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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First Release	Aug 2010

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1. OVERVIEW

The 7837CDM line of composite analog video to serial digital converters are broadcast quality decoders with an extensive list of additional features. High quality audio analog to digital conversion can be packaged with the decoder to create a video/audio frame synchronizer with audio embedder. The decoder has a 3D temporal comb filter and a 5-line super adaptive 2D comb filter.

In addition, Evertz fault monitoring processing will analyze and report video problems remotely via VistaLINK® SNMP.

The Features of the Decoding Process:

- 12 bit, 8fsc sampling of input video.
- Internal processing to maintain 10 bit digital video quality.
- Support for non-time base corrected signals.
- User configurable luma and chroma detail enhancement.
- User selectable noise reduction.
- Supports chroma AGC or user controlled chroma gain.
- User adjustable input video processing functions: black level, gain, hue, and saturation.

The Features of All 7837CDM's are:

- Flexible input options for hybrid analog and digital plants/studios. Two input BNC's are configured as dual inputs with one channel of SDI and one channel of composite analog video.
- **NOTE: There is no audio demultiplexing on the SDI input.**
- Four SDI 525 or 625, 270 Mb/s component digital video outputs WITHOUT OSD text.
- One composite analog video output with OSD text.
- One composite analog reference input (NTSC or PAL-B) on BNC. 75 Ohm or high-Z, jumper configurable input impedance.
- Video frame synchronization.
- Infinitely variable output phase (27MHz clock increments).
- Loss of video modes: black, freeze.
- Adjustable free running frequency.
- A comprehensive on screen display is available to configure the various features of the module.

The Features of the "-A4" Option are:

- 4 balanced analog audio inputs on a removable terminal strip.
- High impedance inputs (user supplies termination resistors for other impedance's).
- Adjustable analog audio input levels (software controlled).
- Audio delay tracks video delay.
- Additional audio delay of up to 5 seconds.
- Audio advance of up to 1 frame less 3 microseconds.
- One group (4 channels of audio) is multiplexed on the outgoing digital video.
- 2 unbalanced AES audio outputs which track the video delay.
- Loss of video modes: pass audio, mute audio.

1.1. FUNCTIONAL DESCRIPTION

Composite analog video is converted to 10 bit parallel data and decoded to 4:2:2 digital component. Various video processing functions (gain, saturation, noise reduction, etc.) are performed during the decoding process.

In the 7837CDM-A4 version, the audio is converted from balanced analog to digital PCM audio. The digital audio is then delayed to match the video. The delayed audio is output as unbalanced 75 Ohm AES audio on output BNC's AES OUT 1 and AES OUT 2. The four audio channels are also formatted into one group of audio and embedded on the SDI output video signal.

This video goes out through two paths; a SDI parallel to serial converter and a monitoring quality composite encoder with the OSD "burn-ins" for monitoring and control.

The CPU also handles commands from the card edge shaft encoder to navigate through on-screen menus and to configure the operation of the card.

Figure 1-1 illustrates the processing blocks of the 7837CDM [-A4].

NOTE: There is no audio demultiplexing on the SDI input.

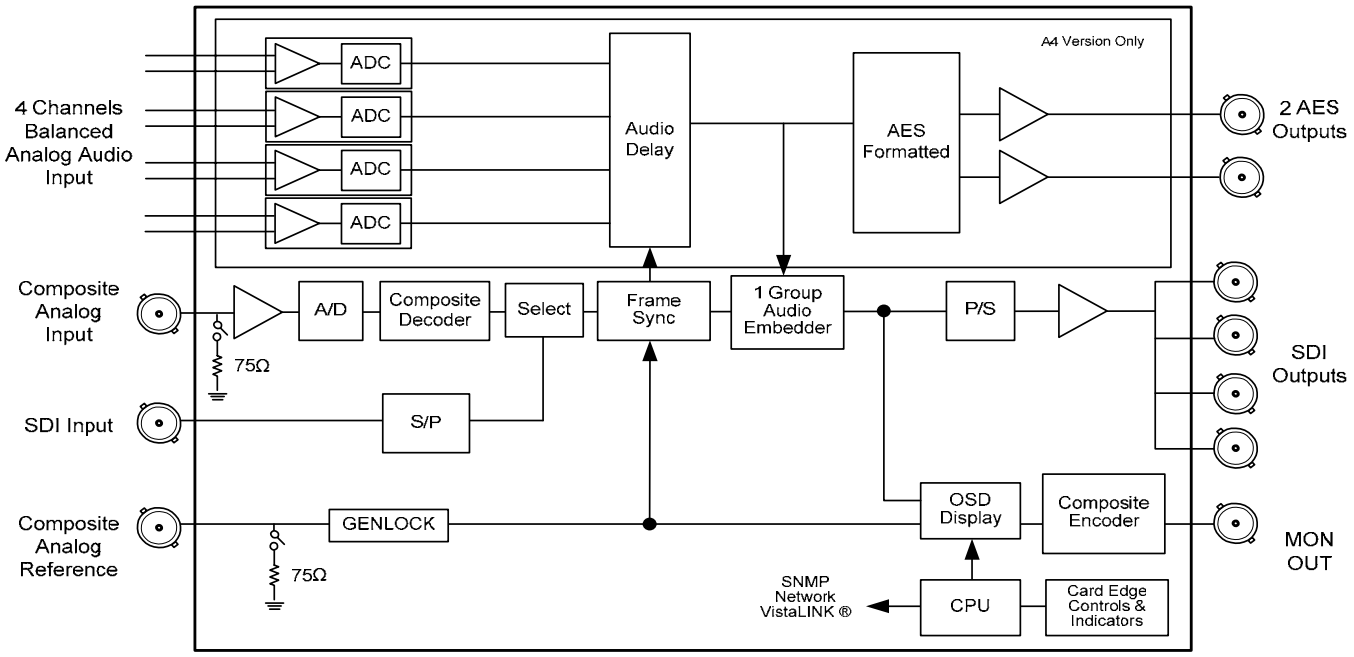


Figure 1-1: 7837CDM [-A4] Block Diagram

2. INSTALLATION

All 7837CDM series modules come with a companion rear plate and occupy one slot for the 7837CDM and two slots for the 7837CDM-A4 in the 7800FR frame and two and three slots respectively in the 7700FR-C. **For proper operation in the 7700FR-C, the on-board "slot blocker" *must be* installed in order for the card to power-up.** If a 7837CDM series module is installed in a 7700FR-C without the "slot blocker" installed, the card will not power-up and will show RED on its Local Fault LED. For information on mounting the rear plate and inserting the module into the frame see section 3 of the 7700FR manual. Refer to section 7.4 of this manual for more information on the 7837CDM series slot blocker. Refer to Figure 2-1 for the 7837CDM series rear plate layouts.

