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REVISION HISTORY

REVISION	DESCRIPTION	DATE
0v0_1	Original Version – Preliminary	Oct 02
0v0_2	Minor updates to 0v)_1	Oct 02

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1. OVERVIEW

Optimized for multiple video signal monitoring, Evertz's 7766MVM 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 and is optimized to fit 4:3 projection or 16:9 plasma displays. 7766MVM 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 7766MVM 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

- Eight, twelve and sixteen composite analog (NTSC or PAL) video inputs with external analog audio (7766MVM-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 20 user-configurable GPI inputs available for display modifications, tally indicators, display borders and display modes
- RS-232 or RS-422 serial port (jumper configurable) for interface to external equipment via communication protocols
- External analog audio, serial communication ports and GPI I/Os are available on 68-pin SCSI connectors with optional Bulkhead Breakout Panels
- System configuration and channel monitoring through VistaLINK™ with 3RU 7700FR-C frame and a 7700FC VistaLINK™ Frame Controller module

1.1. FUNCTIONAL DESCRIPTION

Each of the 7766AVM-4A-M and 7766AVM-S4A-M modules of the PKG7766MVM are quad composite analog channel video monitoring cards with 4 balanced analog audio (1 group) inputs per video input. Composite video inputs (or S-video) are programmed for NTSC or PAL standards, then independently digitized, with VBI data extracted and processed by the CPU. The CPU analyzes the audio, extracts performance data, and creates level and phase bar graphs writing them to the on screen display (OSD) memory. The CPU also reads raw closed captioning, VITC and SID data and extracts time code, program rating and the source ID information, which is also written to memory. The hardware mixes (keys) the on-screen text and bar graphs display information onto the video stream. In addition, the CPU receives pushbutton and toggle-switch commands from either the card-edge control or set-up parameters and draws extensive menus for configuring the operation of the card. Four general-purpose (GPI) inputs and

four general-purpose (GPO) outputs are also available. Refer to Figure 1 for a block diagram of the 7766AVM-4A-M and 7766AVM-S4A-M modules.

Up to four 7766AVM-4A-M, 7766AVM-S4A-M (or combination thereof) modules connect to a single 7765Q module. The 7765Q module is used to display the video inputs using pre-configured window layouts. In addition, tally information via picture borders is also controlled through this module.

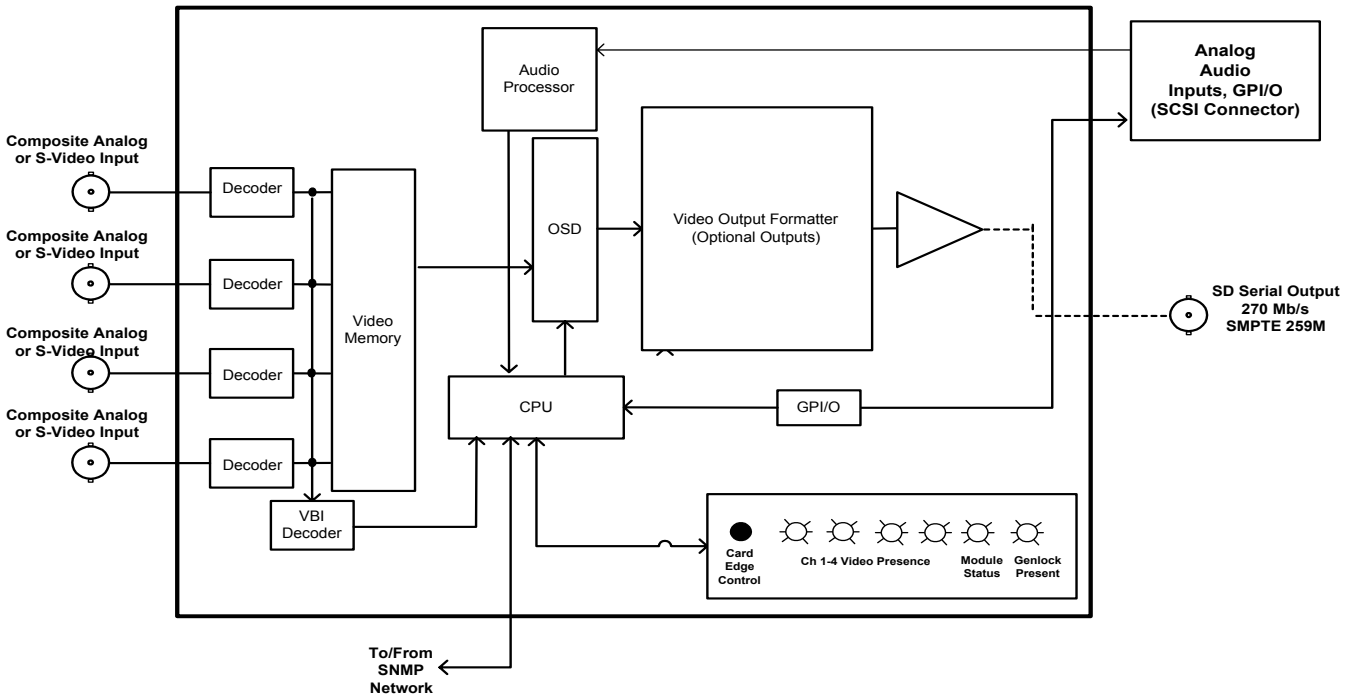

Figure 1: 7766AVM-4A-M and 7766AVM-S4A-M Module Block Diagram

2. INSTALLATION

The modules of PKG7766MVM-x come with a companion rear plate that includes BNC connectors, a high-density DB-15 on the 7765Q module and several female 68 pin SCSI connectors. PKG7766MVM 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 composite analog NTSC or PAL video to each (or any) of the four composite analog inputs (labeled “VIDEO INPUT 1-4”). Processed video with text and audio bar graphs are available on one of the SD, Composite Analog or VGA outputs.

