7890AESM-8-IP
Eight Channel AES Encapsulating IP Gateway
User Manual

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Version 1.0, April 2015

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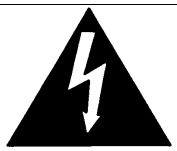
IMPORTANT SAFETY INSTRUCTIONS

	The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated “Dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.
	The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (Servicing) instructions in the literature accompanying the product.

- Read these instructions
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer’s instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

WARNING
TO REDUCE THE RISK OF FIRE OR ELECTRIC – SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE

WARNING
DO NOT EXPOSE THIS EQUIPMENT TO DRIPPING OR SPLASHING AND ENSURE THAT NO OBJECTS FILLED WITH LIQUIDS ARE PLACED ON THE EQUIPMENT

WARNING
TO COMPLETELY DISCONNECT THIS EQUIPMENT FROM THE AC MAINS, DISCONNECT THE POWER SUPPLY CORD PLUG FROM THE AC RECEPTACLE

WARNING
THE MAINS PLUG OF THE POWER SUPPLY CORD SHALL REMAIN READILY OPERABLE

INFORMATION TO USERS IN EUROPE

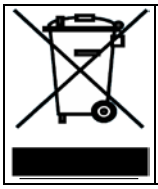
NOTE

CISPR 22 CLASS A DIGITAL DEVICE OR PERIPHERAL

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to the European Union EMC directive. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE

EN60065	Safety
EN55103-1: 1996	Emission
EN55103-2: 1996	Immunity



EN504192 2005
Waste electrical products should not be disposed of with household waste.
Contact your Local Authority for recycling advice

INFORMATION TO USERS IN THE U.S.A.

NOTE

FCC CLASS A DIGITAL DEVICE OR PERIPHERAL

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING

Changes or Modifications not expressly approved by Evertz Microsystems Ltd. could void the user's authority to operate the equipment.

Use of unshielded plugs or cables may cause radiation interference. Properly shielded interface cables with the shield connected to the chassis ground of the device must be used.

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Figures

REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First Release	April 2015

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1. OVERVIEW

The 7890AESM-8-IP is part of the Evertz family of gateway products, which unlock the potential of IP networks for audio transport. The proliferation of carrier-grade IP networks and their associated capacity, flexibility and cost make them an attractive solution for modern audio/video transport networks. Evertz gateway products facilitate the bridge between audio and IP worlds, providing the extensive capability, control & monitoring, resilience and low latency demanded by content creators and transport service providers.

The 7890AESM-8-IP provides eight input ports that transport balanced and unbalanced AES signals over dual Gigabit Ethernet trunks. Forward Error Correction (FEC) can be added to combat packet loss for continuity of audio service. The 7890AESM-8-IP also facilitates connection to redundant IP trunks and provides automatic switching between a pair of IP links.

Features & Benefits

- Can add Forward Error Correction to mitigate packet loss
- Facilitates redundant Ethernet Links for maximum resilience on critical signals
- Eight AES audio inputs (balanced or unbalanced)
- SMPTE2022 FEC
- SFP Gig Ethernet trunk ports allow the use of copper and/or optical connections
- Low jitter performance
- Fully hot-swappable from the front of the frame without de-cabling
- Comprehensive signal and card status monitoring via four digit card edge display or remotely through SNMP and VistaLINK®
- VistaLINK® capability is available when modules are used with the 7700FC and 3700FC VistaLINK® Frame Controller module in slot 1 of the frame

