



eyeheight



AV-2E/AV-4

SDI Audio Video Error Detection units

user manual

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I System Overview

This manual describes the function of the AV-2E/AV-4. This unit monitors both the video and audio (embedded audio for AV-2E and AES audio for AV-4). It also flags alarms and displays the information onto a screen overlaid onto a video screen.

The AV-2E/AV-4 is a unit that will monitor the SDI data stream checking that the video is present, the screen has not become black and that the picture has not frozen. It also checks channel 1 (a stereo pair) of audio, alerting the operator when the audio stream has been silent. The main features are as follows:-

- The unit monitors, valid video signal missing, video all black, full frame video frozen, and active picture frozen. In addition the AV-2E monitors embedded audio channels 1 for silence, the AV-4 monitors AES 1 channels 1 for silence.
- The user can define a 6 digit channel Ident, definable in foreground colour, background colour, flashing or normal mode.
- All the error messages can be user defined, in foreground colour, background colour, flashing or normal mode and whether that condition triggers an alarm.
- The main “alert” alarms can be “accepted” by the operator setting a second “indication” alarm, which is cleared when the problem is completely resolved.
- The module broadcasts information compatible with the MD-2 Master Display module, enabling collation of any unit’s displays and allowing for remote supervision.
- The operator can set the length of time required to trigger an alarm.

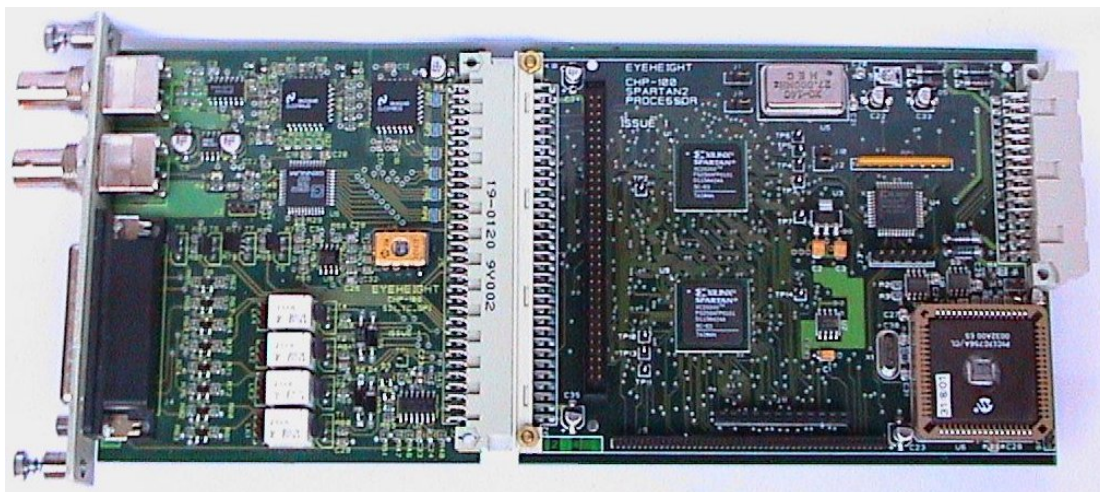


Figure 1-1 The AV-2E audio description module.

I.1 Associated Equipment for the AV-2E/AV-4

The AV-2E/AV-4 is a module and requires both a chassis and a control surface to function.

I.1.1 Chassis Types

- **flexiBox** is a 1RU chassis. The order code is FB-9. This will hold a maximum of six AV-2E modules or three AV-4 modules with “Hot Swap” redundant PSU option.
- **maxiBox** is an alternative low cost 1RU chassis. The order code is MX-9. This also will hold a maximum of six AV-2E modules or three AV-4 modules, but has no redundant PSU option and the AV units must be factory fitted.



Figure 1-2 FlexiBox with flexiPanel fitted

I.1.2 Control Surfaces

- **flexiPanel** is a 1RU control surface that fits on the Front of a 1RU flexiBox. The order code is FP-9. A FlexiPanel can also be used in conjunction with a miniBox, in this case the extra accessory (Order code RR-9) will be required
- **FP-10** is a desk mounting control surface (Order code FP-10). This unit is a modular unit which can be used in conjunction with the units below.



