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REVISION HISTORY

<u>REVISION</u>	<u>DESCRIPTION</u>	<u>DATE</u>
0.1	Preliminary Version	May 05
1.0	First release	Jan 06
1.1	Updated standard change from EIA-608/EIA-708 to CEA-608/CEA-708	Dec 06
1.2	General format clean up	May 09

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1. OVERVIEW

The 7760AVM2 series of video and audio monitoring cards perform a number of quality control and monitoring functions associated with a modern high definition and standard definition serial digital television facility. They perform audio and ancillary data (for HD) or vertical blanking interval (VBI) data (for SDI) demultiplexing from the incoming digital video, analyze the data and display key information about the data on the output video. The outputs are either analog and/or digital video with analog or digital audio.

The 7760AVM2 series modules are available in SD-only versions (7760AVM2-A and 7760AVM2-B) and a combination HD/SD version (7760AVM2-HD). Throughout this manual, the common features will be described by referring to the 7760AVM2 series. Any features specific to one or more versions will use the unique model number. Table 1-1 illustrates the differences between the various versions of the 7760AVM2.

Input/Outputs	-A	-B	-HD
SDI Input	270Mb/s	270Mb/s	270Mb/s or 1.5 Gb/s
Re-clocked SDI output	270Mb/s	270Mb/s	270Mb/s or 1.5 Gb/s
SDI output with superimposed information	---	270Mb/s	270Mb/s or 1.5 Gb/s
Composite analog output with superimposed information	NSTC or PAL	---	---

Table 1-1: 7760AVM2 Model Comparisons

The 7760AVM2 series modules can be ordered with a 7760AVM-BHP Bulkhead Breakout Panel. This panel is an accessory that provides a convenient way of connecting the audio and GPIO signals into the high-density DB-15 connectors on the rear of the modules. This panel is available for five or ten 7760AVM2's and includes 3 ft. cables to connect to the 7760AVM2 modules.

The 7760AVM2 series modules occupy one card slots in the 3RU frame (7700FR-C), which will hold up to 15 modules or one slot in the 1RU frame (7701FR), which will hold up to three modules. The 7760AVM2 series modules may also be used in a standalone unit (S7701FR).

VistaLINK® enables control and configuration capabilities via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration from SNMP enabled control systems such as Evertz VistaLINK® Pro locally or remotely.

Common Features:

- One group (4 channels of audio) is demultiplexed from the incoming digital video and VU/PPM level Indicators are keyed as bar graphs in over the picture
- 4 analog audio outputs available for content monitoring
- Analog audio output levels are adjustable
- Analog audio outputs can be set so both are mono mix of the selected channel pair
- Decodes Line 21 XDS packets from SD signals and displays network name, call letters, program name and time of day
- Decodes Widescreen Signaling (WSS), Video Indexing, Active Format Description (AFD), subtitles, and teletext for monitoring
- Displays program rating (V-Chip)
- Decodes CEA-608 closed captions from SD signals and displays on screen
- Decodes vertical interval time code (VITC) from SD signals and “burns” the time code into the picture
- A comprehensive on screen display is available to configure the various features of the module
- Flexible configuration of the text and audio bar graph information displays
- An extensive list of error conditions can be monitored and fault conditions can be configured from these conditions
- On screen messages can be triggered by the configured fault conditions
- Two GPI inputs are available to modify the display characteristics
- GPO output to indicate user definable fault conditions
- Audio and GPI/Os are available on a high density DB15 connector
- 7760AVM-BHP bulkhead panel is available to facilitate wiring to the high density DB15 connector (up to 10 AVM2 modules can be wired using each bulkhead panel)
- RS-232 Data logging port to log fault conditions
- VistaLINK[®] enabled offering remote control and configuration capabilities via SNMP (using VistaLINK[®] PRO, 9000NCP, or 9000NCP2 Network Control Panel) is available when modules are used with the 3RU 7700FR-C frame and a 7700FC VistaLINK[®] Frame Controller module in slot 1 of the frame

Features (7760AVM2-A and -B versions only):

- One 270 Mb/s SDI 525i/59.94 or 625i/50 video input
- One re-clocked SDI video output
- One SDI video output with superimposed monitoring information (-B version only)
- Composite analog output video with superimposed monitoring information (-A version only)
- Decodes PESA format Source ID (8 characters) or Evertz format VITC Source ID (5 or 9 characters) from SDI signals and burns the ID into the picture

Features (7760AVM2-HD versions only):

- One auto sensing video input – supports 1080i/60, 1080i/59.94, 1080i/50, 720p/60, 720p/59.94, 720p/50, 525i/59.94 or 625i/50.
- One re-clocked HD or SD video output (same as input)
- One HD or SD (same as input) video output with superimposed monitoring information
- Decodes RP188 Ancillary time code (ATC) from HD signals or vertical interval time code (VITC) from SD signals and “burns” the time code into the picture
- Optionally decodes PESA format Source ID (8 characters) or Evertz format VITC Source ID from SDI signals, or Evertz format ATC Source ID and burns the ID into the picture. (with +SID option)
- Decodes CEA-708 closed captions from HD signals and displays on screen
- AFD monitoring
- Dolby metadata monitoring

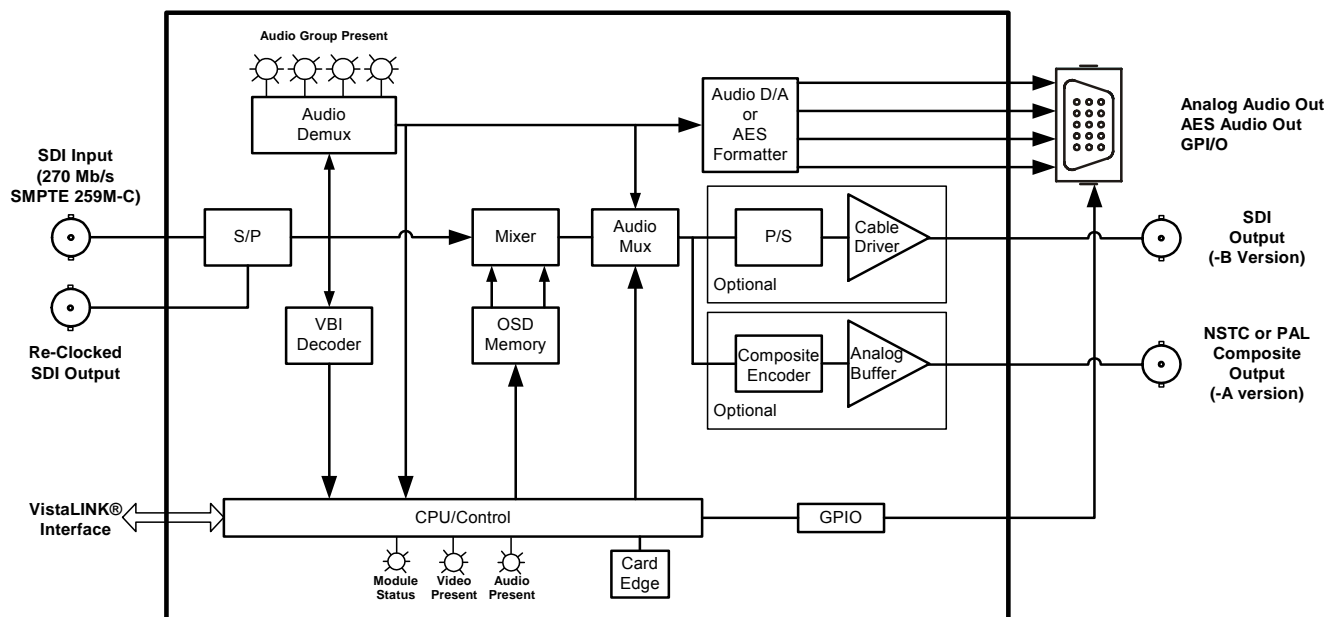


Figure 1-1: 7760AVM2 Block Diagram

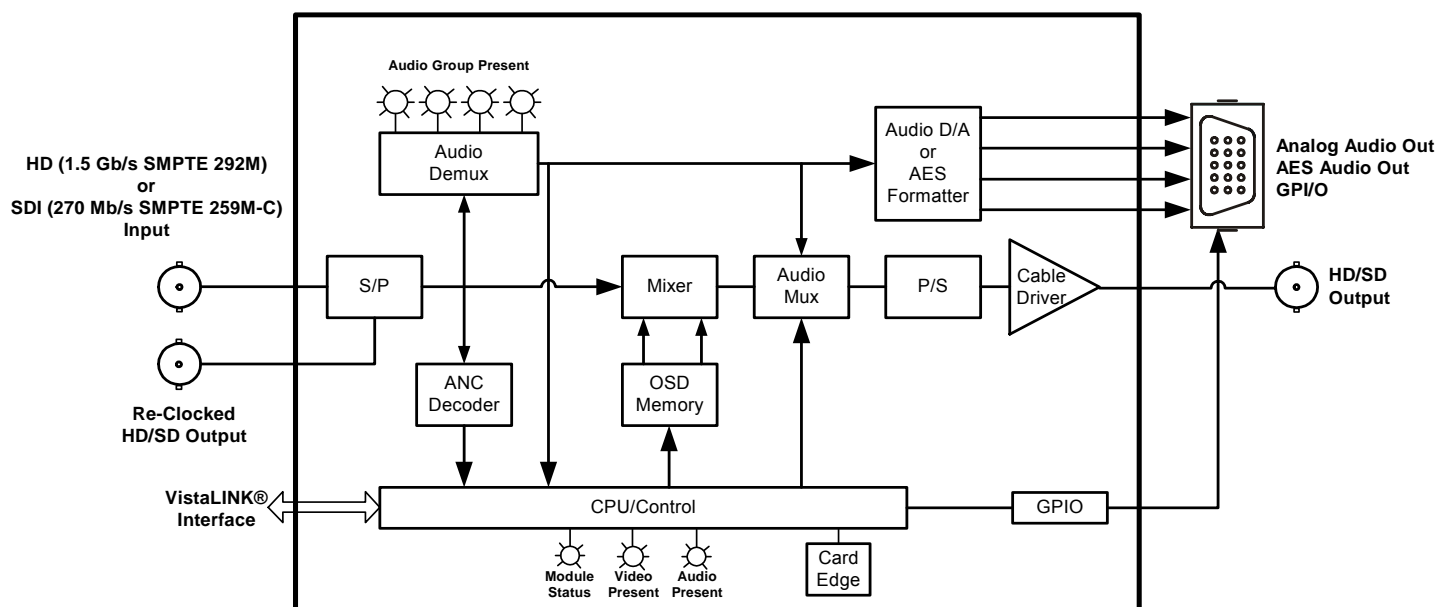


Figure 1-2: 7760AVM2-HD Block Diagram

2. INSTALLATION

The 7760AVM2 series modules come with a companion rear plate that occupies one slot in the frame. For information on mounting the rear plate and inserting the module into the frame see the 7700FR chapter section 3.