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Figure 2: 7766MVM-8 and 7766MVM-8A Rear Plate

68-pin SCSI	7766AVM -4A/-S4A	Description	68-pin SCSI	7766AVM -4A/-S4A	Description
1	Rx+	RS-422 (Jumper configurable)	35	RX-/RX	RS-422/232 input (Jumper configurable)
2	Tx+	RS-422 (Jumper configurable)	36	TX-/TX	RS-422/232 (Jumper configurable)
3	GPO1	General Purpose Output 1	37	GPO4	General Purpose Output 4
4	GPO2	General Purpose Output 2	38	GPO3	General Purpose Output 3
5	GND	Ground	39	GND	Ground
6	A3+	Audio Input Channel	40	A3-	Audio Input Channel
7	A4-	Audio Input Channel	41	A4+	Audio Input Channel
8	GND	Ground	42	GND	Ground
9	A1+	Audio Input Channel	43	A1-	Audio Input Channel
10	A2+	Audio Input Channel	44	A2-	Audio Input Channel
11	GND	Ground	45	GND	Ground
12	B1-	Audio Input Channel	46	B1+	Audio Input Channel
13	GND	Ground	47	GND	Ground
14	D1-	Audio Input Channel	48	D1+	Audio Input Channel
15	GND	Ground	49	GND	Ground
16	B3-	Audio Input Channel	50	B3+	Audio Input Channel
17	GND	Ground	51	GND	Ground
18	B4-	Audio Input Channel	52	B4+	Audio Input Channel
19	GND	Ground	53	GND	Ground
20	D2+	Audio Input Channel	54	D2-	Audio Input Channel
21	GND	Ground	55	GND	Ground
22	B2-	Audio Input Channel	56	B2+	Audio Input Channel
23	GND	Ground	57	GND	Ground
24	C1-	Audio Input Channel	58	C1+	Audio Input Channel
25	GND	Ground	59	GND	Ground
26	C2+	Audio Input Channel	60	C2-	Audio Input Channel
27	GND	Ground	61	GND	Ground
28	C3-	Audio Input Channel	62	C3+	Audio Input Channel
29	C4+	Audio Input Channel	63	C4-	Audio Input Channel
30	GND	Ground	64	GND	Ground
31	D3+	Audio Input Channel	65	D3-	Audio Input Channel
32	D4+	Audio Input Channel	66	D4-	Audio Input Channel
33	GPI3	General Purpose Input 3	67	GPI4	General Purpose Input 4
34	GPI1	General Purpose Input 1	68	GPI2	General Purpose Input 2

Table 1: Audio and AUX I/O Pinouts for 7766AVM-4A-M and 7766AVM-S4A-M Modules

DB-25	7765Q module	Description
1	GPI1	General Purpose Input 1
2	GPI2	General Purpose Input 2
3	GPI3	General Purpose Input 3
4	GPI4	General Purpose Input 4
5		
6		
7		
8		
9		
10		
11	GPI9	General Purpose Input 9
12	GPI10	General Purpose Input 10
13	GPI5	General Purpose Input 5
14	GPI6	General Purpose Input 6
15	GPI7	General Purpose Input 7
16	GPI8	General Purpose Input 8
17		
18		
19		
20		
21	Ground	Ground
22		
23		
24	GPI11	General Purpose Input 11
25	GPI12	General Purpose Input 12
Shell	GND	Ground

Table 2: Audio and AUX I/O Pinouts for 7765Q Module

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.

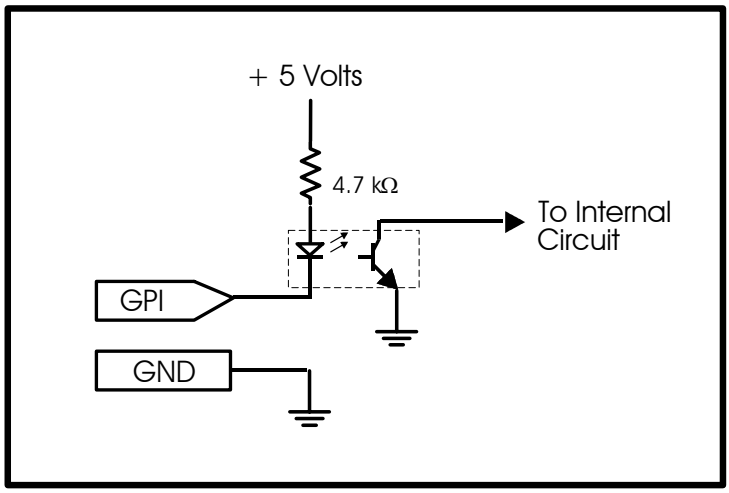


Figure 3: GPI Input Circuitry

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.

