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REVISION HISTORY

REVISION	DESCRIPTION	DATE
0.1	Preliminary version	Aug 05
0.2	Update manual with correct functionality	Mar 06
0.3	General format cleanup. Updated VistaLINK® description.	June 09

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1. OVERVIEW

The 7760VMS-HD is a Video Monitoring tool for two 1.5Gb/s HDTV serial digital video signals. The 7760VMS-HD has a HDTV split-screen output from two input signals and also provides a monitoring downconverted split screen. The 7760VMS-HD accepts all the popular international SMPTE 292M video formats. This module is useful in mobile broadcast vehicles and broadcast plants to compare primary and secondary video feeds.

This 7700 series module provides 3 reclocked primary outputs and 1 reclocked secondary output. The 7760VMS-HD occupies two card slots in the 3RU frame which will hold up to 7 modules, or 1 slot in the 1RU frame which will hold up to 3 modules.

Features:

- Two Serial digital 1.5Gb/s HD inputs per SMPTE 292M
- 3 Reclocked DA outputs from input 1 and 1 Reclocked DA output from input 2
- Mixer takes left half of input 1 and right half of input 2 and keys them together to form the HD Program Output
- Monitoring downconverter for SDI monitoring of split signal
- Occupies two card slots in the 3RU frame, which will hold up to 7 modules, or the 1RU frame, which will hold up to three modules
- Card edge LEDs indicate module health, video present
- Tally output on Frame Status bus upon loss of input signals
- VistaLINK® -capable offering remote control and configuration capabilities via SNMP (using VistaLINK® PRO, 9000NCP or 9000NCP2 Network Control Panel) is available when modules are used with the 3RU frame and a 7700FC VistaLINK® Frame Controller module in slot 1 of the frame

