GV grass valley

8920ADC

AUDIO A-TO-D CONVERTER

Instruction Manual

SOFTWARE VERSION 2.0.1A

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Contacting Grass Valley

Region	Voice	Fax	Address	Web Site
North America	(800) 547-8949 Support: 530-478-4148	Sales: (530) 478-3347 Support: (530) 478-3181	Grass Valley P.O. Box 599000 Nevada City, CA 95959-7900 USA	www.thomsongrassvalley.com
Pacific Operations	+852-2585-6688 Support: 852-2585-6579	+852-2802-2996		
U.K., Asia, Middle East	+44 1753 218 777	+44 1753 218 757		
France	+33 1 45 29 73 00			
Germany, Europe	+49 6150 104 782	+49 6150 104 223		

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FAQ Database — Solutions to problems and troubleshooting efforts can be found by searching our Frequently Asked Questions (FAQ) database.

Software Downloads — Software updates, drivers, and patches can be downloaded.

Contents

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*).

8920ADC Analog Audio to AES/EBU Converter

Introduction

The 8920ADC converts analog audio to digital audio. The right and left channel audio inputs enter via a terminal block-to-BNC adapter on the rear panel. A 48 kHz AES/EBU reference is required to lock the module, which is connected to the loop through input BNCs. The module outputs 4 AES/EBU 75 Ω signals through BNCs on the rear panel.

The 8920ADC can modify the outgoing signal to provide channel swapping, channel summing, tone and phase inversion. The remote control capability supports mode selection and input gain control.

The 8920ADC features:

- 24-bit resolution,
- AES/EBU loop-through reference input,
- 48 kHz sampling rate,
- Terminal block input via adapter,
- Independent input level control from +12 dBu to +28 dBu,
- 8900 Series Frame compatibility,
- Remote control via ethernet frame I/F,
- Newton Control Panel,
- SNMP monitoring, and
- Remote control lockout via onboard jumper.

Installation

Installation of the 8920ADC module is a process of:

1. Placing the module in the desired frame slot,

2. Cabling and terminating signal ports, and

3. Configuring the module.

The 8920ADC module can be plugged in and removed from an 8900 Series frame with power on. When power is applied to the module, LED indicators reflect the initialization process (see *Power Up* on page 11).

Frame Capacity

The 8920ADC module can be installed in all 8900 Series frames but with varying maximum quantities determined by frame cooling capacity. Table 1 provides the power capacity, cooling capacity, and maximum module count for each frame type.

Table 1. Power, Cooling, and Module Capacity of 8900 Frames

Capacity Calculated	8900TX Frame	8900TF Frame	8900TFN Frame
Power (W)	100	100	100
Recommended Module Cooling (W)	30	90	90
8920ADC Modules	7	10	10

**Note** Module capacity figures assume no other modules are in the frame.

Module Placement in the 8900 Frame

There are ten cell locations in the frame to accommodate either analog or digital modules. These are the left ten locations. Refer to Figure 1 on page 9.

The two cells on the right are allocated for the power supplies. For additional information concerning the Power Supply module, refer to the *Gecko 8900 Frame Instruction Manual*.

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

Figure 1. 8900 Series Frame
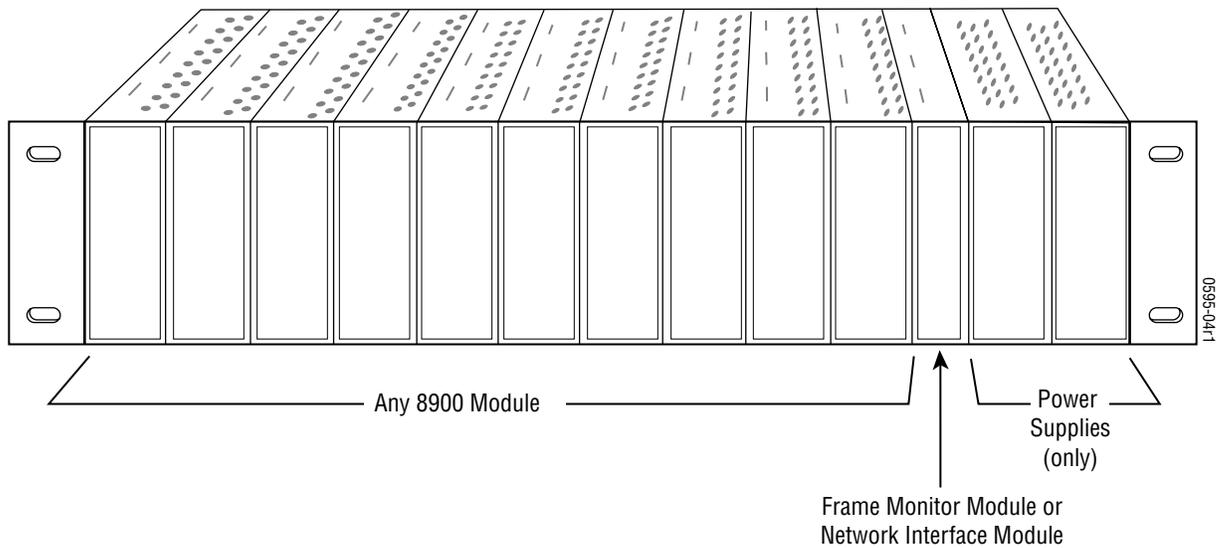
8900 modules are interchangeable within the module cells. There are 10 BNC connectors in each cell's I/O group. The functional assignment of each connector in a group is determined by the module that is placed in that cell. The maximum number of modules an 8900 frame can accept is ten. Figure 2 illustrates the rear connector plate for an 8900 Series frame.

