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KAM-SD-4ADC-MUX

KAMELEON SERIES MODULES

Instruction Manual

SOFTWARE VERSION 4.0.1

071834900
DECEMBER 2004

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Contents

Preface

About This Manual

This manual describes the features of the Kameleon multi-function modules that are part of the Kameleon Media Processing System. As part of this module family, it is subject to Safety and Regulatory Compliance described in the Kameleon/2000 Series frame and power supply documentation (see the *Kameleon 2000 Series Frames Instruction Manual*).

KAM-SD-4ADC-MUX Kameleon Series Module

Introduction

This manual provides installation, operation and configuration information for the KAM-SD-4ADC-MUX Kameleon Series module.

The KAM-SD-4ADC-MUX modules provides a serial digital video input and output with embedded audio. Four analog audio input channels are converted to two separate 48 kHz AES digital audio streams that can be multiplexed into the SDI output video.

This module features:

- Broadcast quality serial digital video processing and frame synchronization,
- Four analog audio input channels that are converted to AES audio and muliplexed into the SDI output stream,
- Audio and video delay, synchronization and processing amplifier,
- Powerful line-by-line VBI processing including user-configuration of active video lines for carrying data,
- 4x4 audio router for mapping audio channels to specific AES streams,
- Audio and video test generators,
- Hot swappable,
- 5 user-programmable E-MEM registers,
- Save/load module configuration files to a networked PC,
- SNMP monitoring capability,
- Web browser GUI (graphical user interface), and
- Support for Newton Control System and NetConfig Network Configuration application.

Note KAM-SD-4ADC-MUX operation requires 2000NET Network Interface Module hardware revision 01A1 or greater with software version 3.2.2 or greater. Systems installed in the 2000T3N frame require the 2000FAN fan sled (refer to Figure 4 on page 12).

Installation

To install the Kameleon modules, perform the following steps:

1. Place the KAM-MIX-R passive rear module in a rear frame slot and tighten the screws on each side of the rear module.
2. Install the audio submodule on KAM-SD-4ADC-MUX module (if required) and place the front module in the corresponding front slot.
3. Cable the signal ports.

All Kameleon modules can be inserted and removed from a 2000 Series Kameleon Frame with power on.

Note Remove the front processing module before removing the rear I/O module.

Audio submodules must be installed or removed with the front module removed from the frame (front module powered down).

System Requirements

For proper operation of the KAM-SD-4ADC-MUX modules, the frame must be a 2000T1DNG or 2000T3NG which include the following components:

- 2000NET module (software version 3.2.2 or later recommended for full functionality)
- 2000GEN module
- Dual 130W power supplies in the 2000T1DNG frame
- Single 240W power supply and 2000FAN in the 2000T3NG frame

Frame Capacity

The 1 RU 2000T1DNG (with dual 130W power supplies, 2000NET and 2000GEN modules) frames have no Kameleon module capacity limitations.

The 3 RU 2000T3NG (single 240W p/s, 2000FAN, 2000NET and 2000GEN modules) frame can be fully populated with Kameleon modules when the 2000FAN fan sled and two power sleds are installed.

Table 1 provides the maximum Kameleon module count for frame types.

Table 1. Power, Cooling, and Module Capacity of 2000 Series Kameleon Frames

Item	2000T3NG Kameleon Frame Capacity	2000T1DNG Kameleon Frame Capacity
KAM-SD-4ADC-MUX Module set	12	4

Module Placement in the 2000T3NG Kameleon Frame

There are twelve slot locations in both the front and rear of a 3 RU frame to accommodate 2000 and Kameleon Series media modules (audio/video signal handling modules). The Kameleon media modules consist of a two-module set with a front processing media module and a KAM-ADC-S submodule, and a passive rear module that can be plugged into any of the 12 frame slot pairs. The rear modules provide the input and output interface connectors.

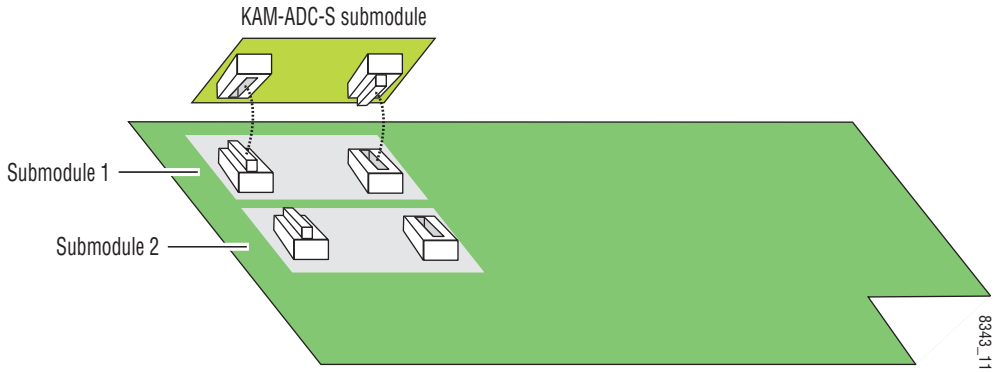
Kameleon Audio Submodule

The KAM-SD-4ADC-MUX module requires a KAM-ADC-S submodule installed in the Submodule 1 position. The submodule will be provided with the front processing media module. The Submodule 2 position is not supported in this application.

If the submodule needs to be installed, line up the connectors on the bottom of the submodule with the correct submodule position on the top of the media module circuit board (Figure 1). Press firmly to seat the submodule.

After power-up, installation status of the submodule will be reported on the Status web page as described in *Status Web Page* on page 26.

Figure 1. Kameleon Submodule Installation

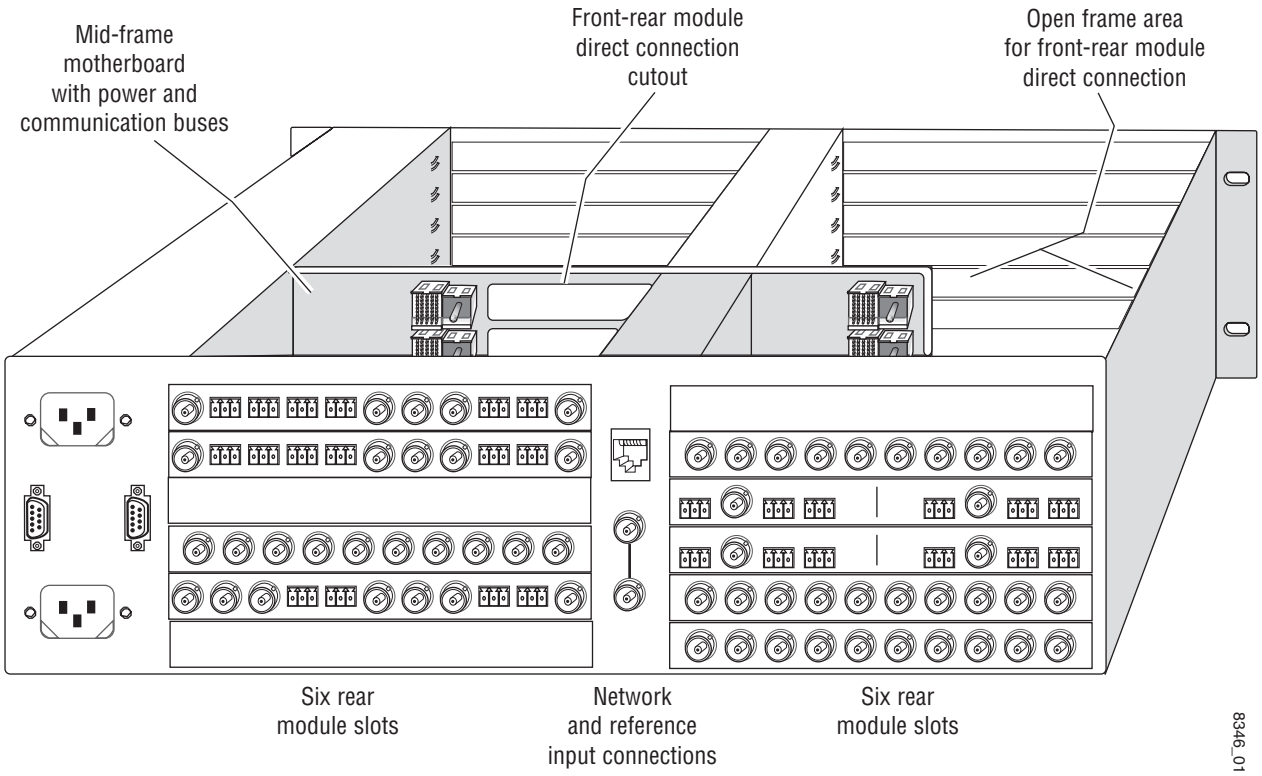


Installing the Front and Rear Modules

To install a KAM-SD-4ADC-MUX module set in the 2000 Series frame:

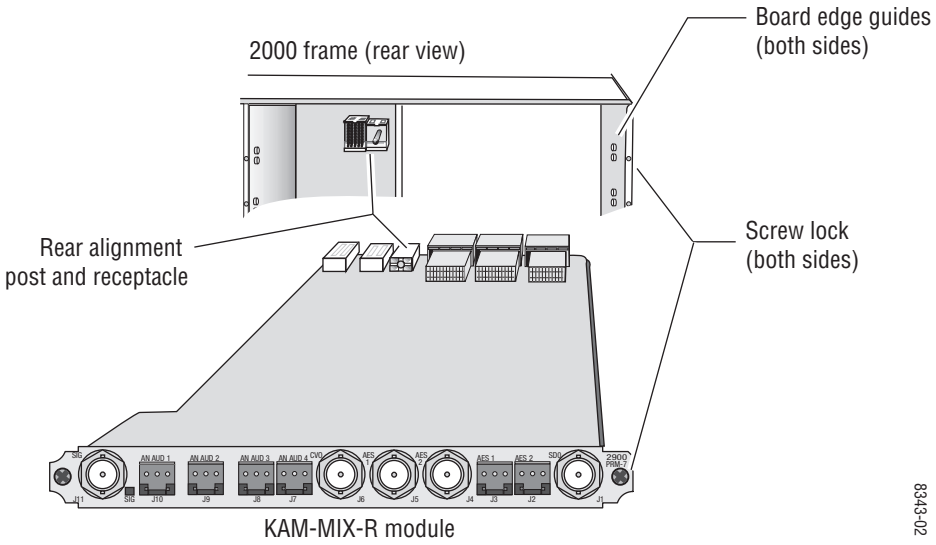
1. Locate a vacant slot in the rear of the 3 RU frame (Figure 2).

Figure 2. 2000T3NG Kameleon Frame, Rear View



2. Insert the KAM-AES-R passive rear module into the vacant rear slot of the frame as illustrated in Figure 3.

Figure 3. Installing Passive Rear Module

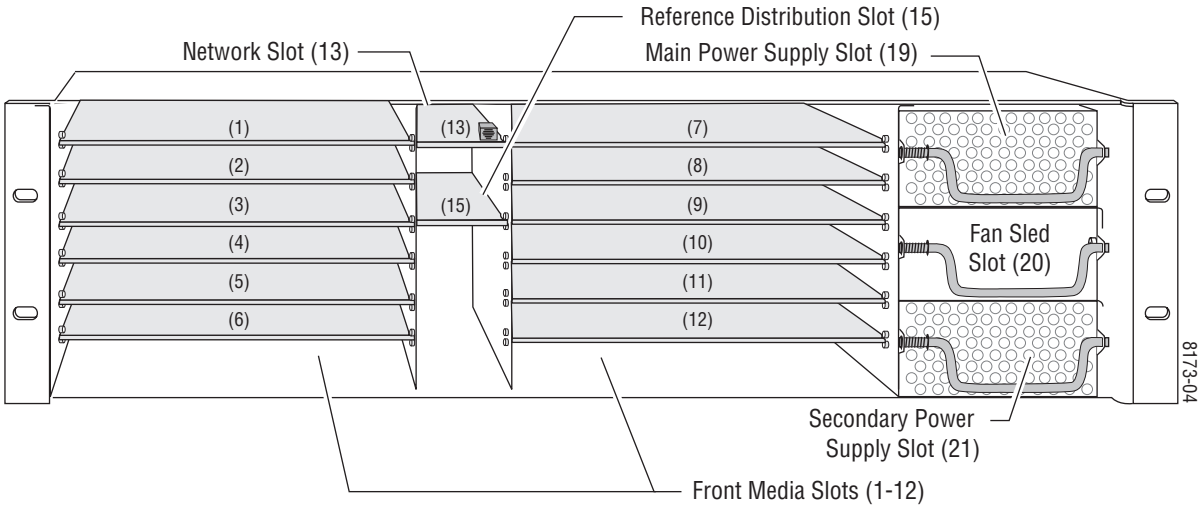


3. Verify that the module connector seats properly against the midplane.

4. Using a crossblade screwdriver, tighten the two screw locks to secure the module in the frame.

5. Locate the corresponding front media slot (1 -12) in the frame. The 3 RU frame front view is illustrated in Figure 4.

Figure 4. 2000T3NG Kameleon Frame, Front Slots

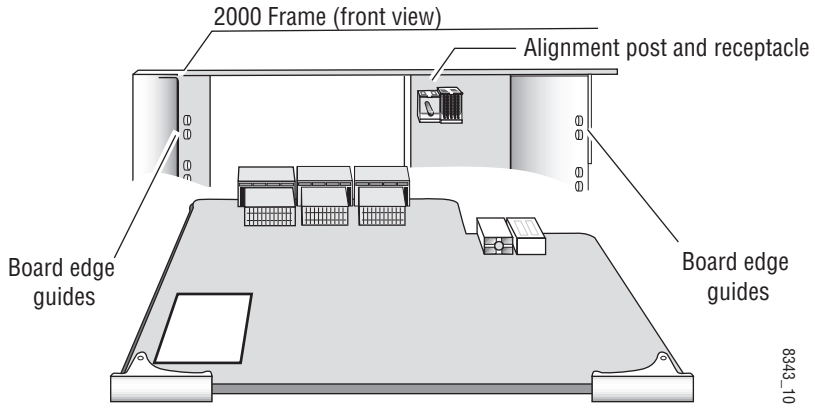


6. With the component side up, insert the processing module in the corresponding front slot (see Figure 5).

7. Verify that the module connector seats properly against the midplane and rear module connector.

8. Press firmly on both ejector tabs to seat the module.

Figure 5. Installing Front Media Module



Cabling

All cabling to the module is done on the KAM-MIX-R passive rear module shown in Figure 6.

SDI Video In

Connect SDI video to connector J11, labeled **V1**.

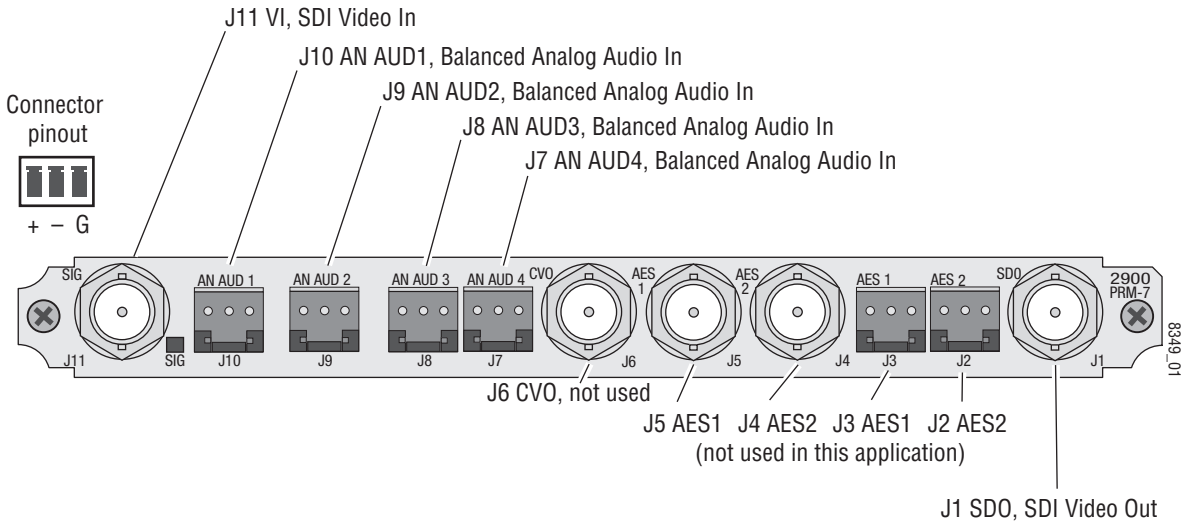
Analog Audio Inputs

Four balanced analog audio inputs are available at connectors J7, J8, J9, and J10 (AN AUD1-4). Connect analog audio as shown in the connector pinout at left of Figure 6.

SDI Video Out

The SDI video is output at BNC connector J1, labeled **SDO**.