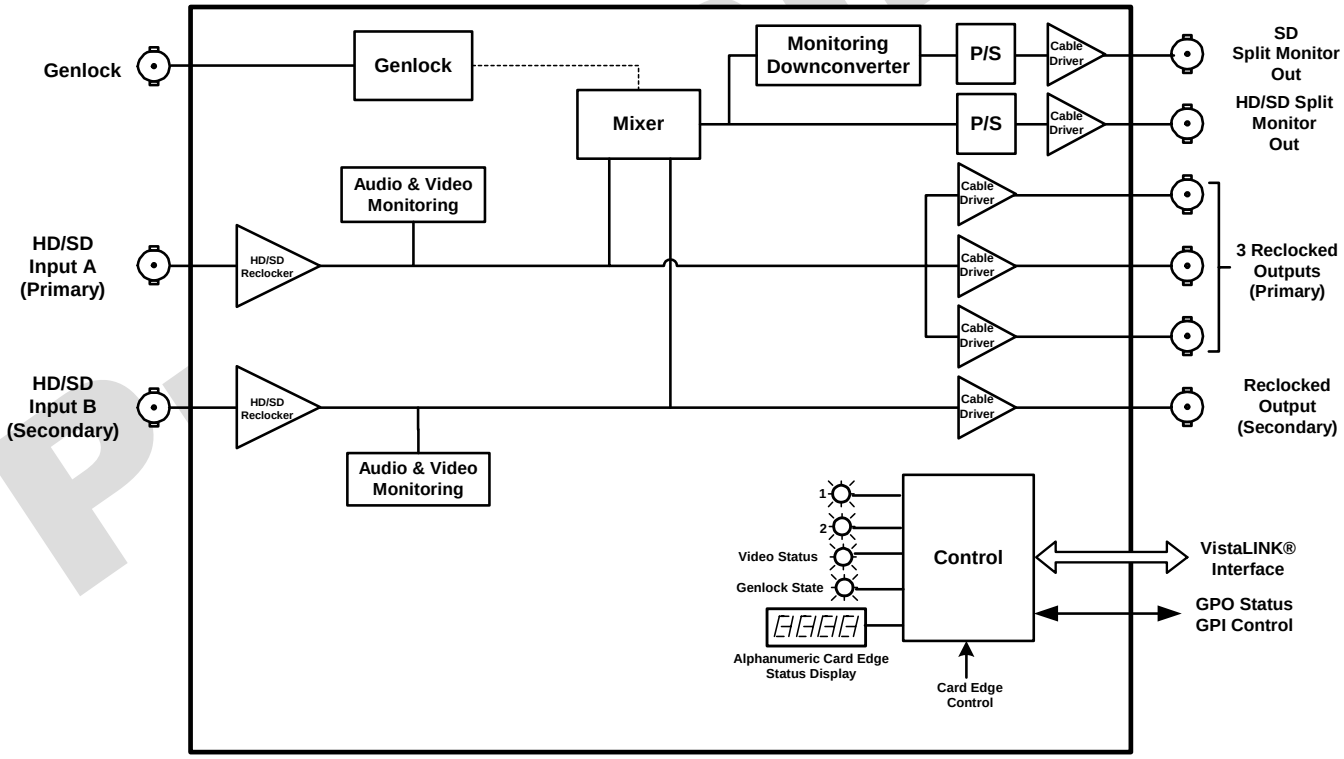


Figure 1-1: 7760VMS-HD Block Diagram

2. INSTALLATION

The 7760VMS-HD comes with a companion rear plate that occupies two slots in the frame. For information on inserting the module into the frame see the 7700FR chapter section 3.

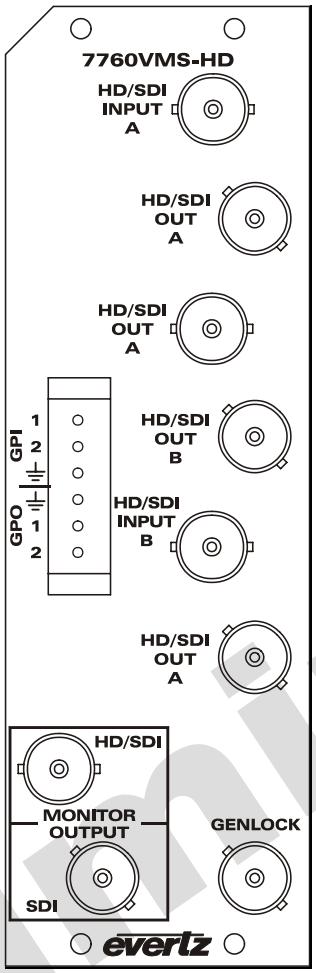


Figure 2-1: 7760VMS-HD Rear IO Module

2.1. HD AND SD VIDEO INPUTS AND OUTPUTS

HD/SDI INPUT A, B: Input BNC connectors for 10-bit serial digital signals compatible with the SMPTE 292M or SMPTE 259M-C standards. The **HD/SDI INPUT A** connector is the *Primary* input and the **HD/SDI INPUT B** connector is for the *Secondary* input. Both input video feeds must be clock-locked to the genlock signal in order to properly split the picture.

HD/SDI OUT A: These three BNC connectors are reclocked outputs from the **HD/SDI INPUT A** connector.

HD/SDI OUT B: This BNC connector is a reclocked output from the **HD/SDI INPUT B** connector.

HD/SDI MONITOR OUTPUT: This BNC connector provides a split screen output in the same video standard as the input video. The left portion of the picture comes from Input A and the right portion of the picture comes from Input B.

SDI MONITOR OUTPUT: This BNC connector provides a downconverted version of the signal on the **HD/SDI MONITOR OUTPUT** BNC. When the input video standard is standard definition the downconverter is bypassed and this BNC connector become an additional monitor output.

2.2. GENLOCK REFERENCE

For proper synchronization of the output video the module must be locked to a genlock signal of the output video format. In addition, both input video feeds must be clock-locked to the genlock signal in order to properly split the picture.

GENLOCK: The genlock signal may be NTSC or PAL colour black or tri-level sync (the same frame rate as the input video format). The reference input type must be selected in the menu. Jumper J17 on the 7760VMS-HD module selects whether the selected reference input is terminated to 75 ohms (default) or high impedance.