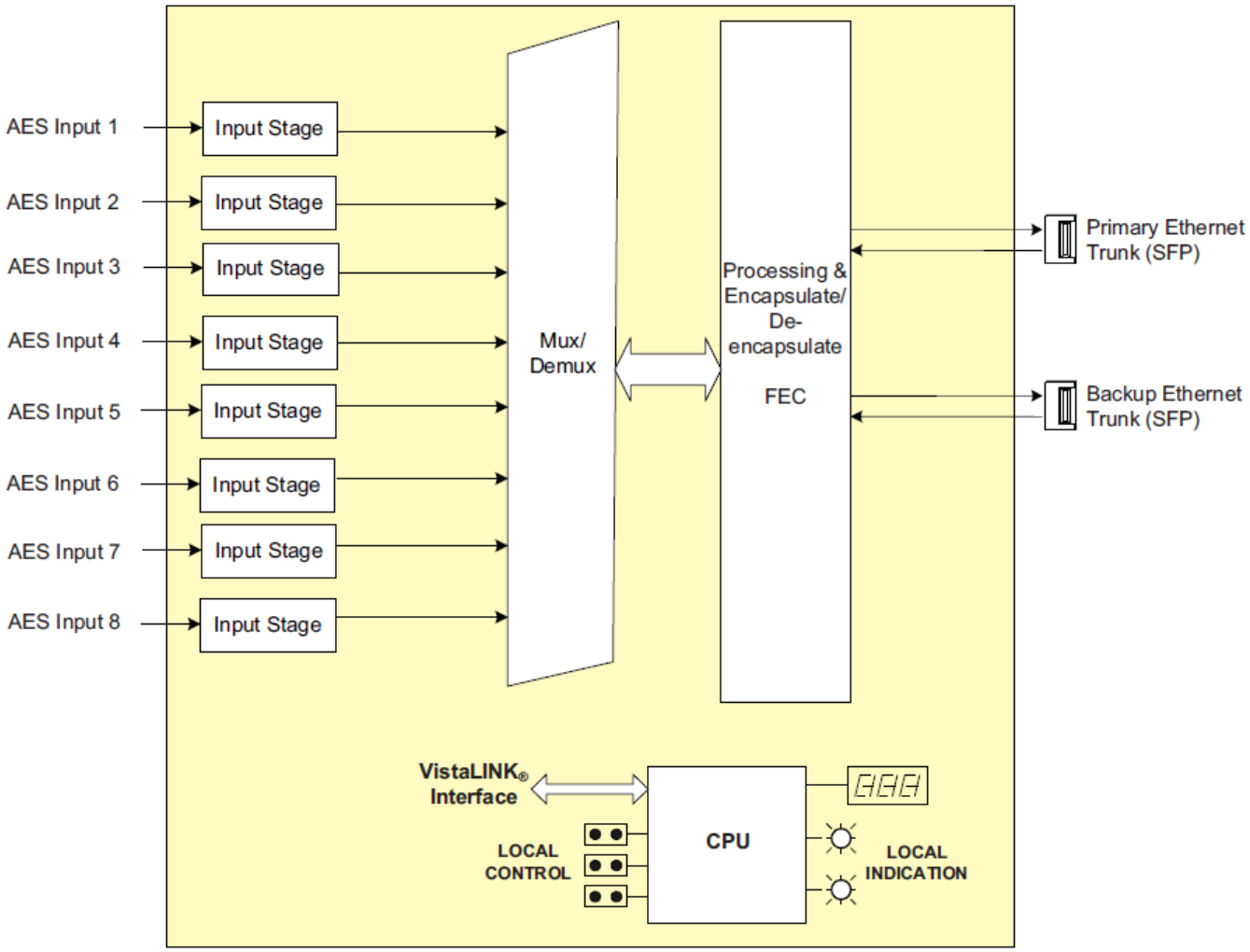


Figure 1-1: 7890AESM-8-IP Block Diagram

2. GETTING STARTED

2.1. REAR PANEL DESCRIPTION

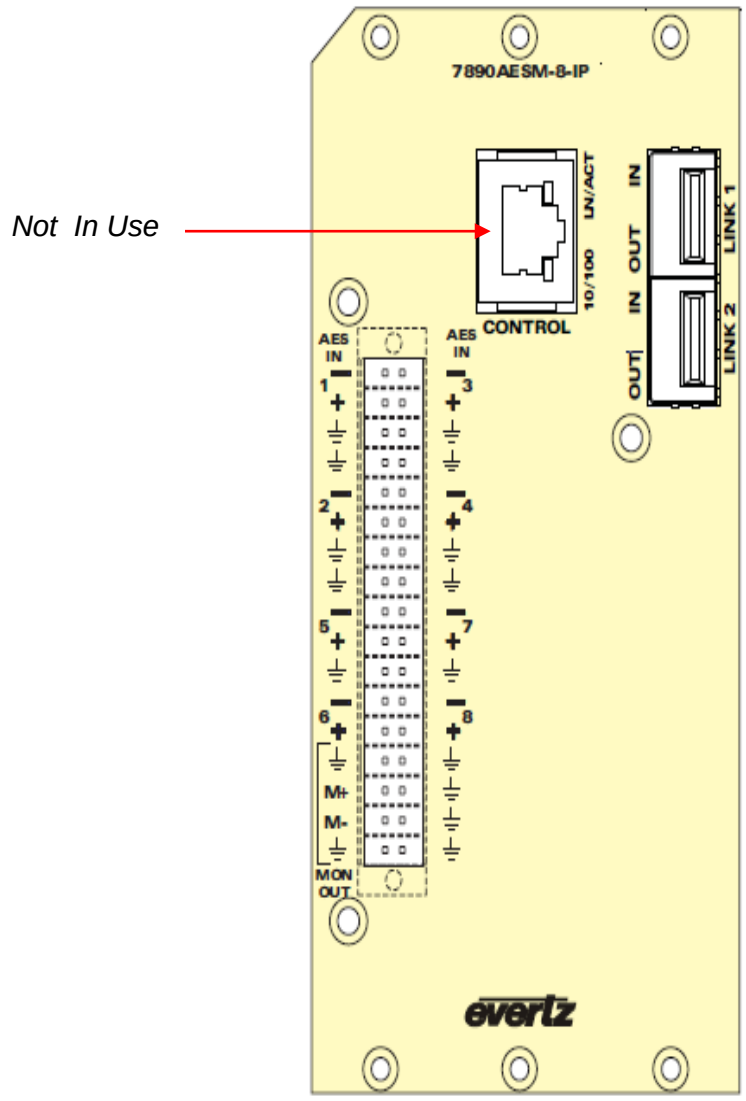


Figure 2-1: 7890AESM-8-IP Rear Plate

AES Video IN: 8 inputs on terminal block connectors which support AES3-1992, Balanced or Unbalanced (selectable) Dolby-E® compatible

Link 1 & 2: 2 x SFP input/output which support 802.3ab (1000baseTX) standard

Control: Not in use

2.2. HARDWARE INSTALLATION

To successfully install the 7890AESM-8-IP, you will require the following:

1. 7800FR frame or a 3700FR frame.
2. 7800FC frame controller.
3. VLPro Client connected to the VLPro Server.

Before handling the card it is important to minimize the potential effects of static electricity. It is therefore recommended that an ESD strap be worn.

Locate on the chassis 3 adjacent vacant slots. Unpack the 7890AESM-8-IP and separate the rear panel from the main card. Remove the blank panels on the rear of the frame chassis. Insert the rear panel into the back of the chassis and secure using the screws provided. Slide in module on the slot runners that correspond to the location of the rear plate and lock card ejector.

2.3. 7790AESM-8-IP STATUS LED AND CONTROLS

The 7890AESM-8-IP has 16 LED Status indicators and a 4 digit alphanumeric display on the front card edge to show operational status of the card at a glance. The card edge pushbutton and toggle switch are used to select various displays on the alphanumeric display. Figure 2-2 shows the locations of the indicators, pushbutton and toggle switch. ***Note: C sub-board is not included in picture below***.

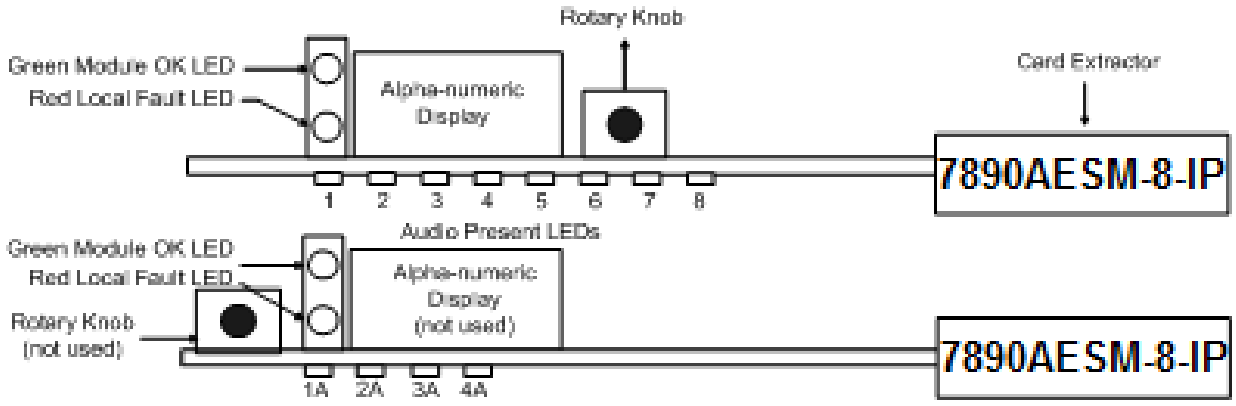


Figure 2-2: Location of Status Indicators and Controls

2.3.1. Status Indicator LEDs

LOCAL FAULT: On the 7890AESM-8-IP A main board, this Red LED will be ON if a card fault exists, or if a local input power fault exists (i.e.: a blown fuse).

On the 7890AESM-8-IP B sub-board this Red LED will be ON if a local input power fault exists (i.e.: a blown fuse).

On the 7890AESM-8-IP C sub-board this Red LED will be ON if a local input power fault exists (i.e.: a blown fuse).

The LOCAL FAULT indications can also be reported to the frame through the FRAME STATUS jumper.

MODULE OK: This Green LED indicates good module health on the A board and C board. On the B board, it will be ON when a valid audio input signal is present

On the 7890AESM-8-IP, there are eight small LEDs on the front of the board that indicate the presence of audio signals.

AUDIO 1 STATUS LED:	**GREEN**	Valid signal output. No errors.
	RED	Valid signal output. Errors detected.
	OFF	No valid output detected.

AUDIO 2-8 STATUS LEDs function similar to AUDIO 1 STATUS LED.

On the 7890AESM-8-IP, there are also four small LEDs on the front of the main board (bottom board) that indicate the presence of audio signals.

IP Trunk STATUS LED:	**GREEN**	Valid signal output. No errors.
	RED	Valid signal output. Errors detected.
	OFF	No valid output detected.

LED 1:

GREEN:	IP Trunk Input 1 Present
RED:	IP Trunk Input 1 Error
YELLOW:	IP Trunk Input 1 Overbandwidth
OFF:	IP Trunk Input 1 Loss

LED 2:

GREEN:	IP Trunk Input 2 Present
RED:	IP Trunk Input 2 Error
YELLOW:	IP Trunk Input 2 Overbandwidth
OFF:	IP Trunk Input 2 Loss

LED 3:

GREEN:	IP Trunk Output 1 Present
RED:	IP Trunk Output 1 Error
YELLOW:	IP Trunk Output 1 Overbandwidth

OFF: IP Trunk Output 1 Loss of Link

LED 4:

GREEN: IP Trunk Output 2 Present
RED: IP Trunk Output 2 Error
YELLOW: IP Trunk Output 2 Overbandwidth
OFF: IP Trunk Output 2 Loss of Link

2.3.2. 7890AESM-8-IP CTRL – (Control) MENU STRUCTURE

LEVEL 1	LEVEL 2	LEVEL 3
MON	CHNL	CH 1..8
	ENAB	YES NO
	BAL	BALA UBAL
DISP	VERT HORZ	

MON Monitoring port control. Here the input audio channel can be routed to the monitor output (CHNL). This port can be disabled (ENAB) as well as the characteristics of the audio signal can be selected (BAL).