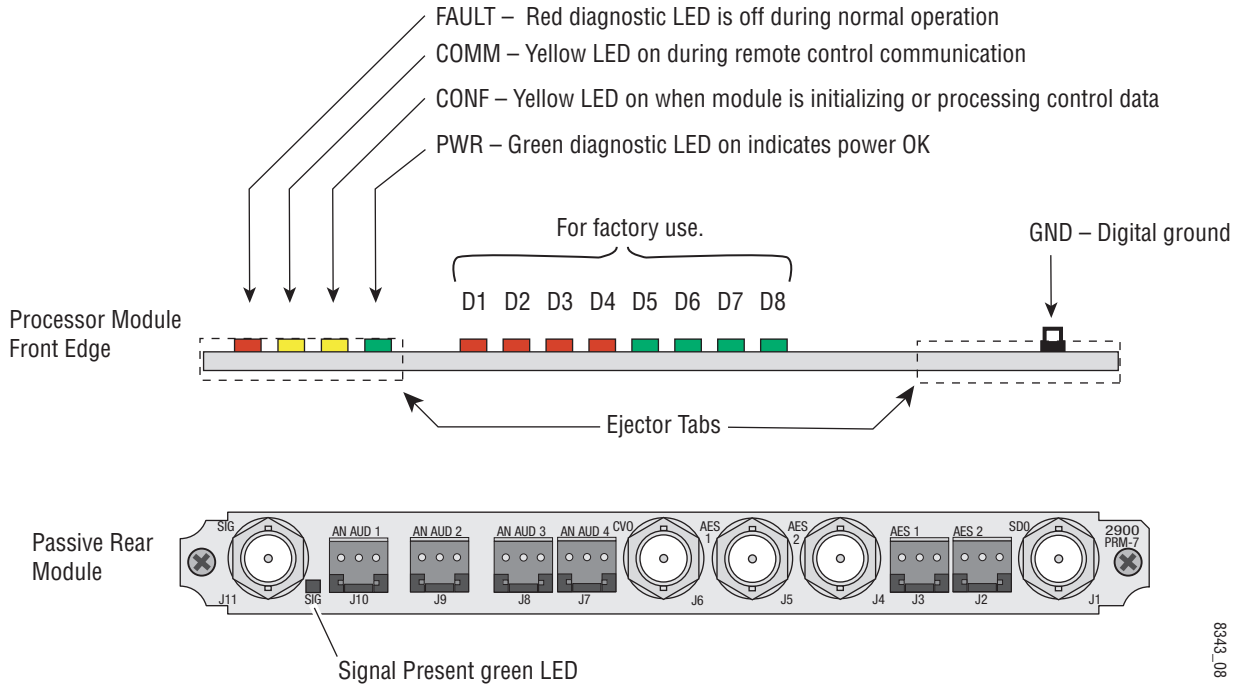
Figure 6. KAM-MIX-R Input/Output Connectors



Power Up

The front LED indicators are illustrated in Figure 7.

Figure 7. Front and Rear Module Indicator LEDs



A green Signal Present LED can be seen on the Passive Rear Module (PRM) when a valid input signal is present.

Operation Indicator LEDs

Table 2 provides a complete list of possible operating conditions and the resulting indicator status.

A red FAULT LED indicates an error situation. Table 2 describes signal output and LED indications for the 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 internal fault
	Long flash	One of the inputs is missing or is wrong standard
	Short flash	Errors present in SDI and/or AES/EBU input
COMM (yellow)	Off	No activity on frame communication bus
	Three flash/off pattern	Module Location command received from a remote control system
	Short flash	Activity present on the frame communication bus
CONF (yellow)	Off	Module is in normal operating mode
	Three flash/off pattern	Module Location command received from a remote control system
	On continuously	Module is initializing, changing operating modes or updating firmware. (When solid on along with Fault LED on, board has failed to load data.)
PWR (green)	Off	No power to module or module's DC/DC converter failed
	On continuously	Normal operation, module is powered

Note The yellow **COMM** and **CONF** LEDs are used for the module location function that is enabled using the 2000NET GUI. The module location function causes these LEDs to repeatedly flash concurrently three times followed by an off state of 900 ms duration (see *Slot Configuration* on page 62).

Configuration and Adjustments

KAM-SD-4ADC-MUX configuration and monitoring can be performed using a web browser GUI interface or a networked Newton Control Panel. This section provides an overview of each of these controls along with the configuration parameters available with each type of control device.

Configuration Summary

The configuration parameters and monitoring functions available with the web browser interface and the Newton Control Panel are summarized in Table 3. The parameter defaults, choices, ranges, and resolution are provided for each function

Table 3. Summary of KAM-SD-4ADC-MUX Configuration Controls

Function	Default	Range/Choices Resolution	Web Page/ Function Name	Newton Panel
SDI In web page view selection	Summary	Summary or Detail	SDI In/ Summary or Detail radio button	N/A
Set error reporting for SDI input video	Enabled	Enabled or Disabled	SDI In/Detail View/ Check or uncheck error checkboxes	N/A
Input status loss of signal report	Enable	Enable or Disable	Video Input Select/ Input Status Report Loss of Signal checkbox	N/A
Select video line rate	Auto	525, 625, or Auto	Video Input Select/ Video Line Rate radio button	N/A
Frame reference loss of signal report	Enable	Enable or Disable	Video Input Select/ Frame Reference Loss of Signal checkbox	N/A
SDI Input Error status	Warn SDI Errors	Warn SDI Errors or No Warning	Video Input Select/ SDI Input Errors Warn SDI Errors Warn SDI Errors checkbox	N/A
Select output timing source	Video In	Video In or Internal Frame Reference	Video Input Select/ Output Timing Selection radio buttons	N/A
Define VBI data lines	None	525: None, 21/284, 22/285, 23/286 or 24/287 625: None, 24/337, 25/338, 26/339 or 27/340 or 28/341	Video Input Select/ Advanced (VBI Config) radio button VBI/Data Lines Last Data Line radio button	N/A
Main video horizontal timing adjustment	0	525: 0 to 857.5 pixels 625: 0 to 863.5 (0.5 pixel steps)	Frame Sync/ HTiming control (pixels)	HTiming
Main video vertical timing adjustment	0	525: 0 to 524 lines 625: 0 to 624 lines (1 line steps)	Frame Sync/ VTiming control (Lines)	VTiming
Freeze mode selection (Video In timing source)	None	None, Field 1, Field 2, or Frame	Frame Sync/ Freeze Mode Selection radio buttons	N/A
Freeze mode selection (Internal timing source)	None	None, AutoBlack, AutoFreeze, Field 1, Field 2, or Frame	Frame Sync/ Freeze Mode Selection radio buttons	N/A

Table 3. Summary of KAM-SD-4ADC-MUX Configuration Controls

Function	Default	Range/Choices Resolution	Web Page/ Function Name	Newton Panel
Enable video processing	Enable	Disable, Enable, or Color Bars	Video Proc/ Video Processing radio buttons	N/A
Video gain lock	Off	On or Off	Video Proc/ Video Gain Lock radio buttons	N/A
Main video contrast/Y gain	100%	50 to 149.6% (0.4% steps)	Video Proc/Standard View Y Gain control (%)	YGain
Main video chroma gain	100%	50 to 149.6% (0.4% steps)	Video Proc/Standard View Chroma Gain control (%)	ChroGain
Enable Clip controls	Disable	Enable or Disable	Video Proc/Standard View Clip Settings radio buttons	N/A
Apply clips to VBI	Off	On or Off	Video Proc/Standard View Apply Clips to VBI checkbox	N/A
Main video soft/Y black clip	-6.8%	-6.8 to 109% (0.1% steps)	Video Proc/Standard View Soft/Y Black Clip control (%)	YBClip
Main video hard/video black clip	-37.3% (525) -30.0% (625)	-37.3 to -7.3% (525) -30.0 to 0% (625) (0.1% steps)	Video Proc/Standard View Hard/Video Black Clip control (%)	VBClip
Main video soft/Y white clip	109%	-6.8 to 109% (0.1% steps)	Video Proc/Standard View Soft/Y Clip control (%)	YWClip
Main video hard/video white clip	138.7%	-6.8 to 138.7% (0.1% steps)	Video Proc/Standard View Hard/Video Clip control (%)	VidWClip
Main video brightness/Y offset	0%	-3.55 to 3.44% (0.11% steps)	Video Proc/Advanced View Brightness/Y Offset control (%)	YOffset
Main video hue/chroma phase	0.0	± 89.8 degrees (0.1 degree steps)	Video Proc/Advanced View Hue/Phase control (degrees)	ChroPhs
Main video B-Y gain	100%	50 to 149.6% (0.4% steps)	Video Proc/Advanced View B-Y Gain control (%)	BYGain
Main video B-Y balance/offset	0.0	-3.55 to 3.44% (0.11% steps)	Video Proc/Advanced View B-Y Balance/Offset control (%)	N/A
Main video R-Y gain	100%	50 to 149.6% (0.4% steps)	Video Proc/Advanced View R-Y Gain control (%)	RYGain
Main video R-Y balance/offset	0.0	-3.55 to 3.44% (0.11% steps)	Video Proc/Advanced View R-Y Balance/Offset control (%)	N/A
Embedded audio group deletion	No Delete	Delete Group/No Delete	MUX/ Group Deletion Group 1-4 Delete checkboxes	N/A
Clear all HANC data in SDI video in	Don't Clear	Clear or Don't Clear	MUX/ Clear all HANC data checkbox	N/A
Mux group insert to Stream A and B	No Insert	Insert or No insert	MUX/ Group Replacement Insert checkboxes	N/A
Mux group number for replacement	Group 1	Group 1 to Group 4	MUX/ Group number radio buttons	N/A
Mux Bits/Sample rate	20 Bits	20 or 24 bits	MUX/ 20 or 24 Bit radio buttons	N/A
Blank SDI VBI lines (line-by-line)	Not Blanked	Blank/Not Blanked	VBI SDI/ Field 1/Field 2 Blank VBI line checkboxes	N/A
Apply clips set in video processor to all VBI lines	Not Apply	Apply /Not Apply	VBI SDI/ Apply Clips to VBI checkbox	N/A

Table 3. Summary of KAM-SD-4ADC-MUX Configuration Controls

Function	Default	Range/Choices Resolution	Web Page/ Function Name	Newton Panel
Audio Pair 1 and Pair 2 channel swap	–	–	Audio Channel Pairing/ Pair 1 and 2 Ch A and Ch B radio buttons	Pair1Swp Pair2Swp
Define audio Pair 1 and Pair 2 Ch A and Ch B audio streams	Pair1ChA= Str1.Ch1 Pair1ChB= Str1.Ch2 Pair2ChA= Str2.Ch1 Pair2ChB= Str2.Ch2	Str1.Ch1 Str1.Ch2 Str2.Ch1 Str2.Ch2 Silence	Audio Channel Pairing/ Pair 1 and 2 Ch A and Ch B radio buttons	Str1.Ch1 Str1.Ch2 Str2.Ch1 Str2.Ch2 Silence
Enable auto tracking for Pair 1 and 2 Ch A and Ch B	Off	On or Off	Audio Sync/ Pair 1 and Pair 2 Ch A and Ch B Enable Auto Track On checkbox	N/A
Lock Pair 1 Ch A and Ch B delay adjustments and Pair 2 Ch A and Ch B delay adjustments	Unlocked	Lock or Unlocked	Audio Sync/ Pair 1 and Pair 2 Ch A and Ch B Channel Lock Locked checkbox	N/A
Audio Pair 1 Ch A delay adjust Audio Pair 1 Ch B delay adjust Audio Pair 2 Ch A delay adjust Audio Pair 2 Ch B delay adjust	0	0 to 5180 ms (20 ms steps)	Audio Sync/ Pair 1 and Pair 2 Ch A and Ch B Delay controls (ms)	Ch1ADly Ch1BDly Ch2ADly Ch2BDly
Select audio processing option for Pair 1 Ch A' and Ch B' and Pair 2 Ch A' and Ch B'	Pass	Pass Invert, A+B A – B, -(A+B) 1 kHz 400 Hz Silence	Audio Proc/ Pair 1 and Pair 2 Ch A' and Ch B' Processing pulldowns	Ch1AProc Ch1BProc Ch2AProc Ch2BProc
Lock Pair 1 Ch A and Ch B gain adjustments and Pair 2 Ch A and Ch B gain adjustments	Unlocked	Lock or Unlocked	Audio Proc/ Pair 1 and Pair 2 Ch A and Ch B Locked checkbox	N/A
Audio Pair 1 Ch A gain adjust Audio Pair 1 Ch B gain adjust Audio Pair 2 Ch A gain adjust Audio Pair 2 Ch B gain adjust	0 dB	-40 to + 6 dB	Audio Proc/ Pair 1 and Pair 2 Ch A and Ch B Gain controls (dB)	Ch1AGain Ch1BGAin Ch2AGain Ch2BGain

Newton Control Panel Configuration

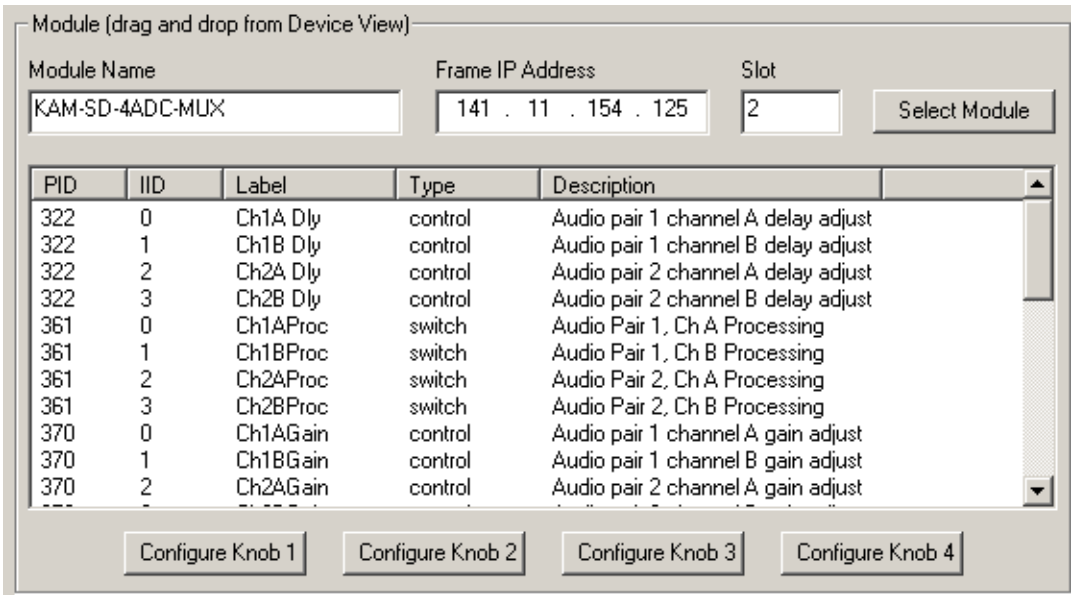
A Newton Control Panel (hard or soft version) can be interfaced to the Kameleon 2000 Series frame over the local network. Control panel access offers the following considerations for module configuration and monitoring:

- 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 module are listed in Table 3 on page 16.

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

Figure 8. Newton Configurator Example



Refer to the documentation that accompanies the Newton Modular Control System for installation, configuration, and operation information.

Web Browser Interface

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

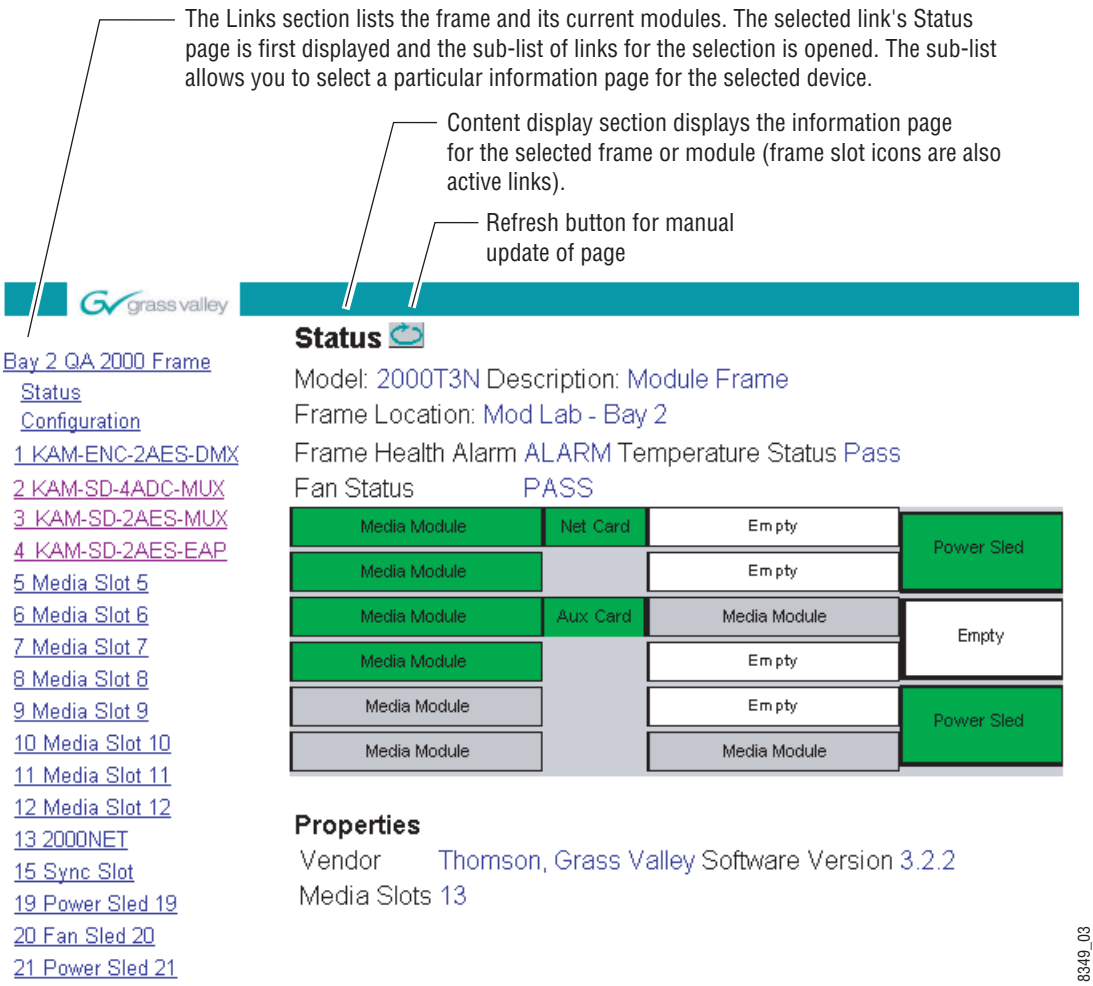
Use of the web interface offers the following considerations:

- 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 the **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.