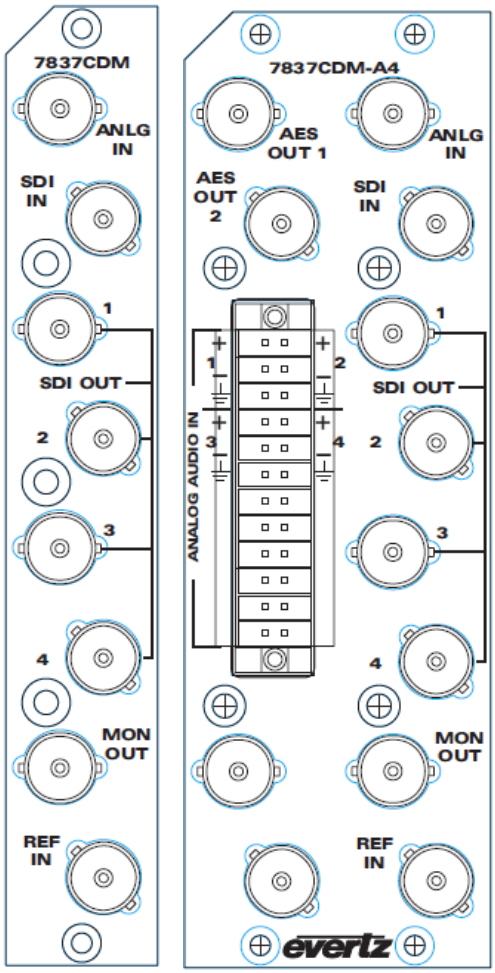


Figure 2-1: 7837CDM Rear Panels

2.1. VIDEO IN AND OUT

Dual SDI/analog inputs are supported. This means that you can apply both a composite analog signal and an SDI signal and you can choose, via card edge/OSD or VistaLINK®, which signal gets processed in the card.

Connect a reference black signal to the REF BNC.

Decoded video with embedded (-A4 only) audio is available on the SDI OUT BNC's. Decoded and re-encoded analog video with OSD support is available on the MON OUT output BNC. If the card is not present or the power is off, there will be nothing present on any of the outputs.

2.2. AUDIO IN AND OUT (–A4 Only)

The audio versions of the CDM [-A4] has an audio path through the card that is delayed/synchronized with the video. The –A4 version will perform an A to D conversion on 4 balanced analog inputs (2 stereo pairs); delay the audio channels to match the video delay, and output 2 AES channels that are synchronous to the video. The -A4 version also provides one group of embedded audio on the output video.

On the –A4 version, pull out the removable terminal strip and, with a small screw driver, connect bare wires following the connections on the rear panel. If the audio is unbalanced (single-ended), connect the ground to both the ground input and the –ve input while the signal is connected to the +ve input. Push the terminal strip back into the rear panel making sure there is enough slack in the cabling to not put pressure on the connector.

CDM-A4 will drive 48 kHz unbalanced 75 Ohm AES audio on the AES OUTPUT BNC's.

The AES outputs are always synchronous to the output video. This means that the AES is frequency/phase locked to the video with an exact relationship between the number of audio samples and the number of output video frames.

3. SPECIFICATIONS

3.1. ANALOG VIDEO INPUT

Standard:	NTSC, SMPTE 170M PAL, ITU624-4 PAL-M
Number of Inputs:	1
Connector:	BNC per IEC 61169-8 Annex A
Signal Level:	1V nominal
Frequency Lock Range:	±50ppm from nominal
Input Level Control Range:	>±4dB
Black Level Control Range:	>±5 IRE
Chroma Level Control Range:	>±20%
Hue Control Range:	±180 deg
Input Impedance:	75 Ohm or High impedance (jumper selectable)
Return Loss:	>35dB to 5MHz
Lock up Time on a Hot Switch:	between 15 and 45 frames (may be longer with noisy signals)

3.2. SERIAL VIDEO INPUT

Standard:	SMPTE 259M-C – 525 or 625 line component
Number of Inputs:	1
Number of Re-clocked Outputs:	0
Connector:	BNC per IEC 61169-8 Annex A
Return Loss:	>15dB to 300MHz
Embedded Audio:	SMPTE 272M-A
Frequency Lock Range:	±50ppm from nominal

3.3. REFERENCE VIDEO INPUT

Standard:	NTSC, SMPTE 170M PAL, ITU624-4
Number of Inputs:	1
Connector:	BNC per IEC 61169-8 Annex A
Signal Level:	1V nominal
Frequency Lock Range:	±50ppm from nominal
Input Impedance:	75 Ohm or High impedance (jumper selectable)
Return Loss:	>35dB to 5MHz

3.4. ANALOG MONITORING VIDEO OUTPUT

Standard:	NTSC, SMPTE 170M PAL, ITU624-4
Number of Outputs:	1
Connector:	BNC per IEC 61169-8 Annex A
Signal Level:	1V nominal
Output Impedance:	75 Ohm
Return Loss:	>35dB to 5MHz

3.5. SERIAL VIDEO OUTPUT

Standard:	SMPTE 259M-C – 525 or 625 line component
Number of Outputs:	4
Connector:	BNC per IEC 61169-8 Annex A
Signal Level:	800mV +/- 10%
DC Offset:	0V ±0.5V
Rise and Fall Time:	900 – 1500ps
Overshoot:	<10% of amplitude
Return Loss:	>15dB to 270MHz
Jitter	<0.2 UI (all outputs)
Embedded Audio:	SMPTE 272M-A