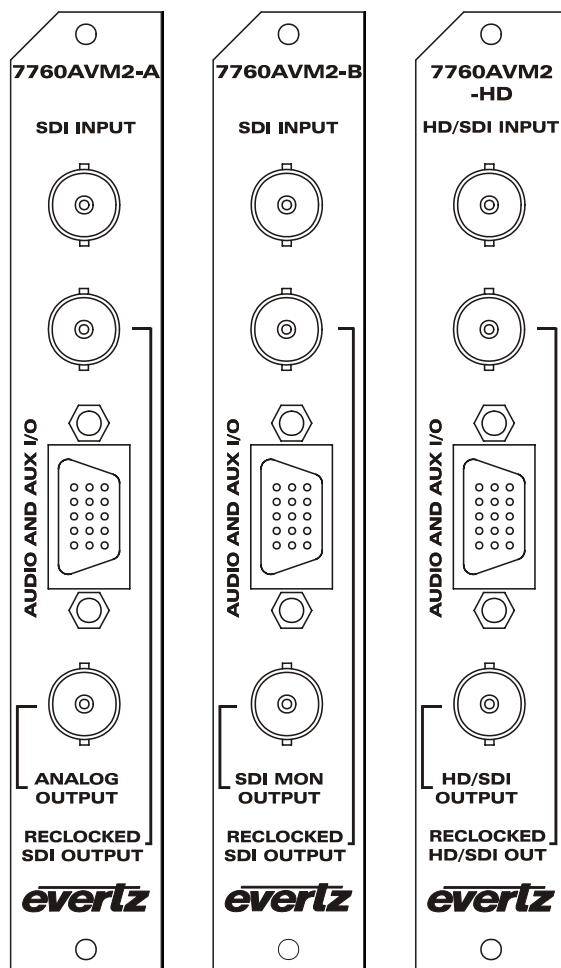


Figure 2-1: Rear Panel

2.1. VIDEO CONNECTIONS

2.1.1. Models 7760AVM2-A and 7760AVM2-B

SDI INPUT: The input BNC connector for 270 Mb/s 10-bit serial digital video signals compatible with the SMPTE 259M-C standard. The module can be set to a specific video standard or set to automatically detect.

RECLOCKED SDI OUTPUT: This BNC connector is a reclocked output. The output signal is the same as the input without any changes.

ANALOG OUTPUT: This BNC connector is used to output composite analog video (NTSC or PAL) with monitoring information superimposed over the video. It also superimposes the On Screen Display (OSD) over the video. **(Only on –A versions)**

SDI MON OUTPUT: This BNC connector is used to output SDI video with monitoring information superimposed over the video. It also superimposes the On Screen Display (OSD) over the video. **(Only on –B versions)**

2.1.2. Model 7760AVM2-HD

HD/SDI INPUT: The input BNC connector for 10-bit serial digital video signals compatible with the SMPTE 292M or SMPTE 259M-C standard. The module can be set to a specific video standard or set to automatically detect.

RECLOCKED HD/SDI OUTPUT: This BNC connector is a reclocked output. The output signal is the same as the input without any changes.

HD/SDI OUTPUT: This BNC connector is used to output HD/SDI (same as input) video with monitoring information superimposed over the video. It also superimposes the On Screen Display (OSD) over the video.

2.2. AUDIO CONNECTIONS

The audio outputs are available on a female high density DB-15 connector labeled **AUDIO AND AUX I/O**. Table 2-1 shows the pin out of the connector. Both the analog and AES outputs have the same demultiplexed audio group.

Name	Description	DB-15 Pin
GPI2	General Purpose Input 2	1
Tx	RS-232 Transmit output	2
GPO1	General Purpose Output 1	3
A1-	Audio channel 1 – Output	4
A1+	Audio channel 1 + Output	5
Rx	RS-232 Receive input	6
AES2	Single ended AES output 2	7
GPI1	General Purpose Input 1	8
A3-	Audio channel 3 – Output	9
A3+	Audio channel 3 + Output	10
AES1	Single ended AES output 1	11
A4-	Audio channel 4 – Output	12
A4+	Audio channel 4 + Output	13
A2-	Audio channel 2 – Output	14
A2+	Audio channel 2 + Output	15
GND	Ground	Shell

Table 2-1: AUDIO AND AUX I/O Connector Pin Out

2.2.1. AES Audio Connections

Two unbalanced AES audio outputs (2 pairs) are available on this connector.

2.2.2. Analog Audio Connections

Four channels of balanced analog audio are available through this connector. The balanced audio can be connected to male XLR connectors as follows (standard pin 2 +ve connection):

HD DB-15	XLR
Audio +	2
Audio -	3
Shell	1

Table 2-2: Analog Audio to XLR Connection

2.3. 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 2-2 shows the input circuit for the General Purpose inputs.

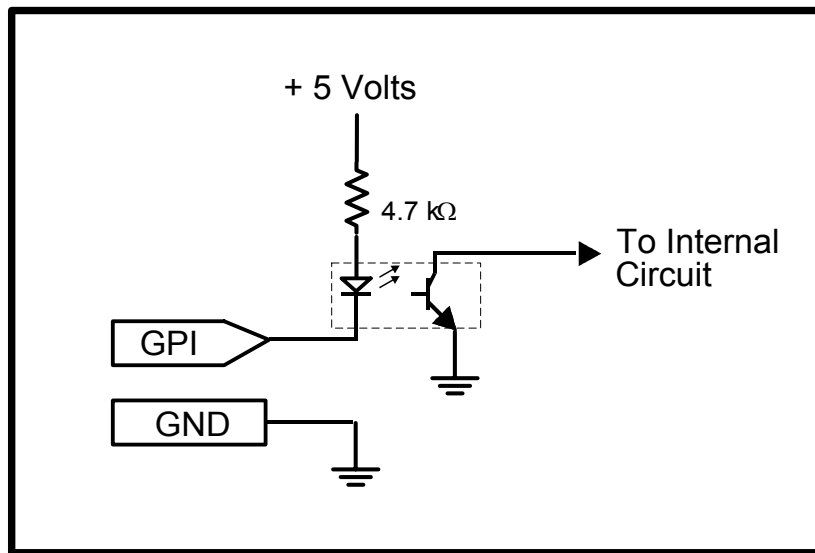


Figure 2-2: GPI Input Circuitry

The GPO's are software programmable active high or low with internal pull up (18kΩ) 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 2-3 shows the circuit for the General Purpose output.

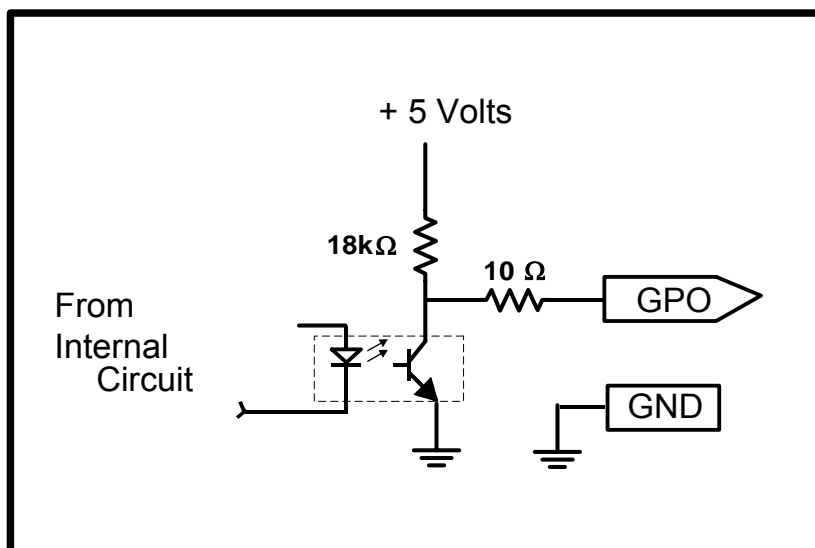


Figure 2-3: GPO Output Circuitry

2.4. RS-232 SERIAL PORT CONNECTIONS

The COM port signals are standard RS-232 with no hardware flow control. The directions of the signals are indicated in Table 2-1. The RS-232 port on the **AUDIO AND AUX I/O** connector is used for data logging of the status and fault conditions. 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.

2.5. INSTALLING THE BULKHEAD BREAKOUT PANEL

The 7760AVM-BHP Bulkhead breakout panel is an accessory that provides you with a convenient way of connecting the audio and GPIO signals into the HD DB-15 connectors on the rear of the modules. This panel occupies 1.5 rack units of rack space and is designed for mounting at the rear of your rack panel. The breakout panel can be used to connect up to ten 7760AVM2 modules. Each of the ten sets of connectors on the breakout panel is fitted with two BNCs for AES audio out, two six position terminal strips for the 4 channels of analog audio, and one six position terminal strip for the GPIO and RS-232 signals. Figure 2-4 shows one section of the breakout panel. On the rear of the breakout panels are ten female HD DB-15 connectors.

To connect the 7760AVM2 module to the breakout panel, connect the 15 pin extender cables supplied with the breakout panel between the **AUDIO AND AUX I/O** connector on the rear of the 7760AVM2 module and the appropriate D connector on the breakout panel. Make sure that you secure the connectors with the screws supplied. The audio and aux. cables can be secured into the removable portion of the terminal strips using a small screwdriver. The removable part of the terminal strip is then inserted into the breakout panel and secured using the two hold-down screws.

2.6. CARD EDGE DIP SWITCHES

The 7760AVM2 modules have a series of card edge DIP switches. They are currently **reserved** for future use. The user should leave them in the state that they receive them in.

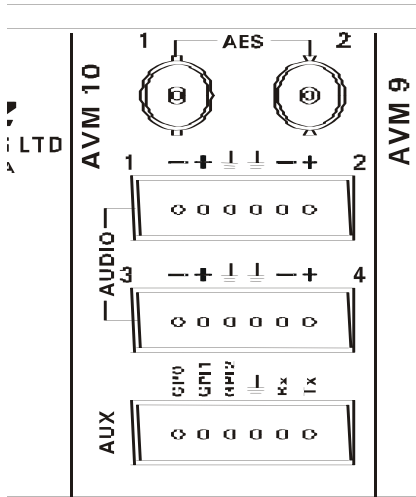


Figure 2-4: Breakout panel for Wiring AUDIO AND AUX I/O Connections

3. SPECIFICATIONS

3.1. SERIAL DIGITAL VIDEO INPUTS

Standards:	Auto detect or menu selectable SMPTE 292M (1.5Gb/s): 1080i/60, 1080i/59.94, 1080i/50, 720p/60, 720p/59.94 and 720p/50 – 7760AVM2-HD only SMPTE 259M-C (270 Mb/s): 525i/59.94 or 625i/50
Number of Inputs:	1
Connector:	BNC per IEC 61169-8 Annex A
Input Equalization:	Automatic to 200m @ 1.5Gb/s with Belden 8281 or equivalent cable Automatic to 115m @ 1.5Gb/s with Belden 1694 or equivalent cable
Return Loss:	
SD Standards:	>15 dB up to 270Mb/s
HD Standards:	>15 dB up to 1.5Gb/s

3.2. SERIAL DIGITAL VIDEO OUTPUTS

Standard:	Same as input
Number of Outputs:	1 Reclocked (all models) 1 Monitored (7760AVM2-B and 7760AVM2-HD)
Connector:	BNC per IEC 61169-8 Annex A
Signal Level:	800mV nominal
DC Offset:	0V ±0.5V
Rise and Fall Time:	
SD Standards:	470ps nominal
HD Standards:	200ps nominal
Overshoot:	<10% of amplitude

3.3. ANALOG VIDEO OUTPUT (MODEL 7760AVM2-A ONLY)

Standard:	NSTC, SMPTE 170M; PAL, ITU624-4
Number of Outputs:	1
Connector:	BNC per IEC 61169-8 Annex A
Signal Level:	1V nominal
DC Offset:	0V ±0.1V
Return Loss:	>35dB up to 5MHz
Frequency Response:	0.8dB to 4 MHz
Differential Phase:	< 0.9° (<0.6° typical)
Differential Gain:	< 0.9% (<0.5% typical)
SNR:	>56dB to 5 MHz (shallow ramp)

3.4. ANALOG AUDIO OUTPUTS

Number of Outputs: 4

Type: Balanced Analog Audio

Connectors: Female High Density DB-15

Output Impedance: 33Ohm

Sampling Frequency: 48kHz

Signal Level: 0dB FS => 8 to 24dBu (user settable)

NOTE: High impedance loads only (10 k Ω)

Not good for low impedance loads (i.e. 600 Ω)

Frequency Response: 50Hz to 20kHz: +/- 0.20dB

SNR: >85dB (50Hz to 20 kHz)

THD+N: 65 dB @ 1kHz, 0 dB FS, typical

3.5. AES AUDIO OUTPUTS

Number of Outputs: 2

Standard: SMPTE 276M compatible, single ended synchronous or asynchronous AES

Connectors: High-density female DB-15

Resolution: 24 bits

Sampling Rate: 48 kHz

Impedance: 75 Ω unbalanced

3.6. AUDIO BAR GRAPHS

Number of Graphs: 4 (1 group)

Ballistics: AES/EBU, DIN, BBC and Nordic N9

(See Table 7-1 for detailed specifications)

3.7. GENERAL PURPOSE INPUTS AND OUTPUTS

Number of Inputs: 2 (behavior is assigned via. On screen menu items)

Number of Outputs: 1 (behavior is programmable via. On screen menu items)

Type: Opto-isolated, active low with internal pull-ups to +5V

Connector: Female High Density DB-15

Signal Level: +5V nominal

3.8. DATA LOGGING SERIAL PORT

Standard: RS 232

Connector: Female High Density DB-15

Baud Rate: 57600

Format: 8 bits, no parity, 2 stop bits and no flow control

3.9. ELECTRICAL

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

3.10. PHYSICAL

350FR:
7700FR-C: 1
7800FR:

4. STATUS INDICATORS

The 7760AVM2 series modules have 3 LED Status indicators on the main circuit board front card edge to show operational status of the card at a glance. Figure 8-1 shows the location of the LEDs and card edge controls.