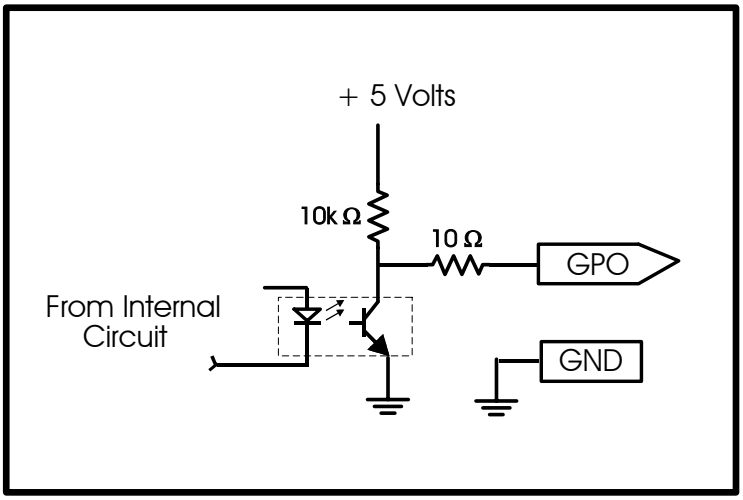


Figure 4: GPO Output Circuitry

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 J23 located on the 7766AVM-4A/-S4A 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.

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.

3. SPECIFICATIONS

3.1. ANALOG VIDEO INPUT (7766AVM-4A-M)

Standard: NTSC, SMPTE 170M or PAL, ITU624-4
Number of Inputs: 4
Connector: BNC per IEC 169-8
Signal Level: 1V nominal
DC Offset: 0V +/- 1V
Input Impedance: 75 Ω
Return Loss: >40dB up to 5MHz

3.2. S-VIDEO INPUT (7766AVM-S4A-M)

Number of Inputs: 4
Connector: 4-pin mini DIN
Signal Level: Y: 1.0 Vp-p, C: 0.286 Vp-p
Input Impedance: 75Ω, sync negative, 75Ω terminated

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 AUDIO INPUT

Number of Inputs: 8 (4 balanced inputs per video input channel)
Connector: 68-pin SCSI
Input Impedance: 20 kΩ minimum (differential)
Sampling Frequency: 48kHz
Peak Signal and Common Mode Level: 30 dBu

3.5. ANALOG VIDEO OUTPUT

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

3.6. AUDIO BAR GRAPHS

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

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

Number of Inputs:	up to 20 (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 68-pin SCSI
Input signal:	Closure to ground
Signal Level:	+5V nominal

3.8. DATA INPUT/OUTPUT SERIAL PORT

Number of Ports:	1 RS-232 or 1 RS-422 (jumper selectable)
Connector:	Female 68-pin SCSI
Baud Rate:	Up to 1 Mbaud
Format:	RS-232: 8 bits, no parity, 2 stop bits and no flow control

3.9. GENLOCK INPUT

Type:	NTSC (SMPTE 170M) color black
Level:	1Vp-p nominal
Connector:	BNC per IEC 169-8

3.10. ELECTRICAL

Voltage:	+12VDC	
Power:	PKG7766MVM-8A:	~80W
	PKG7766MVM-12A:	~100W
	PKG7766MVM-16A:	~125W
EMI/RFI:	Complies with FCC Part 15, Class A and EU EMC directive	

3.11. PHYSICAL

Number of slots:	PKG7766MVM-8A:	7
	PKG7766MVM-12A:	9
	PKG7766MVM-16A:	11

4. PKG7766MVM-xA Identification and Ordering Information

Module	Description	System Modules	Rear Plate
PKG7766MVM-8A	Up to 8-window display, video & analog audio monitoring, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame Controller (includes copy of VLPRO-C). Also includes BHP for analog audio breakout + 2 breakout cables	2 - 7766AVM-4A-M 1 - 7765Q-8 1 - 7700FC (includes VLPRO-C) 1 - 7700FR-C (includes 1 power supply) 2 – 7766MVM-1-0-40C patch cable 1 – 7766AVM-4A-BHP-4 2 – WA7766AVMBHP3F BHP cable	7766MVM-8A & 7700FC
7766MVM-8A	Up to 8-window display, video & analog audio monitoring. Used with existing 7700FR-C frame and 7700FC VistaLINK™ Frame Controller from PKG7766MVM-8A. Also includes 2 audio breakout cables	2 – 7766AVM-4A-M 1 - 7765Q-8 2 – 7766MVM-1-0-40C patch cable 2 – WA7766AVMBHP3F BHP cable	7766MVM-8A
PKG7766MVM-12A	Up to 12-window display, video & analog audio monitoring, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame Controller (includes copy of VLPRO-C). Also includes BHP for analog audio breakout 3 breakout cables	3 – 7766AVM-4A-M 1 - 7765Q-12 1 - 7700FC (includes VLPRO-C) 1 - 7700FR-C (includes 1 power supply) 3 – 7766MVM-1-0-40C patch cables 1 – 7766AVM-4A-BHP-4 3 – WA7766AVMBHP3F BHP cable	7766MVM-12A & 7700FC
PKG7766MVM-16A	Up to 16-window display, video & analog audio monitoring, with 7700FR-C Frame, 1 Power Supply, and 7700FC VistaLINK™ Frame Controller (includes copy of VLPRO-C). Also includes BHP for analog audio breakout 4 breakout cables	4 – 7766AVM-4A-M 1 - 7765Q-16 1 - 7700FC (includes VLPRO-C) 1 - 7700FR-C (includes 1 power supply) 4 – 7766MVM-1-0-40C patch cables 1 – 7766AVM-4A-BHP-4 4 – WA7766AVMBHP3F BHP cable	7766MVM-16A & 7700FC

