Figures

Tables

REVISION HISTORY

REVISION	DESCRIPTION	DATE
0v0_1	Original Version – Preliminary	May 02
0v0_2	Minor modifications to OSD menu structure	Jun 02
1v0_0	First Release Version	Jul 02
1v0_1	Added MultiViewer layout graphics section	Aug 02
1v0_2	Added Audio invalid duration; increased video invalid duration	Aug 02
1v0_3	Updated OSD menus; removed PESA SID reference; video and audio duration fault parameters not configurable up to 900 frames.	Aug 03
1v0_3a	Additional minor corrections to User's Manual	Aug 03

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1. OVERVIEW

Optimized for multiple video signal monitoring, Evertz's 7765MVM MultiViewer Monitoring product line simultaneously extends audio, video and data signal integrity monitoring (as per Evertz's AVM product line) capabilities up to 8, 12 and 16 video input channels – optimized to fit 16:9 or 4:3 displays. 7765MVM modules conveniently fit into Evertz's 7700FR-C frame, and offer a high-resolution and cost-effective monitor-wall solution for multi-channel broadcast transmission facilities.

The 7765MVM modules come equipped with 7700FC VistaLINK™ Frame Controllers and are VistaLINK™ ready, offering remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP). The 7700FC VistaLINK™ Frame Controller card provides a single point of access to communicate with VistaLINK™-enabled 7700 series of cards. The 7700FC provides a 10Base-T/100Base-TX Ethernet port and communication is facilitated through the use of Simple Network Management Protocol (SNMP). The 7700FC handles all SNMP communications between the frame (7700FR-C) and the network manager (NMS), and serves as a gateway to individual cards in the frame. This product feature offers another solution to manage operations including signal monitoring and module configuration from SNMP-enabled control systems (Manager or NMS) locally or remotely.

FEATURES

- Multi-display solutions (7765MVM-8, 7765MVM-12 and 7765MVM-16) with embedded audio, video and data signal monitoring
- Eight, twelve and sixteen SDI/601 525 or 625 line, 270 Mb/s component digital video inputs with embedded-only (7765MVM-8, -12, -16) or embedded and external AES/EBU audio (7765MVM-8A, -12A, -16A) monitoring and status display
- On-screen audio level and phase bar graphs, decoded XDS, Source ID (UMD) and fault alerts
- H/V delay and expanded view display
- User-configurable error conditions monitored with four fault condition alert messages per video input
- Standard analog RGB (VGA-type) output, optimized for 4:3 rear-projection type displays and 16:9 plasma displays
- Up to 60 user-configurable GPI inputs (MVM-16) available for display modifications, tally indicators, display borders, display modes and UMDs (up to 20 user-configurable GPIs on MVM-16A)
- External AES audio (MVM-xA versions only) and GPI I/Os are available on DB-25 connectors with optional Bulkhead Breakout Panels
- RS-232 or RS-422 serial port (jumper configurable) for interface to external equipment via communication protocols
- System configuration and channel monitoring through VistaLINK™ with 3RU 7700FR-C frame and a 7700FC VistaLINK™ Frame Controller module

1.1. FUNCTIONAL DESCRIPTION

For each of the four SDI(601) inputs, serial digital video is converted to parallel and embedded audio, VITC, closed captioning and source ID are extracted from it. The audio is read by the CPU and further processed to extract level information. The CPU creates the level and phase bar graphs and writes them out to the on screen display (OSD) memory. The hardware mixes (keys) the on screen text and bar graphs display information onto the video stream. This video goes out digitally through a parallel to serial converter and/or analog through a composite encoder.

The CPU also gets push-button and toggle-switch commands from the card edge controls and draws extensive menus for configuring the operation of the card. Card configuration is also possible through VistaLINK™.

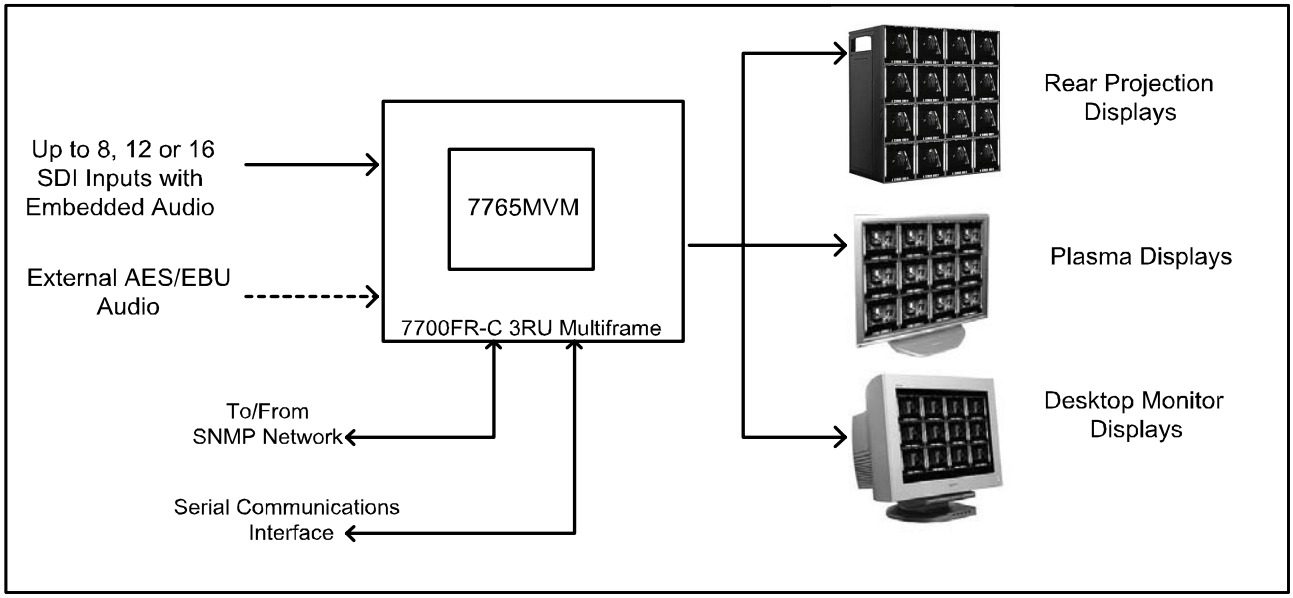


Figure 1: 7765MVM-16/-16A System Block Diagram

2. INSTALLATION

The modules of PKG7765MVM-x come with a companion rear plate that includes BNC connectors, a high-density DB-15 and several female DB-25 connectors. PKG7765MVM packages occupy up to 11 slots in the 7700FR-C frame. For information on mounting the rear plate and inserting the module into the frame see the 7700FR-C chapter, section 3.

2.1. VIDEO IN AND OUT

Connect a source of component digital 525 line or 625 line 270 Mb/s (with or without embedded audio, or external AES/EBU) video to each (or any) of the four SDI inputs (labeled “SDI INPUT 1-4”). Subsequently, connect the “Video Output” BNC to the “Video Input” BNC. These should be connected in the order that they are numbered.

In some cases, one rear plate spanning the total number of input and output BNC is replaced by separate, dual slot rear plates per module. As in the above case, connect the serial video output BNC on the 7765AVM-4-SD (7765AVM-4-M) or 7765AVM-4A-SD (7765AVM-4A-M) modules to the input BNC on the 7765AVM-4-VGA (7765-Q) rear plate. For additional information on the Quattro rear plates, refer to the Quattro (7765AVM-x or 7766AVM-x) manual.

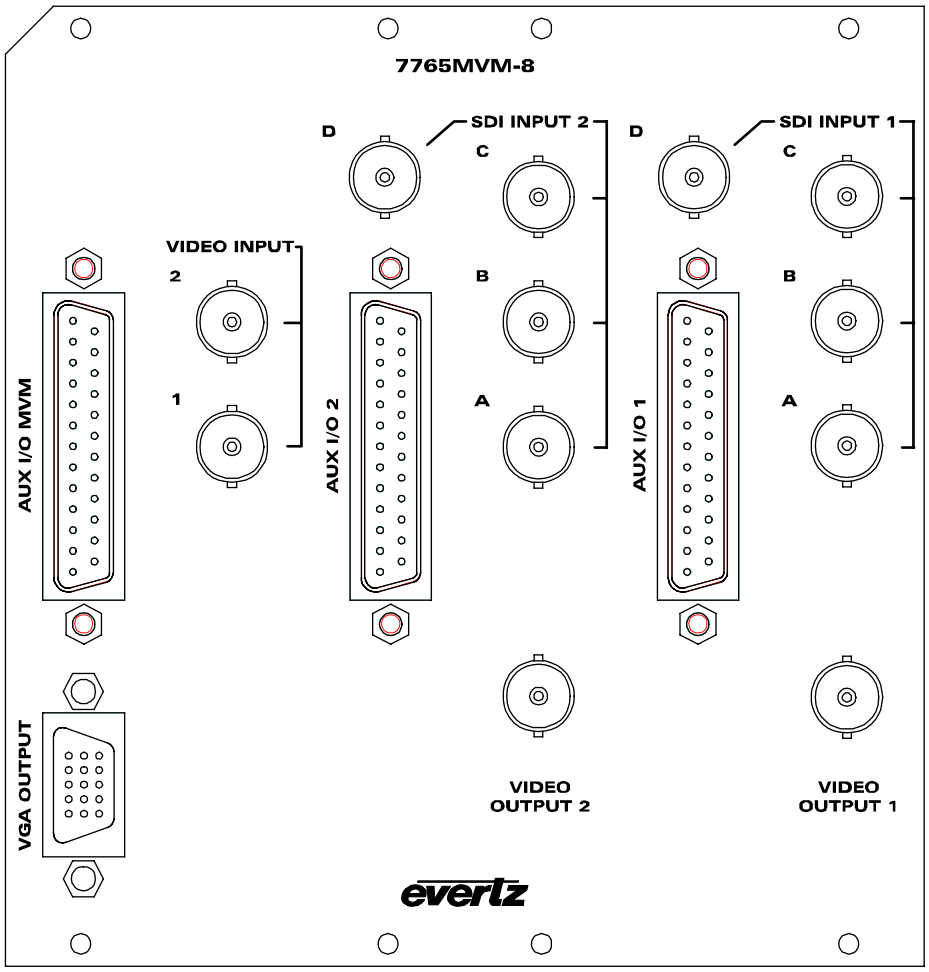


Figure 2: 7765MVM-8 and 7765MVM-8A Rear Plate (similar for the –12 and –16 options)

DB-25	7765AVM-4-M (MVM module)	Description	7765AVM-4A-M (MVM module)	Description
1	GPI1	General Purpose Input 1	GPI1	General Purpose Input 1
2	GPI2	General Purpose Input 2	GPI2	General Purpose Input 2
3	GPI3	General Purpose Input 3	AES5	AES2 Video B
4	GPI4	General Purpose Input 4	AES6	AES3 Video B
5	Tx+	RS-422 (Jumper configurable)	Tx+	RS-422 (Jumper configurable)
6	Tx-/Tx	RS-422/232 (Jumper configurable)	Tx-/Tx	RS-422/232 (Jumper configurable)
7	GPO1	General Purpose Output 1	GPO1	General Purpose Output 1
8	GPO2	General Purpose Output 2	GPO2	General Purpose Output 2
9			AES1	AES1 Video A
10			AES2	AES2 Video A
11	GPI9	General Purpose Input 9	AES7	AES1 Video C
12	GPI10	General Purpose Input 10	AES8	AES2 Video C
13	GPI5	General Purpose Input 5	AES9	AES3 Video C
14	GPI6	General Purpose Input 6	AES11	AES2 Video D
15	GPI7	General Purpose Input 7	AES12	AES3 Video D
16	GPI8	General Purpose Input 8	GPI3	General Purpose Input 3
17	Rx+	RS-422 (Jumper configurable)	Rx+	RS-422 (Jumper configurable)
18	Rx-/Rx	RS-422/232 input (Jumper configurable)	Rx-/Rx	RS-422/232 input (Jumper configurable)
19	GPO3	General Purpose Output 3	GPO3	General Purpose Output 3
20	GPO4	General Purpose Output 4	GPO4	General Purpose Output 4
21	Ground	Ground	GND	Ground
22			AES3	AES3 Video A
23			AES4	AES1 Video B
24	GPI11	General Purpose Input 11	GPI4	General Purpose Input 4
25	GPI12	General Purpose Input 12	AES10	AES1 Video D
Shell	GND	Ground	GND	Ground

Table 1: Audio and AUX I/O Pinouts

2.2. GENERAL PURPOSE INPUTS AND OUTPUTS

The GPI's are active low with internal pull up resistors (4.7k Ohms) to +5V. To make an input active, lower the signal to near ground potential (i.e. connect to shell or chassis ground). This can be done with a switch, relay, TTL drive, GPO output or other similar method. Figure 3 shows the input circuit for the General Purpose inputs.

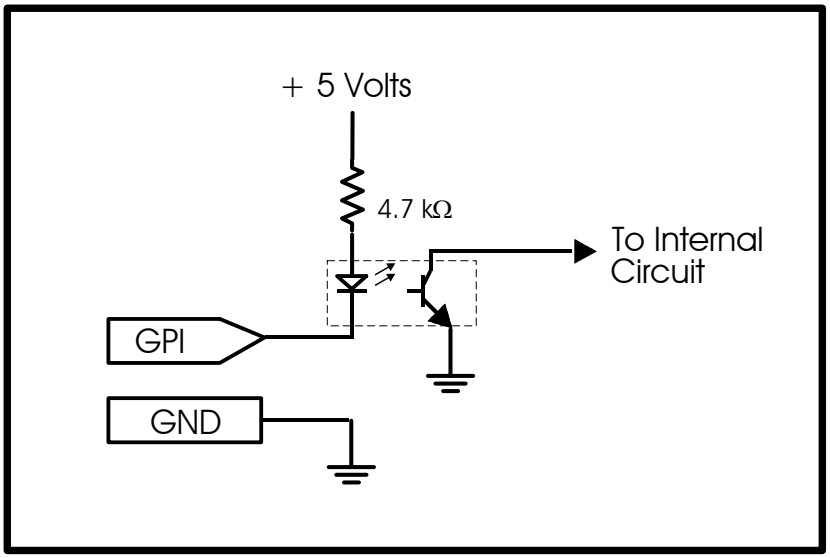


Figure 3: GPI Input Circuitry

The GPO's are software programmable active high or low with internal pull up (10kΩ) resistors to +5V. When the output goes low it is able to sink up to 10mA. When high, the signal will go high (+5V). **Do not draw more than 100μA from the output.** Figure 4 shows the circuit for the General Purpose output.

