7708VB-8-HSE
8 SDI/ASI or 6 HD-SDI plus
Ethernet Fiber Transceiver
User Manual

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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.

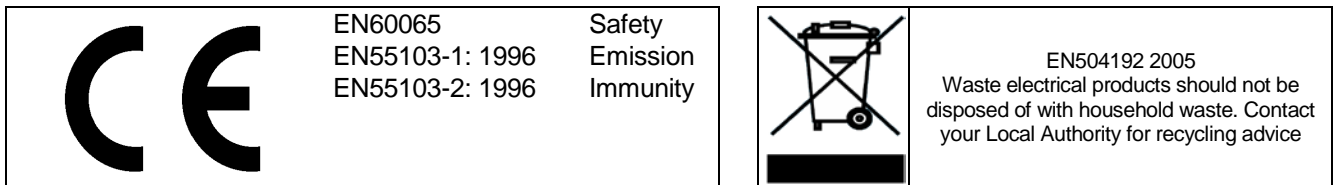| |
|---|
| **WARNING**
TO REDUCE THE RISK OF FIRE OR ELECTRIC – SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE |
| **WARNING**
DO NOT EXPOSE THIS EQUIPMENT TO DRIPPING OR SPLASHING AND ENSURE THAT NO OBJECTS FILLED WITH LIQUIDS ARE PLACED ON THE EQUIPMENT |
| **WARNING**
TO COMPLETELY DISCONNECT 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.

$C \in$	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

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REVISION HISTORY

REVISION	DESCRIPTION	DATE
0.1	Preliminary Release	Oct 2014

Information contained in this manual is believed to be accurate and reliable. However, Evertz assumes no responsibility for the use thereof nor for the rights of third parties, which may be affected in any way by the use thereof. Any representations in this document concerning performance of Evertz products are for informational use only and are not warranties of future performance, either expressed or implied. The only warranty offered by Evertz in relation to this product is the Evertz standard limited warranty, stated in the sales contract or order confirmation form.

Although every attempt has been made to accurately describe the features, installation and operation of this product in this manual, no warranty is granted nor liability assumed in relation to any errors or omissions unless specifically undertaken in the Evertz sales contract or order confirmation. Information contained in this manual is periodically updated and changes will be incorporated into subsequent editions. If you encounter an error, please notify Evertz Customer Service department. Evertz reserves the right, without notice or liability, to make changes in equipment design or specifications.

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1. OVERVIEW

Features & Benefits

- Single card TDM multiplexer for six bi-directional asynchronous HD-SDI, or eight bi-directional asynchronous SD-SDI, or DVB-ASI signals or any combination thereof with maximum total bandwidth of 9Gb/s.
- Built-in Ethernet transceiver with one 10/100/1000 Base-T port with FBM (Fiber Bandwidth Management) technology.
- Uncompressed, full-rate video transport.
- Signal transport over fiber uninterrupted by loss of any input feed.
- Transparently passes embedded AES or any other data in the horizontal or vertical ancillary data space.
- Fully hot-swappable from front of frame.
- Supports single-mode fiber optic cable.
- Optical output wavelengths of 1310nm, 1550nm, and up to eight CWDM wavelengths (1470nm - 1610nm).
- DWDM wavelength (ITU-T G.694.1 compliant) support.
- Pluggable Evertz XFP module permits wavelength swapping/sparing.
- 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 3RU 7800FR or 350FR frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame.
- Occupies three card slots and is housed in a 3RU frame that holds up to 5 modules or 350FR portable frame that holds up to 2 modules.
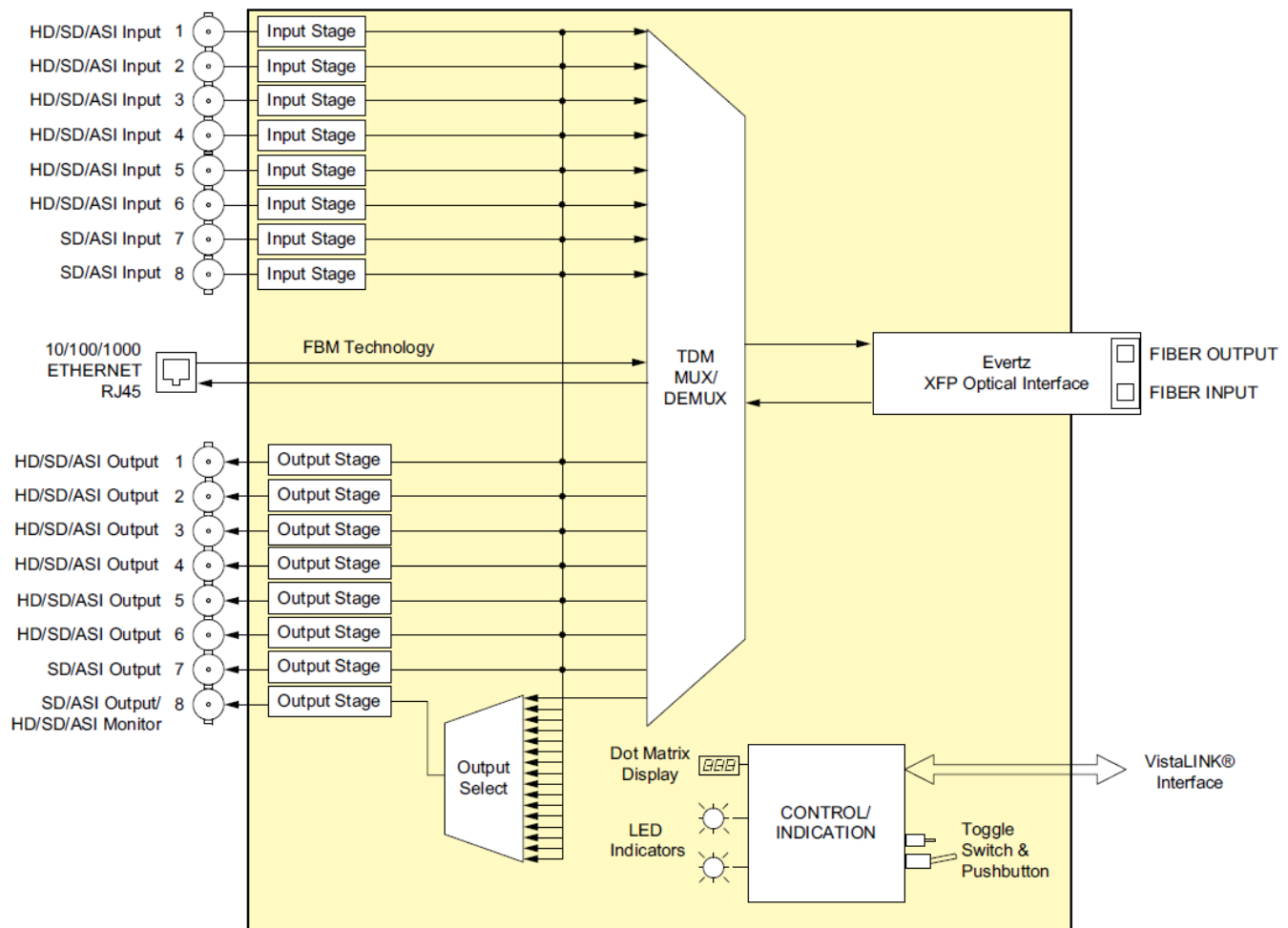
Figure 1-1: 7708VB-8-HSE Block Diagram

2. GETTING STARTED

2.1. REAR PLATE DESCRIPTION
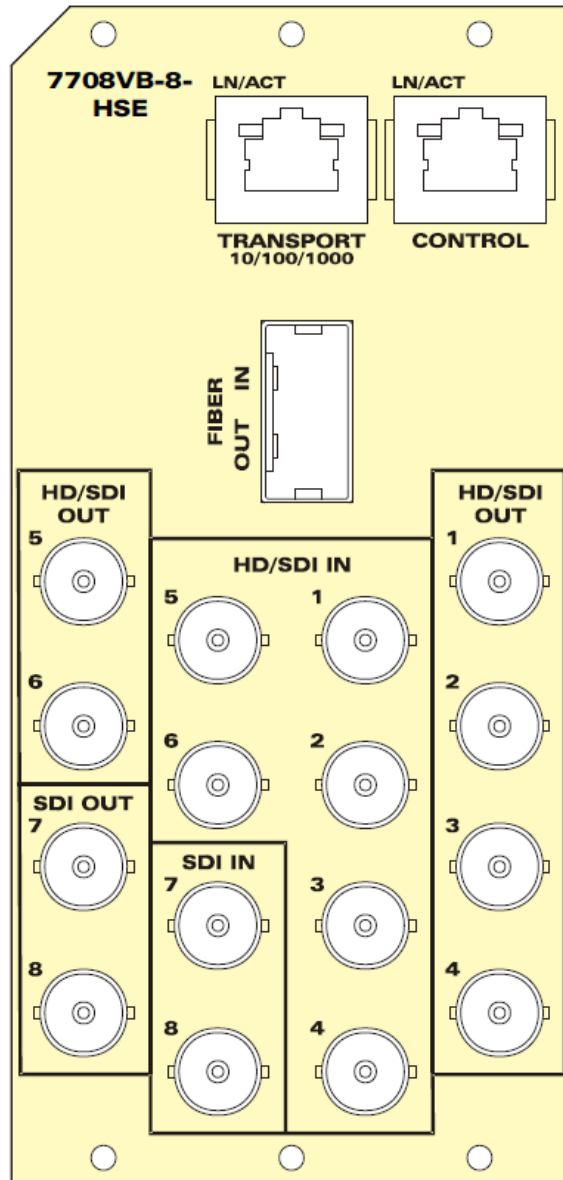
Figure 2-1: 7708VB-8-HSE Rear Plate

2.1.1. Video Connection

HD/SDI IN: Six auto-sensing BNC inputs for HD-SDI, SDI/SDTi, or DVB-ASI. These inputs provide adaptive equalization for up to 100m of industry standard Belden 1694A cable at 1.485Gb/s, or 250m of 1694A cable at 270Mb/s.

SDI INPUTS: Two auto-sensing BNC inputs for SDI/SDTi or DVB-ASI. These inputs provide adaptive equalization for up to 250m of industry standard Belden 1964A cable.

HD/SDI OUT: Six BNC outputs for HD-SDI, SDI/SDTi, or DVB-ASI.

SDI OUTPUTS: Two BNC outputs for SDI/SDTi or DVB-ASI. The channel 8 output is a selectable monitor output that additionally supports HD-SDI (see section 4.2).

2.1.2. SFP Connection

FIBER IN/OUT: Pluggable XFP fiber module with standard LC Duplex connector. This module permits wavelength swapping/sparing. When inserting an XFP, ensure that the main board remains properly seated by opening the frame door and applying pressure to the card-edge ejector.
.

2.1.3. Ethernet Connection

TRANSPORT: RJ-45 connection for transport of 10/100/1000 Ethernet. Flexible Bandwidth Management (FBM) is used to control Ethernet bandwidth allocation.

CONTROL: This port is not currently implemented and is designed for future use.

2.2.   CARE AND HANDLING OF OPTICAL FIBER

2.2.1. Safety

⚠	CLASS 1 LASER PRODUCT

2.2.2. Assembly

Assembly or repair of the laser sub-module is done only at Evertz facility and performed only by qualified Evertz technical personnel.

2.2.3. Labeling

Certification and Identification labels are combined into one label. As there is not enough room on the product to place the label, it is reproduced here in the manuals.

- There is no date of manufacture on this label as it can be traced by the bar code label placed on the printed circuit board of each Evertz plug-in module.

evertz Evertz Microsystems Ltd.
5288 John Lucas Drive
Burlington, ON, CANADA L7L 5Z9
www.evertz.com

Model#:

Serial#:   Made in
                                            Canada

CLASS 1 LASER PRODUCT
Complies with 21 CFR 1040.10 and 1040.11
except for deviations pursuant to
LN No. 50, dated July 26/2001
Complies with IEC 60825-1, Am.2
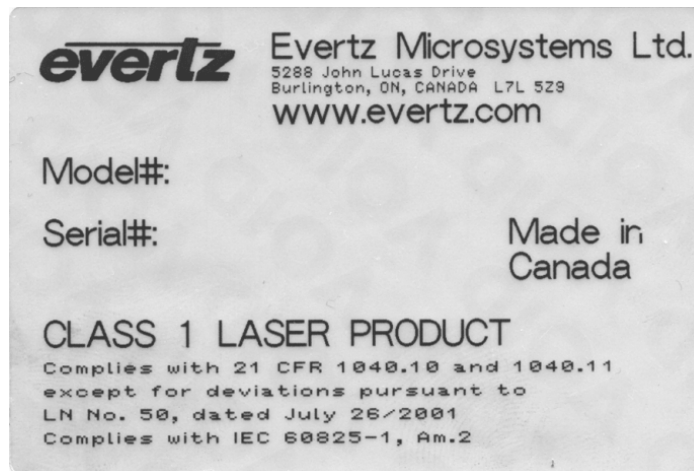
Figure 2-2: Reproduction of Laser Certification and Identification Label

2.2.4. Handling and Connecting Fibers

	Note: Always keep dust caps on optical fiber connectors when not connected and always remember to properly clean the optical end face of a connector before making a connection. Never touch the end face of an optical fiber.

