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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First Release	Oct 08
1.1	Updated Network Ethernet Fill section	Oct 08

WARNING

Never look directly into an optical fiber. Non-reversible damage to the eye can occur in a matter of milliseconds.

1. OVERVIEW

The 7707VB-8-HS-OC192 is a *Vista*LINK® enabled SONET/SDH transceiver for up to six HD-SDI signals, eight SDI/SDTi/DVB-ASI signals, 10/100/1000 Ethernet or combinations thereof. The product acts as bi-directional Network Equipment, providing efficient use of SONET/SDH capacity in both directions.

All video signals may be asynchronous, and each output remains locked to its corresponding source. Video outputs are full-rate and uncompressed, with all horizontal and vertical ancillary data intact. Monitoring and control is provided locally at the card edge or remotely via *Vista*LINK®.

Features:

- Interfaces directly to SONET (OC-192) or SDH (STM-64) infrastructure.
- Flexibility to combine video and Ethernet signals to fill SONET/SDH capacity in each direction:
  - Six HD-SDI signals, plus one SDI/DVB-ASI or 10/100/1000 (FBM) Ethernet.
  - Five HD-SDI signals, plus three SDI/DVB-ASI and 10/100/1000 (FBM) Ethernet.
  - Four HD-SDI signals, plus four SDI/DVB-ASI and 10/100/1000 (full bandwidth) Ethernet.
  - Other combinations up to Eight SDI/DVB-ASI, plus 10/100/1000 (full bandwidth) Ethernet.
- Full-rate, uncompressed, asynchronous video channels with wide tolerance (+/-50ppm).
- Flexible Bandwidth Management (FBM) to control Ethernet bandwidth allocation.
- One loopback (output channel eight), user selectable for monitoring of inputs/outputs.
- Pluggable XFP fiber module permits wavelength swapping/sparing.
- SONET/SDH jitter performance with Stratum 3 clocking.
- Comprehensive signal and card status monitoring via four-digit card-edge display.
- *Vista*LINK® enabled for remote monitoring/control, with two possible interface methods:
  - Using local Ethernet connection on the rear-plate (has local SNMP Agent).
  - Using 7700FC *Vista*LINK® Frame Controller installed in 7700FR-C frame.
- Automatic coaxial equalization up to 100m at 1.485Gb/s (Belden 1694A or equivalent cable)
- Fully hot-swappable from front (main board) and rear (XFP fiber module) of frame.
- Optical output wavelengths of 1310nm, 1550nm, and range of CWDM and DWDM channels.
- Female LC Duplex fiber connector.