Three large LEDs on the front of the main board indicate the general health of the module.

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

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

VIDEO PRESENT This Green LED will be ON when there is a valid video signal present at the module input.

There also is a small LED that indicates the presence of audio.

AUDIO This Green LED will be ON when there is a valid audio signal present for the monitored audio group (see 7.4.1).

4.1. AUDIO STATUS LEDs

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

Audio Group LED	Colour	Audio Group Status
1	Off	No group 1 present on input video.
	Green	Group 1 present on input video.
2	Off	No group 2 present on input video.
	Green	Group 2 present on input video.
3	Off	No group 3 present on input video.
	Green	Group 3 present on input video.
4	Off	No group 4 present on input video.
	Green	Group 4 present on input video.

Table 4-1: Audio Group Status LEDs

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

This section contains notes to understand how the 7760AVM2 product line relates digital audio levels, analog output audio levels, and the displayed bar graph levels.

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

$$\text{PGM reference level} + \text{headroom} = \text{peak output level}$$



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

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

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

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 7760AVM2. See section 7.9 for a complete description of the fault definition menu items.

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 stereo signal that originated from mono material and that has a large amount of uncorrelated noise added to each channel. This will allow you to set the *Mono Threshold* to a value that will detect the mono condition in the presence of noise.
Warning: Make sure that the material is in-phase. Mono material will not be detected if it is out of phase.
2. Turn off all sources of errors in a *Fault Condition* and assign *Mono* as the only error. Also, make sure that you set the *Fault Duration* to a small number of frames so that you will see when the error condition disappears.

3. Set the *Mono Duration* to 0.5 sec so that you can see the results of adjusting the *Mono Threshold Level* without getting confused with the detection time.
4. Adjust the *Mono Threshold Level* so that the *Fault Condition* detects the mono material in the presence of noise.
5. Set the *Mono Duration* to a time period appropriate to your application.
Warning: Periods of silence (below the *Silence Level*) will extend this duration. In other words, periods without audio content are not included in the mono detection.
Warning: Stereo material with long periods of similar left/right content (i.e. talking heads in a news cast) may cause the mono detector to fire. It is best to set the *Mono Duration* to a value larger than what you would expect.

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 its characteristics (opacity, colour, etc).
4. Assign the *Fault Condition* to an output contact closure (GPO) if it is desired.

7. ON SCREEN MENUS

7.1. NAVIGATING 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. To enter the on-screen menu system, hold the toggle switch in the up or down position and then press and hold the pushbutton for 3 seconds. 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.

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.

7.2. 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.

7.3. ON SCREEN DISPLAY – MAIN MENU

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 7.4 to 7.10 provide detailed descriptions of each of the sub menus. The tables in sections 7.4 to 7.10 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.

<i>Audio</i>	Configuration of the parameters associated with audio de-multiplexing and the analog audio outputs
<i>Video/SID</i>	Controls for the operation of video processing.
<i>Bar graphs</i>	Configuration of the audio level and phase bar graphs.
<i>On-screen display configuration</i>	Positioning controls and the on/off state of all windows and bar graphs. Configuration of the text window colours and opacity levels.
<i>GPO configuration</i>	Configuration of the General Purpose Outputs.
<i>Fault definitions</i>	Definition of the fault conditions. Configuration of the fault message windows.
<i>Utilities</i>	Card preset management and various debug and maintenance features.
<i>Clear faults and peaks</i>	An easy to access “clear fault state and bar graph peaks” command.
<i>Decoder Setup</i>	Configures the CEA-608 and CEA-708 (on 7760AVM2-HD only) decoders.

7.4. CONFIGURING THE AUDIO CONTROLS

The *Audio* menus are used to configure parameters associated with the audio demultiplexing and the analog audio outputs. The chart below shows the items available in the *Audio* menu. Sections 7.4.1 to 7.4.4 give detailed information about each of the menu items. Many of the menu items are the same for the channel 1/2 and 3/4 channel pairs. For simplicity only the menu items for the channel 1/2 channel pair are shown in the manual.

<i>Audio source</i>	Selects the source of audio to process.
<i>Ch1/ch2 swap</i>	Controls whether the channel 1 and 2 (L/R) outputs will be swapped
<i>Ch3/ch4 swap</i>	Controls whether the channel 3 and 4 (L/R) outputs will be swapped
<i>Ch1/ch2 output mode</i>	Controls whether the channel 1 and 2 will be treated as a stereo pair or will be added to make mono outputs
<i>Ch3/ch4 output mode</i>	Controls whether the channel 3 and 4 will be treated as a stereo pair or will be added to make mono outputs
<i>Fine ch 1 adjust</i>	Channel 1 fine level control
<i>Fine ch 2 adjust</i>	Channel 2 fine level control
<i>Fine ch 3 adjust</i>	Channel 3 fine level control
<i>Fine ch 4 adjust</i>	Channel 4 fine level control

7.4.1. Selecting the Audio Source to Monitor

<i>Audio</i>	Up to 4 groups of audio may be embedded in the incoming SDI video. This control selects which one of the four to monitor. There are four green LEDs under the PCB to indicate which of the four groups are currently present on the input video.
<i>Audio source</i>	
<i>Group 1</i>	
<i>Group 2</i>	
<i>Group 3</i>	
<i>Group 4</i>	It is this group that is delivered to both the audio bar graph displays and the audio output section of the card.

7.4.2. Swapping the Audio Channels of a Channel Pair

<i>Audio</i>	This control, if set to Yes, routes the two channels or a channel pair to the opposite channel output of the pair.
<i>Ch1/ch2 swap</i>	
<i>No</i> <i>Yes</i>	

7.4.3. Selecting Whether a Channel Pair is Monitored in Stereo or Mono

Audio
Ch1/ch2 output mode
Stereo
Mono

This control, if set to *Mono*, adds the two channels of the pair, reduces the summed amplitude by 2 (to keep consistent operating levels), and routes this mono signal to both analog audio outputs or the channel pair.

7.4.4. Setting the Analog Levels - Fine Adjust

There are 4 menu items to adjust the levels of each of the analog audio outputs. For simplicity only the menu for channel 1 will be shown in the manual.

Audio
Fine ch1 adjust
-128 to 127
0

The channel output level is adjusted with this control. It has a range of approximately +/- 3 dB with 15mdB resolution.

7.5. CONFIGURING THE VIDEO AND SOURCE ID CONTROLS

The *Video/SID* menus are used to configure parameters associated with the video input and output functions and the Source ID decoders. The chart below shows the items available in the *Video/SID* menu. Sections 7.5.1 to 7.5.15 give detailed information about each of the menu items.

<i>Video standard</i>	Selects the input video standard
<i>Loss of video</i>	Selects the action to take when the input video is missing
<i>NTSC setup pedestal</i>	Selects whether the NTSC 7.5 IRE pedestal will be enabled on the composite analog output
<i>Composite display mode</i>	Selects whether the composite analog output will be colour or monochrome
<i>525 VITC line</i>	Sets the line number for decoding Vertical Interval Time Code in 525-line video.
<i>625 VITC line</i>	Sets the line number for decoding Vertical Interval Time Code in 625-line video.
<i>525 PESA line</i>	Sets the line number for decoding PESA format Source ID in 525-line video.
<i>625 PESA line</i>	Sets the line number for decoding PESA format Source ID in 625-line video.
<i>Default SID mode</i>	Selects whether the Default SID message will be shown when there is no source ID on the incoming video
<i>Default SID msg</i>	Sets the message that will be shown when <i>Default SID mode</i> is enabled and the SID window is turned On
<i>WSS Type</i>	Selects the type Wide Signaling (WSS) to decode
<i>WSS Decode ITN</i>	Selects which field from WSS ITN data to decode
<i>WSS Decode ITU-R</i>	Selects which field from WSS ITU-R data to decode
<i>Video Index</i>	Selects the type Video Index to decode
<i>WST Line Select A</i>	Sets the line number (A) for decoding World System Teletext (WST)
<i>WST Line Select B</i>	Sets the line number (B) for decoding World System Teletext (WST)

7.5.1. Setting the Video Standard

<i>Video/SID</i>
<i>Video standard</i>
525
625
1080i/60 *
1080i/59.94 *
1080i/50 *
720p/60 *
720p/59.94 *
720p/50 *
<u>Auto</u>

The video line standard is selected with this control. If set to *Auto* mode, the card will adjust operation as needed for the incoming standard.

*** - Available on 7760AVM2-HD only**

7.5.2. Selects the Action to Take When Input Video is Missing

<i>Video/SID</i>
<i>Loss of video</i>
Pass
<u>Black</u>

The user can either have the output video go to black or pass whatever data is at the input.

7.5.3. Setting the NTSC Setup Pedestal

<i>Video/SID</i>
<i>NTSC setup pedestal</i>
<u>On</u>
Off

The setup pedestal should not be present when operating in Japan. This control allows it to be removed.

7.5.4. Setting the Composite Display Mode – Colour or Monochrome

<i>Video/SID</i>
<i>Composite display mode</i>
<u>Colour</u>
B/W

If monochrome operation is desired on the composite output, colour may be turned off with this control.

7.5.5. Setting the VITC Line Number – 525 Line Video

Video/SID
525 VITC line
10 to 32
<u>10</u>

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 7760AVM2 will automatically decode it, and turn on the SID window if the user has enabled this window (see “GPI, GPO and Window State Setup”).

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

7.5.6. Setting the VITC Line Number – 625 Line Video

Video/SID
625 VITC line
6 to 32
<u>10</u>

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 7760AVM2 will automatically decode it, and turn on the SID window if the user has enabled this window (see “GPI, GPO and Window State Setup”).

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

7.5.7. Setting the PESA Source ID Line Number – 525 Line Video

Video/SID
525 PESA line
10 to 21
<u>11</u>

With this control, set the VBI line number that contains the PESA SID information when operating in 525 video mode. If the wrong line number is set, no SID will be decoded.

This control is available only on the –A and –B versions, and on –HD versions when the +SID option is fitted.

7.5.8. Setting the PESA Source ID Line Number – 625 Line Video

Video/SID
625 PESA line
7 to 22
<u>11</u>

With this control, set the VBI line number that contains the PESA SID information when operating in 625 video mode. If the wrong line number is set, no SID will be decoded.

This control is available only on the –A and –B versions, and on –HD versions when the +SID option is fitted.

7.5.9. Setting the Default SID Mode

Video/SID
Default SID mode
<u>Disable</u>
<u>Enable</u>

Determines if the Default SID message will be displayed in the SID window when there is no incoming source ID on the VITC. This control is available only on the –A and –B versions, and on –HD versions when the +SID option is fitted.

Set to *Disable* to blank the SID window when there is no incoming source ID.