The transmission characteristics of the fiber are dependent on the shape of the optical core and therefore care must be taken to prevent fiber damage due to heavy objects or abrupt fiber bending. Evertz recommends that you maintain a minimum bending radius of 5 cm to avoid fiber-bending loss that will decrease the maximum attainable distance of the fiber cable. For further information about care and handling of fiber optic cable, see section 3 of the Fiber Optics System Design section of this manual binder.

3. TECHNICAL SPECIFICATIONS

3.1. SERIAL VIDEO INPUT

Standards: SMPTE ST 292-1, SMPTE ST 259-C, DVB-ASI, SMPTE 305M (SDTi)
Number of Inputs: 8
Connector: BNC per IEC 61169-8 Annex A
Equalization: Automatic to 70m @2.470Gb/s, 100m @ 1.485Gb/s, and 250m @270Mb/s with Belden 1694A or equivalent
Return Loss: > 15dB up to 1.5Gb/s

3.2. SERIAL VIDEO OUTPUT

Standards: SMPTE ST 292-1, SMPTE ST 259-C, DVB-ASI, SMPTE 305M (SDTi)
Number of Outputs: 8 (output #8 is selectable as an output or monitor port)
Connector: BNC per IEC 61169-8 Annex A
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 900ps nominal @ 270Mb/s, <270PS @1.485G/bs
Overshoot: <10% of amplitude
Return Loss: >15dB to 1.5Gb/s
Alignment Jitter: <0.2 UI

3.3. OPTICAL OUTPUT

Number of Outputs: 1
Connector: Female LC Duplex
Fiber Size: 9µm core/125µm overall
Wavelength:

Standard: 1310nm, 1550nm (nominal)
CWDM: 1470nm to 1610nm
DWDM: D200 to D590

Power:

1310nm: -6dBm to 1dBm
1550nm: -1dBm to +2dBm
CWDM: +1dBm to +4dBm
DWDM DFB: -1dBm to +2dBm

3.4. OPTICAL INPUT

Number of Inputs: 1
Connector: Female LC Duplex
Wavelength: 1270nm to 1610nm

3.5.   MAXIMUM INPUT POWER

Max Input Power: Standard: -1dBm
High Sensitivity: -7dBm

Optical Sensitivity: Standard: -14dBm
High Sensitivity: -22dBm

3.6.   ELECTRICAL

Voltage: +12V DC
Power: 20W

3.7.   PHYSICAL (NUMBER OF SLOTS)

350FR: 3
7700FR-C: 3
7800FR: 3

3.8.   COMPLIANCE

Laser Safety: Complies with 24 CFR 1040.10 and 1040.11
EMI/RFI: Complies with FCC regulations for Class A devices
Complies with EU EMC directive

4. STATUS INDICATORS AND DISPLAYS

The 7708VB-8-HSE has 8 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 shaft-encoder/pushbutton is used to select various displays on the alphanumeric display. Figure 4-1 shows the locations of the indicators and shaft-encoder/pushbutton.
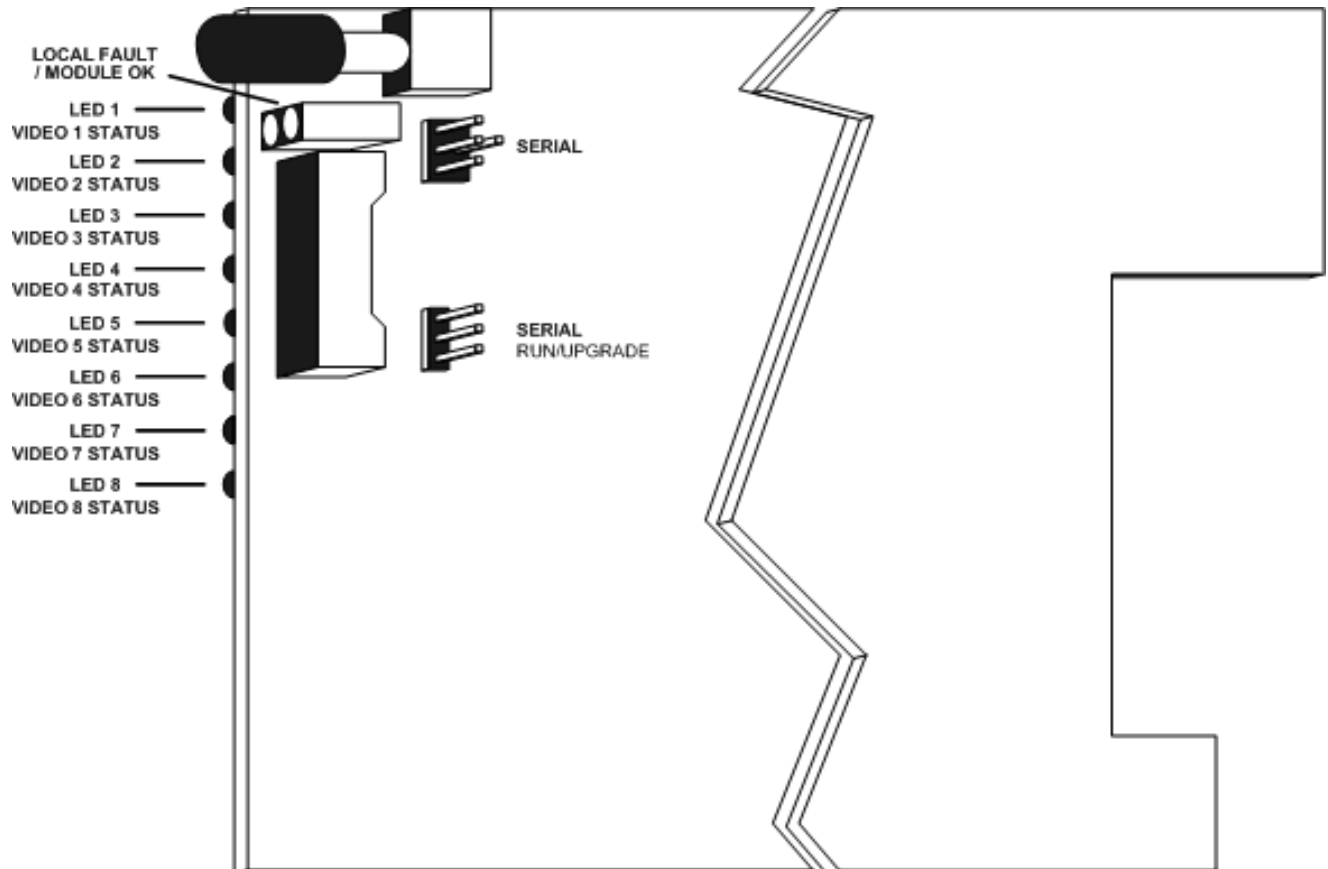
Figure 4-1: Location of Status Indicators, Jumpers and Controls

4.1. STATUS INDICATOR LEDS

Two large LEDs at the front card-edge display the status of module as follows:

MODULE OK: This Green LED indicates good module health. It will be ON while there is no laser, XFP, card-slot or power faults.

LOCAL FAULT: This Red LED will illuminate when a fault condition is detected. Possible fault conditions include laser, XFP, card-slot or power faults. Whether or not this LOCAL FAULT indication is reported to the frame may be determined by the FRAME STATUS jumper (see section 5.1).

Eight multi-coloured LEDs have selectable video status indications as follows:

4.1.1. Input Video Status

Select indication of input video status using the CTRL/LED/VIN menu selection (see section 4.2).

GREEN Indicates the presence of a valid input to the corresponding channel.

YELLOW Indicates that an input to the corresponding channel is denied for one of several possible reasons. The STAT/VIN menu item for the corresponding channel will report a reason (see section 4.2).

RED Indicates the detection of video CRC or EDH errors, or a DVB-ASI error.

OFF Indicates a signal loss of signal condition.

4.1.2. Output Video Status

Select indication of output video status using the CTRL/LED/VOUT menu selection (see section 4.2).

GREEN Indicates the presence of a valid output to the corresponding channel.

YELLOW Indicates that an output to the corresponding channel is denied for one of several possible reasons. The STAT/VOUT menu item for the corresponding channel will report a reason (see section 4.2).

OFF Indicates a signal loss of the signal condition.

4.2. DOT-MATRIX DISPLAY / CARD STATUS AND CONTROLS

Additional status monitoring and controls are provided via the 4-digit dot-matrix display located at the card-edge. The card-edge shaft-encoder/pushbutton (see Figure 4-1) is used to navigate through the display menus.

You can use the toggle switch to move up and down the list of available parameters to adjust. To adjust any parameter, use the toggle switch to move up or down to the desired parameter and press the pushbutton. Using the toggle switch, adjust the parameter to its desired value. If the parameter is a numerical value, the number will increase if you push up on the toggle switch and decrease if you push down on the toggle switch. If the parameter contains a list of choices, you can cycle through the list by pressing the toggle switch in either direction. The parameter values are changed as you cycle through the list.

When you have stopped at the desired value, depress the pushbutton. This will return to the parameter select menu item you are setting (the display shows the parameter name you were setting). To change another parameter, use the toggle switch to select other parameters. If neither the toggle switch nor pushbutton is operated for several seconds the card edge control will exit the menu system and return to an idle state.

On all menus, there is an extra selectable item: *BACK*. Selecting *BACK* will take you to the previous menu (the one that was used to get into the current menu). On the main menu, *BACK* will both take the user to the normal operating mode (indicated by the moving line on the card edge display).

4.3. TOP LEVEL STATUS MENU STRUCTURE

Table 4-1 gives a brief description of the top level of the STATUS menu tree that appears when you enter the Status card edge menu system. Selecting one of these items will take you down into the next menu level to set the value of that parameter. The details of the each of the menu items are described in sections 4.3.1 to 4.3.9.

VIN	Displays the Video Input Status
VOUT	Displays the Video Output Status
OPTO	Displays the Optical Status settings
NET	Displays the Network Status
VER	Displays the software version

Table 4-1: Top Level STATUS Menu

4.3.1. Display of Warning Status Indications

The top level, default display indicates general card status and critical warnings:

OK   Normal operation.

SLOT…ERR   Slot Error Warning – A compatible rear-plate is not detected. Flashing indication alternates between **SLOT** and **ERR.**

XFP…ERR   XFP Module Error Warning – A compatible XFP module is not detected. Flashing indication alternates between **XFP** and **ERR.**

LASR…ERR   Laser Error Warning – A laser degrade condition is detected. Flashing indication alternates between **LASR** and **ERR**.

LINK…LOS   Link Error Warning – A valid optical link input is not detected. Flashing indication alternates between **LASR** and **LOS**.

Pressing the shaft encoder from this default display will allow the user to select from **STAT** (status) and **CTRL** (control) menu items.
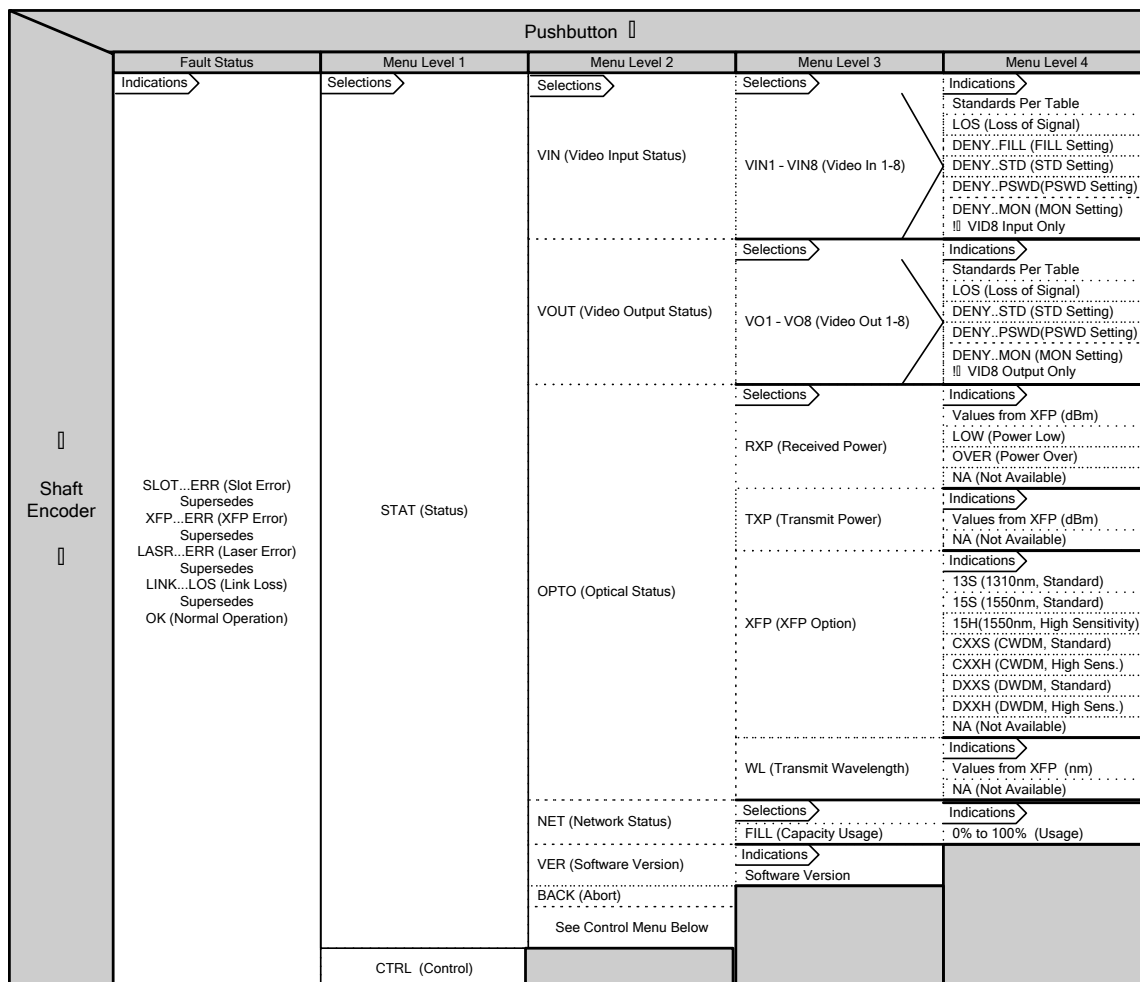

Figure 4-2: Card Edge Menu Structure (Status Section)

If a specific menu selection has a configuration value associated with it, then this may be changed using the shaft encoder. Pressing the pushbutton will apply the displayed value and return you to the previous menu level.