Figure 2. 8900 Series Frame Rear Connector
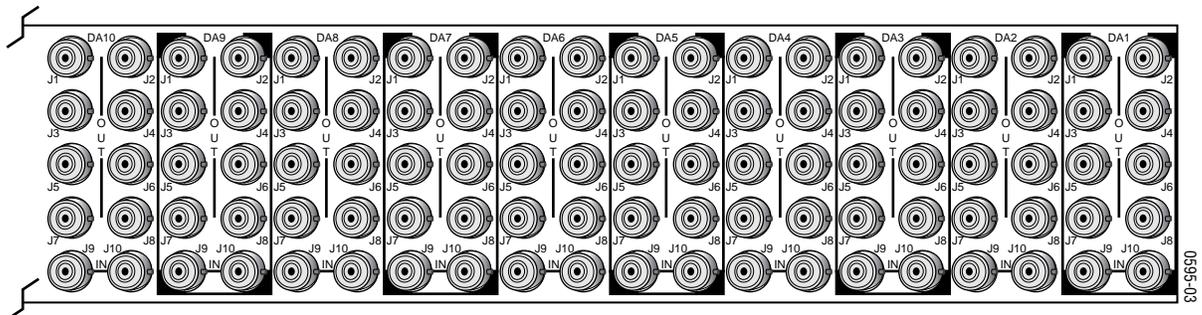
To install a module in the frame:

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 the ejector tab in to seat the module in place.

Cabling

Note At the back of this manual are overlay cards that can be placed over the rear connector BNCs to identify the specific 8920ADC connector functions.
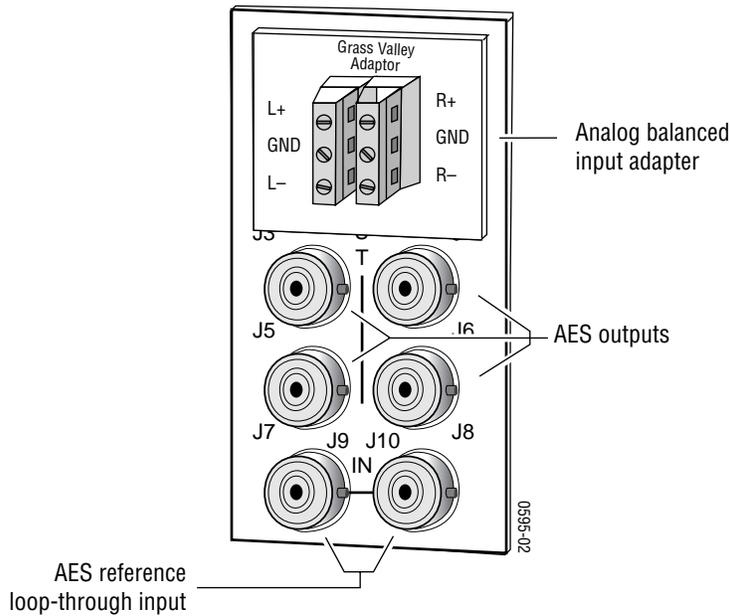
Input

Connect a balanced input source to the stereo pair input terminal block (see Figure 3).

CAUTION The input signal must be balanced. Connecting an un-balanced input signal at high signal levels may damage the input receivers.

The 8920ADC can produce a full-scale output from an analog audio input signal level of +12 dBu to +28 dBu.

Figure 3. 8920ADC Input/Output Connectors

Outputs

The 8920ADC has four AES/EBU serial digital outputs—J5 through J8. The destination equipment should have a 75 Ω input impedance or loop through inputs that are terminated into 75 Ω.

Reference Inputs

Loop-through input BNCs are provided for the required 48 kHz AES/EBU reference signals. Terminate the looping BNC into 75 Ω if not used.

Power Up

The front LED indicators and configuration switches are illustrated in Figure 4. Upon power-up, the green PWR LED should light and the yellow CONF LED should illuminate for the duration of module initialization.

Operation Indicator LEDs

With factory default configuration and valid input and reference signals connected, the green PWR LED and the green LOCK LED should be on.

Figure 4. Operation Indicator LEDs
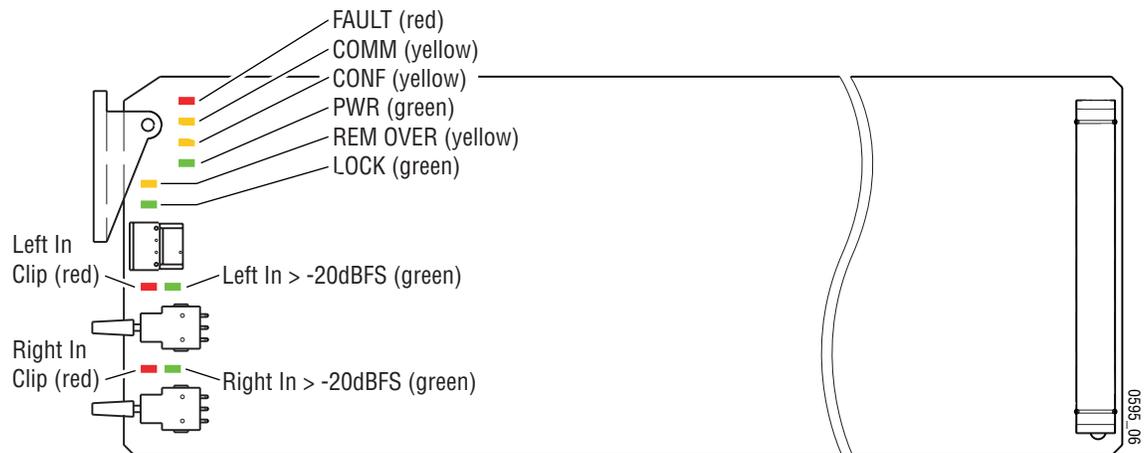
A red FAULT LED indicates an error situation and, with the other LEDs, can indicate the operational conditions presented in Table 2. The table describes signal output and LED indications for various input/reference combinations and user settings.