Set to *Enable* to show the Default SID message in the SID window when there is no incoming source ID. The SID window must also be turned On to display the default SID message. See section 7.7.4 for information on turning the SID window On.

7.5.10. Setting the Message to be Displayed When There is No Incoming SID

Video/SID
Default SID msg
<u>No SID</u>

This control sets the message that will be 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 7.2 for information on changing text fields. This control is available only on the –A and –B versions, and on –HD versions when the +SID option is fitted.

7.5.11. Setting the Widescreen Signaling (WSS) Type to Decode

Video/SID
WSS Type
<u>ITU-R-BT.1119-1</u>
<u>ITN</u>

This control sets the type of WSS to decode.

7.5.12. Decoding WSS ITN Data

Video/SID
WSS Decode ITN
<u>Aspect Ratio</u>
<u>AFD Description</u>
<u>Enhanced Services</u>
<u>Aspect Ratio & AFD #</u>

This control sets which field of the WSS ITN data to decode.

7.5.13. Decoding WSS ITU-R Data

Video/SID
WSS Decode ITU-R
<u>Subtitles</u> Film Mode Format

This control sets which field of the WSS ITU-R data to decode.

7.5.14. Decoding the Video Index Data Format

Video/SID
Video Index
<u>Scanning System</u> AFD Description Scanning Sys & AFD# Signal Form Sample Structure Pan & Scan Data Color Field Video/Film Data Frame Rate Source Flags Color Encoding Luminance Equation Gamma Equation Sample Quantization Filtering Data AR & AFD #

This control sets which field in the Video Index Data to decode.

Scanning System, AFD Description, Scanning Sys & AFD #, Signal Form, and Sample Structure provides information required to display the signal.

Pan & Scan Data displays the pan and scan parameters for the signal.

Color Field, Video/Film Data, Frame Rate, Source Flags, and Color Encoding are parameters that define the field rate technical heritage information.

Luminance Equation, Gamma Equation, Sample Quantization, and Filtering Data are parameters that define the slow-rate technical heritage information.

AR & AFD# describes the Aspect Ratio and Active Format Description of the input signal.

RP186 describes in further detail Video Index Data formats.

7.5.15. Setting the WST Line Selects A and B

Video/SID
WST Line Select A
<u>10</u> 7 to 22

The control will set the line number (A) for decoding World System Teletext (WST).

Video/SID
WST Line Select B
<u>20</u> 7 to 22

The control will set the line number (B) for decoding World System Teletext (WST).

7.6. CONFIGURING THE BAR GRAPH CONTROLS

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. Sections 7.6.1 to 7.6.15 give detailed information about each configuration item for the audio bar graphs. Sections 7.6.1 to 7.6.4 show the items in the bar graphs 1 and 2 menu tree. These sections apply also to the items in the bar graph 3 and 4 menu tree. Sections 7.6.13 to 7.6.15 apply globally to all bar graphs.

<i>Bar graphs 1/2</i>	Setup items for bar graphs 1 and 2.
<i>Bar graphs 3/4</i>	Setup items for bar graphs 3 and 4.
<i>Size</i>	Sets bar graph size.
<i>Background opacity</i>	Sets the background opacity or how much video picture content will be visible through the bar graph backgrounds.
<i>Bars opacity</i>	Sets the background opacity or how much video picture content will be visible through the bar graph bars.

7.6.1. Selecting the Bar Graph Operating Mode

<i>Bar graphs</i>	In <i>Normal</i> mode, stereo bar graphs are displayed.
<i>Bar graphs 1/2</i>	
<i>Bar mode</i>	In <i>Sum + diff</i> 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.
<i>Normal,</i>	
<i>Sum + diff</i>	

7.6.2. Setting the Headroom

Bar graphs

Bar graphs 1/2

Headroom

0 to 30db

0db

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

This control is used to position the 0 dB point for the VU and PPM meters (excluding AES/EBU ballistics mode that always uses 0 dB FS). For example, if you set this control to 15dB and input a signal that is -15 dB FS, then the bar graph top will be at 0dB. If you are in PPM mode with AES/EBU ballistics, then the meter will read -15dB. When you adjust this level, you are also changing the 0dB or program reference point on the bar graphs to maintain the relationship:

$$\text{PGM. Ref.} + \text{headroom} = \text{peak output level}$$

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

7.6.3. Setting the Analog Peak Audio Output Level

Bar graphs

Bar graphs 1/2

Ch. 1/ch2 peak output level

8 to 24dBu

14dBu

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

This control is used to position the 0 dB point for the VU and PPM meters (excluding AES/EBU ballistics mode that always uses 0 dB FS). For example, if you set this control to 15dB and input a signal that is -15 dB FS, then the bar graph top will be at 0dB. If you are in PPM mode with AES/EBU ballistics, then the meter will read -15dB. When you adjust this level, you are also changing the 0dB or program reference point on the bar graphs to maintain the relationship:

$$\text{PGM. Ref.} + \text{headroom} = \text{peak output level}$$

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

7.6.4. Setting the Bar Graph Type

Bar graphs
Bar graphs 1/2
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

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.

7.6.5. Setting the PPM Mode and Ballistics

Bar graphs
Bar graphs 1/2
PPM mode
DIN
BBC
Nordic N9
AES/EBU

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

When one of these modes is selected, a number of items are set to adhere with predefined industry standards. The items affected include; meter attack time, meter decay time, min level displayed, max level displayed, analog reference (100%) level and, in some instances, region colouring and phase graph representation. Table 7-1 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: <ul style="list-style-type: none"> • 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	# 4 on the scale is the reference level
Nordic N9	5 ms	1.7 sec for 20 dB	6 dBu	-42 dB	+12 dB	6 + headroom	
AES/ EBU	1 sample period	1.5 sec for 20 dB	User defined	-60 dB	0 dB	User defined	100% reading is user definable. 0 dB corresponds to 0 dB FS

Table 7-1: PPM Bar Graph Characteristics



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

7.6.6. Setting the VU Display Range

<i>Bar graphs</i>
<i>Bar graphs 1/2</i>
<i>VU range</i>
<i>Normal</i>
<i>Extended</i>

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.

7.6.7. Setting the Phase Bar Graph Type

<i>Bar graphs</i>
<i>Bar graphs 1/2</i>
<i>Phase type</i>
<i>Stereo</i>
<i>DIN</i>

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).

7.6.8. Setting the Bar Graph Error Region

<i>Bar graphs</i>
<i>Bar graphs 1/2</i>
<i>Error region</i>
<i>-1 to -20 dB FS</i>
<i><u>-6 dB FS</u></i>

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

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 you choose the type, you can adjust this value to your desired level.

7.6.9. Setting the Bar Graph Warning Region

<i>Bar graphs</i>
<i>Bar graphs 1/2</i>
<i>Warning region</i>
<i>-2 to -40 dB FS</i>
<i><u>-20 dB FS</u></i>

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

This value cannot be higher than the "error" region value. If the "error" region is lowered below the value of this parameter, the "warning" region will also be lowered.

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 you choose the type, you can adjust this value to your desired level.

7.6.10. Setting the Level Bar Graph Scale Position

<i>Bar graphs</i>
<i>Bar graphs 1/2</i>
<i>Scale position</i>
<i>Off</i>
<i>Left</i>
<i><u>Right</u></i>

This control allows you to enable and position the level bar graph scale tick marks and the scale labels with respect to the bar itself. When off, there will not be any ticks or numerical labels while left or right will position them to the left or the right of the graphs respectively.

If a combination VU/PPM mode is selected, then "left" will select VU scale on the left, PPM scale on the right and "right" will select VU scale on the right and PPM scale on the left.

7.6.11. Setting the Phase Bar Graph Scale Position

<i>Bar graphs</i>
<i>Bar graphs 1/2</i>
<i>Phase scale</i>
<i><u>Top</u></i>
<i>Bottom</i>
<i>None</i>

This control allows you to enable and position the phase bar graph scale tick marks and the scale labels with respect to the bar itself. When off, there will not be any ticks or numerical labels while top or bottom will position them to the top or the bottom of the phase bar graph respectively.



7.6.12. Setting the Colours of the Bar Graphs

Each of the level bar graphs consists of three regions: the “OK”, “Warning” and “Error” regions. The *Colours* menu items allow you to select one of a group of standard colours, or choose your own custom colours 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 colours 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 colours, the 7760AVM2 automatically sets the R, G, and B values. If you choose the custom colour, you will be able to set the R, G, and B values independently to give you the desired colour. If you are having problems setting these values with the menu system, open a paint program, select the colour you like (usually from a colour wheel) and set the R, G, and B values into the 7760AVM2 card using the respective *Custom colour* menu items for the region.

7.6.12.1. Setting the Level Bar Graph Region Colour

Bar graphs
Bar graphs 1/2
Colours
OK Region
White
Black
Grey
Yellow
Red
Green
Custom

This control sets the colour of the bottom “OK” region of level bar graphs. You can choose from one of the predefined colours or define a custom colour.

7.6.12.2. Selecting a Bar Graph Region Custom Colour

There are three menu items used to set the custom colour: *Red*, *Green*, and *Blue*. The menu item for each colour component works in the same way so for simplicity only the menu item for the *Red* component will be shown in the manual.

Bar graphs
Bar graphs 1/2
Colours
Custom OK Red
0
0 to 255

This control defines one of the component colours for a custom colour for one of the regions of level bar graphs.

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

7.6.13. Setting the Level Bar Graph Size

<i>Bar graphs</i>
<i>Size</i>
<i>Small</i>
<i><u>Big</u></i>

This control sets the vertical size of the level bar graphs.

Two sizes of bar graphs are available. The *Big* size is about $\frac{3}{4}$ of the screen height while the *Small* size is about $\frac{1}{2}$ of the screen height.

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

<i>Bar graphs</i>
<i>Background opacity</i>
<i>0 to 64</i>
<i><u>32</u></i>

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 colour will be visible over the video content. At the maximum value, very little of the background video will be visible through the bar graph.

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

<i>Bar graphs</i>
<i>Bars opacity</i>
<i>0 to 64</i>
<i><u>64</u></i>

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 colour will be visible over the video content. At the maximum value, very little of the background video will be visible through the bar graph.

7.7. CONFIGURING THE ON-SCREEN DISPLAY CONTROLS

The *On-screen display 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 *On-screen display configuration* menu. Sections 7.7.1 to 7.7.6 give detailed information about each of the menu items.

<i>Window position</i>
<i>Window enable</i>
<i>Text windows</i>

Controls used to position each one of the On Screen windows.

Controls used to configure the GPI functions, and the on/off states of the text and bar graph windows.

Controls used to set the text style, background colour and opacity for the On screen windows.

When many windows are turned on, 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
4	Phase bar graphs
5 (bottom)	Level bar graphs

Table 7-2: OSD Priority

7.7.1. Descriptions of the 7760AVM2 On Screen Windows

7.7.1.1. Video/Audio Status Window

The purpose of the Video/Audio status window is to show as much status information about the video and audio as possible in a small, concise table. Table 7-3 shows each item that may appear in the status screen. The Status window may be operated on one of two modes. In *normal* mode, all lines are controlled by the text window attributes. In *Fault* mode, those lines whose associated fault triggers are used to activate a 7760AVM2 fault will be displayed using fault window properties. All other lines use the text window properties. If the Status window is enabled by a 7760AVM2 fault, only those lines associated with the fault triggers that enable the fault window will be displayed using fault window properties. All other lines use text window properties.