✎ **Note: The most recent user selection will be maintained in non-volatile memory in the event of power loss to the module.**

4.3.2. Displaying the Input Video Standard

Menu selection can display the status of the video signals present at its inputs. To display the video input status from the **STAT** menu, use the shaft encoder/pushbutton to select the **VIN** menu item and then choose from video channel **VIN1** to **VIN8**. The following indications are possible:

1080I-60	1080P-24	720P-50
1080I-59.94	1080P-23.98	1080P-60
1080I-50	1080P-25	1080P-59.94
1035I-60	1080P-30	ASI
1035I-59.94	1080P-29.97	525I
1080I-48	720P-60	525I-SDTI
1080I-47.96	720P-59.94	625I
1080I-60		

```
STAT
  VIN
    VIN1-VIN8
      LOS
      DENY…FILL
      DENY…STD
      DENY…PSWD
      DENY…MON
```

LOS   Loss of Signal – A valid input is not detected.

DENY…FILL   Denied due to Capacity Restriction – This message may be indicated for one of two reasons: 1) The bandwidth of the applied signal may exceed available network capacity, as indicated by the STAT/NET/FILL menu item, or 2) The bandwidth of the applied signal may exceed the capacity cap/reserve for the input, as configured by the CTRL/NET/FILL menu items.

DENY…STD   Denied due to Standard Restriction – This message is indicated if the applied signal does not match the permitted standard for the input, as configured by the CTRL/VID/STD menu items.

DENY…PSWD   Denied due to Password Restriction – This message is indicated if the input is password-protected, as configured by the CTRL/PSWD menu items.

DENY…MON   Denied due to Monitoring Channel (Video 8 only) – This message may be indicated only for Video input 8, when this channel is used as a monitoring channel, as configured by the CTRL/VID/MON menu item

UKNOWN   Unknown Signal – An input is detected, but the format is not recognized.

4.3.3. Displaying the Output Video Standard

To display the video output standard from the **STAT** menu, use the shaft encoder/pushbutton to select the **VOUT** menu item and then choose the desired video channel **VO1** to **VO8**. The following indications are possible:

```
1080I-60            1080P-24            720P-50
1080I-59.94         1080P-23.98         1080P-60
1080I-50            1080P-25            1080P-59.94
1035I-60            1080P-30            ASI
1035I-59.94         1080P-29.97         525I
1080I-48            720P-60             525I-SDTI
1080I-47.96         720P-59.94          625I
1080I-60
```

STAT
VOUT
VO1-VO8
LOS
DENY…STD
DENY…PSWD
DENY…MON

LOS   Loss of Signal – A valid output is not present.

DENY…STD   Denied due to Standard Restriction – This message is indicated if the applied signal does not match the permitted standard for the input, as configured by the CTRL/VID/STD menu items.

DENY…PSWD Denied due to Password Restriction – This message is indicated if the output is password-protected, as configured by the CTRL/PSWD menu items.

DENY…MON   Denied due to Monitoring Channel (Video 8 only) – This message may be indicated only for Video input 8 when this channel is used as a monitoring channel, as configured by the CTRL/VID/MON menu item.

UKNOWN   Unknown Signal – An output is present, but the format is not recognized.

4.3.4. Displaying the Receiver Optical Power

Menu selection can display the received optical power detected by the XFP module in (dBm). To display the received power from the **STAT** menu, use the shaft encoder/pushbutton to select the **OPTO** menu item and then choose the **RXP** menu item.

STAT
OPTO
RXP
Values from
XFP
LOW
OVER
NA

The following indications are possible:

-30 to **+8**   Optical Power (dBm).

LOW   Optical Power Low – Power is below –30dBm.

OVER   Optical Power Over – Power is over the specified maximum (damage may occur).

NA   Not Available – Pluggable XFP module not detected.

4.3.5. Displaying the Transmit Power

Menu selection can display transmit optical power detected by the XFP module in (dBm). To display the transmit power from the **STAT** menu, use the shaft encoder/pushbutton to select the **OPTO** menu item and then choose the **TXP** menu item.

STAT
OPTO
TXP
Values   from
XFP
N/A

The following indications are possible:

-30 to **+8**   Optical Power (dBm).
NA   Not Available – Pluggable XFP module not detected.

4.3.6. Displaying the Installed XFP Fiber Option

Menu selection can display the installed XFP Option. To display the XFP option from the **STAT** menu, use the shaft encoder/pushbutton to select the **OPTO** menu item and then choose the **XFP** menu item.

STAT
OPTO
XFP
13S
15S
15H
CXXS
CXXH
DXXS
DXXH
NA

The following indications are possible:

13S   1310nm, Standard Sensitivity XFP option is installed.
15S   1550nm, Standard Sensitivity XFP option is installed.
15H   1550nm, High Sensitivity XFP option is installed.
CXXS   CWDM, Standard Sensitivity XFP option is installed.
CXXH   CWDM, High Sensitivity XFP option is installed.
DXXS   DWDM, Standard Sensitivity XFP option is installed.
DXXH   DWDM, High Sensitivity XFP option is installed.
NA   Not Available – Pluggable XFP module not detected.

4.3.7. Displaying the Transmit Optical Wavelength

Menu selection can display the nominal optical transmit wavelength. To display the transmit wavelength from the **STAT** menu, use the shaft encoder/pushbutton to select the **OPTO** menu item and then choose the **WL** menu item.

STAT
OPTO
WL
Values   from
XFP
NA

The following indications are possible:

0 to **3276.75** Nominal Optical Transmit Wavelength (nm)
NA   Not Available – Pluggable XFP module not detected.

4.3.8. Displaying the Link Capacity Usage (Fill)

Menu selection can display the network capacity usage of the Output. To display the network capacity usage from the **STAT** menu, use the shaft encoder/pushbutton to select the **NET** menu item, and then choose the **FILL** menu item.

STAT
NET
FILL
0% to 100%

The following indications are possible:

0% to **100%** Used network capacity of Output (%).

The indicated value will include any fixed cap/reserve values configured by the CTRL/NET/FILL menu, even if the cap/reserve is under-utilized due to lower rate or absent input. It will not include capacity that is dynamically allocated to Ethernet when CTRL/NET/FILL/ETH/AUTO is selected.

Various input signals are allocated network capacity as follows:

HD-SDI	Each HD-SDI signal will use 16.17% of network capacity.
SDI	Each SDI signal will use 2.94% of network capacity.
ETHERNET-1G	A 1Gbps Ethernet signal will use 13.23% of network capacity.
ETHERNET-780M	A 780Mbps (FBM) Ethernet signal will use 10.29% of network capacity.
ETHERNET-220M	A 220Mbps (FBM) Ethernet signal will use 2.94% of network capacity.

4.3.9. Displaying the Firmware Version

To display the module firmware version from the **STAT** menu, use the shaft encoder/pushbutton to select the **VER** menu item. The following indications are possible:

STAT
VER
Software Version

The software version will be displayed here. For example:

VER 1.0 BLD 067

4.4.   TOP LEVEL CONTROL MENU STRUCTURE

Table 4-2 gives a brief description of the top level of the CONTROL menu tree that appears when you enter the Control card edge menu system. Selecting one of these items will take you down into the next menu level to set the value of that parameter. The details of the each of the menu items are described in sections 4.4.1 to 4.4.10.

LED	Configures the LED indications
VID	Configures the Video Control
NET	Configures the Network Control
PSWD	Sets the password protect
DISP	Configures the display orientation
FRST	Selects the factory reset

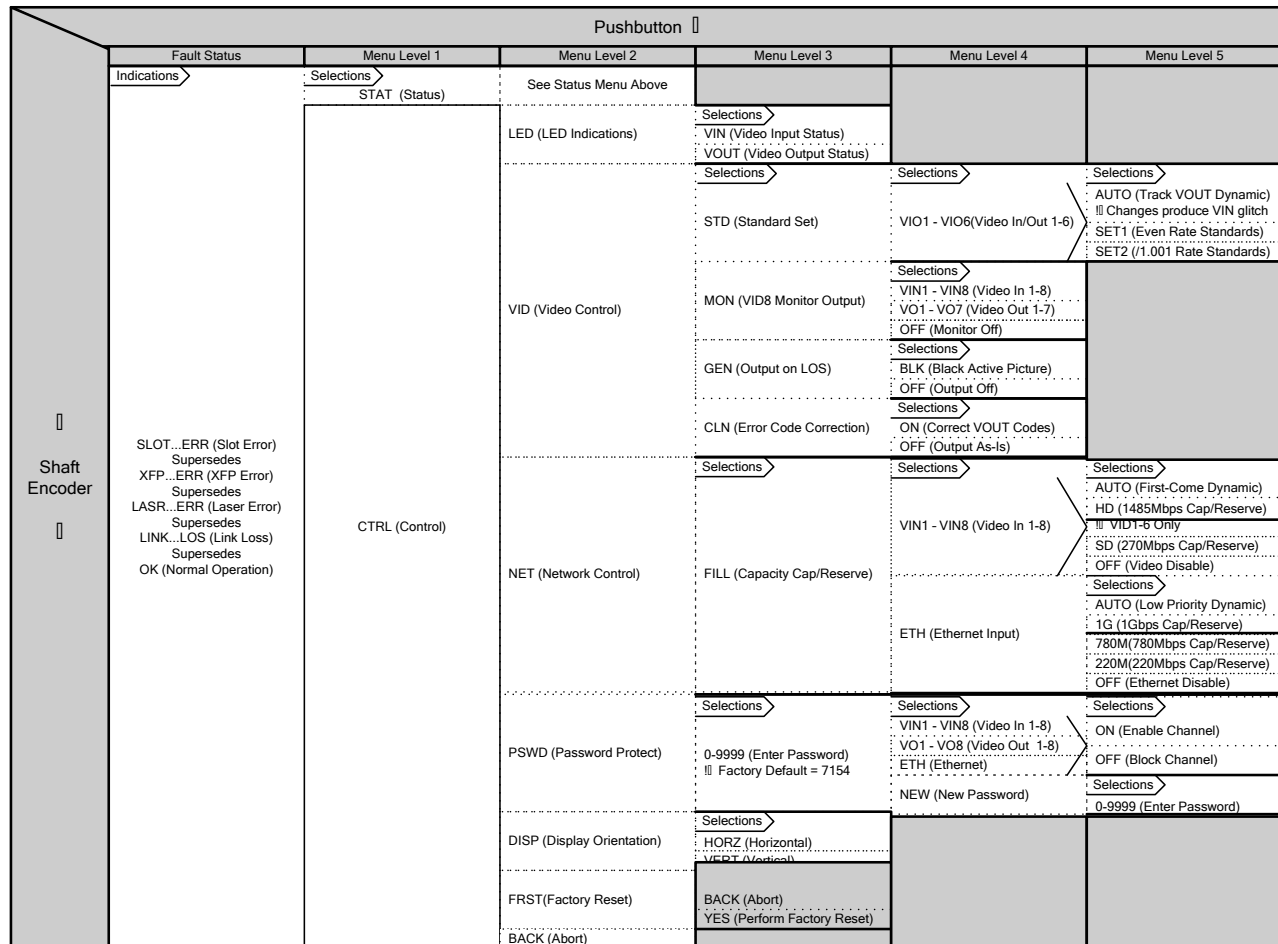**Table 4-2: Top Level CONTROL Menu**

Figure 4-3: Card Edge Menu Structure (Control Section)

4.4.1. Controlling the LED Status Indicators

The LED status indicators can be controlled using menu selections. To configure the LED status indicators from the **CTRL** menu, use the shaft encoder/pushbutton to select the **LED** menu item. The following selections are available:

```
CTRL
  LED
    VIN
    VOUT
```

VIN   Selects video input status for display according to section 4.1.

VOUT   Selects video output status for display according to section 4.1.