Table 2. Indicator LEDs and Conditions Indicated

LED	Indication	Condition
FAULT (red)	Off	Normal operation.
	On continuously	Module has detected an internal fault.
	Flashing	Reference input is faulty or not present.
COMM (yellow)	Off	No activity on frame communication bus.
	Long flash	Location Command received by the module from a remote control system.
	Short flash	Activity present on the frame communication bus.
CONF (yellow)	Off	Module is in normal operating mode.
	On continuously	Module is initializing, changing operating modes or updating firmware. Simultaneous CONF and FAULT LEDs on indicate FPGA load error.
	Flashing	Indicates rate of change of paddle-controlled analog setting.
PWR (green)	Off	No power to module or module's DC/DC converter failed.
	On continuously	Normal operation, module is powered.

Table 2. Indicator LEDs and Conditions Indicated - (continued)

LED	Indication	Condition
REM OVER (yellow)	Off	Module configuration matches switch and jumper settings.
	On continuously	Module configuration may not match switch and jumper settings. Control has been remotely overridden.
LOCK (green)	Off	Module does not detect a valid AES in reference signal.
	On continuously	Valid AES in reference signal is present and module is locked to it.
LEFT IN (green)	Off	Left channel level is less than -20 dBFS.
	On continuously	Left channel level is greater than -20 dBFS.
	Flashing	Left channel level is transitioning through -20 dBFS
RIGHT IN (green)	Off	Right channel level is less than -20 dBFS.
	On continuously	Right channel level is greater than -20 dBFS.
	Flashing	Right channel level is transitioning through -20 dBFS
LEFT IN CLIP (red)	Off	Left channel digitized signal level is less than -0.5 dBFS.
	On continuously	Left channel digitized signal level is greater than -0.5 dBFS.
	Flashing	Left channel digitized signal level is transitioning through -0.5 dBFS.
RIGHT IN CLIP (red)	Off	Right channel digitized signal level is less than -0.5 dBFS.
	On continuously	Right channel digitized signal level is greater than -0.5 dBFS.
	Flashing	Right channel digitized signal level is transitioning through -0.5 dBFS.

Table 3 provides the possible input conditions and the output condition that results.

Table 3. Possible Operating Conditions

Audio Input Condition	Reference Input Condition	Output Condition
Audio inputs present	Valid reference input present	AES/EBU serial digital output sampled at 48 kHz.
No audio input signal present	Valid reference input present	AES/EBU serial digital output sampled at 48 kHz. See S/N specification for level.
Audio inputs present	Reference not present	AES/EBU serial digital output sampled at approximately 47.992 kHz. Internal freerun clock rate.
Audio inputs present	Invalid reference input	Invalid AES/EBU serial digital output.

Configuration

The 8920ADC can be configured locally using onboard switches or remotely using the 8900NET network interface GUI or a networked Newton Control Panel.

Refer to the following sections for configuration instructions:

- Configuration Summary (page 13)
- Local Onboard Module Configuration (page 18)
- Remote Control and Monitoring (page 19)

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

Configuration Summary

This section provides a summary of all parameters that can be configured on the 8920DAC module. Table 6 on page 17 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.

The following parameters must be set on the 8920ADC module:

- Output level (Left and Right) – coarse and fine adjustment of analog input levels for full scale digital outputs,
- Output mode – such as channel swapping, summing, tone and phase inversion, and

Output Level Adjustment

To correctly adjust the 8920ADC for your digital application, determine your maximum operating level and set the Coarse Level gain jumpers on the module circuit board as described below. This is the level above which digital clipping occurs.

Example Maximum Operating Level Setting

A setting of +24 dBu is a common maximum level. Using +24 dBu as the maximum level, refer to Table 4 to select the lowest input level range that includes the maximum level of +24 dBu. Select the Coarse Level Setting pin 4 to 5 jumper setting (refer to Figure 5 on page 18) because it is the highest level supported by that range and requires the least amount of gain to bring +24 dBu up to 0.0 dBFS level. This will give the best signal-to-noise ratio that the system can deliver.

Setting Maximum Operating Level

Once you have determined the proper coarse level jumper setting, perform the following steps:

Default
Position
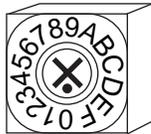
1. Set the Function Rotary Switch (SW1) on the front of the module circuit board to the position marked 0 as shown at left.

2. Remove the module from the frame and set jumpers on JP5 and JP6 to the jumper setting that you determine using Table 4.