DISP Changes the orientation of the display. Vertical (VERT) or Horizontal (HORZ).

2.3.3. 7890AESM-8-IP STAT – (Status) MENU STRUCTURE

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
AES	PRES	CH1..8	YES NO
	RATE	CH1..8	NA 44k (44.1) 48k 32k
VER	x.xx build x		

AES Allows access for AES signal monitoring parameters such as signal presence (PRES) and AES audio sampling rate (RATE).

VER Displays the version information.

3. TECHNICAL SPECIFICATIONS

3.1. SERIAL VIDEO INPUTS OR OUTPUTS

3.2. AES AUDIO INPUTS

Standard:	AES3-1992, Balanced or Unbalanced (selectable), Dolby-E® compatible
Number of Inputs:	8
Connectors:	Multi pin terminal block
Input Sample Rate:	32 to 48kHz
Input Impedance:	Unbalanced: 75Ω
Input Return Loss:	> 15dB
Input Amplitude (max):	Unbalanced: 1.2V p-p
Balanced:	7V p-p
Input Amplitude (min):	Unbalanced: 320mV p-p
Balanced:	200mV p-p
Cable Equalization (max):	
	Unbalanced: 450m (≈1900ft) of Belden 1694A cable Balanced

3.3. ETHERNET TRUNK LINK

Connector:	2 SFP
Standard:	802.3ab (1000baseTX)
FEC encoding:	SMPTE2022-1
Encapsulation:	SMPTE2022-2

3.4. OPTICAL:

Number:	2 SFP ports
Connector:	Female Duplex LC/UPC (on SFP)
Electrical:	RJ45 (SFPTR-RJ45-SGM-GI)

3.5. TRANSMIT WAVELENGTHS

SFP1G-TR13:	1310nm
SFP1G-TR15S:	1550nm
SFP1G-TR15H:	1550nm
SFP1G-TRCxx:	1270-1610nm

3.6. RECEIVE WAVELENGTHS

1270-1610NM

3.7. OPTICAL OUTPUT POWER

SFP1G-TR13:	-9 to -3dBm
SFP1G-TR15S:	0 to +5dBm
SFP1G-TR15H:	0 to +5dBm
SFP1G-TRCxxH:	0 to +5dBm

3.8. RECEIVE SENSITIVITY

SFP1G-TR13:	-23 dBm
SFP1G-TR15S:	-24 dBm
SFP1G-TR15H:	-22 dBm
SFP1G-TRCxxH:	-31 dBm

3.9. ELECTRICAL

Voltage:	+12V DC
Power:	44W – 7890VB-8-IP

3.10. COMPLIANCE

Safety:	CSA Listed to CSA C22 No. 60065-03, UL 60065-03, IEC 60065-(2001-12) 7th Edition, Complies with CE Low Voltage Directive 93/68/EEC
EMI/RFI:	Complies with FCC with FCC regulations for class A devices, Complies with EU EMC directive 89/3 36/EEC

3.11. PHYSICAL

3700FR:	3 slots
7800FR:	3 slots

4. VISTALINK® PRO INTERFACE

4.1. CONNECTING TO VLPRO

This chapter assumes that the VistaLINK® PRO server and client are already configured for your network and you have basic knowledge of the VistaLINK® PRO interface. It also assumes that the user or network administrator has already added the appropriate jar file to the server, and both the client and server applications have been restarted.

NOTE: When using VistaLINK® PRO it is important to ensure that the most recent 7890AES-8-IP ".JAR" control file is installed. See Section 5.2 for details on how to upgrade the 7890AES-8-IP VistaLINK® PRO JAR file.

Open VistaLINK® PRO and click on the refresh tree icon. Expand the hardware tree by clicking on the "+" button under the Frame Controllers IP address that your module is installed in. Your card should appear as a newly listed device.

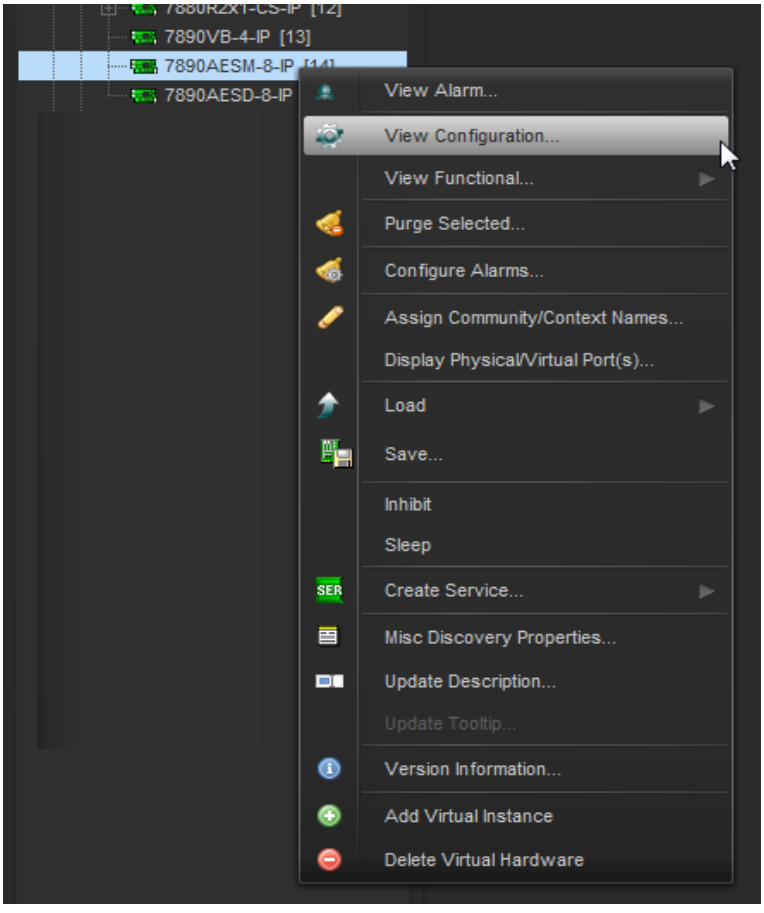


Figure 4-1: Viewing Configurations on 7890AES-8-IP Series Modules in VistaLINK® PRO

Please consult your network administrator if you continue to have problems connecting the card with VistaLINK® PRO, alternatively contact Evertz Microsystems Ltd. or your authorized reseller for technical support.

4.2. CARD INPUT

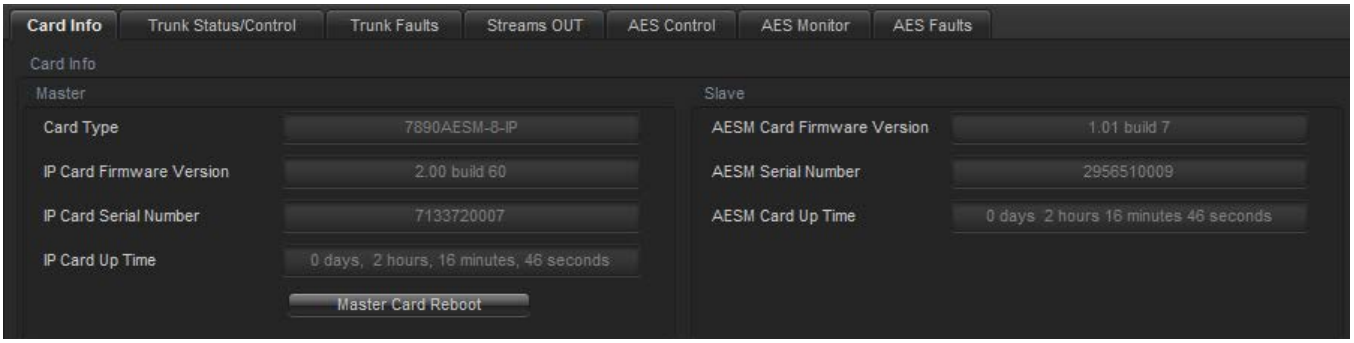


Figure 4-2: Card Information Screen

Card Info

Card Type: Name of the card displayed here.