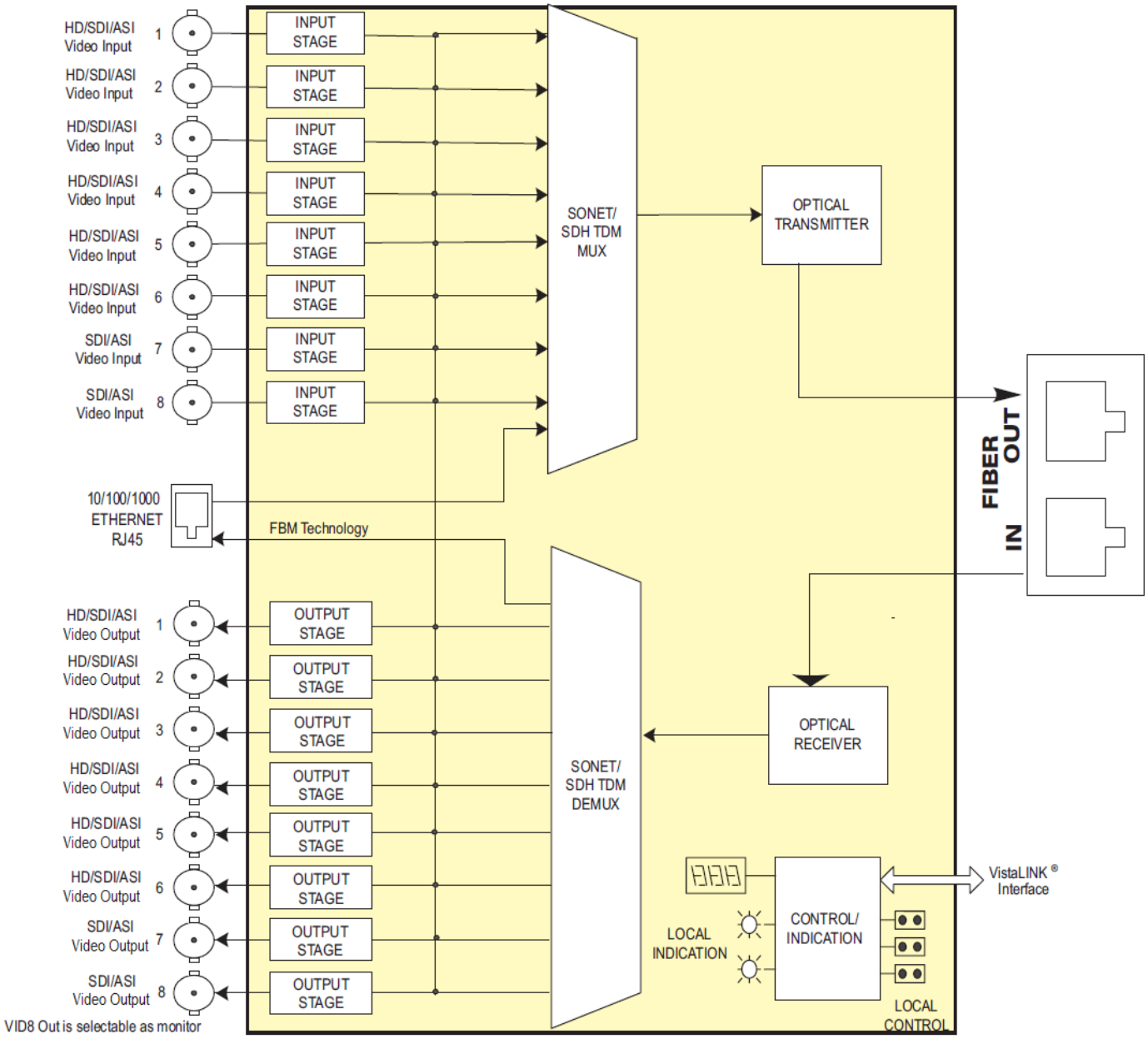


Figure 1-1: 7707VB-8-HS-OC192 Block Diagram

2. INSTALLATION

The 7707VB-8-HS-OC192 comes with a companion rear plate that has sixteen BNC connectors, two Ethernet connectors and one LC Duplex optical connector. For information on mounting the rear plate and inserting the module into the frame see section 3 of the 7700FR chapter.

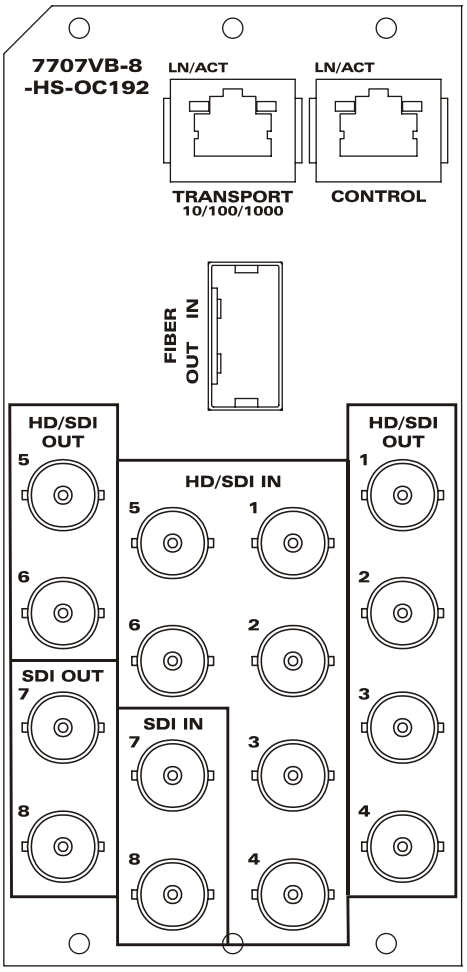


Figure 2-1: 7707VB-8-HS-OC192 Rear Panel

HD/SDI INPUTS: 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 OUTPUTS: 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).

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.

TRANSPORT 10/100/1000: RJ-45 connection for transport of 10/100/1000 Ethernet. Flexible Bandwidth Management (FBM) is used to control Ethernet bandwidth allocation (see section 4.2).

CONTROL: RJ-45 connection for SNMP monitoring and control via 10/100 Ethernet. The module can possess a local SNMP agent.