Item	Value(s)	Description
Video	525 625 1080i/60 * 1080i/59.94 * 1080i/50 * 720p/60 * 720p/59.94 * 720p/50 * Not present	Input video standard detected regardless of what the card is configured to process. *- Only on 7760AVM2-HD
Picture Content	Moving Frozen Frozen, black	Shows the status of the picture content. Shows <i>moving</i> if the picture is active, <i>frozen</i> if the card detects no motion, or <i>frozen, black</i> if the picture is black
EDH	FF: checksum, AP: checksum Not present	The EDH checksums are periodically sampled and displayed
VITC	TC Value Not present	If present, the time code value is displayed here.
SID	VITC or PESA SID value Not present	If present, the SID is displayed here. VITC SID has priority over PESA SID in SD video.
PR	Value Not present	The program rating of Closed Captioning is indicated, if present.
CC	Present Not present	The presence/absence of Closed Captioning is indicated.
Audio groups	None 1,2,3 or 4	All audio groups that are present are displayed. Note that the LED's under the PCB, near the card extractor also indicates which groups are present.
Audio channels	None 1,2,3 or 4	Displays which channels are present within selected Audio group.
Ch. 1 and 2	NA [(silent/over), (mono/out of phase)]	Status information about channels 1 and 2 are shown here.
Ch. 3 and 4	NA [(silent/over), (mono/out of phase)]	Status information about channels 3 and 4 are shown here.
WSS	Present Not Present N/A Valid on SD only (7760AVM2-HD only)	The presence/absence of Widescreen Signaling (WSS)
Video Index	Present Not Present N/A Valid on SD only (7760AVM2-HD only)	The presence/absence Video Index information coding.
Teletext	Present Not Present	The presence/absence of Teletext in the input video.

Table 7-3: Video/Audio Status Screen Items

7.7.1.2. VITC Time Code Window

The VITC time code window shows the vertical interval time code present at the input to the 7760AVM2 module. Use the VITC line select items on the Video menu to configure the lines that the 7760AVM2 will use for reading VITC. (See sections 7.5.5 and 7.5.6 for information about setting the VITC line numbers.)

The VITC time code window cannot be positioned in the top half of the screen. The screen updates are performed in the top half of the screen, so if the window is positioned there, the time code will be displayed 1 field too late. The *TC window size* menu item controls whether the time code window will be displayed in the normal or large font size.

7.7.1.3. Program Rating Window

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. The *PR window size* menu item controls whether the time code window will be displayed in the normal or large font size. There also is support for Canadian French and English program ratings.

7.7.1.4. Closed Captioning Window

The CC window is only available on 7760AVM2 models that have an analog video output. It contains caption information from the CC1 data stream.

7.7.1.5. XDS Window

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.

7.7.1.6. Source Identification Window

The 7760AVM2-A and 7760AVM2-B modules have the ability to decode Evertz source identification (SID) information from the vertical interval time code (VITC) present at the input to the 7760AVM2 module. When no Evertz VITC SID is encoded, the 7760AVM2 module will decode SID that has been encoded in the PESA format. The 7760AVM2-HD version with the +SID option fitted will decode Evertz VITC or PESA source ID from SD sources or Evertz ancillary time code (ATC) Source ID from HD sources. The Source Identification window is used to display the decoded SID information. When there is neither Evertz SID (VITC for SD or ATC for HD) nor PESA SID (in SD only) encoded, the *Default SID message* will be displayed if *Default SID mode* is enabled, otherwise the SID window will be turned off. (See sections 7.5.9 and 7.5.10 for information about setting the *Default SID message*). For SD video standards, use the VITC line select items on the Video menu to configure the lines that the 7760AVM2 will use for reading VITC. (See sections 7.5.5 and 7.5.6 for information about setting the VITC line numbers.) Use the PESA line select items on the Video menu to configure the lines that the 7760AVM2 will use for reading PESA format source ID. (See sections 7.5.7 and 7.5.8 for information about setting the VITC line numbers.) For HD video standards, the 7760AVM2-HD will auto detect the location of the ATC packets containing the source ID. The *SID window size* menu item controls whether the SID window will be displayed in the normal or large font size.

7.7.1.7. Fault Message Windows

The Fault 1 and Fault 2 window show user text messages when the Fault 1 or Fault 2 conditions are triggered. The Fault message windows have their own set of colour, opacity and size attributes, they can be set to come on steady or blinking and they contain fully programmable messages. See section 7.9 for more information on setting up the fault conditions and configuring the fault windows.

7.7.1.8. Video Index AFD Window

The 7760AVM2 module has the ability to decode video index (and AFD) information from the vertical interval time code present at the input to the 7760AVM2 module. The Video Index AFD window displays the decoded Video Index information. The information that is display will be dependant on the decoding configuration (see section 7.5.14). The *Video Index AFD window size* menu item controls whether the Video Index AFD window will be displayed in the normal or large font size.

7.7.2. Setting the Position of On Screen Windows

To set the horizontal and vertical position of the Status, Time Code, Program Rating, SID, one of the Fault windows or the Video Index AFD, use the *WINDOW ROW* and *WINDOW COLUMN* menu items for the respective window. The controls for all of the windows work in the same way so, for simplicity only the menu items for the *STATUS WINDOW* will be shown.

7.7.2.1. Setting the Horizontal Position of On Screen Windows

On-screen display configuration
Window position
Status Window Row
0
0 to 23

The *Window Row* position menu item sets the top row for the respective window.

When you select this parameter, the screen text will disappear and a box of the correct size will appear. Move it around to the desired position with the toggle switch. Press the pushbutton when done.

7.7.2.2. Setting the Vertical Position of On Screen Windows

On-screen display configuration
Window position
Status Window Column
0
0 to 52

The *Window Column* position menu item sets the leftmost character position for the respective window.

When you select this parameter, the screen text will disappear and a box of the correct size will appear. Move it around to the desired position with the toggle switch. Press the pushbutton when done.

7.7.3. Setting the Position of the Bar Graphs

To set the horizontal and vertical position of the Level bar graph pair 1/2 or 3/4 or the phase bar graph pair 1/2 or 3/4, use the *Level bar Row* and *Level bar Column* menu items for the respective bar graph. The controls for all of the bar graphs work in the same way so, for simplicity the menu item for the *Level bar graph 1/2* will be shown.

7.7.3.1. Setting the Horizontal Position of the Bar Graphs

On-screen display configuration
Window position
Level bar 1/2 Row
0 to 23
0

The *Bar Row* position menu item sets the top row for the respective window.

When you select this parameter, the horizontal position of the respective bar graph can be adjusted. Move it around to the desired position with the toggle switch. Press the pushbutton when done.

The default H position for Level bar 3/4 is (34).

7.7.3.2. Setting the Vertical Position of the Bar Graphs

On-screen display
configuration

Window position

Level bar 1/2 Column

0 to 52

0

The *Bar Column* position menu item sets the leftmost position for the respective window.

When you select this parameter, the vertical position of the respective bar graph can be adjusted. Move it around to the desired position with the toggle switch. Press the pushbutton when done.

7.7.4. Selecting What Bar Graphs and Windows to Display (via “*Window Enable*” Menu Item)

The 7760AVM2 has two general purpose inputs that can be programmed to turn the Level or Phase bar graphs or the Status, VITC, Program Rating, SID, CC, XDS, Video Index AFD windows on or off, and to clear the level bar graphs *PEAK HOLD* or the Fault Displays. The windows and bar graphs can also be turned permanently on or off. The *Window enable* menu item is used to program the GPIs, and the on/off states of the text and bar graph windows. To display the Fault windows use the *Fault condition* menu item on the *Fault definitions* menu. (See section 7.9.1.4)

When you select the *Window enable* menu item you are presented with a list of the possible functions that can be controlled using the GPIs as shown in Table 7-4. Select the desired function using the toggle switch. When the pushbutton is pressed, the cell cycles through the valid values for the field. Each of the windows and bar graph displays can be set to *Always On*, *Always Off* or *GPI*. When set to *Always On*, the corresponding window or bar graph is always displayed. When set to *Always Off*, the window or bar graph is always off. When set to *GPI*, the window will be on when the configured GPI is active. The GPI columns will either be blank; will contain the *GPI1* or *GPI2*, or both *GPI1* and *GPI2*. When they are set to *GPI1* or *GPI2* the window will be turned on when the respective GPI goes active.

Note that the *Peak holds* and the *Clear faults* items cannot be set to *Always On* or *Always Off*. They must be cleared with the GPI's or the main menu *Clear faults and peaks* menu item (see section 7.12).

Item	State (On/Off)	GPI1	GPI2	Fault 1	Fault 2
Ch 1/2 level bars	√	√	√		
Ch 3/4 level bars	√	√	√		
Ch 1/2 phase bars	√	√	√		
Ch 3/4 phase bars	√	√	√		
Ch 1/2 clear peak		√	√		
Ch 3/4 clear peak		√	√		
Status	√	√	√	√	√
Time code	√	√	√		
Program Rating	√	√	√		
CC	√	√	√		
XDS	√	√	√		
SID	√	√	√		
Clear fault 1		√	√		
Clear fault 2		√	√		
Video Index AFD	√	√	√		

Table 7-4: Methods of turning Windows and Bar graphs On and Off

7.7.5. Setting the Text Window Attributes

The On screen text windows can be displayed as white characters with or without a coloured 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 window config* menu items are used to set these parameters for all the text windows except the Fault windows. See section 7.7.6 for information on setting the *Fault window* attributes.

7.7.5.1. Turning on the Text Window Backgrounds

On-screen display configuration
Text windows
Text window config
Text type
White on BG
White with no BG

The text displayed in the Text windows may either have a background box or if too much video information is hidden, it may be inserted with a thin black outline.

7.7.5.2. Setting the Text Window Background Colours

On-screen display configuration
Text windows
Text window config
Background colour
Black
Grey
Yellow
Red
Green

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

7.7.5.3. Setting the Text Window Background Opacity

On-screen display configuration
Text windows
Text window config
Background opacity
0 to 64
32

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 colour will be visible over the video content. At the maximum value, very little of the background video will be visible through the window background.

7.7.5.4. Setting the Text Window Text Opacity

On-screen display
configuration

Text windows

Text window config

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.

7.7.5.5. Setting the Time Code Window Font Size

On-screen display
configuration

Text windows

Text window config

TC window size

Normal

Big

This control sets the font size of the VITC time code window.

When it is set to *Big* the font size will be double the height and width of the *Normal* font size.

7.7.5.6. Setting the Program Rating Window Font Size

On-screen display
configuration

Text windows

Text window config

PR window size

Normal

Big

This control sets the font size of the program rating window.

When it is set to *Big* the font size will be double the height and width of the *Normal* font size.

7.7.5.7. Setting the Source ID Window Font Size

On-screen display
configuration

Text windows

Text window config

SID window size

Normal

Big

This control sets the font size of the source ID window. This control is available only on the –A and –B versions, and on –HD versions when the +SID option is fitted.

When it is set to *Big* the font size will be double the height and width of the *Normal* font size.

7.7.5.8. Setting the Status Window Mode

On-screen display configuration
Text windows
Text window config
Status window mode
<u>Normal</u>
Fault

This control determines the display properties of the status window.

When it is set to *Normal* the status window will use the text window properties.

When it is set to *Fault*, items in the status window that have been selected for fault generation using the *Fault Trigger* menu item will use the *Fault window* properties when the fault is active. If either Fault 1 or Fault 2 triggering enables the status window, then only the faults that actually enabled the window will be shown in the *Fault window* properties. The rest of the items on the status window will be shown in the *Text window* properties.

For example, if "program rating" is set up as a fault trigger, and the rating disappears, then the "program rating" line of text on the status screen will take up the characteristics of the "fault text". Usually this is white text on a red background.

7.7.5.9. Setting the Video Index AFD Window Font Size

On-screen display configuration
Text windows
Text window config
Video Index AFD window size
<u>Normal</u>
Big

This control sets the font size of the Video Index AFD window.

When it is set to *Big* the font size will be double the height and width of the *Normal* font size.

7.7.6. Setting the Fault Window Attributes

The On screen Fault windows can be displayed as white characters with or without a coloured 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 window config* menu items are used to set these parameters for the Fault windows.

7.7.6.1. Turning on the Fault Window Backgrounds

On-screen display configuration
Text windows
Fault window config
Text type
<u>White on BG</u>
White with no BG

The text displayed in the fault window may either have a background box or if too much video information is hidden, it may be inserted with a thin black outline.