4.4.2. Controlling the Video Standard Restriction

The 7708VB-8 can output even-rate video (e.g., 60Hz), or /1.001 video (e.g.59.94Hz). Upon an output change between even-rate and /1.001 standards, the corresponding video input will receive a glitch. For this reason, a selection is provided to restrict the accepted video input/output rate/standard. To configure the video standard restriction from the **CTRL** menu, use the shaft encoder/pushbutton to select the **VID** menu item, then the **STD** menu item, and then choose the desired video channel **VIO1** to **VIO8**. The following selections are available:

```
CTRL
  VID
    STD
      VIO1 to VIO8
        AUTO
        SET1
        SET2
```

AUTO   Does not restrict the video standard. Output will track the corresponding input.

SET1   Restricts the video input to even-rate standards. Examples of even-rate are those having 60Hz, 50Hz, 48Hz, 30Hz, 25Hz or 24Hz field rates, plus all SD signals.

SET2   Restricts the video input to /1.001 standards. Examples of even-rate are those having 59.94Hz, 47.96Hz, 29.97Hz or 23.98Hz field rates.

To explain further by example, if Video Output 1 is changed from 1080i/60 to SD, then the corresponding Video Input 1 will not receive a glitch, since both output standards are even-rate.

As another example, if Video Output 1 is changed from 1080i/60 to 1080i/59.94, then the corresponding Video input 1 (and only this input) will receive a glitch. However, the glitch can be avoided in this second example by selecting CTRL/VID/STD/VID1/SET1. In this case, upon change to 1080i/59.94, the new signal will be denied, the corresponding card-edge LED will illuminate amber, and the corresponding STAT/VIN menu item will indicate DENY…STD.

4.4.3. Controlling the Monitoring Output (Video 8)

The Video 8 Output can be configured as a monitoring output using menu selections. To configure the monitoring output from the **CTRL** menu, use the shaft encoder/pushbutton to select the **VID** menu item and then choose the **MON** menu item. The following selections are available:

```
CTRL
  VID
    MON
      OFF
      VO1
      VO2
      VO3
      VO4
      VO5
      VO6
      VO7
      VIN1
      VIN2
      VIN3
      VIN4
      VIN5
      VIN6
      VIN7
      VIN8
```

OFF	Monitoring output OFF – Output Video 8 signal received from link.
VO1	Output Video 1 signal received from link.
VO2	Output Video 2 signal received from link.
VO3	Output Video 3 signal received from link.
VO4	Output Video 4 signal received from link.
VO5	Output Video 5 signal received from link.
VO6	Output Video 6 signal received from link.
VO7	Output Video 7 signal received from link.
VIN1	Output signal received at Video Input 1.
VIN2	Output signal received at Video Input 2.
VIN3	Output signal received at Video Input 3.
VIN4	Output signal received at Video Input 4.
VIN5	Output signal received at Video Input 5.
VIN6	Output signal received at Video Input 6.
VIN7	Output signal received at Video Input 7.
VIN8	Output signal received at Video Input 8.

Note that while the Video 8 Output is configured as a monitoring output, the corresponding Video 8 Input will be disabled. In this case, applying a signal to Video Input 8 will cause the corresponding LED to illuminate amber, and the STAT/VIN/VID8 menu item to indicate DENY…MON.

4.4.4. Controlling Video Generation on LOS

The video generation on LOS can be controlled using menu selections. To configure the video generation from the **CTRL** menu, use the shaft encoder/pushbutton to select the **VID** menu item and then choose the **GEN** menu item.

```
CTRL
  VID
    GEN
      BLK
      OFF
```

The following selections are available:

BLK	Video generation on LOS enabled. Outputs black active picture using last standard.
OFF	Video generation on LOS disabled. Output is muted (i.e., no transitions).

4.4.5. Controlling Video Error-Code Cleaning

The video CRC and EDH code cleaning can be controlled using menu selections. To configure the error-code cleaning from the **CTRL** menu, use the shaft encoder/pushbutton to select the **VID** menu item and then choose the **CLN** menu item.

CTRL
VID
CLN
ON
OFF

The following selections are available:

ON   Re-calculate CRC/EDH values at video outputs.

OFF   Output video as-is, with any erroneous CRC/EDH values

4.4.6. Controlling the Network Video Fill

The network video fill (cap/reserve) can be controlled using menu selections. To configure the network video fill from the **CTRL** menu, use the shaft encoder/pushbutton to select the **NET** menu item, then the **FILL** menu item and then choose the desired video channel **VIN1** to **VIN8**.

CTRL
NET
FILL
VIN1 to VIN8
AUTO
HD
SD
OFF

The following selections are available:

AUTO   No Cap/Reserve. Accept/Deny corresponding input on a first-come-serve basis.

HD   Cap/Reserve corresponding input at 1485Mbps (Video Inputs 1-6 only).

SD   Cap/Reserve corresponding input at 270Mbps.

OFF   Disable corresponding input.

The above controls permit guaranteed service for critical signals when appropriate Cap/Reserve is configured. If AUTO is selected, then service for the corresponding signal is not guaranteed. In this case, if a signal is switched while other signals are denied (i.e., waiting for capacity allocation), then link capacity of the switched signal is relinquished and may not be available following the switch. The AUTO mode should only be used for low-priority Video Input signals. For critical Video Input signals, always configure a Cap/Reserve using the above controls.

4.4.7. Controlling the Network Ethernet Fill

The network Ethernet fill can be controlled using menu selections. Flexible Bandwidth Management (FBM) dynamically assigns free bandwidth up to 1Gbps, and a reserve value may be configured to guarantee a minimum assigned bandwidth. To configure the network Ethernet fill from the **CTRL** menu, use the shaft encoder/pushbutton to select the **NET** menu item, choose the **FILL** menu item and then select the **ETH** menu item. The following selections are available:

```
CTRL
  NET
    FILL
      ETH
        AUTO
        220M
        780M
        1G
        OFF
```

AUTO   Flexible Bandwidth Management (FBM) dynamically assigns free bandwidth up to 1Gbps, with no guaranteed minimum bandwidth reserved for Ethernet. All assigned bandwidth may be relinquished as required for video.

220M   Flexible Bandwidth Management (FBM) dynamically assigns free bandwidth up to 1Gbps, with a guaranteed minimum of 220Mbps reserved for Ethernet. Assigned bandwidth greater than 220Mbps may be relinquished as required for video.

780M   Flexible Bandwidth Management (FBM) dynamically assigns free bandwidth up to 1Gbps, with a guaranteed minimum of 780Mbps reserved for Ethernet. Assigned bandwidth greater than 780Mbps may be relinquished as required for video.

1G   Bandwidth of 1Gbps reserved for Ethernet. Guarantees full bandwidth for Gig-E.

OFF   Disable Ethernet.

Ethernet bandwidth in excess of that assigned will result in full frames dropped. Other frames will remain intact. The selections 220M and 780M may seem arbitrary, however, these correspond to increments in available bandwidth with various combinations of video. Only the reserved portion of the assigned bandwidth will be reported via the STAT/NET/FILL menu (see section 4.3.9). Additional bandwidth dynamically assigned by FBM will not be reported via this menu.

4.4.8. Controlling Channel Password Protection

The channels password protection can be controlled using menu selections. To configure the channel password protection from the **CTRL** menu, use the shaft encoder/pushbutton to select the **PSWD** menu item. By turning the shaft encoder, enter the correct password (Default **7154**).

Once the correct password is entered, turn the shaft encoder to select **VIN1** through **VIN8**. Pushing on the shaft encoder when each channel is shown, will open the selection of **ON** (Enable Channel) or **OFF** (Block Channel) for that particular channel.

```
CTRL
  PSWD
    0-9999 (enter
    pswd)
      VIN1 to VIN8
      VO1 to VO8
      ETH
        ON
        OFF
```

The following selections are available:

ON   Enables the selected channel.
OFF   Blocks the selected channel.

Selecting **NEW** rather than a channel will allow the user to define a password (**0-9999**).

4.4.9. Controlling the Orientation Card-Edge Display Text

The text orientation can be controlled using menu selections. To configure the text orientation from the **CTRL** menu, use the shaft encoder/pushbutton to select the **DISP** menu item. The following selections are available:

CTRL	HOR	Horizontal display for modules housed in 7701FR frame or stand-alone enclosure.
DISP		
HOR	VERT	Vertical display for modules housed in 7700FR frame.
VERT		

4.4.10. Controlling the Factory Reset

The factory reset can be controlled using menu selections. To configure factory reset from the **CTRL** menu, use the shaft encoder/pushbutton to select the **FRST** menu item. The following selections are available:

CTRL	YES	Reset all parameters and menu selections to factory default.
FRST		
YES	NO	Abort factory reset.
NO		

5.   JUMPERS AND LOCAL CONTROLS

Several jumpers, located at the front of the module are used to preset various operating modes.
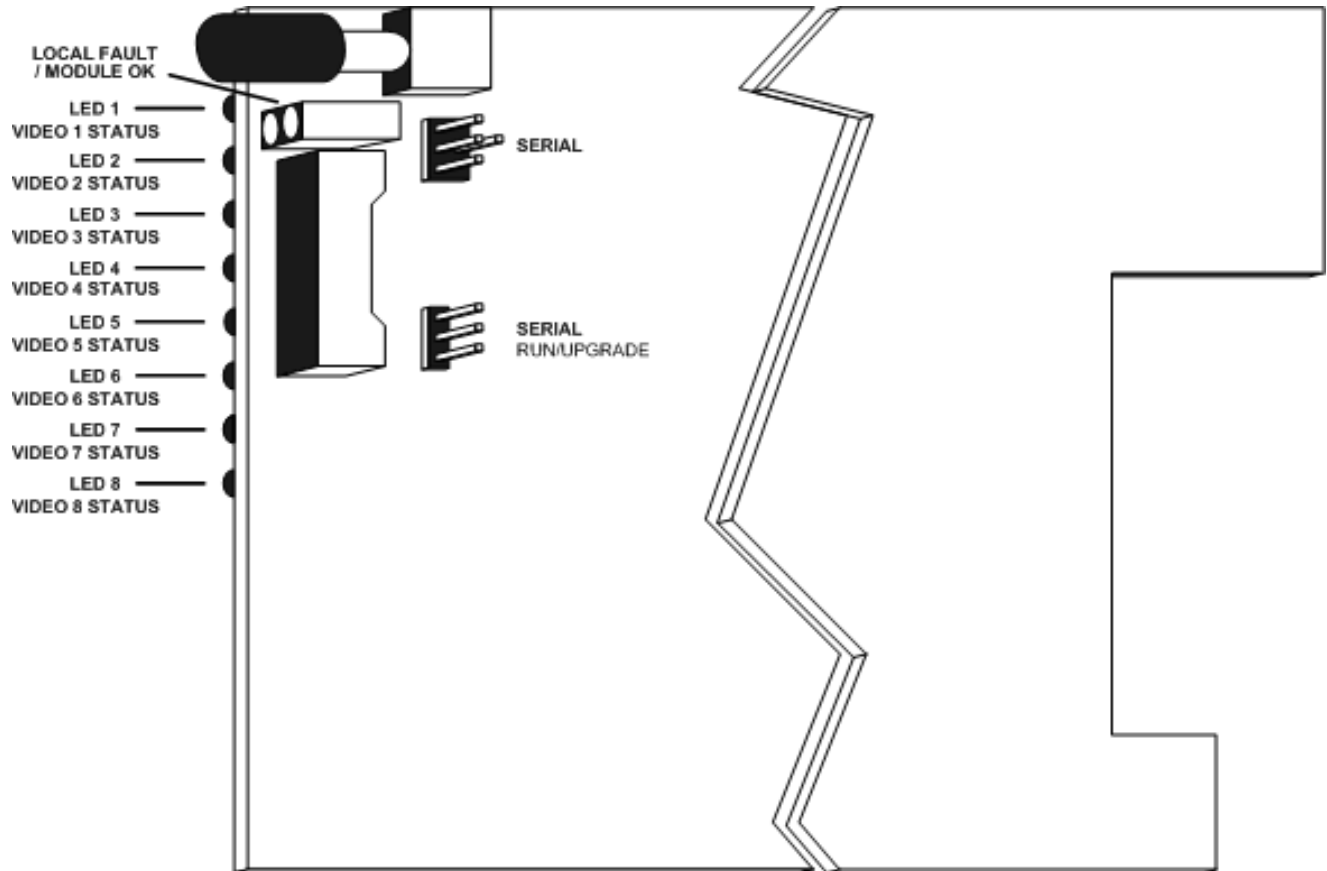
Figure 5-1: Jumpers Location

5.1.   SELECTING WHETHER LOCAL FAULTS WILL BE MONITORED BY THE GLOBAL FRAME STATUS

The FRAME STATUS jumper determines whether local faults (as shown by the Local Fault indicator) will be connected to the 7700FR frame's global status bus.

FRAME STATUS: To monitor faults on the 7708VB-8 with the frame status indicators on the Power Supply FRAME STATUS LEDs and on the frame's Fault Tally output, install this jumper in the ON position. (default)

When this jumper is installed in the OFF position, local faults on this module will not be monitored by the power supply LEDs or the frame's Fault Tally output but will only be indicated by the local fault indicator on the card itself.

5.2. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

UPGRADE: The UPGRADE jumper is used when firmware upgrades are being done to the card. For normal operation, this jumper should be installed in the RUN position. See the *Upgrading Firmware* section of this manual for more information.

