
- Input mapping to Inputs 1, 2 = AES 1 A, B, Inputs 3, 4 to AES 2 C, D

The following controls will default to the current on-board jumper and rotary switch settings on the module:

- Sample Rate – jumper J12 is set for 48 kHz, the current default for this release.
- Output Resolution – will default to the jumper setting for 20 or 24 bit word length on jumper J13 for AES 1 and jumper J14 for AES 2.
- Output processing mode – will default to the rotary switch setting on rotary switch SW1 for AES 1 and SW2 for AES 2.

Table 4 provides a complete summary of the 8921ADT functions and a comparison of the functionality available with each control type along with the ranges and default values for each parameter.

Table 4. Summary of 8921ADT Configuration Functions

Function Type	Default	Range/Choices Resolution	Web Page/ Function Name	Jumper or Rotary Switch Bank/Setting	Newton Panel Mnemonic	Notes/ Conditions
Analog input levels and routing						
Inputs 1 and 2	+ 24 dBu	0 – + 30 dBu (0.1 dB steps)	Analog Audio Inputs/ Max Input Levels 1&2 Select **Locked** checkbox	1:1	N/A	Preserves gain offsets between channels.
Inputs 3 and 4			Analog Audio Inputs/ Max Input Levels 3&4 Select **Locked** checkbox	1:2		
Input 1			Analog Audio Inputs/ Max Input Level 1	1:3	N/A	**Locked** boxes must be unchecked on web pages.
Input 2			Analog Audio Inputs/ Max Input Level 2	1:4		
Input 3			Analog Audio Inputs/ Max Input Level 3	1:5		
Input 4			Analog Audio Inputs/ Max Input Level 4	1:6		
Input to AES 1 A output	Audio In 1	Audio In 1-4	Audio Channel Pairing/ Assign AES 1 ChA	1:7	Ch1A Sel	Route analog input to AES output
Input to AES 1 B output	Audio In 2	Audio In 1-4	Audio Channel Pairing/ Assign AES 1 ChB	1:8	Ch1B Sel	
Input to AES 2 A output	Audio In 3	Audio In 1-4	Audio Channel Pairing/ Assign AES 2 ChA	1:9	Ch2C Sel	
Input to AES 2 B output	Audio In 4	Audio In 1-4	Audio Channel Pairing/ Assign AES 2 ChB	1:A	Ch2D Sel	
Adjust AES output delay						
Delay AES 1 A	0 sec	0 – 5 sec (2 ms steps)	Audio Delay/ AES 1 A Delay (ms)	2:7	Ch1ADly	**Locked** boxes must be unchecked on web pages.
Delay AES 1 B			Audio Delay/ AES 1 B Delay (ms)	2:8	Ch1BDly	
Delay AES 2 A			Audio Delay/ AES 2 A Delay (ms)	2:9	Ch2CDly	
Delay AES 2 B			Audio Delay/ AES 2 B Delay (ms)	2:A	Ch2DDly	
Delay AES 1 (A & B)			Audio Delay/ AES 1 A or B Delay (ms) Select **Locked** checkbox	2:B	N/A	**Locked** boxes must be checked on web pages.
Delay AES 2 (A & B)			Audio Delay/ AES 2 A or B Delay (ms) Select **Locked** checkbox	2:C		

Table 4. Summary of 8921ADT Configuration Functions

Function Type	Default	Range/Choices Resolution	Web Page/ Function Name	Jumper or Rotary Switch Bank/Setting	Newton Panel Mnemonic	Notes/ Conditions
Auto-tracking AES 1	Disable	Disable or Enable	Audio Delay/AES 1 Enable Auto Track On button	1:C (both AES 1 and AES 2)	N/A	Independent control of auto-tracking in remote control only.
Auto-tracking AES 2	Disable	Disable or Enable	Audio Delay/AES 2 Enable Auto Track On button			
Select reference source	Reference In	Reference In or Free Run	I/O Config/ Reference Source radio button	1:B	N/A	
Adjust AES output gain						
AES 1 (A & B) Gain	0 dB	– 40 – +6 dB (0.1 dB steps)	Audio Proc/ AES 1 A or B Gain (dB) Select **Locked** checkbox	2:1	N/A	**Locked** boxes must be checked on web pages.
AES 2 (A & B) gain			Audio Proc/ AES 2 A or B Gain (dB) Select **Locked** checkbox	2:2		
AES 1 A gain			Audio Proc/ AES 1 A (dB)	2:3	Ch1AGain	**Locked** boxes must be unchecked on web pages.
AES 1 B gain			Audio Proc/ AES 1 B (dB)	2:4	Ch1BGain	
AES 2 A gain			Audio Proc/ AES 2 A (dB)	2:5	Ch2CGain	
AES 2 B gain			Audio Proc/ AES 2 B (dB)	2:6	Ch2DGain	
Set AES output resolution						
AES 1 output	Jumper J13 value	20 or 24 bit	Audio Proc/ AES output resolution 20 bit or 24 bit radio button	Jumper J13 (see Figure 6 on page 25)	N/A	Remote control can override on-board jumper settings.
AES 2 output	Jumper J14 value		Audio Proc/ AES Output Resolution 20 bit or 24 bit radio button	Jumper J14 (see Figure 6 on page 25)		

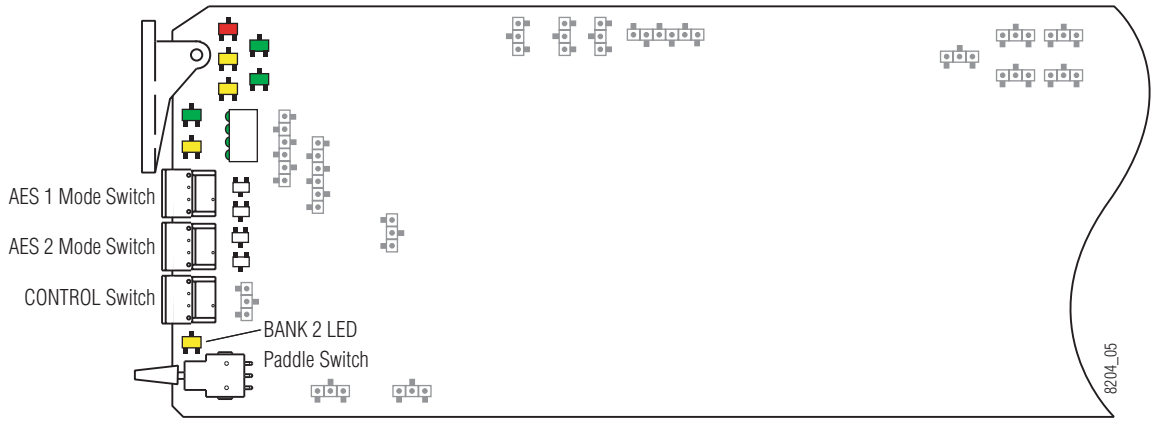
Table 4. Summary of 8921ADT Configuration Functions

Function Type	Default	Range/Choices Resolution	Web Page/ Function Name	Jumper or Rotary Switch Bank/Setting	Newton Panel Mnemonic	Notes/ Conditions
User settings	N/A	Recall or Learn (Save)	E-MEM/ **Recall** or **Learn** buttons	1:E	N/A	
Recall factory defaults	N/A	See Default column	E-MEM/ Recall factory settings button	1:F	N/A	
Set output processing						
AES 1 processing	A, B	A, B	Audio Proc/ AES 1 Processing pulldown	AES 1 Mode Rotary Switch S1 (see Table 6 on page 27)	A, B	
		– A, – B			– A, – B	
		– A, B			– A, B	
		A, – B			A, – B	
		A + B			A + B	
		A+B, A-B			A+B, A-B	
		– (A + B)			– (A + B)	
		1 kHz			1 kHz	
		400 Hz			400 Hz	
		Silence			Silence	
		A + B, C			A + B, C	
		A + B, D			A + B, D	
		A/B ID			A/B ID	
AES 2 processing	C, D	C, D	Audio Proc/ AES 2 Processing pulldown	AES 2 Mode Rotary Switch S2 (see Table 6 on page 27)	C, D	
		– C, – D			– C, – D	
		– C, D			– C, D	
		C, – D			C, – D	
		C + D			C + D	
		C+D, C-D			C+D, C-D	
		– (C + D)			– (C + D)	
		1 kHz			1 kHz	
		400 Hz			400 Hz	
		Silence			Silence	
		C/D ID			C/D ID	

Local Onboard Module Configuration

The 8921ADT module can be configured and operated locally using the rotary and paddle switches on the front edge of the module (Figure 6).

Figure 6. Module Jumpers and Switches for Local Configuration



Configuration Switches and Controls

The switches available for local configuration are described below. Refer to Figure 6 for the following descriptions:

- MODE and CONTROL (rotary) switches — Three rotary hex switches are present on the front edge of the module, AES 1 MODE, AES 2 MODE, and CONTROL.