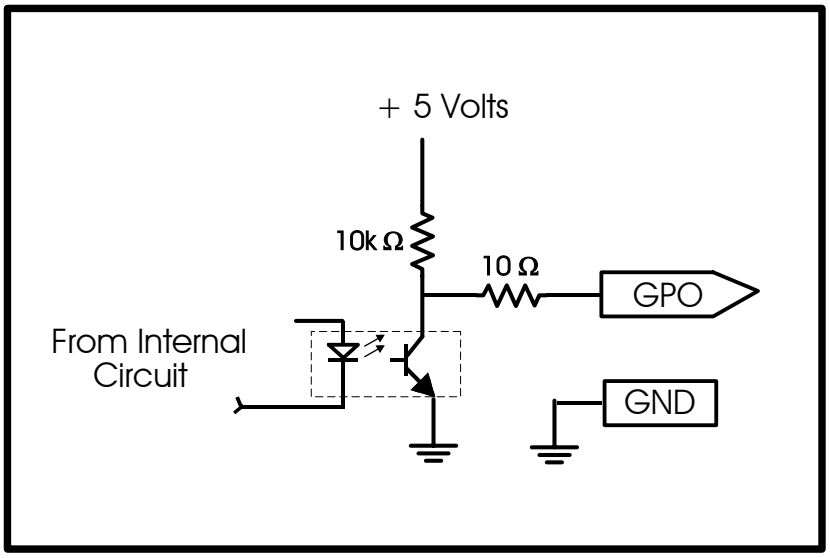


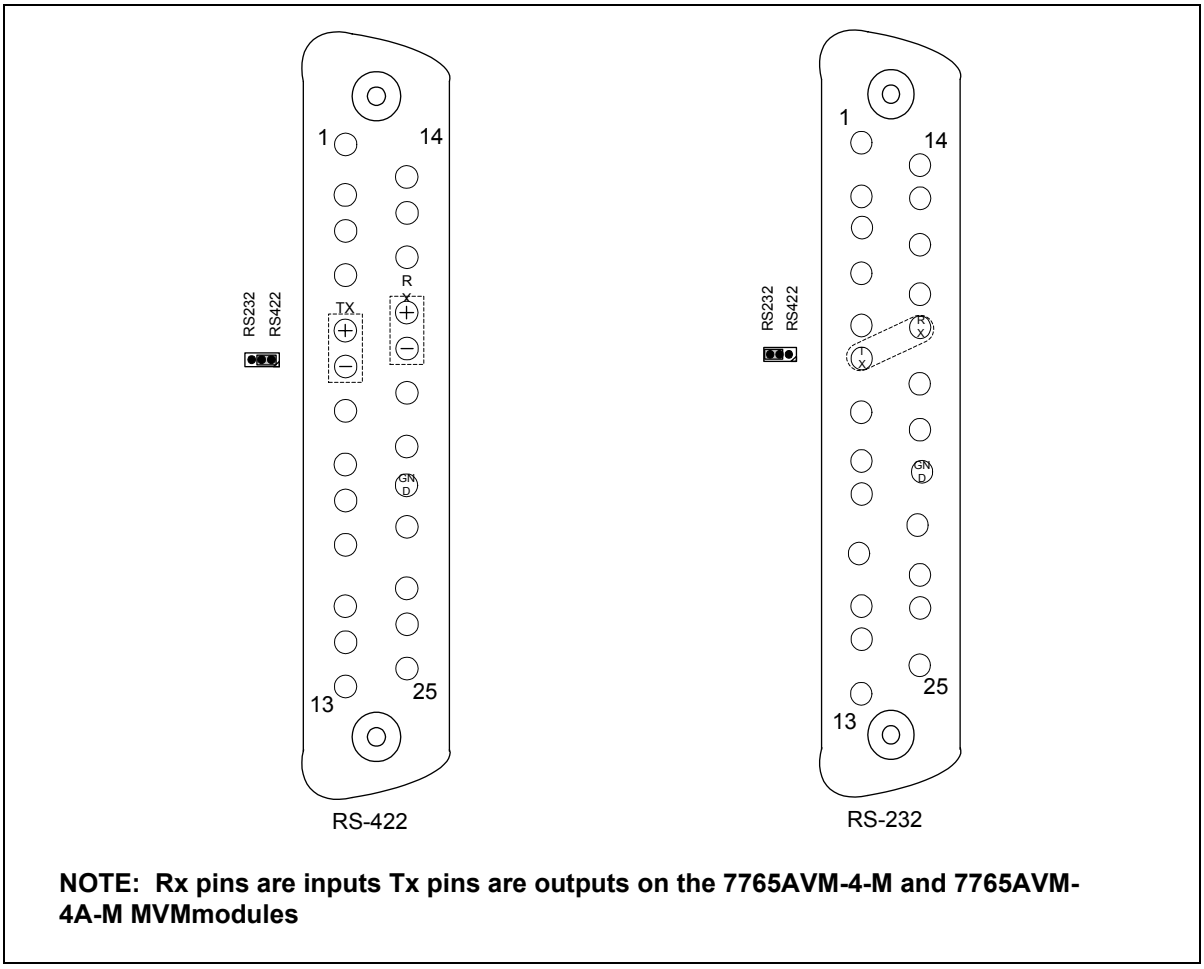
Figure 4: GPO Output Circuitry

2.2.1. RS-232/422 Serial Port Connections

The COM port signals are either standard RS-422 or RS-232 with no hardware flow control. The directions of the signals are indicated in Table 1. The port on the AUDIO AND AUX I/O connector is used for data logging of the status and fault condition alerts. Jumper J21 located on the 7765AVM-4 module is used to determine whether the designated pins operate as a balanced RS422 Receive and Transmit channel, or as a RS-232 Receive and Transmit channel. (See Figure 7.)

For RS-232 operation, connect this port to a COM port on your PC running a terminal application such as Windows HyperTerminal. Configure the port to 57600 baud, 8 bits, no parity, 2 stop bits and no flow control.

The port's physical layout, with RS-422/232 designation is shown in Figure 5.



NOTE: Rx pins are inputs Tx pins are outputs on the 7765AVM-4-M and 7765AVM-4A-M MVMmodules

Figure 5: AUDIO AND AUX I/O Physical Layout and RS-232/422 Serial I/O Pin Connections

3. SPECIFICATIONS

3.1. SERIAL DIGITAL INPUT ("M" Module)

Standard: SMPTE 259M-C, 525 or 625 lines component
Number of Inputs: up to 8, 12, or 16
Connector: BNC per IEC 169-8
Termination: 75Ω
Equalization: Automatic >225m @ 270 Mb/s with Belden 8281 (or equivalent)
Return Loss: >15dB up to 270MHz
Embedded Audio: SMPTE 272M-A

Note: "Video Output" from video input modules ("M") is not SMPTE 259M-C (270Mb/s) compliant. It will not be visible on a SDI monitor. It is connected to the "Video Input" BNC of the "Q" module.

3.2. SERIAL DIGITAL INPUT ("Q" Module)

Number of Inputs: up to 4 (from the "M" module – this is not SDI @ 270Mb/s)
Connector: BNC per IEC 169-8
Termination: 75Ω
Equalization: Automatic >225m @ 270 Mb/s with Belden 8281 (or equivalent)
Return Loss: >15dB up to 270MHz

3.3. ETHERNET CONNECTION

Network Type: Ethernet 10 Base-T 802.3 (10 Mbps)/Fast Ethernet 100 Base-TX IEEE 802.3u (100 Mbps) baseband CSMA/CD local area network
Connector: RJ-45

3.4. ANALOG VIDEO OUTPUT (Standard "Q" Module)

Standard: VESA (XGA, 1024x768)
Number of Outputs: 1
Connector: Female high-density DB-15
Video: 1Vp-p YPrPb/RGB or 0.7Vp-p XGA, 60Hz refresh
Sync: 300mV or 4V
Impedance: 75 Ω

3.5. AUDIO BAR GRAPHS

Number of Graphs: 4 (1 group) per video input channel
Ballistics: AES/EBU, DIN, BBC and Nordic N9

3.6. GENERAL PURPOSE INTERFACE I/O (GPI/GPO)

Number of Inputs:	up to 60 (user-configurable) per MultiViewer Package
Number of Outputs:	up to 16 (user-configurable) per MultiViewer Package
Type:	Opto-isolated, active low with internal pull-ups to +5V
Connector:	Female DB-25
Input signal:	Closure to ground
Signal Level:	+5V nominal

3.7. DATA INPUT/OUTPUT SERIAL PORT

Number of Ports:	1 RS-232 or 1 RS-422 (jumper selectable)
Connector:	Female DB-25
Baud Rate:	Up to 1 Mbaud
Format:	RS-232: 8 bits, no parity, 2 stop bits and no flow control

3.8. ELECTRICAL

Voltage:	+12VDC	
Power:	7765MVM-8/-8A:	~80W
	7765MVM-12/-12A:	~100W
	7765MVM-16/-16A:	~125W
EMI/RFI:	Complies with FCC Part 15, Class A and EU EMC directive	

3.9. PHYSICAL

Number of slots:	7765MVM-8/-8A:	7
	7765MVM-12/-12A:	9
	7765MVM-16/-16A:	11

4. PKG7765MVM Identification and Ordering Information

Module	Description	System Modules	Rear Plate
PKG7765MVM-8	Up to 8-window display, embedded audio, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame Controller (includes copy of VLPRO-C)	2 - 7765AVM-4-M 1 - 7765Q-8 1 - 7700FC (includes VLPRO-C) 1 - 7700FR-C (includes 1 power supply) 2 - 7765MVM-1-0-40C patch cables	7765MVM-8 & 7700FC
7765MVM-8	Up to additional 8-window display, embedded audio. Used with existing 7700FR-C frame and 7700FC VistaLINK™ Frame Controller	2 - 7765AVM-4-M 1 - 7765Q-8 2 - 7765MVM-1-0-40C patch cables	7765MVM-8
PKG7765MVM-8A	Up to 8-window display, embedded and/or external AES/EBU audio, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame Controller (includes copy of VLPRO-C)	2 - 7765AVM-4A-M 1 - 7765Q-8 1 - 7700FC (includes VLPRO-C) 1 - 7700FR-C (includes 1 power supply) 2 - 7765MVM-1-0-40C patch cables	7765MVM-8 & 7700FC
7765MVM-8A	Up to additional 8-window display, embedded and/or external AES/EBU audio. Used with existing 7700FR-C frame and 7700FC VistaLINK™ Frame Controller	2 - 7765AVM-4A-M 1 - 7765Q-8 2 - 7765MVM-1-0-40C patch cables	7765MVM-8
PKG7765MVM-12	Up to 12-window display, embedded audio, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame Controller (includes copy of VLPRO-C)	3 - 7765AVM-4-M 1 - 7765Q-12 1 - 7700FC (includes VLPRO-C) 1 - 7700FR-C (includes 1 power supply) 3 - 7765MVM-1-0-40C patch cables	7765MVM-12 & 7700FC
PKG7765MVM-12A	Up to 12-window display, embedded and/or external AES/EBU audio, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame Controller (includes copy of VLPRO-C)	3 - 7765AVM-4A-M 1 - 7765Q-12 1 - 7700FC (includes VLPRO-C) 1 - 7700FR-C (includes 1 power supply) 3 - 7765MVM-1-0-40C patch cables	7765MVM-12 & 7700FC
PKG7765MVM-16	Up to 16-window display, embedded audio, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame Controller (includes copy of VLPRO-C)	4 - 7765AVM-4-M 1 - 7765Q-16 1 - 7700FC (includes VLPRO-C) 1 - 7700FR-C (includes 1 power supply) 4 - 7765MVM-1-0-40C patch cables	7765MVM-16 & 7700FC
PKG7765MVM-16A	Up to 16-window display, embedded and/or external AES/EBU audio, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame Controller (includes copy of VLPRO-C)	4 - 7765AVM-4A-M 1 - 7765Q-16 1 - 7700FC (includes VLPRO-C) 1 - 7700FR-C (includes 1 power supply) 4 - 7765MVM-1-0-40C patch cables	7765MVM-16 & 7700FC

Apart from the packages listed above, there are a number of additional analog/digital input packages available. Please contact your Evertz Sales representative for a complete list.

5. STATUS LEDs

5.1. MODULE STATUS LEDs

MODULE STATUS: This Green LED will be on each module (7765Q and 7765AVM-4-M/7765AVM-4A-M) when the module is operating properly.

LOCAL FAULT: This Red LED makes it easy to identify one module in a frame that is missing an essential input or has another fault.

The Red LED will blink on and off if the microprocessor is not running.

The Red LED will be on when there is a fault in the module power supply or a user configurable error condition exists (as configured through the Frame Status Trigger menu option).

5.2. VIDEO STATUS LEDs

Four LEDs on the top board ((B)7700CC) of each MultiViewer module indicate which video input signals are present.

Video LED	Color	Video Status
1	Off	No video present on channel A
	Green	Video present on channel A
2	Off	No video present on channel B
	Green	Video present on channel B
3	Off	No video present on channel C
	Green	Video present on channel C
4	Off	No video present on channel D
	Green	Video present on channel D

Table 2: Video Status LEDs

6. OPERATING LEVELS, HEADROOM, CLIPPING AND THE BAR GRAPHS

This section contains notes to understand how the AVM product line relates digital audio levels, analog output audio levels, and the displayed bar graph levels.