IP Card Firmware Version: Firmware version of the IP Card.

AES Card Firmware Version: Firmware version of VB Card.

IP Card Serial Number: Display of the IP card's serial number.

AES Card Serial Number: Display of VB card's serial number.

IP Card Up Time: Current running time of the card since the last reboot

AESM Card Up Time: Current running time of the card since the last reboot

Note: This module is constructed of two parts. The 'AESM card' also known as the AES Encapsulator interface module, and the 'IP card' also known as the IP trunk interface module.

4.3. TRUNK STATUS/CONTROL

Figure 4-3: Trunk Status/Control Screen

IP Control

Host Multicast Filter: Allows for multiples transmissions at the same time. If this option is 'ON' then multicasting is permitted to defined hosts. By default this option is set to 'OFF'.

Buffer Non-FEC Streams: This control allows the user to either 'Enable' or 'Disable' a default buffer for streams without the Forward Error Correction (FEC) field inserted within the Ethernet packet. By default this control is 'Disabled'.

- **Global FEC Disable:** This control allows the user to disable Forward Error Checking on all streams
- **Reset IP Error Counters:** Allows the user to reset all the recently logged errors captured
- **Disable All Streams:** This control will disable all streams
- **Enable All Streams:** This control will enable all streams

Trunk (1 and 2) Configuration

Ethernet Physical Port Setup

IP Address: This control allows the user to define the IP address for the Trunk port.

Netmask Address: This control allows the user to define the Netmask/Subnet that the card is joined to.

Gateway Address: This control allows the user to define the Gateway/Router address, which will allow the card to communicate with devices on other networks.

Broadcast Address: This control allows the user to set the Broadcast address that will be used to transmit to all devices contained on the same Netmask/Subnet.

SFP Status

SFP Part Info: This parameter displays information regarding the SFP connector type.

SFP Receive Power: This parameter displays the current SFP receive power in dBm for an SFP connected to an Ethernet Trunk port.

SFP Transmit Wavelength: This parameter displays the transmitted Wavelength in Nanometres (nm) for an SFP connected to an Ethernet Trunk port.

SFP Optical Power Alarm Threshold: This control allows the user to set the alarm threshold for the SFP connected to an Ethernet Trunk port. Range for this value can be set from 0dBm to -30dBm.

Ethernet

Status: This parameter will display the Trunk Ethernet status as either in the 'UP' or 'DOWN' state.

Ethernet Rx Bitrate: This parameter displays the current bitrate that are being received on the Trunk Ethernet ports in kbps.

Ethernet TX Bitrate: This parameter displays the current bitrate that are being transmitted on the Trunk Ethernet ports in kbps.

Counter

Ethernet Tx Packet: This parameter displays the amount of Ethernet frames that have been transmitted from the Trunk Ethernet ports.

Ethernet Rx Packet: This parameter displays the amount of Ethernet frames that have been received on the Trunk Ethernet ports.

Ethernet Rx Host Packet: This parameter displays the amount of Ethernet packets which are received by the host from an originating source IP. This parameter is a metric for unicast IP streaming.

Ethernet Rx Unmatched Packet: This parameter displays the amount of Ethernet packets that are received which are unexpected/unmatched packets. Another metric of CRC error checking.

Ethernet Rx Error Packet: This parameter displays the amount of Ethernet bit errors that are received.

Ethernet Errored Seconds: This parameter displays the amount of errored seconds. An errored second is an interval of a second during which any error whatsoever has occurred.

4.4. TRUNK FAULTS

Figure 4-4: Trunk Fault Monitor

This control allows the user to enable or disable the following Trunk Faults on either Trunk 1 and Trunk 2:

- Ethernet Status
- Host Bandwidth Error
- SFP Laser Status
- SFP Optical Power Warning

If the Fault status indicator is solid green, this means the control monitor is enabled and up and running.

4.5. STREAMS OUT

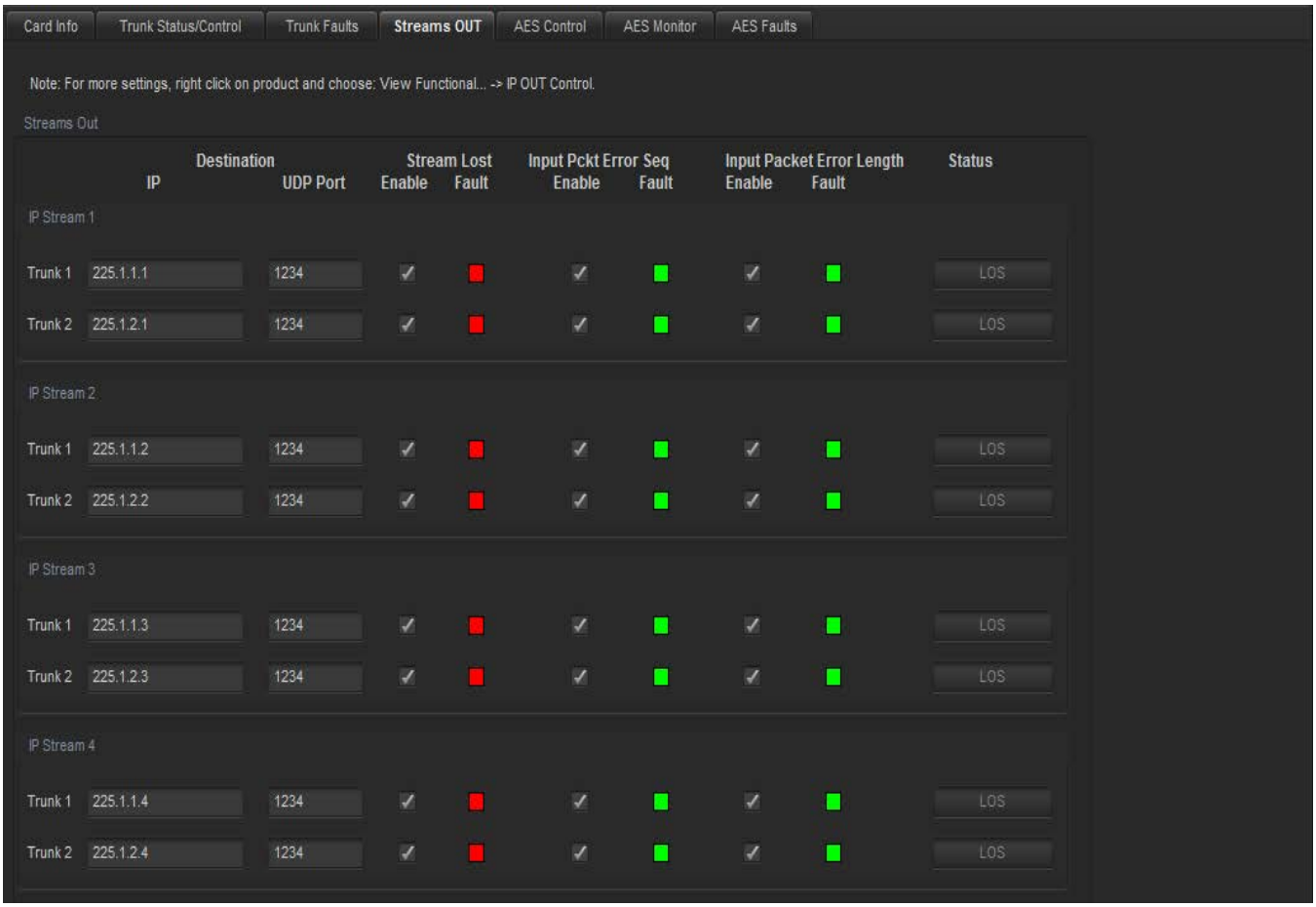
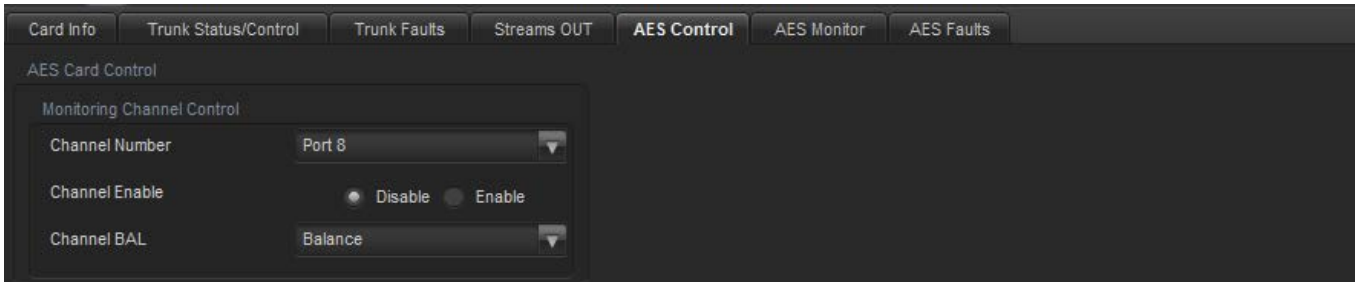