2.3. GENERAL PURPOSE INPUTS & OUTPUTS

The 6 pin terminal strip has 2 general purpose inputs and 2 general purpose outputs. The GPI inputs are active low. This means that if you leave an input floating (not connected) then it will not be activated. The user can activate GPIs simply by connecting the GPI input pins to Ground using a button, switch, relay or an open collector transistor. The inputs are internally pulled up to either +5 or +12 volts DC set by jumper J16

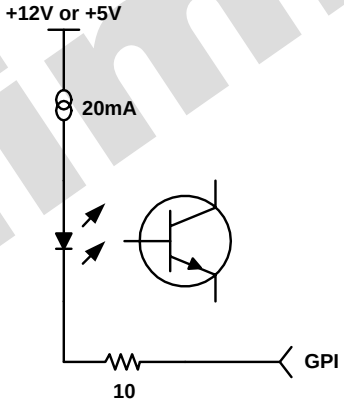


Figure 2-2: Typical GPI Circuitry

The GPO outputs are internally pulled up to +3.3 volts DC. Figure 2-3 shows the circuitry for each of the I/O pins.

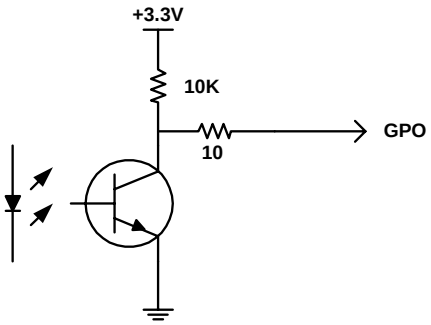


Figure 2-3: Typical GPO Circuitry

The GPIO cables can be secured into the removable portion of the terminal strips using a small screwdriver. The removable part of the terminal strip is then inserted into the rear panel and secured using the hold down screws.

3. SPECIFICATIONS

3.1. SERIAL VIDEO INPUTS

Standard:	1.485 Gb/sec SMPTE 292M (1080i/50, 1080i/59.94, 720p/50, and 720p/59.94) or 270 Mb/s SMPTE 259M (525/59.94 and 625/50) auto-detects standard SMPTE 260M, SMPTE 274M, SMPTE 296M, SMPTE 349M
Connector:	2 BNC per IEC 61169-8 Annex A
Input Equalization:	Automatic to 100m @ 1.5Gb/s with Belden 1694 or equivalent cable (Input A) Automatic to 75m @ 1.5Gb/s with Belden 1694 or equivalent cable (Input B)
Return Loss:	>20 dB up to 270 MHz >12 dB up to 1.5GHz

3.2. RECLOCKED SERIAL VIDEO OUTPUTS

Standard:	Same as input
Number of Outputs:	3 outputs from input A, 1 output from input B,reclocked
Connector:	BNC per IEC 61169-8 Annex A
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	200ps nominal for HD 600ps nominal for SD
Overshoot:	<10% of amplitude
Return Loss:	>20 dB up to 270 MHz > 15 dB at 1.5 Gb/s
Jitter:	< 0.16UI (HD) or < 0.10UI (SD)

3.3. DOWNCONVERTED SERIAL VIDEO OUTPUT

Standard:	SMPTE 259M-C (270 Mb/s)
Number of Outputs:	1
Connector:	BNC per IEC 61169-8 Annex A
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	600ps nominal
Overshoot:	<10% of amplitude
Return Loss:	> 15 dB at 270 Mb/s
Jitter:	< 0.2 UI

3.4. GENLOCK INPUT

Type:	NTSC or PAL Colour Black 1 V p-p HD Tri-level Sync
Connector:	BNC per IEC 61169-8 Annex A
Termination:	High impedance or internal 75 ohm termination (jumper selectable)

3.5. GPIO CONTROL PORT

Number of Inputs: 2
Number of Outputs: 2
Type: Opto-isolated, active low with internal pull-ups to +5 or +12V (jumper settable)
Connector: 6 pins removable terminal block
Signal Level: closure to ground

3.6. ELECTRICAL

Voltage: +12VDC
Power: 12 Watts
EMI/RFI: Complies with FCC regulations for class A devices
Complies with EU EMC directive

3.7. PHYSICAL

7700 frame mounting:
Number of slots: 2

7701 frame mounting:
Number of slots: 1

4. STATUS INDICATORS

The 7760VMS-HD has 9 LED Status indicators on the main circuit board front card edge to show operational status of the card at a glance. Figure 7-1 shows the location of the LEDs and card edge controls.