When a full-scale digital signal is input, you will get an analog output signal level that is set by the *Peak Output Level*. The *Headroom* control sets the 100% program reference level (0 dB on the scale) with respect to the *Peak Output Level*. For example, if the *Peak Output Level* is set to 24 dBu and the *Headroom* is set to 20 dB, then the 0 dB reference on the bar graphs will correspond to an output level of 4 dBu. This level will be achieved when a digital input signal of –20 dB FS is applied at the input. Therefore, the following relationship is always maintained:

PGM reference level + headroom = peak output level

NOTE: The VU and PPM standards were set before the digital revolution. These standards deal with headroom levels that are quite a bit lower what should be used in the digital world. Also, most of the bar graphs only display a few dB above the program reference level. In a digital world, one needs to leave around 20 dB of headroom to keep most material away from clipping.

For best results, follow these steps when setting up the audio bar graphs and output levels:

1. Set the *Headroom* control to the desired value. Remember that this is the value in dB between the 100% reference level (expressed in dB FS) and saturation level of the digital input word (0 dB FS). It will also correspond to the value in dB between the analog output level when a reference level is input and the maximum output level set by *Peak Output Level*.
2. Pick the bar graph type and mode. This selection will configure the bar graphs with the defaults dictated by the standards. It will also set the *Peak Output Level* and the 0dB reference level to adhere to the standard and the desired headroom.
3. Adjust any of the bar graph configuration parameters to customize the display of the graphs.
4. Save the card configuration into a preset so that you can recall it if any card parameter is tampered with.

7. AUDIO ALARM CALIBRATION PROCEDURE

This section contains detailed description on setting the various audio warning/error detection parameters.

Some of the audio alarm detection algorithms are dependent on the state of other audio alarm detectors. For instance, the mono detection algorithm will not use periods of silence as determined by the silence detection. For this reason, the following sequence should be used to calibrate the audio alarms. The items in *Italics* refer to menu items in the AVM. See section 7.5 for a complete description of the fault definition menu items.

7.1. CALIBRATE AUDIO SILENCE DETECTION

1. Supply the card with your plant's noisiest audio feed without any audio program material present. This will be a baseline noise level to calibrate the silence detector.
2. Turn off all sources of errors in a *Fault Condition* and assign *Audio Silence* as the only error. Also, make sure that you set the *Fault Duration* to a small number of frames so that you will see when the error condition disappears.
3. Set the *Silence Duration* to 0.5 sec so that you can see the results of adjusting the *Silence Level* parameter without getting confused with the detection time.
4. Adjust the audio *Silence Level* until the *Fault Condition* begins to go active. This will be the noise floor level. Raise the *Silence Level* a few dB to make the detector insensitive to this noise level.
5. Set the *Silence Duration* to a time appropriate to your application. This should be set to a value longer than your worst case acceptable quiet period.

7.2. CALIBRATE AUDIO PHASE REVERSAL DETECTION

1. Supply the card with a stereo signal that has the phases reversed. Make sure that the material is typical of normal content for this channel.
2. Turn off all sources of errors in a *Fault Condition* and assign *Phase Reversal* as the only error. Also, make sure that you set the *Fault Duration* to a small number of frames so that you will see when the error condition disappears.
3. Set the *Phase Reversal Duration* to 0.5 sec so that you can see the results of adjusting the *Phase Reversal Level* without getting confused with the detection time.
4. Adjust the *Phase Reversal Level* so that the *Fault Condition* detects the phase reversal.
5. Set the *Phase Reversal Duration* to a time period appropriate to your application.
   Warning: Periods of silence (below the *Silence Level*) will extend this duration. In other words, periods without audio content are not included in the phase reversal detection.
   Warning: Stereo material with long periods of dissimilar left/right content (i.e. music with plenty of panning) may cause the phase reversal detector to fire. It is best to set the *Phase Reversal Duration* to a value larger than what you would expect.

7.3. CALIBRATE AUDIO MONO DETECTION

1. Supply the card with a stereo signal that originated from mono material and that has a large amount of uncorrelated noise added to each channel. This will allow you to set the *Mono Threshold* to a value that will detect the mono condition in the presence of noise.
   Warning: Make sure that the material is in-phase. Mono material will not be detected if it is out of phase.
2. Turn off all sources of errors in a *Fault Condition* and assign *Mono* as the only error. Also, make sure that you set the *Fault Duration* to a small number of frames so that you will see when the error condition disappears.
3. Set the *Mono Duration* to 0.5 sec so that you can see the results of adjusting the *Mono Threshold Level* without getting confused with the detection time.
4. Adjust the *Mono Threshold Level* so that the *Fault Condition* detects the mono material in the presence of noise.
5. Set the *Mono Duration* to a time period appropriate to your application.
   Warning: Periods of silence (below the *Silence Level*) will extend this duration. In other words, periods without audio content are not included in the mono detection.
   Warning: Stereo material with long periods of similar left/right content (i.e. talking heads in a news cast) may cause the mono detector to fire. It is best to set the *Mono Duration* to a value larger than what you would expect.

7.4. DEFINE THE AUDIO FAULT CONDITION(S)

1. A *Fault Condition* is defined as a group of one or more problems grouped together that will create a fault when any one of the problems exists. Decide what grouping of error conditions will generate a fault by setting the appropriate condition to *Yes* in the *Fault Condition* menu.
2. Set the *Fault Duration* to either *Until Reset* or to a time value. This is how long the condition will stay active after the conditions generating the fault go away.
3. Configure a *Fault Message*. Enter the text to display on screen, it's H and V position, and it's characteristics (opacity, color, etc).
4. Assign the *Fault Condition* to an output contact closure (GPO) if it is desired.

8. ON SCREEN MENUS

8.1. NAGIVATING THE ON SCREEN MENU SYSTEM

A toggle switch and pushbutton allow card edge navigation of a set of on-screen menus used to configure the card. Module configuration is possible through VistaLINK™ using either the VistaLINK™ PRO Network Management System (NMS) or other SNMP Manager (provided that the interface has been developed for the third-party manager).

Using the push-button/toggle technique, enter the on-screen menu system by pressing the pushbutton once. 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. An arrow (>) moves up and down the left hand side of the menu items to indicate which item you are currently choosing. Once the arrow is on the desired item, press the pushbutton to select the next menu level.

On all menus, there are two extra selectable items: *Back* and *Exit*. Selecting *Back* will take you to the previous menu (the one that was used to get into the current menu) while *Exit* will return the display to its normal operating mode. On the main menu, BACK and EXIT will both take you to the normal operating mode.

Once in a sub menu, there may be another menu layer, or there may be a list of parameters to adjust. If there is another set of menu choices, use the toggle switch to select the desired menu item and press the pushbutton.

To adjust any parameter, use the toggle switch to move up or down to the desired parameter and press the pushbutton. The arrow will move to the right hand side of the line (<) indicating that you can now adjust the parameter. 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 move the arrow back to the left side of the parameter list (>). Continue selecting and adjusting other parameters or use the BACK or EXIT commands.

8.1.1. Changing Text Fields

Some of the controls of the OSD menu allow you to adjust a text-based field. Editing a line of text can be a little tedious with a toggle switch and a pushbutton, but it can be done with the following procedure:

1. Select the text to edit by pressing the pushbutton when the menu item is selected. This will take you to a screen that has the label/name of the text being edited and a white box. The white box contains the text to change and is drawn to the maximum size of the text field.

   ```
   SAMPLE TEXT
   ^
   ```

   Note the arrow (^) under the character. This indicates which character you will be changing with the toggle switch.

2. Use the toggle switch to change the first character of the text message.

3. Once you have selected the desired character, press the pushbutton. This will advance the arrow to the next character. Continue changing the remainder of the characters in the same way.

4. There are two special characters to help you enter the text: a backspace character (left pointing arrow), and an end of line character (stop sign):

Left Arrow: If you have accidentally advanced to the next character and want to go back, select the left arrow with the toggle switch. When you press the pushbutton, you will go back to the previous character. This will save you from having to complete the editing and re-edit it to change the mistake.

Stop sign: If you are done changing the text, and the new text is shorter than old text, you can terminate the line with a stop sign. When you use the pushbutton after selecting the stop sign, any remaining characters in the text field will be erased and you will return to the menu structure.

5. You are done editing when you reach the end of the field (maximum length), or you select the stop sign and press the pushbutton.

8.2. ON SCREEN DISPLAY – 7765AVM-4-M MAIN MENU

Video X	Video-specific on-screen display settings, including audio bar graph configuration, on-screen display text windows, conditions for fault alerting and expanded, H/V delay view mode settings. Also includes audio source configuration, source ID and fault definitions
On screen display configuration	Bar-graphs, text window and fault window display properties
GPI configuration	General Purpose Interface input (GPI) trigger assignment summary screen
GPO configuration	General Purpose Interface output (GPO) trigger assignment summary screen
H/V Delay	Menu to control the H and V delay position of the active picture
Serial Port	Serial port configuration menu for data logging or interface to UMD protocol
Utilities	Store/Recall configuration presets; upgrade utility, factory reset and product firmware specification
Loss of video	Global setting to pass video or black upon loss of video input

The OSD menu is arranged in a layered structure that groups similar configuration items together. The following section gives a brief description of the first level of menus that appear when you enter the OSD screens. Selecting one of these items will take you to the next menu level. Sections 8.2.1 to 7.11 provide detailed descriptions of each of the sub menus. The tables in sections 8.2.1 to 7.11 are arranged in an indented structure to indicate the path taken to reach the control. Menu items or parameters that are underlined indicate the factory default values.

8.2.1. CONFIGURING VIDEO INPUT SOURCE AND WINDOW DISPLAY PARAMETERS

Audio source	Identifies the audio group that is monitored
Audio channel ½	Select audio channel ½ for reference level and bar graph configuration
Audio channel ¾	Select either audio channel ¾ for reference level and bar graph configuration
Bar graph ½	Sets audio bar graph parameters for audio channels ½
Bar graph ¾	Sets audio bar graph parameters for audio channels ¾
Clear peaks	Clears all audio bar graph peaks
Source ID/UMD	Set Source ID/Under Monitor Display (UMD) properties
Burn-in configuration	Enables and adjustments to on-screen display windows, for quadrant and expanded view modes
Fault definitions	Definition of fault conditions, levels, thresholds, durations for inputs
Fault conditions	Sets and enables fault conditions and fault messages
Clear faults	Clears all fault definitions in that quadrant.
Disable on-screen faults	A tool to turn off all on-screen fault messages per specific video input. This can be done permanently, or via GPI control.
H/V delay	Selects an external GPI trigger to enable H/V delay view mode

8.2.2. Setting the Audio Source Group to De-embed and Display

Video X
- *Audio source*
  - *Group 1*
  - *Group 2*
  - *Group 3*
  - *Group 4*
  - *AES/EBU*

Up to 4 groups of audio may be embedded in the incoming SDI video. This control selects which one of the four groups to monitor and display in on-screen bar graphs.

(AES/EBU option is only available on 7765MVM-xA-M modules. Also, only 2 pair of associated audio can be displayed per video input. Three (3) AES pair, as per certain Quattro modules is unavailable.)

8.2.3. Audio Channel Configurations

Audio level mode	Sets the bar mode to be either normal or sum + diff. mode for audio channel ½.
Headroom	Sets the audio operating level headroom for audio channel ½.
PPM mode	Parameter used to select one of the available industry standard ballistics for audio channel ½.
Clear peak	Setting to clear audio peaks for channel ½ . Peaks cleared through OSD menu or through configurable GPIs.

8.2.3.1. Setting Audio Bar Graph Operating Modes

Video X
- *Audio channel ½*
  - *Audio level mode*
    - *Normal*
    - *Sum + diff*

Configuration for audio channel ½ reference levels and bar graphs. For simplicity only channel ½ menu items are shown in this manual – channels ¾ configuration menu is similar.

In *Normal* mode, stereo bar graphs are displayed.

In *Sum + diff* mode, bar graph 1 is the absolute value of the sum of both channels and bar graph 2 displays the absolute value of the magnitude of the difference of the two signals.

8.2.3.2. Setting Audio Headroom

Video X
- *Audio channel ½*
  - *Headroom*
    - *0 to 30dB*
    - *0dB*

The *headroom* is the level difference between a maximum amplitude signal that can be represented in the digital input (this is called 0 dB FS or 0 dB Full Scale) to a nominal, user defined operating level, represented in Decibels. In modern digital studios and broadcast stations this is on the order of 20 dB.

This control is used to position the 0 dB point for the VU and PPM meters. For example, if you set this control to 15dB and input a signal that is –15 dB FS, then the bar graph top will be at 0dB. When you adjust this level, you are also changing the 0dBr or program reference point on the bar graphs to maintain the relationship:

PGM. Ref. + headroom = peak output level

This value should be set first. After you set the headroom and select the bar type/mode, you can adjust the bar graph colored area sizes with the *Error region* and *Warning region* controls.

8.2.3.3. Setting PPM Mode and Ballistics

Video X
- *Audio channel ½*
  - *PPM mode*
    - *DIN*
    - *BBC*
    - *Nordic N9*
    - *AES/EBU*

This parameter selects one of four industry standard Peak Program Meter (PPM) display modes.

When one of these modes is selected, a number of items are set to adhere with predefined industry standards. The items affected include; meter attack time, meter decay time, min level displayed, max level displayed, analog reference (100%) level and, in some instances, region coloring and phase graph representation. Table 3 illustrates the values set by the standards.