Table 4. Jumper Coarse Level Settings for 0.0 dBFS Output

Input Level	JP5/JP6 Jumper Position
12 to 16 dBu	Pins 1 and 2
16 to 19 dBu	Pins 2 and 3
19 to 25 dBu	Pins 4 and 5
25 to 28 dBu	Pins 5 and 6

3. Return the module to the frame.

Using Level Gain Toggle Switches

Note   The toggle switches change input levels by increments of approximately 0.1 dB when held momentarily. Holding the switch up or down for about 1 second activates a continuous change mode that ramps the change rate from about 0.1 dB per second to 0.6 dB per second. The yellow CONF LED will flash slow (0.1 dB rate) or fast (0.6 dB rate) to indicate the change rate.

There are three ways to adjust the onboard gain toggle switches to the proper level:

- Apply the maximum level to the input (example +24 dBu) and monitor the AES output with a meter that indicates digital level in dBFS and adjust the toggle switch for each channel until the meter indicates 0.0 dBFS.

  Because the toggle switches have a resolution of 0.1 dB, you may not be able reach 0.0 dBFS exactly. Use the closest negative setting possible.

- Apply an audio level that is -20 dB below the maximum level, (+4 dBu for the example, +24 dBu -20 dB = +4 dBu) and adjust the AES output as indicated on a digital audio meter to -20 dBFS.

  If you have no meters calibrated in dBFS you can use the tone output position to compare with the output level. Tone output is position E on the Function Switch and outputs a 1 kHz tone at -20 dBFS. Note the internal tone level indication while monitoring the AES output and switch back to 0 or F position on the Function Switch, then adjust the gain toggle switch to the same level as the internal tone level.

- Apply the maximum level to the input (example +24 dBu) and adjust the gain toggle switch for each channel until the clip LED comes on. This is -0.5 dBFS, and by tapping the toggle switch four more times you will be within 0.15 dB (worst case) of the correct gain setting.

CAUTION Using a maximum level that is larger than the high end of the range setting jumper will result in a clipped waveform and high distortion. Use the next higher jumper setting that includes the maximum level and readjust the gain following the instructions above.

Configuring Output Mode

The 8920ADC provides thirteen possible output configurations as shown in Table 5. The module can be configured using the rotary switch shown in Figure 5 on page 18. To make a configuration setting, rotate the switch to the desired output configuration. The 16-position rotary switch selects one of 13 possible output modes. Positions B and C are not used and positions 0 and F select the same mode—the factory default.

Table 5. 8920ADC Output Mode Configuration

Switch Position	Mode Description
0	Factory default – No phase inversion, channel swapping or summing
1	Channel swap – Left and Right
2	Both channels phase inverted
3	Left channel phase inverted
4	Right channel phase inverted
5	Right channel to both channel outputs
6	Left channel to both channel outputs
7	Left + Right to both channel outputs (-6 dB mono sum)
8	Left - Right to both channel outputs
9	Left + Right to Left channel output and Left- Right to Right channel output
A	Left + Right to both channel outputs and both channels phase inverted
B	Not used (outputs AES silence)
C	Not used (outputs AES silence)
D	Tone 1 to all channels (AES Silence)
E	Tone 2 to all channels (1 kHz, -20 dBFS)
F	Factory default – No phase inversion, channel swapping or summing

Remote Control Lockout

When a jumper is placed across pins 1 and 2 of jumper block JP7 (see Figure 5 on page 18), module output mode settings are adjustable from the Local on-board switches only. To have both Local and Remote access, set the jumper across pins 2 and 3.

Table 6 provides a complete summary of the 8920ADC processing functions and a comparison of the functionality available with each control type along with the ranges and default values for each parameter.

Table 6. Summary of 8920ADC Configuration Functions

Function Type	Default	Range/Choices Resolution	Web Page/ Function Name	Rotary Switch Bank/Setting	Newton Control Panel
Operational modes	Default	Default L/R Swap L/R Invert L Invert R Invert R Mono (R to L/R) L Mono (L to L/R) L plus R to L/R L minus R to L/R L plus R, L minus R (L plus R) Inv to L/R AES Silence 1K@ -20 dBFS	Audio Control and Status/ Operational Modes pulldown Refer to Table 7 on page 24 for a description of each setting	Function Rotary Switch SW1. Refer to Table 5 on page 16 for switch settings.	Op Mode
Controls type	Numeric	Numeric or Sliders	Audio Control and Status/ Controls Type pulldown	N/A	Controls
Left Channel Level	0 dB	± 6 dB	Audio Control and Status/ Left Channel Level (dB)	Refer to *Using Level Gain Toggle Switches* on page 14	Lt Level
Right Channel Level	0 dB	± 6 dB	Audio Control and Status/ Right Channel Level (dB)		Rt Level
Monitor Audio Outputs	Disabled	Enabled or Disabled	User Settings/ Monitor Audio Outputs pulldown	N/A	Monitor

## Local Onboard Module Configuration

The 8920ADC module can be configured locally to set parameters using the jumpers, the rotary switch and two toggle switches shown in Figure 5. The CONF LED indicates status of the configuration process.

These components perform the following:

- Jumper JP7 – sets control mode for Local only or Remote and Local.

- Jumpers JP5 and JP6 – set coarse input level adjustment for left and right channels as explained in *Setting Maximum Operating Level* on page 14).

- SW2 and SW3 (toggle) switches – provide fine adjustment of the left and right channel input levels as described in *Using Level Gain Toggle Switches* on page 14.

- Function (rotary) switch – selects a desired output configuration (0 through 9, A through F), although not all positions are used.