2.1. CARE AND HANDLING OF OPTICAL FIBER

2.1.1. Safety

CLASS 1 LASER PRODUCT

2.1.2. Assembly

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

2.1.3. 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.

Figure 2-2: Reproduction of Laser Certification and Identification Label

2.1.4. Handling and Connecting Fibers

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. SPECIFICATIONS

3.1. SERIAL VIDEO INPUT

Standards: SMPTE 259M-C, SMPTE 292M, DVB-ASI, SMPTE 305M (SDTi)
Number of Inputs: 8
Connector: 1 BNC per IEC 61169-8 Annex A
Equalization: Automatic to 250m @ 270Mb/s with Belden 1694A or equivalent cable
Return Loss: > 15dB up to 1.5Gb/s
Freq Offset Tolerance: ±50ppm

3.2. SERIAL VIDEO OUTPUT

Standards: SMPTE 259M-C, SMPTE 292M, DVB-ASI, SMPTE 305M (SDTi)
Number of Outputs: 8
Connector: 1 BNC per IEC 61169-8 Annex A
Signal Level: 800mV nominal
DC Offset: 0V ±0.5V
Rise and Fall Time: 900ps nominal @ 270 Mb/s
Overshoot: <10% of amplitude
Return Loss: >12dB
Alignment Jitter: <0.2 UI

3.3. OPTICAL OUTPUT

Number: 1
Standard: OC-192C/STM-64
Connector: Female LC Duplex
Return Loss: > 12dB
Fiber Size: 9µm core/125mm overall
Wavelengths: 1310nm, 1550nm

3.4. OPTICAL INPUT

Number of Inputs: 1
Standard: OC-192C/STM-64
Connector: Female LC Duplex
Operating Wavelength: 1310nm to 1550nm
Maximum Input Power:
Standard (+S) Receiver: -1dBm
High Sensitivity (+H) Receiver: -7dBm
Optical Sensitivity:
Standard +S) Receiver: -11dBm
High Sensitivity (+H) Receiver: -22dBm

3.5. ELECTRICAL

Voltage: +12V DC
Power: 25W

3.6. COMPLIANCE

Electrical Safety: CSA Listed to CSA C22.2 No. 60065-03 IEC 60065-(2001-12)
7th Edition Complies with CE Low voltage directive 93/68/EEC

Laser Safety: Complies with 24 CFR 1040.10 and 1040.11 except for deviations pursuant to LN No. 50, dated July 6, 2001 Complies with IEC 0825-1, Am. 2

EMI/RFI: Complies with FCC regulations for class A devices
Complies with EU

3.7. PHYSICAL

Number of slots: 3

4. STATUS INDICATORS AND DISPLAYS

The 7707VB-8-HS-OC192 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.