  The AES 1and AES 2 MODE rotary switches select the output mode for each AES channel from 1 of 16 possible settings. Local settings for each output mode are given in Table 6 on page 27.

  The CONTROL switch is used to set input/output gain, delay, save and recall user settings, and for input selection in conjunction with the CONTROL paddle switch. It addresses two banks of functions; each bank has 16 possible positions (0 through 9 and A through F). Not all positions are used. The next bank of functions is accessed each time the CONTROL switch makes a complete revolution past zero (or back through F): While in Bank 1, a complete revolution past zero accesses Bank 2; while in Bank 2, a complete revolution past zero accesses Bank 1 again. The yellow BANK 2 LED indicates which bank is currently being accessed.

CAUTION The CONTROL rotary switch should be kept in position 0 in any bank (parked) when not in use to avoid any inadvertent change in configuration. Position 0 in each bank is inactive.

- BANK 2 (second Function) yellow LED – when off, indicates that the rotary switch is addressing the first bank of functions. When on, indicates that the rotary switch is addressing the second bank of functions.

- CONTROL (paddle) switch – actuates or selects the desired setting for the selected function when the switch is held momentarily in either the up or down position.
- CONF (configuring) yellow LED – when on, indicates the module is programming hardware.

8921ADT Module Onboard Configuration Settings

To make a configuration setting:

1. Rotate the CONTROL rotary switch to Bank 1 (BANK 2 LED off) or Bank 2 BANK 2 LED on) and to the desired function within that bank.
2. Move the paddle switch to the up or down position and hold momentarily to set the desired function (refer to Table 5).

Note Holding the paddle switch in the up or down position for more than a half second will automatically accelerate through the value range for parameters with 256 or more values. The full range can be accessed in about 10 seconds.

Table 5. CONTROL Rotary and Paddle Switch Functions

	Rotary Switch Setting	Paddle Switch Up	Paddle Switch Down	Function Description
Bank 1 (BANK 2 LED off)				
Bank 1 (BANK 2 LED off)	0	–	–	Default position for normal operation (paddle has no effect).
	1	Increase	Decrease	Adjust maximum input level for inputs 1 and 2 together.[1]
	2	Increase	Decrease	Adjust maximum input level for inputs 3 and 4 together.[1]
	3	Increase	Decrease	Adjust maximum input level for input 1 separately.
	4	Increase	Decrease	Adjust maximum input level for input 2 separately.
	5	Increase	Decrease	Adjust maximum input level for input 3 separately.
	6	Increase	Decrease	Adjust maximum input level for input 4 separately.
	7	Increment input #	Decrement input #	Select input channel to be used for Ch A (L) on AES 1 output.
	8	Increment input #	Decrement input #	Select input channel to be used for Ch B (R) on AES 1 output.
	9	Increment input #	Decrement input #	Select input channel to be used for Ch C (L) on AES 2 output.
	A	Increment input #	Decrement input #	Select input channel to be used for Ch D (R) on AES 2 output.
	B	Reference In	Free Run	Select the reference source input to lock or free run.
	C	Enable	Disable	Auto tracking enable or disable.
	D	-	–	Not used
	E	Recall	Save	Save and recall current user settings.
	F	Recall	–	Recall the following factory defaults: Maximum input levels to + 24 dBu Output gains to 0 dB Delay to 0 sec Input mapping to Inputs 1, 2 = AES 1 A, B, Inputs 3, 4 to AES 2 C, D

Table 5. CONTROL Rotary and Paddle Switch Functions

	Rotary Switch Setting	Paddle Switch Up	Paddle Switch Down	Function Description
Bank 2 (BANK 2 LED on)				
Bank 2 (BANK 2 LED on)	0	–	–	Default position for normal operation (paddle has no effect).
	1	Increase	Decrease	Adjust output gain of both Ch A and Ch B of AES 1 together.[1]
	2	Increase	Decrease	Adjust output gain of both Ch C and Ch D of AES 2 together.[1]
	3	Increase	Decrease	Adjust output gain of Ch A of AES 1.
	4	Increase	Decrease	Adjust output gain of Ch B of AES 1.
	5	Increase	Decrease	Adjust output gain of Ch C of AES 2.
	6	Increase	Decrease	Adjust output gain of Ch D of AES 2.
	7	Increase	Decrease	Delay Ch A output of AES 1 separately.
	8	Increase	Decrease	Delay Ch B output of AES 1 separately.
	9	Increase	Decrease	Delay Ch C output of AES 2 separately
	A	Increase	Decrease	Delay Ch D output of AES 2 separately.
	B	Increase	Decrease	Delay both channels of AES 1 output together.
	C	Increase	Decrease	Delay both channels of AES 2 output together.
	D-E	–	–	Not used.
	F	Recall	–	Recall defaults as given in Bank 1, position F.

[1] Preserves gain offsets between channels.

Set Output Processing Modes

Two rotary switches are provided on the front edge of the module for setting the desired output mode for AES 1 (SW1) and AES 2 (SW2). Refer to *Output Processing Modes* on page 18 for an overview of each mode.

Table 6. AES 1 and AES Modes Switch Settings

Position	AES 1 Processing Mode	AES 2 Processing Mode
0	A, B (Pass)	C, D (Pass)
1	– A, – B	– C, – D
2	– A, B	– C, D
3	A, – B	C, – D
4	A + B (– 6 dB)	C + D (– 6 dB)
5	A + B, A–B (MS D/E)	C + D, C–D (MS D/E)
6	– (A + B)	– (C + D)
7	1 kHz	1 kHz
8	400 Hz	400 Hz
9	Silence	Silence
A	A + B, C	C, D (Pass)
B	A + B, D	C, D (Pass)
C-D	A, B Pass	C, D (Pass)
E	A/B ID	C/D ID
F	A, B (Pass)	C, D (Pass)

Remote Configuration and Monitoring

8921ADT configuration and monitoring can be performed using a web browser GUI interface when the 8900NET Network Interface module is present in the audio frame (Gecko 8900TFN-A frame). This section describes the GUI access to the module configuration functions.

For remote access, make sure the jumper block on the module is set for both Local and Remote access (Figure 6 on page 25).

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

Note For optimal performance and access to the latest features, it is recommended that the 8900NET module be updated to the latest software release. Check the Grass Valley web site for the current 8900NET software.

Refer to the Frame Status page shown in Figure 7 on page 29. The 8900 audio modules can be addressed by clicking either on a specific module icon in the frame status display or on a module name or slot number in the link list on the left.

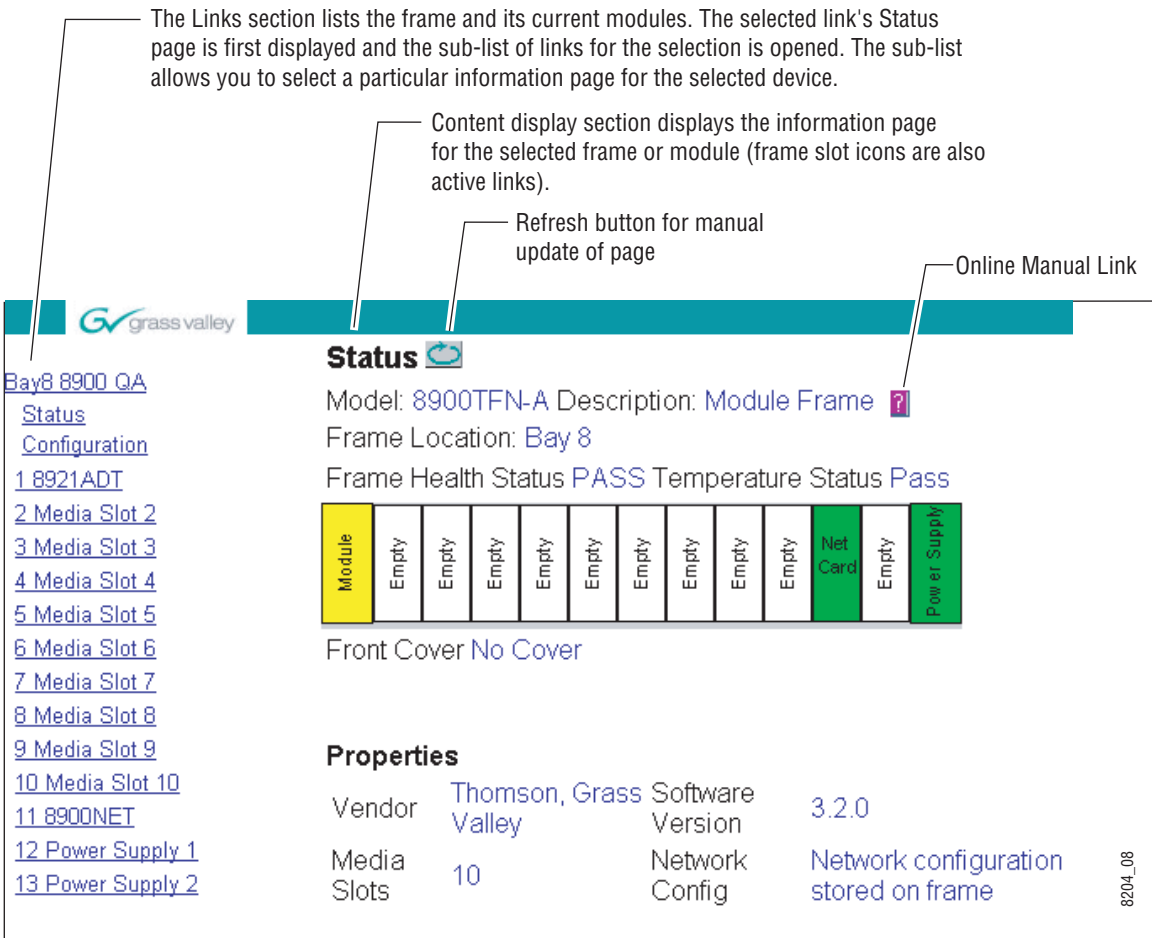
Note The physical appearance of the menu displays on the web pages shown in this manual represent the use of a particular platform, browser and version of 8900NET module software. They are provided for reference only. Displays will differ depending on the type of platform and browser you are using and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

Use the **Refresh** button to update the display (available with 8900NET software version 3.0 and later).