Mode	***Attack Time***	***Decay Time***	***Ref. Level***	***Min Level***	***Max Level***	***Peak Output Level***	***Notes***
DIN 45 406 (IRT Rec. 3/6)	10 ms	1.5 sec for 20 dB	6 dBu	-50 dB	5 dB	6 + headroom	1 dB per div until –10 dB, logarithmic to bottom -50dB. Associated DIN phase correlation scale: • both the same => 1 r, • only 1 signal => 0 r, • both out of phase => -1r.
BBC 55428 part 9	12 ms	2.8 sec for 7 to 1	8 dBu	1 -12 dB	7 +12 dB	8 + headroom	# 6 on the scale is the reference level
Nordic N9	5 ms	1.7 sec for 20 dB	6 dBu	-42 dB	+12 dB	6 + headroom	
AES/ EBU	1 sample period	1.5 sec for 20 dB	User defined	-60 dB	0 dB	User defined	100% reading is user definable. 0 dB corresponds to 0 dB FS.

Table 3: PPM Bar Graph Characteristics

Note: The phase correlation scale on the DIN type is different from our other phase indicators (*Sum* + *Diff* and phase bar graphs).

8.2.4. Clearing Audio Peaks

Video X
- *Audio channel ½*
  - *Clear peak*
    - *Off*
    - *GPI1 – GPI12*

This menu item provides a convenient method to reset audio peak holds for audio channel ½ through the use of a GPI.

8.2.5. Setting Bar Graph Parameters

The *Bar Graphs* menu items deal with the configuration and operation of the audio bar graphs; modes, ballistics, display properties, etc. The chart below shows the items available in the *Bar Graphs* menu.

When many windows are enabled, the on-screen information can get very crowded. The bar graphs and text windows are layered to keep the most important information from being covered by other not-so important windows. The priority is as follows:

Priority Level	Display Type
1 (top)	Fault Messages
2	Time Code Source ID Program Rating XDS
3	Status window

Bar graph properties	Quick link to *On screen display properties*, *Bar graphs* menu, as well offers option to set bar graph level and background transparency levels
Level type	Control sets bar graphs to one of five basic types
VU range	When VU mode enabled, VU range set by this parameter
Phase type	Set audio phase bar graph to STEREO or DIN
Error region	Defines region at which audio becomes unacceptable
Warning region	Defines region between the audio OK and audio error regions

8.2.5.1. Setting the Bar Graph Type

Video X
- *Bar graph ½*
  - *Level type*
    - *PPM*
    - *PPM peak*
    - *VU*
    - *VU peak*
    - *VU PPM*

This control sets the bar graph to one of five basic types. The ballistics and display characteristics of the bar graphs are configured with other items in this section of the menu structure.

Bar graph types for channel ¾ are configurable in a similar menu.

PPM:
Peak Program Meter tracks the peaks of the audio content rather than the perceived loudness or the power content of the material.

PPM with peak hold: (PPM peak)
The peak hold feature allows the user to keep track of the audio peak. A floating mark is pushed up by audio peaks and is reset with either a programmed GPI input (see the section on “GPI, GPO and Text Window Setup”) or a menu command (see the “Clear Faults” menu).

VU:
Volume Unit meter follows, approximately, the perceived loudness of human hearing.

VU with peak hold: (VU peak)
The peak hold feature allows the user to keep track of the peak VU reading. A floating mark is pushed up by audio VU peaks and is reset with either a programmed GPI input (see the section on "GPI, GPO and Text Window Setup") or a menu command (see the "Clear Faults" menu).

VU with floating PPM: (VU PPM)
This mode displays both VU levels and PPM levels on the same bar graph. The VU level is indicated by the solid bar going up and down, while the PPM reading is indicated by a floating white bar. The scale displayed is a decibel scale with 0 corresponding to program reference level.

8.2.5.2. Setting the VU Display Range

Video X
Bar graph ½
VU range
Normal
Extended

This parameter selects the VU display range when VU modes are active

Most VU meters have two possible ranges. These are:

Normal range: +3 to –20dB
Extended range: +3 to –57dB

The bar graphs will be re-scaled to represent the selected range.

When using VU and BBC PPM mode, the VU scale is truncated to –6dB to match the scaling of BBC mode.

8.2.5.3. Setting The Phase Bar Graph Type

Video X
Bar graph ½
Phase type
Stereo
DIN

There are two types of phase bar graphs available: one that has a focus of presenting the amount and L/R distribution of stereo content (STEREO), and one that presents in-phase/out-of-phase proportions (DIN).

8.2.5.4. Setting the Bar Graph Error Region

Video X
Bar graph ½
Error region
-20 to –1dB FS
-6dB FS

The bar graph "error" region is the area from clipping (0 dB FS) down to the level selected by this control. It is intended to tell the user when the audio signal is getting close to clipping.

If the error region is set to a value less than the warning region, the warning region value will be set equal to the error region.

Warning:
Some bar graph types (and ballistics) have this region defined. When you select one of these types, this value is preset. After you choose the type, you can adjust this value to your desired level.

8.2.5.5. Setting the Bar Graph Warning Region

- *Video X*
  - *Bar graph ½*
    - *Warning region*
      - *-40 to –2 dB FS*
      - *-20 dB FS*

The bar graph "warning" region is the area between the "OK" region and the "error" region. It is intended to indicate when the audio level is approaching the "error" region. This control sets the bottom of the "warning" region. Normally, it is set to the audio program level. The upper boundary of this region is always set with the "error" region control.

If the warning region is set to a value greater than the error region, the error region value will be set equal to the warning region.

Warning:
Some bar graph types (and ballistics) have this region defined. When you select one of these types, this value is preset. After you choose the type, you can adjust this value to your desired level.

8.2.6. Clearing Audio Level Peaks

- *Video X*
  - *Clear peaks*
    - *Cancel*
    - *Clear*

This menu option clears audio peaks.

8.2.7. Setting Source ID/UMD Configurations

525 VITC line	Set the line number for decoding Vertical Interval Time Code in 525 line video (525 code only).
625 VITC line	Set the line number for decoding Vertical Interval Time Code in 625 line video. (625 code only).
Default source ID mode	Selects whether the Default SID message will be shown when there is no source ID on the incoming video
Default source ID message	Set the message that will be shown when *Default SID mode* and the SID window are enabled.
SID/UMD color 1 enable	On-screen source ID/UMD display color can be controlled through GPI.
SID/UMD color 2 enable	On-screen source ID/UMD display color can be controlled through GPI.
SID/UMD color 3 enable	On-screen source ID/UMD display color can be controlled through GPI.

8.2.7.1. Setting the VITC Line Number – 525 Line Video

Video X
Source ID
525 VITC line
10 to 32
10

With this control, set the VBI line number that contains the VITC information when operating in 525 video mode. If the VITC contains Source ID (SID) information, the AVM will automatically decode it, and turn on the SID window if the user has enabled this window. If there is no VITC SID information, the AVM will automatically check for PESA SID (see section 7.3.6).

If the wrong line number is set, no time code (or SID) will be decoded.

8.2.7.2. Setting the VITC Line Number – 625 Line Video

Video source A
Source ID
625 VITC line
6 to 32
10

With this control, set the VBI line number that contains the VITC information when operating in 625 video mode. If the VITC contains Source ID (SID) information, the AVM will automatically decode it, and turn on the SID window if the user has enabled this window. If there is no VITC SID information, the AVM will automatically check for PESA SID.

If the wrong line number is set, no time code (or SID) will be decoded.

8.2.7.3. Setting the Default SID Mode

Video source A
Source ID
Default source ID mode
Disable
Enable

Determines if the Default SID message will be displayed in the SID window when there is no incoming source ID on the VITC.

8.2.7.4. Setting the Message to be Displayed When There Is No Incoming SID

Video source A
Source ID
Default source ID message
VIDEO SOURCE A

This control sets the message that will be automatically displayed in the SID window when there is no incoming source ID on the PESA/VITC. The text of the message can be changed. See section 8.1.1 for information on changing text fields.

8.2.7.5. Enabling the Color of Source ID

Video source A
Source ID
SID/UMD color 1 enable
Off
GPI1 – GPI12

This option allows the user to control the Source ID background color characteristics through pre-defined GPI. Actual Source ID background color is set in *On-screen display configuration* menu.

For simplicity control settings for Source ID color 1 is displayed. Control options for source ID colors 2 and 3 are similar.

(GPI5-12 are not available on 7765AVM-4A-M modules.)

8.2.8. Configuring The On-Screen Display Controls Through Burn-in Configuration Menu

The *Burn-in configuration* menu items is used to configure the position and display characteristics of the text windows. It is also used to program the GPIs, and the on/off states of the text and bar graph windows. The chart below shows the items available in the *Burn-in configuration* menu.

On-screen display configuration	Quick link to *On screen display configuration* menu (see On-screen display configuration section for more information).
Burn-in enable	Controls used to configure the GPI functions, and the on/off states of the text and bar graph windows.
Burn-in position	Controls used to set the position of enabled text and bar graph windows
Status burn-in mode	Defines format of displayed status window information

8.2.8.1. Enabling On-Screen Displays

Ch ½ level bars	Enable/disable channel ½ audio level bars
Ch ¾ level bars	Enable/disable channel ¾ audio level bars
Ch ½ phase bars	Enable/disable channel ½ audio phase bars
Ch ¾ phase bars	Enable/disable channel ¾ audio phase bars
Time code	Enable/disable decoded time code display window
Program rating	Enable/disable decoded program rating display window
XDS	Enable/disable decoded XDS display window
Source ID/UMD	Enable/disable decoded or default source ID display

8.2.8.2. Enabling Channel ½ Level Bar Display

Video X
- *Burn-in configuration*
  - *Burn-in enable*
    - *Ch ½ level bars*
      - *Off*
      - *On*
      - *GPI1 – GPI12*

This menu item enables audio channels ½ level bar graphs. By selecting “On”, the bar graphs will always be displayed. Selecting a GPI enables the level bar graphs only upon the module receiving an active GPI signal. Level bar graphs will always appear to the side of the active video window.

Similarly, channel ¾ level bar graph can also be configured through the subsequent *Burn-in enable* menu item.

(GPI5-12 are not available on 7765AVM-4A-M modules.)

8.2.8.3. Enabling Channel ½ Phase Bar Display

Video X
Burn-in configuration
Burn-in enable
Ch ½ phase bar
Off
On
GPI1 – GPI12

This menu item enables audio channels ½ phase bar graph. By selecting "On", the bar graphs will always be displayed. Selecting a GPI enables the phase bar graph only upon the module receiving an active GPI signal. Phase bar graphs will always appear to the side of the active video window.

Similarly, channel ¾ phase bar graph can also be configured through the subsequent *Burn-in enable* menu item.

(GPI5-12 are not available on 7765AVM-4A-M modules.)

8.2.8.4. Enabling Time Code Display

Video X
Burn-in configuration
Burn-in enable
Time code
Off
On
GPI1 – GPI12

This menu item enables Time Code (TC) display. By selecting "On", time code will always be displayed. Selecting a GPI also enables time code but only upon the module receiving an active GPI signal. Time code display position is configurable for both quadrant and expanded views through the *TC window H and V* menu item controls.

The VITC time code window shows the vertical interval time code present at the input to the AVM module. Use the VITC line select items on the Video menu to configure the lines that the AVM will use for reading VITC.

(GPI5-12 are not available on 7765AVM-4A-M modules.)

8.2.8.5. Enabling Program Rating Display

Video X
Burn-in configuration
Burn-in enable
Program rating
Off
On
GPI1 – GPI12

This menu item enables Program Rating (PR) display. By selecting "On", Program rating will always be displayed. Selecting a GPI also enables program rating but only upon the module receiving an active GPI signal. Program rating display position is configurable for both quadrant and expanded views through the *PR window H and V* menu item controls.

The Program rating window shows data decoded from the Line 21 XDS Program rating packet. The user to control the operation of V-Chip decoders in the viewer's receiver usually encodes this information. Canadian French and English program ratings are also supported.

(GPI5-12 are not available on 7765AVM-4A-M modules.)

8.2.8.6. Enabling XDS Display

- *Video X*
  - *Burn-in configuration*
    - *Burn-in enable*
      - *XDS*
        - *Off*
        - *On*
        - *GPI1 – GPI12*

This menu item enables Extended Data Services (XDS) display. By selecting "On", XDS will always be displayed. Selecting a GPI also enables XDS but only upon the module receiving an active GPI signal. XDS display position is configurable for both quadrant and expanded views through the *XDS window H and V* menu controls.

The XDS window contains 2 lines with the following information: network name, call letters, program name and time of day. Only the information found in the XDS stream will be displayed. An item is considered to be missing if it does not appear in the XDS stream for 15 seconds. There is no ability to trigger faults on the absence of XDS.

(GPI5-12 are not available on 7765AVM-4A-M modules.)

8.2.8.7. Enabling Source ID (SID) Display

- *Video X*
  - *Burn-in configuration*
    - *Burn-in enable*
      - *Source ID/UMD*
        - *Off*
        - *On*
        - *GPI1 – GPI12*

The Quattro module has the ability to decode source identification (SID) information from the vertical interval time code present at the input. When no VITC SID is encoded, the Quattro module will decode SID that has been encoded in the PESA format. The Source Identification window is used to display the decoded SID information. When there is neither VITC SID nor PESA SID encoded, the *Default SID message* will be displayed if *Default SID mode* is enabled, otherwise the SID window will be turned off. The *SID window* is always displayed in the Under Monitor Display (UMD) location.

(GPI5-12 are not available on 7765AVM-4A-M modules.)

8.2.9. Configuring Burn-In Display Positions

Once enabled, monitoring tools can be positioned horizontally and vertically within the specific video quadrant. The following menu identifies the available positions.