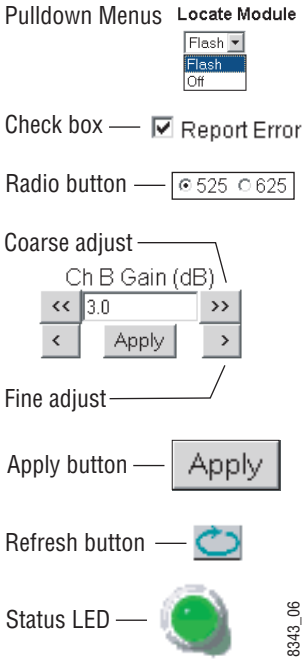
Refer to the Frame Status page shown in Figure 9 on page 21. The Kameleon and 2000 modules can be addressed by clicking either on a specific module icon in the frame status display or on a module name or slot number in the link list on the left.

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 2000NET 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 2000NET software installed in your system. This manual reflects 2000NET software version 3.2.2.

Figure 9. 2000NET GUI



Web Page Operations and Functional Elements



The following conventions and functional elements (shown at left) are used in Kameleon web page operations. (The examples shown throughout this manual represent 2000NET software version 3.2.2 or later):

- Pulldown menus allow you to choose selections from a list.
- Check boxes are used when a selection can be enabled or included in a group. Multiple check box selections or enables can be made for some parameters.
- Radio buttons are used to make a choice of one parameter in a group.
- Each numerical adjustment control has a **Coarse** adjust button (left and right top double arrows) and a **Fine** adjust button (left and right bottom single arrows).
- To change a value, use the arrow button controls or enter a value into the number field and select the **Apply** button. You may also enter a number into the number field from a keyboard and hit the **Enter** key to apply the value.
- A **Refresh** button (circular arrow) is provided for manual refresh of the web page to view recently changed parameters.
- The Status LED is explained below.

Status and Identification Header

Each configuration web page has a Status and Identification Header.

Figure 10. Typical Status/ID Header

Status LED icon

The Status LED icon reports communication status for the frame slot and is a link to the module Status web page where Warnings and Faults are displayed. LED colors indicate:

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

Variables:

- Model and Description are read-only generated by the module.
- Frame Location is entered in 2000 Series Kameleon Frame configuration.
- Slot number reports the module's location in the frame.
- Last Recalled E-MEM reports the last E-MEM configuration recalled from the module.

Initial Configuration Process Overview

To configure the Kameleon module proceed as follows:

1. Go to the **I/O Config** web page to setup and name inputs and outputs.
2. If not already connected, connect all input and output signals. Go to the module **Status** web page to verify component and signal presence and condition.
3. Go to the **Video Input Select** web page to configure the video source and output timing source.
4. Go to the **MUX** web page if you are multiplexing audio into the output video signal.
5. Go to the **Functional View** web page to:
   - Verify the module's functional configuration is correct, and
   - Begin with the Input block links to configure each function in turn.

Note **Next**, **Functional View**, and **Back** links are provided to help you navigate through a logical configuration sequence.

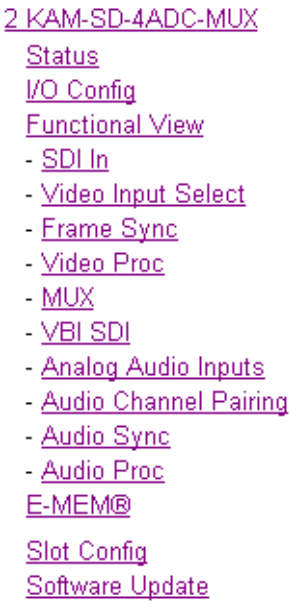
6. Use **E-MEM** memory to store or recall configurations as necessary.

KAM-SD-4ADC-MUX Links and Web Pages

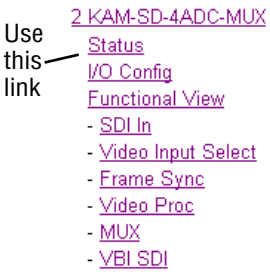
The 2000 GUI provides the following links and web pages for the module (Figure 11):

- Status – reports input and reference signal status and module information (page 26),
- I/O Config – shows a graphic representation of inputs and outputs to the module and allows naming of each input (page 29),
- Functional View – shows a block diagram of the module with links to each configuration web page (page 31),
- Module Configuration web pages for setting up the module (beginning on page 32),
- E-MEM – provides a Standard view for Local Recall operations for up to 5 E-MEM registers (page 57) and an Advanced view providing additional **Save to** and **Load from** file operations (page 58),
- Slot Config – provides a Locate Module function, Slot Identification and Memory, and SNMP trap enable/disable controls (page 62), and
- Software Update – allows updating of software from a CD-ROM or the web site (page 65).

Figure 11. KAM-SD-4ADC-MUX Web Page Links



Status Web Page



The Status web page for the KAM-SD-4ADC-MUX module (Figure 12 on page 27) provides an overall indication of the health of the system and links to web pages for the active components:

- Status Header – the same on all Kameleon configuration pages (see *Web Page Operations and Functional Elements* on page 22),
- Color-coded communication status for each component and path,
- Summary of all fault/warning conditions, and
- Textual module status, front module, and submodule properties.

Color-coded Status Indicators and Links

Each box represents a Kameleon module or submodule as indicated in Figure 12 on page 27. Arrows represent signal paths that may or may not be monitored. These elements act as links when their function is active (indicated by underlined function name).

Color code:

- Green = Pass – operating as expected.
- Yellow = Warning – signal is absent, has errors, or is misconfigured.
- Red = Fault – a component has failed.
- Grey = Not monitored.
- White = Not present.

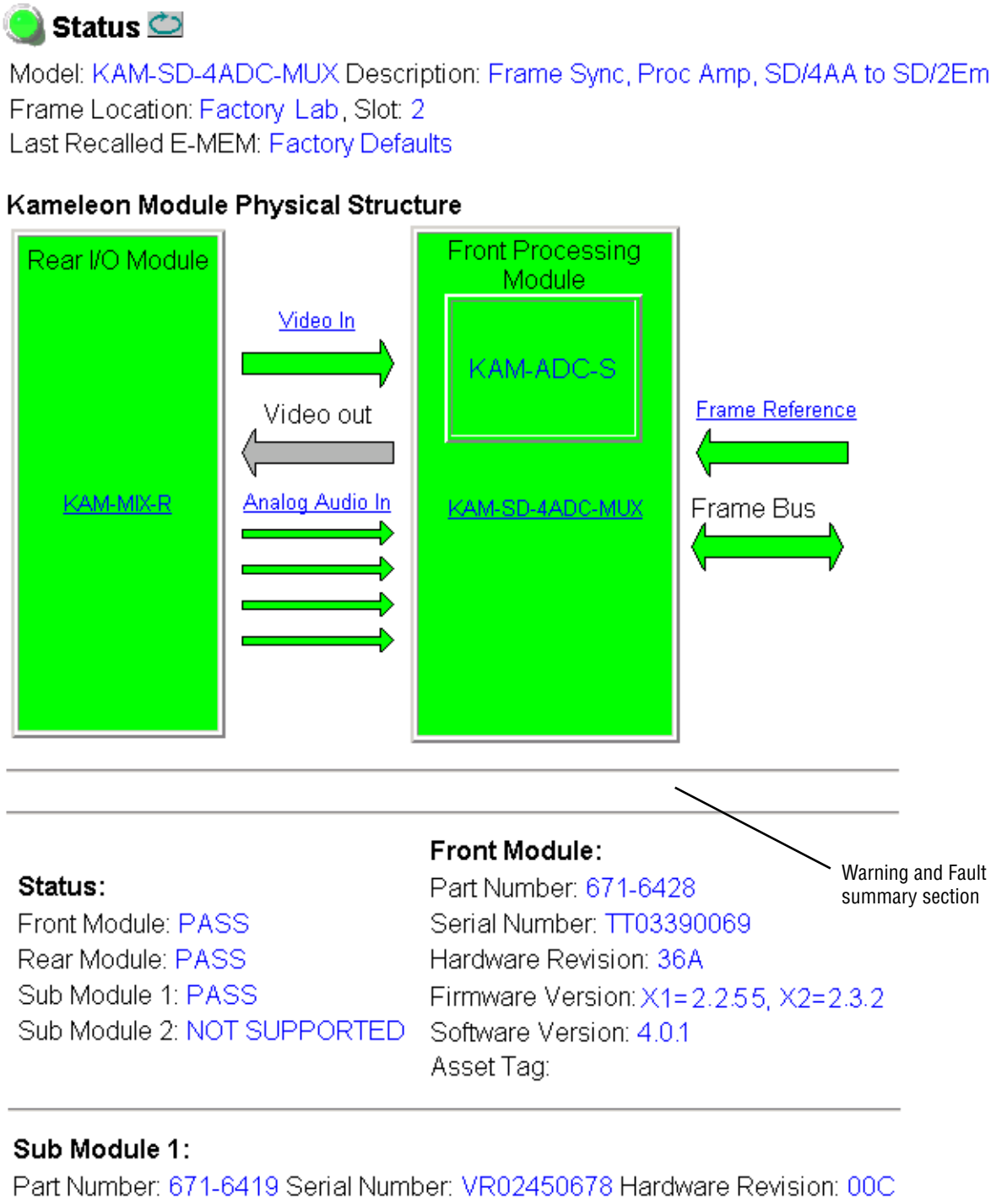
Status/Front Module Properties

The Status/Front Module properties in the footer provide a textual summary of the color-coded module status. Front module properties provide hardware, firmware, software identification, and asset tag number for the KAM-SD-4ADC-MUX module. Presence and status of any submodules is also reported.

Submodule Properties

The Submodule properties in the footer provide a textual summary of the color-coded submodule status. Submodule properties provide part number, serial number, and hardware revision.

Figure 12. Module and Signal Status



Warning/Fault Summary

The warnings and faults shown below are reported in the summary section of the Status web page (Figure 12 on page 27). A **Fault** indicates a serious condition that prohibits proper operation. A **Warning** indicates a condition which may or may not adversely affect operating conditions, but should be noted. Warnings may possibly be corrected by changing configuration, settings or input signals.

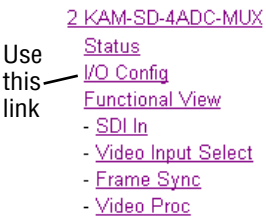
Warnings

- WARNING - Rear Module is not connected
- WARNING - Wrong Rear Module (incompatible with Kameleon)
- WARNING - Wrong Rear Module (no communication)
- WARNING - Wrong Rear Module (unknown type, incompatible)
- WARNING - Video Input is 625 and reference is 525 lines
- WARNING - Video Input is 525 and reference is 625 lines
- WARNING - Video Input is 625 but configuration is 525 lines
- WARNING - Video Input is 525 but configuration is 625 lines
- WARNING - Video Input Signal not detected
- WARNING - Frame Reference is not present
- WARNING - Frame Reference is not locked to input
- WARNING - Frame Reference is not present
- WARNING - No Video output - GenLock selected but not present
- WARNING - 1 or more Audio Input signals not detected
- WARNING - 1 or more Audio Input signals have had AES stream errors
- Internal Error - Unknown submodule type

Faults

- FAULT - nnV power supply bad. (nn = variable: 24 V, 12.5 V, 5 V, 3.3 V, 1.5 V, -5 V, or -12.5 V)
- FAULT - A/D failed (A /D system measuring power supplies and bus levels)
- FAULT - Xilinx 1 failure (main video processor)
- FAULT - Xilinx 2 failure (main audio processor)
- FAULT - MFM (Multi-function module) EEPROM checksum fails
- FAULT - DS1803 not responding (digital potentiometer for video in adjustment)
- Internal Error - Unknown front module type

Input/Output Configuration Web Page

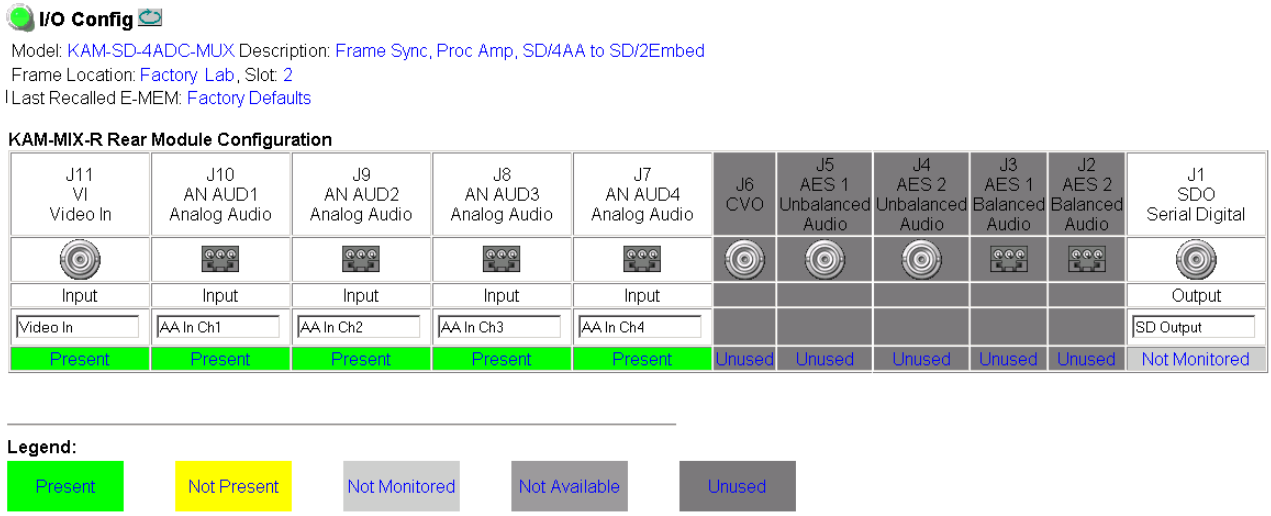


Use the I/O Config web page to:

- View a graphical overview of the currently installed rear module connectors,
- See signal status of inputs,
- Assign easily recognized signal names that will help later in the configuration process.

Figure 13 illustrates the I/O Config web page for the KAM-MIX-R passive rear module required for the KAM-SD-4ADC-MUX front module.

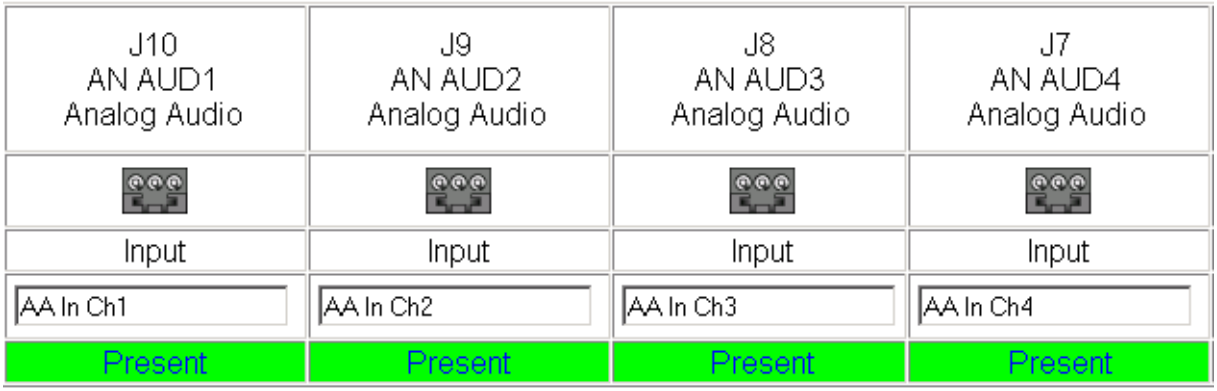
Figure 13. KAM-AES-R Rear Module Configuration Web Page



I/O Config Web Page Elements

The four Analog Audio Input rear module connectors are shown in detail in Figure 14 to illustrate the function of each row of the diagram.

Figure 14. Analog Audio Inputs



Header Row

The top header row provides the connector hardware physical label (J#) and the dedicated signal type for the connector. This information is determined by the type of rear module and front processor module installed (refer to the *Functional View Web Page* on page 31).

Connectors

The connector row illustrates connector type provided (BNC or 3-pin terminal) for each port. For this rear module, one serial digital video input, four analog audio inputs, and one serial digital output are provided.

Input/Output Mode

I/O mode is either static read-only or an operational Input/Output selection (determined by the rear module used).

Signal Name

Enter a signal name (up to 15 characters) for each operational input/output. The name will be used to identify the signal in other configuration web pages. Factory default names are shown in Figure 14 on page 29.

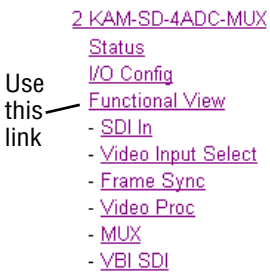
Status

Table 4 shows, by color and signal type, the signal status reports that may be displayed in the Status row for this module configuration:

Table 4. I/O Config Status Report Messages

Color	Video In	Analog Audio In	Analog Audio Out	Digital Audio In	Digital Audio Out	Video Out
Green	Present	Present	None	None	None	None
Yellow	Not present or 525/625 mismatch	None	None	None	None	None
Light Grey	None	Silent	None	None	None	Not Monitored
Medium Grey	None	Not Available	None	None	None	None
Dark Grey	None	None	None	Unused	Unused	None

Functional View Web Page



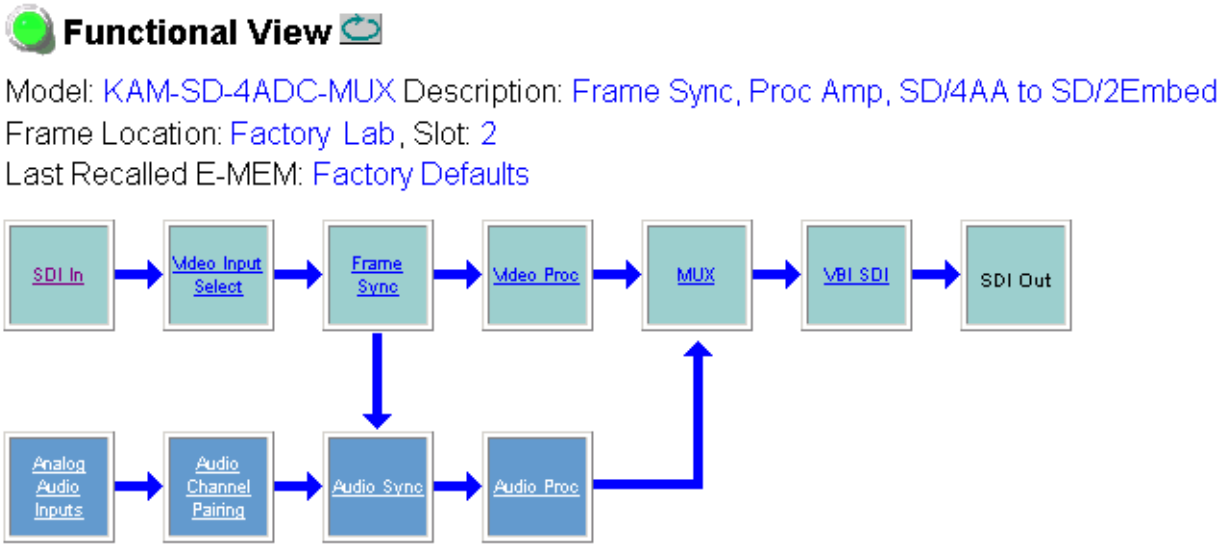
Use the Functional View web page (Figure 15) to:

- Monitor module functions and signal paths, and
- Navigate to web pages for configuring active functions.