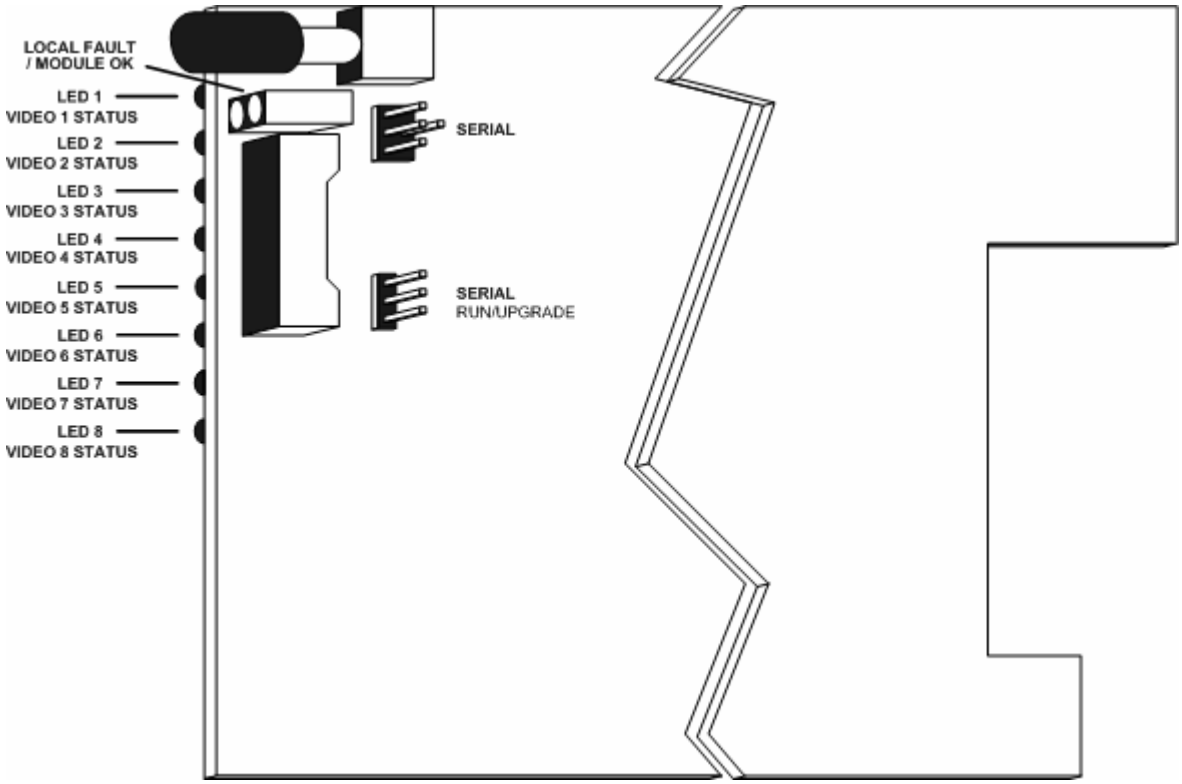


Figure 4-1: Location of Status Indicators, Jumpers and Controls

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 4.3.14.

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.