Parameter	7765MVM-4-M window (525 line code)	7765MVM-4-M window (625 line code)
Time code window row	0 to 8 4	0 to 9 4
Time code window col	0 to 19 0	0 to 25 0
Program rating window row	0 to 8 5	0 to 9 5
Program rating window col	0 to 19 0	0 to 25 0
XDS window row	0 to 8 6	0 to 9 6
XDS window col	0 to 19 0	0 to 25 0
Fault 1 window row	0 to 8 0	0 to 9 0
Fault 1 window col	0 to 19 0	0 to 25 0
Fault 2 window row	0 to 8 1	0 to 9 1
Fault 2 window col	0 to 19 0	0 to 25 0
Fault 3 window row	0 to 8 2	0 to 9 2
Fault 3 window col	0 to 19 0	0 to 25 0
Fault 4 window row	0 to 8 3	0 to 9 3
Fault 4 window col	0 to 19 0	0 to 25 0

8.2.10. Defining Fault Conditions

The *Fault definitions* menu items are used to define scenarios which exceed normal operating conditions, thereby enabling a fault condition. The chart below shows the items available in the *Fault definition* menu.

Video error duration	Sets the number of invalid video frames that the AVM will ignore for which video fault condition alert message is not triggered.
Loss of audio duration	Sets the number of invalid video frames that the AVM will ignore for which audio fault condition alert message is not triggered.
EDH error duration	Sets the number of consecutive fields of EDH errors to consider as a fault
Over level	Sets the level of audio over which is considered a fault or error condition
Over duration	Sets the duration of audio (in samples) over the above considered to be a fault.
Silence level	Sets the level of audio considered silence and a fault.
Silence duration	Sets the duration of audio (in seconds) under the level considered to be a fault.
Phase rev. level	Sets the level of L/R audio difference over considered to be a phase reversal fault.
Phase rev. duration	Sets the duration of audio (in seconds) over the above phase reversal level considered to be a fault.
Mono threshold level	Sets the level of L/R audio difference under which is considered mono.
Mono duration	Sets the duration of mono audio (in seconds) considered to be a fault.
Loss of CC duration	Sets the duration for no primary CC1 captions (in seconds) considered to be a fault.
Loss of program rating duration	Sets the duration for no program rating XDS packet (in seconds) considered to be a fault.
Picture noise level	Sets the approximate level of noise expected in the video signal feed and used to determine picture freeze condition.
Freeze duration	Sets the minimum duration (+/- 2 frames) of still picture before it is considered “frozen”.
Black video duration	Sets the minimum duration below 7 IRE before the picture is considered “black”.

8.2.10.1. Setting Video Error Duration

Upon hot-switches, a resulting glitch in the video signal can cause the AVM to momentarily report a video fault if enabled as a Fault definition. This menu item allows the user to set a minimum duration (in frames) during which the AVM will ignore such glitches and not trigger a fault alert.

Video X *Fault definitions* *Video error duration* *0 to 900 frames* *0*	This control sets the duration for which the AVM ignores glitches on the video signal thereby not displaying fault alert messages.

8.2.10.2. Setting Audio Error Duration

Upon hot-switches, the resulting glitch in the video signal can also cause a corresponding glitch to occur in the audio signal. This can create a brief “Audio Error” message to trigger if “Loss of Audio” duration is set too low. To avoid such an error message, this menu option is used to set a minimum threshold duration (in frames) during which the AVM will ignore such glitches and not trigger a corresponding fault alert.

- *Video source A*
  - *Fault definitions*
    - *Loss of audio duration*
      - *0 to 900 frames*
      - *0*

This control sets the duration for which the AVM ignores glitches on the audio signal thereby not displaying fault alert messages.

8.2.10.3. Error Detection and Handling (EDH) Error Duration

- *Video X*
  - *Fault definitions*
    - *EDH error duration*
      - *N/A*
      - *1 to 127 fields*

A check sum is calculated for every field of video and compared to the same EDH check sum transmitted in the vertical interval. If the check sums do not match, then there was at least one bit error in the active picture area of the image.

With this control, you can set an error condition when a number of consecutive fields contain EDH errors. If set to NA, this type of fault detection is turned off. If set to 1, any "Error Detection and Handling" (EDH) error will generate an error while large numbers (>20) will effectively check the presence/absence of EDH encoding.

If the video signal has passed through hardware that has modified the picture (i.e. a vision mixer) without re-calculating the EDH check sums, then both full field and active picture errors will be generated. In that case, disable both full field and active picture error detection in the "Fault Definitions" above.

If the video signal has passed through hardware that has modified the ANC data area (i.e. audio multiplex) without re-calculating the EDH check sums, then full field errors will always be generated. In that case, disable full field error detection and use active picture only.

Fore more information on Error Detection and Handling, see SMPTE RP-165.

8.2.10.4. Setting the Audio Over Level Faults

The Over level and Over duration controls are used to detect when an audio amplitude is close to a dangerous level (i.e. clipping a downstream device, or saturating the digital word length). The Over level control sets the audio level over which there is considered to be a fault. When the fault condition exists, the audio must be over the *Silence level* for at least 1 second before the fault condition will be removed. A fault will be generated when any channel has generated an over condition.

Video X *Fault definitions* *Over level* *-30dB to 0dB FS in 1/4dB increments* *-6dB FS*	This control sets the audio level over which there is considered to be over level. This value is expressed in dB full scale (FS) and can even be used to detect digital clipping. If set to 0 dB FS, then if 3 or more consecutive samples (set with the duration control) are at digital saturation (max or min), then the digital word length has been exceeded.

8.2.10.5. Setting the Audio Over Duration

Video X *Fault definitions* *Over duration* *3 to 255 samples* *3*	This control sets the duration, in number of consecutive samples that are at or above the *Over level* before a fault condition exists. Note that as longer durations are configured, you are eliminating the detection of higher frequency content over the set *Over level*.

8.2.10.6. Setting Audio Silence Faults

The *Silence level* and *Silence duration* controls are used to detect when the audio is considered to be silent. The *Silence level* control sets the audio level under which the audio is considered to be silent. The audio must be under the *Silence level* for the duration set by the *Silence duration* control before the fault condition exists. When the fault condition exists, the audio must be over the *Silence level* for the duration set by the *Silence duration* control before the fault condition will be removed. A fault will be generated when both channels in a pair (1 and 2 or 3 and 4) have satisfied a silence condition.

Video X *Fault definitions* *Silence level* *-96dB to –20dB FS* *-60dB FS*	This control sets the audio level under which it is considered to be silent. This value is expressed in dB full scale (FS)

8.2.10.7. Setting the Audio Silence Duration

Video X *Fault definitions* *Silence duration* *0.5 to 127 sec (in 0.5 second increments)* *10 sec*	This control sets the amount of time the audio is silent in seconds before a fault occurs.

8.2.10.8. Setting Audio Phase Reversal Faults

All stereo audio material has a varying amount of phase difference between the two channels. If there is significant phase reversal for a period of time, then this is a sign that the audio signals may be out of phase.

The *Phase reversal level* and *Phase reversal duration* controls are used to detect when the left and right audio channels are considered to be out of phase. The *Phase reversal level* control sets the amount of phase difference that is considered to be out of phase. The audio must be out of phase by more than the *Phase reversal level* amount for the duration set by the *Phase reversal duration* control before the fault condition exists. When the fault condition is active, the audio must be out of phase by less than the *Phase reversal level* amount for at least 1 second before the fault condition will be removed.

Video X
Fault definitions
Phase rev. level
0.5 to 1 (in 0.01 increments) *0.90*

This control sets the amount of phase difference before the audio is considered to be out of phase. This phase reversal is calculated by comparing the difference of the two channels to the average of the two. If a signal is always out of phase, then the difference between the two will be high compared to the average of the two. This corresponds to 1 in this control.

If there is only content on one of the channels (i.e. left only or right only), then the difference is equivalent to the average of the two channels. This corresponds to 0.5 in this control.

8.2.10.9. Setting the Audio Phase Reversal Duration

Video X
Fault definitions
Phase rev. duration
0.5 to 127 sec (in 0.5 second increments) *10 sec*

This control sets the period over which to analyze the audio content for phase reversal.

Note that conditions of silence are not included in this value. This means that if the audio is 50% quiet then it will take twice the period set with this control to detect a phase reversal condition.

8.2.10.10. Setting Audio Mono Faults

Mono audio material can take two forms: one channel with information and the other quiet or both channels with the same information. The AVM cards will detect both types of mono material.

If there is only a small amount of phase difference between the two channels (perhaps caused by the noise present on the audio) then the content may be mono. If there is no significant difference for a period of time, then this is a sign that the audio signals are mono.

Mono is detected by comparing the difference of the two channels to the average of the two. If a signal always has no out of phase information (or just a small amount) for a period of time, then the signal may be mono.

The *Mono level* and *Mono duration* controls are used to detect when two audio channels are considered to be mono. The *Mono level* control sets the threshold that decides whether the signals are the same. The audio difference must be less than the *Mono level* amount for the duration set by the *Mono duration* control before the fault condition exists. When the fault condition exists, the audio difference must be more than the *Mono level* amount for at least 1 second before the fault condition will be removed.

Material that is both mono and out of phase will be detected as being out of phase and not mono. Once the phase polarity is fixed, then the card will detect mono material.

Video X
Fault definitions
Mono threshold level
0.2 to 0.5 (in 0.01 increments)
0.20

This control sets the level of L/R audio difference under which is considered mono

8.2.10.11. Setting the Audio Mono Duration

Video X
Fault definitions
Mono duration
0.5 to 127 sec (in 0.5 s increments)
10 sec

This control sets the duration of mono audio in seconds, which is considered a fault.

8.2.10.12. Detecting Loss of Primary Captioning

Video X
Fault definitions
Loss of CC duration
2 to 512 sec (in 2 sec increments)
180 sec

This control sets the amount of time in seconds with no primary CC1 captions encoded, which is considered a fault

This fault condition will also be generated if the closed caption signal is missing on the input video.

8.2.10.13. Detecting Loss of Program Rating Duration

Video X
Fault definitions
Loss of program rating duration
1 to 255 sec (in 3 sec increments)
30 sec

This control sets the amount of time in seconds with no program rating packet encoded in the Line 21 XDS data stream, which is considered a fault

This fault condition will also be generated if the closed caption signal is missing on the input video.

8.2.10.15. Optimizing Picture Noise Level and Picture Freeze Duration Parameters

The *Picture noise level* and *Picture freeze duration* controls are used to detect when a video picture is considered frozen. The *Picture noise level* control sets the threshold that decides whether activity in the picture is considered to be noise. The picture activity must be greater than this amount for the duration set by the *Picture freeze duration* control before the fault condition exists.

Video X *Fault definitions* *Picture noise level* *1 to 10* *<u>9</u>*	This control sets the approximate level of noise expected in the video signal feed. It is used by the freeze detect feature to distinguish motion from background noise on top of a video feed. As a guide, here are some signal to noise ratio comparisons: 1 = digital freeze (no noise on top of frozen picture) 10 = 40 dB SNR

Video X *Fault definitions* *Picture freeze duration* *6 to 902 frames (4 frame increments)* *<u>302 frames</u>*	This control sets duration, in frames, of video activity under the *Picture noise level* that is considered a fault.

When increasing *Picture noise level*, it is recommended that you increase *Picture freeze duration* as well. This is because the higher the Picture noise level, the lower is equipment's motion sensitivity, thus long periods without significant on-screen movement are more likely to trigger a "false" freeze alarm.

8.2.10.16. Optimizing the Picture Noise Level and Picture Freeze Duration Parameters

Setting up the optimum *Picture noise level* and *Picture freeze duration* parameters will depend on the amount of noise in the video path from the first equipment with freeze-frame capability to the monitoring point. The system designer should determine the maximum amount of time permissible between the moment of freeze and the alarm.

Setting this time as high as tolerable has two benefits:

- It lowers the frequency of "false" freeze alarms generated when a perfectly valid content contains long motionless periods
- It allows raising the *Picture noise level* parameter, without increasing frequency of "false" freeze alarms.

It is suggested that *Picture noise level* should be set after setting the *Picture freeze duration*.

If the video path is fully digital, then set the *Picture noise level* depending on bit-error rate of the link as follows:

- For bit-error rates less than 1 in 10^{E-12}, set value in the range of 1 to 5
- For bit-error rates greater than 1 in 10^{E-12}, set value in the range of 6 to 10

If the path is even partially analog and if the user can place the equipment farthest upstream in the video path to go to a 'freeze frame' mode, then the *Picture noise level* should be optimized by initiating the 'freeze frame' mode in the upstream equipment and adjusting *Picture noise level* as low as possible, without losing the freeze alarm on the AVM. The user should note that because of the random nature of noise, the freeze alarm might be intermittent at some *Picture noise level* settings. The optimal *Picture noise level* setting is obtained when the loss of freeze alarm in the AVM occurs no more then once every 5 minutes.

If the path is even partially analog and the equipment farthest upstream in the video path cannot go to a 'freeze frame' mode, then *Picture noise level* should be optimized by adjusting it as high as possible. If you trigger false freeze alarms more often than acceptable lower the *Picture noise level* setting. Since the acceptable rate could be on the order of a day perhaps (depending on the facility), this adjustment procedure may consume a couple of days.

Failing to accomplish optimal adjustment of the *Picture noise level* will result in either:

- A large number of false alarms, or
- Lack of alarm condition when the video is frozen.

The *Picture noise level* and *Picture freeze duration* controls have been designed to be able to detect short-term "digital" freezes such as MPEG or motion JPEG server artifacts. When these devices have a significant problem with the content that they are de-compressing, they will typically start to produce a "blocky" effect. If the problem is severe enough, they will freeze a frame of video and play it out for a number of frames. With the *Picture noise level* set to 1 (i.e. only detect exact, or nearly exact pictures) and the *Picture freeze duration* set to *minimum*, the AVM can detect these quick "digital freezes". You can't however detect both this type of freeze and a freeze from a link that has added noise to the picture

8.2.10.17. Detecting Picture Black Duration

Video X		
	Fault definitions	
		Black video duration
		4 to 900 frames (4 frame increments) *88 frames*

This control sets duration, in frames, of active picture content below 7 IRE that is considered a fault.

A Fault is generated when the video level within the active picture area falls below the preset black level (7 IRE) and remains for the specified duration.