5. STATUS LEDs

5.1. MODULE STATUS LEDs

MODULE STATUS: This Green LED will be on each module (7765Q and 7766AVM-4A-M/7766AVM-S4A-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 of each module indicates 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 3: Video Status LEDs

6. 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.

6.1. 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.

6.2. 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.

6.3. CALIBRATE AUDIO MONO DETECTION

1. Supply the card with a balanced 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.

6.4. 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.

7. ON SCREEN MENUS

7.1. 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.

7.1.1. 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.

7.2. ON SCREEN DISPLAY – 7766AVM-4A-M MAIN MENU

Video X	Audio source configuration, source ID and fault definitions including quadrant-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
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
Frame Status Trigger	Frame status trigger assignment menu option
HV Delay	General H/V delay display parameter setting
Loss of video	Global setting to pass video or black upon loss of video input
Video input type	Selection for composite analog video or S-video inputs (temporary menu option)
NTSC pedestal setup	Option allows the user to setup NTSC pedestal.
Utilities	Upgrade utility, factory reset and product firmware specification

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 0 to 7.11 provide detailed descriptions of each of the sub menus. The tables in sections 0 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.

7.2.1. CONFIGURING VIDEO INPUT SOURCE AND WINDOW DISPLAY PARAMETERS

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.
H/V delay	Selects an external GPI trigger to enable H/V delay view mode

7.2.2. Audio Channel ½ Configurations

Audio level mode	Sets the bar mode to be either normal or sum + diff. mode for audio channel ½.
Reference level	Sets the audio operating level for audio inputs 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.

7.2.2.1. 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.

7.2.2.2. Setting Audio Reference Level

- *Video X*
  - *Audio channel ½*
    - *Reference level*
      - *-10 to 10 dBu*
      - *4 dBu*

This control is used to set the facility audio level. In most broadcast facilities this level is 4 dBu. By definition, once set, audio reference level is equivalent to 0 dBr and it also defines the “floor” of the Warning region

Reference levels for audio channels ¾ are set accordingly.

7.2.2.3. Setting PPM Mode and Ballistics

- *Video X*
  - *Audio channel ½*
    - *PPM mode*
      - *DIN*
      - *BBC*
      - *Nordic N9*
      - *Default*

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	
Default	1 sample period	1.5 sec for 20 dB	User defined	down to -60 dBr	up to 30 dBr	Similar to AES/EBU ballistics for digital meters	

Table 4: 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).

7.2.3. Clearing Audio Peaks

Video X
- *Audio channel ½*
  - *Clear peak*
    - *Off*
    - *GPI1 – GPI4*

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

7.2.4. 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

7.2.4.1. 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.

7.2.4.2. 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.

7.2.4.3. 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).

7.2.4.4. Setting the Bar Graph Error Region

- *Video X*
  - *Bar graphs ½*
    - *Error region*
      - *0 to 20 dBr*
      - *16 dBr*

This control is used to set the “floor” of the Error region. The peak signal level input of the 7766AVM is 30dBu.

The Error region is defined as an area above the Warning region and Reference level. These are graphically represented by different colors (usually yellow and red) on the audio level bar graphs. This setting is intended to inform the user when the audio signal is approaching or in the error region.

The values are displayed in dBr units – these are values relative to the set normal operating level (or Reference level).

Warning:
Some bar graph types (and ballistics) have this region defined. When you select one of these types, this value will automatically be set. After choosing the ballistic, the region is re-adjusted through this control.

7.2.5. Clearing Audio Level Peaks

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

This menu option clears audio peaks.

7.2.6. 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 SID mode	Selects whether the Default SID message will be shown when there is no source ID on the incoming video
Default SID msg	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.

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

7.2.6.2. Setting the VITC Line Number – 625 Line Video

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

7.2.6.3. Setting the Default SID Mode

Video X
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.

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

Video X *Source ID* *Default source ID message* *VIDEO X*	This control sets the message that will be automatically displayed in the SID window when there is no incoming source ID on the VITC. The text of the message can be changed. See section 7.1.1 for information on changing text fields.

7.2.6.5. Enabling the Color of Source ID

Video source A *Source ID* *Source ID color 1 enable* *Off* *GPI1 – GPI4*	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.