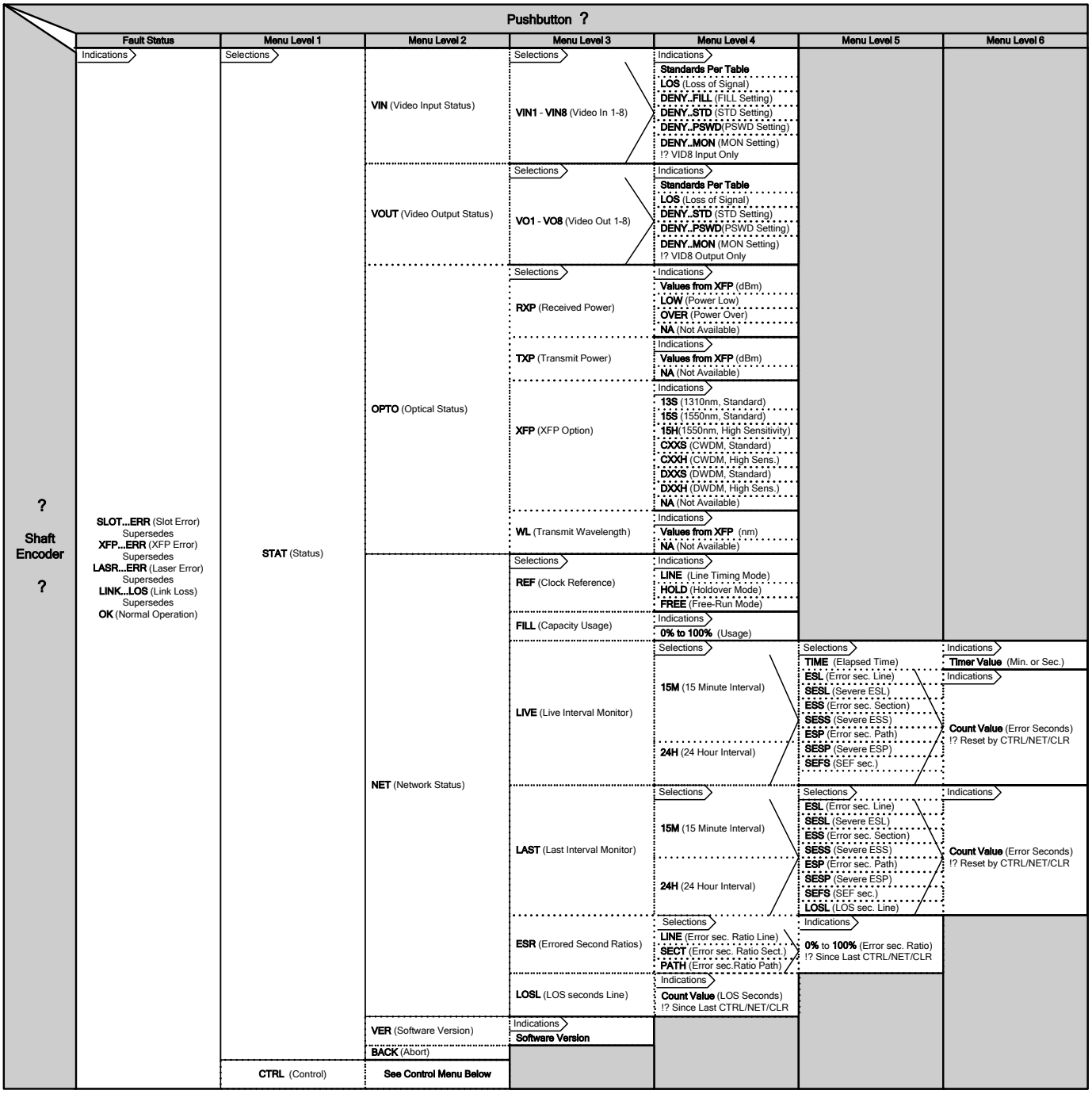


Figure 4-2: Card Edge Menu Structure (Status Section)

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.

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.

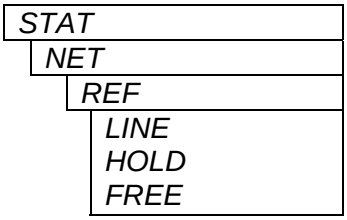
STAT
OPTO
WL
Values from XFP
NA

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 Network Clock Reference

Menu selection can display the network reference clock automatically selected by the module. To display the network reference clock from the **STAT** menu, use the shaft encoder/pushbutton to select the **NET** menu item and then choose the **REF** menu item. The following indications are possible:



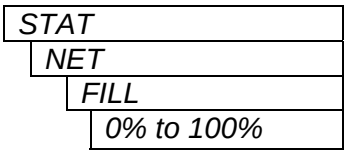
LINE The selected network reference clock derived from the SONET/SDH input.

HOLD The selected network reference clock is a local, Stratum 3 holdover clock.

FREE The selected network reference clock is a local, free-running clock.

4.3.9. Displaying the Link Capacity Usage (Fill)

Menu selection can display the network capacity usage of the SONET/SDH 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.



The following indications are possible:

0% to **100%** Used network capacity of SONET/SDH output (%).

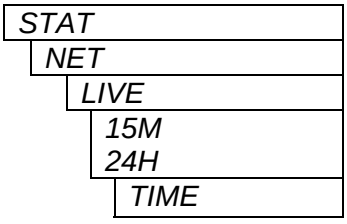
The indicated value will include any fixed cap/reserve values configured by the CTRL/NET/FILL menu, even if the cap/reserve is under-utilized due to lower rate or absent input. It will not include capacity that is dynamically allocated to Ethernet when CTRL/NET/FILL/ETH/AUTO is selected.

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.

4.3.10. Displaying the Live Interval Performance Counters

This menu displays Live interval performance counters, useful for monitoring network integrity. To display these performance counters from the **STAT** menu, use the shaft encoder/pushbutton to select the **NET** menu item and then choose the **LIVE** menu item. The module records Live performance over 15 minute and 24 hour intervals, which restart once expired. The corresponding status is displayed by selecting either the **15M** or **24H** menu item. To display the current timer value, select **TIME**.



The following indications are possible:

0 to **899/1440** Timer value in seconds or minutes, for 15M or 24H timers, respectively.

The following menu provides selections that are also available when the TIME menu option is not selected, to display performance counts:

- *STAT*
  - *NET*
    - *LIVE*
      - *15M*
      - *24H*
        - *ESL*
        - *SESL*
        - *ESS*
        - *SESS*
        - *ESP*
        - *SESP*
        - *SEFS*

ESL	Errored Seconds Line – Seconds having detected B2 errors.
SESL	Severe Errored Seconds Line (threshold set by CTRL/NET/SETH/SESL).
ESS	Errored Seconds Section – Seconds having detected B1 errors.
SESS	Severe Errored Seconds Section (threshold set by CTRL/NET/SETH/SESS).
ESP	Errored Seconds Path – Seconds having detected B3 errors.
SESP	Severe Errored Seconds Path (threshold set by CTRL/NET/SETH/SESP).
SEFS	Severe Errored Frame Seconds – Seconds having severe errored frames.

Please note to clear all timers and counters, select CTRL/NET/CLR/YES.