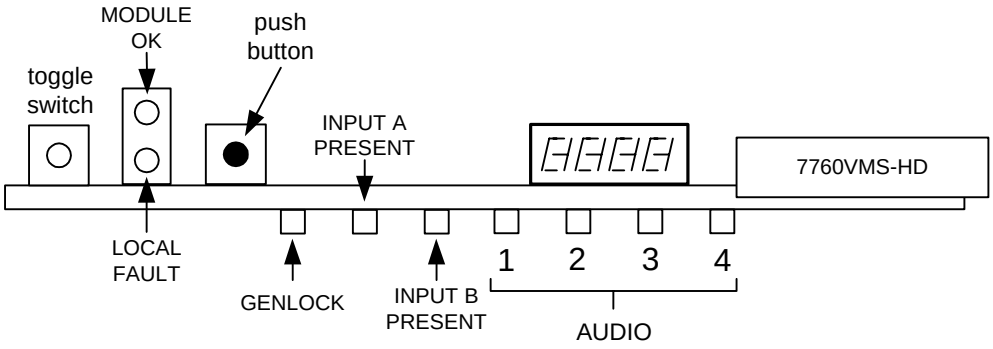


Figure 4-1: Status LED locations

Two large LEDs on the front of the board indicate the general health of the module

LOCAL FAULT: This Red LED indicates poor module health and will be ON during the absence of a valid input signal (on Input A or B) or if a local input power fault exists (i.e.: a blown fuse). The LOCAL FAULT indication can also be reported to the frame through the FRAME STATUS jumper.

MODULE OK: This Green LED indicates good module health. It will be ON when a valid input signal on Inputs A **and** B is present, and board power is good.

There are 7 small LEDs near the middle edge of the board that indicate the status of 7760VMS-HD.

GENLOCK PRESENT: This Green LED will be ON when the selected genlock input is present. It will be OFF, if the genlock input is not present.

INPUT A PRESENT: This Green LED will be ON when there is a valid input signal present on module input A. The LED will be OFF, if input signal is invalid or missing.

INPUT B PRESENT: This Green LED will be ON when there is a valid input signal present on module input B. The LED will be OFF, if input signal is invalid or missing.

4.1. AUDIO STATUS LEDs

Four LEDs located on the lower edge of the module (near the card extractor) indicate which audio groups are present in the input video. Audio group LED 1 is located closest to the center of the module.

Audio LED	Colour	Audio Group Status
1	Off	Neither group 1 or group 2 present on input A video.
	Flashing	Only group 1 or group 2 present on input A video.
	Green	Both group 1 and group 2 present on input A video.
2	Off	Neither group 3 or group 4 present on input A video.
	Flashing	Only group 3 or group 4 present on input A video.
	Green	Both group 3 and group 4 present on input A video.
3	Off	Neither group 1 or group 2 present on input B video.
	Flashing	Only group 1 or group 2 present on input B video.
	Green	Both group 1 and group 2 present on input B video.
4	Off	Neither group 3 or group 4 present on input B video.
	Flashing	Only group 3 or group 4 present on input B video.
	Green	Both group 3 and group 4 present on input B video.

Table 4-1: Audio Group Status LEDs

5. CARD EDGE CONTROLS

The 7760VMS-HD is equipped with an 8 position DIP switch, toggle switch, push button and a 4 character dot matrix display to allow the user to select various functions. The DIP switch provides basic configuration functions that will normally be set only once such as video standard selection, dot matrix display orientation, and VistaLINK® remote control selection. All other card functions are available through a menu system controlled by the toggle switch and push button and displayed on the 4 character dot matrix display. (See section 6.2)

DIP switch 1 is located at the top of the DIP switch (farthest from to the card ejector). Table 5-1 gives an overview of the DIP switch functions. Sections 5.1 give a detailed description of each of the DIP switch functions.