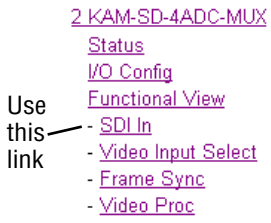
The Functional View web page is a block diagram of the installed Kameleon module that reports the module functions and signal paths that are active or inactive in the current configuration. It can be used as a link map for configuring module functions. Begin configuring with one of the input function blocks on the left.

Color coding indicates active functions and flow. Grayed components are inactive due to hardware and/or software constraints. Underlined module functions are links to the web page for that function. Return links and logical next step links are provided at the bottom of each configuration web page.

Figure 15. Functional View Web Page



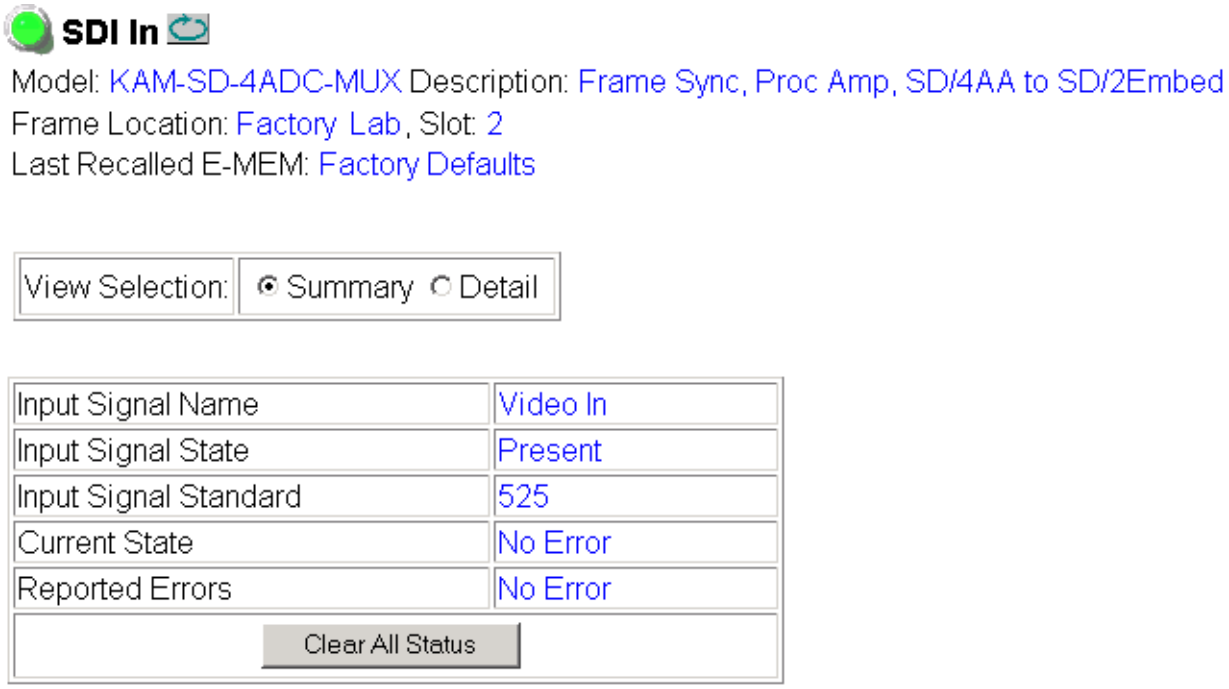
SDI In Web Page



Use the SDI In web page to view the status of the SDI input signal in Summary view (Figure 16) or Detail view (Figure 17 on page 33):

- Select the **Summary** radio button to bring up the summary view shown in Figure 16.
- Use the **Clear All Status** button to clear and reset the status reporting.

Figure 16. SDI In Web Page (Summary View)



To view a detailed view of the SDI input status, select the **Detail** radio button to bring up the view shown in Figure 17 on page 33.

This view provides input signal status for both EDH Error and Feed Forward status. Each status report can be disabled by deselecting the corresponding **Reporting** checkbox. Each status report can also be cleared and reset by selecting the corresponding **Clear Status** button.

Figure 17. SDI In Web Page (Detail View)

SDI In

Model: KAM-SD-4ADC-MUX Description: Frame Sync, Proc Amp, SD/4AA to SD/2Embed
Frame Location: Factory Lab, Slot: 2
Last Recalled E-MEM: Factory Defaults

View Selection: ○ Summary ◉ Detail

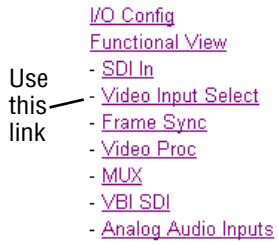
Input Signal Name	Video In
Input Signal State	Present
Input Signal Standard	525
Current State	No Error
Reported Errors	No Error

Clear All Status

EDH Errors	Error Reporting	Status	
Full Frame EDH Error Detection	☑ Report Error	No Error	Clear Status
Active Picture EDH Error Detection	☑ Report Error	No Error	Clear Status
Feed Forward Status	**Error Reporting**	**Status**	
UES Full Field	☑ Report Unknown	Known	Clear Status
EDH Full Field	☑ Report Error	No Error	Clear Status
IDH Full Field	☑ Report Error	No Error	Clear Status
EDA Full Field	☑ Report Error	No Error	Clear Status
IDA Full Field	☑ Report Error	No Error	Clear Status
UES Active Picture	☑ Report Unknown	Known	Clear Status
EDH Active Picture	☑ Report Error	No Error	Clear Status
IDH Active Picture	☑ Report Error	No Error	Clear Status
EDA Active Picture	☑ Report Error	No Error	Clear Status
IDA Active Picture	☑ Report Error	No Error	Clear Status
UES Ancilliary Data	☑ Report Unknown	Known	Clear Status
EDH Ancilliary Data	☑ Report Error	No Error	Clear Status
IDH Ancilliary Data	☑ Report Error	No Error	Clear Status
EDA Ancilliary Data	☑ Report Error	No Error	Clear Status
IDA Ancilliary Data	☑ Report Error	No Error	Clear Status

Functional View Next

Video Input Select Web Page



Use the Video Input Select web page (Figure 18 on page 35) to:

- Configure input video line rate,
- Enable or disable Loss of Signal reporting to the Status web page and SNMP monitoring (refer to 2000NET manual for SNMP information),
- Configure Vertical Blanking Interval (in Advanced mode), and
- Select the output timing reference.

View Selection

In the View Selection display, choose the **Standard** radio button to display the standard settings shown in Figure 18. Use the **Advanced** view for configuring the Vertical Blanking Interval for selecting active video lines to carry data (see *Advanced VBI Configuration* on page 36).

Video Selection Settings

The following functions are provided in the Video Selection section in both the Standard and Advanced views:

- Input Name – (read-only) signal name is entered on the **I/O Config** web page
- Input Status –
  - Signal presence reported
  - Enable/disable Loss of Signal report to both Kameleon status web pages and SNMP monitoring devices.

Note The disabling of video and reference Loss of Signal reports and SDI Input Error warnings allow you to filter reports from higher level Kameleon status displays and SNMP monitoring. They will still be reported on this web page.

- Video Format – current input video format reported.
- Video Line Rate – select 525 or 625 line rate or enable automatic line rate detection
- Frame Reference –
  - 2000GEN frame reference signal presence reported,
  - Enable/disable Loss of Signal report to both Kameleon status web pages and SNMP monitoring devices.
- SDI Input Errors –
  - Input signal errors reported, and
  - Enable/disable SDI error warning report to both Kameleon status web pages and SNMP monitoring devices.

- Frame Sync/Delay – (read-only) Frame Sync mode is reported when Output Timing Selection is **Internal Frame Reference** and timing is provided from the 2000GEN module. Frame Delay mode is reported when the input signal (**Video In**) is used for timing reference.

Output Timing Selection

The 2000GEN reference module must be installed in the frame and for the Kameleon to work as a frame synchronizer, set the output timing source to **Internal Frame Reference**. Otherwise, set the output timing source to **Video In**.

Figure 18. Video Input Select – Standard View

Video Input Select

Model: KAM-SD-4ADC-MUX Description: Frame Sync, Proc Amp, SD/4AA to SD/2Embed
Frame Location: Factory Lab , Slot: 2
Last Recalled E-MEM: Factory Defaults

View Selection:	◉ Standard ○ Advanced (VBI Config)

Video Selection

	Current	Selection
Input Name	Video In	
Input Status	Present	☑ Report Loss of Signal
Video Format	SDI	SDI
Video Line Rate	525	○ 525 ○ 625 ◉ Auto
Frame Reference	Present	☑ Report Loss of Signal
SDI Input Errors	Clear	☑ Warn SDI Errors
Frame Sync / Delay	Frame Sync	

Output Timing Selection

	Source	Status	Mode	GenLock	Audio Framing
Internal Frame Reference	◉	Present	525	Locked	Free Run
Video In	○	Present	525	-	-

Back Functional View Next

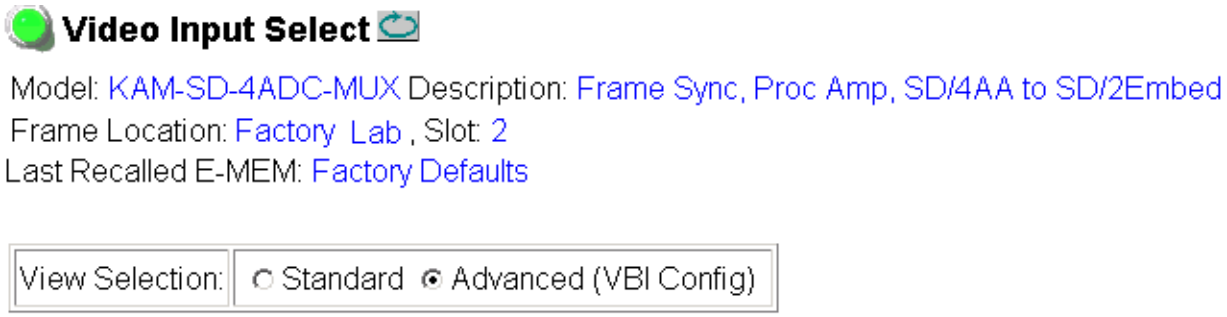
Advanced VBI Configuration

Advanced VBI configuration allows you extend VBI into the active picture range for special data insertion requirements. Active video lines that are used to carry data are referred to as Data Lines.

To add Data Lines to VBI:

1. Choose **Advanced (VBI Config)** on the Video Input Select web page (Figure 19).

Figure 19. Standard and Advanced View Selection



The **VBI/Data Lines** panel will appear at the bottom of the web page (see Figure 20 on page 37 for 525 line rate and Figure 21 on page 37 for 625 line rate).

2. Select the last line (includes all previous active video lines) that will be used for data.

Selected active video lines will be shown in the **Reserved for Data** section of the web page as shown for lines 21/284 and 22/285 in Figure 20 and lines 24/337 and 25/338 in Figure 21.

Active video lines that can be made available for data insertion are:

- For 525, lines 21 - 24 in Field 1, lines 284 -287 in Field 2
- For 625, lines 24 - 28 in Field 1, lines 337 -341 in Field 2

Figure 20. Advanced VBI Configuration – 525 Line Rate

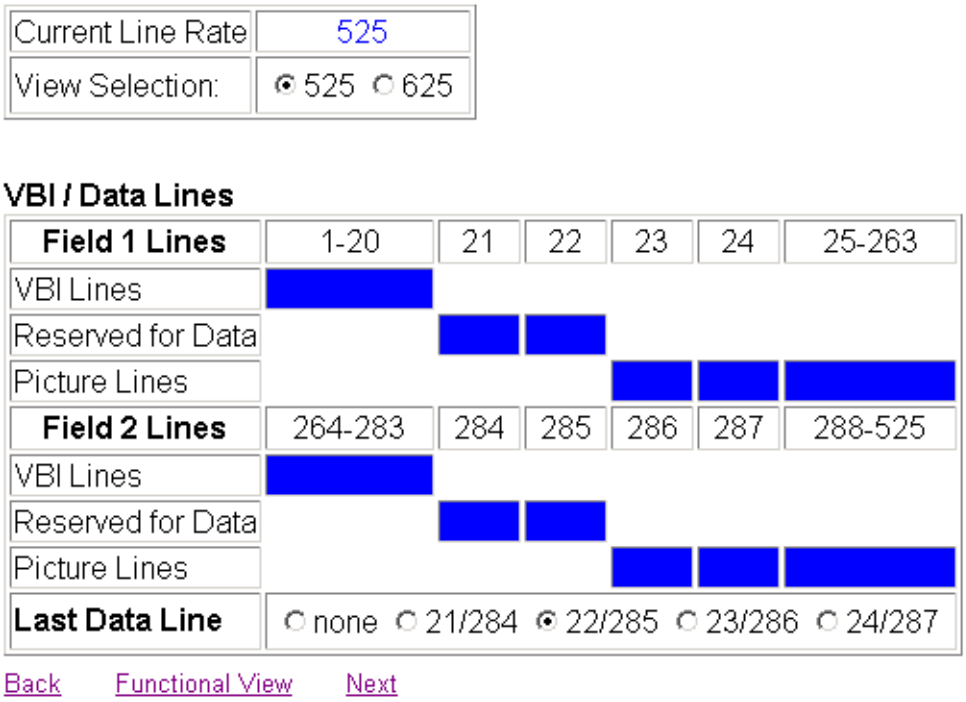
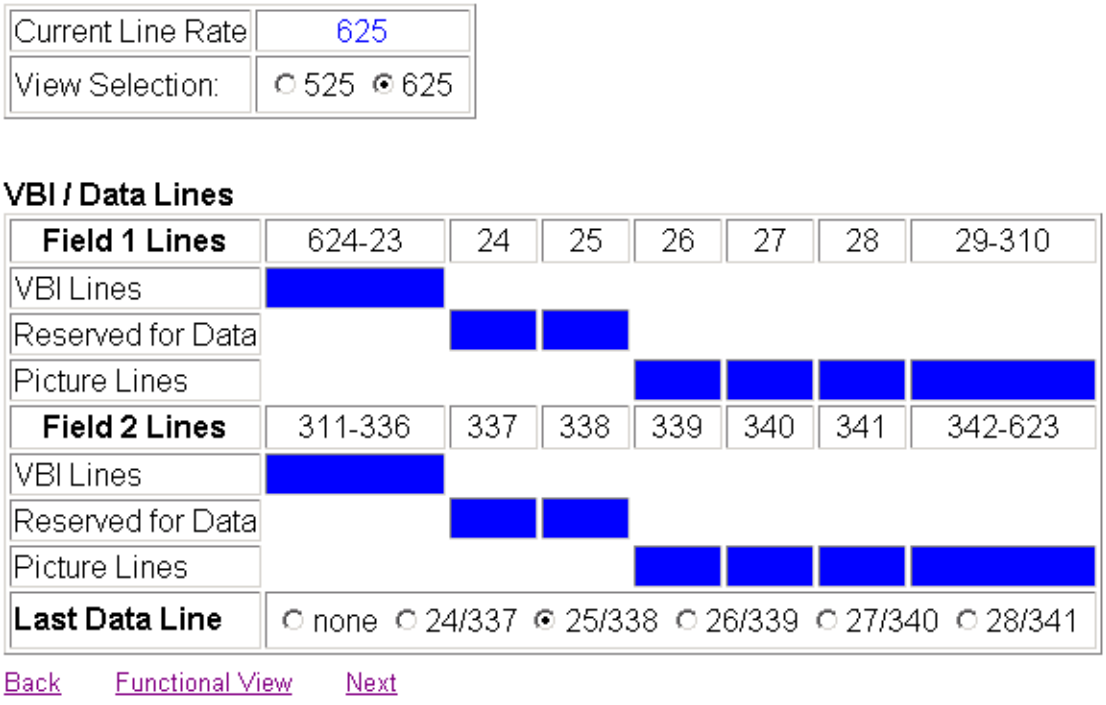
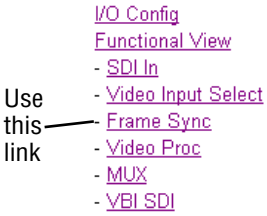


Figure 21. Advanced VBI Configuration – 625 Line Rate



Frame Sync Web Page



Use the Frame Sync web page (Figure 22 on page 39 and Figure 23 on page 39) to:

- Adjust horizontal and vertical timing, and
- Freeze the current output or, if using a 2000GEN reference signal, select an automatic freeze mode for output when the signal is lost.

Timing Adjustment

Table 5 shows the ranges of timing adjustment for 525 and 625 signal formats.