3.6. DECODER PERFORMANCE (SDI Output Only)

Frequency Response:	<±0.1dB (100kHz to 4.2MHz)
Differential Gain:	<±0.5% typical
Differential Phase:	<±0.5 deg. typical
Noise Floor:	< -60dBrms (VBI lines, black video, 15kHz to 5MHz)
C/L Gain:	<±1%
C/L Delay:	<±9ns
Minimum Delay:	4.5 lines
Maximum Delay:	1 frame plus 4.5 lines

3.7. ANALOG AUDIO INPUT (-A4 Only)

Number of Inputs:	4
Type:	Balanced analog audio
Connector:	Removable terminal strip
Input Impedance:	20kOhm minimum (differential)
Sampling Frequency:	48kHz
Signal Level:	0dB FS => 18 or 24dBu (user selectable)
Level Control Range:	+/- 10dB
Frequency Response:	+/- 0.1dB (20Hz to 20kHz) (broadcast quality)
SNR:	100dB with input at -0.5dBFS
THD+N:	<0.001% (>100dB) @ 1kHz, -0.5 dB FS (rev 2) <0.001% (>100dB) @ 20Hz to 20kHz, -0.5 dB FS (input video locked to genlock video)
CMRR:	>90dB @ 1kHz

3.8. AES AUDIO OUTPUTS (-A4 Only)

Number of Outputs:	2
Output Standard:	SMPTE 276M, single ended synchronous AES
Connectors:	BNC per IEC 61169-8 Annex A
Resolution:	24 bits
Sampling Rate:	synchronous 48 kHz
Minimum I/O Delay:	2.9msec
Maximum I/O Delay:	5 seconds

3.9. ELECTRICAL

Voltage:	+ 12VDC
Power:	15 Watts CDM + 4 Watts (-A4 option) = 19 Watts total
EMI/RFI:	Complies with FCC Part 15, class A and EU EMC directive

3.10. PHYSICAL

7700 Frame Mounting:

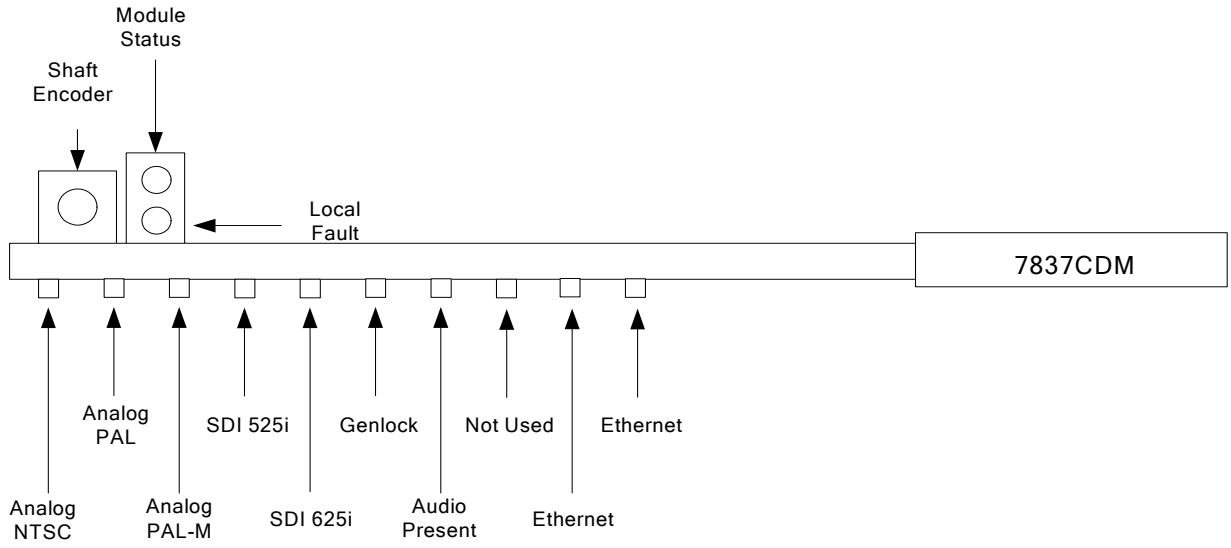
Number of Slots:	2 for non-audio version 3 for audio version

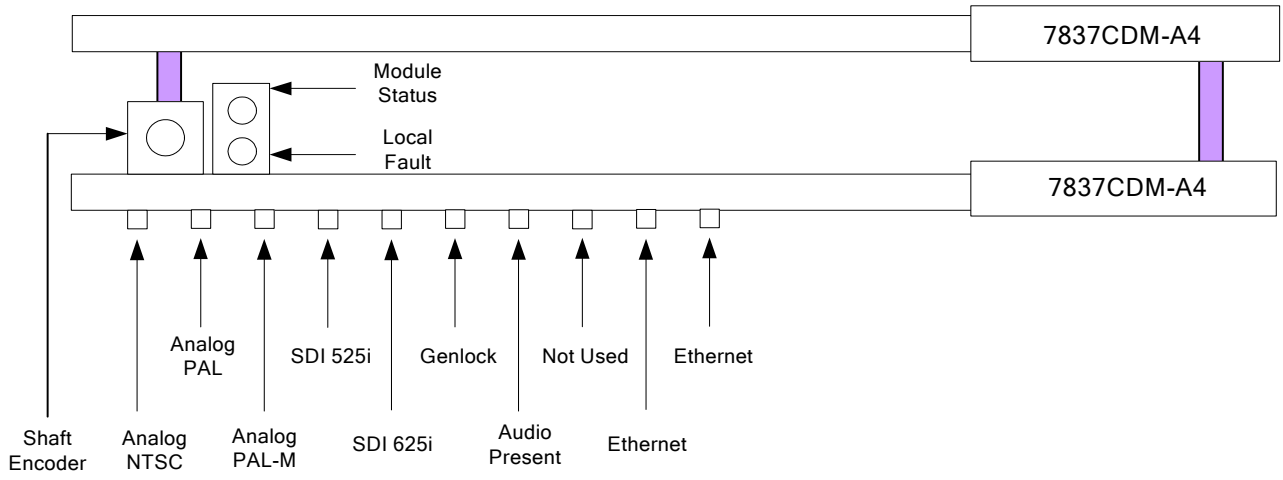
7800 Frame Mounting:

Number of Slots:	1 for non-audio version 2 for audio version

4. STATUS LEDS

4.1. MODULE STATUS LEDS





MODULE STATUS: This Green LED will be on when the module is operating properly.