7.7.6.2. Setting the Fault Window Background Colours

On-screen display
configuration

Text windows

Fault window config

Background colour

Black

Grey

Yellow

Red

Green

Select the desired background colour around the text in the fault windows.

7.7.6.3. Setting the Fault Window Background Opacity

On-screen display
configuration

Text windows

Fault window config

Background opacity

0 to 64

64

This control sets the Fault 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 colour will be visible over the video content. At the maximum value, very little of the background video will be visible through the window background.

7.7.6.4. Setting the Fault Window Text Opacity

On-screen display
configuration

Text windows

Fault window config

Text opacity

0 to 64

64

This control sets the Fault 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.

7.7.6.5. Setting the Fault Window Font Size

Similar window size menu items are available for Fault 1 and Fault 2 windows.

On-screen display
configuration

Text windows

Fault window config

Fault 1 window size

Normal

Big

This control sets the font size of the program rating window.

When it is set to *Big* the font size will be double the height and width of the *Normal* font size.

7.7.6.6. Setting the Blink Mode of the Fault Windows

Similar blink mode menu items are available for the Fault 1 and Fault 2 windows.

<i>On-screen display configuration</i>
<i>Text windows</i>
<i>Fault window config</i>
<i>Fault 1 blink</i>
<i><u>Disable</u></i>
<i><u>Enable</u></i>

This control determines if the Fault 1 window will blink or be on solid when the fault is active.

When it is set to *Disable* the fault window will be on steady when it is active.

When it is set to *Enable* the fault window will blink when it is active.

7.8. CONFIGURING THE GENERAL PURPOSE OUTPUTS

The 7760AVM2 modules have a General Purpose output available on the high-density DB-15 connector which can be used to signal several conditions to the user. In addition this output can be configured to be active high or low. The 7700 frame also has a fault monitoring LED and general-purpose output. The user also has the ability to configure which faults the 7760AVM2 will assert onto the frame status system. The *GPO configuration* menu contains the controls used to configure the GPOs. Sections 7.8.1 to 7.8.3 give detailed information about each of the menu items.

<i>GPO1 active state</i>
<i>GPO1 trigger</i>
<i>Frame stat trigger</i>

Controls whether the general-purpose output is active high or low.

Controls what events will trigger the general-purpose output.

Controls what events will trigger the Frame Status Fault line and the Fault Status LED.

7.8.1. Setting the General Purpose Output Active State

<i>GPO configuration</i>
<i>GPO1 active state</i>
<i><u>High</u></i>
<i><u>Low</u></i>

This control sets the output level for active state of the General Purpose output.

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.

7.8.2. Configuring what Condition will Activate the General Purpose Output

<i>GPO configuration</i>
<i>GPO1 trigger</i>
<i><u>None</u></i>
<i><u>Fault 1</u></i>
<i><u>Fault 2</u></i>
<i><u>Fault 1 or 2</u></i>

This control configures what condition will cause the general-purpose output to go to the active state.



7.8.3. Frame Status Fault Trigger Condition

GPO configuration
Frame status trigger
None
Fault 1
Fault 2
Fault 1 or 2

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 cannot be disabled from the status signal.

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 8

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

7.9. CONFIGURING THE FAULT DEFINITIONS

When many windows are turned on, 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 Fault windows have the highest priority. The priority of the other windows is shown in section 7.7.

The *Fault definition* menu items are used to configure the fault settings, and the presentation of the fault conditions. The chart below shows the items available in the *Fault definition* menu. Sections 7.9.1 to 7.9.15 give detailed information about each configuration item for the fault definitions.

<i>Fault condition 1</i>	Controls used to configure the Fault Condition 1 display.
<i>Fault condition 2</i>	Controls used to configure the Fault Condition 2 display.
<i>Fault window config</i>	Controls used to set the Fault Window text style, background colour and opacity. These parameters may also be set using the <i>On-screen</i>
<i>Video invalid duration</i>	Sets the number of frames that the 7760AVM2 will ignore for which video fault condition message is not triggered.
<i>Loss of Audio duration</i>	Sets the number of frames that the 7760AVM2 will ignore for which audio fault condition message is not triggered.
<i>EDH error duration</i>	Sets the number of consecutive fields of EDH errors to consider as a fault
<i>Over level</i>	Sets the level of audio over which is considered a fault or error condition
<i>Over duration</i>	Sets the duration of audio, over the above level which is considered a fault
<i>Silence level</i>	Sets the level of audio under which is considered silence
<i>Silence duration</i>	Sets the duration of audio in seconds under the above level which is considered a fault
<i>Phase reversal level</i>	Sets the level of L/R audio difference over which is considered phase reversal
<i>Phase reversal duration</i>	Sets the duration of audio in seconds over the above phase reversal level which is considered a fault
<i>Mono threshold level</i>	Sets the level of L/R audio difference under which is considered mono
<i>Mono duration</i>	Sets the duration of mono audio in seconds which is considered a fault
<i>Loss of CC duration</i>	Sets the duration, of no primary CC1 captions, in seconds which is considered a fault
<i>Loss of Teletext duration</i>	Sets the duration, of no teletext, in seconds which is considered a fault
<i>Loss of PR duration</i>	Sets the duration, of no program rating XDS packet, in seconds which is considered a fault
<i>Picture noise level</i>	Sets the approximate level of noise expected in the video signal feed. It is used by the freeze detect feature to distinguish motion from
<i>Freeze Duration</i>	Sets the duration, of no picture activity above the <i>Picture noise level</i> , in seconds which is considered a fault
<i>Black Duration</i>	Sets the duration, of no active picture content above 7 IRE, in seconds which is considered a fault
<i>EIA708 CC Missing Dur</i>	Sets the duration, of no CEA-708 services, in seconds which is considered a fault (only on 7760AVM2-HD)

7.9.1. Setting Up How a Fault is Triggered and How it is Presented

The 7760AVM2 has two fault conditions that can be configured to warn the user of numerous conditions. The *Fault condition 1* and *Fault condition 2* menu items are used to configure when fault 1 or fault 2 is triggered, and how the fault should be 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 (user configurable, by default) once the fault condition is inactive. The controls for each fault condition operate the same way so, for simplicity, the manual shows only the menu items for *Fault condition 1*.

7.9.1.1. Displaying Current Fault Status

<i>Fault definitions</i>

<i>Fault condition 1</i>

<i>Fault status</i>

This menu item displays a screen that shows the current status of all faults that can be used to define a fault condition

7.9.1.2. Setting the position of the Fault Windows

<i>Fault definitions</i>

<i>Fault condition 1</i>

<i>Window position</i>

This control allows you to change the window positions of all 7760AVM2 windows and bar graphs. The window positions can also be set from the *Window position* menu item on the *On-screen display configuration menu*. See sections 7.7.2 to 7.7.4 for detailed information on position the windows and bar graphs.

7.9.1.3. Setting the Message Associated with a Fault

<i>Fault definitions</i>

<i>Fault condition 1</i>

<i>Fault 1 message</i>

<i>Video error</i>

This control sets the message to display when the fault condition is active. The text of the message can be changed. See section 7.2 for information on changing text fields.

Default message for Fault 2 is "Audio error".

7.9.1.4. Determining If the Fault Message Will Be Displayed

<i>Fault definitions</i>

<i>Fault condition 1</i>

<i>Fault 1 mode</i>

<i>Disable</i>

<i>Enable</i>

This control sets whether the fault message will be displayed when the fault condition is active.

When enabled, the fault message will be displayed until the condition is reset. When disabled, it will never be displayed. See section 7.9.1.5 for information on setting the duration of the fault condition.

7.9.1.5. Setting the Duration of the Fault Condition

<i>Fault definitions</i>
<i>Fault condition 1</i>
<i>Fault duration</i>
<i>Until reset</i>
<i>1 to 254 frames</i>
<i>30 frames</i>

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 resets (via programmed GPI, using the Clear faults & peaks menu option or by pressing the toggle switch when not in a menu) the condition or until a programmable timer expires.

7.9.1.6. Determining Logic Operation to Generate the Fault Condition

<i>Fault definitions</i>
<i>Fault condition 1</i>
<i>Logic</i>
<i>Or</i>
<i>And</i>

This control is determines whether one item (see section 7.9.1.7) or more than one item will generate a fault. The user will set this parameter to a logical OR or AND.

7.9.1.7. Determining What Items Will Generate the Fault Condition

<i>Fault definitions</i>
<i>Fault condition 1</i>

This control provides a list of items (see Table 7-5) 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. Enabled items will be shown with a check mark.

A fault condition will exist when any of the selected items occurs.

<i>Video invalid</i>	Video absent or incorrect standard at input
<i>Loss of audio</i>	Audio absent on channels ½ AND ¾
<i>Loss of audio ch ½</i>	Audio absent on channels ½ (independent of “Loss of audio” setting)
<i>Loss of audio ch ¾</i>	Audio absent on channels ¾ (independent of “Loss of audio” setting)
<i>AP EDH errors</i>	Active picture EDH errors present
<i>FF EDH errors</i>	Full Field EDH errors present
<i>Audio format error</i>	Audio Format Errors
<i>Phase reversal 1/2</i>	Audio 1 and 2 out of phase
<i>Phase reversal 3/4</i>	Audio 3 and 4 out of phase
<i>Audio over 1/2</i>	Audio 1 or 2 over level
<i>Audio over 3/4</i>	Audio 3 or 4 over level
<i>Audio silence 1/2</i>	Audio 1 and 2 silent
<i>Audio silence 3/4</i>	Audio 3 and 4 silent
<i>Audio mono 1/2</i>	Audio 1 and 2 mono
<i>Audio mono 3/4</i>	Audio 3 and 4 mono
<i>Loss of VITC</i>	VITC absent
<i>Loss of SID</i>	SID absent
<i>Loss of program rating</i>	Program rating absent
<i>Loss of CC</i>	Primary CC1 Closed captioning absent (EIA 608 only)
<i>Loss of Teletext</i>	Teletext is absent
<i>GPI1</i>	General Purpose Input 1 closed to ground
<i>GPI2</i>	General Purpose Input 2 closed to ground
<i>Picture Freeze</i>	No activity above preset noise level in active picture
<i>Picture Black</i>	No active picture above 7 IRE

Table 7-5: Possible Error Conditions to Produce a Fault

7.9.2. Setting the Fault Window Attributes

The Fault windows can be displayed as white characters with or without a coloured 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 window config menu items are used to set these parameters for the Fault windows.

<i>Fault definitions</i>
<i>Fault window config</i>

This control is used to change the fault window colours. These parameters can also be set using the *Fault window config* menu items on the *On screen display* menu. See section 7.7.6 for a complete description of the *Fault window config* menu items.

7.9.3. Setting Video Invalid Duration

Upon hot-switches, a resulting glitch in the video signal can cause the 7760AVM2 to momentarily report a video fault. 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.

<i>Fault definitions</i>
<i>Video invalid duration</i>
<u>0</u> 0 to 900 Frames

This control sets the duration for which the 7760AVM2 ignores glitches on the video signal thereby not displaying fault alert messages. The parameter is adjusted in 1 frame increments.

7.9.4. Setting Loss of Audio Duration

Upon hot-switches, the resulting glitch in the video signal can also cause a corresponding glitch to occur in the audio signal. This can create a brief “Audio Error” message to trigger if “Loss of Audio” duration is set too low. To avoid such an error message, this menu option is used to set a minimum threshold duration (in frames) during which the 7760AVM2 will ignore such glitches and not trigger a corresponding fault alert.

<i>Fault definitions</i>
<i>Loss of audio invalid duration</i>
<u>0</u> 0 to 900 Frames

This control sets the duration for which the 7760AVM2 ignores glitches on the video signal thereby not displaying fault alert messages. The parameter is adjusted in 1 frame increments.