Table 5. Timing Adjustment Ranges

Line Rate	Max Horizontal Adjustment	Max Vertical Adjustment
525/NTSC	857.5 pixels	524 lines
625/PAL	863.5 pixels	624 lines

Freeze Mode Selection

The Freeze mode controls available depend on the output timing reference selected on the *Video Input Select Web Page* on page 34.

When set to Frame Delay mode (using the **Video In** output timing reference), Freeze Mode allows you to manually freeze the output using **Field 1**, **Field 2**, or one **Frame** (Figure 22 on page 39). A field freeze provides less resolution and no motion artifacts in the output. In Frame mode the resolution is higher since both fields are present, but the presentation of two fields can cause motion artifacts.

Frame Sync mode (using the 2000GEN **Internal Frame Reference** as the output timing reference) provides the manual activation selections plus **AutoBlack** and **AutoFreeze** modes to be used when the video signal is lost (Figure 23 on page 39). AutoBlack outputs a black signal while AutoFreeze outputs the last complete video field.

Figure 22. Frame Synchronizer Web Page – Video In Reference

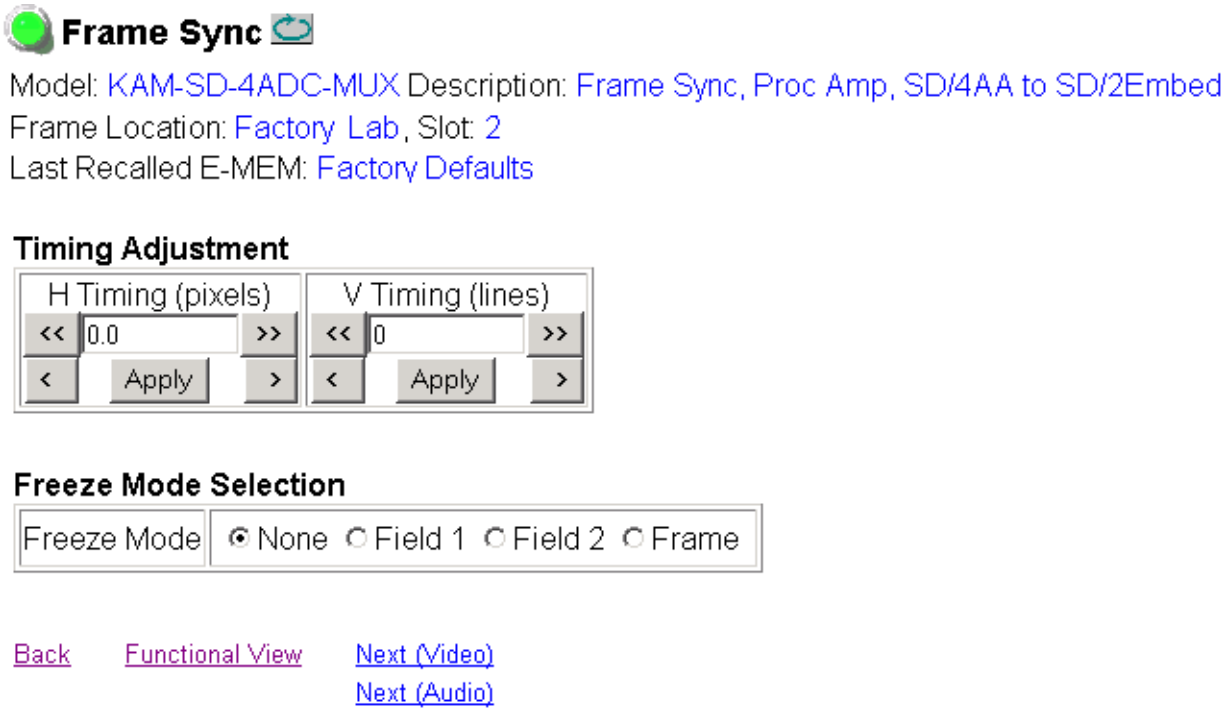
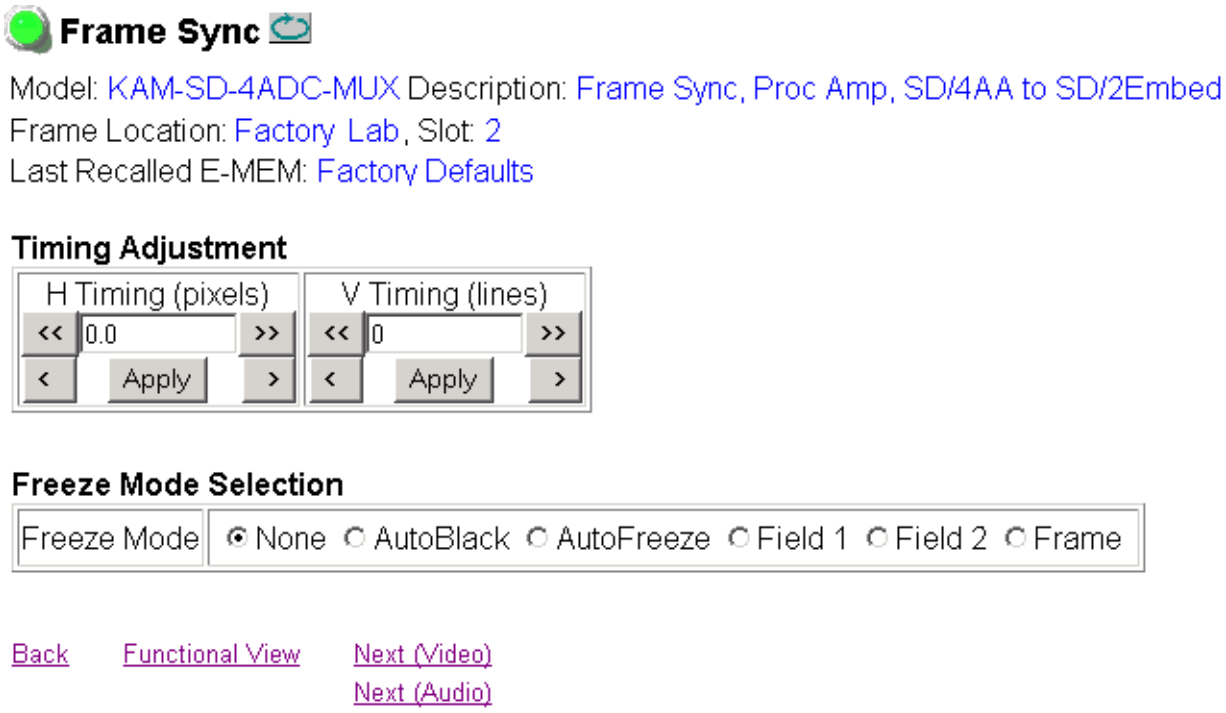
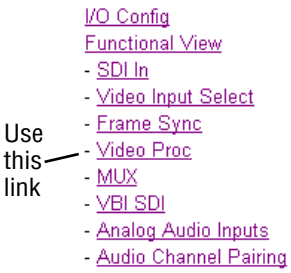


Figure 23. Frame Synchronizer Web Page – Internal Frame Reference



Video Processing Web Page



Use the Video Proc web page to:

- Enable/disable Standard or Advanced video processing,
- Turn on Color Bars test signal,
- Enable/disable video gain lock,
- Adjust component video gain (Y, B-Y, R-Y),
- Adjust component video DC Offset (Y, B-Y, R-Y),
- Enable/disable soft and hard clipping controls, and
- Apply selected clip settings to VBI.

Video Processing Controls

Video Processing Enable

To bypass Video Processing on the SDI signal select **Disable** (Figure 24 on page 41). To make video processing adjustments to the SDI signal select **Enable** or select **Color Bars** to use the internally generated 100% vertical color bars test signal.

Two modes of video processing are available, Standard or Advanced. With **Standard** selected, only the Y Channel Video Processing controls on the left will be visible along with the clipping controls.

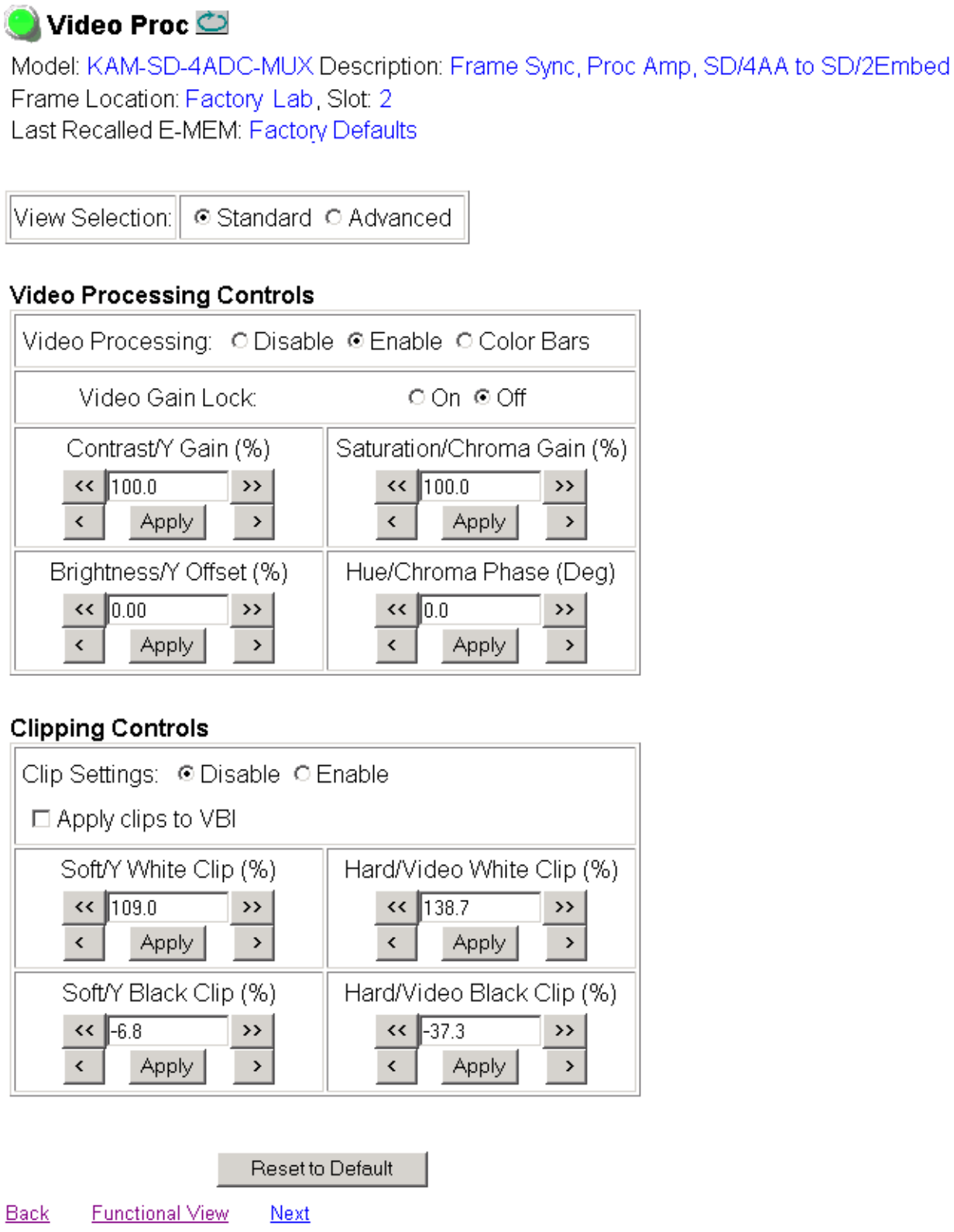
When **Advanced** is selected, the B-Y and R-Y Gain and Balance/Offset controls will also be displayed as shown in Figure 25 on page 43.

Standard View

In Standard View (Figure 24 on page 41), adjust the following for the Y Channel:

- Contrast/Y Gain – adjust the percentage of luminance relative to white (50 to 149.6%).
- Saturation/Chroma Gain – adjust the percentage of saturation and chroma gain relative to 100% saturation (50 to 149.6%).
- Brightness/Y Offset – adjust the amount of brightness/Y offset in mV (-3.55 to 3.44%)
- Hue/Chroma Phase – adjust the hue/chroma phase in degrees (-89.8 to 89.8 degrees).

Figure 24. Video Processing Web Page – Standard View



Advanced View

In Advanced View (Figure 25 on page 43), adjust the following for the B-Y and R-Y Channels:

Note To adjust gain for all channels simultaneously, set **Video Gain Lock** to **On**. This locks Y, B-Y, and R-Y adjustments together. Adjustment of one gain setting changes all gain values (Y, B-Y, R-Y) the same amount.

- B-Y/R-Y Gain – adjust the percentage of B-Y and R-Y gain relative to 100% (50 to 149.6%).
- B-Y/R-Y Balance/Offset – adjust the amount of B-Y and R-Y DC offset in mV (-3.55 to 3.44%)

Clipping Controls

Clipping controls are provided that affect the luminance (soft/Y) and overall saturation (hard/video) levels of the output signal.

Refer to Figure 25 on page 43. To enable the clip controls select the **Enable** radio button. You may also apply the clip levels to the vertical blanking interval by checking the **Apply clips to VBI** box. This control is also available on the VBI SDI web page (page 49).

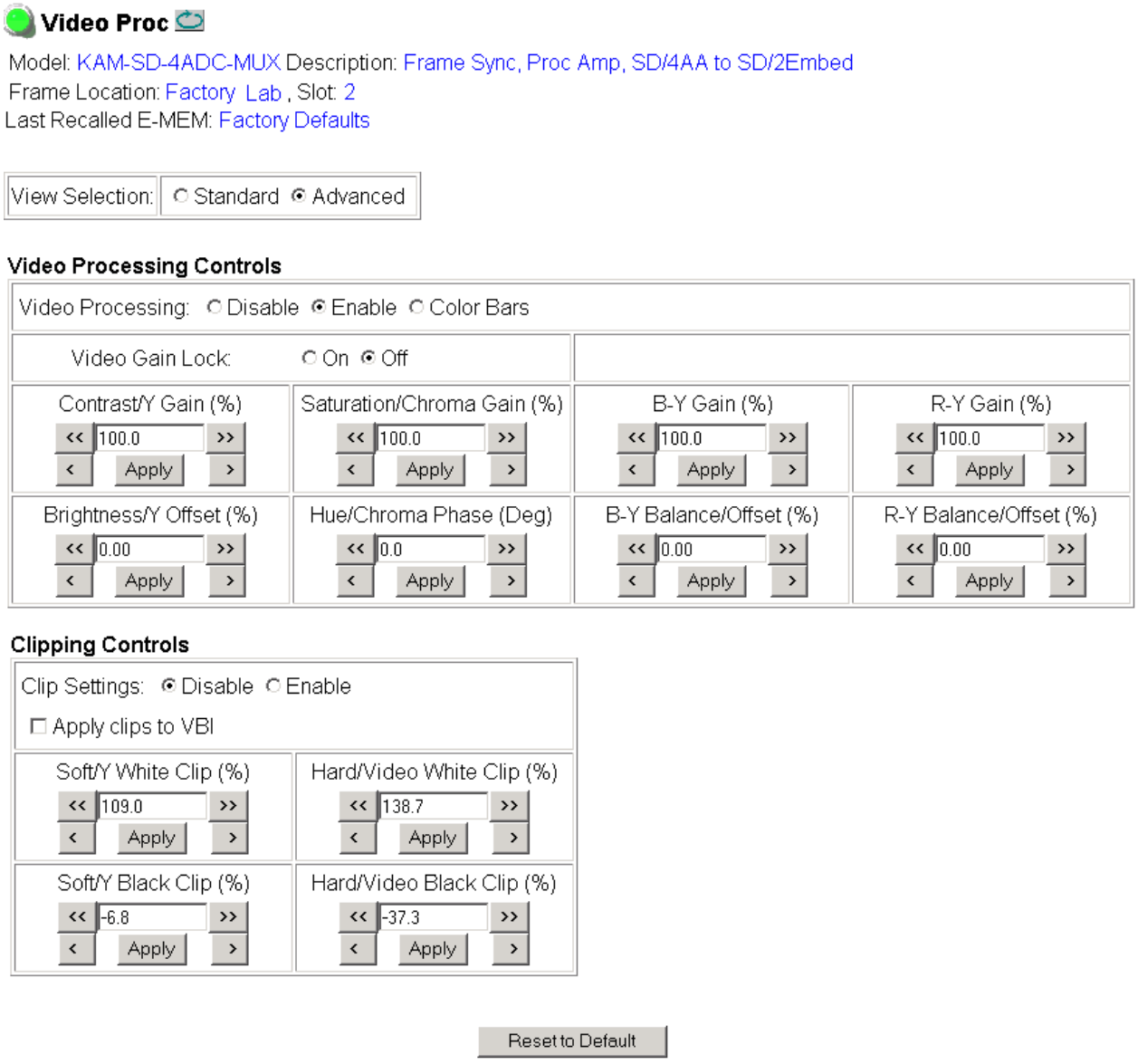
Use the following clipping controls to adjust levels on the video output:

- Use the **Soft/Y White Clip** control to set the clipping level for the top end (white) of the luminance signal (positive excursions).
- Use the **Soft/Y Black Clip** control to set the clipping level for the bottom end (black) of the luminance signal (negative spikes and Super Black).
- Use the **Hard/Video White Clip** control to set the clipping level for the top end (white) of the overall video signal (clips white and reduces overall saturation level to fit within clip).
- Use the **Hard/Video Black Clip** control to set the clipping level for the bottom end (black) of the overall video signal (clips black and reduces overall saturation level to fit within clip).

Reset To Default

Select the **Reset To Default** button on the bottom of the screen to return all values to the factory defaults.