Figure 1-3 Desktop modular panel FP-10



Figure 1-4 1RU panel FP-9

2 Installation

2.1 Installation of the AV-2E/AV-4 product

If this unit is already pre-installed in a flexiBox (FB-9), or a maxiBox, with either a local or a remote panel from the factory then refer to the "Hardware Installation Guide" which will be enclosed with the system. If this unit is pre-installed in a miniBox (MB-9), then also refer to the "Hardware Installation Guide" which will be enclosed with the system

If this unit has been ordered separately, we assume here that you already have a flexiBox system with a Flexipanel and that the flexiBox has at least one spare slot for an AV-2E card or two spare slots for an AV-4.

2.2 Installing the AV-2E/AV-4 into a flexiBox

To install the AV-2E/AV-4 into a flexiBox it is desirable (but not necessary) to power down the flexiBox. Follow these instructions.

On the rear of the flexiBox are 6 slots for Products. Remove any spare blanking plate. There are 2 off M2.5 Screws, which require unfastening.

Slide the Product PCB into the spare slot and firmly push it "home".

Use the two thumbscrews to fasten the unit in place.

Now refer to the "GeNETics User Guide". If your system consists of a single flexiBox with a single flexiPanel then refer to the section titled "flexiPanel Auto Set-up". If your system is part of a network with more than one flexiPanel then refer to the section titled "flexiPanel Manual Set-up". This will guide you through acquiring your product as a device on the flexiPanel.

2.3 Connecting to an AV-2E/AV-4

2.3.1 Rear Connections of AV-2E

A diagram of the Video connections for the AV-2E and alarm outputs is shown below.



Figure 2-1 Rear connector of AV-2E

Connection	Function
IN	SDI Video Input. This is the input to be monitored
OUT	SDI Video Output. This is the input overlaid with the On Screen Display Ident. Optionally the Ident can be switched out making this a simple Input loop through.
GPI-TC	This connection is a 25Way Female D-Type and has the GPI Inputs and Alarm outputs.

Figure 2-2 Connections for AV-2E

2.3.2 Rear Connections of AV-4

A diagram of the Video connections for the AV-4 and alarm outputs is shown below.

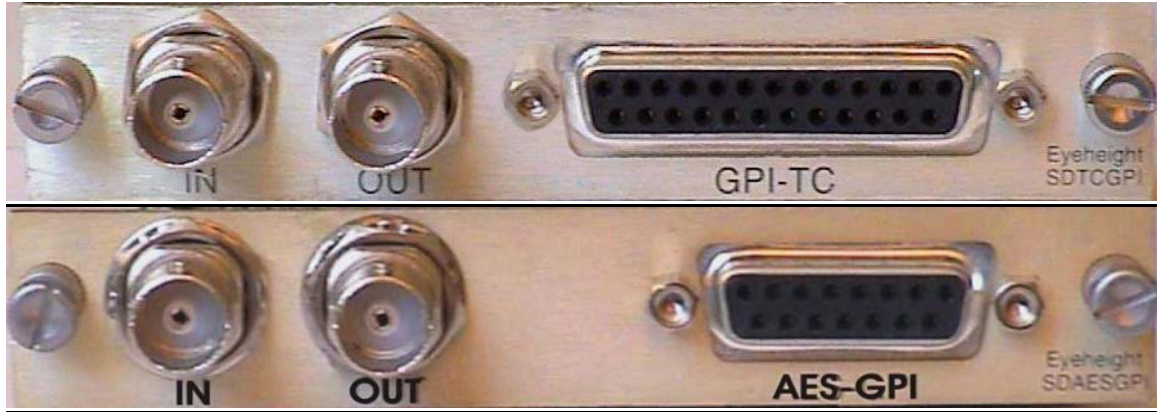


Figure 2-3 Rear connector of AV-4

IN	Not Used
OUT	Not Used
GPI-TC	This connection is a 25Way Female D-Type and has the GPI Inputs and Alarm outputs.