4.3.11. Displaying the Last Interval Performance Counters

This menu displays Last interval performance counts recorded each time the Live Interval counters expire. To display these performance counts from the **STAT** menu, use the shaft encoder/pushbutton to select the **NET** menu item and then choose the **LAST** menu item. The module records Last interval counts for 15 minute and 24 hour intervals. The corresponding status is displayed by selecting either the **15M** or **24H** menu item. The following selections are available to display performance counts:

- *STAT*
  - *NET*
    - *LAST*
      - *15M*
      - *24H*
        - *ESL*
        - *SESL*
        - *ESS*
        - *SESS*
        - *ESP*
        - *SESP*
        - *SEFS*

ESL	Errored Seconds Line – Seconds having detected B2 errors.
SESL	Severe Errored Seconds Line (threshold set by CTRL/NET/SETH/SESL).
ESS	Errored Seconds Section – Seconds having detected B1 errors.
SESS	Severe Errored Seconds Section (threshold set by CTRL/NET/SETH/SESS).
ESP	Errored Seconds Path – Seconds having detected B3 errors.
SESP	Severe Errored Seconds Path (threshold set by CTRL/NET/SETH/SESP).
SEFS	Severe Errored Frame Seconds – Seconds having severe errored frames.

Please note to clear all timers and counters, select CTRL/NET/CLR/YES.

4.3.12. Displaying the Errored Second Ratios

Menu selection can display the Errored Second Ratios calculated over the duration since CTRL/NET/CLR/YES was last selected. To display these ratios from the **STAT** menu, use the shaft encoder/pushbutton to select the **NET** menu item and then choose the **ESR** menu item. The following selections are available to display Errored Second Ratios:

- *STAT*
  - *NET*
    - *ESR*
      - *LINE*
      - *SECT*
      - *PATH*
        - *0 to 100%*

LINE	Errored Seconds Ratio for Line (%). Based on B2 error detection.
SECT	Errored Seconds Ratio for Section (%). Based on B1 error detection.
PATH	Errored Seconds Ratio for Path (%). Based on B3 error detection.

Please note to clear all timers and counters, select CTRL/NET/CLR/YES.

4.3.13. Displaying the LOS Second Line Counter

This menu displays a LOS Seconds Line counter recorded over the duration since CTRL/NET/CLR/YES was last selected. To display the LOSSL counter from the **STAT** menu, use the shaft encoder/pushbutton to select the **NET** menu item and then choose the **LOSL** menu item.

- *STAT*
  - *NET*
    - *LOSL*
      - *Count Value*

The following indications are possible:

0 to **9999**	LOS Seconds Line count value.

Please note to clear all timers and counters, select CTRL/NET/CLR/YES.

4.3.14. 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 4.4.13.