There are two types of DIP switches possible. For slide switches the On (closed) position is farthest from the front edge of the printed circuit board. For 'piano key' switches the On (closed) position is down or closest to the printed circuit board.

DIP Switch	Function
1	VistaLINK® or Local Control Selection
2	Reserved – set to Off
3	
4	
5	
6	
7	
8	

Table 5-1: DIP Switch Functions

5.1. SELECTING WHETHER THE MODULE WILL BE CONTROLLED FROM THE LOCAL CONTROLS OR THROUGH THE VistaLINK® INTERFACE

The 7760VMS-HD can be controlled using the card edge DIP switches and menu system or remotely via SNMP using VistaLINK® PRO. See section 8 for a full description of the parameters that can be monitored or controlled using VistaLINK®. VistaLINK® control is only available when the card is installed in the 3RU 7700FR-C frame and a 7700FC VistaLINK® Frame Controller card is installed in slot 1 of the frame.

DIP switch 1 is used to enable or disable VistaLINK® control.

DIP 1	CONTROL MODE
Off	Local control mode. The module will be controlled using the DIP switches and menu system
On	VistaLINK® control mode. The module will be controlled remotely through SNMP.

Table 5-2: VistaLINK® Mode Switch Settings

6. CARD EDGE MENUS

6.1. NAVIGATING THE CARD EDGE MENU SYSTEM

Status monitoring and control over the card's parameters is provided via the 4-digit alphanumeric display located on the card edge. The toggle switch and pushbutton are used to navigate through a menu system to set various parameters for the module. In Status mode the menu system provides status of the card only. To enter the menu system, press the pushbutton. This will bring you to the main setup menu where you can use the toggle switch to move up and down the list of available sub menus. Once you have chosen the desired sub menu, press the pushbutton to select the next menu level.

Once you are in the sub menu, there will be a list of 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 lift 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.

When you have stopped at the desired value, depress the pushbutton. This will update the parameter to the selected value and return to the sub menu. To change another parameter, press the pushbutton to enter the main menu system again and continue selecting and adjusting other parameters.

Each of the menu items is described in the following sections, with an explanation of what each choice does. Throughout the descriptions of the menu items, the default values are shown in underlined text.

6.2. CARD EDGE SETUP MENU

The following is a brief description of the top level of the menu tree that appears when you enter the card edge setup menu. Selecting one of these items will take you down into the next menu level. The details of the each of the displays are described in the sections 6.2.1 to 6.2.8.

BACK	Returns the display back to monitoring mode
GTSD	Selects the genlock standard
VIDP	Selects the behaviour of the monitor output when there is a loss of video
ASP1	Selects the aspect ratio for monitor output
PCL1	Selects the panel colours for monitor output
HSPL	Sets the horizontal split line
VSPL	Sets the vertical split line
DISP	Sets the orientation of the display
VER	Display the firmware version number

6.2.1. Selecting the Reference Input Type

GTSD
525
7P50
7P59
1I50
1I59
625

This control selects the genlock reference type being used.
525/59.94 colour black
720p/50 Tri-level sync
720p/59.94 Tri-level sync
1080i/50 Tri-level sync
1080i/59.94 Tri-level sync
625/50 colour black

6.2.2. Configuring the Behaviour of the Split Screen Output on Loss of Video

VIDP
PASS
BLUE

This control sets the behaviour of the Split Screen output when there is loss of input video.

PASS – This will simply pass on the error video signal (green screen).
BLUE – This will display a blue screen on the side of the input that is missing.

6.2.3. Configuring the Downconverted Split Screen Output Aspect Ratio

ASP1
16:9
4:3Q
4:3S

This control selects the aspect ratio setting for the Downconverted Split Screen output.