To upgrade the 7708VB-8's firmware, begin by pulling it out of the frame. Move the UPGRADE jumper into the UPGRADE position. Install the upgrade cable provided (located in the vinyl pouch in the front of this manual) onto the SERIAL header at the card edge (see Figure 4-1). Re-install the module into the frame. Run the upgrade as described in the *Upgrading Firmware* section of this manual. Once the upgrade is complete, remove the module from the frame, move the UPGRADE jumper into the RUN position, remove the upgrade cable and re-install the module. The module is now ready for normal operation.

6. *VISTA*LINK® REMOTE MONITORING/CONTROL

6.1. WHAT IS *VISTA*LINK®?

VistaLINK® is Evertz's remote monitoring and configuration platform which operates over an Ethernet network using Simple Network Management Protocol (SNMP). SNMP is a standard computer network protocol that enables different devices sharing the same network to communicate with each other. VistaLINK® provides centralized alarm management, which monitors, reports, and logs all incoming alarm events and dispatches alerts to all the VLPro Clients connected to the server. Card configuration through VistaLINK® PRO can be performed on an individual or multi-card basis using simple copy and paste routines, which reduces the time to configure each module separately. Finally, VistaLINK® enables the user to configure devices in the network from a central station and receive feedback that the configuration has been carried out.

There are 3 components of SNMP:

1. An SNMP manager, also known as a Network Management System (NMS), is a computer running special software that communicates with the devices in the network. Evertz VL-Fiber demo Manager graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz *Vista*LINK® enabled fiber optic products.

2. Managed devices (such as 7708VB-8-HSE), each with a unique address (OID), communicate with the NMS through an SNMP Agent. Evertz VistaLINK® enabled 7700 series modules reside in the 3RU 7700FR-C MultiFrame and communicate with the manager via the 7700FC VistaLINK® frame controller module, which serves as the Agent.

3. A virtual database, known as the Management Information Base (MIB), lists all the variables being monitored, which both the Manager and Agent understand. Please contact Evertz for further information about obtaining a copy of the MIB for interfacing to a third party Manager/NMS.

For more information on connecting and configuring the *Vista*LINK® network, see the 7700FC Frame Controller chapter.
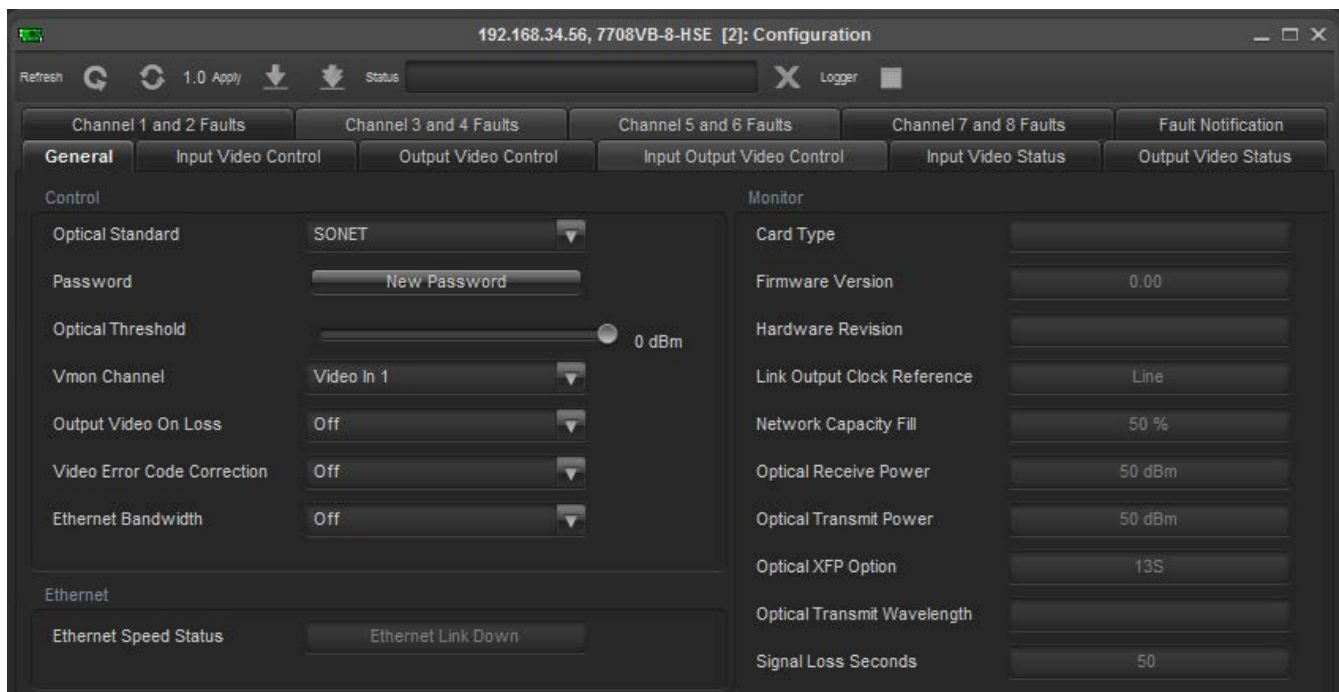
6.2.   GENERAL

Figure 6-1: General Tab

Control

Password: This parameter allows the user to set a new password to protect the 7708VB-8. Pressing this control will open a secondary window as shown in Figure 4-2: New Password Window.
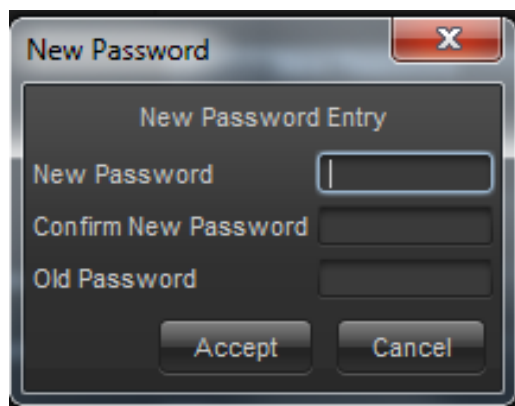

Figure 6-2: New Password Window

Optical Threshold: This parameter allows the user to set the optical threshold value, the range is between -30dBm to 0dBm.

Vmon Channel: This parameter allows the user to set the video in/video out channel.

Output Video On Loss: This parameter allows the user to set the output when the output video is lost, options include off and black.

Video Error Code Correction: This parameter allows the user to enable or disable the video error code correction.

Ethernet Bandwidth: This parameter allows the user to select the desried Ethernet bandwidth, options include Auto, 1G, 780M or 220M.

Ethernet
Ethernet Speed Status: This parameter displays the speed of the Ethernet connection.

Monitor
Card Type: This parameter displays the card type.

Firmware Version: This parameter displays the firmware version currently loaded to the card.

Hardware Revision: This parameter displays the most recent hardware revision of the card.

Link Output Clock Reference: This parameter displays the line number that the Clock Reference output is linked to.

Network Capacity Fill: This parameter displays the percentage of the network capacity that is in use.

Optical Receive Power: This parameter display the amount of optical power being received, the units are in dBm.

Optical Transmit Power: This parameter displays the amount of optical power being transmitted, the units are in dBm.

Optical XFP Option: This parameter displays the available XFP option.

Optical Transmit Wavelength: This parameter displays the optical wavelength being transmitted.
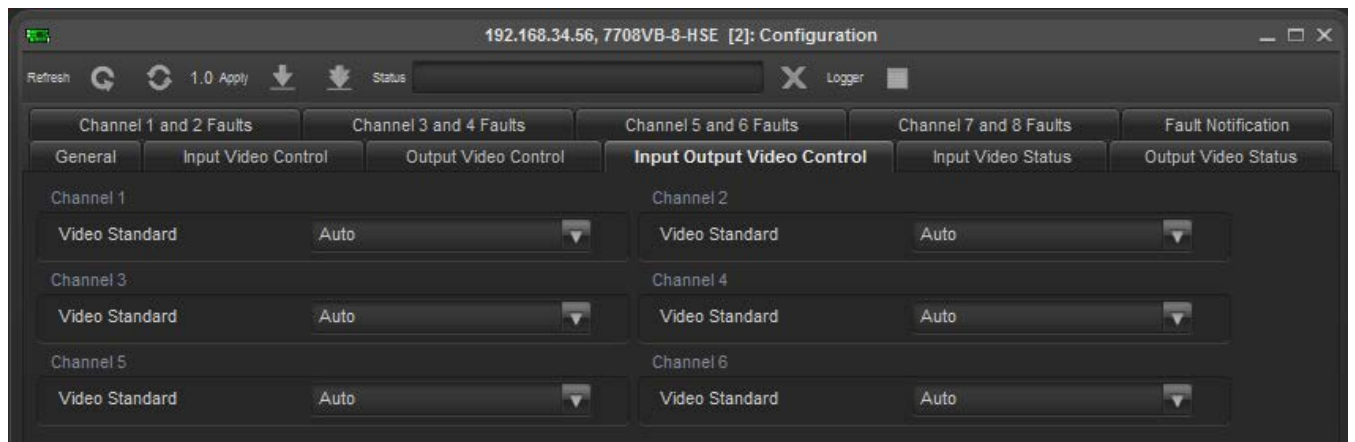
6.3.   INPUT VIDEO CONTROL
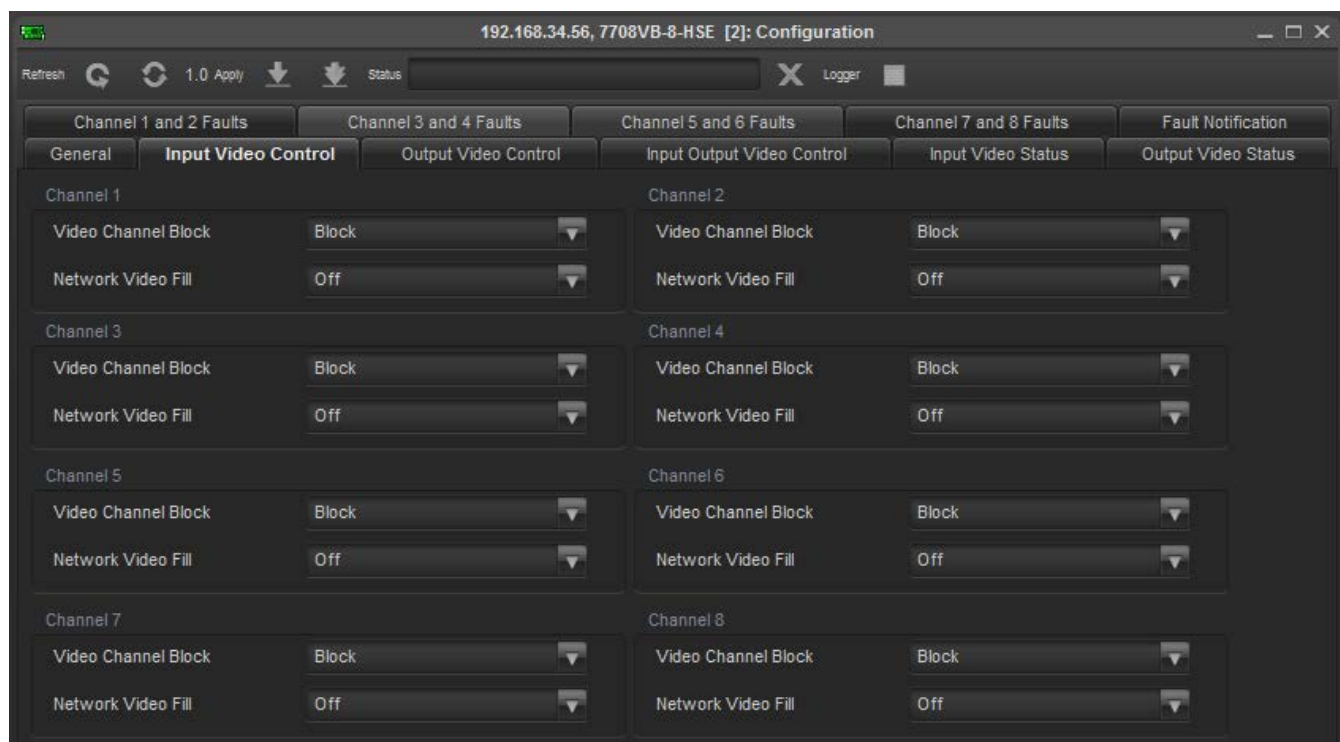
Figure 6-3: Input Video Control Tab

There are 8 input channels for the 7708VB-8, for each channel the following two parameters can be set by the user.

Video Channel Block: This parameter allows the user to either block or unblock the video channel.

Network Video Fill: This parameter allows the user to set the network video fill to be either auto, SD or HD.