Figure 25. Video Processing Web Page – Advanced View



MUX Web Page

Use this link

Functional View
- SDI In
- Video Input Select
- Frame Sync
- Video Proc
- MUX
- VBI SDI
- Analog Audio Inputs

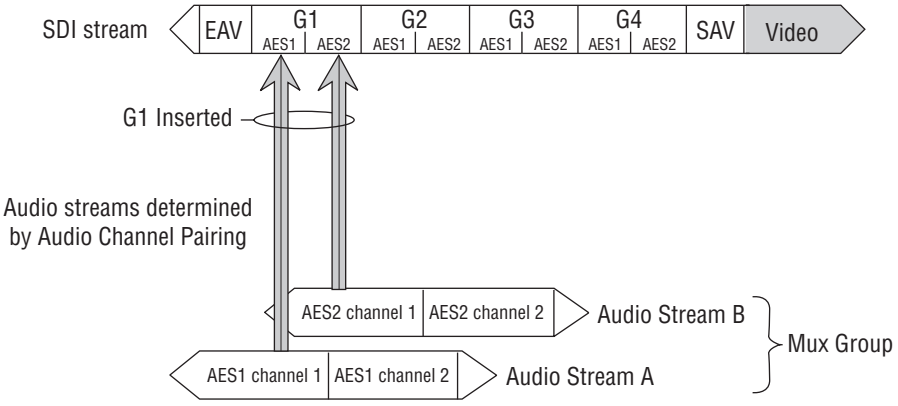
Use the MUX (multiplex) web page (Figure 29 on page 47) to:

- Delete unwanted embedded audio groups from the SDI input signal or delete all horizontal ancillary data (HANC) in all audio groups, and
- Insert (multiplex) AES audio streams that have been converted from analog audio inputs in the ADC audio submodule into the SDI video output stream.

Note The audio channel pairs available to each Mux Group below are determined by the Audio Channel Pairing web page (see page 52).

Figure 26 depicts the multiplexing of the processed audio streams back into the SDI video stream based on the selections made on the Mux web page in Figure 29 on page 47.

Figure 26. Multiplexing into the SDI Stream



The Mux web page provides two functions: Group Deletion and Group Replacement. Each of these functions depends on the presence of embedded audio groups in the incoming SDI video stream and the external audio inputs.

Group Deletion

The Group Deletion area of the Mux web page reports if audio is present in any of the four audio groups in the incoming SDI video signal and the output status of each group. It can be used to delete unwanted embedded audio groups and clear all HANC (horizontal ancillary data) in the incoming video stream with the following controls:

- **Delete** – check the box to delete all embedded audio in the corresponding audio group.
- **Clear all input HANC data** – check the box to delete all horizontal ancillary data in all audio groups.

The warning "24 Bit Audio in all four groups may exceed data space capabilities" may appear under the Group Deletion section when any of the following conditions occur:

- SDI Video In,
- 525 line video format,
- 24 bit audio format for Mux Group A, or
- 24 bit audio format for Mux Group B.

An example of this may be seen in Figure 29 on page 47.

Group Replacement

The Group Replacement function allows the insertion of processed AES audio streams converted from the external analog audio inputs (determined on the *Audio Channel Pairing Web Page* on page 52) into any Group (1-4) in the SDI output stream with the following controls:

- Use the **Stream A** and/or **Stream B** checkboxes in the Insert column to insert Pair 1 and/or Pair 2 into the SDI output steam.
- Select the audio Group number in the SDI stream into which to insert (embed) the streams.
- Select the output sample rate for the inserted audio as **20 bits** or **24 bits**.

An example of this may be seen in Figure 29 on page 47.

Audio Multiplexing

There are four possible conditions for multiplexing as described next.

No Embedded Audio

If no audio groups are present in the incoming SDI video signal, the Group Deletion input status section will appear as shown in Figure 27. Input Status is **Not Present** and Output Status is **Empty** for each audio group. No deletion is possible with this status.

Figure 27. No Embedded Audio Present

Group Deletion

	Group 1	Group 2	Group 3	Group 4
Input Status	Not Present	Not Present	Not Present	Not Present
Delete	☐ Delete	☐ Delete	☐ Delete	☐ Delete
Output Status	Empty	Empty	Empty	Empty

Pass Embedded Audio

If an embedded audio group is present in the incoming SDI signal and no replacement is selected, the audio group will be passed to the output as shown in Figure 28. Input Status is **Present** and Output Status is **Passed.**

Check the corresponding **Delete** checkbox to remove an audio group completely that is reported as **Present** from the SDI stream if desired.

Figure 28. Pass Embedded Audio

Group Deletion

	Group 1	Group 2	Group 3	Group 4
Input Status	Present	Not Present	Not Present	Not Present
Delete	☐ Delete	☐ Delete	☐ Delete	☐ Delete
Output Status	Passed	Empty	Empty	Empty

Replace Embedded Audio

An external analog audio group can be selected to replace an existing audio group in the incoming SDI stream with the Group replacement function as shown in Figure 29. In this case, the present audio, Group 1, has been replaced with Group 1 from the external analog audio input converted in the ADC audio submodule and processed in the audio processor.

When Stream A and/or Stream B is selected in the Replace column, the Input Status will report **Present** and the Output Status will report **Replaced.** Deletion is not possible with this status (N/A).

Figure 29. Multiplex Web Page

Model: KAM-SD-4ADC-MUX Description: Frame Sync, Proc Amp, SD/4AA to SD/2Embed
Frame Location: Factory Lab, Slot: 2
Last Recalled E-MEM: Factory Defaults

Group Deletion

	Group 1	Group 2	Group 3	Group 4
Input Status	Present	Not Present	Not Present	Not Present
Delete	N/A	☐ Delete	☐ Delete	☐ Delete
Output Status	Replaced	Empty	Empty	Empty
	☐ Clear all input HANC data			
Warning! 24 Bit Audio in all four groups may exceed data space capabilities				

Group replacement

Mux Group	Replace	Group	Bits/Sample
Pair 1: AA In Ch1 & AA In Ch2	☑ Stream A	◉ Group 1 ○ Group 2 ○ Group 3 ○ Group 4	◉ 20 bits ○ 24 bits
Pair 2: AA In Ch3 & AA In Ch4	☑ Stream B		

Back (Video) Functional View Next
Back (Audio)

Insert Embedded Audio

An external analog audio group can be selected to replace an empty audio group in the SDI input stream with the Group replacement function as shown in Figure 30. In this case, an external analog audio has been converted in the ADC audio submodule and processed in the Audio processor, and selected to replace an empty audio Group.

When Stream A and/or Stream B is selected in the Replace column, the Output Status will report **Inserted** in an empty Group selected in Group Replacement.

Figure 30. Insert Embedded Audio

Model: KAM-SD-4ADC-MUX Description: Frame Sync, Proc Amp, SD/4AA to SD/2Embed
Frame Location: Factory Lab, Slot: 2
Last Recalled E-MEM: Factory Defaults

Group Deletion

	Group 1	Group 2	Group 3	Group 4
Input Status	Present	Not Present	Not Present	Not Present
Delete	☐ Delete	☐ Delete	☐ Delete	☐ Delete
Output Status	Passed	Inserted	Empty	Empty
	☐ Clear all input HANC data			

Group replacement

Mux Group	Replace	Group	Bits/Sample
Pair 1: AA In Ch1 & AA In Ch2	☑ Stream A	○ Group 1 ◉ Group 2 ○ Group 3 ○ Group 4	◉ 20 bits ○ 24 bits
Pair 2: AA In Ch3 & AA In Ch4	☑ Stream B		

Back (Video) Functional View Next
Back (Audio)

VBI SDI

Use this link

- Video Proc
- MUX
- VBI SDI
- Analog Audio Inputs
- Audio Channel Pairing
- Audio Sync
- Audio Proc

E-MEM®

Use the VBI SDI web page (Figure 31 for 525, Figure 32 on page 50 for 625 line rate) to configure blanking for the VBI and Data Lines.

- The currently detected line rate will be reported. Use the View Selection to view the web page at the correct line rate with the **525** or **625** radio button.
- On a line-by-line basis you can blank existing VBI and Data Line information by selecting the corresponding checkbox.
- Check the **Apply Clips to VBI** checkbox to apply the clip values made with the Video Processor to all of the VBI lines. This control is also available on the Video Processing web page (page 40).

Note The data lines not reserved for carrying data on the Video Input Select web page will appear grayed out. See *Advanced VBI Configuration* on page 36.

Figure 31. VBI SDI Web Page – 525 Line Rate

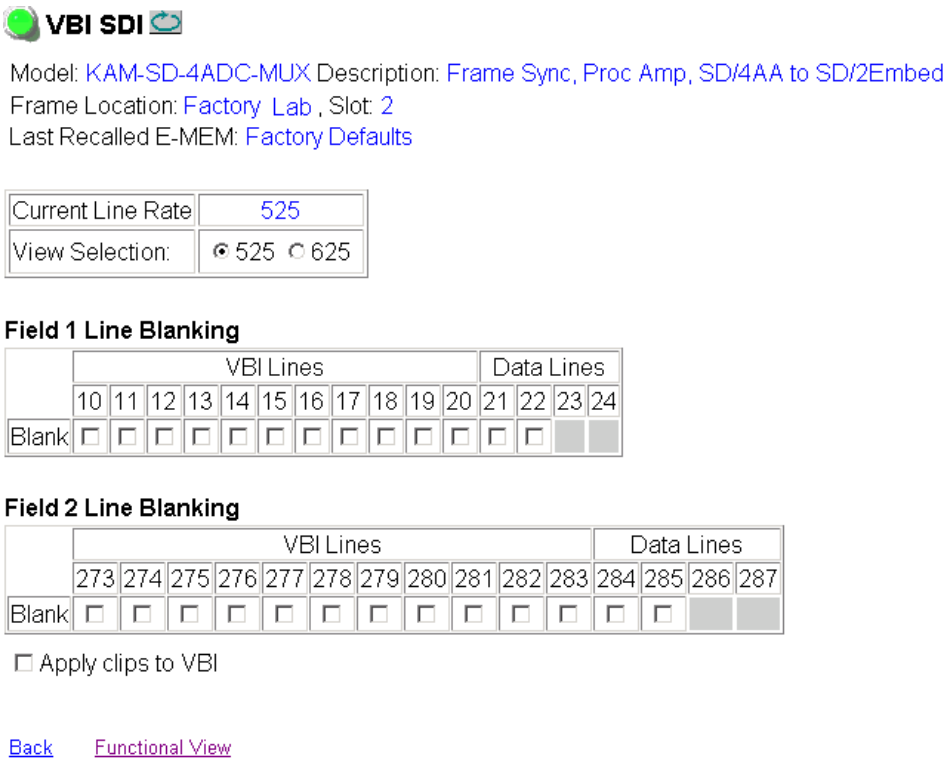
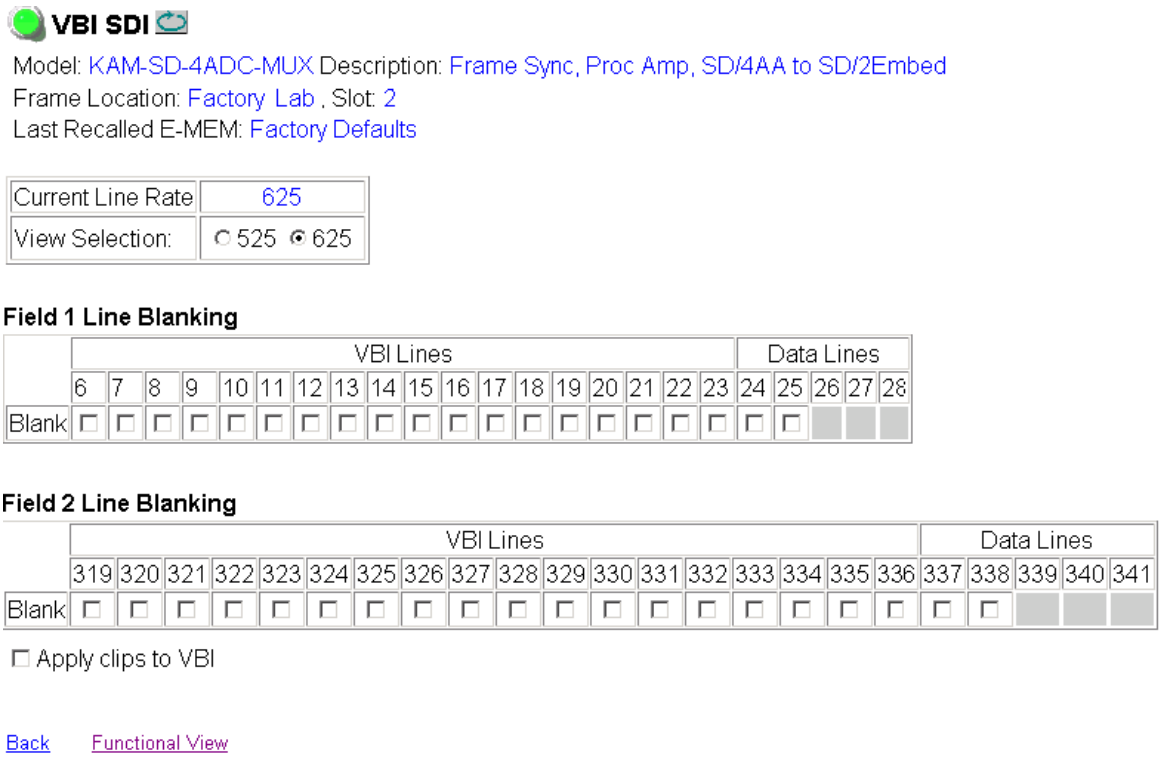


Figure 32. VBI SDI Web Page – 625 Line Rate

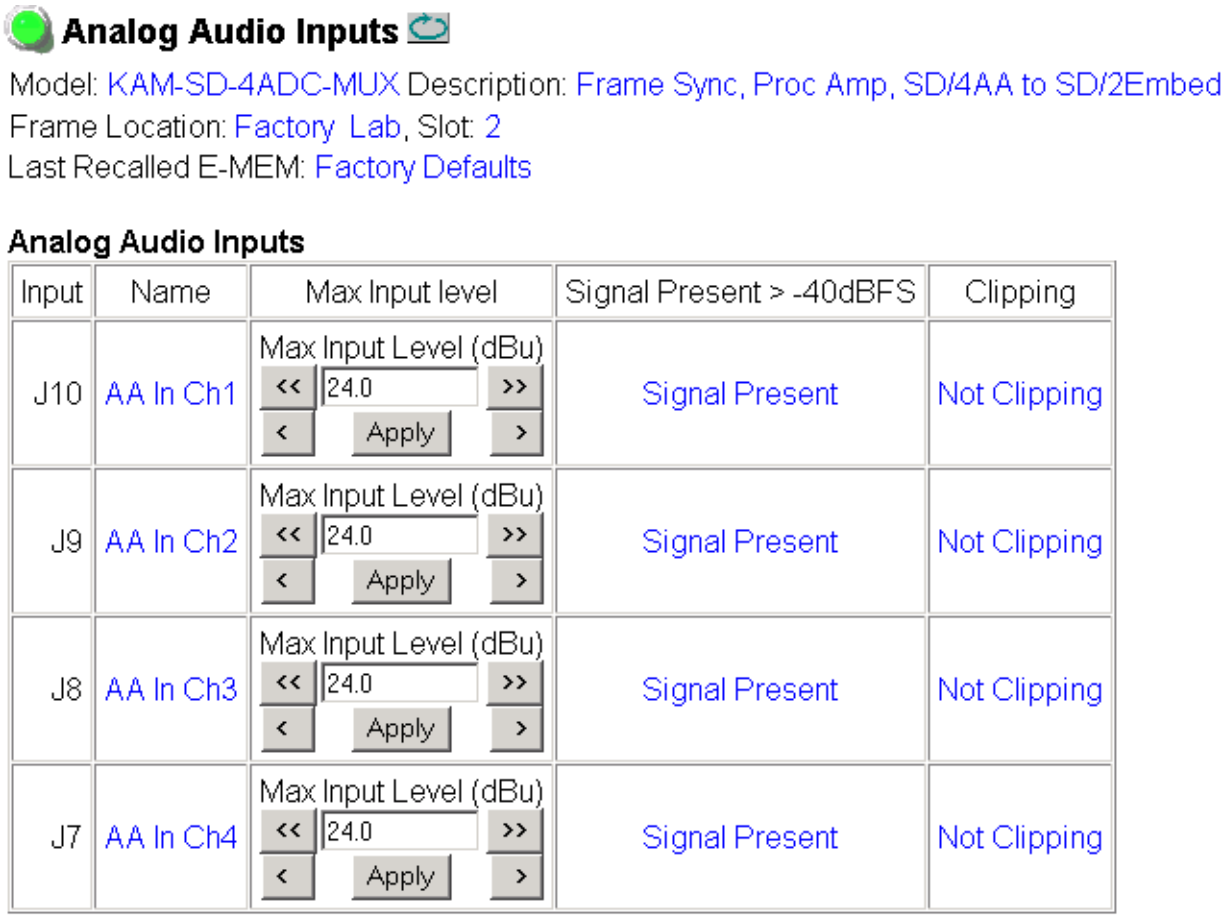


Analog Audio Inputs Web Page

Use the Analog Audio Inputs web page (Figure 33) to set maximum analog audio input levels.

- **Signal Present** is reported if the incoming signal is greater than -40 dBFS.
- **Clipping** is reported for incoming signals in excess of approximately 0.5 dB of maximum level.
- **Maximum Input Level** is adjustable -2.0 to +28 dBu for each analog audio input. Kameleon uses this value to adjust the signal level into the A-to-D converter for the best signal-to-noise and dynamic range.

Figure 33. Analog Audio Inputs Web Page



Audio Channel Pairing Web Page

The Audio Channel Pairing web page (Figure 34) allows the input audio channels to be arbitrarily recombined into new pairs and swapped or set to **Silence**. The rows represent the audio input channels and the columns represent the audio output channels. The columns are grouped together into two different pairs (Pair 1 Ch A and Ch B and Pair 2 Ch A and Ch B).

The streams in each pair are grouped together into a Mux group on the Mux web page. Then Stream A or Stream B or both can be inserted into the SDI output video (see *MUX Web Page* on page 44).

Note Audio input names are assigned using the **I/O Config** web page.