Figure 4-5: Streams OUT Screen

Streams Out

IP Output Streams: This allows the user to route the input Ports coming in and give it a multicast address for an output. It also shows status of the streams.

4.6. AES CONTROL



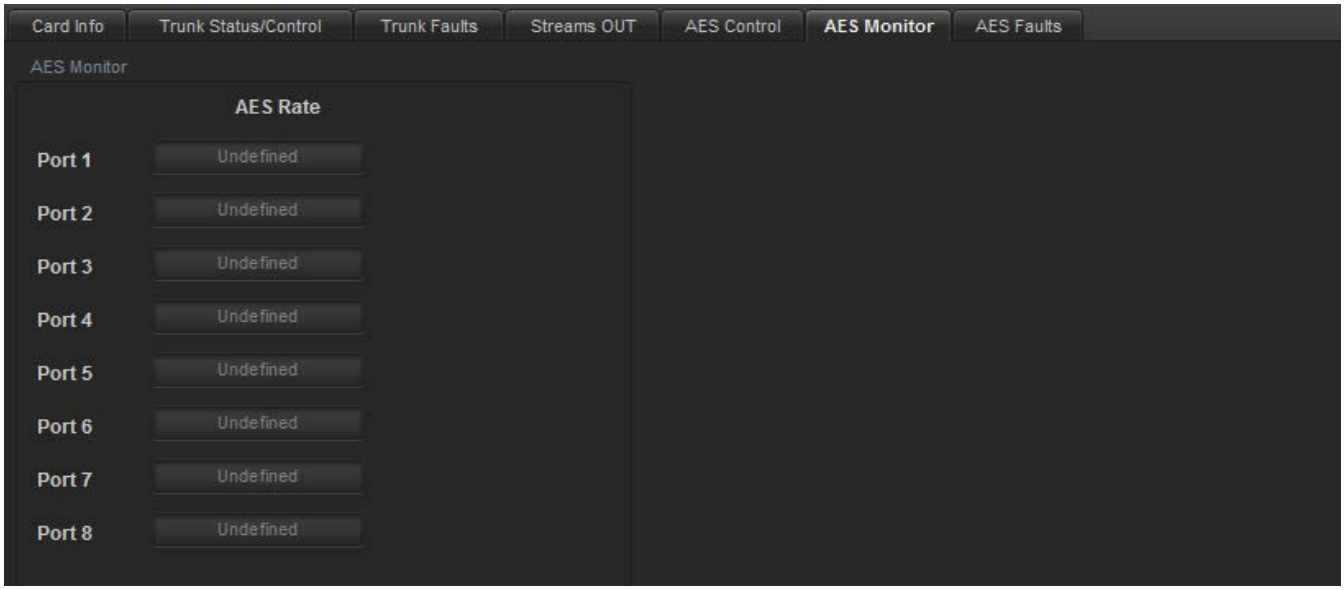
AES Card Control
Monitoring Channel Control

Channel Number: Selects the channel number that will be outputted to the monitoring port

Channel Enable: Enable or disable channel monitoring for the monitoring port

Channel BAL: Sets the termination for the audio port (Unbalanced or Balanced)