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

The LED will be on when there is a fault in the module power supply or when video is not present on both Analog and Digital inputs.

ANALOG NTSC/PAL/PAL-M: The ANALOG LEDs will indicate the video standard of the composite analog input. An LED will be green when the corresponding video standard signal is applied. If no video is present, all LEDs will be off.

SDI 525i/625i The SDI 525i and SDI 625i LEDs will indicate the video standard of the SDI inputs. The LED will be green when the corresponding video standard signal is applied. If no video is present, all LEDs will be off.

GENLOCKED: This Green LED is on solid if the user selected genlock source (either external input or from the frame) is present and the user has turned on genlocking.

The LED will flash if the user has turned on genlocking and the selected genlock source is not present.

The LED will be off if the user has not selected an external genlock source.

AUDIO PRESENT: This Green LED will come on if audio is present on any of the analog audio input channels.

5. AUDIO BUFFER MANAGEMENT

The audio is delayed, through a large memory buffer, by the same time value as experienced by the video through the video frame synchronizer. This is done to maintain a consistent video/audio relationship. Unfortunately, when the video frame buffer drops or repeats frames of video, we cannot do the same with the audio. Instead, the rate of the ingoing audio data is changed, so that over a period of time, the audio buffer delay is returned to a value that matches the video delay. The 48 kHz sampling clock is changed slightly from its nominal value on the analog audio input (-A4 only). This method is also used when video is first applied or there is a sudden change in either the input video phase or genlock video phase.

Audio A to D converters and sample rate converters have inherent delays that are much longer than what the minimum acceptable video I/O delay is. To allow the user to operate the video synchronizer with small video delays, the audio buffer delay is set at its lowest value when the video is less than this minimum.

6. ON SCREEN MENUS

6.1. NAVIGATING THE ON SCREEN MENU SYSTEM

A shaft encoder allows card edge navigation of the on-screen menus used to configure the card.

NOTE: The On-Screen menus are only visible on the MON OUT BNC (composite video output).

To enter the on-screen menu system, press the shaft encoder once. This will bring you to the main setup menu where you can turn the shaft encoder 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 shaft encoder 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 exit the menu system.

Once in a sub-menu, there may be further menu layers, or there may be a list of parameters to adjust. If there is another set of menu choices, turn the shaft encoder to select the desired menu item and press the shaft encoder to enter the next menu layer.

To adjust any parameter, turn the shaft encoder to move up or down to the desired parameter and press it to select the parameter. The arrow will move to the right hand side of the line (<) indicating that you can now adjust the parameter. Turn the shaft encoder to adjust the parameter to its desired value, then press the shaft encoder to set the control

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.

6.2. 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 6.3 to 6.11 provide detailed descriptions of each of the sub-menus. The tables in sections 6.3 to 6.11 are arranged in an indented structure to indicate the path taken to reach the control. Menu items or parameters that are underlined indicate the factory default values.

Input Video	Controls for configuring the input video.
Analog Video Processing	Video processing controls for the analog video inputs.
Digital Video Processing	Video processing controls for the SDI video inputs.
Output Video	Controls for configuring the output video.
Audio Processing	Analog audio inputs and audio multiplexing controls. (-A4 only)
Genlock Reference	Controls for video operating frequency and genlock source selects.
Thumbnails	Controls for thumbnail transmission settings on the module.
Presets	Controls for storing and recalling presets.
Audio/Video Status	Provides audio and video delay and standards monitoring.

6.3. INPUT VIDEO CONTROLS

This menu contains controls related to input video. The chart below shows the items available in the *Input Video* menu. The following sections give detailed information about each of the parameters.

Input Video Source	Selects the input source to be processed.

6.3.1. Input Video Source

Input Video *Input Video Source* *Analog* *SDI* *Auto Analog* *Auto SDI*	There are 2 input sources for video on the 7837CDM (ANLG IN and SDI IN). With this control you will be able to select which input to process and send out on the SDI and MON outputs. When set to *Analog* the ANLG IN BNC will be used. When Set to *SDI* the SDI IN BNC will be used. In *Auto Analog;* the source automatically switches to SDI when analog video is lost. In *Auto SDI;* the source automatically switches to analog when SDI video is lost.

6.4. ANALOG VIDEO PROCESSING CONTROLS

The *Analog Video Processing* menu is used to configure parameters associated with the composite decoder video processing path. The chart below shows the items available in the *Analog Video Processing* menu.

NTSC Setup Pedestal	Selects whether the NTSC 7.5 IRE pedestal will be removed from the composite analog input video.
Line 21	Controls line 21 processing.
Black Level	Controls the input video black level.
Video Level	Controls the input video level.
Chroma Level	Controls the input video saturation.
Hue	Controls the input video hue.
TBC Mode	On/off mode control for processing non-time base corrected video.
Detail Threshold	Controls when the image enhancement is enabled.
Detail Enhancement	Controls the amount of image enhancement when threshold is exceeded.
Noise Reduction	Enables/Disables noise reduction.

6.4.1. NTSC Setup Pedestal

Analog Video Processing *NTSC Setup Pedestal* *Remove* *Don't remove*	Composite NTSC analog video may have a 7.5 IRE pedestal while 4:2:2 SDI video does not. This control, when set to *remove*, will remove the pedestal and re-scale the video accordingly. The setup pedestal should not be present on composite video when operating in Japan.

6.4.2. Line 21 Processing

Analog Video Processing
Line 21 Setup
Remove setup, Don't remove setup, Blank

Closed captioning has been defined to NOT have a 7.5 IRE pedestal, but it is placed on the first active line of video where there may be a pedestal. This depends on the upstream closed captioning and/or composite encoder that generated the video. When decoding composite video with closed captioning, care must be taken to not remove a pedestal if it is not there.

This control, when set to *Don't remove setup*, will not remove 7.5 IRE pedestal from line 21. This is the default state for properly generated captioning.

When set to *Remove setup*, the 7.5 IRE pedestal will be removed from line 21. Note that this state is only valid if the preceding NTSC Setup Pedestal control is set to "Remove".

Blank is used to remove captioning from line 21. This is most useful for removing captioning when going into an up-converter.