8.2.11. Setting Fault Condition Parameters

The 7765AVM-4 and 7765AVM-4A have four configurable fault conditions per quadrant. The *Fault condition 1, Fault condition 2, Fault condition 3* and *Fault condition 4* menu items are used to configure fault triggering, and how the fault alert message is presented. For audio mono, audio phase reversal and audio silence faults, fault triggers become active if the fault condition is active for the programmed fault duration. The fault trigger will deactivate within 1 second once the fault definition is inactive. The controls for each fault condition operate the same way so, for simplicity, the manual shows only the menu items for *Quadrant 1*, *Fault condition 1*.

Fault burn-in properties	Quick link to Fault burn-in properties menu. Used to set the global (all quadrants) background colors and opacities as well as text opacities of fault condition messages.
Fault condition 1	Adjusts specific fault 1 condition alert display parameters
Fault condition 2	Adjusts specific fault 2 condition alert display parameters
Fault condition 3	Adjusts specific fault 3 condition alert display parameters
Fault condition 4	Adjusts specific fault 4 condition alert display parameters

8.2.11.1. Fault Condition Menu

Fault status	Quick snapshot of the current signal/fault status for selected video input.
Burn-in position	Quick link menu item to select row and column position for the fault condition message.
Message	This control sets the message to display when the fault condition is active.
Mode	This control enables or disables Fault condition 1 message display. When enabled, the fault message will be displayed until the condition is reset.
Logic	Option to add “OR”, “AND” logic to multiple fault parameters.
Color	Select the desired background color around the text in the fault windows.
Blink	This control determines if the Fault 1 window will blink or be on solid when the fault is active.
Duration	This control sets how long the fault condition will be held.
Clear fault	This control allows the user to externally clear the fault through a pre-defined GPI.

Video error	Video error based on fault definitions Factory default: Fault condition 1
Audio error	Audio error based on fault definitions
Loss of audio	Audio absent on all channels
Loss of audio channel ½	Audio absent on channels ½ Factory default: Fault condition 2
Loss of audio channel ¾	Audio absent on channels ¾ Factory default: Fault condition 2
AP EDH errors	Active picture EDH errors present
FF EDH errors	Full Frame EDH errors present
Phase reversal 1/2	Audio 1 and 2 out of phase
Phase reversal 3/4	Audio 3 and 4 out of phase
Audio over 1/2	Audio 1 or 2 over level
Audio over 3/4	Audio 3 or 4 over level
Audio silence 1/2	Audio 1 and 2 silent level
Audio silence 3/4	Audio 3 and 4 silent level
Audio mono 1/2	Audio 1 and 2 mono setting
Audio mono 3/4	Audio 3 and 4 mono setting
Loss of VITC	VITC absent
Loss of SID	SID absent
Loss of program rating	Program rating absent Factory default: Fault condition 4
Loss of CC	Primary CC1 Closed captioning absent
Picture freeze	No activity above preset noise level in active picture Factory default: Fault condition 3
Picture black	No active picture above 7 IRE
GPI1-12	General purpose input 1 to 12 closed to ground. External trigger customized by user. (GPI5-12 are unavailable on 7765AVM-4A-M modules)

Table 4: Possible Error Triggers to Produce Faults

8.2.11.2. Setting Fault Windows Position Within Quadrant

Video X
Fault conditions
Fault condition 1
Burn-in position

Quick link to "Burn-in position" menu under "Video X" root directory to set the X and Y position of the fault message within the active display window.

8.2.11.3. Setting the Message Associated with a Fault

Video X
Fault conditions
Fault condition 1
Message
VIDEO ERROR

This control sets the message to display when the fault condition is active. The text of the message can be changed. See section 8.1.1 for information on changing text fields.

For Fault condition 2, default message is "*AUDIO ERROR*".
For Fault condition 3, default message is "*VIDEO FROZEN*".
For Fault condition 4, default message is "*NO PROG RATING*".

8.2.11.4. Enabling Fault Condition Mode

Video X
Fault conditions
Fault condition 1
Mode
Enable
Disable

This control enables or disables Fault condition 1 message display. When enabled, the fault message will be displayed until the condition is reset. When disabled, it will never be displayed.

8.2.11.5. Using Fault Logic Tool

Video X
Fault conditions
Fault condition 1
Logic
OR
AND

This control allows the user to enable more than one fault trigger (if "AND" selected) or keep one trigger for Fault Condition 1 ("OR" option).

8.2.11.6. Setting Fault Message Background Color

Video X
Fault conditions
Fault condition 1
Color
Background 1 color
Background 2 color

This setting displays the background color selections made in the "Fault burn-in properties" menu. Having two colors allows the user to identify between critical and non-critical faults.

8.2.11.7. Enabling Fault Message to Blink

- *Video X*
  - *Fault conditions*
    - *Fault condition 1*
      - *Blink*
        - *Disable*
        - *Enable*

This control determines if the Fault condition 1 alert message will blink or remain solid when the fault is active. When *Disable* is selected the Fault condition message alert remains solid. When it is set to *Enable* the fault alert message blinks upon activation.

8.2.11.8. Setting the Duration of the Fault Condition

- *Quadrant 1*
  - *Fault conditions*
    - *Fault condition 1*
      - *Duration*
        - *Until reset*
        - *1 to 254 frames*
        - *30 frames*

This control sets how long the fault condition will be held. The fault display will be displayed as long as the fault condition is active and the *Fault mode* is set to *Enable*. The fault condition can either be held until the user clears the condition or until a programmable timer expires.

8.2.11.9. Clearing Fault Conditions Alert Messages

- *Video X*
  - *Fault conditions*
    - *Fault condition 1*
      - *Clear fault*
        - *Off*
        - *GPI1 – GPI12*

This control allows the user to externally clear the fault through a pre-defined GPI.

8.2.11.10. Determining Fault Condition Triggers

- *Video X*
  - *Fault conditions*
    - *Fault condition 1*

This control provides a list of items that may generate a fault condition. Use the toggle switch to travel up and down this list and the pushbutton to enable or disable the item from the fault condition criteria. A fault condition will exist when any of the selected items from the following list occurs.

8.2.12. Clearing Fault Messages

- *Video X*
  - *Clear faults*
    - *Cancel*
    - *Clear*

This menu item on the top level menu provides a convenient method to clear any fault conditions through the on-screen menu.

8.2.13. Setting H/V Delay Line and Pixel Variables

8.2.13.1. Setting H/V Delay

H/V delay, or phasing control, allows the user to optimize video input and output delays, thereby configuring the active picture display. Configuring H/V delay also allows the user to view either HANC or VBI.

Video X *H/V delay* *Enable* *Off* *On* *GPI1 – GPI12*	Control to enable H/V delay manually through Off/On or to have external GPI trigger H/V delay enabling.

8.2.14. Disabling On-screen Fault Messages

In some cases, no on-screen fault messages are desired, or the ability to turn of these message through an external contact closure is required. This menu option allows the user to turn of such fault alert message "permanently" through the "ON" option or via GPI configuration.

Video X *Disable on-screen fault* *Off* *On* *GPI1 – GPI12*	Control to disable on screen display fault per selected video input permanently through the "ON" option, or through external GPI control. Note that GPI 5-12 are unavailable on 7765AVM-4A-M modules.

8.3. ON-SCREEN DISPLAY CONFIGURATION

Bar graph properties	Adjusts bar graph display parameters.
Text burn-in properties	Adjusts text message display parameters.
Fault burn-in properties	Adjusts fault text message display parameters.

8.3.1. Setting Bar Graph Regions

Each of the level bar graphs consists of three regions: the "OK", "Warning" and "Error" regions. The *Colors* menu items allow you to select one of a group of standard colors, or choose your own custom colors for each of the regions. The controls for each region operate the same way so for simplicity only the controls for the OK region will be shown in the manual.

Tip: The colors of the various regions are defined by three 8 bit R, G, B values very similar to the values used in most paint programs like Microsoft Paint. When you choose one of the predefined colors, the AVM automatically sets the R, G, and B values. If you choose the custom color, you will be able to set the R, G, and B values independently to give you the desired color. If you are having problems setting these values with the menu system, open a paint program, select the color you like (usually from a color wheel) and set the R, G, and B values into the AVM card using the respective *Custom color* menu items for the region.

8.3.1.1. Setting the Level Bar Graph Region Color

On-screen display configuration
- *Bar graphs*
  - *OK region*
    - *White*
    - *Black*
    - *Grey*
    - *Yellow*
    - *Red*
    - *Green*
    - *Custom*

This control sets the color of the bottom, "OK", region of level bar graphs. You can choose from one of the predefined colors or define a custom color.

For *Custom* color configuration see section 7.5.1.2

8.3.1.2. Selecting a Bar Graph Region Custom Color

There are three menu items used to set the custom color. The menu item for each color component works in the same way so for simplicity only the menu item for the *Custom OK Region* will be shown in the manual.

On-screen display configuration
- *Bar graphs*
  - *OK region*
    - *Custom ok red:*
    - *0 to 255*
    - *0*

This control defines the red component color for a custom color for one of the regions of level bar graphs.

When the menu item is selected you are shown a screen which shows all three color components, with an arrow (<) to the right of the color component you will be adjusting. In addition you are shown two boxes on the screen, which show you the current custom color value to aid you in selecting the desired color. The box on the left side of the screen shows the color with the bar graph background opacity value applied, while the box on the right shows the color with the bar graph bar opacity value applied.

On-screen display configuration
- *Bar graphs*
  - *OK region*
    - *Custom ok green:*
    - *0 to 255*
    - *192*

This control defines the green component colors for a custom color for one of the regions of level bar graphs.

On-screen display configuration
- *Bar graphs*
  - *OK region*
    - *Custom ok blue:*
    - *0 to 255*
    - *0*

This control defines the blue component colors for a custom color for one of the regions of level bar graphs.

8.3.1.3. Setting the Transparency (Opacity) of Bar Graph Background

- *On-screen display configuration*
  - *Bar graphs*
    - *Background opacity*
      - *0 to 64*
      - *32*

This control sets the bar graph background opacity or how much video picture content will be visible through the bar graph backgrounds.

When set to the minimum value, very little of the bar graph background color will be visible over the video content. At the maximum value, very little of the background video will be visible through the bar graph.

8.3.1.4. Setting the Transparency (Opacity) of the Bar Graph Bars

- *On-screen display configuration*
  - *Bar graphs*
    - *Bars opacity*
      - *0 to 64*
      - *64*

This control sets the bar graph foreground opacity or how much video picture content will be visible through the bar graph backgrounds.

When set to the minimum value, very little of the bar graph color will be visible over the video content. At the maximum value, very little of the background video will be visible through the bar graph.

8.3.2. Setting Text Burn-in Properties

The On screen text windows can be displayed as white characters with or without a colored background. In addition the text and background opacity or how much video picture content will be visible through the text or background is adjustable. The *Text burn-in configuration* menu items are used to set these parameters for all the text windows except the Fault windows.

8.3.2.1. Setting Source ID Color 1

- *On-screen display configuration*
  - *Text burn-in properties*
    - *SID/UMD color 1*
      - *Black*
      - *Grey*
      - *Yellow*
      - *Red*
      - *Green*
      - *Blue*
      - *Orange*

Select the desired source ID/UMD color around the text.

8.3.2.2. Setting Source ID Color 2

- *On-screen display configuration*
  - *Text burn-in properties*
    - *SID/UMD color 2*
      - *Black*
      - *Grey*
      - *Yellow*
      - *Red*
      - *Green*
      - *Blue*
      - *Orange*

Select the desired source ID/UMD color around the text.

8.3.2.3. Setting Source ID Color 3

- *On-screen display configuration*
  - *Text burn-in properties*
    - *SID/UMD color 3*
      - *Black*
      - *Grey*
      - *Yellow*
      - *Red*
      - *Green*
      - *Blue*
      - *Orange*

Select the desired source ID/UMD color around the text.

8.3.2.4. Setting the Text Window Default Background Color

- *On-screen display configuration*
  - *Text burn-in properties*
    - *Default background color*
      - *Black*
      - *Grey*
      - *Yellow*
      - *Red*
      - *Green*
      - *Blue*
      - *Orange*

Select the desired background color around the text in the Text windows.

8.3.2.5. Setting the Text Window Background Opacity

On-screen display configuration
- *Text burn-in properties*
  - *Background opacity*
    - *0 to 64*
    - *64*

This control sets the Text window background opacity or how much video picture content will be visible through the window background.

When set to the minimum value, very little of the window background color will be visible over the video content. At the maximum value, very little of the background video will be visible through the window background.

White text without any background can be configured by setting the background opacity to 0.

8.3.2.6. Setting the Text Window Text Opacity

On-screen display configuration
- *Text burn-in configuration*
  - *Text opacity*
    - *0 to 64*
    - *64*

This control sets the Text window text opacity or how much video picture content will be visible through the text characters.

When set to the minimum value, very little of the white window text will be visible over the video content. At the maximum value, very little of the background video will be visible through the white window text.

8.3.3. Setting Fault Burn-in Properties

The On screen text windows can be displayed as white characters with or without a colored background. In addition the text and background opacity or how much video picture content will be visible through the text or background is adjustable. The *Fault burn-in configuration* menu items are used to set these parameters for all the text windows except the Fault windows.

8.3.3.1. Setting the Fault Text Background Colors

On-screen display configuration
- *Fault burn-in properties*
  - *Background color 1*
    - *Black*
    - *Grey*
    - *Yellow*
    - *Red*
    - *Green*
    - *Blue*
    - *Orange*

Select the desired background color around the text in the Fault window.

On-screen display configuration *Fault burn-in properties* *Background color 2* *Black* *Grey* *Yellow* *Red* *Green* *Blue* *Orange*	Select the desired background color around the text in the Fault window.

8.3.3.2. Setting the Fault Text Background Opacity

On-screen display configuration *Fault burn-in properties* *Background opacity* *0 to 64* *64*	This control sets the Text window background opacity or how much video picture content will be visible through the window background. When set to the minimum value, very little of the window background color will be visible over the video content. At the maximum value, very little of the background video will be visible through the window background. White text without any background can be configured by setting the background opacity to 0.