6.4. OUTPUT VIDEO CONTROL
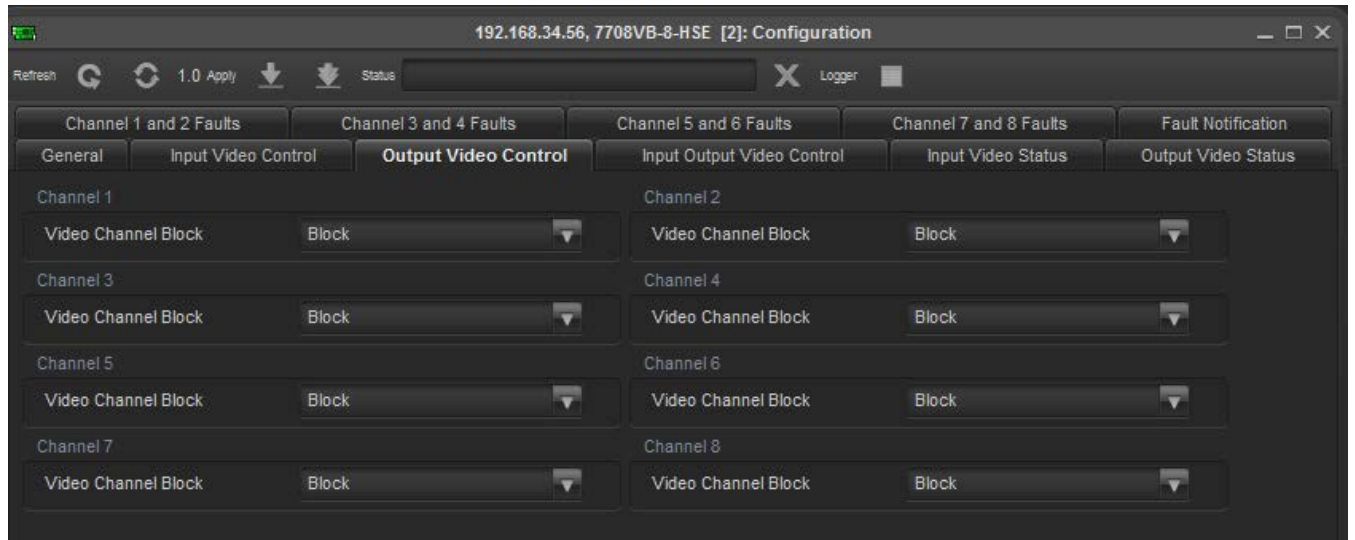
Figure 6-4: Output Video Control Tab

There are 8 output channels for the 7708VB-8, for each channel the following parameter can be set by the user.

Video Channel Block: This parameter allows the user to either block or unblock the video channel.

6.5. INPUT OUTPUT VIDEO CONTROL

Figure 6-5: Input Output Video Control Tab

There are 6 input / output channels for the 7708VB-8, for each channel the following parameter can be set by the user.

Video Standard: This parameter allows the user to control the video standard being input and output, options include Auto, Set 1 and Set 2.

6.6. INPUT VIDEO STATUS
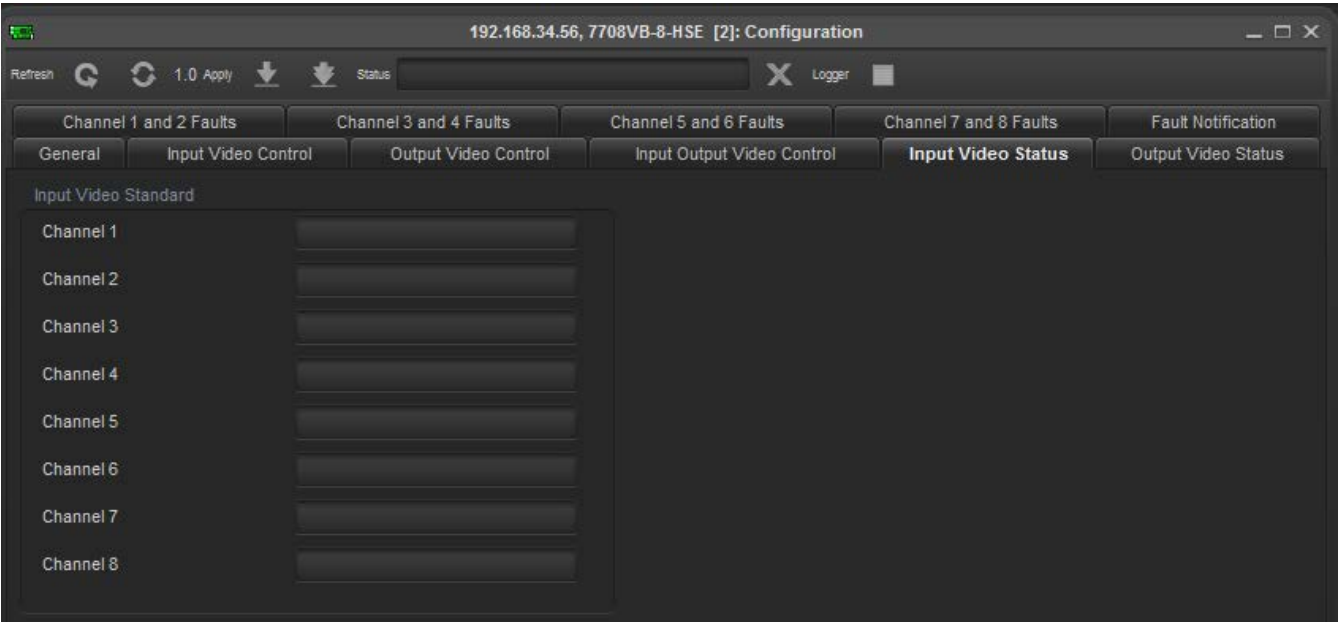
Figure 6-6: Input Video Status Tab

There are 8 input channels for the 7708VB-8, for each channel the following parameter can be viewed by the user.

Input Video Standard: This parameter displays the video standard for each input channel.

6.7. OUTPUT VIDEO STATUS
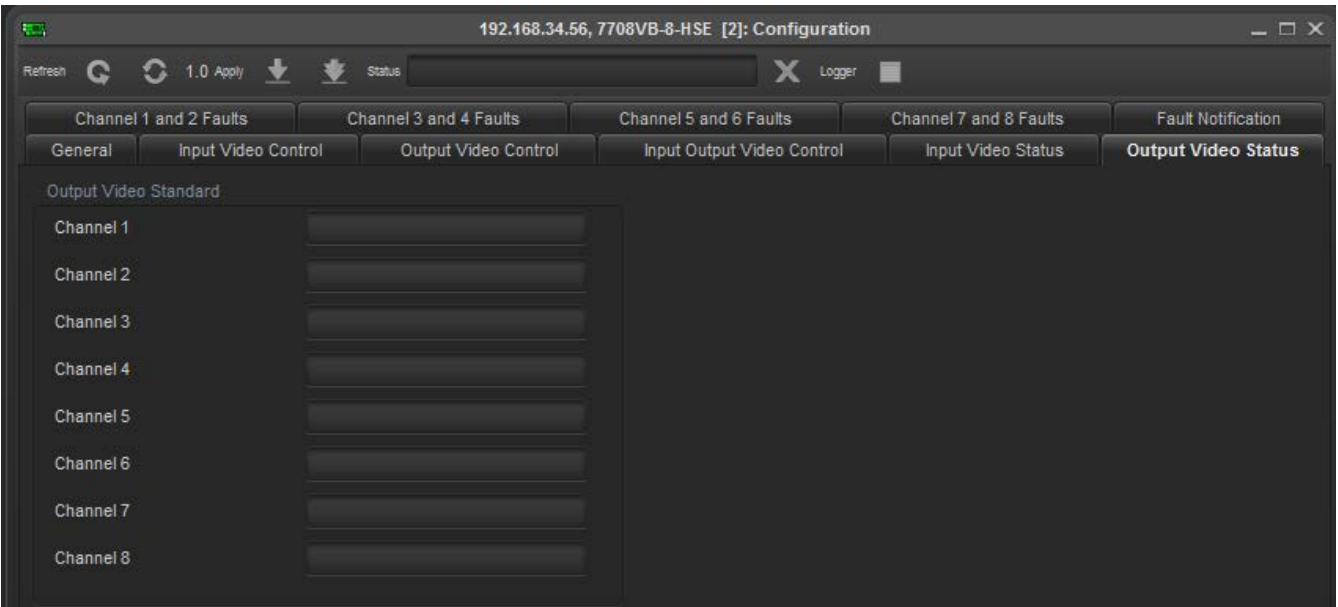
Figure 6-7: Output Video Status Tab

There are 8 output channels for the 7708VB-8, for each channel the following parameter can be viewed by the user.

Output Video Standard: This parameter displays the video standard for each output channel.