The **Online Manual Link** button can be set up to link to the documentation in pdf format. Link configuration is done on the Frame Configuration page.

For information on status and fault monitoring and reporting shown on the Status page, refer to *Status Monitoring* on page 51.

Figure 7. Frame Status Page

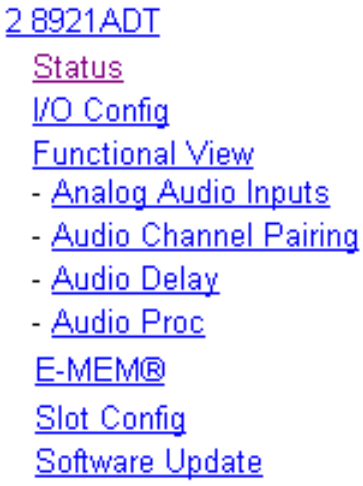


8921ADT Links and Web Pages

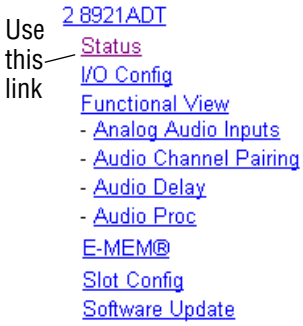
The 8900 GUI provides the following links and web pages for the 8921ADT module (Figure 8):

- Status – reports input and reference signal status and module information (page 31),
- I/O Config – shows a graphic representation of inputs and outputs to the module and allows naming of each input (page 32),
- Functional View – shows a block diagram of the module with links to each configuration page (page 33),
- Module Configuration pages for setting up the module (page 34),
- E-MEM – provides Learn and Recall functions for local operations as well as **Save to** and **Load from** file operations for current and user settings (page 39),
- Slot Config – provides a Locate Module function and Slot Memory (page 42), and
- Software Update – allows updating of software from a CD-ROM or the web site (page 44).

Figure 8. 8921ADT Web Page Links



Status Page



The Status page (Figure 9) shows the signal status of the audio, reference, and AES 1 or Tracking inputs and the AES 1 and AES 2 and Tracking outputs. Color coding of the display indicates the signal status. Refer to *Status Monitoring* on page 51 for an explanation of the color coding.

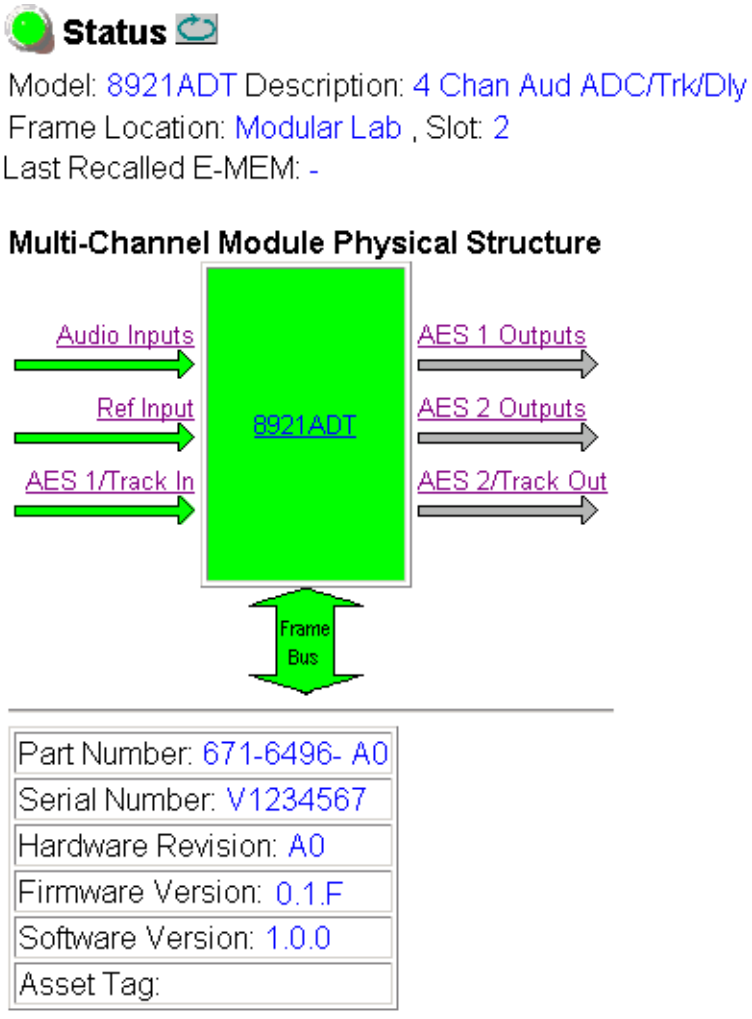
Information about the module, such as part number, serial number, hardware revision and software and firmware versions are given in a read-only section at the bottom of the display. Enabled options are also reported.

The Asset Tag field is for future 8900NET capability.

Clicking on the underlined links to the audio inputs and outputs will take you to the I/O Config page.

Clicking on the model number in the center box will take you to the Functional View page illustrating a block diagram overview of the module with links to each of the configuration pages.

Figure 9. 8921ADT Status Page



I/O Config Page

Use this link

2 8921ADT
Status
I/O Config
Functional View
- Analog Audio Inputs
- Audio Channel Pairing
- Audio Delay
- Audio Proc
E-MEM®
Slot Config
Software Update

The I/O Config page (Figure 10) shows the rear input and output connections to the module. Audio input and Reference In status is reported by the color-coding of the corresponding blocks. Grayed components are inactive due to hardware and/or software constraints. Refer to *Web Browser Interface* on page 52 for a complete explanation of status reporting.

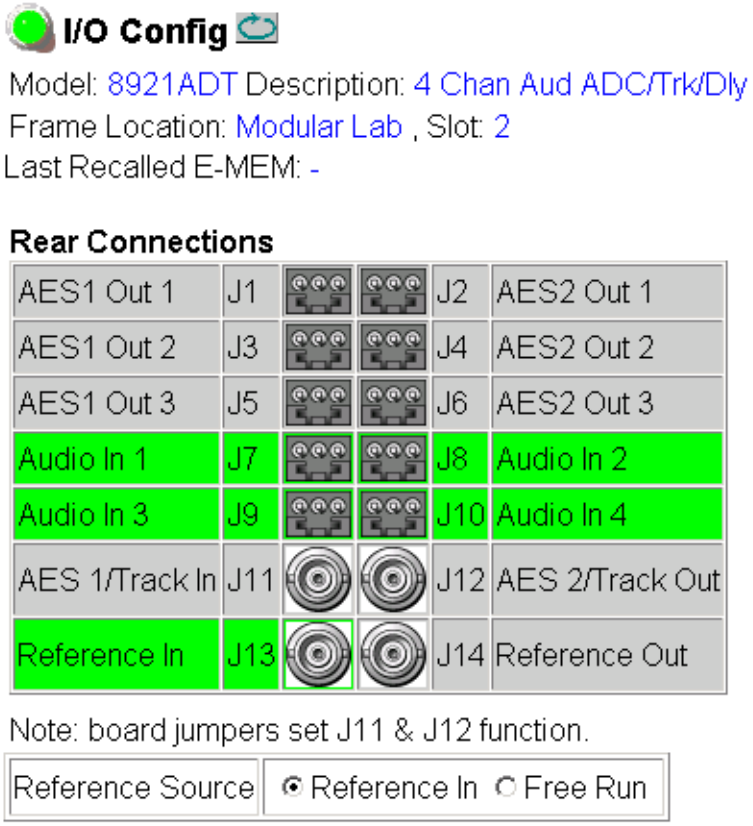
Note Output status is not reported in this application.