8.3.3.3. Setting the Fault Text Opacity

On-screen display configuration *Fault burn-in properties* *Text opacity* *0 to 64* *64*	This control sets the Text window text opacity or how much video picture content will be visible through the text characters. When set to the minimum value, very little of the white window text will be visible over the video content. At the maximum value, very little of the background video will be visible through the white window text.

8.4. GPI CONFIGURATION

8.4.1. Viewing GPI Configurations

- *GPIx (x = 1 to 12)*
  - *GPI enable status*

A status screen displaying GPI trigger allocations associated with the four inputs of a particular 7765AVM-4-M module

GPI5-12 are unavailable on 7765AVM-4A-M modules.

8.5. GPO CONFIGURATION

Each 7765AVM-4-M module has four General Purpose outputs available through the DB-25 connector which can be used to signal several conditions to the user. In addition, these outputs can be configured to be active high or low. The 7700FR-C frame also has a fault monitoring LED and general-purpose output. The user also has the ability to configure which faults the 7765AVM-4-M module will assert onto the frame status system. The *GPO configuration* menu contains the controls used to configure the GPOs. For simplicity, only menu items for GPO1 will be described below.

- *GPO configuration*
  - *GPOx*
    - *GPO active state*
      - *High*
      - *Low*
    - *Video y fault z*
      - *Yes*
      - *No*

This menu item controls whether the General purpose output is active *High* or *Low*. Also, setting the GPO to trigger upon a fault condition 1 or fault condition 2 alert in a particular quadrant is also controlled in this menu. (x = 1 to 4, y = 1 to 4, z = 1 to 4)

NOTE: The output will power up in a high state until the software has had sufficient time to update the output with the appropriate condition.

- *GPO configuration*
  - *Frame status trigger*
    - *Video y fault z*
      - *Yes*
      - *No*

The 7700 frame has a global status line that any card can pull active. With this control, you can select the condition for the card to cause the line to go active. Also included on the frame status signal is card power supply monitoring. This is derived with hardware and can not be disabled from the status signal. (y = 1 to 4, z = 1 to 4)

If it is desired to use this feature, the frame status jumper J22 (located near the card extractor) must also be set to the *On* position. See section 10.1

The Red *Local Fault* LED will be On when the global status line is active regardless of the position of jumper J22.

8.6. CONFIGURING H/V DELAY PARAMETERS

8.6.1.1. Setting H/V Delay 525 Start Line

Video X
H/V delay
525 start line
8 to 262
120

Global control to set starting line with 525 line input (when module outfitted with 525 firmware).

8.6.1.2. Setting H/V Delay 625 Start Line

Video X
H/V delay
625 start line
5 to 312
140

Global control to set starting line with 625 line input (when module outfitted with 625 firmware)

8.6.1.3. Setting H/V Delay 525 Line Start Sample

Video X
H/V delay
525 start sample
0 to 856 (in 2 sample increments)
574

Global control to set the starting pixel with a 525 line input (when module outfitted with 525 firmware)
.

8.6.1.4. Setting H/V Delay 625 Line Start Sample

Video X
H/V delay
625 start sample
0 to 862 (in 2 sample increments)
574

Global control to set the starting pixel with a 625 line input input (when module outfitted with 625 firmware).

8.7. SERIAL PORT CONFIGURATION

Data logging	Configuration to keep the output serial port as a fault data logging interface
TSL protocol	Configuration for TSL UMD protocol
Serial port configuration	Serial port function selection menu item

8.7.1. Data Logging

Data logging is performed through the rear serial port. Since standard ASCII text is used, the fault data is human readable. Any PC running a terminal program can be used to view the log data or save the data logs to disk, providing a permanent report of any errors that existed over a specific period of time. When faults are logged on the serial port a time stamp accompanies them from an internal clock. The data logging serial port (RS-232) operates at 57600 baud, 8 bits, no parity, 2 stop bits and no flow control.

There are 2 data logging options which can be enabled separately or at the same time:

- Periodically output card status
- Output fault data on a fault status change

Fault log *Disable* *Enable*	This control selects whether or not fault log data should be sent out the serial port. When Fault logging is enabled, a text message is sent out the serial port when a fault condition changes.
Status log *Disable* *Enable*	This control selects whether or not status log data should be sent out the serial port. When Status logging is enabled, text messages representing the current status of the card are sent out the serial port at the poll rate specified in the *Status poll rate* menu item.
Card ID *7765AVM-4-M*	This menu item identifies the specific Quattro™ card. This label will appear on the data log along with associated fault and status information.
Event stamp *Current time*	This control shows and sets the current state of the free-running clock (*Current time*).
Poll rate *1 to 60 min (1 min increments)* *1 min*	This control sets the rate at which card status is sent out the rear serial port when Status logging is enabled. The status includes all items from the status window and AP and FF EDH error states.
Query status *Yes* *No*	This menu item is used to output the card status regardless of whether the polling rate timer has expired. Each time the *Query status* menu item is set to *Yes*, the card status is output on the serial port.

8.7.2. TSL Protocol

TSL Protocol	
	Video source A address =
	0 to 126

This menu item allows the user to set the TSL protocol address identifying where the Quattro must look to decode the UMD information. For simplicity, only "A" menu I shown here. Sources "B", "C" and "D" are set in a similar manner, with default addresses set to "1", "2" and "3" respectively.

8.7.3. Serial Port Configuration

Serial port configuration	
	Data logging
	TSL protocol
	Probel protocol

This menu item defines the function of the serial port on the back of the Quattro rear plate module. For Data logging, the module itself can be left in RS-232 mode (via jumper). For either TSL or Probel UMD mode, the jumper must be moved to RS-422 mode.

The jumper/header position is located on the top "CC" board (Figure 7), along its top edge. In positions 1-2, or is left open the serial port will function as an RS-232 port. If pins 2-3 are connected, the port will communicate via RS-422 type protocols.

8.8. UTILITIES

About…	A Quick reference menu item that displays the currently loaded firmware revision for the AVM along with serial and build numbers.
Upgrade	Set the card into upgrade mode. This menu option allows the user to bypass the Upgrade Jumper on the card when upgrading with newer firmware through the RS-232 communication port located at the front card-edge.
Factory reset	Resets the card configuration to factory default values. (Factory default values are underlined in the manual.)

8.8.1. About…

Utilities	
	About…

This menu item lists the particulars about this module including the hardware, and software revisions. This item can be used to determine if an upgrade to the module is required.

8.8.2. Initiating a Software Upgrade

Utilities
- *Upgrade*
  - *Yes*
  - *Cancel*

This menu item is used to initiate an upgrade of the module software.

In addition to the software upgrade support detailed in this manual (See the *Upgrading Firmware* section of this manual for more information), you can initiate an upgrade with this command. This will allow you to upgrade the software without unplugging the card and changing the upgrade jumper.

After selecting the upgrade operation, you must change the command to *Yes* and press the pushbutton before the upgrade can take place. You can abort the operation by pressing the pushbutton when *Cancel* is displayed.

After the upgrade has finished, the unit will automatically restart and run in normal operating mode.

8.8.3. Restoring the AVM to its Factory Default Configuration

Utilities
- *Factory reset*
  - *Yes*
  - *Cancel*

This menu item is used to restore all controls back to their factory defaults.

After selecting the reset operation, you must change the command to *Yes* and press the pushbutton before the command takes place. After the command, all parameters will be set to their factory default. You can abort the operation by pressing the pushbutton when *Cancel* is displayed.

8.9. SETTING INSTRUCTIONS UPON LOSS OF VIDEO SIGNAL

Loss of video
- *Pass*
- *Black*

Upon loss of video for any one of the inputs, the output for input signal is set to either black (default) or to pass the actual input.

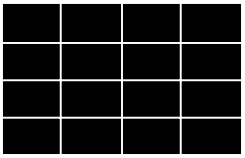
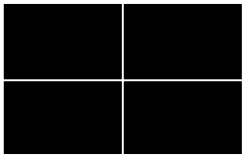
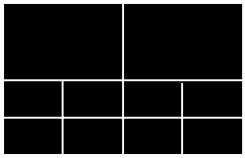
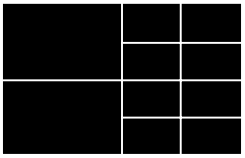
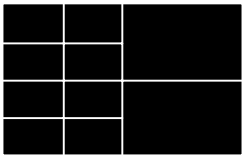
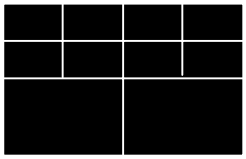
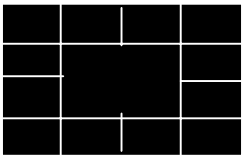
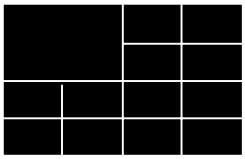
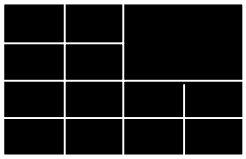
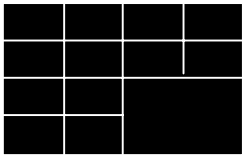
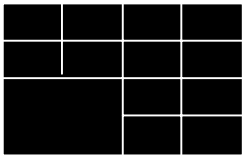
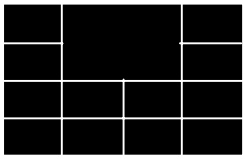
9. ON SCREEN DISPLAY – 7765Q-x MAIN MENU

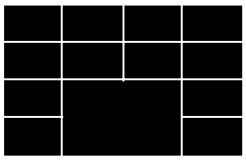
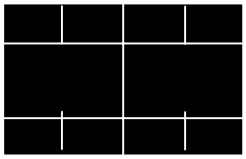
Layout	Presets for configuring the window display layout of the MultiViewer package.
Border Control	User configuration to control the border around a particular active picture display – can be used for tally control via GPI or fault indication.
GPI Configuration	On-screen display of allocated GPI inputs on 7765Q-x module.
Utilities	Upgrading, resetting and firmware-version identifying utility.

9.1. LAYOUT

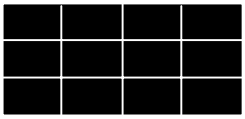
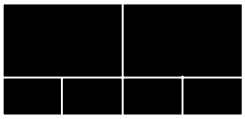
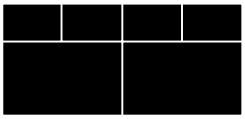
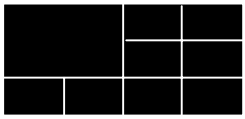
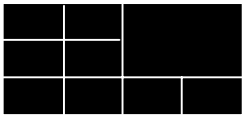
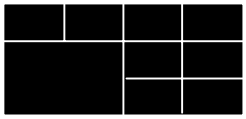
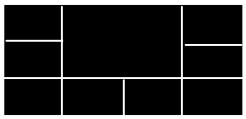
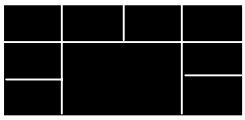
Layout Preset	Presets for configuring the display layout of the MultiViewer. Depending on the 7765MVM package, a number of preset layouts are available to choose from. Available layouts are labeled 1 – up to 14 presets (on the 7765MVM-16/16A) and are depicted in sections 9.1.1 to 9.1.3.
Window x source =	Binding of an input video source to a particular display window of the MultiViewer. The "x" identifies the display window. For simplicity the windows are numbered from left to right by rows. The user can select which input corresponds to which window to the maximum number of inputs available.

9.1.1. Video Display Layout Presets (PKG7765MVM-16/-16A)

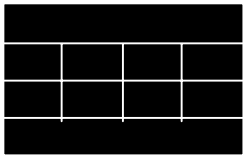
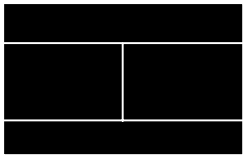
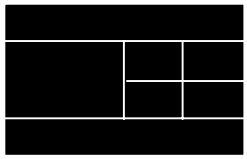
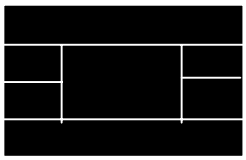
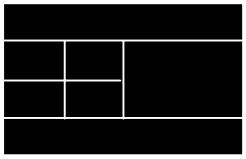
Layout 1: 	Layout 2: 	Layout 3: 
Layout 4: 	Layout 5: 	Layout 6: 
Layout 7: 	Layout 8: 	Layout 9: 
Layout 10: 	Layout 11: 	Layout 12: 

Layout 13: 	Layout 14: 	

9.1.2. Video Display Layout Presets (PKG7765MVM-12/-12A)

Layout 1: 	Layout 2: 	Layout 3: 
Layout 4: 	Layout 5: 	Layout 6: 
Layout 7: 	Layout 8: 	Layout 9: 

9.1.3. Video Display Layout Presets (PKG7765MVM-8/-8A)

Layout 1: 	Layout 2: 	Layout 3: 
Layout 4: 	Layout 5: 	

9.2. BORDER CONTROL

Default color	When no border colors are configured from the menu item below, this default border color is used for all borders. This menu option allows the user to change and even disable border colors to avoid screen "burn-in" particularly on plasma displays.
Window x colors	Option to select and enable up to four border colors surrounding the active picture display on the MultiViewer.

9.2.1. Setting the Default Border Color

Border Control

Default color

none
white
gray
yellow
red
green
blue
orange
black/white
black/yellow
black/red
black/green
black/blue
black/orange
yellow/blue
yellow/green
yellow/red
white/blue
white/green
white/red

This control allows the user to set the default border color for all borders. This setting is over-written if a specific border color selection is made as defined in section 8.2.2 for a specific display window.

The two color selections in this menu causes the border color to cycle between both colors thereby appearing to flash on the display.