- CONF (configuring) LED – when on, indicates the module is initializing or processing configuration information.

Note   Function switch positions 0 and F (Factory defaults) can be used to return the module configuration to the original factory settings.

Figure 5. Module Configuration Switches and LEDs
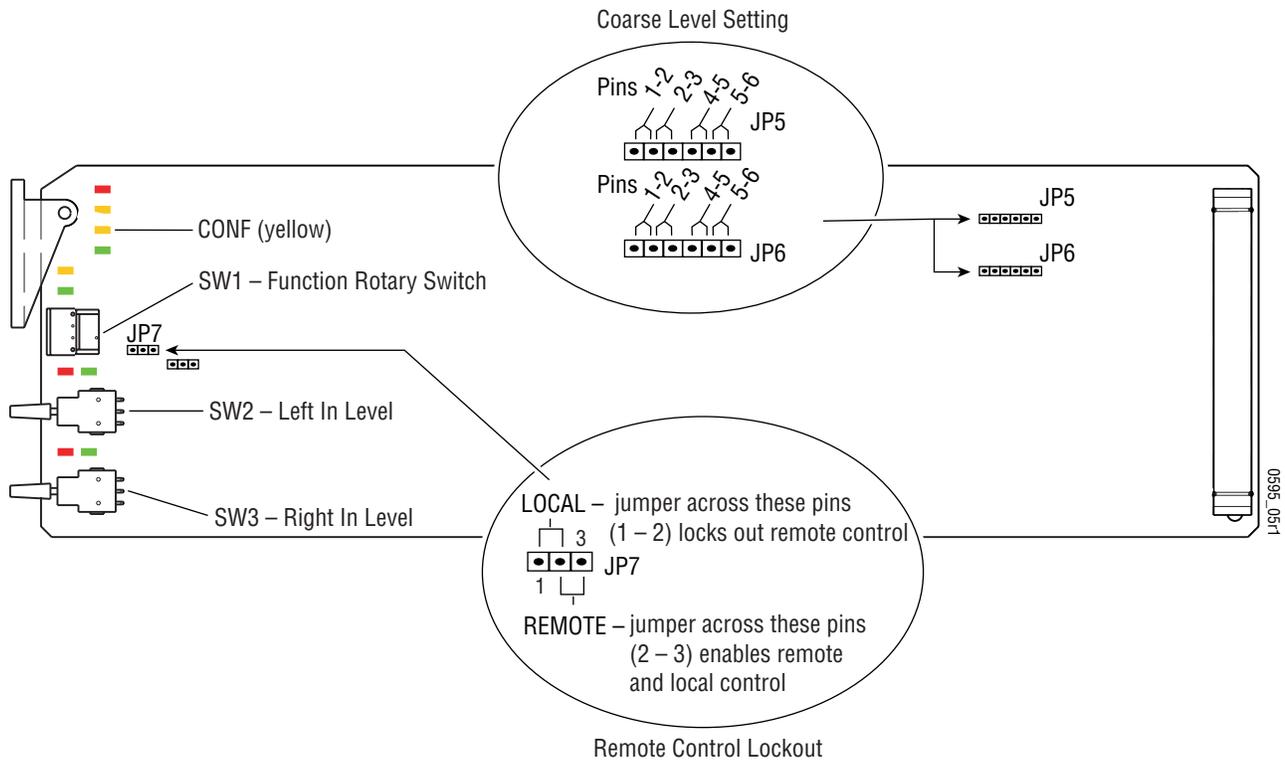
Remote Configuration and Monitoring

8920ADC configuration and monitoring can be performed using a web browser GUI interface or a networked Newton Control Panel when the 8900NET Network Interface module is present in the video frame (Gecko 8900TFN-V frame). Each of these interfaces is described below.

Note   For remote access, make sure the jumper block on the module is set for both Local and Remote access (Figure 5 on page 18).

8900NET Module Information

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

Note   The 8900NET module in the frame must be running software version 3.2.0 or higher for proper remote and control panel operation. Upgrade software and instructions for the 8900NET can be downloaded from the Grass Valley web site.

Newton Control Panel Configuration

A Newton Control Panel (hard or soft version) can be interfaced to the Gecko 8900 Series frame over the local network. Refer to the documentation that accompanies the Newton Modular Control System for installation, configuration, and operation information.

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

- Ability to separate system level tasks from operation ones, minimizing the potential for on-air mistakes.

- Ability to group modular products—regardless of their physical locations—into logical groups (channels) that you can easily manipulate with user-configured knobs.

- Update software for applicable modules and assign frame and panel IP addresses with the NetConfig Networking application.

- Recommended for real-time control of module configuration parameters, providing the fastest response time.

Note   Not all module functions are available with the control panel, such as E-MEM and factory default recalls. The available control panel controls for the 8920ADC module are listed in Table 6 on page 17.

An example of the Newton Configurator is shown in Figure 6 on page 20.

Figure 6. Newton Configurator Example

Web Browser Interface

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

Use of the web interface offers the following considerations:

- Provides complete access to all module status and configuration functions, including naming of inputs and outputs, factory parameter and name default recalls, E-MEM functions, slot configuration, and SNMP monitoring controls.

- Web access will require some normal network time delays for processing of information.

- Configuration parameter changes may require pressing **Apply** button or **Enter**, upload processing time, and a manual screen refresh to become effective.

- Web interface recommended for setting up module signal and slot names, E-MEMS, and reporting status for SNMP and monitoring.