6.8. CHANNEL 1 AND 2 FAULTS
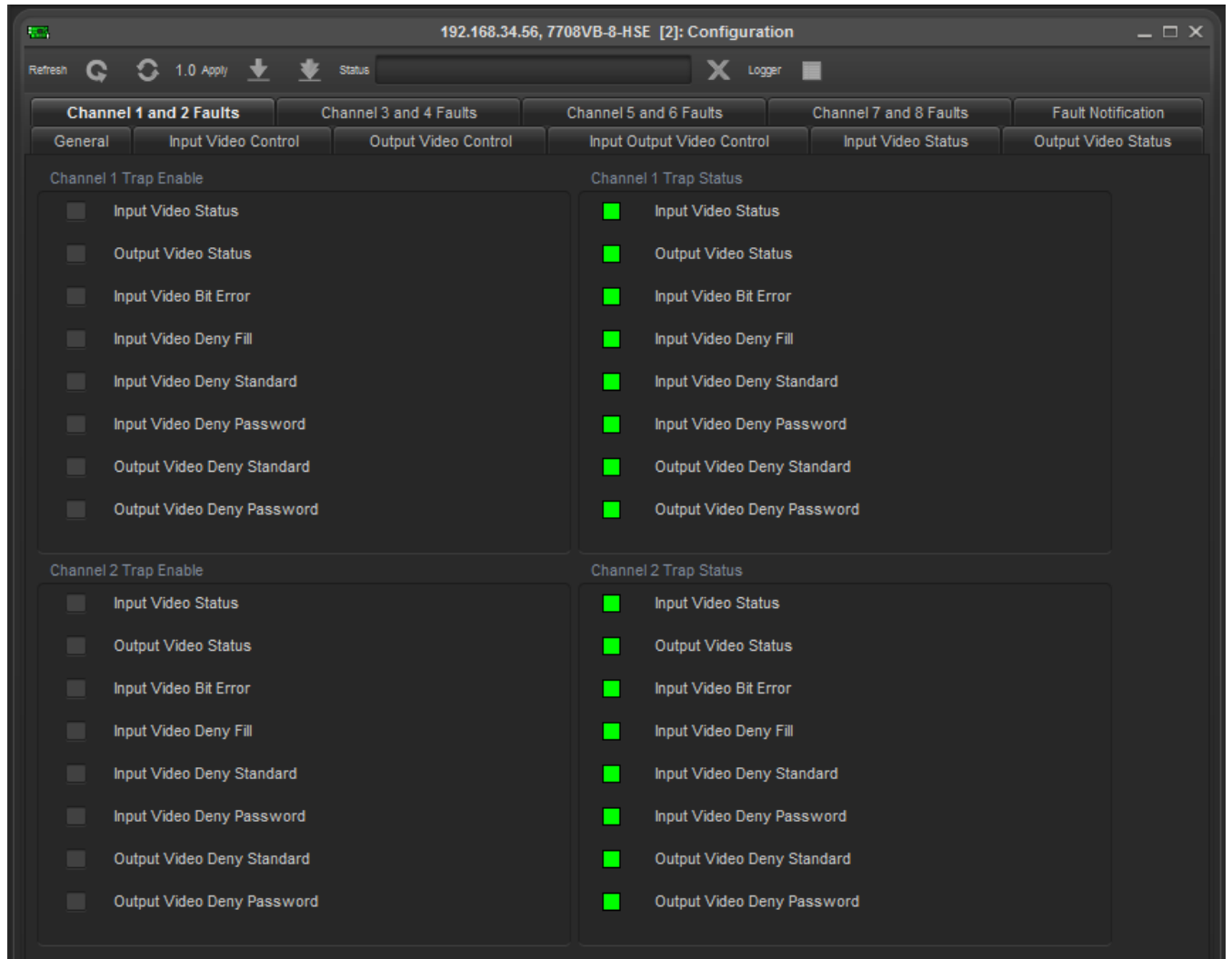
Figure 6-8: Channel 1 and 2 Faults Tab

For each channel, 1 and 2, the user can enable the listed traps to be monitored and reported. The user will know there is a fault when the green indicator turns red.
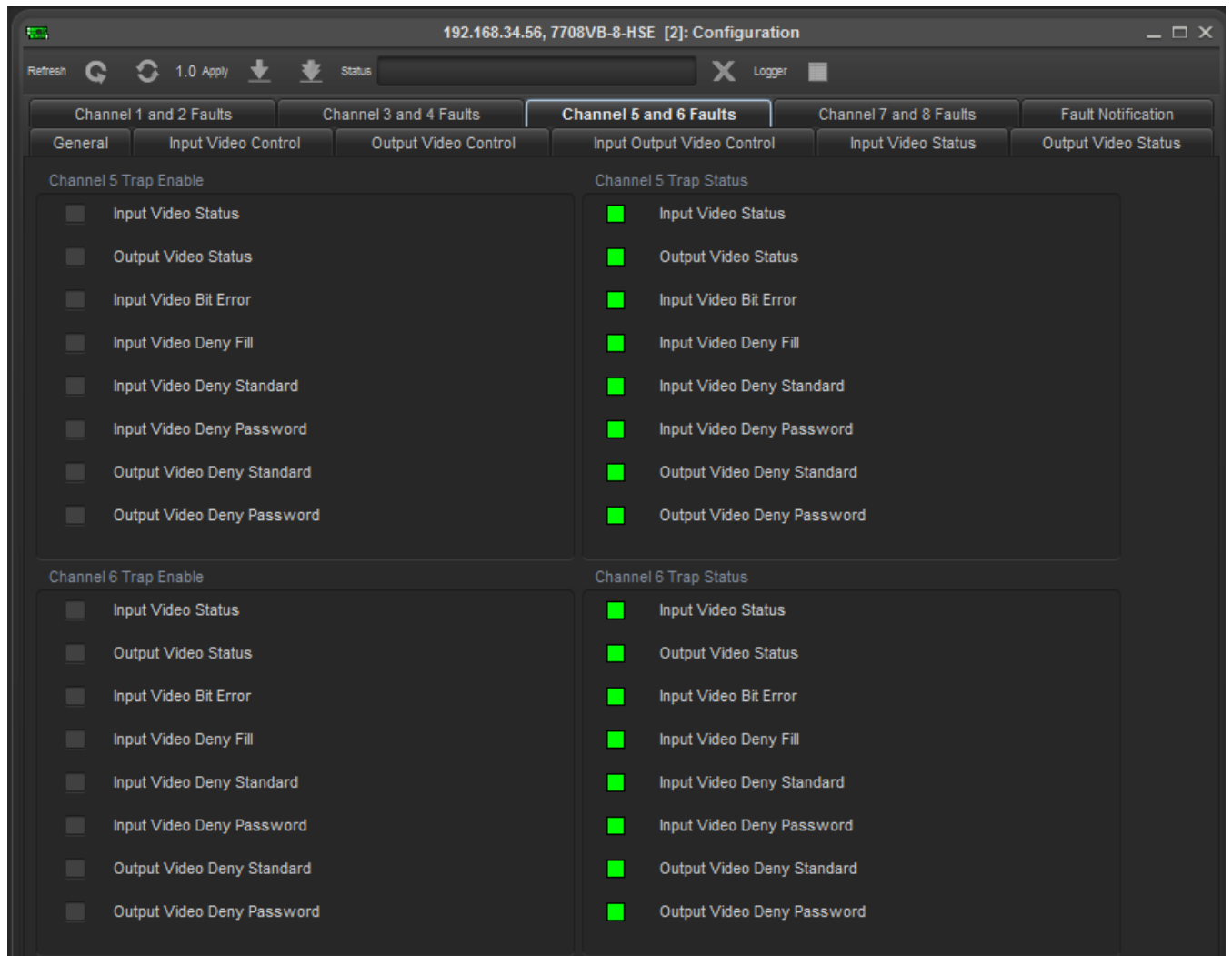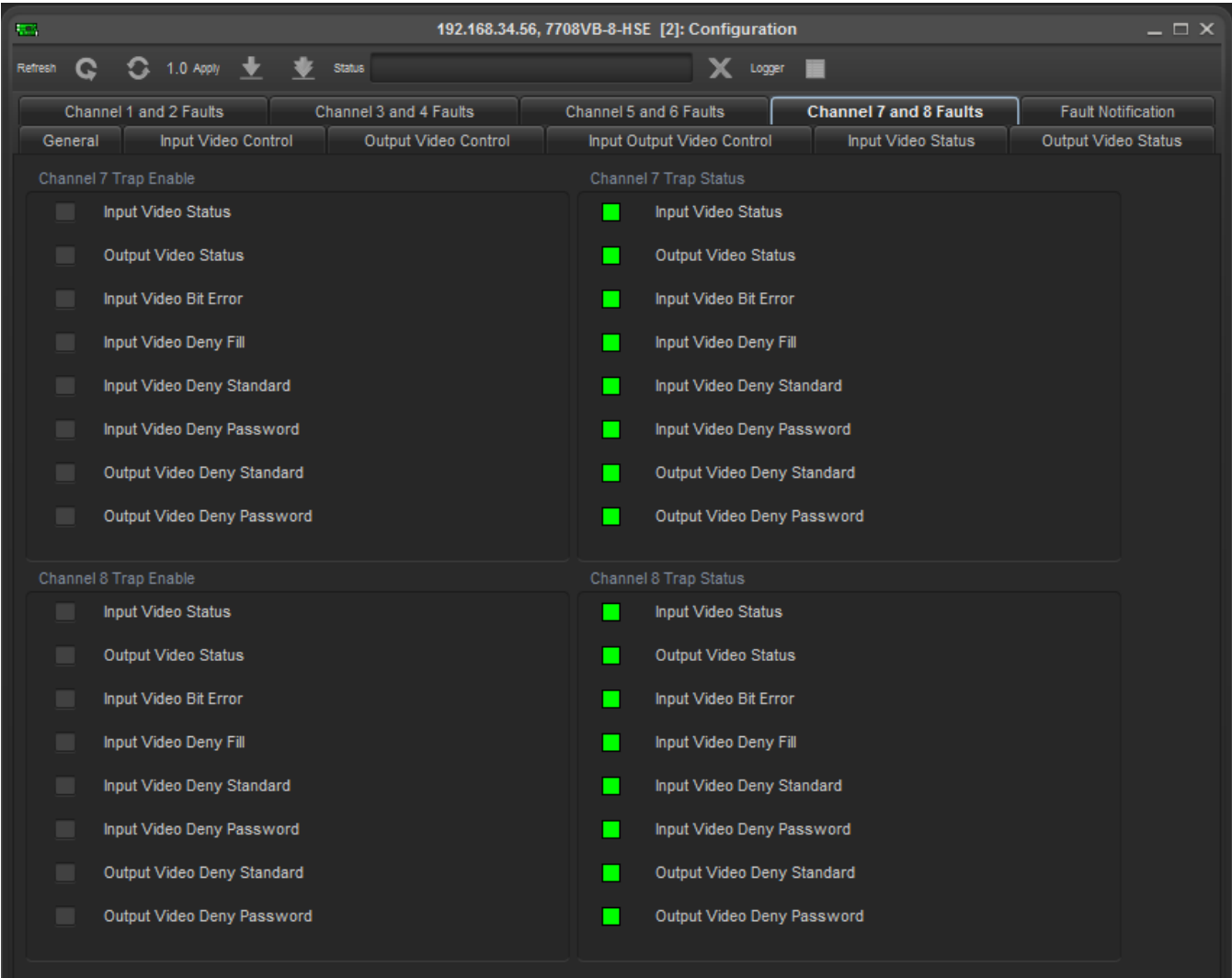
6.9. CHANNEL 3 AND 4 FAULTS
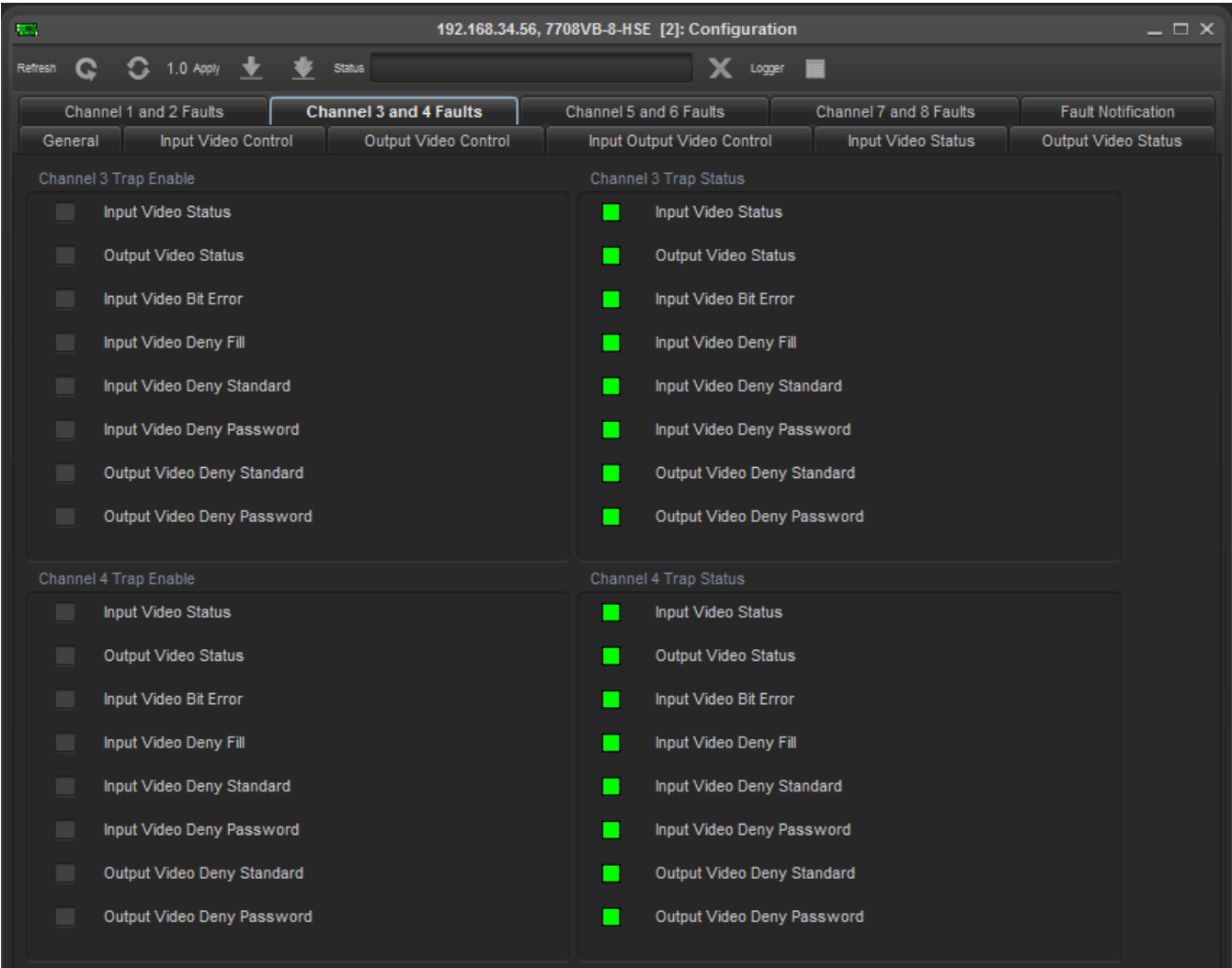
Figure 6-9: Channel 3 and 4 Faults Tab

For each channel, 3 and 4, the user can enable the listed traps to be monitored and reported. The user will know there is a fault when the green indicator turns red.

6.10. CHANNEL 5 AND 6 FAULTS

Figure 6-10: Channel 5 and 6 Faults Tab

For each channel, 5 and 6, the user can enable the listed traps to be monitored and reported. The user will know there is a fault when the green indicator turns red.

6.11. CHANNEL 7 AND 8 FAULTS

Figure 6-11: Channel 7 and 8 Faults Tab

For each channel, 7 and 8, the user can enable the listed traps to be monitored and reported. The user will know there is a fault when the green indicator turns red.

6.12. FAULT NOTIFICATION
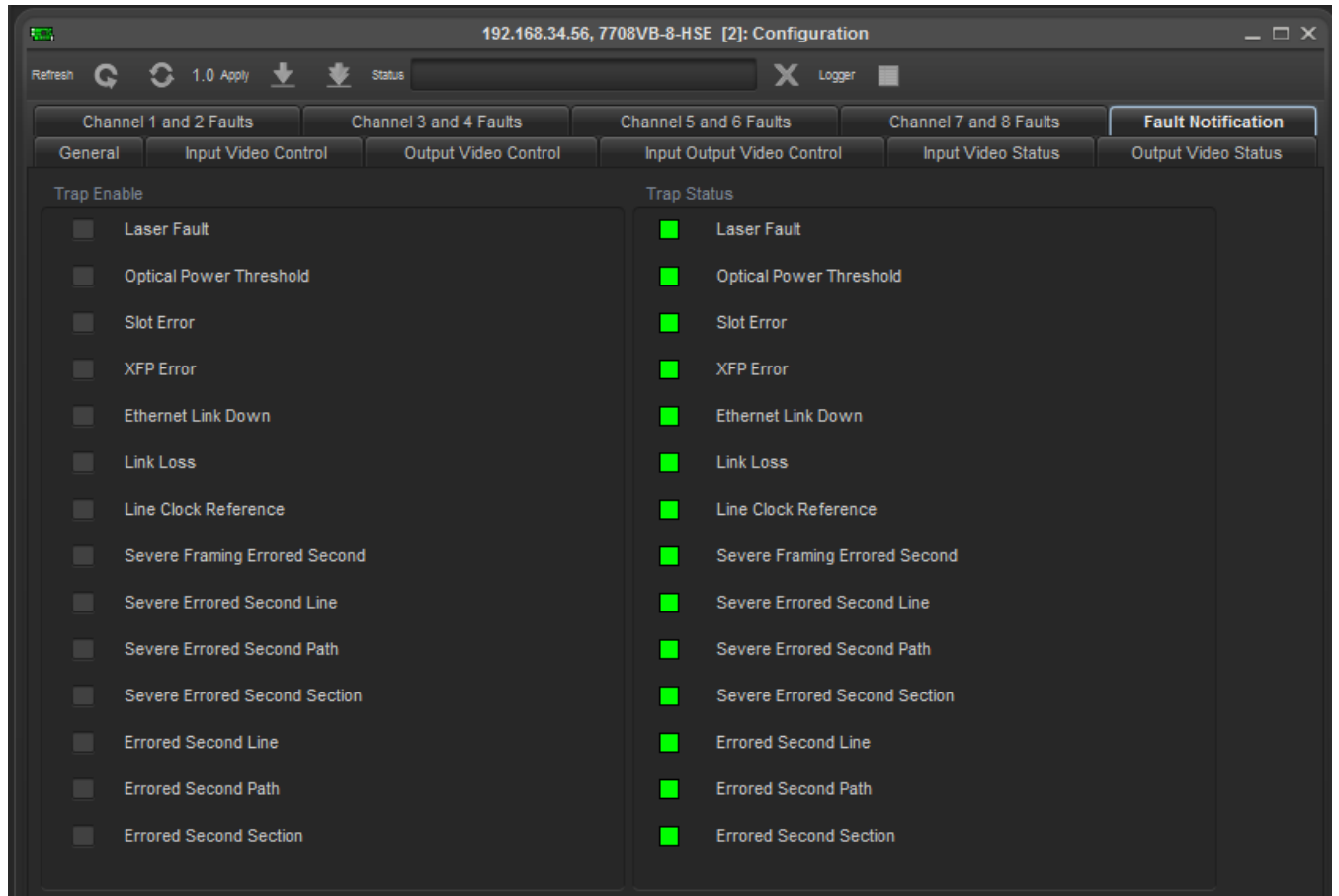
Figure 6-12: Fault Notification Tab

These traps can be set to monitor the parameters of the 7708VB-8, the user will know there is a fault when the green indicator turns red.