Use this page to do the following:

- Set the Reference Source to either **Reference In** (to lock to an input reference when present) or **Free Run** (no reference input present or to force module to free run and not lock to an input reference).

Rear BNC functionality for BNCs J11 and J12 is defined by jumper settings on the module. Refer to *Module On-board Jumper Settings* on page 8 for more information.

Figure 10. 8921ADT I/O Config Page



Functional View Page

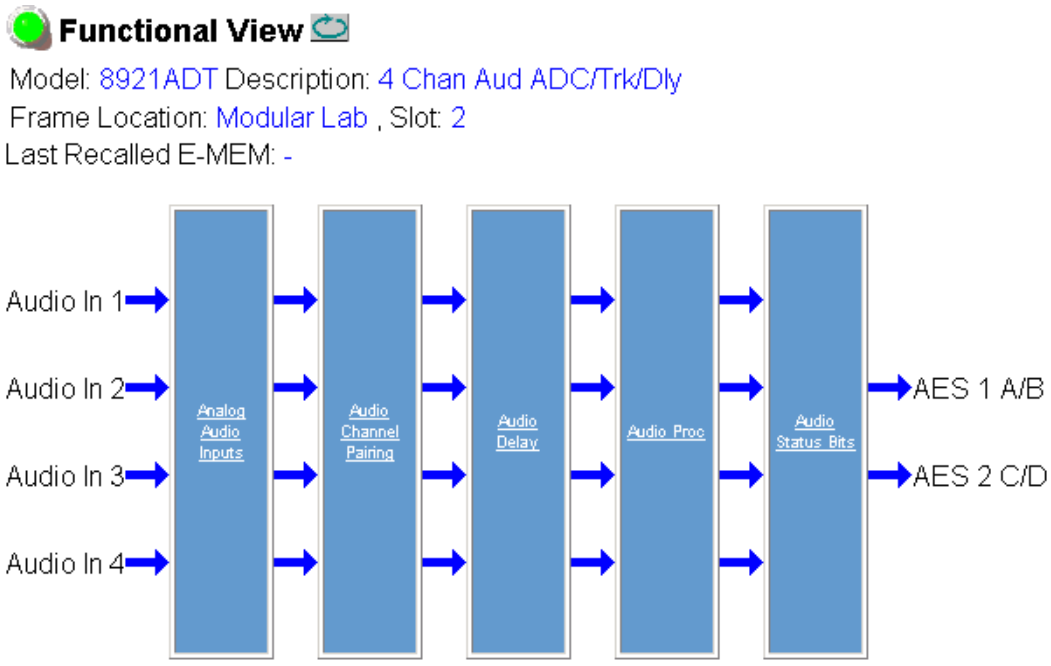
Use this link

2 8921ADT
Status
I/O Config
Functional View
- Analog Audio Inputs
- Audio Channel Pairing
- Audio Delay
- Audio Proc
E-MEM®
Slot Config
Software Update

The Functional View page (Figure 11) illustrates a block diagram of the 8921ADT 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. Underlined module functions are links to the web page for that function.

Use the Functional View to configure the 8921ADT module in the order of the signal flow. Refer to each of the module configuration web pages given in the next section.

Figure 11. 8921ADT Functional View Page



Module Configuration Pages

Module configuration is provided for the following functions with the GUI interface:

- Analog Audio Inputs (page 35)
- Audio Channel Pairing (page 36)
- Audio Delay (page 37)
- Audio Proc (page 38)

Read-only information about the module is given on the top of each page including model name and description, frame and slot location and last E-MEM function recalled (E-MEM, File, or Defaults).

Note If the module is power cycled, the Last E-MEM Recalled field will indicate a dash (–) instead of the last E-MEM function name recalled. The last recalled function information will be retained by the module, but the function name will not be remembered.

After making a parameter value change, click on **Apply** to activate settings in each selection.

Select the **Back**, **Functional View**, or **Next** link to navigate to the next function or use the links on the left of the web page.

Click on the **Refresh** button at the top of the display to update the entire display.

Analog Audio Inputs Page

Use this link

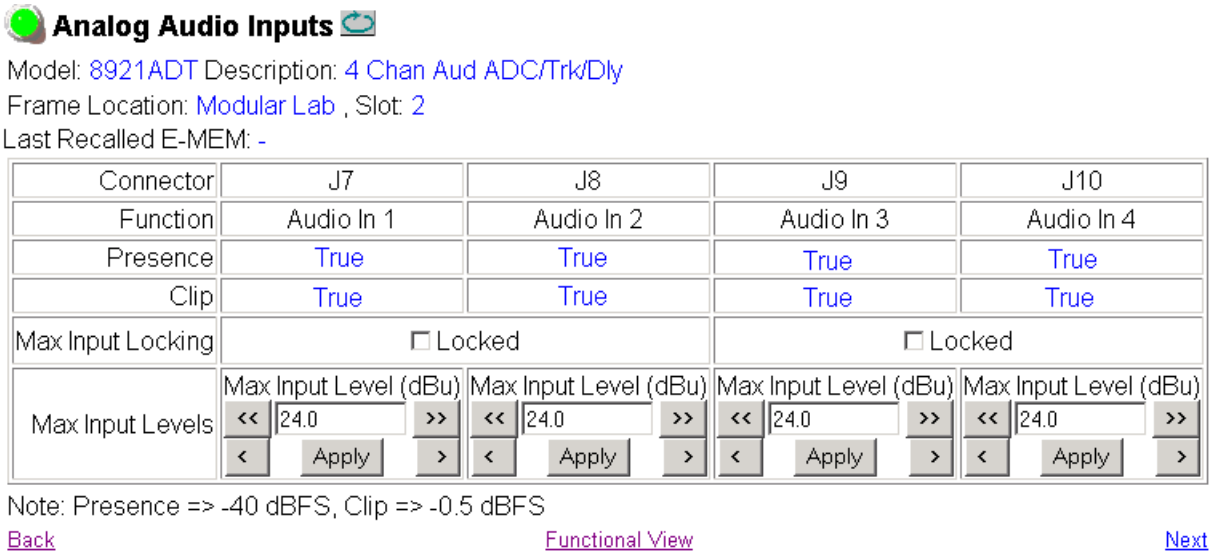
2 8921ADT
- Status
- I/O Config
- Functional View
- Analog Audio Inputs
- Audio Channel Pairing
- Audio Delay
- Audio Proc
- E-MEM®
- Slot Config
- Software Update

The Analog Audio Inputs page (Figure 12) reports the following for each of the analog audio inputs:

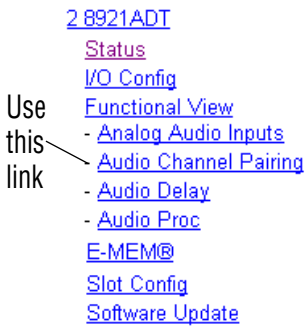
- Presence of input signal (True = > – 40 DBFS)
- Clip status of input signal (True = > – 0.5 dBFS).

Set the maximum input level of each of the analog audio inputs from 0 to + 30 dBu with the Max Input Levels controls. Input levels can also be adjusted in pairs (J7 and J8, J9, and J10) by selecting the corresponding **Locked** checkbox and adjusting either level control in the pair.

Figure 12. 8921ADT Analog Audio Inputs Page



Audio Channel Pairing Page



The Audio Channel Pairing page (Figure 13) allows routing the four audio input streams to be output on any of the four output channels AES 1 A and B, AES 2 C and D.

Assign each input audio stream from the list on the left to AES 1 A or B or AES 2 C or D by clicking on the corresponding radio button under the AES output. The default routing (Input 1 to AES 1 Ch A, Input 2 to AES Ch 2, Input 3 to AES 2 Ch C and Input 4 to AES 2 Ch D) is shown in the example.