Refer to the Frame Status page shown in Figure 7 on page 21. 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 web page 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. Web page displays will differ depending on the type of platform and browser you are using and the version of the 8900NET software installed in your system. This manual reflects 8900NET software version 4.0.0.

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

Figure 7. Gecko 8900 Frame Status Page

The Links section lists the frame and its current modules. The selected link's Status page is first displayed and the sub-list of links for the selection is opened. The sub-list allows you to select a particular information page for the selected device.

Content display section displays the information page for the selected frame or module (frame slot icons are also active links).

Refresh button for manual update of page

Bay 1 QA 8900 Video
  Status
  Configuration
  Connections
1 8910ADA-SR
2 Media Slot 2
3 Media Slot 3
4 8964ENC
5 Media Slot 5
6 8990ARC
7 Media Slot 7
8 Media Slot 8
9 Media Slot 9
10 Media Slot 10
11 8900NET
12 Power Supply 1
13 Power Supply 2

Status

Model: 8900TFN-V Description: Module Frame
Frame Location: 8900: QA Bay 1
Frame Health Alarm WARNING Temperature Status Pass

WARNING - Module Data or Config Errors

[Module | Empty | Empty | Module | Empty | Module | Empty | Empty | Empty | Empty | Net Card | Empty | Power Supply]

Front Cover No Cover

Properties

Vendor	Thomson, Grass Valley	Software Version	3.2.2
Media Slots	10	Network Config	Network configuration stored on frame

0595_08

8920DAC Links and Web Pages

The 8900 GUI provides the following links and web pages for the 8920ADC module (Figure 8):

- Status – reports input and reference signal status and module information (page 23),

- Audio Control and Status – select output format for module and adjust the levels for video, composite sync and DC output, and video setup amplitude (page 24),

- User Settings – select factory defaults and enable or disable status reporting of audio inputs (page 26)

- Slot Config – provides a Locate Module function and Slot Memory and SNMP reporting status information (page 27), and

- Software Update – provides information on software updating (page 29).

Figure 8. 8920ADC Web Page Links

1 8920ADC
   Status
   Audio Control and
   Status
   User Settings
   Slot Config
   Software Update

Refer to Table 6 on page 17 for a summary in table format of all parameters and their ranges, and default values.

Status Web Page

Use
this—
link

1 8920ADC
Status
Audio Control and
Status
User Settings
Slot Config
Software Update

The Status web page (Figure 9) shows the input signal status of the audio input and the Reference Signal input. Color coding of the display indicated the signal status. Audio input status monitoring can be disabled on the User Settings webpage (page 26). If set to disabled, the Input Signal (s) arrow will be gre yed out. Refer to *Status Monitoring on page 32* 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.

Figure 9. 8920ADC Status Web Page (Monitor Audio Inputs Enabled)

1 8920ADC

Use
this —— Audio Control and
link Status
User Settings
Slot Config
Software Update

Status

Audio Control and Status Web Page

The Audio Control and Status web page (Figure 10 on page 25) provides controls for setting the following audio parameters on the 8920ADC module:

• Operational (output) mode, and

• Fine adjustment of left and right output channel levels.

The following audio status items are reported on this web page:

• Left and Right Ch > -20 dBFS – indicates whether the left and right channel digital output levels are greater than -20 dBFS (True) or less than -20 dBFS (False).

• Left and Right Ch > -0.5 dBFS Clip – indicates whether the digital output clipping levels are greater than -0.5 dBFS (True) or less than -0.5 dBFS (False).

• Reference Signal – indicates whether the module is **Locked** (valid AES in reference signal is present and module is locked to it) or **Unlocked** (module does not detect a valid AES in reference signal).

Use the following controls to set the parameters for the 8920ADC:

• **Operational Modes** – Set the operational mode pulldown for the desired output of the module from the thirteen selections listed below in Table 7 and shown in the web page in Figure 10 on page 25. After making the selection, select the **Apply** button to activate it.

Table 7. Audio Output Configuration Modes

Mode Name	Mode Description
Default	Factory default with no phase inversion, channel swapping or summing.
L/R Swap	Swaps left and right channel outputs.
L/R Invert	Both left and right channel outputs phase inverted.
L Invert	Left channel output phase inverted.
R Invert	Right channel output phase inverted.
R Mono (R to L/R)	Right channel to both channel outputs.
L Mono (L to L/R)	Left channel to both channel outputs.
L plus R to L/R	Left plus right to both channel outputs.
L minus R to L/R	Left minus right to both channel outputs
L plus R, L minus R	Left plus right to left channel output and left minus right to right channel output.
(L plus R) Inv to L/R	Left plus right to both channel outputs with both channel outputs phase inverted.
AES Silence	AES silence on both left and right channel outputs.
1K@ -20dBFS	Tone to both channel outputs.

- Left and Right Channel Levels – fine gain adjustment of the module output levels can be done with the **Left** and **Right Channel Level** controls. Coarse gain levels must first be set up using the on-board jumpers JP5 and JP6 as described in *Remote Configuration and Monitoring* on page 19. Follow the procedures given there for adjusting the output levels using the fine gain adjustments described below.

  Adjust the fine gain in either **Numeric** or **Sliders** mode (Numeric mode shown in Figure 10.) The single arrows increment the value by 1x and the double arrow will increment the value by approximately 10x. These controls will allow you ± 6.0 dB of fine adjustment range.