6.4.3. Black Level

Analog Video Processing
Black Level
-60 - 60 0

The *black level* controls the black level of the decoding process. You have greater than +/- 5 IRE range on this control.

Note: Make sure to select the proper setup pedestal removal before setting this control. Don't set the video level control until after you have set this control properly.

6.4.4. Video Level

Analog Video Processing
Video Level
Auto 0.362 – 2.83

The *video level* controls the input video level of the decoding process. You have greater than +/-4dB range on this control.

Note: Make sure to select the proper setup pedestal removal and calibrate the black level before setting this control.

6.4.5. Chroma Level

Analog Video Processing
Chroma Level
Off, 0.51 – 7.99

The default "*off*" position of this control will, in the decoding process, correctly scale the chroma as per SMPTE-170M/125M. If you need to adjust the chroma level, you have a range of -2.9 dB, 9.0 dB.

6.4.6. Hue

Analog Video Processing
Hue
-512 - 511 0

The hue of the decoded signal can be adjusted with this control. You have +/- 180 deg. range with this control.

6.4.7. TBC Mode

Analog Video Processing
TBC Mode
Off,
On

Controls the processing of non-time base corrected video input signals is affected by this menu item.

When set to *"On",* the input video processing is modified to be more tolerant of non-time base corrected signals.

6.4.8. Detail Enhancement Threshold

Analog Video Processing
Detail Enhance Threshold
very low,
low,
medium,
high

Experimentally, set this to a level that will apply acceptable detail/edge enhancement without over enhancing the input noise.

Lower thresholds will apply enhancement to smaller edge transitions thus bringing out smaller details. Unfortunately, if the threshold is set too low, input noise will eventually be enhanced making the picture look noisier.

6.4.9. Detail Enhancement Level

Analog Video Processing
Detail Enhance Level
Off,
0..127

When an edge passes the threshold set by the Detail Enhancement Threshold, the amount of enhancement is specified by this control. The higher the number, the more enhancement is applied.

6.4.10. Noise Reduction

Analog Video Processing
Noise Reduction
Off
On

When turned on, a small amount of wideband noise reduction is applied to the signal.

6.5. DIGITAL VIDEO PROCESSING CONTROLS

The *Digital Video Processing* menu is used to configure parameters associated with the SDI Input video processing path. The chart below shows the items available in the *Digital Video Processing* menu.

Black Level	Controls the input video black level.
Luma Level	Controls the input luma level.
Chroma Level	Controls the input video saturation.
Hue	Controls the input video hue.

6.5.1. Black Level

Digital Video Processing
Black Level
-20.0 – 20.0 *0.0*

The *black level* controls the black level of the SDI video process. You have greater than +/- 20 IRE range on this control.

It's better to set/calibrate this black level control before the luma level control is adjusted. If the luma level is adjusted first, and you need to adjust this black level control, you will have to go back and correct the luma level slightly.

6.5.2. Luma Level

Digital Video Processing
Luma Level
1.000, *-0.500 – 2.000*

The *luma level* control sets gain of the luma input video level of the SDI video process. You have greater than +/-3dB range on this control.

It is better to calibrate the black level control before setting this control.

6.5.3. Chroma Level

Digital Video Processing
Chroma Level
1.000, *-0.500 – 2.000*

This control is used to set the gain on the chroma signals (Cb and Cr) of the SDI video process. The range is +/- 3 dB on this control.

6.5.4. Hue

Digital Video Processing
Hue
-180.0 – 180.0 *0.0*

The hue of the SDI video signal can be adjusted with this control. The control provides +/- 180 deg. of adjustment range.

6.6. OUTPUT VIDEO CONTROLS

The Output *Video Settings* menu is used to configure parameters associated with the output video processing functions. The chart below shows the items available in the *Output Video Settings* menu. The following sections provide detailed information about each of the parameters.

Loss of Video	Selects the action to take when the input video is missing.
525 H Phase	Sets the horizontal phase of the output signal with respect to the NTSC Genlock reference input.
625 H Phase	Sets the horizontal phase of the output signal with respect to the PAL Genlock reference input.
525 V Phase	Sets the vertical phase of the output signal with respect to the NTSC Genlock reference input.
625 V Phase	Sets the vertical phase of the output signal with respect to the PAL Genlock reference input.

6.6.1. Loss Of Video

Output Video Settings
- *Loss of Video*
  - *Freeze*
  - *Black*

The user can either specify the output video to black, or freeze the last valid video frame during loss of video.

6.6.2. Horizontal Phase – NTSC/525 Video

Output Video Settings
- *525 H Phase*
  - *0 to 1715*
  - *0*

This control sets the horizontal timing of the output video with respect to the Genlock reference input when operating in NTSC/525 video mode. Setting this control to 0, keeps the monitoring output video in time with the Genlock reference. Increasing the value will delay the output video in one-sample increments.

6.6.3. Horizontal Phase – PAL-B/625 Video

Output Video Settings
- *625 H Phase*
  - *0 to 1727*
  - *0*

With this control, you can set the horizontal timing of the output video with respect to the Genlock reference input when operating in PAL/625 video mode. Setting this control to 0, keeps the monitoring output video in time with the Genlock reference. Increasing the value will delay the output video in one-sample increments.

6.6.4. Vertical Phase – NTSC/525 Video

Output Video Settings
- *525 V Phase*
  - *0 to 524*
  - *0*

With this control, you can set the vertical timing of the output video with respect to the Genlock reference input when operating in NTSC/525 video mode. Setting this control to 0 keeps the output video in time with the Genlock reference. Increasing the value will delay the output video in one-line increments.

6.6.5. Vertical Phase – PAL-B/625 Video

Output Video Settings
625 V Phase
0 to 624
0

With this control, you can set the vertical timing of the output video with respect to the Genlock reference input when operating in PAL/625 video mode. Setting this control to 0, keeps the output video in time with the Genlock reference. Increasing the value will delay the output video in one-line increments.

6.7. AUDIO PROCESSING CONTROLS (-A4 only)

The *Audio Processing* menus are used to configure parameters associated with the audio inputs and the audio multiplexing. The chart below shows the items available in the *Audio Processing* menu. The following sections provide detailed information about each of the parameters.