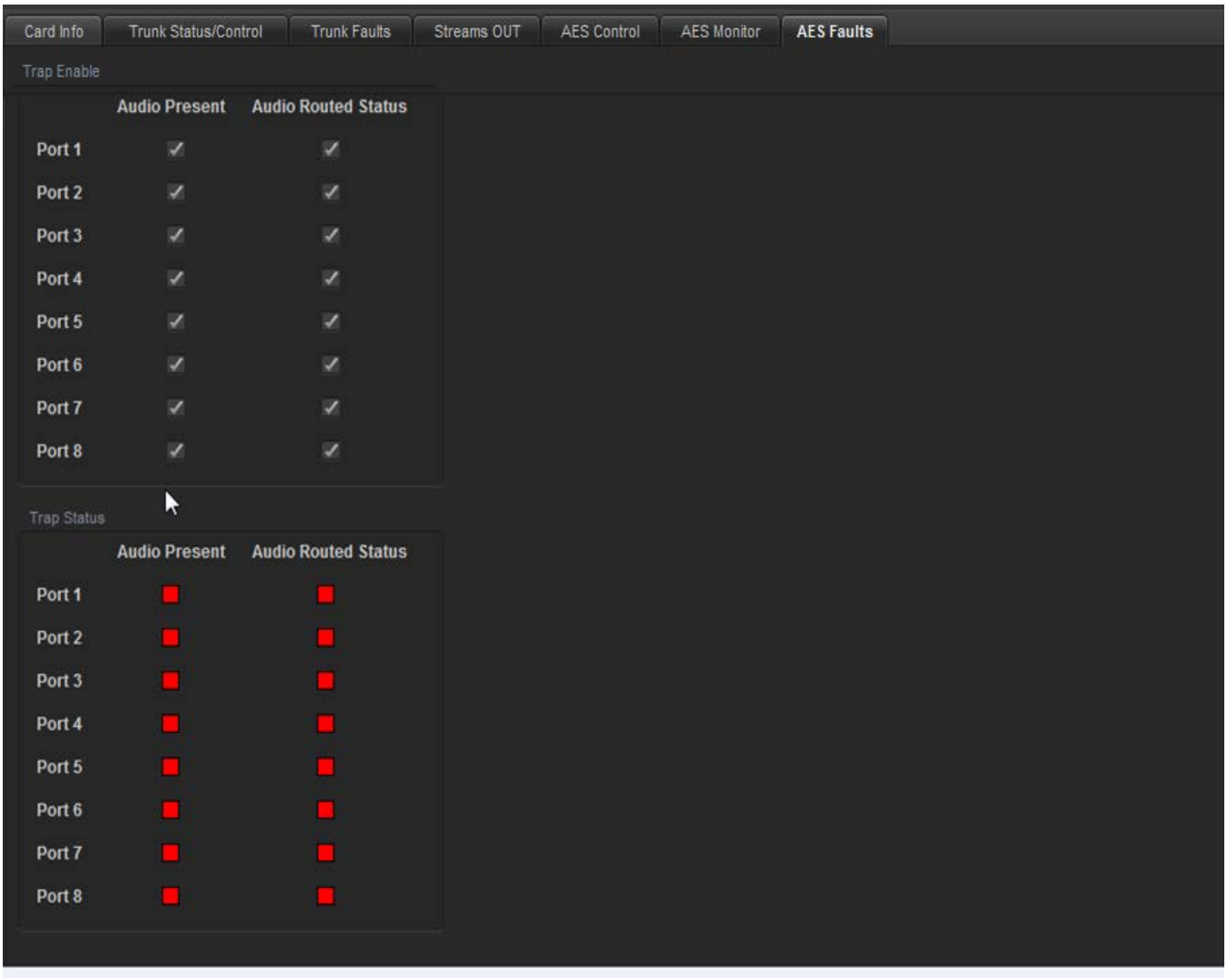
4.7. AES MONITOR



AES Monitor (Port 1 to 8)

AES Rate: Sampling rate detection for the corresponding source input. 48k, 44.1k and 32k

4.8. AES FAULTS



Trap Enable

Audio Present: Checks for presence of AES audio on the corresponding port

Audio Routed Status: Checks whether or not an LSID is assigned to the corresponding source port

5. FIRMWARE UPGRADE PROCEDURES

5.1. VLPRO UPGRADE

Ensure that the card is running the latest firmware, to check this simply right click on the frame controller cards address in VLPro Client and select ***Version Information***.

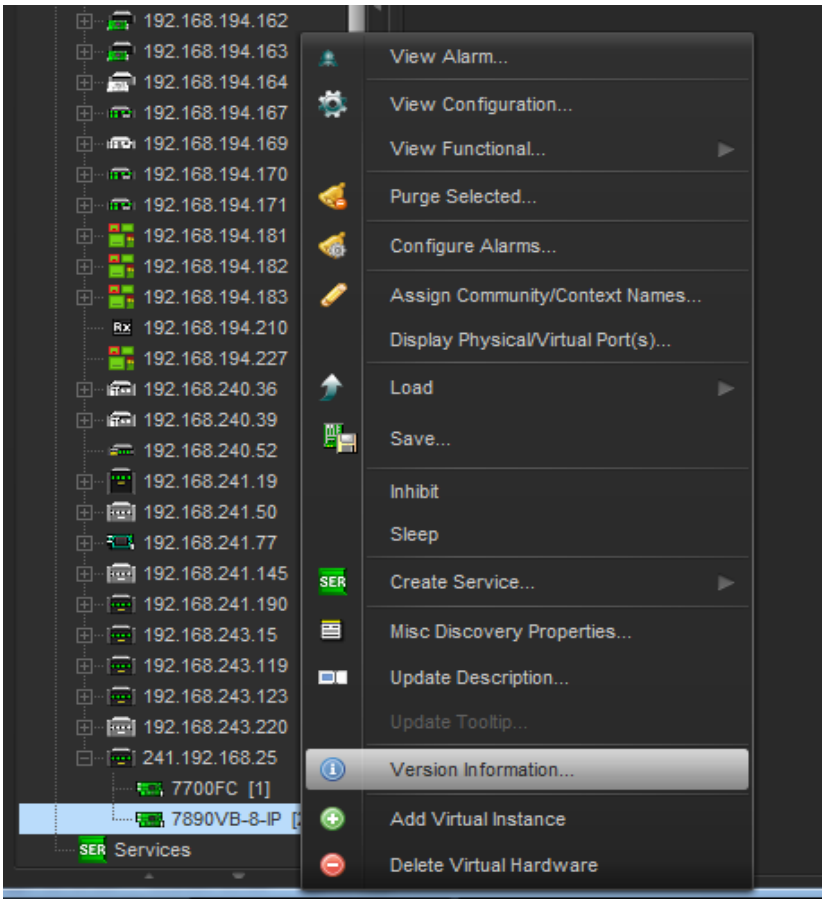


Figure 5-1: Version Information Drop-down Menu

The DHCP mode should be disabled before proceeding with the 7800FC Frame Controller to upgrade.

Note: Please contact Evertz for the latest firmware if it's not available on Evertz web site.

This will open a window that displays all of the current version information loaded onto the card.

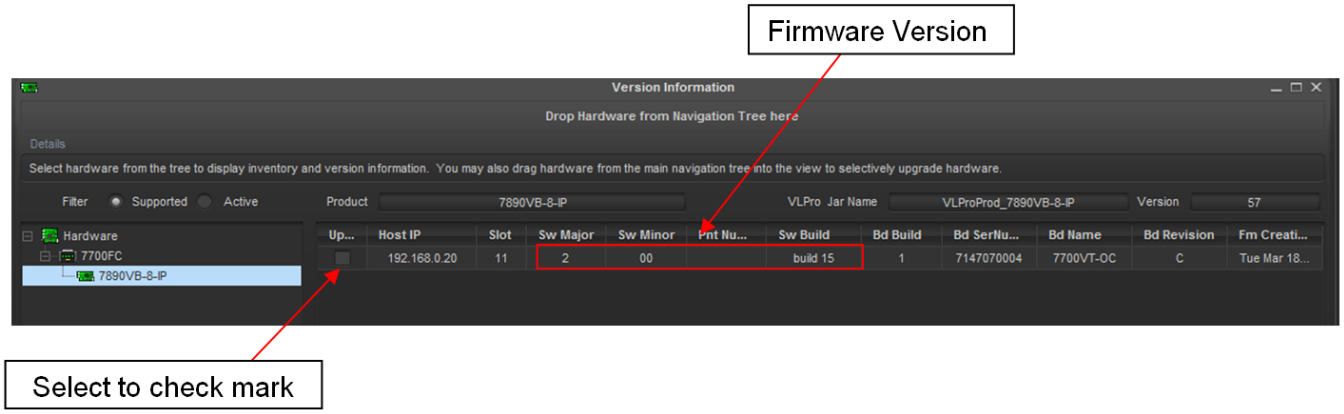


Figure 5-2: Version Information Screen

Check mark the product to be upgrade. Multiple products of the same type may be selected to be upgraded at the same time.