Figure 34. Audio Channel Pairing Web Page

Audio Channel Pairing

Model: KAM-SD-4ADC-MUX Description: Frame Sync, Proc Amp, SD/4AA to SD/2Embed
Frame Location: Factory Lab, Slot: 2
Last Recalled E-MEM: Factory Defaults

Pair Input Audio Channels

Names	Pair 1 ChA	Pair 1 ChB	Pair 2 ChA	Pair 2 ChB	Streams
AA In Ch1	◉	○	○	○	Str1.Ch1
AA In Ch2	○	◉	○	○	Str1.Ch2
AA In Ch3	○	○	◉	○	Str2.Ch1
AA In Ch4	○	○	○	◉	Str2.Ch2
Silence	○	○	○	○	Silence

Back Functional View Next

Audio Sync Web Page

Use the Audio Sync web page (Figure 35 on page 54) to:

- Synchronize the two audio channel pairs to video Frame Sync, and/or
- Add audio delay using the delay adjust controls to add delay to each channel or lock the channels together as a pair and adjust delay.

Enable Auto Track

Select the **On** checkbox to enable auto tracking to synchronize the audio pair to the video frame sync. The amount of auto tracking applied is shown in the Auto Tracking Delay read-only display.

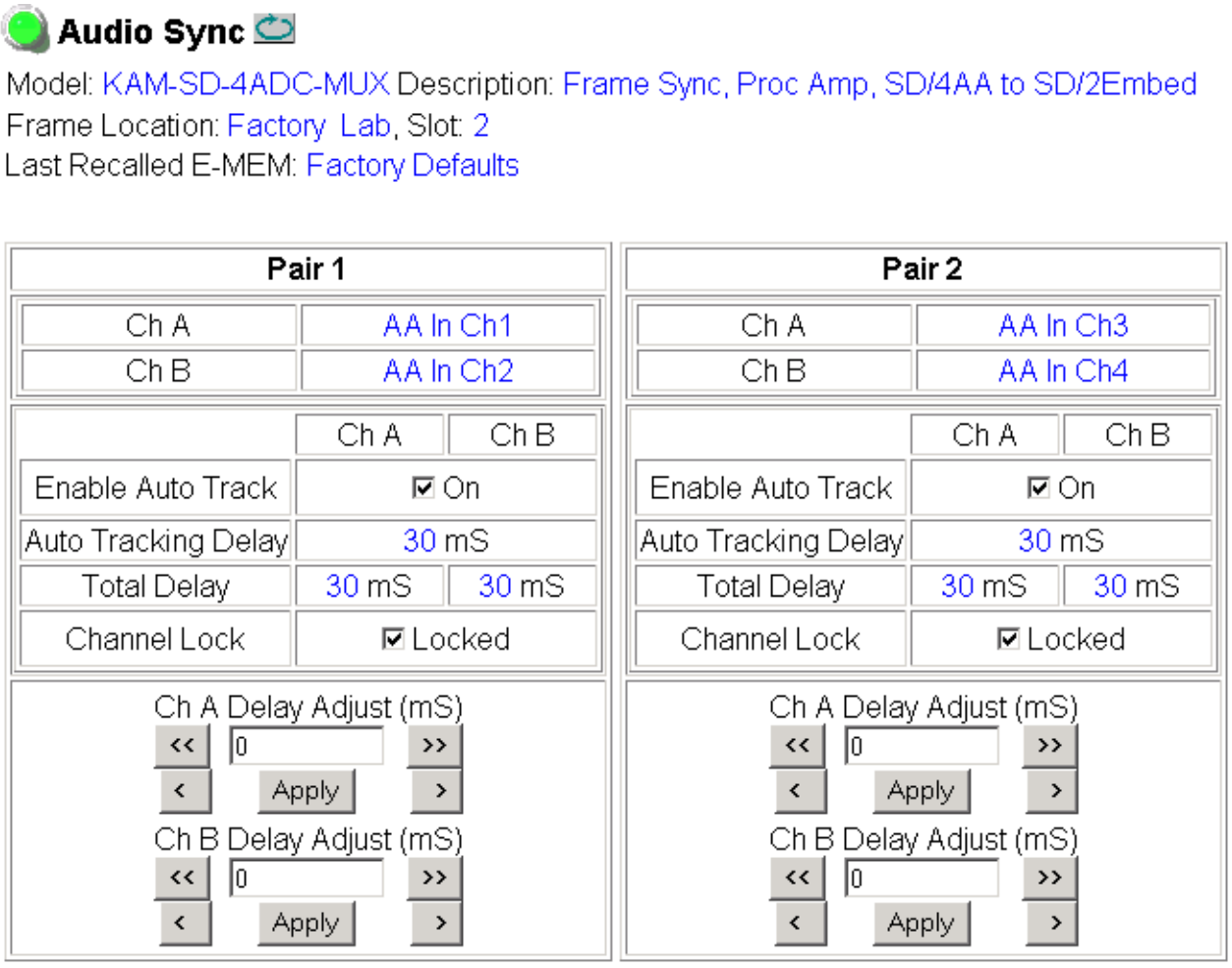
The total amount of delay is reported in the Total Delay read-only display for each channel.

Delay Adjustments

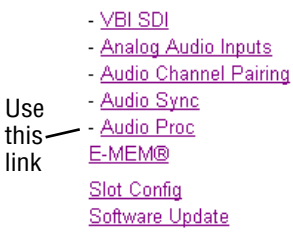
Each audio channel can be adjusted for delay separately or in pairs. Use the following adjustments for audio delay:

- To lock the two channels in a pair together, select the **Channel Lock** checkbox for Pair 1 or Pair 2.
- Adjust the delay for each channel with the Ch A Delay Adjust and Ch B Delay adjust controls for each pair. If the pair is locked, adjusting either control will set the delay to the same value for each channel in the pair.

Figure 35. Audio Synchronizer Web Page



Audio Processing Web Page



Use the Audio Processing web page (Figure 36) to adjust the following for each audio pair:

- Adjust audio signal gain for each individual channel or the two audio pairs,
- Lock gain settings for simultaneous channel A/channel B adjustment, and
- Select a processing option for each channel.

Figure 36. Audio Processing Web Page

Audio Proc

Model: KAM-SD-4ADC-MUX Description: Frame Sync, Proc Amp, SD/4AA to SD/2Embed
Frame Location: Factory Lab, Slot: 2
Last Recalled E-MEM: Factory Defaults

Pair 1		Pair 2	
Ch A	AA In Ch1	Ch A	AA In Ch3
Ch B	AA In Ch2	Ch B	AA In Ch4
Gain Settings	☐ Locked	Gain Settings	☐ Locked
Ch A Gain (dB) << 0.0 >> < Apply >		Ch A Gain (dB) << 0.0 >> < Apply >	
Ch B Gain (dB) << 0.0 >> < Apply >		Ch B Gain (dB) << 0.0 >> < Apply >	

	Ch A'	Ch B'
Presence	True	True
Clip	False	False
Processing	Pass	Pass

	Ch A'	Ch B'
Presence	True	True
Clip	False	False
Processing	Pass	Pass

Note: Presence = > -40 dBFS, Clip = > -0.5 dBFS

Back Functional View Next

Audio Gain

Each audio channel can be adjusted for gain separately or in pairs. Use the following adjustments for audio gain:

- To lock the two channels in a pair together, select the Gain Settings **Locked** checkbox for Pair 1 and/or Pair 2.
- Adjust the gain (-40 to +6 dB) for each channel with the Ch A Gain Adjust and Ch B Gain adjust controls for each pair. If the pair is locked, adjusting either control will set the gain to the same value for each channel in the pair.

Note After gain has been adjusted, a straight quote mark (') will be added to Ch A' and Ch B' to indicate the status of the channels after gain.

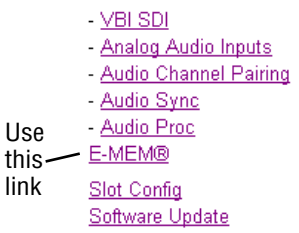
Output Processing

Set the output processing for each channel with the Processing pulldown to one of the following:

- Pass
- Invert
- A+B
- A-B
- -(A+B)
- 1 kHz (test tone)
- 400 Hz (test tone)
- Silence

The Presence and Clipping status of each audio channel is reported as **True** or **False** in the read-only displays. If the audio is > -40 dBFS, it will be reported as **True**. If clipping is < 0.5 dBFS, it will be reported as **False** as shown in Figure 36 on page 55.

E-MEM Configuration Web Page



The E-MEM page provides local operations for learning and recalling configurations into five E-MEM registers. File operations are also available for saving or loading the learned E-MEM files to and from a hard disk or other accessible media.

Factory default settings for all channels can be recalled by selecting the **Recall factory settings** button. To return the module to the factory signal names (such as the signal inputs), select the **Recall factory names** button.

There are two E-MEM view selections: **Standard** and **Advanced**.

In Standard view (Figure 37), any one of five learned E-MEMs can be recalled by selecting the corresponding **Recall** button in the Local Operations window. This will place the configuration for the entire module into that E-MEM into the KAM-SD-4ADC-MUX. This change will occur immediately upon recall. The name of the last recalled E-MEM will appear in the top header of each web page for the module.

To learn an E-MEM select the **Advanced** button in the View Selection section. This will open the Advanced view (Figure 38 on page 58).

Figure 37. E-MEM Web Page (Standard View)

The Advanced View (Figure 38) includes a File Operations section to learn a configuration into E-MEM (**Learn**), save a file to a disk location (**Save to…**) or load a file from a disk location (**Load from…**).

To learn an E-MEM:

1. Open the Advanced view.
2. When the configuration is complete for all channels on the module, type a descriptive name for the configuration into an unused E-MEM register (or overwrite an existing one).
3. Learn the E-MEM to memory by selecting the corresponding **Learn** button. All channel configurations are learned at once and stored in the same register. This register is now learned and ready for recall.

Figure 38. E-MEM Web Page (Advanced View)

Model: KAM-SD-4ADC-MUX Description: Frame Sync, Proc Amp, SD/4AA to SD/2Embed
Frame Location: Factory Lab, Slot: 2
Last Recalled E-MEM: Factory Defaults

View Selection: ○ Standard ◉ Advanced

E-MEM®

Local Operations				File Operations	
Recall	E-MEM 1:	Studio 1	Learn	Save to...	Load from...
Recall	E-MEM 2:		Learn	Save to...	Load from...
Recall	E-MEM 3:		Learn	Save to...	Load from...
Recall	E-MEM 4:		Learn	Save to...	Load from...
Recall	E-MEM 5:		Learn	Save to...	Load from...

Recall Restore factory settings

Recall Restore factory names

File Operations

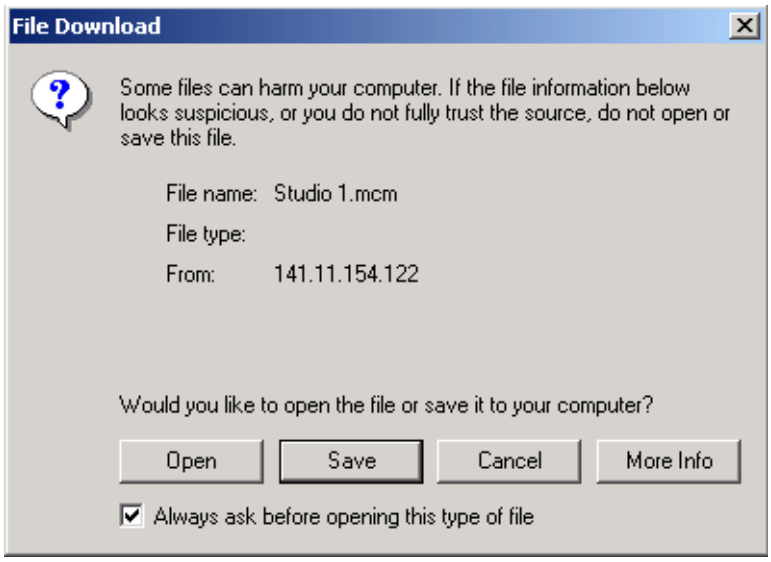
Save File

File operations allow you to save learned configurations to a computer hard drive or other accessible media for later recall to the onboard E-MEM registers of any Kameleon module in your system.

To save to a file, first make sure you have learned the configuration, then press the **Save To…** button.

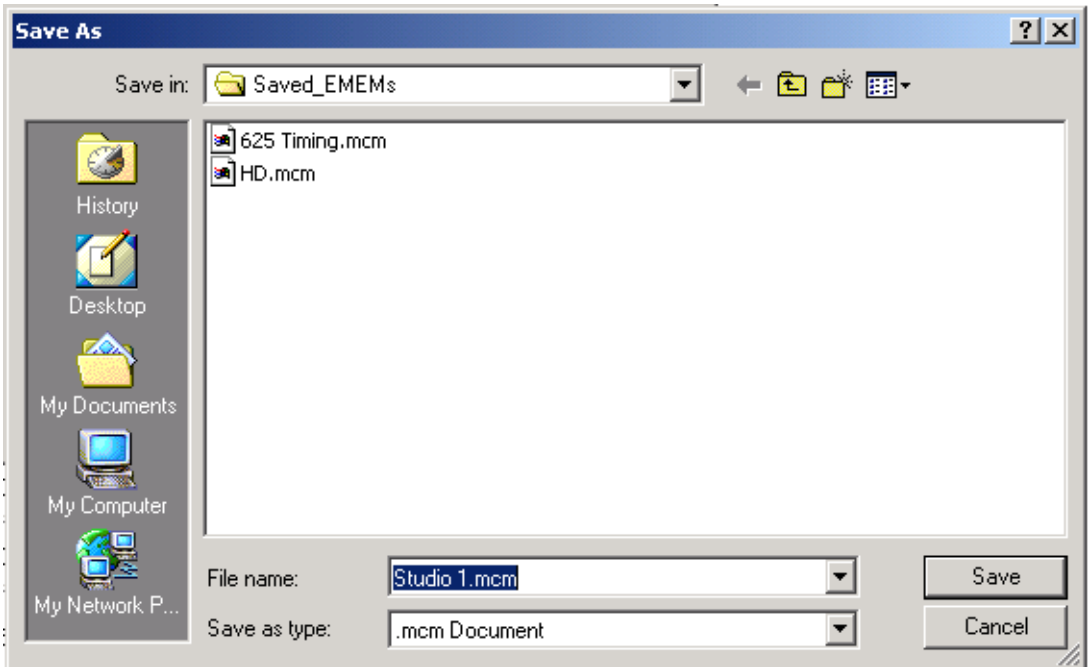
This will bring up a File Download screen similar to Figure 39. Select **Save**.

Figure 39. File Download Screen



This will bring up the Save As screen as shown in Figure 40. Locate or create a directory for storing the E-MEMs and select **Save**. This E-MEM register is now saved to the selected location and may be recalled as described below.

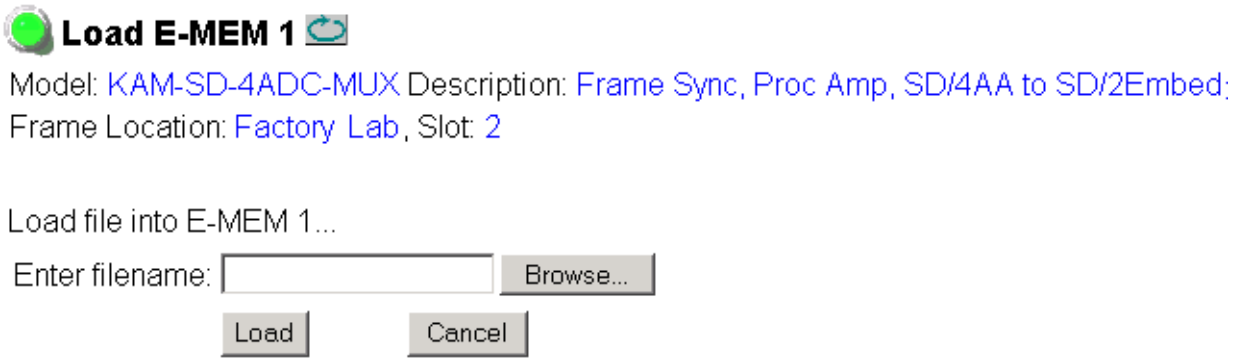
Figure 40. Save As Screen



Load File

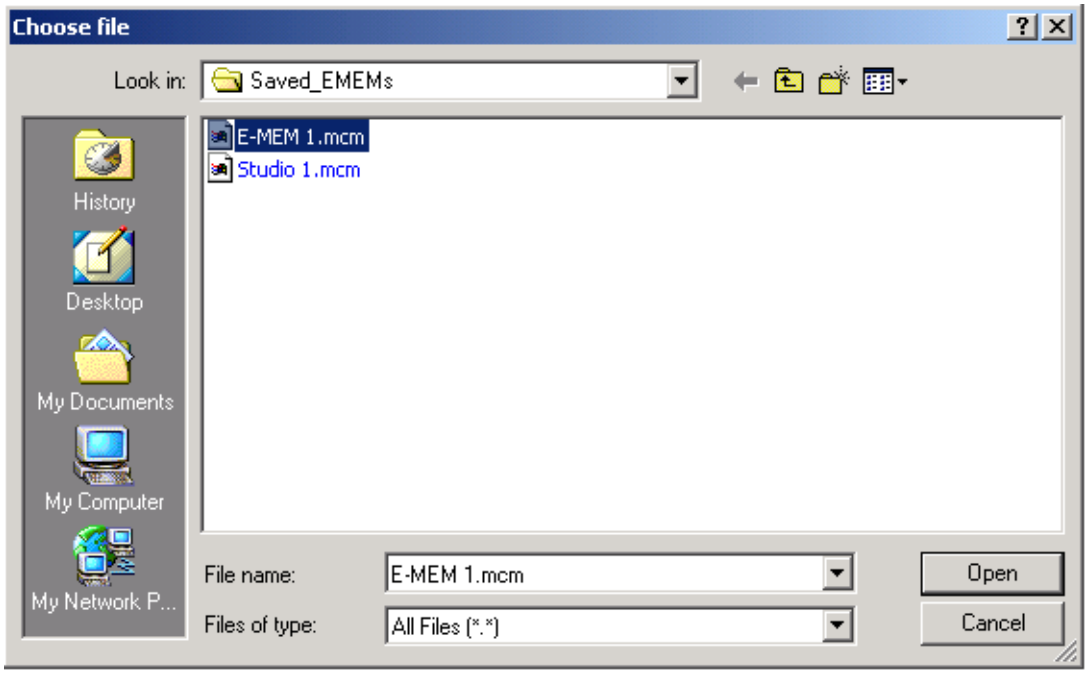
A file may be loaded from a saved directory to a register on the E-MEM web page by selecting the **Load From...** button in the associated E-MEM register in the Advanced view. This will bring up the Load E-MEM web page (Figure 41).