Figure 13. 8921ADT Audio Channel Pairing Page

Audio Channel Pairing

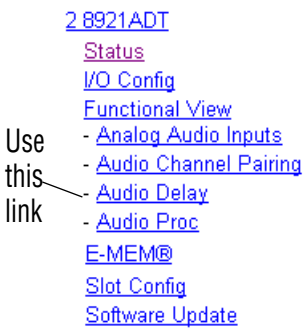
Model: 8921ADT Description: 4 Chan Aud ADC/Trk/Dly
Frame Location: Modular Lab , Slot: 2
Last Recalled E-MEM: -

Input Stream Select

	AES 1		AES 2	
	A	B	C	D
Audio In 1	◉	○	○	○
Audio In 2	○	◉	○	○
Audio In 3	○	○	◉	○
Audio In 4	○	○	○	◉

Back Functional View Next

Audio Delay Page



The Audio Delay page (Figure 14) provides delay controls for the AES 1 and AES 2 outputs. Use this page to do the following:

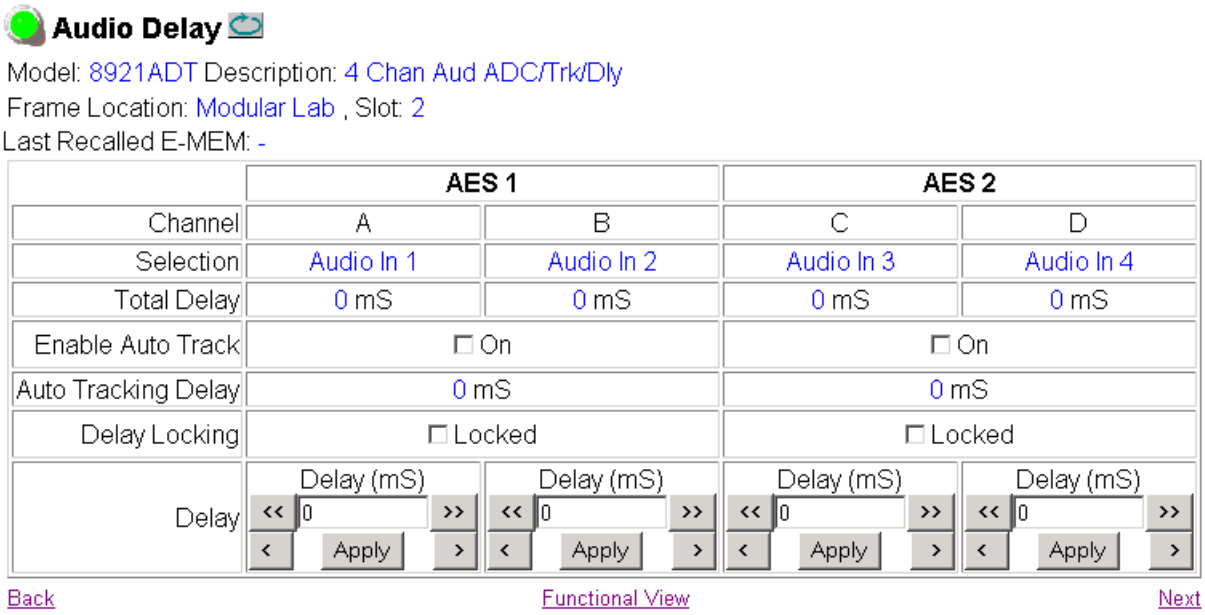
- Enable auto tracking to an external tracking signal from an 8900FSS or 8981FS module input. Select the **On** checkbox to enable auto-tracking for either channel.

  The amount of auto tracking delay in ms will be shown in the Auto Tracking Delay boxes for both channels.

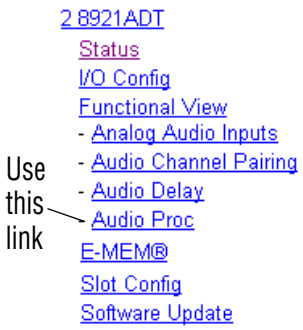
- Set manual delay for each output channel with the Delay controls at the bottom of the page. AES 1 A and B and AES 2 C and D can also be adjusted together by selecting the corresponding **Locked** checkbox in the Delay Locking areas for each channel.

  The total amount of delay for each channel is reported in the Total Delay boxes.

Figure 14. 8921ADT Audio Delay Page



Audio Proc Page



The Audio Proc page (Figure 15) reports the following for each AES output channel:

- Presence of audio input signal (True = > – 40 dBFS)
- Clip status of audio input signal (True = > – 0.5 dBFS)

Use the Audio Proc page to make the following adjustments:

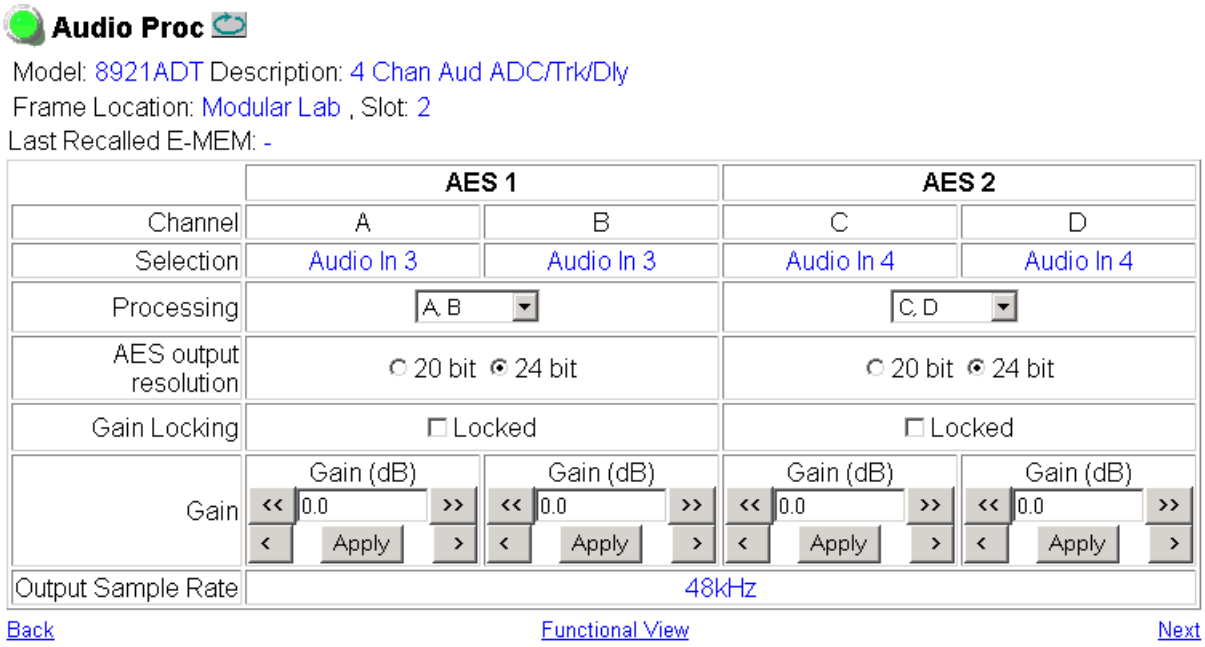
- Processing – set the output processing mode for AES 1 and AES 2 from the corresponding Processing pulldown. Refer to *Output Processing Modes* on page 18 for an overview of each output processing mode.

Note Also set the on-board AES1 and AES2 Mode rotary switches on the front of the module to match your settings. Refer to *Set Output Processing Modes* on page 27. If defaults are recalled, the module will default to the local settings.

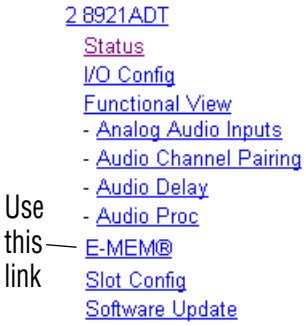
- AES Output Resolution – set the output resolution to 20 or 24 bit for AES 1 and AES 2. This setting will override the on-board settings made at jumpers J13 and J14 (Table 1 on page 8 and Figure 1 on page 9).
- Gain – adjust the output gain in dB for each channel with the corresponding **Gain** controls.

  Output gains can also be adjusted in pairs (AES 1 A and B, AES 2 C and D) by selecting the corresponding **Locked** checkbox in the Gain Locking area and adjusting either **Gain** control in the pair.
- Output Sample Rate – the default output sample rate for AES 1 and AES 2 of **48kHz** will be reported (read only).

Figure 15. 8921ADT Audio Proc Page



E-MEM Page

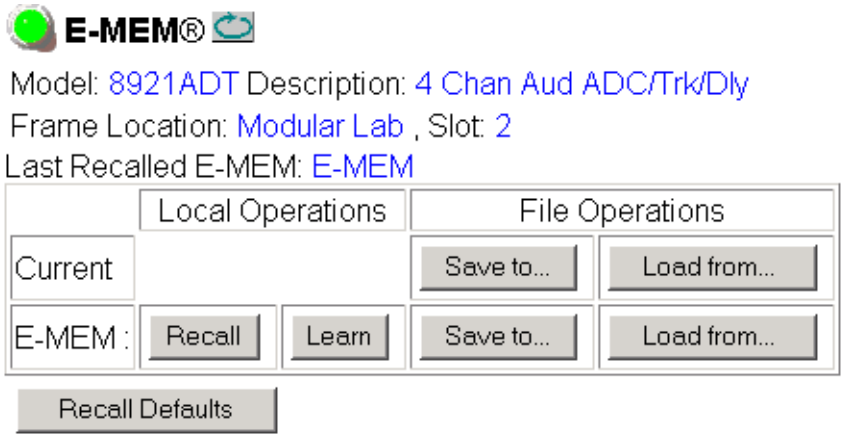


The E-MEM page (Figure 16) provides local operations for learning and recalling the current user configuration. File operations are also available for saving or loading the saved files to and from a hard disk or other accessible media. Defaults can also be recalled from this page.