Audio Destination	Selects the destination group for audio output.
Audio Delay	Sets user desired additional audio delay.
Audio Freeze Mode	Selects audio behavior during loss of video.
ADC Clip Level	Sets the full scale audio level to either + 18 dBu or +24 dBu.
Channel Pair Swap	Controls routing of stereo pairs.
Ch1/Ch2 Swap	Controls routing of audio channels 1 & 2.
Ch3/Ch4 Swap	Controls routing of audio channels 3 & 4.
Channel 1 Gain	Channel 1 level control.
Channel 2 Gain	Channel 2 level control.
Channel 3 Gain	Channel 3 level control.
Channel 4 Gain	Channel 4 level control.

6.7.1. Audio Destination

Audio
Audio Destination
Group 1
Group 2
Group 3
Group 4
None

This control selects the destination audio group of the multiplexed output audio. The output audio will be embedded into the output video in this group.

6.7.2. Additional Audio Delay

Audio
Audio Delay
0 -37ms to 5sec in 0.5ms increments

In addition to delaying the audio to match the video delay (from the video frame synchronizer), additional user requested audio delay may be added or removed with this control.

NOTE: Both the embedded audio AND the external AES audio are delayed by this amount.

NOTE: Advancing audio can only happen when the video delay is greater than the audio. If the system configured video delay becomes too small, the audio buffer shrinks to its smallest delay and stays at that value.

6.7.3. Audio Freeze Mode

Audio
Audio Freeze Mode
Pass Mute

Two selectable actions can take place when input video is lost: pass audio or mute audio.

If it is desirable to maintain audio through the composite decoder (both embedded and AES outputs), then set this control to *pass.* When set to mute, the audio will automatically be muted when video is lost.

6.7.4. ADC Clip Level

Audio Processing
ADC Clip Level
+18 dBu +24 dBu

The ADC Clip Level can be set to either + 18dBu or +24 dBu.

When the ADC Clip Level is set to +24dBu the input range is optimized for peak audio levels up to +24dBu.

When the ADC Clip Level is set to +18 dBu, best performance is achieved when input peak levels are below +18dBu.

6.7.5. Audio Channel Pair Swap

Audio
Channel Pair Swap
Pass, Swap

Pass routes both stereo channels straight through, while *Swap*, swaps the channel pairs. This means that channels 1 and 2 are routed to adjust channels 3 and 4 of the embedded audio and to AES 2, while channels 3 & 4 are routed to output channels 1 & 2 of the embedded audio and to AES 1.

6.7.6. Audio Channel Swap

Controls for Channels 1 and 2 are the same for Channels 3 and 4. To avoid unnecessary repetition, only channels 1 and 2 will be mentioned.

Audio	
Ch1/Ch2	
Pass	Basic audio channel manipulation is possible with this control.
Swap	*Pass*, routes both input channels straight through, while *Swap*, routes the two channels to the opposite channel of the output pair.
Ch1 split	The *Ch1 split and Ch2 split* modes take a single channel, adjust the magnitude by –6dB (i.e. in half) and duplicates it on both output channels. This mode is designed for preparing a single channel (i.e. SAP: Secondary Audio Program) for a stereo infrastructure.
Ch2 split	

6.7.7. Audio Channel Gain

There are 4 menu items to adjust the levels of each of the analog audio input channels. To avoid unnecessary repetition only the menu for channel 1 will be described.

Audio	
Ch1 Adjust	
-24.0 to 24.0 ,	The channel input level is adjusted with this control. It has a range of +/- 24.0 dB with 1/2 dB resolution.
0.0	

6.8. GENLOCK CONTROLS

The *Genlock* menu is used to configure parameters associated with the module operating reference signal. The chart below shows the items available in the *Genlock* menu. The following sections provide detailed information about each of the parameters.

Video Standard	Selects the module operating video standard.
Genlock Source	Selects the input source for the reference signal.
Free-Run Freq	Sets the VCXO free-running frequency.

6.8.1. Video Standard

Genlock *Video Standard* *NTSC/525* *PAL-B/625* *Auto*	The video standard is selected with this control. When set to *Auto* the module will automatically configure itself based on the detected input video standard.

6.8.2. Genlock Source

Genlock *Genlock Source* *Ref. 1,* *Ref. 2,* *Card ref,* *Free-Run* *Input Video*	The *Genlock Source* control allows you to select the reference video input to the frame synchronizer. The reference must be an externally supplied colour black. Optionally, the synchronizer can be free-run if the "Free-Run" option is selected. There are three possible sources of external reference video; the *card ref*erence input BNC and two frame reference inputs (*Ref. 1* and *Ref. 2*) on the frame (Available on the 7700FR-G and 7800FR frames). Make sure to adjust the video H and V output phase controls to calibrate the output phase of the video as desired.

6.8.3. Free-Run Frequency

Genlock *Free-Run Freq* -256 to 256 *0*	This control allows you to calibrate the free-running frequency of the on-board Voltage Controlled Crystal Oscillator (VCXO). This oscillator provides the time-base when operating without a reference input (free-running). To calibrate the free-running frequency, use this or a similar procedure: • Set genlock source to “Free-run”. Wait for the VCXO to stabilize at its free-running frequency. • Apply the composite analog monitoring output video to a scope that is externally referenced to the signal (usually plant reference black) that you are trying to frequency match. • Adjust this control until the scrolling stops. • Turn genlocking back on or apply reference video.

6.9. THUMBNAIL TRANSFER CONTROLS

The 7837CDM module can be setup to work with the VistaLINK® thumbnail server in order to send video images of the output picture using the Simple Network Management Protocol (SNMP).

NOTE: In order for thumbnail transmission to function correctly, the following conditions are necessary:

1) **The 7837CDM module must be installed in a 7700FR, 7700FR-C or a 7800FR frame which includes a 7700FC frame controller module.**

2) **The 'Thumbmail Server IP Address' control must be set to match the IP of the VistaLINK® Pro thumbnail server. This control must be set through the 7837CDM module configuration using the VistaLINK® Pro client application. This control is located in the 'Thumbnails' tab.**

3) **The 'Thumbnail Transfer' control on the 7837CDM module must be set to 'enable'.**

For further information regarding thumbnail support, please refer to the VistaLINK® Pro manual.