7.2.7. 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

7.2.7.1. Enabling On-Screen Displays via Burn-In Enable Menu

Ch ½ level bars	Enable/disable channel ½ audio level bars
Ch ¾ level bards	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

7.2.7.2. Enabling Channel ½ Level Bar Display

Video X
- *Burn-in configuration*
  - *Burn-in enable*
    - *Ch ½ level bars*
      - *Off*
      - *On*
      - *GPI1 – GPI4*

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.

7.2.7.3. Enabling Channel ½ Phase Bar Display

Video X
- *Burn-in configuration*
  - *Burn-in enable*
    - *Ch ½ phase bar*
      - *Off*
      - *On*
      - *GPI1 – GPI4*

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.

7.2.7.4. Enabling Time Code Display

- *Video X*
  - *Burn-in configuration*
    - *Burn-in enable*
      - *Time code*
        - *Off*
        - *On*
        - *GPI1 – GPI4*

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.

7.2.7.5. Enabling Program Rating Display

- *Video X*
  - *Burn-in configuration*
    - *Burn-in enable*
      - *Program rating*
        - *Off*
        - *On*
        - *GPI1 – GPI4*

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.

7.2.7.6. Enabling XDS Display

- *Video X*
  - *Burn-in configuration*
    - *Burn-in enable*
      - *XDS*
        - *Off*
        - *On*
        - *GPI1 – GPI4*

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.

7.2.7.7. Enabling Source ID (SID) Display

Video X
Burn-in configuration
Burn-in enable
Source ID/UMD
Off
On
GPI1 – GPI4

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.

7.2.7.8. 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	7766MVM-4A-M window (525 line code)	7766MVM-4A-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

7.2.8. 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 invalid duration	Sets the number of invalid video frames that the AVM will ignore for which video fault condition alert message is not triggered.
Max APL	Sets the maximum APL threshold level considered to be a fault if exceeded for a set duration
Max APL duration	Sets the duration, in frames, after which a set maximum APL will trigger a fault condition
Min APL	Sets the minimum APL threshold level considered to be a fault if exceeded for a set duration
Min APL duration	Sets the duration, in frames, after which a set minimum APL will trigger a fault condition
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 reversal level	Sets the level of L/R audio difference over considered to be a phase reversal fault.
Phase reversal 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 PR 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 duration	Sets the minimum duration below 7 IRE before the picture is considered “black”.

7.2.8.1. Setting Video Invalid 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 invalid 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.

7.2.9. Setting Peak Video (APL) Level and Duration

Video input A
Fault definitions
Max APL
60 to 108 IRE
100

This parameter is used to set the maximum average picture level threshold. If this level is exceeded a fault alert is triggered (if enabled).

Video input A
Fault definitions
Max APL duration
0 to 900 frames
300

This parameter sets the duration for which maximum average picture level is exceeded before reporting a fault alert.

7.2.10. Setting Minimum Video (APL) Level and Duration

Video input A
Fault definitions
Min APL
0.0 to 20.0 IRE (in 0.5 increments)
7.5

This parameter is used to set the minimum average picture level. If this level is exceeded a fault alert is triggered (if enabled).

Video input A
Fault definitions
Min APL duration
0 to 900 frames
90

This parameter sets the duration for which minimum average picture level (APL) is exceeded before reporting a fault alert.

7.2.10.1. 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
0 dBr to 20 dBr in ¼ dB increments
16 dBr

This control sets the audio level over which there is considered to be over level. This value is expressed in dBr – relative to set reference level.

7.2.10.2. 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*.

7.2.11. Detecting 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.

7.2.11.1. Setting the Audio Silence Level

Video source A
Fault definitions
Silence level
-60 dBr to 0 dBr in ¼ dB increments
-40 dBr

This control sets the audio level under which it is considered to be silent. This value is expressed in dBr – relative to the reference audio level setting.

7.2.11.2. 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.

7.2.11.3. 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 reversal 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.

7.2.11.4. Setting the Audio Phase Reversal Duration

Video X
Fault definitions
Phase reversal 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.

7.2.11.5. 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

7.2.11.6. 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.

7.2.11.7. 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.

7.2.11.8. 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.

7.2.11.10. 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
9

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

7.2.11.11. Setting the Picture Freeze Duration

Video source A
Fault definitions
Freeze duration
6 to 9000 frames
300 frames

This control sets duration, in frames, of video activity under the *Picture noise level* that is considered a fault.

From 6 to 150 frames – in 4 frame increments
From 150 to 1800 frames – in 30 frame increments
From 1800 to 9000 frames – in 150 frame increments

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.

7.2.11.12. Detecting Picture Black Duration

Video source A
Fault definitions
Black video duration
6 to 9000 frames
90 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 7 black level and remains for the specified duration.

From 6 to 150 frames – in 4 frame increments
From 150 to 1800 frames – in 30 frame increments
From 1800 to 9000 frames – in 150 frame increments

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.