Figure 41. Load E-MEM Web Page



Enter a path and filename or use the **Browse** button to locate your saved E-MEM files. Browse to the Choose File screen (Figure 42), select the E-MEM file to download and select **Open**.

Figure 42. Choose File Screen



This will place the path and filename in the Load E-MEM screen (Figure 41 on page 60). If this is the correct file, select **Load**. Continue to load files or select **Cancel** to return to the main E-MEM web page. Loaded files will now be entered in the associated E-MEM registers.

Select the associated **Recall** button for each E-MEM register to load the configuration to the module.

Slot Configuration

Use the Slot Config web page (Figure 43 on page 63) to:

- Assign an appropriate name to the module slot,
- Assign an Asset Tag identification,
- Enable/disable the **Locate Module** function,
- Save module configuration and enable slot memory,
- Check SNMP related 2000NET module switch settings, and
- Enable/disable SNMP reporting for the specific Kameleon slot.

Slot Identification

You may identify the module by typing a specific name in the **Name** field. The assigned name is stored on the 2000NET module and travels with the 2000NET module if it is moved to another frame. Select **Default** to enter the factory default module name.

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

Locate Module

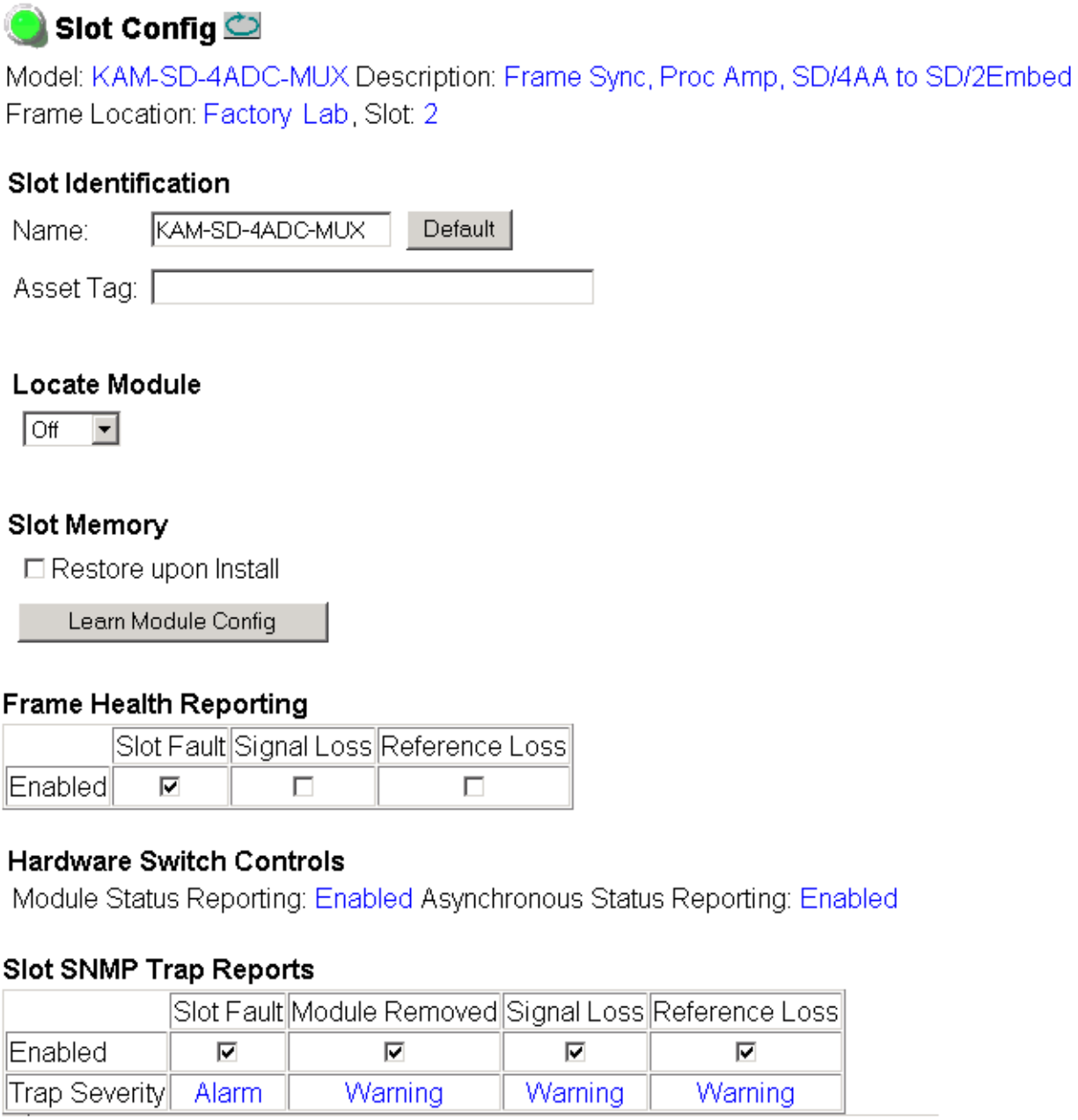
When enabled by selecting the **Flash** pulldown, the **Locate Module** function flashes the yellow COMM and CONF LEDs on the front of the module to make it easy to locate in the frame (see *Operation Indicator LEDs* on page 15).

Slot Memory

The slot configuration for each media module is automatically saved periodically to the 2000NET 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 2000NET module. If the 2000NET 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 2000NET module will be downloaded to the new module. The box must be checked before the current module with the saved configuration is removed.

Figure 43. Slot Configuration Web Page



Frame Heath Reporting

The reporting of Slot Fault, Signal Loss, and Reference Loss can be enabled or disabled to the Frame Health connector on the rear of the Kameleon frame by selecting or deselecting the corresponding checkbox.

Hardware Switch Controls

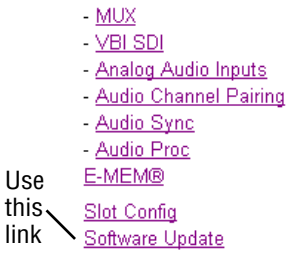
This section is a read-only status report of 2000NET module switch settings for Module Status Reporting and Asynchronous Status Reporting. These functions must be enabled for the following Slot SNMP Trap Reports to function.

Slot SNMP Trap Reports

This section is displayed only when the SNMP Agent software has been installed on the 2000NET module (refer to the *2000NET Instruction Manua*l for installation instructions). Slot SNMP traps can be enabled only when the hardware switches for Module Fault reporting and Asynchronous Status reporting are enabled on the 2000NET 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 2000NET configuration. Trap severity is read-only hard-coded information that is interpreted and responded to by the SNMP Manager software configuration.

Software Update Web Page

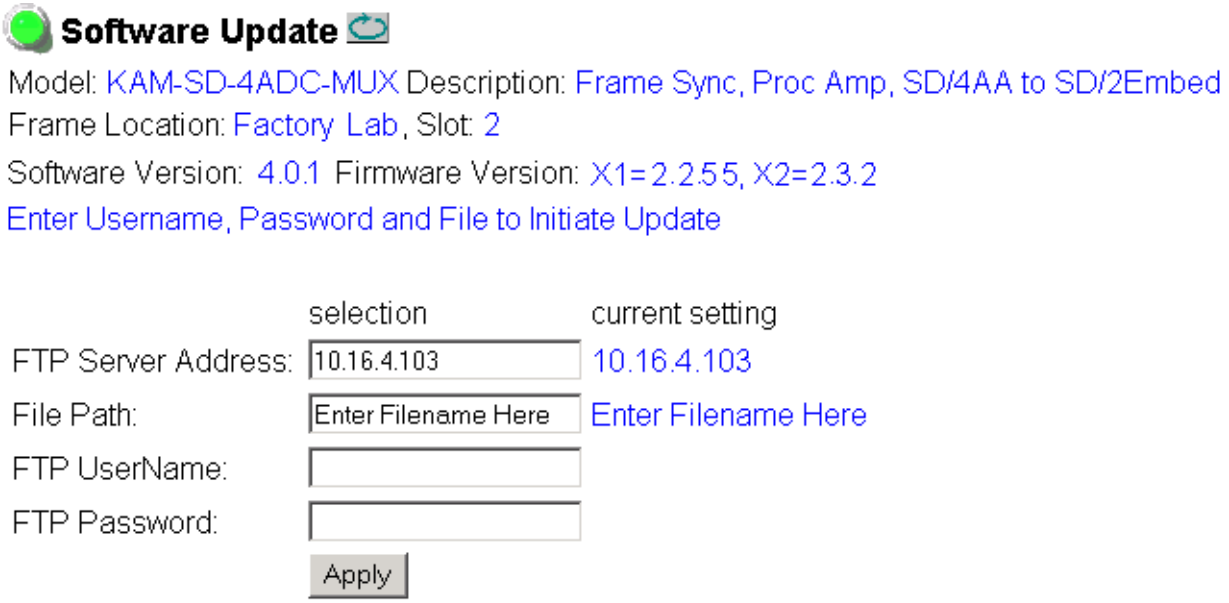


The Software Update web page (Figure 44) allows you to download new software versions for the module using the FTP server method described in the 2000NET Instruction Manual available on-line.

Software may also be updated using the NetConfig Networking Application PC option available with Modular and other Grass Valley products as described in the documentation that accompanies the option.

Refer to the latest module Release Notes for complete details on how to obtain and install the latest software for this module.

Figure 44. Software Update Web Page



Specifications

Note Specifications are subject to change without notice

Table 6. SDI Input/Output Specifications

Parameter	Value
SDI Input	
Signal type	Serial digital video conforming to SMPTE259M 10-bit 4:2:2component digital signal
Input impedance	75 Ω
Connector type	75 Ω BNC on rear module
Input return loss	>15 dB to 270 MHz
Common mode rejection ratio	2 V p-p to 60 Hz
Equalization	Up to 250 meters of Belden 1694A
SDI Output	
Number of outputs	1
Signal type	Serial digital video conforming to SMPTE259M 10-bit 4:2:2 component digital signal
Signal level	800 mV ±10%
Output impedance	75 Ω
Connector type	75 Ω BNC on rear module
DC offset	< 0.5 V when terminated into 75 Ω
Output return loss	>15 dB up to 270 MHz
Jitter	Conforms to SMPTE17.12/002 <400 ps above 1 KHz
Rise/fall time	700 – 900 ps (20 – 80% amplitude)
SDI I/O Control Parameters	
Vertical blanking processing	Line by line blank

Table 7. Audio ADC Specifications

Parameter	Value
Analog Input (ADC)	
Number of inputs	4 per submodule
Level for full-scale output	-2 dB to +28 dBu, adjustable in 0.1 dBu steps
Input impedance	> 22 kΩ
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	Multi-pin (receptacle)
Analog Audio Input Conversion Performance	
Signal-to-noise ratio	> 102 dB, 20 Hz to 20 kHz > 105 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

Table 7. Audio ADC Specifications - (continued)

Parameter	Value
Intermodulation distortion	< -100 dB CCIF two-tone test, 19 & 20 kHz tones
Interchannel gain mismatch	0.1 dB
Frequency response	± 0.1 dB, relative to 1 kHz, 20 Hz to 20 kHz
DC offset	± 1 mV
Emphasis	Not selectable
Output resolution	24 bits
Effective number of bits	18
Static withstand	5 kV (330 Ω, 150 pF) any input or output

Table 8. Frame Sync/Timing Specifications

Parameter	Value
Video Frame Sync Timing Control Parameters	
Delay adjustment (main)	0 to 1 frame in 37 ns steps
Additional delay, SDI out	0 to 151 µs in 37 ns steps

Table 9. Main Video Processing Specifications

Parameter	Value
Main Video Frame Processing Control Parameters	
Y gain	±50% in 0.4% steps, 100% default
Y offset	±3.5% of 100% white in 0.11% steps, 0% default
B-Y gain	±50% in 0.4% steps, 100% default
B-Y offset	±3.5% of 100% white in 0.11% steps, 0% default
R-Y gain	±50% in 0.4% steps, 100% default
R-Y offset	±3.5% of 100% white in 0.11% steps, 0% default
Color bars	On/Off

Table 10. Multiplexing Specifications

Parameter	Value
MUX Performance	
Standard	SMPTE 272M A, C: Synchronous audio, 48K, 20/24 bits/sample Compatible with buffer sizes down to 48 samples
Pass through	Up to 4 groups (frame sync must be in delay mode)
Insert	1 group
Bits/sample on inserted audio	20/24 bits, selectable
Buffer size	170 samples
MUX delay	1.77 ms
Distribution	Evenly distributed, minimum of 3 samples per line, maximum of 4 samples per line except near switching lines Switch line and nearby lines (lines 4, 5, 6, 317, 318, 319 for 625; 8, 9, 10, 270, 271, 272 for 525) have 0 samples

Table 11. Audio Processing Specifications

Parameter	Value
Audio Processing	
Number of channels supported	4
Fixed Delay	0 – 5.2 sec in 20 ms steps, individual setting for each channel
Delay Tracking	Delay can be set to automatically track delay through video frame sync with fixed offset
Gain	+6 to -40dB in 0.1dB steps, individual setting for each channel.
Other processing	Selectable: Invert; L + R; L-R; -(L-R); 1 kHz; 400 Hz; Silence Individual setting for each channel.
Re-pairing	Complete flexibility to swap or recombine any input channel with any other

Table 12. Electrical Length Specifications

Parameter	Value
Electrical Length	
SDI In to SDI Out	1 line + 10 µs
AES/EBU to SDI Out (MUX)	3.8 ms @ 48 kHz

Table 13. Environmental/Power Specifications

Parameter	Value
Environmental	
Frame temperature range	0 to 40 degrees C ambient
Operating humidity range	0 to 90% non-condensing
Non-operating temperature	-10 to +70 degrees C
Mechanical	
Frame type	2000T1DNG Kameleon Frame or 2000T3NG Kameleon Frame
Power	
Consumption	13 Watts typical

Service

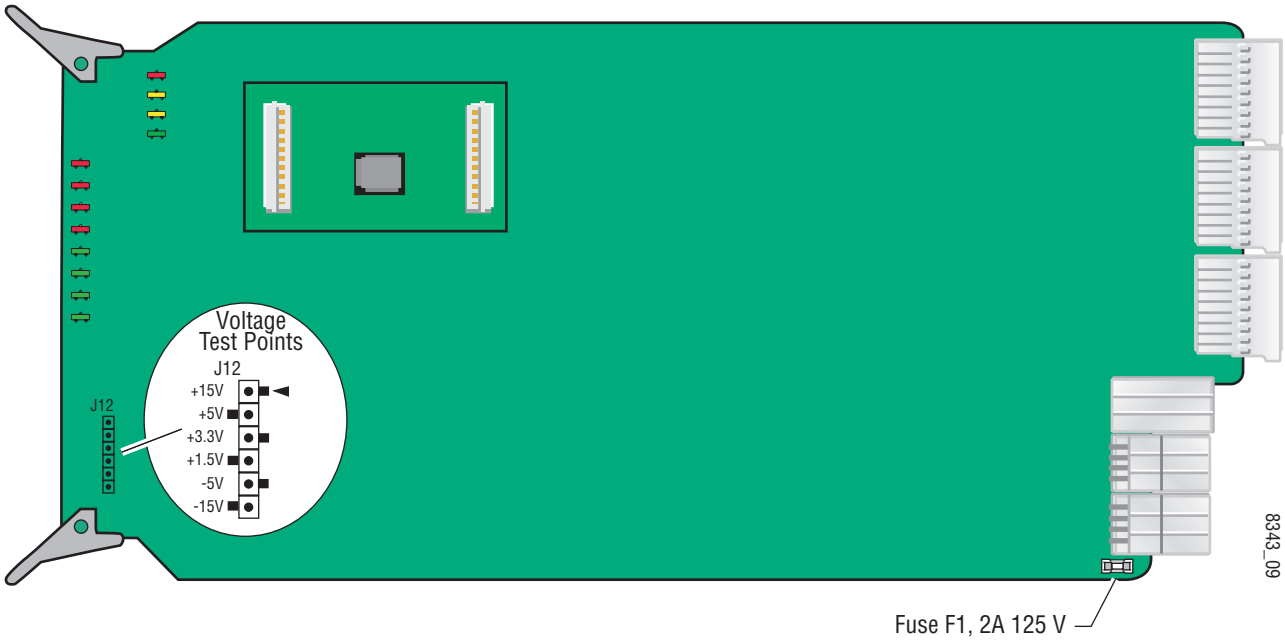
The Kameleon modules make extensive use of surface-mount technology and programmed parts to achieve compact size and adherence to demanding technical specifications. Circuit modules should not be serviced in the field except to check and replace fuses.

Troubleshooting

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

- Check frame and module power at the front edge testpoints (Figure 45).
- If power is not present, check the fuse on the +24 V input (Figure 45).
- Check for presence and quality of input signals.
- Verify that source equipment is operating correctly.
- Check cable connections.

Figure 45. Location of Module Fuse and Voltage Testpoints



Refer to Figure 7 on page 14 for the location of PWR LED and Table 2 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 Support Information number.

Index

Numerics

A

B

C

D

E

F

G

H

I

K

L

M

N

O

P

R

S

T

V

W

Y