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7. UPGRADE PROCEDURE

Ensure that the 7708VB-8 is running the latest firmware, to check this simply right click on the cards address in VLPro Client and select *Version Information*.
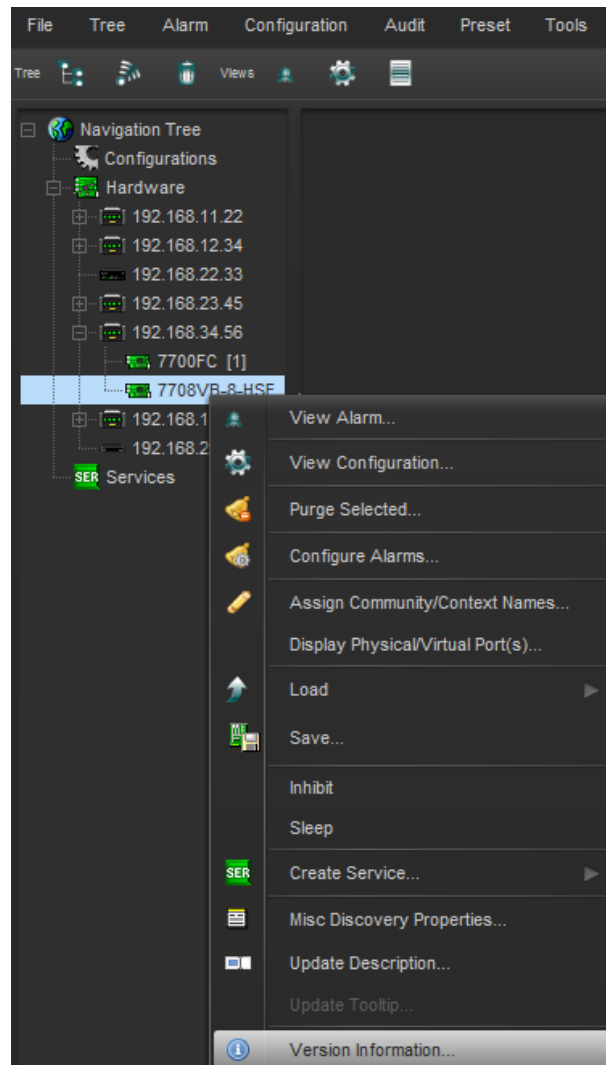
Figure 7-1: Product Version Drop-down Menu

This will open a window that displays all of the current version information loaded onto the 7708VB-8.
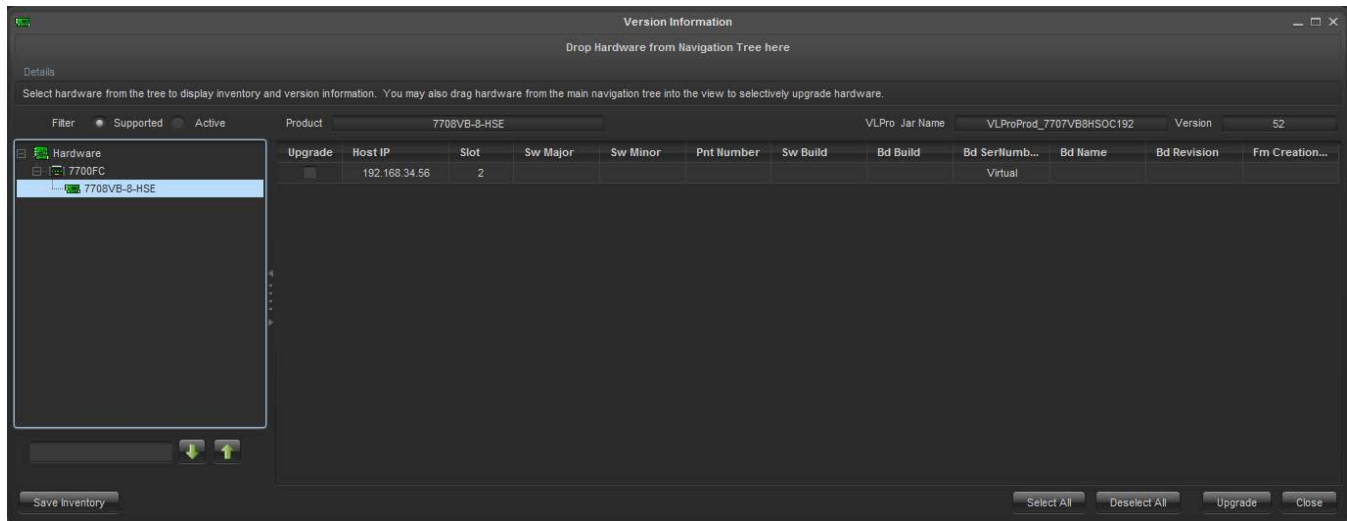
Figure 7-2: Product Firmware Version

To upgrade the firmware, locate the latest .jar files which can be found on the Evertz website. Open VLPro Client and navigate to the top tool bar. Locate the **Help** drop down menu and select **Apply Update**.
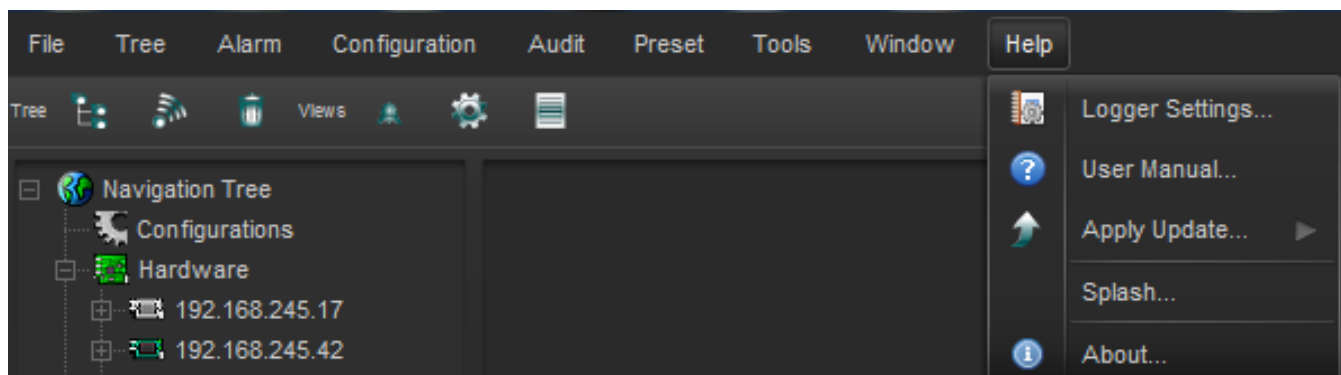

Figure 7-3: Product Update Drop-down menu

Another drop down menu should appear at this point, select **Product**.
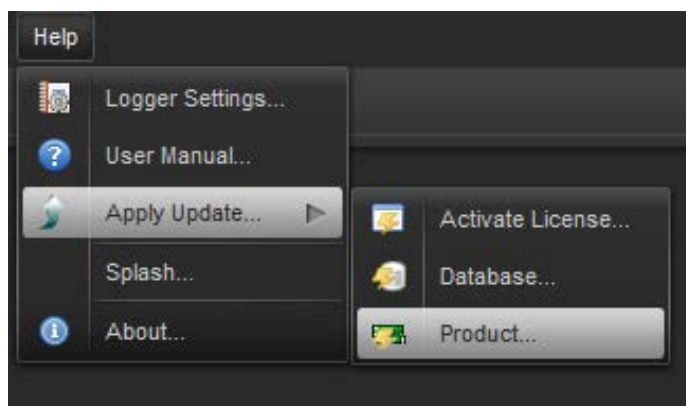

Figure 7-4: Apply Update Option

When the window opens you want to select the latest .jar file for the 7708VB-8, from its saved location on the computer and select **Open**.
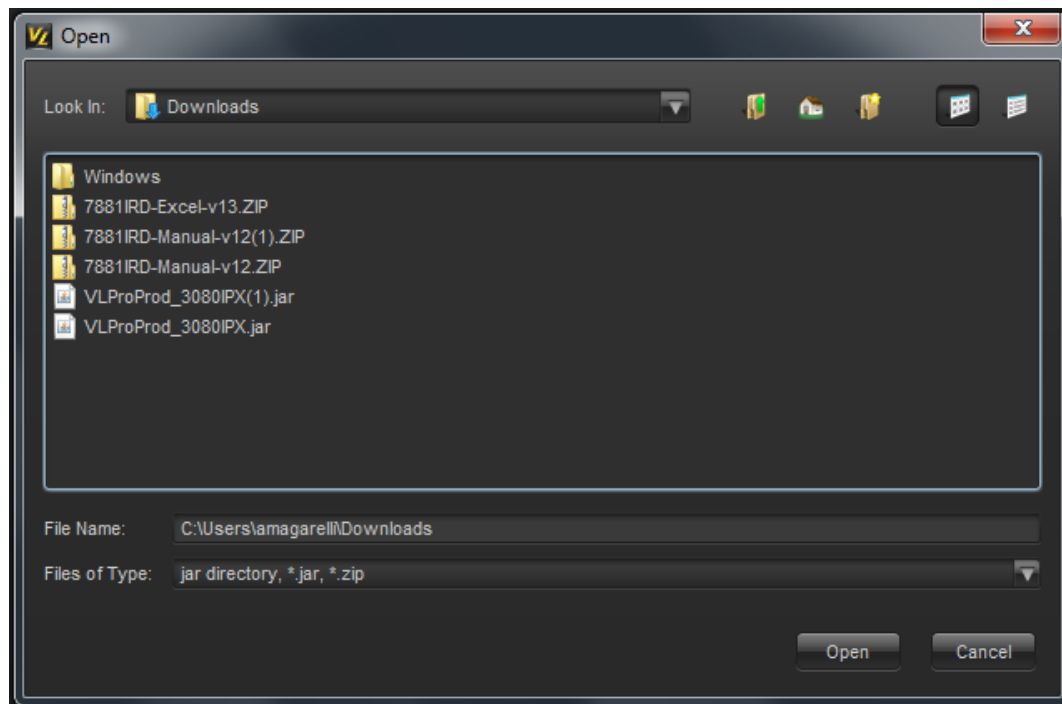

Figure 7-5: Jar File Directory Location

At this point the VLPro Server will send a message asking to Restart, select **Yes**. This will apply the update firmware to the 7708VB-8.
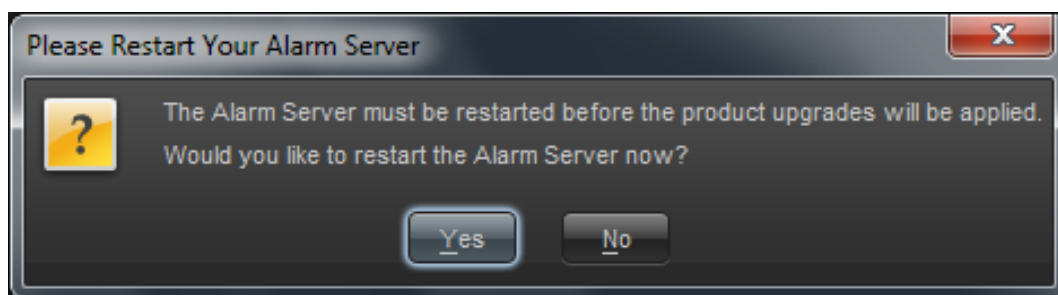

Figure 7-6: Alarm Server Restart Notification

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