Local Operations

To save the current module configuration to the E-MEM register stored on the module, select the **Learn** button. Recall a configuration stored in the Local Operations E-MEM register by selecting the **Recall** button. The **Last Recalled E-MEM** field will report **E-MEM** as shown in Figure 16.

Figure 16. 8921ADT E-MEM Page



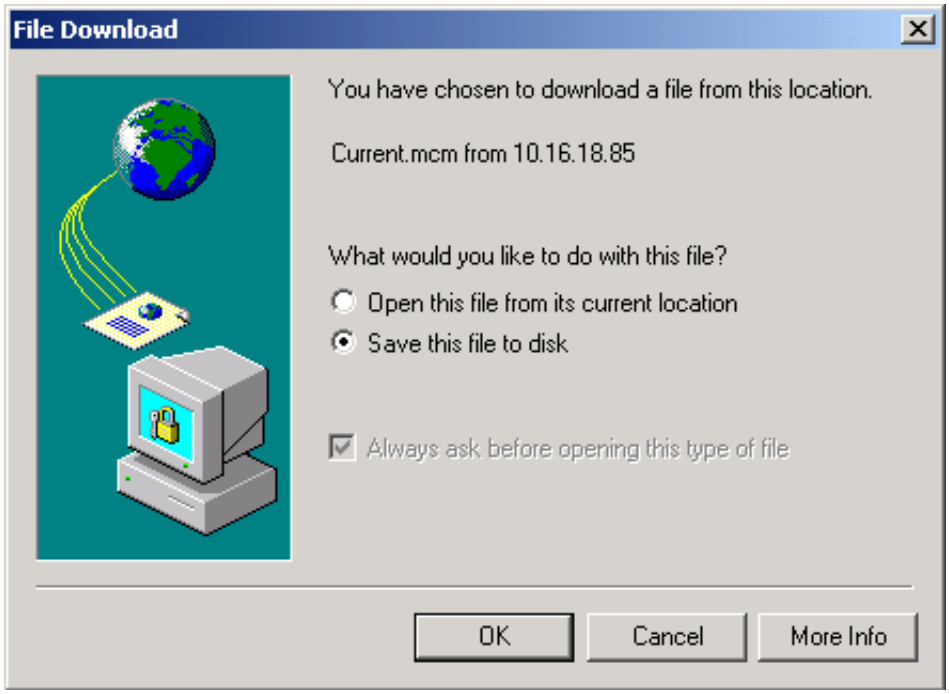
File Operations

Current module configurations and the E-MEM configuration can also be saved and recalled to/from a file for storage in another location outside of the frame.

To save the current configuration or E-MEM to a file:

1. Select the **Save to…** button under the Current or E-MEM row.
2. This will bring up a File Download screen (Figure 17 on page 40).
3. Follow the prompts and select the **Save this file to disk** button and **OK**.

Figure 17. E-MEM Save to Operation



4. In the resulting Save As dialog box, the default file name can be changed to an identifying name for the file, such as Audio_Studio_1. Browse to the folder where you want to save the configuration and select **Save**. The file saves as a .mcm file type.

To load a saved file from a location outside of the frame:

1. Select the **Load from ...** button under File Operations in the Current or E-MEM row.

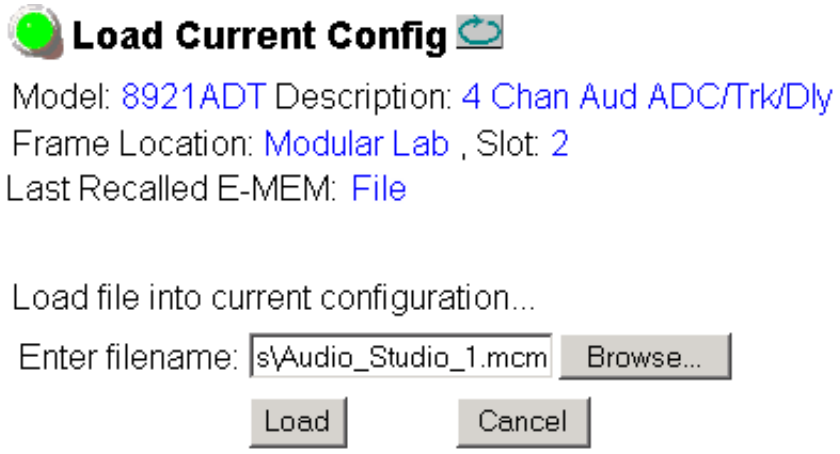
   This will bring up the Load Current Config page (Figure 18) or the Load E-MEM page (not shown).

2. Browse to the location of the file you wish to load and select the file. Select the **Open** button to load the file or enter the filename and path in the Enter filename box.

3. Once the correct path and filename is loaded, select the **Load** button on the Load Current Config or Load E-MEM page.

4. This will place the recalled configuration from the file into the module. The **Last Recalled E-MEM** field will report **File**.

Figure 18. Load Current Config Page

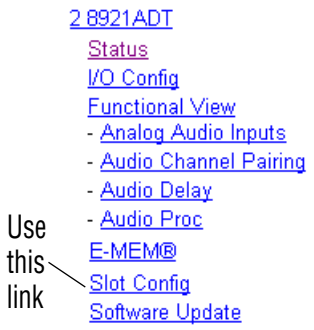


Recall Defaults

Default settings for the module can be recalled by selecting the **Recall Defaults** button on the main E-MEM page. The defaults will revert to the settings given in the Default column in Table 4 on page 22. The **Last Recalled E-MEM** field will report **Default**.

Note Default settings for Sample Rate, AES Output Resolution, and Output Processing Mode will match the hardware jumper settings made in *Module On-board Jumper Settings* on page 8 during installation. Default settings for the AES 1 and AES 2 output processing modes will match the setting on the AES 1 and AES 2 rotary switches on the front of the module.

Slot Config Page



Use the Slot Config page (Figure 19 on page 43) to perform the following functions on the 8921ADT module:

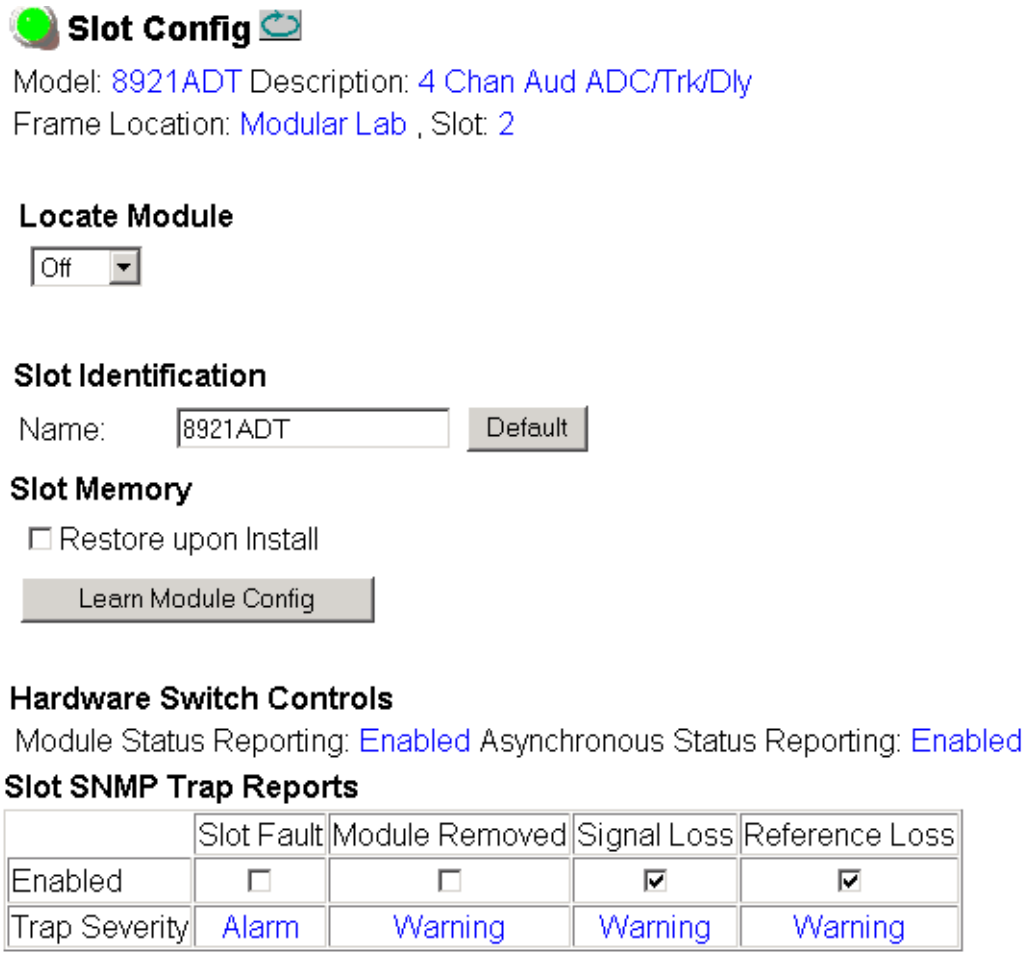
- **Locate Module** – selecting the On pulldown flashes the yellow COMM and CONF LEDs on the front of the module so it can be located in the frame.
- **Slot Identification** – You may identify the module by typing a specific name in the **Name** field. The assigned name is stored on the 8900NET module and travels with the 8900NET module if it is moved to another frame. Select **Default** to enter the factory default module name.
- **Slot Memory** – the slot configuration for each media module is automatically saved periodically (once an hour) to the 8900NET module in that frame. You may also select the **Learn Module Config** button at any time to save the current configuration for this slot. The configuration is saved on the 8900NET module. If the 8900NET module is removed or powered down, the stored configurations are not saved.