16:9 - 16:9 Letterbox
4:3Q - 4:3 anamorphic squeeze
4:3S - 4:3 side cut (sides are removed)

6.2.4. Configuring the Downconverted Split Screen Output Panel Colours

PCL1
BLUE
WHIT
GREN
RED
BLCK

This control selects the panel colours for the downconverted Split Screen output.

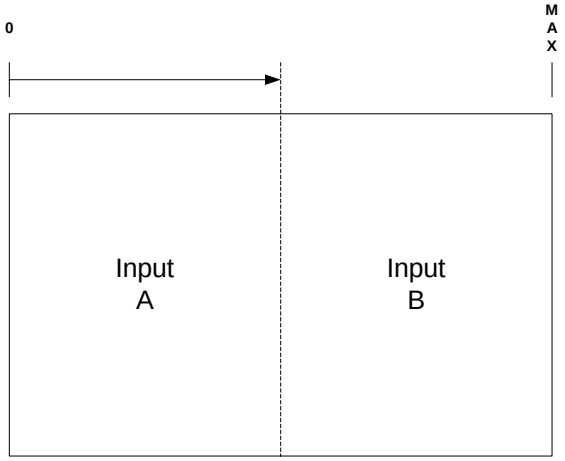
The side panels or letterbox space will be filled in with selected colour.

6.2.5. Configuring the Horizontal Split Line

HSPL
0 to Max

This controls the split line horizontally between inputs A and B.

The HSPL value is an offset that is applied from the leftmost position (vertically). The maximum value that HSPL can be depends on the video format of the input signals.

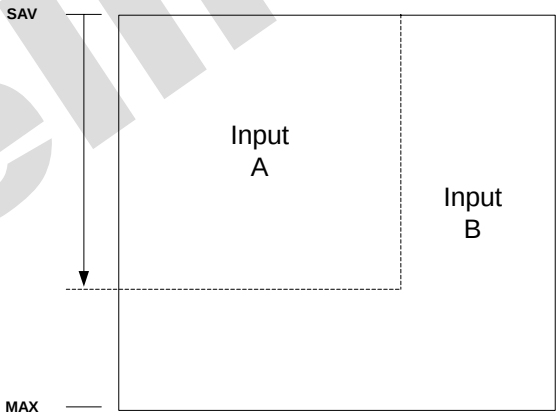


6.2.6. Configuring the Vertical Split Line

VSPL
SAV to Max

This controls the split line vertically between inputs A and B.

The VSPL value is an offset that is applied from the start of active video (SAV). The maximum value that VSPL can be depends on the video format of the input signals.



6.2.7. Configuring the Orientation of the Text On the Display

DISP
VERT
HORZ

This control allows the user to select a horizontal or vertical orientation for the displays to accommodate mounting the module in the 3RU or 1RU frames.

6.2.8. Viewing the Firmware Version

VER
x.xx BUILD xxxx

This control shows the firmware version and build number of the firmware. The message will scroll across the display.