Note   In Numeric mode only, values selected with the single or double arrow keys will be enabled immediately. All other display entries, including typed in values, require pressing **Apply** before the selection is enabled.

Figure 10. 8920ADC Audio Control and Status Display

Configuration

User Settings Web Page

Use this — link

The User Settings web page (Figure 11) allows you to set the following parameters:

- Select the **Get Factory Defaults** button to return the module to factory settings (Operation output mode to default, all audio levels to 0 dB, and Monitor Audio Input mode to disabled).

- Set Monitor Audio Inputs to enable or disable the status reporting of the audio inputs. When set to disabled, the Input Signal(s) arrow on the Status web page will be greyed out.

Figure 11. 8920ADC User Settings Web Page

8920ADC Instruction Manual
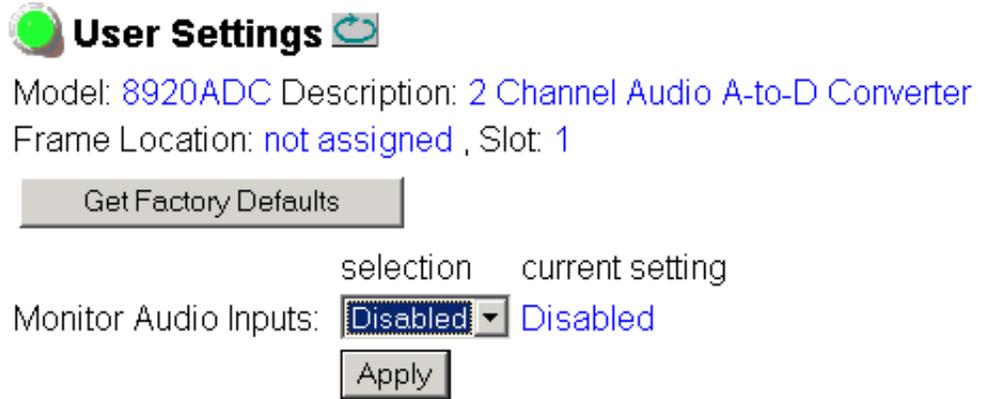
Slot Config Web Page

1 8920ADC
  Status
  Audio Control and
  Status
Use
this —— User Settings
link   Slot Config
  Software Update

Use the Slot Config web page (Figure 12 on page 28) to perform the following functions on the 8920ADC module:

- **Locate Module** – selecting the **Flash** radio button flashes the yellow COMM and CONF LEDs on the front of the module so it can be located in the frame.

- **Controls** – the Controls status report will display either **Normal** or **Remote Override** if a setting on the web pages is overriding that of the module jumpers.

- **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.

  You may also enter a name in the **Input Signal Name** field.

- **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.

- **Frame Heath Reporting** – this function is not active with the latest version of the 8900NET module that controls this page.

- **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 5 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.

Figure 12. 8920ADC Slot Config Web Page

Software Update Web Page

The Software Update page (Figure 13) is not used to update 8920ADC software. For instructions on updating to the latest software, refer first to the 8920ADC Release Notes that accompany the software update for complete details.

Currently, the only recommended method of software updating is done with a software kit (8900-FLOAD-CBL) that includes a CD-ROM with the current software files and a serial cable assembly available from Grass Valley.

Refer to the 8900-FLOAD-CBL Software Upgrade Instruction Manual in PDF format on the CD-ROM for complete updating instructions and the required software files for the module.

Figure 13. 8920ADC Software Update Web Page

Software Update

Model: 8920ADC Description: 2 Channel Audio A-to-D Converter
Frame Location: not assigned , Slot: 1
Software Version: 2.0.1A Firmware Version: 1
Enter Username, Password and File to Initiate Update

	selection	current setting
FTP Server Address:	10.16.23.56	10.16.23.56
File Path:	Enter Filename Here	Enter Filename Here
FTP UserName:		
FTP Password:		

Apply

Specifications

Table 8. 8920ADC Specifications

Parameter	Value
Analog Input	
Number of inputs	Balanced stereo pair
Connector type	Terminal block
Input impedance	> 20 kΩ differential
Input level range	+12 to +28 dBu
Common mode rejection	> 65 dB 50 Hz to 20 kHz
Differential DC	0.25 V maximum
Common mode input voltage	20 V maximum
AES Reference Input	
Signal type	AES3 ID (1992) transformer coupled
Number of inputs	1 Loop-through
Input return loss	>15 dB (100 kHz-10 MHz)
Sampling rate	48 kHz
Maximum jitter	< 200 ps RMS
Outputs	
Number of outputs	4
Signal type	SMPTE 276M, AES3 ID (1992)
Signal level	+12 to +28 dBu input range adjustable to 0.0 dBFS
Output impedance	75 Ω
Connector type	75 Ω BNC
Coupling	AC coupled
Performance (@ +28 dBU input and full scale output)	
Sampling rate	48 kHz
Frequency response	± 0.05 dB relative to 1 kHz, 20 Hz to 20 kHz
Signal-to-noise ratio	>102 dB unweighted, 20 Hz to 20 kHz >105 dB "A" weighted, 20 Hz to 20 kHz
Interchannel crosstalk	<-100 dB, 20 Hz - 20 kHz
Delay (input to output)	925 µS
Environmental	
Frame temperature range	See Gecko 8900 Frame specification
Operating humidity range	0 to 90% non-condensing
Non-operating temperature	-10 to 70 degrees C
Mechanical	
Frame type	Gecko 8900 Series
Power Requirements	
Supply voltage	±12 V
Power consumption	< 4.2 Watts

Service

The 8920ADC 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.