Thumbnail Transfer	Enables/Disables thumbnail transfers.
Thumbnail Size	Selects the size of image to send to VistaLINK® Thumbnail sever.

6.9.1. Thumbnail Transfer

Thumbnail Settings
Thumbnail Transfer
Disable
Enable

This control allows the user to Enable/Disable the transfer of thumbnails to the thumbnail server.

6.9.2. Thumbnail Size

Thumbnail Settings
Thumbnail Size
1/32
1/16
1/8
1/4

The size of the image sent to the VistaLINK® Thumbnail server can be selected with this option. This will enable the user to send either 1/32, 1/16, 1/8, or 1/4 of the original video size to the thumbnail server.

NOTE: The size of the thumbnail image directly impacts the refresh rate of the thumbnail stream at the thumbnail server. As the thumbnail size increases, the refresh rate decreases.

6.10. PRESETS

The 7837CDM module provides 10 user presets to store complete card control configurations. The *Recall preset* and *Store preset* menu items are used to save and recall these configurations.

6.10.1. Recalling Presets

Presets	
Recall Preset	
	None, Default User 1 to 10

This control is used to initiate a recall of one of the saved module configurations. The user can either select the factory default configuration of the module or one of the previously stored user presets (1 - 10).

To select a configuration, scroll to the desired configuration and press the shaft encoder.

Warning: There will be a slight disturbance in the operation of the module and the On-Screen display while the new preset is being recalled.

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

6.10.2. Storing Presets

Presets	
Store Preset	
	None User 1 to 10

This control is used to initiate a store of the current module configuration into one of the user presets. The current configuration can be saved by selecting one of the 10 user selectable presets and then pressing the shaft encoder.

6.11. AUDIO/VIDEO STATUS MENU

The *Audio/Video Status* menu is used to monitor parameters associated with both audio and video. The chart below shows the items available in the *Audio/Video Status* menu. The following sections provide detailed information about each of the parameters.

Input Video Source	Displays the source of the incoming video. (ANLG IN or SDI IN)
Analog Video Standard	Displays the video standard on the analog input BNC. (ANLG IN)
SDI Video Standard	Displays the video standard on the SDI input BNC. (SDI IN)
Ext. Genlock	Displays the external genlock status.
Video Delay	Reports video delay.
H Phase Delay	Reports current horizontal input to output delay.
V Phase Delay	Reports current vertical input to output delay.
Audio Delay	Reports Audio delay. (-A4 only)

6.11.1. Input Video Source

Audio/Video Status *Input Video Source*	This option reports which video input source is currently being used.

6.11.2. Analog Input Standard

Audio/Video Status *Analog Video Standard*	This option reports the detected analog video input standard on the Analog input (ANLG IN).

6.11.3. SDI Input Standard

Audio/Video Status *SDI Video Standard*	This option reports the detected SDI video input standard on the SDI input (SDI IN).

6.11.4. External Genlock Status

Audio/Video Status *Ext. Genlock*	This option reports the status of the external reference.

6.11.5. Video Delay

Audio/Video Status *Video Delay*	This item reports the Video delay between the input and output video.

6.11.6. Horizontal Phase Delay

Audio/Video Status	This item displays the horizontal delay between the input and output video. This value is useful to monitor while you are adjusting the H phase parameters and debugging system issues. One count is equivalent to 8 clocks of 27Mhz video.
H Phase Delay	

6.11.7. Vertical Phase Delay

Audio/Video Status	This item displays the vertical delay, measured in lines, between the input and output video. This value is useful to monitor while you are adjusting the V phase parameters and debugging system issues.
V Phase Delay	

6.11.8. Audio Delay

Audio/Video Status	This item reports the Audio delay through the audio processing path from analog audio input to digital audio output, measured in ms.
Audio Delay	

7. JUMPERS

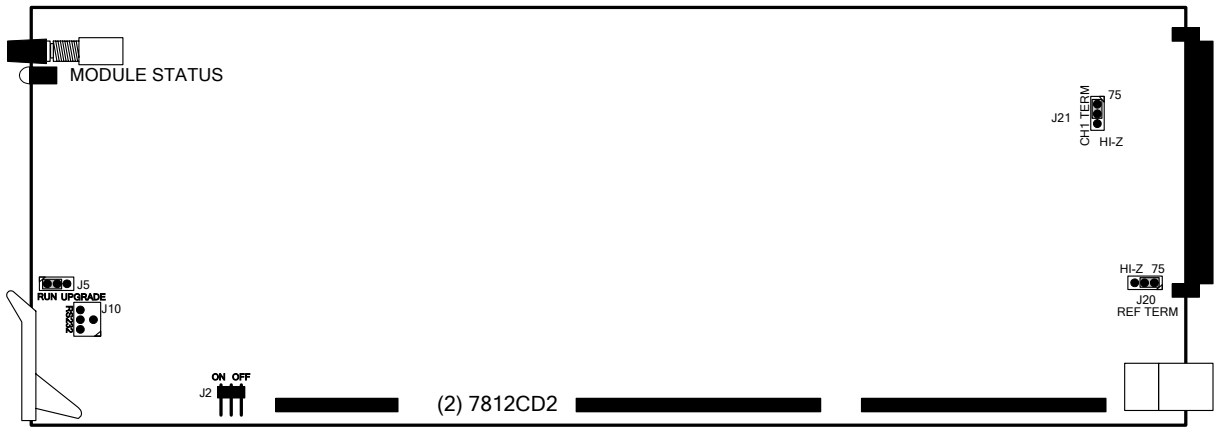


Figure 7-1: Location of Jumpers on 7837CDM Main Board

7.1. TERMINATION JUMPERS

REF TERM: The REF TERM jumper J20, located on the rear of the 7837CDM board near the white multi-pin connectors, selects the reference video termination impedance. Either 75Ω or a high-Z (27kΩ) termination impedance can be selected by placing the jumper in the "75" (top justified) or "HI-Z" (bottom justified) positions, respectively.

CH1 TERM: The CH1 (J21 TERM jumper located on the rear of the 7837CDM board near the white multi-pin connector, selects the video input termination impedance. Either 75Ω or a high-Z (27kΩ) termination impedance can be selected by placing the jumper in the "75" (top justified) or "HI-Z" (bottom justified) positions, respectively.