For example: **`VER 1.0 BLD 067`**

7. LOCATION OF LEDS AND JUMPERS

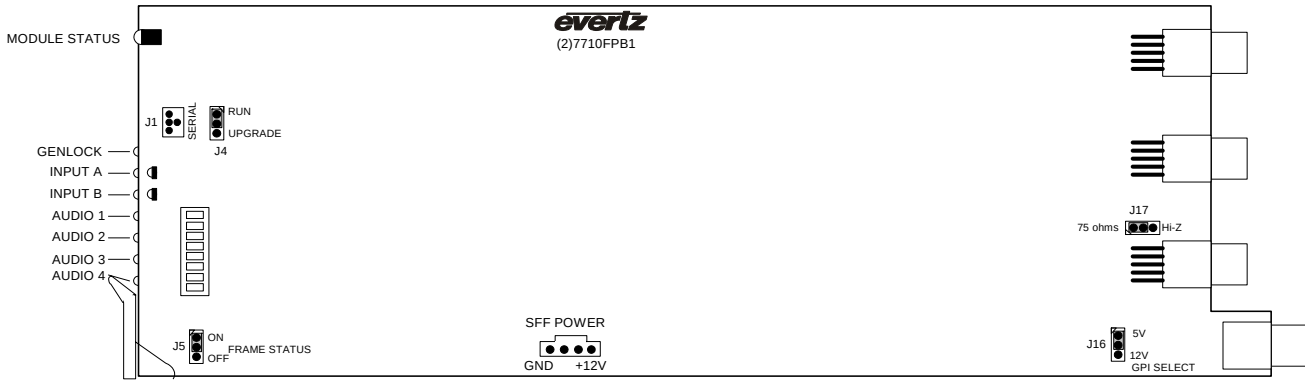


Figure 7-1: LED and Jumper Locations

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

The FRAME STATUS jumper J5, located at the front of the module 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 this module with the frame status indicators (on the power supply's FRAME STATUS LED's and on the Frame's Fault Tally output) install this jumper in the On position.

When this jumper is installed in the Off position local faults on this module will not be monitored.

7.2. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

UPGRADE: The UPGRADE jumper J4 located at the front edge of the module, near the serial port header, is used when firmware upgrades are being done to the module. For normal operation it should be installed in the *RUN* position. See the *Upgrading Firmware* section in the front of the binder for more information.

To upgrade the firmware in the module pull it out of the frame. Move Jumper J4 into the *UPGRADE* position. Install the Upgrade cable provided (located in the vinyl pouch in the front of this manual) onto header J24 near the card ejector. Re-install the module into the frame. Run the upgrade as described in the *Upgrading Firmware* section in the front of the binder. Once the upgrade is completed, remove the module from the frame, move J4 into the *RUN* position, remove the upgrade cable and re-install the module. The module is now ready for normal operation.

Note that the baud rate for firmware upgrades is 115200 baud.

7.3. SELECTING WHETHER THE GENLOCK REFERENCE INPUT IS TERMINATED

TERM: The TERM jumper J17 located at the rear of the module is used to terminate the genlock loop input. Then it is in the 75R position a 75 ohm terminating resistor will connect the input to ground. When it is in the HI-Z position the genlock input will be high impedance.

7.4. CONTROLLING GPI PULLUP VOLTAGE

Jumper J16, located at the rear of the module controls whether the GPI inputs are pulled up to 5 volts or 12 volts.

GPI SELECT: To pull the GPI inputs to 12 volts install this jumper in the position closest to edge of the module.

To pull the GPI inputs to 5 volts install this jumper in the position closest to centre of the module.

8. VISTALINK® REMOTE MONITORING/CONTROL

8.1. What is VistaLINK®?

VistaLINK® is Evertz' 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 VistaLINK® enabled fiber optic products.

2. Managed devices, (such as 7760VMS-HD), 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 VistaLINK® network, see the 7700FC Frame Controller chapter.

8.2. VistaLINK® MONITORED PARAMETERS

The following parameters can be remotely monitored through the VistaLINK® interface.

Parameter	Description
Video Standard Input A	Indicates video standard of input A signal
Video Standard Input B	Indicates video standard of input B signal
Card Type	Indicates the card type (e.g. 7760VMS-HD)

Table 8-1: VistaLINK® Monitored Parameters

8.3. VistaLINK® CONTROLLED PARAMETERS

Parameter	Description
Genlock Standard	Sets the Genlock video standard
Monitoring Output LOV Behaviour	Sets the Split Screen behaviour when there is a loss of input video
Monitoring Output Aspect Ratio	Sets the aspect ratio of the downconverted Split Screen output
Monitoring Output Panel Colour	Sets the panel colour of the downconverted Split Screen output
Horiztonal Split Line	Sets the horizontal split line between inputs A and B
Vertical Split Line	Sets the vertical split line between inputs A and B

Table 8-2: VistaLINK® Controlled Parameters

8.4. VistaLINK® TRAPS

Trap	Description
Input A Video Invalid	Triggers when Input A video is missing or invalid
Input B Video Invalid	Triggers when Input B video is missing or invalid
Genlock Missing	Triggers when genlock is missing

Table 8-3: VistaLINK® Traps

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