7.2.12. 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

7.2.12.1. Fault Condition Menu

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.
Color	Select the desired background colour 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 invalid	Video error based on fault definitions Factory default: Fault condition 1
Max APL over	APL above threshold for certain time duration
Min APL under	APL below threshold for certain time duration
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	Audio 1 over level
Audio over 2	Audio 2 over level
Audio over 3	Audio 3 over level
Audio over 4	Audio 4 over level
Audio silence 1	Audio 1 silence level
Audio silence 2	Audio 2 silence level
Audio silence 3	Audio 3 silence level
Audio silence 4	Audio 4 silence 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 PR	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
GPI1-4	General purpose input 1 to 4 closed to ground. External trigger customized by user.

Table 5: Possible Error Triggers to Produce Faults

7.2.12.2. 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.

7.2.12.3. 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 7.1.1 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*".

7.2.12.4. 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.

7.2.12.5. 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.

7.2.12.6. 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.

7.2.12.7. 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.

7.2.12.8. Clearing Fault Conditions Alert Messages

- *Video X*
  - *Fault conditions*
    - *Fault condition 1*
      - *Clear fault*
        - *Off*
        - *GPI1 – GPI4*

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

7.2.12.9. 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 Table 4 occur.

7.2.13. 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.

7.2.14. Setting H/V Delay Line and Pixel Variables

7.2.14.1. 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* *Off* *On* *GPI1 – GPI4*	Control to enable H/V delay manually through Off/On or to have external GPI trigger H/V delay enabling.

7.3. 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.

7.3.1. 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.

7.3.1.1. 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 8.3.1.2

7.3.1.2. 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.

7.3.1.3. 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.

7.3.1.4. 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.

7.3.2. 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.

7.3.2.1. Setting Source ID Color 1

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

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

7.3.2.2. Setting Source ID Color 2

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

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

7.3.2.3. Setting Source ID Color 3

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

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

7.3.2.4. Setting the Text Window Default Background Color

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

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

7.3.2.5. 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.

7.3.2.6. 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.

7.3.3. 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.

7.3.3.1. 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.

7.3.3.2. 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.

7.3.3.3. 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.

7.4. GPI CONFIGURATION

7.4.1. Viewing GPI Configurations

GPI configuration
GPIx (x = 1 to 4)

A status screen displaying GPI trigger allocations associated with the four inputs of a particular 7766AVM-4A-M module

7.5. GPO CONFIGURATION

Each 7766AVM-4A-M module has four General Purpose outputs available through the SCSI 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 7766AVM-4A-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 9.1

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

7.6. CONFIGURING H/V DELAY PARAMETERS

7.6.1.1. 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).

7.6.1.2. 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)

7.6.1.3. 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)
.

7.6.1.4. 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).

7.7. CONFIGURATION 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.

7.8. SELECTING VIDEO INPUT TYPE

Video input type
Composite
S-Video

This menu item allows the user to identify which video input type is supported by the card. This is a temporary menu item that will be removed in a future revision once input auto-detection is fully implemented.

7.9. SETTING THE NTSC SETUP PEDESTAL

NTSC setup pedestal
Enable
Disable

The setup pedestal allows the user to turn on the composite video output's setup pedestal.

7.10. 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.)

7.10.1. 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.

7.10.2. 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.

7.10.3. 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.

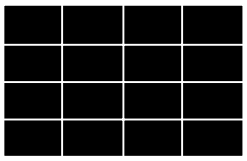
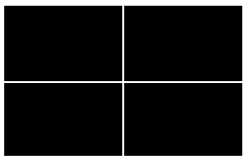
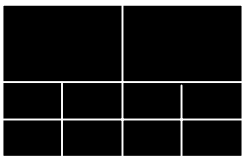
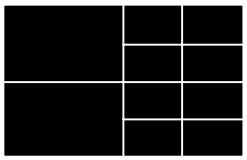
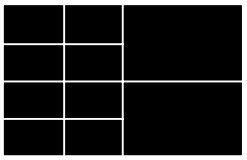
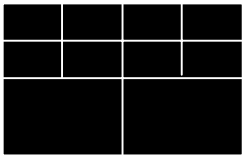
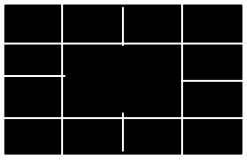
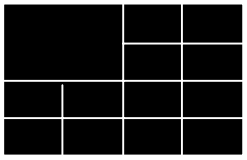
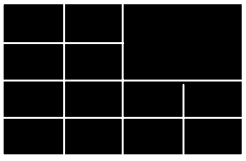
8. ON SCREEN DISPLAY – 7765Q-x MAIN MENU

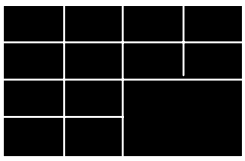
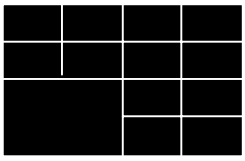
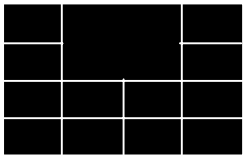
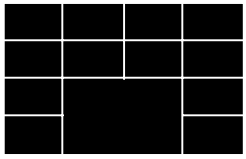
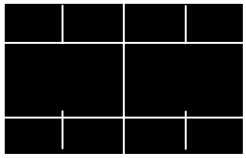
Layout	Presets for configuring the window display layout of the MultiViewer package.
Border Control	User configuration to control the border around a particular active picture display – can be used for tally control via GPI or fault indication.
GPI Configuration	On-screen display of allocated GPI inputs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