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

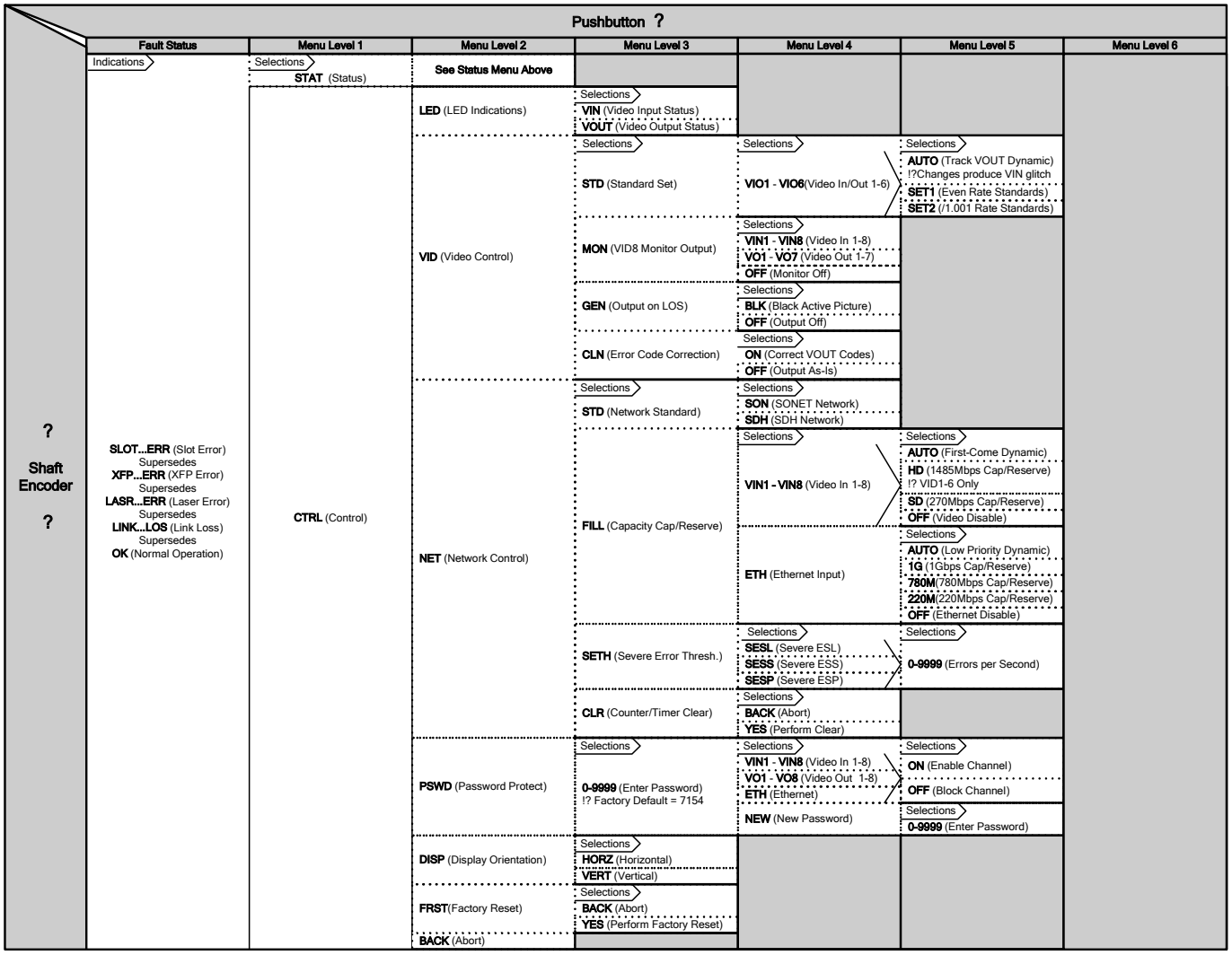


Figure 4-3: Card Edge Menu Structure (Control Section)

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 7707VB-8-HS-OC192 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 SONET/SDH.
VO1	Output Video 1 signal received from SONET/SDH.
VO2	Output Video 2 signal received from SONET/SDH.
VO3	Output Video 3 signal received from SONET/SDH.
VO4	Output Video 4 signal received from SONET/SDH.
VO5	Output Video 5 signal received from SONET/SDH.
VO6	Output Video 6 signal received from SONET/SDH.
VO7	Output Video 7 signal received from SONET/SDH.
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 Standard

The network standard can be controlled using menu selections. To configure the network standard from the **CTRL** menu, use the shaft encoder/pushbutton to select the **NET** menu item and then choose the **STD** menu item.

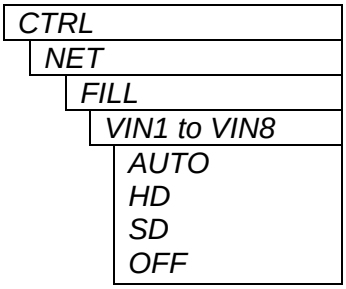
CTRL
NET
STD
SON
SDH

The following selections are available:

SON	Interface to SONET network.
SDH	Interface to SDH network

4.4.7. 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**.



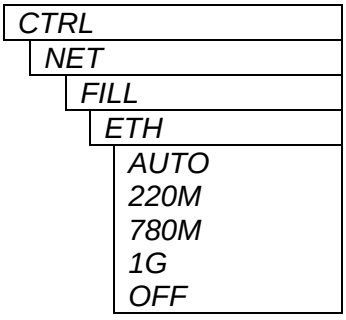
The following selections are available:

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 SONET/SDH 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.

4.4.8. 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:



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.

4.4.9. Controlling the Severe Errored Second Threshold

The Severe Errored Second (SES) threshold can be controlled using menu selections. To configure the SES threshold from the **CTRL** menu, use the shaft encoder/pushbutton to select the **NET** menu item and then choose the **SETH** menu item.

- *CTRL*
  - *NET*
    - *SETH*
      - *SESL*
      - *SESS*
      - *SESP*
        - *0-9999*

The following selections are available:

SESL	Error threshold (errors/second) for SESL counters.
SESS	Error threshold (errors/second) for SESS counters.
SESP	Error threshold (errors/second) for SESP counters.