7.9.5. Error Detection and Handling (EDH) Error Duration

<i>Fault definitions</i>

<i>EDH error duration</i>

<u>NA</u>

1 to 127 fields

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

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

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

If the video signal has passed through hardware that has modified the ANC data area (i.e. audio multiplex) without re-calculating the EDH check sums, then full field errors will always be generated. In that case, disable full field error detection and use active picture only. For more information on Error Detection and Handling, see SMPTE RP-165.

7.9.6. Detecting 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. The audio must be over this level for the duration set by the *Over duration* control before the fault condition exists. A fault will be generated when any channel has generated an over condition.

7.9.6.1. Setting the Audio Over Level

<i>Fault definitions</i>

<i>Over level</i>

<u>-6dB FS</u>

-30dB to 0dB FS

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

The parameter is adjusted in 0.25 dB increments.

7.9.6.2. Setting the Audio Over Duration

<i>Fault definitions</i>
<i>Over level</i>
<u>3</u> 3 to 255 Samples

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*.

The parameter is adjusted in 1 sample increments.

7.9.7. 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 1 sec. 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.

7.9.7.1. Setting the Audio Silence Level

<i>Fault definitions</i>
<i>Silence level</i>
<u>-60dB FS</u> -96dB to -20dB FS

This control sets the audio level under which it is considered to be silent. This value is expressed in dB full scale (FS).

The parameter is adjusted in 0.25 dB increments.

7.9.7.2. Setting the Audio Silence Duration

<i>Fault definitions</i>
<i>Silence duration</i>
<u>10 sec</u> 0.5 to 127 sec

This control sets the amount of time the audio is silent in seconds before a fault occurs.

The parameter is adjusted in 0.5 second increments.

7.9.8. Detecting 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 1 sec. before the fault condition will be removed.

7.9.8.1. Setting the Audio Phase Reversal Level

<i>Fault definitions</i>

<i>Phase reversal level</i>

<u>0.9</u>

0.5 to 1

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.

The parameter is adjusted in 0.01 increments.

7.9.8.2. Setting the Audio Phase Reversal Duration

<i>Fault definitions</i>

<i>Phase reversal duration</i>

<u>10 sec</u>

0.5 to 127 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.

The parameter is adjusted in 0.5 second increments.

7.9.9. Detecting 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 7760AVM2 modules 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 threshold level* and *Mono duration* controls are used to detect when two audio channels are considered to be mono. The *Mono threshold level* control sets the threshold that decides whether the signals are the same. The audio difference must be less than the *Mono threshold 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 threshold level* amount for 1 sec. before the fault condition will be removed.

Material that is a combination of 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.

7.9.9.1. Setting the Audio Mono Threshold Level

<i>Fault definitions</i>
<i>Mono threshold level</i>
<u>0.2</u>
0.2 to 0.5

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

The parameter is adjusted in 0.01 increments.

7.9.9.2. Setting the Audio Mono Duration

<i>Fault definitions</i>
<i>Phase reversal duration</i>
<u>10 sec</u>
0.5 to 127 sec

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

The parameter is adjusted in 0.5 second increments.

7.9.10. Detecting Loss of Primary Captioning

<i>Fault definitions</i>
<i>Loss of CC duration</i>
<u>180 sec</u>
2 to 512 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.

The parameter is adjusted in 2 second increments.

7.9.11. Detecting Loss of Teletext

<i>Fault definitions</i>
<i>Loss of Teletext duration</i>
<u>180 sec</u>
2 to 512 sec

This control sets the amount of time in seconds with Teletext encoded, which is considered a fault.

This fault condition will also be generated if Teletext is missing on the input video.

The parameter is adjusted in 2 second increments.

7.9.12. Detecting Loss of Program Rating Duration

<i>Fault definitions</i>
<i>Loss of PR duration</i>
<u>30 sec</u>
1 to 255 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 XDS data stream is missing on the input video.

The parameter is adjusted in 1 second increments.

7.9.13. Detecting Picture Freeze

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.

7.9.13.1. Setting the Picture Noise Level

<i>Fault definitions</i>
<i>Picture noise level</i>
<u>9</u> 1 to 10

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

7.9.13.2. Setting the Picture Freeze Duration

<i>Fault definitions</i>
<i>Picture freeze duration</i>
<u>302 frames</u> 6 to 902 frames

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

The parameter is adjusted in 4 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.

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

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

Setting this time as high as tolerable has two benefits:

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

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

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

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

If the path is even partially analog and if the user can place the equipment farthest upstream in the video path to go to a 'freeze frame' mode, then the *Picture noise level* should be optimized by initiating the 'freeze frame' mode in the upstream equipment and adjusting *Picture noise level* as low as possible, without losing the freeze alarm on the 7760AVM2. The user should note that because of the random nature of noise, the freeze alarm might be intermittent at some *Picture noise level* settings. The optimal *Picture noise level* setting is obtained when the loss of freeze alarm in the 7760AVM2 occurs no more than once every 5 minutes.

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

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

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

The *Picture noise level* and *Picture freeze duration* controls have been designed to be able to detect short-term "digital" freezes such as MPEG or motion JPEG server artifacts. When these devices have a significant problem with the content that they are de-compressing, they will typically start to produce a "blocky" effect. If the problem is severe enough, they will freeze a frame of video and play it out for a number of frames. With the *Picture noise level* set to 1 (i.e. only detect exact, or nearly exact pictures) and the *Picture freeze duration* set to *minimum*, the 7760AVM2 can detect these quick "digital freezes". You can't however detect both this type of freeze and a freeze from a link that has added noise to the picture

7.9.15. Detecting Picture Black Duration

<i>Fault definitions</i>
<i>Picture black duration</i>
<u>88 frames</u>
4 to 900 frames

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

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

The parameter is adjusted in 4 frame increments.

7.9.16. Detecting Missing CEA-708 Duration

The user is able to monitor the first 16 of the available 63 CEA-708 services. For simplicity sake, only the setting of Service 1 is shown.

<i>Fault Definitions</i>
<i>EIA708 CC Missing Dur</i>
<i>Service 1 Timeout</i>
<u>300 seconds</u>
0 to 999

This control sets the amount of time in seconds CEA-708 Service 1 encoded in the input video, which is considered a fault.

The parameter is adjusted in 1 second increments.

7.10. UTILITIES

The *Utilities* menus are used to list the module firmware version, upgrade the firmware, and manage the user presets. The chart below shows the items available in the *Utilities* menu. Sections 7.10.1 to 7.10.5 give detailed information about each of the parameters.

About...	Shows the firmware version of the module.
Data Logging	Performs data logging through the rear serial port.
Store Preset 1	Allows user to store configuration to preset 1.
Store Preset 2	Allows user to store configuration to preset 2.
Store Preset 3	Allows user to store configuration to preset 3.
Recall Preset 1	Allows user to recall configuration to preset 1.
Recall Preset 2	Allows user to recall configuration to preset 2.
Recall Preset 3	Allows user to recall configuration to preset 3.
Upgrade	Used to upgrade the firmware in the module.
Factory Reset	Perform a reset of the module to factory defaults

7.10.1. Accessing Information About this Module and its Firmware

Utilities	This control lists the particulars about this module and the firmware residing within it. It gives quick access to information about revisions that can be used to determine when upgrades are required.
About...	

7.10.2. Data Logging

Data logging is performed through the rear serial port. Since standard ASCII text is used, the fault data is human readable. Any PC running a terminal program can be used to view the log data or save the data logs to disk, providing a permanent report of any errors that existed over a specific period of time. When faults are logged on the serial port an event stamp accompanies them from incoming VITC or from an internal clock.

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

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

The data logging serial port operates at 57600 baud, 8 bits, no parity, 2 stop bits and no flow control. See section 2.4 for information on connecting the serial port to your computer.

7.10.2.1. Setting the Status Poll Polling Rate

Utilities
Data logging
Status poll setup
Poll rate
1 min
1 to 60 min

This control sets the rate at which card status is sent out the rear serial port when Status logging is enabled.

The status includes all items from the status window, AP and FF EDH error states, and the audio format error state.

7.10.2.2. Outputting the Module Status at Any Time

Utilities
Data logging
Status poll setup
Query status
Yes
No

This menu item is used to output the card status regardless of whether the polling rate timer has expired. Each time the *Query status* menu item is set to Yes, the card status is output on the serial port.

7.10.2.3. Selecting the Fault Log Event Stamp Mode

Utilities
Data logging
Fault log setup
Event stamp mode
Free run,
VITC

When a fault state changes, the 7760AVM2 will event stamp the fault log output. This control selects whether the 7760AVM2 will use VITC (if present) or an internal, free-running clock to event stamp the fault log.

Note: This event stamp does not necessarily have any relation to real time but is designed to be a relative indication of when faults occur.

7.10.2.4. Selecting the Fault Data Logging Mode

Utilities
Data logging
Fault log
Disable
Enable

This control selects whether or not fault log data should be sent out the serial port.

When Fault logging is enabled, a text message is sent out the serial port when a fault condition changes.

7.10.2.5. Selecting the Status Logging Mode

Utilities
Data logging
Status log
Disable
Enable

This control selects whether or not status log data should be sent out the serial port.

When Status logging is enabled, text messages representing the current status of the 7760AVM2 are sent out the serial port at the poll rate specified in the *Status poll rate* menu item. (See section 7.10.2.1)

7.10.2.6. Setting the Data Logging ID

Utilities
Data logging
Card ID
7760AVM2

All data logs include a text string that can be used to uniquely identify a 7760AVM2-X card.

This menu item is used to set the text string. See section 7.2 for information on changing text fields.

7.10.2.7. Setting the Data Logging ID

Utilities
Data logging
Event stamp
Current time

This control shows and sets the current state of the free-running clock (*Current time*).

7.10.3. Saving and Recalling 7760AVM2 Configurations

The 7760AVM2 modules provide three user preset areas to save the complete set of control from the on screen menu. The *Store preset* and *Recall preset* menu items are used to save and recall these configurations.

For simplicity the following sections of the manual show how to store and recall from Preset 1 only.

7.10.3.1. Storing 7760AVM2 Configurations to the User Presets

Utilities
Store preset 1
Store
Cancel

This control is used to initiate a store of the current card configuration into one of the user presets

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

7.10.3.2. Recalling 7760AVM2 Configurations from the User Presets

Utilities
Recall preset 1
Recall
Cancel

This control is used to initiate a recall of the current card configuration from one of the user presets

After selecting the recall preset operation, you must change the command to *Recall* and press the pushbutton before the store will take place. You can abort the operation by pressing the pushbutton when *Cancel* is displayed.

Warning: there will be a slight disturbance in the operation of the card and the on-screen display while the new preset is being recalled.

Warning: the current state of the card will be forgotten if it has not been saved to a preset before a recall is performed.

7.10.4. Initiating a Software Upgrade

<i>Utilities</i>
<i>Upgrade</i>
<i><u>Cancel</u></i>
<i>Yes</i>

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

In addition to the software upgrade support detailed in the *Upgrading Firmware* chapter in the front of the binder, you can initiate an upgrade with this control. 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 *Upgrade* and press the pushbutton before the upgrade can take place. Follow the remainder of the instructions in the *Upgrading Firmware* chapter. 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.



The Upgrade baud rate for the 7760AVM2 series modules is 115,200 baud.

7.10.5. Restoring the 7760AVM2 to its Factory Default Configuration

<i>Utilities</i>
<i>Factory reset</i>
<i>Yes</i>
<i><u>Cancel</u></i>

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.

7.11. CONFIGURING THE CAPTION DECODER

The 7760AVM2 allows for the decoding of closed captions (CEA-608). The chart below shows the items available in the *Decoder Setup* menu. Sections 7.11.1 to 7.11.4 give detailed information about each of the parameters.

<i>Display Select</i>
<i>CEA-608 Decoder</i>
<i>CEA-708 Decoder</i>
<i>Status Display</i>

Select what decode information to display: status, Teletext, CEA-608, or none.

Sets the CEA-608 decoder.