8.1. LAYOUT

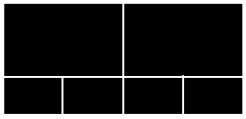
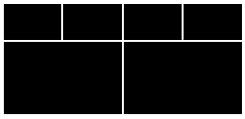
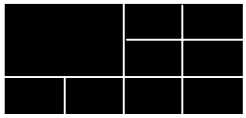
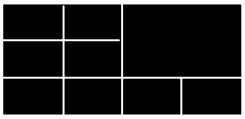
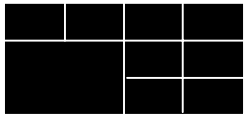
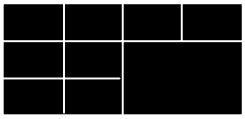
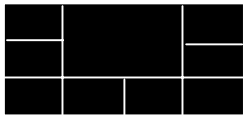
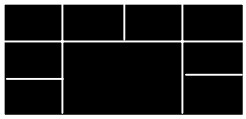
Layout Preset	Presets for configuring the display layout of the MultiViewer. Depending on the 7766MVM package, a number of preset layouts are available to choose from. Available layouts are labeled 1 – up to 14 presets (on the 7766MVM-16A) and are depicted in sections 9.1.1 to 9.1.3.
Window x source =	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 in the MVM package.

8.1.1. Video Display Layout Presets (PKG7766MVM-16A)

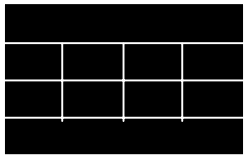
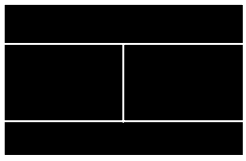
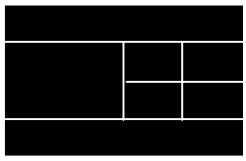
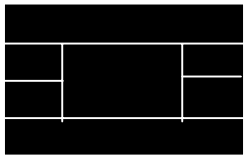
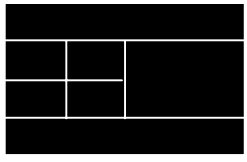
Layout 1: 	Layout 2: 	Layout 3: 
Layout 4: 	Layout 5: 	Layout 6: 
Layout 7: 	Layout 8: 	Layout 9: 

Layout 10: 	Layout 11: 	Layout 12: 
Layout 13: 	Layout 14: 	

8.1.2. Video Display Layout Presets (PKG7766MVM-12A)

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

8.1.3. Video Display Layout Presets (PKG7766MVM-8A)

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

8.2. 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.

8.2.1. 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 9.2.2 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.

8.2.2. 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 9.2.3.

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

8.2.3. Enabling Border Colors

- *Border Control*
  - *Window x color*
    - *Enable color y*
      - *off*
      - *on*
      - *GPI1 – GPI4*
      - *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.

8.3. GPI CONFIGURATION

8.3.1. Viewing GPI Configurations

- *GPI configurations*
  - *GPIx (x = 1 to 4)*

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

8.4. 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.)

8.4.1. 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.

8.4.2. 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.

8.4.3. 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.