Figure 2-4 Connections for top card of AV-4

IN	SDI Video Input. This is the input to be monitored
OUT	SDI Video Output. This is the input overlaid with the On Screen Display Ident. Optionally the Ident can be switched out making this a simple Input loop through.
AES-GPI	This connection is a 15Way Female D-Type and is the AES input for audio monitoring

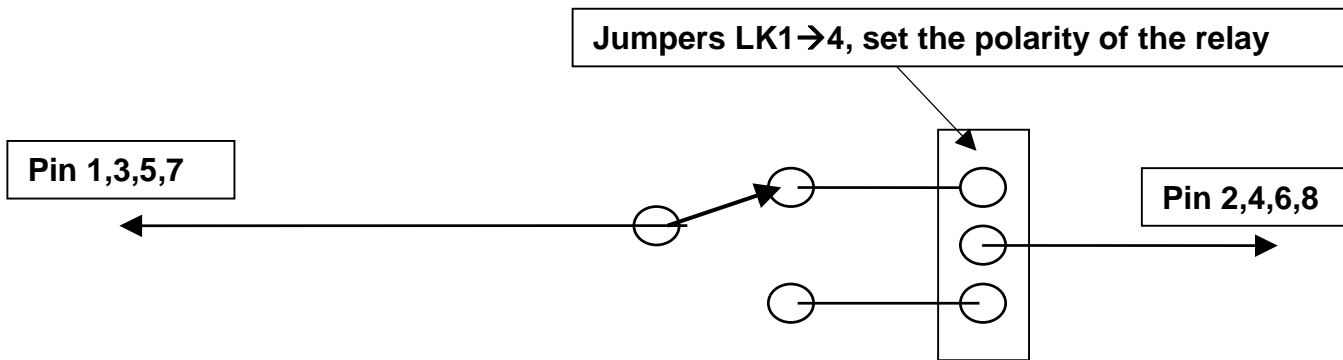
Figure 2-5 Connections for bottom card of AV-4

2.3.3 Pin-outs and Links for Rear Connectors

Jumper	Function
J2	Set to the Right, SDI Jitter Filtering selection
LK1	Set to Top, Polarity selection for GPI Relay Output#1
LK2	Set to Top, Polarity selection for GPI Relay Output#2
LK3	Set to Top, Polarity selection for GPI Relay Relay Output#3
LK4	Set to Top, Polarity selection for GPI Relay Output#4

Figure 2-6 Jumper Links on the GPI I/O card

Diagram of a GPI Output (GPI1→4)



Pin #	Function
1	Isolated Relay closure contact A. VIDEO ALARM
2	Isolated Relay closure contact B. VIDEO ALARM
3	Isolated Relay closure contact A VIDEO ALARM ACCEPT
4	Isolated Relay closure contact B VIDEO ALARM ACCEPT
5	Isolated Relay closure contact A AUDIO ALARM
6	Isolated Relay closure contact B. AUDIO ALARM
7	Isolated Relay closure contact A. AUDIO ALARM ACCEPT
8	Isolated Relay closure contact B. AUDIO ALARM ACCEPT
13	General Purpose Input #1 (GPI1). Pull to Ground to activate. ACCEPT ALARM.
25	GND

Figure 2-7 Rear 25W GPI/Tally D-Type connection

Pin#	Function
1	AES 1 Input+
2	AES 1 Input-
15	GND

Figure 2-8 Rear 15W AES D-Type connection

2.4 Configuring alarms on an AV-2E/AV-4

2.4.1 Video Alarm Conditions

Alarm conditions are as follows:

For video monitoring there are 3 possible causes of alarm.

- 1) Video Missing for a pre-determined time.
- 2) Video Black for a pre-determined time.
- 3) Video is Frozen for a pre-determined time.

The pre-determined times are configured in menus covered in section 3.3 as well as other variables related to the error conditions. (See section 3.3 menus 12→17)

2.4.2 Audio Alarm Conditions

For embedded audio monitoring there are 2 possible causes of alarm.