7.2. LOCAL FAULTS JUMPERS

FRAME STATUS: The FRAME STATUS jumper J2 located at the front of the module, on the 7837CDM board (bottom board), 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) place this jumper in the on position (Default). When this jumper is moved to the *OFF* position, local faults on this module will not be monitored.

Power supply faults will always assert the frame status fault line when J2 is installed.

NOTE: On early production modules, screening for the FRAME STATUS jumper is incorrect. The "ON" position is towards the cards edge closest to the card extractor.

7.3. FIRMWARE UPGRADE JUMPERS

The following method can be used to upgrade the firmware in the CDM card.

UPGRADE: The UPGRADE jumper (J5), located at the front edge of the 7837CDM board above the card extractor, 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 J5 into the *UPGRADE* position. Install the Upgrade cable provided (located in the vinyl pouch in the front of this manual) onto header J10 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 J5 into the *RUN* position, remove the upgrade cable and re-install the module. The module is now ready for normal operation.

The module can also be upgraded through VistaLINK®. (See *FIRMWARE UPGRADES* section in the VLPro manual.)

7.4. 7837 SERIES "SLOT BLOCKER"

The 7837 series of modules can be installed in either the 7700FR-C or the 7800FR frames. These modules are designed to take one slot for the 7837CDM and two slots for the 7837CDM-A4 in the Evertz 7800FR frame and two slots for the 7837CDM and three slots for the 7837CDM-A4 in the 7700FR-C.

Modules can fit into one or two slots in a 7800FR frame because the 7800FR allows modules to consume more power on a per slot basis than the Evertz 7700FR-C. When a 7837 series module is installed in the 7700FR-C, the module must occupy two or three slots to ensure that the frame power is managed properly. This is accomplished by installing a "Slot Blocker" on the bottom side of the board. If the "Slot Blocker" is not installed on the card and the card is inserted into the 7700FR, the card will not power-up. When installing the card in a 7800FR, the "Slot Blocker" may be removed and it will power-up and operate normally. If the "Slot Blocker" remains installed and the card is inserted into the 7800FR, the card will also power-up and operate normally.

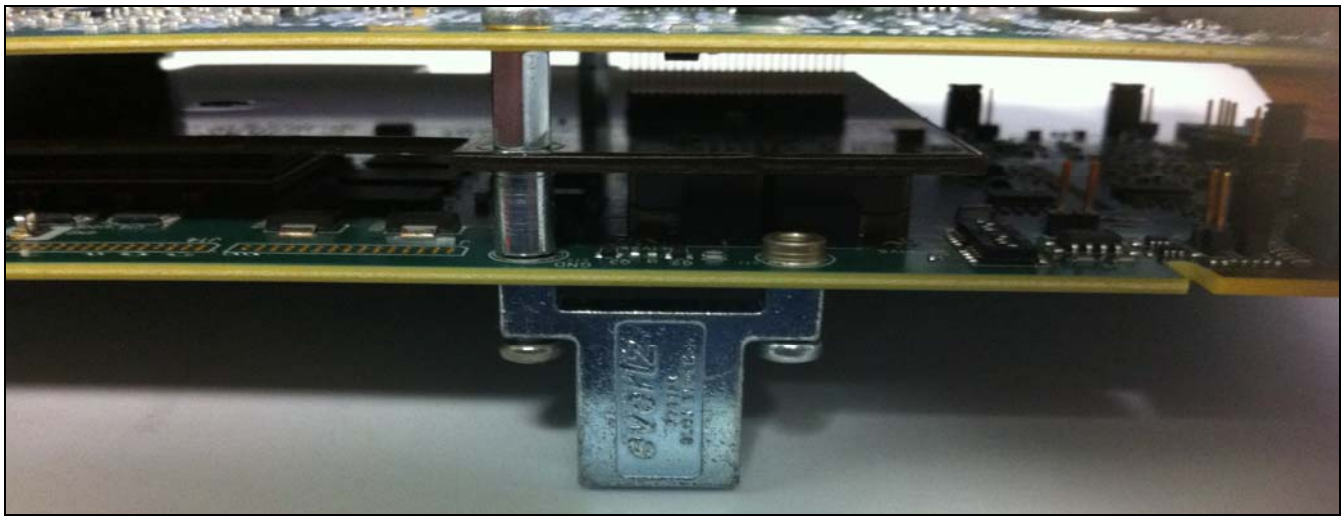


Figure 7-2: Slot Blocker

8. *VISTA*LINK® REMOTE MONITORING/CONTROL

8.1. WHAT IS *Vista*LINK®?

VistaLINK® is Evertz's remote monitoring and configuration platform which operates over an Ethernet network using Simple Network Management Protocol (SNMP). SNMP is a standard computer network protocol that enables different devices sharing the same network to communicate with each other. VistaLINK® provides centralized alarm management, which monitors, reports, and logs all incoming alarm events and dispatches alerts to all the VLPro Clients connected to the server. Module configuration through VistaLINK® PRO can be performed on an individual or multi-module 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 *Vista*LINK® Pro Manager graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz *Vista*LINK® enabled products.

2. Managed devices (such as 7837CDM), each with a unique address (OID), communicate with the NMS through an SNMP Agent. Evertz VistaLINK® enabled 7700 series modules reside in the 3RU 7700FR-C MultiFrame and communicate with the manager via the 7700FC VistaLINK® frame controller module, which serves as the Agent.

3. A virtual database known as the Management Information Base (MIB) lists all the variables being monitored, which both the Manager and Agent understand. Please contact Evertz for further information about obtaining a copy of the MIB for interfacing to a third party Manager/NMS.

For more information on connecting and configuring the *Vista*LINK® network, see the 7700FC Frame Controller chapter.

8.2. *Vista*LINK® TRAPS

The 7837CDM contains video traps that indicate whether or not the input paths are receiving valid video.

Analog Video Loss	Triggers when analog video is lost.
Digital Video Loss	Triggers when SDI video is lost.
Input Std. & Card Std. Mismatch	Triggers when input video standard does not match the configured card operating standard.
Ext. Genlock & Card Std. Mismatch	Triggers when external genlock reference standard does not match the configured card operating standard.