For information about the SESL, SESS, and SESP counters, refer to section 4.3.10.

4.4.10. Controlling the Counter/Timer Clear

The counter/timer clear can be controlled using menu selections. To configure the counter/timer clear from the **CTRL** menu, use the shaft encoder/pushbutton to select the **NET** menu item and then choose the **CLR** menu item.

- *CTRL*
  - *NET*
    - *CLR*
      - *YES*
      - *BACK*

The following selections are available:

YES	Clears all counters, timers, and ratios recorded under the STAT/NET menu items.
BACK	Abort clear.

For information about the cleared counters, timers and ratios, refer to sections 4.3.10 through 4.3.13.

4.4.11. 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**).

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

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

5. JUMPERS AND LOCAL CONTROLS

Several jumpers, located at the front of the module are used to preset various operating modes. Figure 4-1 shows the location of the jumpers.

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 7707VB-8-HS-OC192 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 7707VB-8-HS-OC192'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 7707VB-8-HS-OC192 and 7707VR-8-HS cards), 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. *VISTA*LINK® MONITORED PARAMETERS

The following parameters can be remotely monitored through the *Vista*LINK® interface.

Parameter	Description
Video Input Status	Indicates video input status/standard
Video Output Status	Indicates video output status/standard
Optical Receive Power	Indicates optical receive power
Optical Transmit Power	Indicates optical transmit power
Optical XFP Option	Indicates installed optical XFP option
Optical Transmit Wavelength	Indicates optical transmit wavelength
Network Clock Reference	Indicates the auto-selected network clock reference
Network Capacity Fill	Indicates the network capacity usage (Fill)
Network 15 Minute Timer	Indicates the network 15 m. timer
Network 24 Hour Timer	Indicates the network 24 h. timer
Network Live 15 Minute Counters	Indicates live 15 m. performance monitor counters
Network Live 24 Hour Counters	Indicates live 24 h. performance monitor counters
Network Last 15 Minute Record	Indicates last 15 m. performance monitor record
Network Last 24 Hour Record	Indicates last 24 h. performance monitor record
Network Errored Seconds Ratios	Indicates network Errored Seconds Ratios
Network LOS Seconds Line Counter	Indicates network LOSSL counter

Table 6-1: *Vista*LINK® Monitored Parameters

6.3. *VISTA*LINK® CONTROLLED PARAMETERS

The following parameters can be remotely controlled through the *Vista*LINK® interface.

Parameter	Description
Video Standard	Controls video standard restrictions
Video 8 Monitor Output	Controls video 8 monitor output
Video Generation on LOS	Controls video generation on LOS
Video Error-code Correction	Controls video CRC/EDH code correction
Network Standard	Controls network standard
Network Video Fill	Controls network video fill (bandwidth allocation)
Network Ethernet Fill	Controls network Ethernet fill (bandwidth allocation)
Network Sever Errored Second (SES) Threshold	Controls network SES threshold
Network Timer/Counter Clear	Controls network timer/counter clear
Channel Protection Enables	Controls channel protection enables
Channel Protection Password	Controls channel protection password

Table 6-2: *Vista*LINK® Controlled Parameters

6.4. *VISTA*LINK® TRAPS

The following traps can be remotely reported through the *Vista*LINK® interface.

Trap	Description
Slot Status	Flags Slot Status fault
XFP Status	Flags XFP Status fault
Laser Status	Flags Laser Status fault
Link LOS	Flags Link LOS fault
Video Input LOS	Flags Video Input LOS
Video Output LOS	Flags Video Output LOS
Video Input Bit-Error	Flags Video Input Bit-Error
Video Input Deny Fill	Flags Video Input Deny Fill fault
Video Input Deny Standard	Flags Video Input Deny Standard fault
Video Input Deny Password	Flags Video Input Deny Password fault
Video Output Deny Standard	Flags Video Output Deny Standard fault
Video Output Deny Password	Flags Video Output Deny Password fault
Line Lock Reference	Flags Network Line Lock Reference fault
SESL (Severe Errored Seconds Line)	Flags SESL fault
SESS (Severe Errored Seconds Section)	Flags SESS fault
SESP (Severe Errored Seconds Path	Flags SESP fault
Optical Input Power Threshold	Flags Optical Input Power Threshold fault

Table 6-3: *Vista*LINK® Traps