  When the **Restore upon Install** box has been checked, the current configuration saved to this slot is saved as slot memory. When the current module is removed and another module of the same type 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.
- **Hardware Switch Controls** – a read-only status report of 8900NET module switch settings for Module Status Reporting and Asynchronous Status Reporting. These functions must be enabled for the following Slot SNMP Trap Reports to function.
- **Slot SNMP Trap Reports** – displayed only when the SNMP Agent software has been installed on the 8900NET module. Slot SNMP traps can be enabled only when the hardware switches for Module Fault reporting and Asynchronous Status reporting are in enabled on the 8900NET module (dipswitch S1 segment 7 and dipswitch S2 segment 1).

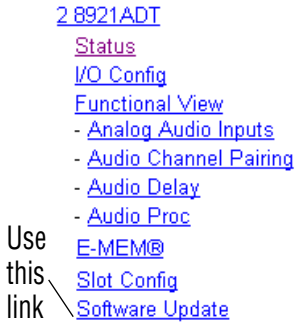
  The enabled SNMP traps will be reported to any SNMP manager that is identified as an SNMP Report Destination in 8900NET configuration. Trap severity is read-only hard-coded information that is interpreted and responded to by the SNMP Manager software configuration.

  SNMP reporting can be also be disabled for individual signal inputs on the I/O Config and Video Composite In web pages.

Figure 19. 8921ADT Slot Config Page



Software Update Page

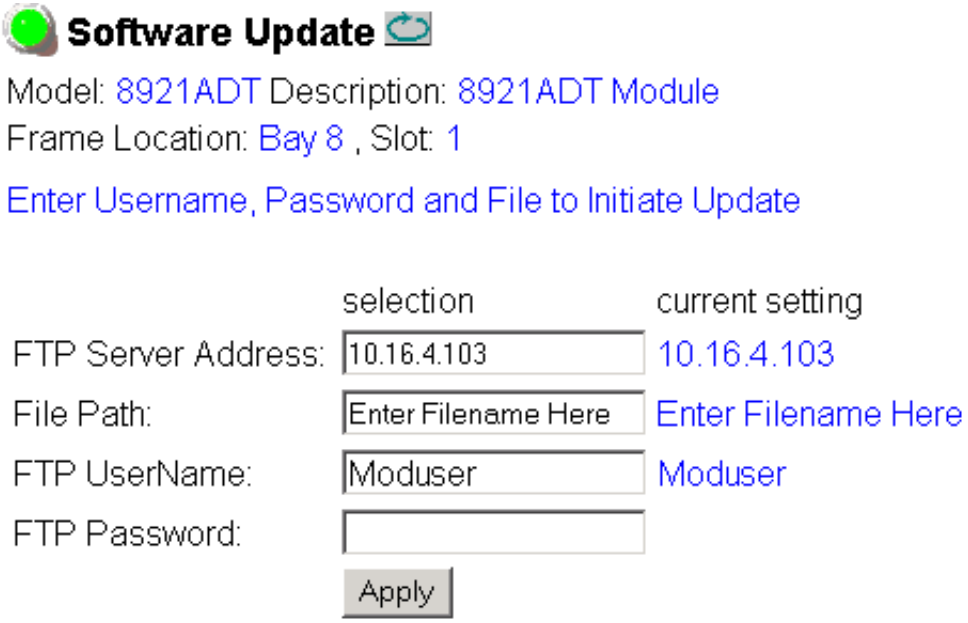


The Software update page (Figure 20) allows updating of software from remote locations such as a CD-ROM or the Grass Valley web site. For instructions on updating to the latest software, refer first to the 8921ADT Release Notes that accompany the software update for compete details.

Updating with this method requires the use of an ftp server application available from the Grass Valley web site. Refer to the *8900NET Network Interface Instruction Manual* for instructions for installing and using the ftp server application.

Software updates may also be performed using the NetConfig application available from Grass Valley. Refer to the *NetConfig Instruction Manual* for more information.

Figure 20. 8921ADT Software Update Page



Control Panel Configuration

An external control panel is available to interface over the network to the 8921ADT module. The configuration functions available with the Grass Valley Newton Control System are summarized in Table 4 on page 22. In addition, the Control Panel mnemonics that will appear with each available function are given in the table.

Note Not all configuration parameters may be available with the Control Panel.

Installation, configuration, and operation of the Newton Modular Control System is provided in a separate manual provided with option.

Specifications

Table 7. 8921ADT Specifications

Parameter	Value
Reference Input	
Number of inputs	1 loop-through
Impedance	75 Ω
Connector type	BNC loop-through
Input return loss	> 40 dB 10 kHz to 10 MHz @ 75 Ω
Common mode input voltage	± 1 V maximum
Differential DC	± 0.25 V maximum
Common mode rejection ratio	> 35 dB @ 50/60 Hz
Free run frequency accuracy	± 20 ppm of selected sampling frequency
Reference input types:	
AES3ID or Word Clock	48 kHz sample rate
	AES3ID level = 1V p-p nominal, 200 mV to 2 V p-p
	Word clock level = 2.5 V p-p nominal, 200 mV to 5 V p-p
	Capture range = ± 100 ppm (48 kHz ± 4.8 Hz)
Video (NTSC/PAL)	Locks to video within ± 50 ppm of the nominal video rate for SMPTE170M/NTSC and CCIR624?PAL. NTSC can use SMPTE318M-1999 signal on line 15 to sync AES blocks. (Downstream equipment may not be able to lock to this wide of range.)
	Level = 1 V p-p nominal
Tracking I/O (jumper J5 set for Trk In and J6 set for Trk Out)	
Number of inputs/outputs	1 input and 1 output
Input/output type	Conforms to RS-232 levels and impedance
Analog Input s	
Number of inputs	4 balanced
Impedance	> 22 k Ω
Common mode input voltage	20 V maximum
Differential DC	± 0.25 V maximum
Common mode rejection ratio	> 72 dB, 20 Hz to 20 kHz
Connector type	3-pin mini-terminal strip
Digital Outputs	
Balanced (jumpers J2, J3, and J4 set to Bal)	
Number of outputs	3 balanced for AES1 and 3 balanced for AES 2 outputs
Signal type	AES3-1992
Output voltage level	3 V p-p ± 0.2 V @ 110 Ω
Output impedance	110 Ω
Output return loss	> 25 dB (100 kHz to 6 MHz)
Output rise/fall time	5 ns to 30 ns with 110 Ω load
Connector type	3-pin mini-terminal strip