9.2.2. Setting Border Colors

Border Control
- *Window x color*
  - *Select color y*
    - *none*
    - *white*
    - *gray*
    - *yellow*
    - *red*
    - *green*
    - *blue*
    - *orange*
    - *black/white*
    - *black/yellow*
    - *black/red*
    - *black/green*
    - *black/blue*
    - *black/orange*
    - *yellow/blue*
    - *yellow/green*
    - *yellow/red*
    - *white/blue*
    - *white/green*
    - *white/red*

This menu option is similar to that for default border color, but specifically relates to a display window. This menu selection will over-write the default setting.

Note, "x" is the display window number. The displays are numbered by rows from left to right. Therefore the top left window will be "1" and this number will increment as one moves to the right.

The variable "y" identifies selected colors 1 to 4. Up to 4 colors can be set in this menu option and enabled through menu options outlined in section 8.2.3.

Window 2 up to 16 are configured in the same manner.

9.2.3. Enabling Border Colors

Border Control
- *Window x color*
  - *Enable color y*
    - *off*
    - *on*
    - *GPI1 – GPI12*
    - *Fault condition 1*
    - *Fault condition 2*
    - *Fault condition 3*
    - *Fault condition 4*
    - *Any fault*

The display windows of the MultiViewer are equipped with active picture borders. These borders can be enabled through a GPI interface, or via fault conditions. Border enabling is achieved through this menu option.

Window 2 up to 16 are configured in the same manner.

9.3. GPI CONFIGURATION

9.3.1. Viewing GPI Configurations

GPIx (x = 1 to 12)
- *GPI enable status*

A status screen displaying GPI trigger allocations associated with the 7765Q-x.

9.4. UTILITIES

About…	A Quick reference menu item that displays the currently loaded firmware revision for the AVM along with serial and build numbers.
Upgrade	Set the card into upgrade mode. This menu option allows the user to bypass the Upgrade Jumper on the card when upgrading with newer firmware through the RS-232 communication port located at the front card-edge.
Factory reset	Resets the card configuration to factory default values. (Factory default values are underlined in the manual.)

9.4.1. About…

Utilities
- *About…*

This menu item lists the particulars about this module including the hardware, and software revisions. This item can be used to determine if an upgrade to the module is required.

9.4.2. Initiating a Software Upgrade

Utilities
- *Upgrade*
  - *Yes*
  - *Cancel*

This menu item is used to initiate an upgrade of the module software.

In addition to the software upgrade support detailed in this manual (See the *Upgrading Firmware* section of this manual for more information), you can initiate an upgrade with this command. This will allow you to upgrade the software without unplugging the card and changing the upgrade jumper.

After selecting the upgrade operation, you must change the command to *Yes* and press the pushbutton before the upgrade can take place. You can abort the operation by pressing the pushbutton when *Cancel* is displayed.

After the upgrade has finished, the unit will automatically restart and run in normal operating mode.

9.4.3. Restoring the AVM to its Factory Default Configuration

Utilities
- *Factory reset*
  - *Yes*
  - *Cancel*

This menu item is used to restore all controls back to their factory defaults.

After selecting the reset operation, you must change the command to *Yes* and press the pushbutton before the command takes place. After the command, all parameters will be set to their factory default. You can abort the operation by pressing the pushbutton when *Cancel* is displayed.

10. JUMPERS

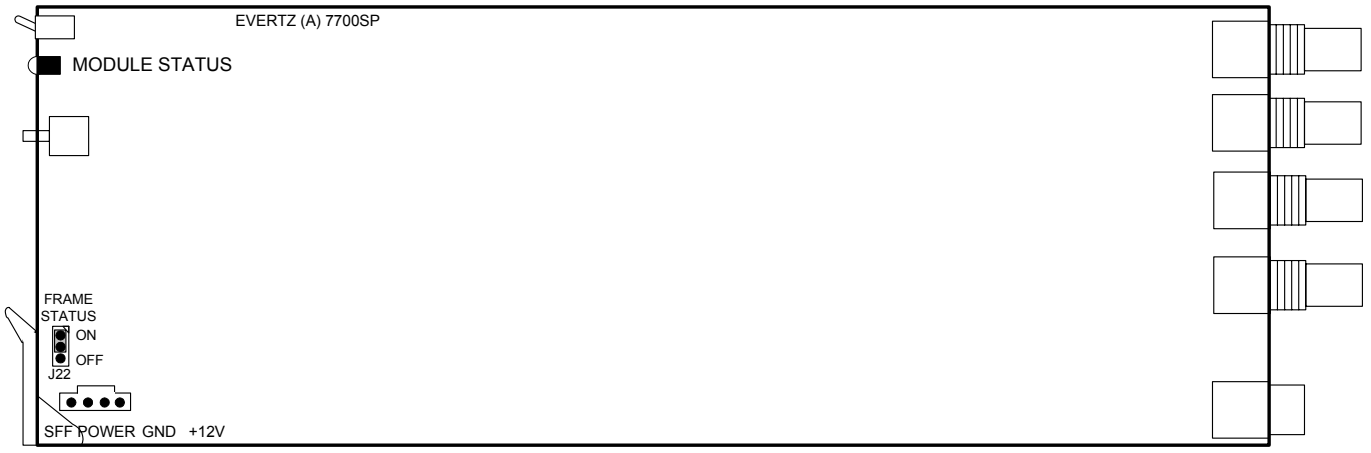


Figure 6: Location of Jumpers on 7700SP Boards

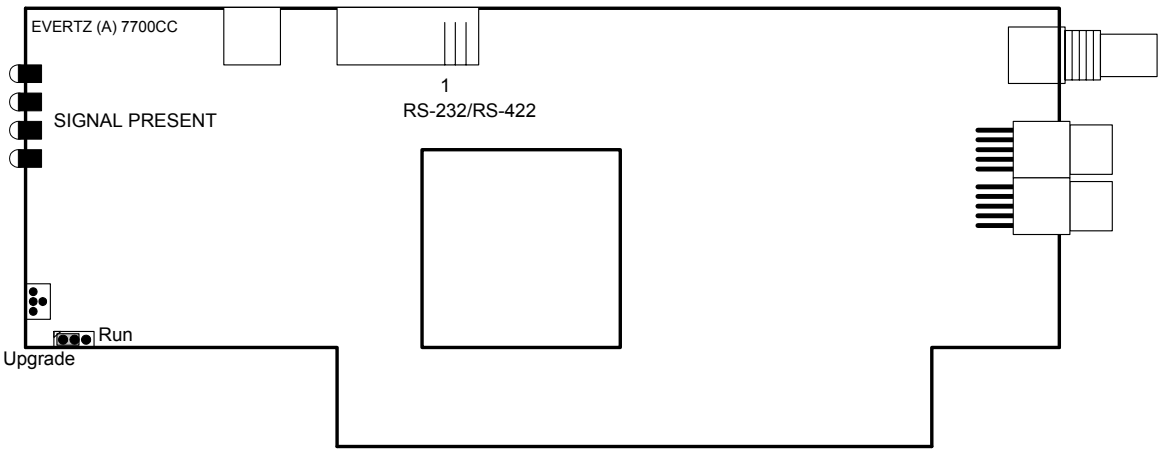


Figure 7: Location of Jumpers on 7700CC Boards

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

FRAME STATUS The FRAME STATUS jumper J22 located at the front of the module determines whether local faults (as shown by the Local Fault indicator) will be connected to the 7700FR-C frame's global status bus.

To monitor faults on this module with the frame status indicators (on the PS FRAME STATUS LED's and on the Frame's Fault Tally output) install this jumper. (Default) When this jumper is removed, local faults on this module will not be monitored. For convenience you may re-install the jumper so that only one side is connected.

The *Frame status trigger* menu item on the *GPO configuration* menu is used to configure whether *Fault condition 1* or *Fault condition 2* will assert the frame status fault line. Power supply faults will always assert the frame status fault line when J22 is installed.

10.2. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

The following method can be used to upgrade the firmware in the AVM card. You can also use the *UPGRADE* menu item located on the *UTILITIES* menu to upgrade the firmware.

UPGRADE

The UPGRADE jumper located on the top module at the bottom, front 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 of this manual for more information.

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

11. Menu Quick Reference

7765AVM-4-M

VIDEO X

- **Audio source**
- **Audio channel ½**
  - Audio level mode
  - Headroom
  - PPM mode
  - Clear peak
- **Audio channel ¾**
  - same as Audio channel ½
- **Bar graph ½**
  - Bar graph properties
  - Level type
  - VU range
  - Phase type
  - Error region
  - Warning region
- **Bar graph ¾**
  - same as Bar graph ½
- **Clear peaks**
- **Source ID/UMD**
  - 525 VITC line
  - 625 VITC line
    - *(not in 525 versions)*
  - Default source ID mode
  - Default source ID message
  - SID/UMD color 1 enable
  - SID/UMD color 2 enable
  - SID/UMD color 3 enable
- **Burn-in configuration**
  - On screen display configuration (Quick link)
  - Burn-in enable
    - *Ch ½ level bars*
    - *Ch ¾ level bars*
    - *Ch ½ phase bar*
    - *Ch ¾ phase bar*
    - *Time code*
    - *Program rating*
    - *XDS*
    - *Source ID/UMD*
  - Burn-in position
    - *Time code window row*
    - *Time code window col*
    - *Program rating window row*
    - *Program rating window col*
    - *XDS window row*
    - *XDS window col*
    - *Fault 1window row*
    - *Fault 1 window col*
    - *Fault 2 window row*
    - *Fault 2 window col*
    - *Fault 3 window row*
    - *Fault 3 window col*
    - *Fault 4 window row*
    - *Fault 4 window col*
  - **Fault definitions**
    - Video error duration
    - Loss of audio duration
    - EDH error duration
    - Over level
    - Over duration
    - Silence level
    - Silence duration
    - Phase rev. level
    - Phase rev. duration
    - Mono threshold level
    - Mono duration
    - Loss of CC duration
    - Loss of PR duration
    - Picture noise level
    - Freeze duration
    - Black video duration
  - **Fault conditions**
  - Fault burn-in properties (Quick link)
  - Fault condition 1
    - *Fault Status (real time status display)*
    - *Burn-in position*
    - *Message*
    - *Mode*
    - *Logic*
    - *Color*
    - *Blink*
    - *Duration*
    - *Clear fault*
    - *Video error*
    - *Loss of audio*
    - *Loss of audio channel ½*
    - *Loss of audio channel ¾*
    - *AP EDH errors*
    - *FF EDH errors*
    - *Phase reversal ½*
    - *Phase reversal ¾*
    - *Audio over ½*
    - *Audio over ¾*
    - *Audio silence ½*
    - *Audio silence ¾*
    - *Audio mono ½*
    - *Audio mono ¾*
    - *Loss of VITC*
    - *Loss of source ID*
    - *Loss of program rating*
    - *Loss of CC*
    - *Picture freeze*
    - *Picture black*
    - *GPI1*
    - *GPI2*
    - *GPI3*
    - *GPI4*
    - *GPI5*
    - *GPI6*
    - *GPI7*
    - *GPI8*
    - *GPI9*
    - *GPI10*
    - *GPI11*
    - *GPI12*

    GPI5 -GPI12 not available in "4A" modules
  - Fault condition 2
    - *Same as for Fault condition 1*
  - Fault condition 3
    - *Same as for Fault condition 1*
  - Fault condition 4
    - *Same as for Fault condition 1*
  - **Clear faults**
  - **Disable on-screen faults**
  - **H/V delay**

ON SCREEN DISPLAY CONFIGURATION

- **Bar graph properties**
  - OK region
  - Custom OK red
  - Custom OK green
  - Custom OK blue
  - Warning region
  - Custom warning red
  - Custom warning green
  - Custom warning blue
  - Error region
  - Custom error red
  - Custom error green
  - Custom error blue
  - Background opacity
  - Bars opacity
- **Text burn-in properties**
  - SID/UMD color 1
  - SID/UMD color 2
  - SID/UMD color 3
  - Default background color
  - Background opacity
  - Text opacity
- **Fault burn-in properties**
  - Background color 1
  - Background color 2
  - Background opacity
  - Text opacity
- **GPI CONFIGURATION**
  - GPIx
- **GPO CONFIG.**
  - GPO1
    - *GPO active state*
    - *V1F1*
    - *V1F2*
    - *V1F3*
    - *V1F4*
    - *V2F1*
    - *V2F2*

- *V2F3*
- *V2F4*
- *V3F1*
- *V3F2*
- *V3F3*
- *V3F4*
- *V4F1*
- *V4F2*
- *V4F3*
- *V4F4*

- GPO2
  - *same as GPO1*
- GPO3
  - *same as GPO1*
- GPO4
  - *same as GPO1*
- Frame status trigger
  - *V1F1*
  - *V1F2*
  - *V1F3*
  - *V1F4*
  - *V2F1*
  - *V2F2*
  - *V2F3*
  - *V2F4*
  - *V3F1*
  - *V3F2*
  - *V3F3*
  - *V3F4*
  - *V4F1*
  - *V4F2*
  - *V4F3*
  - *V4F4*

- **H/V DELAY**
  - 525 start line
  - 625 start line (not in 525 version)
  - 525 start sample
  - 625 start sample (not in 525 version)

- **SERIAL PORT**
- **Data logging**
- **TSL protocol**
  - Video source A address=
  - Video source B address=
  - Video source C address=
  - Video source D address=
- **Serial port configuration**
  - Data logging
  - TSL protocol
  - Probel protocol

- **UTILITIES**
  - About…
  - Upgrade
  - Factory reset

-
- **LOSS OF VIDEO**

7765Q-x

- **LAYOUT**
  - Layout preset
  - Window 1 source =
  - Window 2 – 16 source =
    - *same as Window 1 source*
- **BORDER CONTROL**
  - Default color
  - Window 1 colors
    - *Select color 1*
    - *Select color 2*
    - *Select color 3*
    - *Select color 4*
    - *Enable color 1*
    - *Enable color 2*
    - *Enable color 3*
    - *Enable color 4*
  - Window 2 –16 colors…
    - *same as Window 1 colors*
- **GPI CONFIGURATION**
  - GPIx
- **UTILITIES**
  - About…
  - Upgrade
  - Factory reset