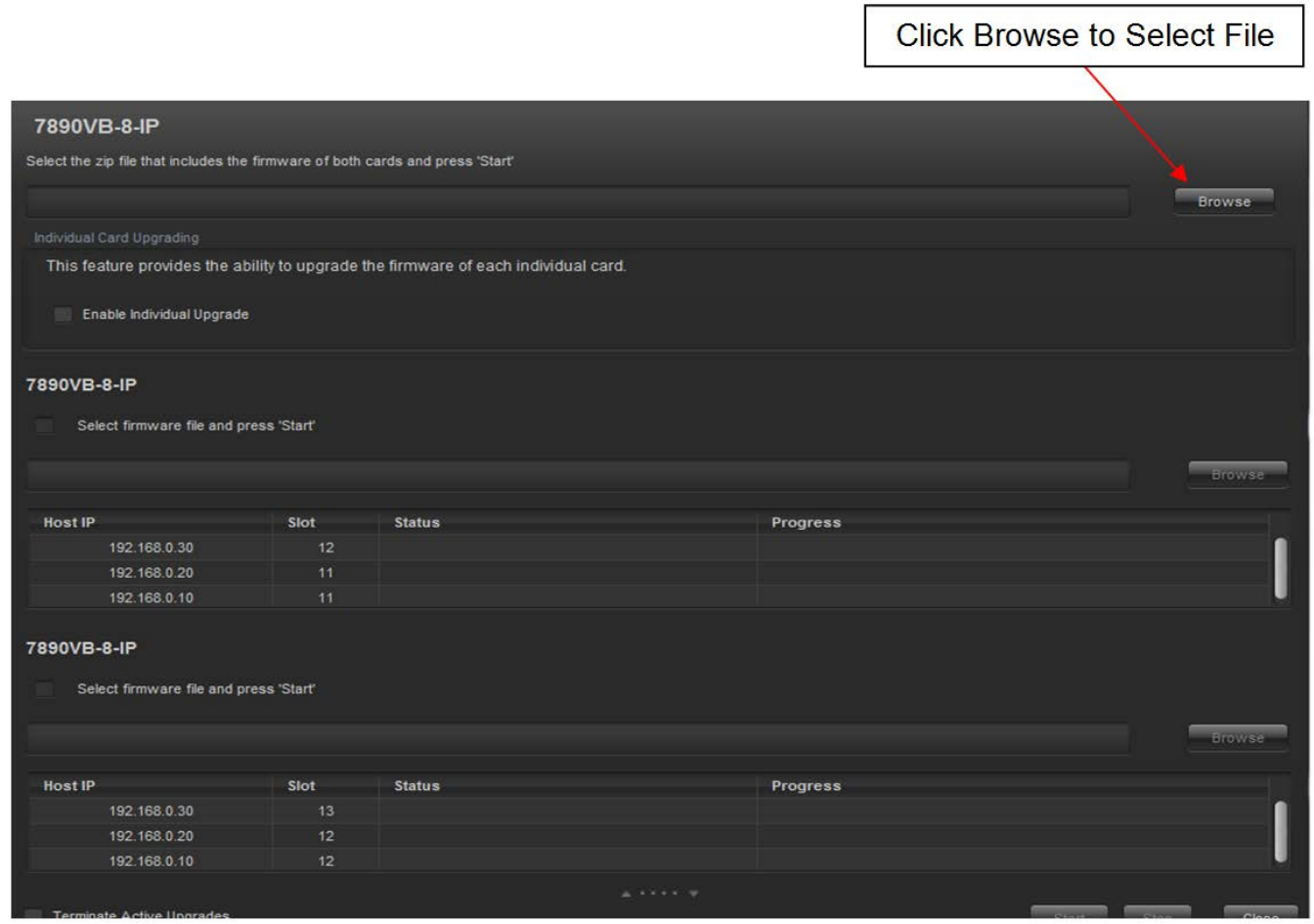


Figure 5-3: Product Upgrade Drop-down Menu

Click *Browse* to select *.bin* image file for downloading. Two files will be extracted. Select *Start* to begin the process.

5.2. JAR FILE UPGRADE PROCEDURES

Evertz products are constantly evolving and new features are often added. It is therefore important to update the JAR files in use to provide access to all the latest features or enhancements. It will also be necessary to add JAR files for new products

Ensure that the card is running the latest JAR file, to check this simply right click on the cards address in VLPro Client and select ***Version Information***.

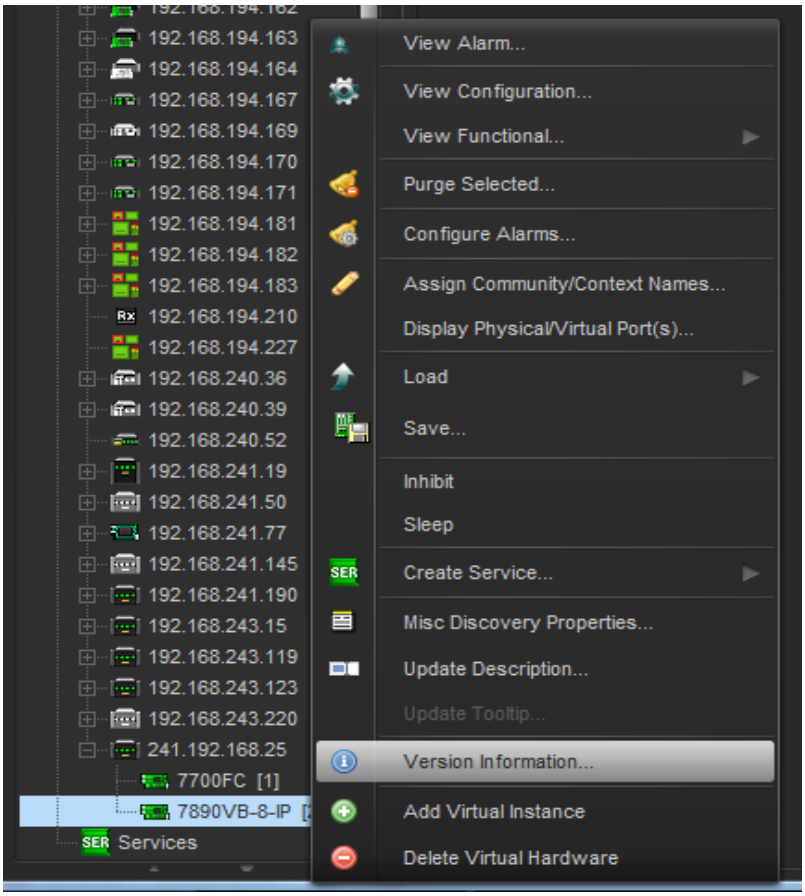


Figure 5-4: Version Information Drop-down Menu

This will open a window that displays all of the current version information loaded onto the card.

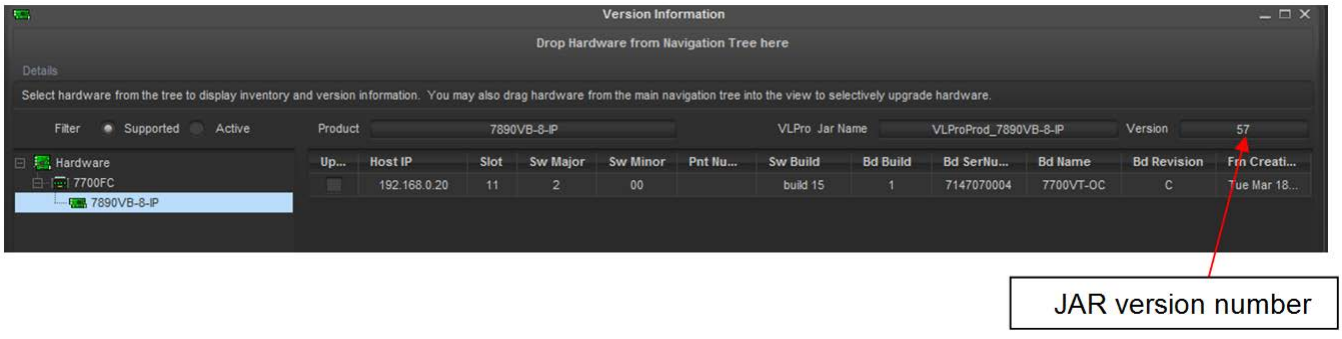


Figure 5-5: Version Information Screen

Download the JAR file ”7890VB-8-IP”. To retrieve the JAR file contact your Evertz sales representative or check Evertz web site for availability (www.evertz.com – Support> Downloads VistaLINK® PRO JAR File Downloads> > Type “7890VB-8-IP” in the Model search and press “Go”). Save the files to the hard drive.

Please contact Evertz for JAR file if it not available on Evertz web site.