Sets the CEA-708 decoder. (only on 7760AVM2-HD)

Sets the contents of the status display.

7.11.1. Setting the Display for Decoded Information

Decoder Setup	This controls what decoded information is displayed.
Display Status	
Status Display	When set to <i>Status Display</i> , the information set in section 7.11.4 will be displayed.
Decode Teletext	
Decode CEA-608	When set to <i>Decode Teletext</i> , <i>Decode CEA-608</i> , or <i>Decode CEA-708</i> , the decoded information will appear on the screen.
Decode CEA-708	
Off	When set to <i>Off</i> , nothing is displayed on the screen.

7.11.2. Setting the CEA-608 Decoder

The 7760AVM2 will allow users to decode CEA-608 closed captions from the input video signal and display them on the screen.

7.11.2.1. Selecting Closed Caption channel

Decoder Setup	Selects which closed caption channel to decode.
CEA-608 Decoder	
CC Channel	
CC1	
CC2	
CC3	
CC4	
Off	

7.11.2.2. Selecting Closed Caption Text channel

Decoder Setup	Selects which text channel to decode.
CEA-608 Decoder	
Text Channel	
T1	
T2	
T3	
T3	
Off	

7.11.2.3. Selecting the Text Window Top Row

Decoder Setup	This control sets the location on the screen of the text window (displaying decoded CEA-608).
CEA-608 Decoder	
Text Window Top Row	
1	
1 to 15	

7.11.2.4. Selecting the Text Window Height

<i>Decoder Setup</i>
<i>CEA-608 Decoder</i>
<i>Text Window Height</i>
<u>4</u> 2 to 15

This control sets the height (in lines of text) of the screen of the text window (displaying decoded CEA-608).

7.11.2.5. Setting the XDS Display

<i>Decoder Setup</i>
<i>CEA-608 Decoder</i>
<i>XDS Display</i>
<u>Off</u> Scrolling Fixed

This control how the decoded XDS will appear in the on-screen XDS display.

7.11.2.6. Selecting the XDS Window Top Row

<i>Decoder Setup</i>
<i>CEA-608 Decoder</i>
<i>XDS Window Top Row</i>
<u>6</u> 1 to 15

This control sets the location on the screen of the text window (displaying decoded XDS).

7.11.2.7. Selecting the XDS Window Height

<i>Decoder Setup</i>
<i>CEA-608 Decoder</i>
<i>XDS Window Height</i>
<u>4</u> 2 to 15

This control sets the height (in lines of text) of the screen of the text window (displaying decoded XDS).

7.11.3. Setting the CEA-708 Decoder (only on 7760AVM2-HD)

The 7760AVM2-HD will allow users to decode CEA-708 closed captions services from the input video signal and display them on the screen.

7.11.3.1. Selecting CEA-708 Closed Caption Service

<i>Decoder Setup</i>
<i>CEA-708 Decoder</i>
<i>Service</i>
<u>1</u> 1 to 63

Selects which closed caption service to decode.



7.11.4. Setting the Status Display

Decoder Setup
Status Display
AVM Status
XDS Status
XDS Faults
CC/Text Status

This allows the user to select what information is displayed in the status display (if select in 7.11.1).

When set to *AVM Status*, the module status will be displayed.

When set to *XDS Status*, the status of the XDS data will be displayed.

When set to *XDS Faults*, the status of the XDS faults will be displayed.

When set to *XDS Status*, the status of the CC/Text data will be displayed.

7.12. CLEARING FAULTS AND PEAKS

Clear faults and peaks
Clear,
Cancel

This menu item on the top level menu provides a convenient method to clear any fault conditions and reset audio peak holds. You can also perform the clear by pressing the toggle switch up or down when not in the menu structure or use a GPI if it is programmed to do so.

8. JUMPERS

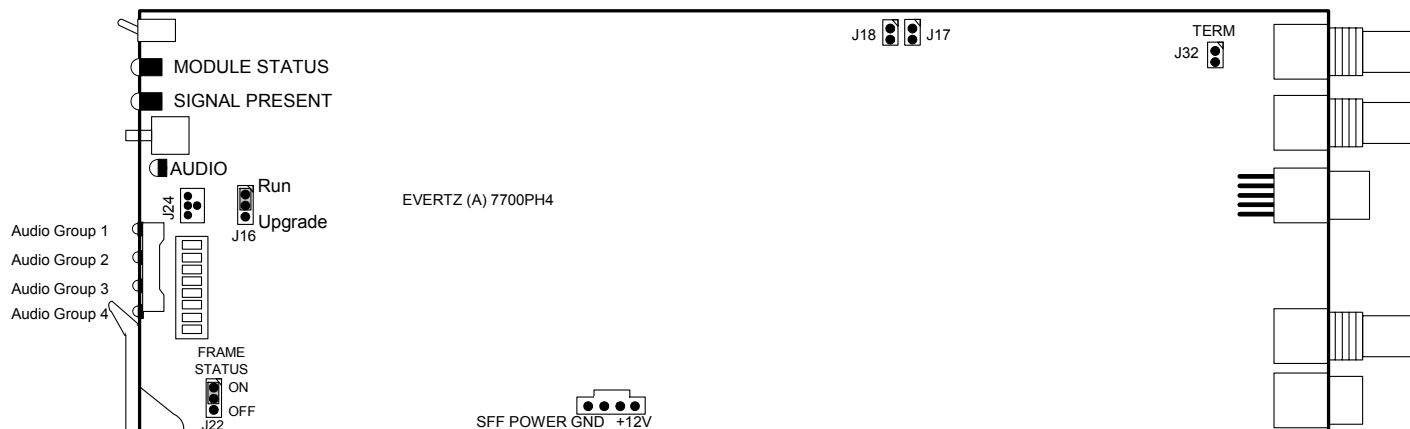


Figure 8-1: Location of Jumpers – Rev A Main Module

8.1. 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 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 stat 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.

8.2. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

Firmware updates can be performed using the *Upgrade* menu item on the *Utilities* menu (see section 7.10.4) or using the **UPGRADE** jumper.

UPGRADE:

The UPGRADE jumper J16 located at the front of the module 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 J16 into the *UPGRADE* position. Install the Upgrade cable provided (located in the vinyl pouch in the front of this manual) onto header J24 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 J16 into the *RUN* position, remove the upgrade cable and re-install the module. The module is now ready for normal operation.



The Upgrade baud rate for the 7760AVM2 series modules is 115,200 baud.

9. VISTALINK[®] REMOTE MONITORING/CONTROL

9.1. WHAT IS VISTALINK[®]?

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

There are 3 components of SNMP:

1. An SNMP manager, also known as a Network Management System (NMS), is a computer running special software that communicates with the devices in the network. Evertz VL-Fiber demo Manager graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz VistaLINK[®] enabled fiber optic products.
2. Managed devices, (such as 7760AVM2 cards), each with a unique address (OID), communicate with the NMS through an SNMP Agent. Evertz VistaLINK[®] enabled 7700 series modules reside in the 3RU 7700FR-C MultiFrame and communicate with the manager via the 7700FC VistaLINK[®] frame controller module, which serves as the Agent.
3. A virtual database, known as the Management Information Base (MIB), lists all the variables being monitored, which both the Manager and Agent understand. Please contact Evertz for further information about obtaining a copy of the MIB for interfacing to a third party Manager/NMS.

For more information on connecting and configuring the VistaLINK[®] network, see the 7700FC Frame Controller chapter.

10. MENU QUICK REFERENCE

Audio

- Audio source
- Ch 1/2 swap
- Ch 3/4 swap
- Ch 1/2 output mode
- Ch 3/4 output mode
- Fine ch 1 adjust
- Fine ch 2 adjust
- Fine ch 3 adjust
- Fine ch 4 adjust

Video/SID

- Video standard
- Loss of video
- NTSC setup pedestal
- Composite display mode
- 525 VITC line
- 625 VITC line
- 525 PESA line
- 625 PESA line
- Default SID mode
- Default SID msg
- WSS Type
- WSS Decode ITN
- WSS Decode ITU-R
- Video Index
- WST Line Select A
- WST Line Select B

Bar graphs

- Bar graphs 1 and 2
 - Bar mode
 - Headroom
 - Ch1 / ch2 peak output level
 - Level type
 - PPM mode
 - VU range
 - Phase type
 - Error region
 - Warning region
 - Scale position
 - Phase scale
 - Window position
 - *(goes to "On Screen Display-> Windows position" sub-menu)*
 - Colours
 - *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*
- Bar graphs 3 and 4
 - Same as bar graphs 1 & 2
- Size
- Background opacity
- Bars opacity

On Screen Display configuration

- Window position
 - Status window Row
 - Status window Column
 - TC window Row
 - TC window Column
 - PR window Row
 - PR window Column
 - XDS window Row
 - XDS window Column
 - SID window Row
 - SID window Column
 - Level bar 1/2 Row
 - Level bar 1/2 Column
 - Level bar 3/4 Row
 - Level bar 3/4 Column
 - Phase bar 1/2 Row
 - Phase bar 1/2 Column
 - Phase bar 3/4 Row
 - Phase bar 3/4 Column
 - Fault 1 window Row
 - Fault 1 window Column
 - Fault 2 window Row
 - Fault 2 window Column
 - Video Index AFD window Column
 - Video Index AFD window Column
- Window enable
 - Ch 1/2 Level bar
 - Ch 3/4Level bar
 - Ch 1/2 Phase bar
 - Ch 3/4Phase bar 3/4
 - Ch 1/2 peak clear
 - Ch 3/4 peak clear
 - Status
 - Time code
 - Program rating
 - CC
 - XDS
 - SID
 - Clear fault 1
 - Clear fault 2
 - Video Index AFD
- Text windows
 - Text window configuration
 - *Text type*
 - *Background colour*
 - *Background opacity*
 - *Text opacity*
 - *TC window size*
 - *PR window size*
 - *SID window size*
 - *Status window mode*
 - Fault window configuration
 - *Text type*
 - *Background colour*
 - *Background opacity*
 - *Text opacity*
 - *Fault 1 window size*
 - *Fault 2 window size*
 - *Fault 1 blink*
 - *Fault 2 blink*

GPO configuration

- GPO1 active state
- GPO1 trigger
- Frame status trigger

Fault definitions

- Fault condition 1
 - Fault status
 - Window position
 - *(goes to "On Screen Display Configuration -> Windows position" sub-menu)*
 - Fault 1 Message
 - Fault Mode
 - Duration
 - Video invalid
 - Loss of audio
 - Loss of audio ch 1/2
 - Loss of audio ch 3/4
 - AP EDH
 - FF EDH
 - Audio format
 - Phase reversal 1/2
 - Phase reversal 3/4
 - Over 1/2
 - Over 3/4
 - Silence 1/2
 - Silence 3/4
 - Mono 1/2
 - Mono 3/4
 - Loss of VITC
 - Loss of SID
 - Loss of PR
 - Loss of CC
 - GPI 1
 - GPI 2
 - Picture freeze
 - Picture black
- Fault condition 2
 - Same as fault condition 1
- Fault window config
 - *(goes to "OSD config->Text windows->fault" sub-menu)*
- Video invalid duration
- Loss of audio duration
- EDH error 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
- CEA-708 Missing Dur (7760AVM2-HD only)

Utilities

- About...
- Data logging
 - Status poll setup
 - Poll rate
 - Query Status
 - Fault log setup
 - Event stamp mode
- Fault log
- Status log
- Card id
- Event stamp
- Store preset 1
- Store preset 2
- Store preset 3
- Recall preset 1
- Recall preset 2
- Recall preset 3
- Upgrade
- Factory reset

Decoder Setup

- Display Select
- CEA-608 Decoder
 - CC Channel
 - Text Channel
 - Text Window Top Row
 - Text Window Height
 - XDS Display
 - XDS Window Height
- CEA-708 Decoder (7760AVM2-HD only)
 - Service
- Status Window

Clear Faults and Peak

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