Table 7. 8921ADT Specifications

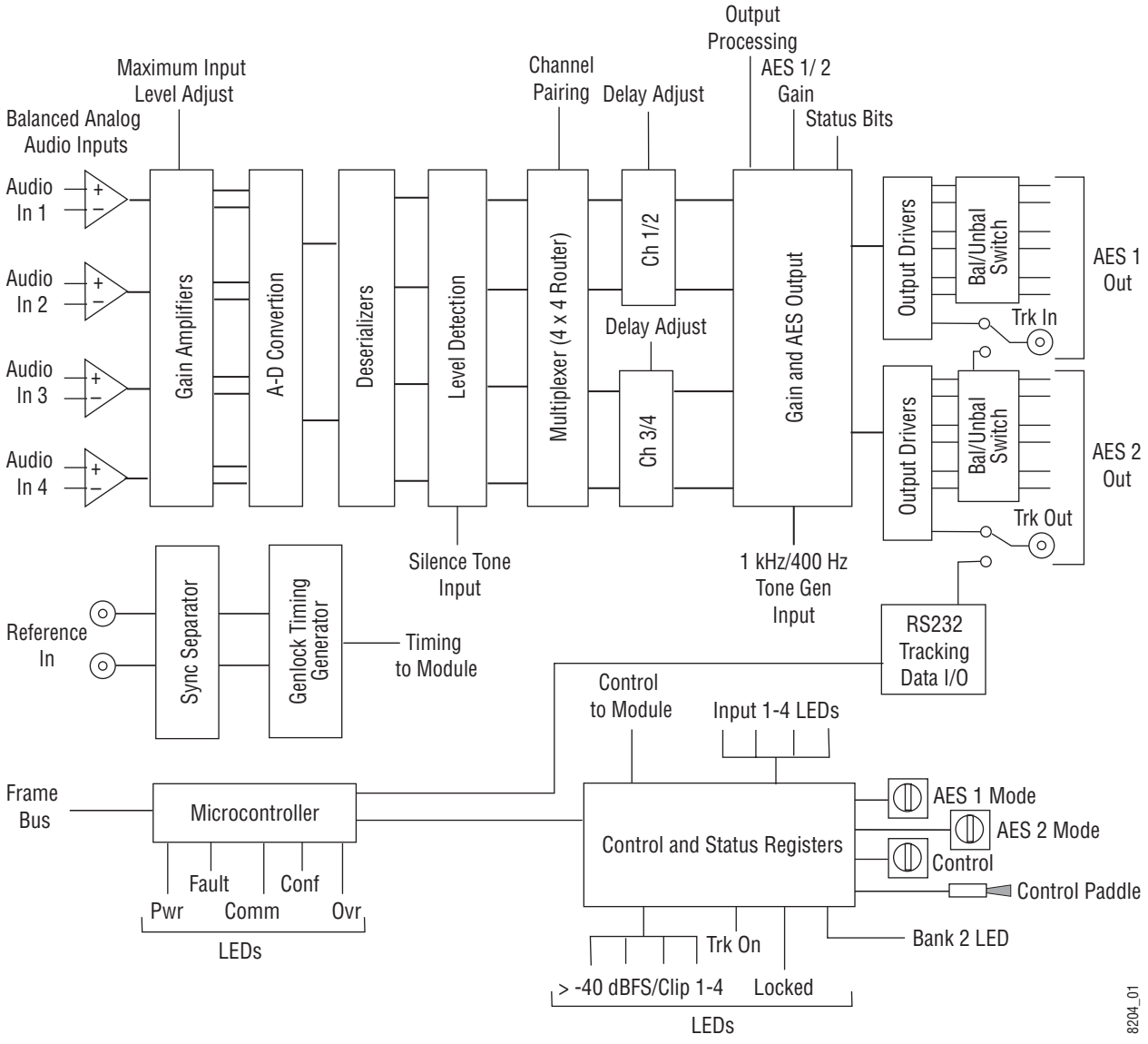
Parameter	Value
Unbalanced (jumpers J2, J3, and J4 set to Un)	
Number of outputs	6 unbalanced (with cable adapter) plus 1 additional AES3id output for each AES stream if tracking input and output BNCs not used.
Signal type	AES3id-2001
Output voltage level	1 V p-p ± 0.2 V @ 75 Ω
Output impedance	75 Ω
Output return loss	> 15 dB (100 kHz to 6 MHz)
Output rise/fall time	37 ns ± 7 ns @ 75 Ω
Connector type	BNC with 8900-A-CBL option (package of four 3 terminal to dual BNC cables)
Bit Resolution	20 or 24 bit
Sample rate	48 kHz
Delay, minimum and maximum and resolution	Minimum = 530 µs Maximum = 5 sec @ 48 kHz sample rate Step size = 2 ms
A/D Audio Performance	
Signal/Noise ratio	> 107 dB. 20 Hz to 20 KHz > 110 dB A weighted
THD+noise, swept 20 Hz - 20 kHz	< - 75 dB, 20 to 20 kHz @ + 28 dBu
Interchannel crosstalk	< - 95 dB, 20 Hz to 20 kHz
Intermodulation distortion	< - 100 dB, CCIF 2-tone test, 19 and 20 kHz tones
Frequency response	± 0.1 dB, relative to 1 kHz, 20 Hz to 20 kHz
Interchannel gain mismatch	1 dB, (correctable to 0.1 dB)
DC offset	± 1 mV
Emphasis	Not supported
Static withstand	5 kV (330 Ω, 150 pF) for any input or output
Output resolution	24 bits
Environmental	
Frame temperature range	0 to 45 degrees C
Operating humidity range	0 to 90% non-condensing
Non-operating temperature	- 10 to 70 degrees C
Mechanical	
Frame type	Gecko 8900 Audio
Power	
Power consumption	< 4.7 W

Functional Description

Refer to the block diagram in Figure 21 for the following functional description.

The 8921ADT receives four channels of balanced analog audio differentially to reduce common mode interference. The audio inputs are converted into single-ended signals that feed a gain amplifier where the maximum input levels can be adjusted to just below the clip point for the analog to digital converter.

Figure 21. 8921ADT Functional Block Diagram



The outputs from the gain amplifiers are converted back to a differential signal before being applied to the A-D converter inputs. The output of the A-D converter is a serial bit stream which is deserialized into two 24-bit parallel words in the deserializer block.

A level detection circuit reports when the output is above – 40 dBFS and near or above clipping on the front panel controls and the web pages.

The multiplexer acts as a 4 x 4 router. Each channel can be routed to any one of the four channels in the output AES streams with the channel pairing control.

The output channels from the routing multiplexer are then stored in delay memory where user-selected delay can be added in increments of 2 msec-onds.

The channels then enter the gain and AES output section where the audio processing controls can be used to set the desired output mode such as inversion, summing etc. The AES 1 and AES 2 gain can be adjusted after processing has been defined. The channels are serialized and formatted into an AES stream then sent on to the output drivers.

The output drivers drive either balanced 110 ohm cables or 75 ohm coaxial cable depending on the selected output format. If no tracking input or output is required, two unbalanced AES outputs are available on the TRK IN/AES 1and TRK OUT/AES 2 BNCS.

The reference input uses loop-through BNCs. The AES or AES word clock and sync from the reference input signal are stripped and the signal is sent to a genlock circuit that locks 27 MHz to the input. This clock is then used to generate all internal and AES timing signals.

The microcontroller handles communications with the frame bus and contains the program for controlling and monitoring the module. Switch settings and read and write registers are read by the microcontroller to perform user adjustments and report status to the user.

Service

The 8921ADT 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 directed otherwise by Customer Service.

If your module is not operating correctly, proceed as follows:

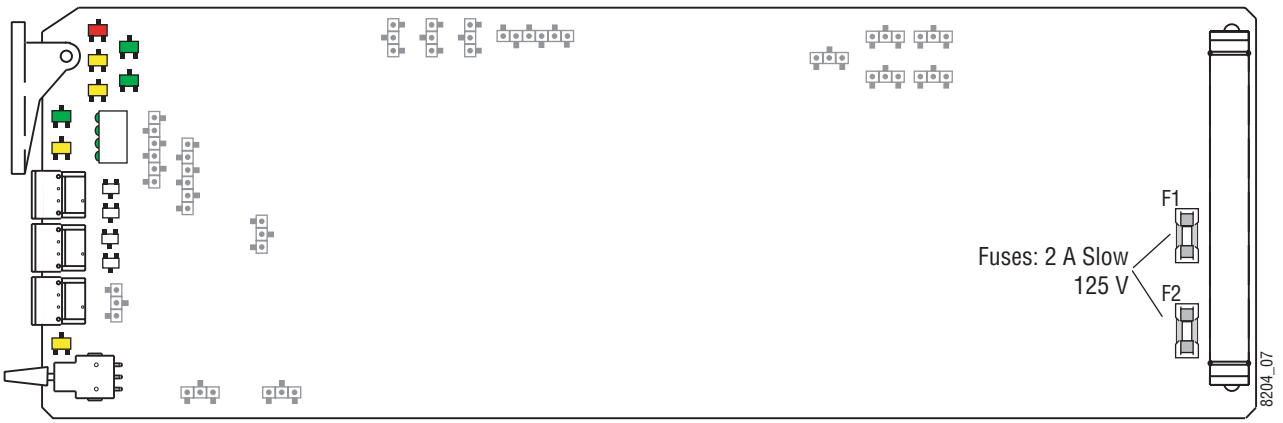
- Check frame and module power and signal present LEDs.
- Verify power at the voltage testpoints (see Figure 22) and check fuse if no voltage is detected.
- Check for presence and quality of input signals.
- Verify that source equipment is operating correctly.
- Check cable connections.
- Check output connections for correct I/O mapping (correct input connector is used for the corresponding channel output).

Refer to Figure 5 for the location of PWR LED and Table 3 on page 15 for proper LED indications.

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 the *Contacting Grass Valley* at the front of this document for the Grass Valley Customer Service Information number.

Figure 22. 8921ADT Fuse and Voltage Testpoint Locations



Status Monitoring

This section provides a summary of status monitoring and reporting for a Gecko 8900 Series system. It also summarizes what status items are reported and how to enable/disable reporting of each item. There are a number of ways to monitor status of modules, power supplies, fans and other status items depending on the method of monitoring being used.

8900 Frame status will report the following items:

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

Module health status will report the following items:

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

LEDs

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

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

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

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

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

Status LEDs for this module are described in *Operation Indicator LEDs* on page 15. LEDs for the 8900NET module are described in the *8900NET Network Interface Instruction Manual*.

Frame Alarm

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

Web Browser Interface

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

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

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

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

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

SNMP Reporting

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

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

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