To perform a JAR update, ensure that all VistaLINK® PRO clients are closed (those clients which are not closed will automatically be disconnected as soon as the VistaLINK® PRO Server is restarted). Maximize the VistaLINK® PRO Server window from the Windows task bar, select *Help> Apply Update> Product* from the menu.

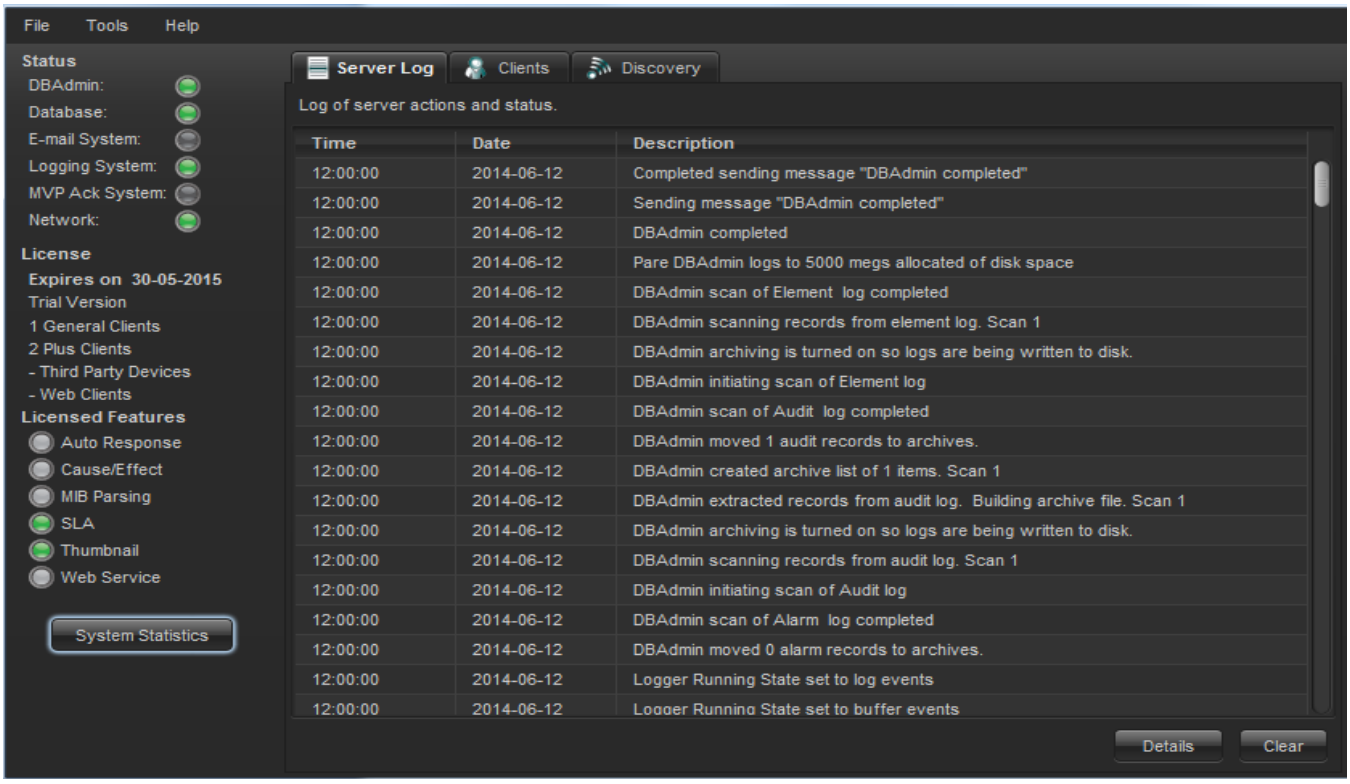


Figure 5-6: VistaLINK® PRO Server

A window will appear, as shown in Figure 5-7 navigate to the location of the new JAR file and double click to select the file. The window will automatically close and the update will be applied in the background.

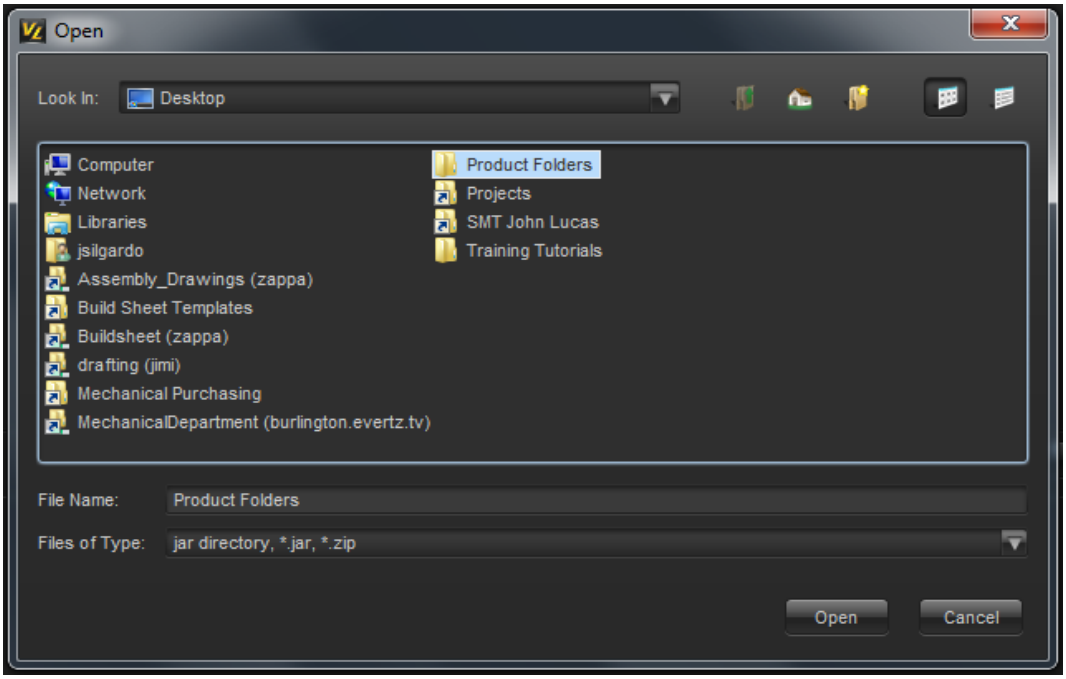


Figure 5-7: Firmware Version Location

When the window opens you want to select the latest .jar file from its saved location on the computer and select ***Open***.

At this point the VLPro Server will send a message asking to Restart, select ***Yes***. This will apply the update firmware to the card.

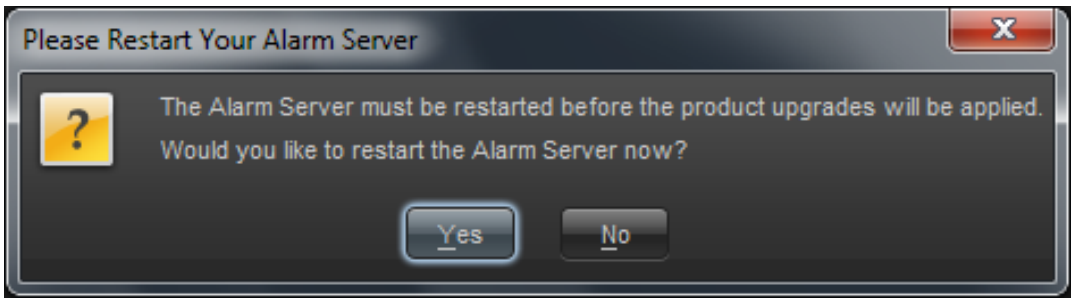


Figure 5-8: Alarm Server Restart Notification

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