9. JUMPERS

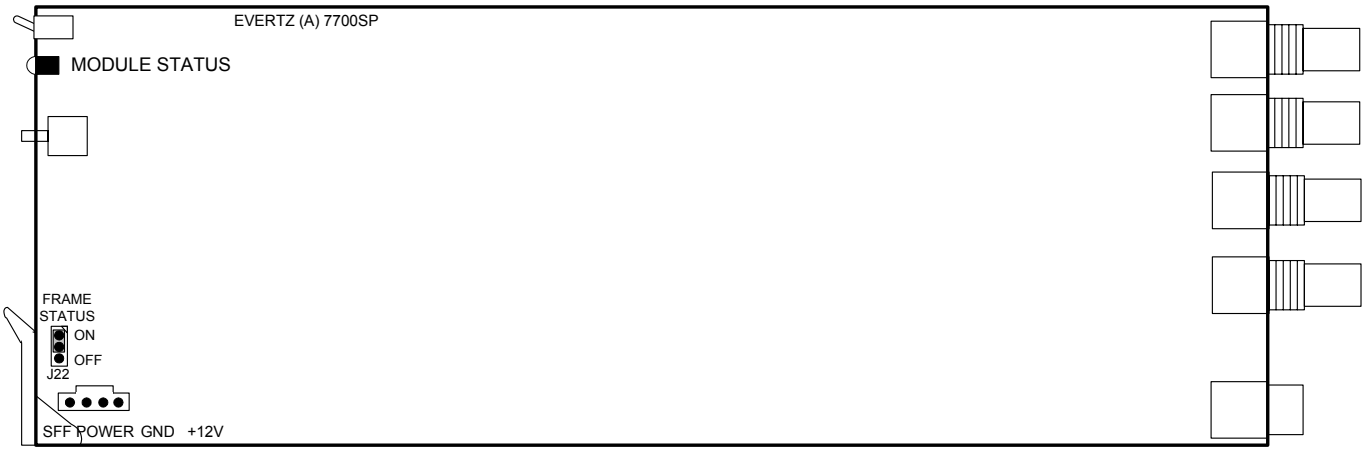


Figure 5: Location of Jumpers on 7700SP Boards

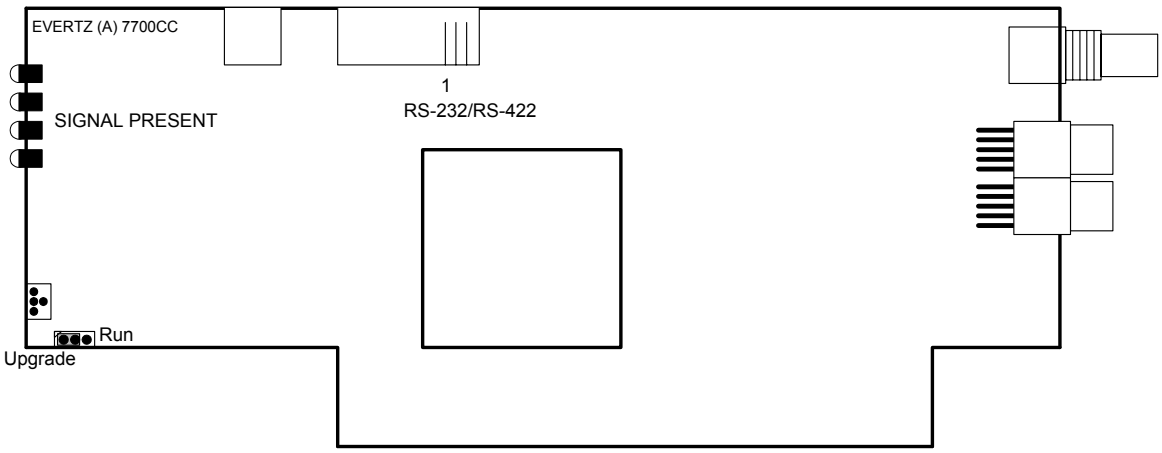


Figure 6: Location of Jumpers on 7700CC Boards

9.1. 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.

9.2. 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.

10. Menu Quick Reference

7766AVM-4A-M

VIDEO X

- **Audio channel ½**
  - Audio level mode
  - Reference level
  - 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
- **Bar graph ¾**
  - same as Bar graph ½
- **Clear peaks**
- **Source ID/UMD**
  - 525 VITC line
  - 625 VITC line
    - *(not in 525 versions)*
  - Default SID mode
  - Default SID msg
  - 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 row*
  - *Time code col*
  - *Program rating row*
  - *Program rating col*
  - *XDS row*
  - *XDS col*
  - *Fault 1 row*
  - *Fault 1 col*
  - *Fault 2 row*
  - *Fault 2 col*
  - *Fault 3 row*
  - *Fault 3 col*
  - *Fault 4 row*
  - *Fault 4 col*
- **Fault definitions**
  - Video invalid duration
  - Max APL
  - Max APL duration
  - Min APL
  - Min APL duration
  - Over level
  - Over duration
  - Silence level
  - Silence duration
  - Phase reversal level
  - Phase reversal duration
  - Mono threshold level
  - Mono duration
  - Loss of CC duration
  - Loss of PR duration
  - Picture noise level
  - Freeze duration
  - Black duration
- **Fault conditions**
  - Fault burn-in properties (Quick link)
  - Fault condition 1
    - *Burn-in position(Quick link)*
    - *Message*
    - *Mode*
    - *Color*
    - *Blink*
    - *Duration*
    - *Clear fault*
    - *Video invalid*
    - *Max APL over*
    - *Min APL under*
    - *Phase reversal ½*
    - *Phase reversal ¾*
    - *Audio over 1*
    - *Audio over 2*
    - *Audio over 3*
    - *Audio over 4*
    - *Audio silence 1*
    - *Audio silence 2*
    - *Audio silence 3*
    - *Audio silence 4*
    - *Audio mono ½*
    - *Audio mono ¾*
    - *Loss VITC*
    - *Loss SID*
    - *Loss of PR*
    - *Loss of CC*
    - *Picture freeze*
    - *Picture black*
    - *GPI1*
    - *GPI2*
    - *GPI3*
    - *GPI4*
  - 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**
- **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
  - Background color
  - Background opacity
  - Text opacity
- **Fault burn-in properties**
  - Background color 1
  - Background color 2
  - Background opacity
  - Text opacity

GPI CONFIGURATION

- GPIx

GPO CONFIGURATION

- 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

HV DELAY
- 525 start line
- 625 start line
- 525 start sample
- 625 start sample

LOSS OF VIDEO

VIDEO INPUT TYPE

NTSC SETUP PEDESTAL

UTILITIES
- About…
- Upgrade
- Factory reset

7765Q-x

LAYOUT
- Layout preset
- Window 1 source =
- Window 2 – 16 source =
  - *same as Window 1 colors*

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

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