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

- Check frame and module power and signal present LEDs.

- 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 4 for the location of PWR LED and Table 2 on page 11 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 Support Information number.

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 *Indicator LEDs and Conditions Indicated* on page 11. 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 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 web page – reports overall frame and module status in graphical and text formats.

- Module Status web page – shows specific input and reference signal status to the module along with 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 web 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.

- grey = 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. Some module status reporting items can also 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 web page for the Frame, the 8900NET module, and each module slot. Refer to the *8900NET Network Interface Instruction Manual* for installation instructions.

Functional Description

The 8920ADC Converts an analog audio stereo pair to a 48 KHz AES/EBU signal. Refer to the block diagram in Figure 9 while reading the following functional description.

Figure 9. 8920ADC Block Diagram
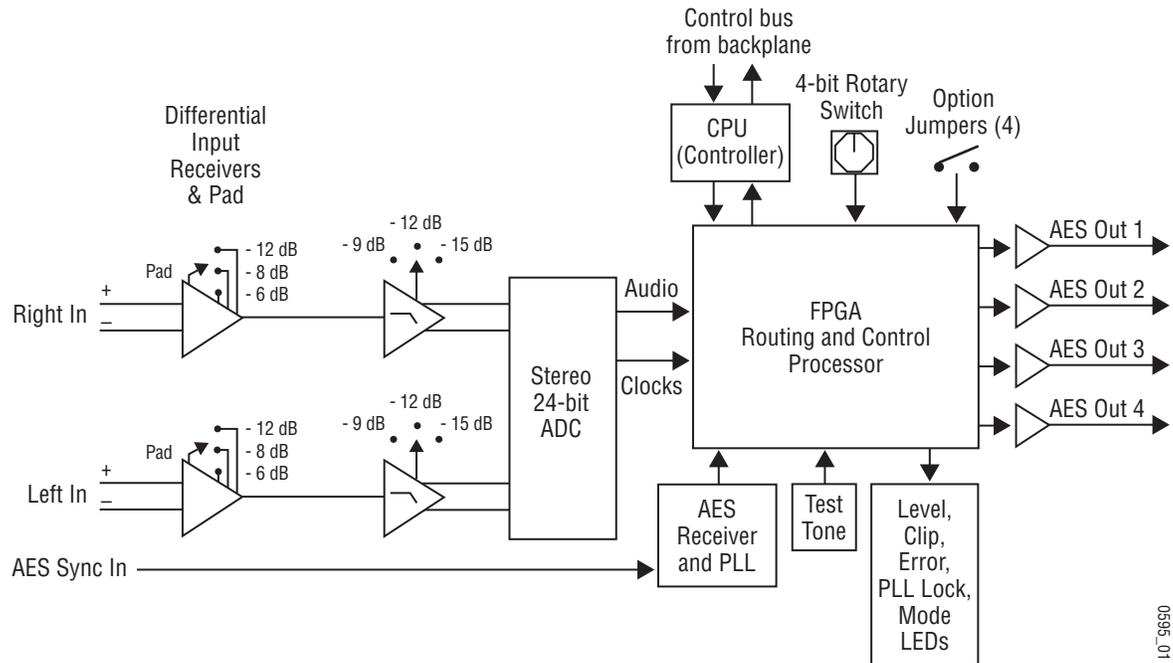
Differential Input, Analog Gain and A/D Converters

The analog input is applied to a differential amplifier stage. This converts the signal to single-ended and applies it to the coarse gain stage. Coarse gain control pre-conditions the incoming signal before it is applied to the A/D converters. For each channel, a six-position jumper sets the desired coarse gain. This jumper controls the front-end pad of the unit in either a -6 dB, -8 dB, or -12 dB mode and allows three 3 dB gain steps on the post gain. This jumper allows input levels from +12 dBu to +28 dBu to be set to 0dBFS at the output.

The fine gain control is by two center-off toggle switches on the front of the module. They provide a 6 dB range of fine gain adjustment in approximately 0.1 dB increments. The control takes approximately 6 to 10 seconds to transition from minimum to maximum.

The signal is converted back to a differential signal and applied to the 24-bit A/D converter, then to the Routing and Control FPGA (Field Programmable Gate Array).

Digital Reference Input

The digital reference is applied via the loop-through input to the AES receiver and phase-locked loop. This provides clock and data to the Control and Routing FPGA and the A/D converters.

Routing and Control FPGA

The signals from the A/D converters are applied to the Routing and Control FPGA. The incoming signal processing and level is determined by the setting of one of 16 possible mode commands from a four-bit rotary encoder switch and four signals from the level toggle switches. After processing, the signals are embedded into an AES stream and applied to the Output Drivers.

The Routing and Control section also drives the front panel LEDs and interfaces to the Controller section.

Controller

The Controller interfaces with the Routing and Control FPGA, the EEPROM and the 8900 Frame Bus. The Controller also provides the FPGA code that is downloaded to the FPGA during boot-up.

The Controller section handles local control and monitoring, as well as remote control and monitoring via the frame bus (when an 8900NET module is installed in the frame). Module settings are stored in the EEPROM for power up recall.

Power Supply

Power is fed from ±12 V rails of the frame's switching power supply. Each stage of the module receives it's own, separate, highly regulated and filtered power source. Two-stage regulation is used in the analog section of the ADC to reduce switching noise.

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