- 1) Audio data Missing for a pre-determined time.
- 2) Audio is silent for a pre-determined time.

The pre-determined times are configured in menus covered in section 3.3 as well as other variables related to the error conditions. (See section 3.3 menus 8→11)

2.4.3 Using the alarms

To make use of an alarm the user must either “observe it” on the on-screen display ident. (Which is not likely to happen unless you know an error condition is coming!) OR you must configure the “Tally output” to respond to an alarm condition. The tally output may then be used to trigger an alarm or activate an emergency switch for automatic video failure bypass. After the alarm is activated the user’s attention may then be brought to the on-screen display which will furnish the user with more detailed information about the error condition.

2.4.4 Configuring Alarm Ident.

Alarms are configured using the EDIT menu (See section 3.3 menu 19). There are 9 states that can be edited to produce different text/colours on the ident and also different alarm conditions on the tally output. Editing the states is done by changing the text in the LCD window of menu 19.

In order to change the text in the window the user must connect a PS-2 keyboard to the front of the flexipanel (LHS). To activate the edit hit RETURN or ENTER. This will cause an inverted character cursor to appear in the menu19 window.

The 9 states are as follows:

- 0=ID displayed on the ident bar.
- 1=Text and colour displayed for “video OK” state.
- 2=Text and colour displayed for “video absent” state.
- 3=Text and colour displayed for “video black” state.
- 4=Text and colour displayed for “video frozen” state.
- 5=Text and colour displayed for “active picture frozen” state.
- 6=Text and colour displayed for “audio OK” state.
- 7=Text and colour displayed for “audio absent” state.
- 8=Text and colour displayed for “audio silent” state.

There are 3 lines of 6 character text on the LCD display. The format of the edit is as follows:

Line1 = “EDIT n”, where n is the edit number between 0→8 (as above)

Line2 = “abcdef”, where “abcdef” is the text that appears to identify the stated condition. (eg for “active picture frozen” the default is “A P Frz”)

Line3 = “XYZ “

X = a number from 0 to 7 representing the colour of the foreground text

Y = a number from 0 to 7 representing the colour of the background text

Z = F or N for (N)ormal colour or (F)lashing colour.

The colour numbers are 0= white, 1= yellow, 2= cyan, 3= green, 4= magenta, 5= red, 6= blue and 7=black.

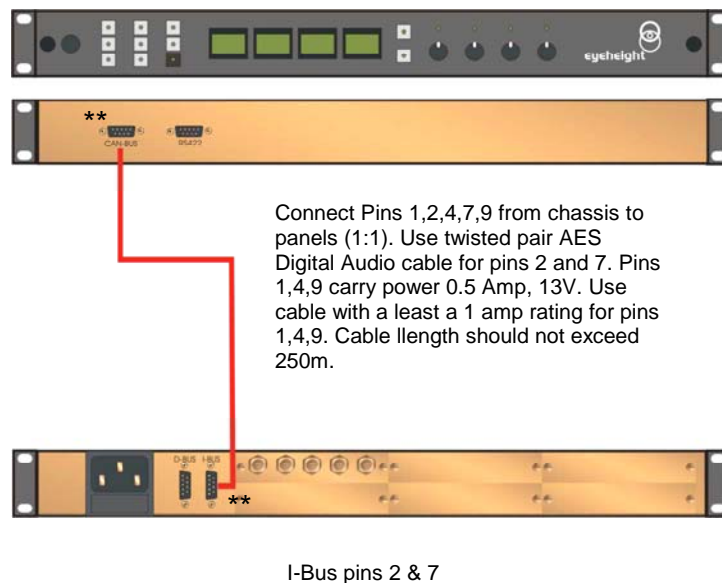
2.4.5 Configuring Alarm Tally.

The alarm tally is activated IF the appropriate error condition is met (For example the video goes to black for an allotted time) AND The colour of either the foreground or background on the text ident is red. (e.g. The colour of either FG or BG in Edit number 3 is colour 6).

Connecting Panels to the AV-2E/AV-4

The AV-2E/AV-4 may be operated using a FP-9 Flexipanel locally mounted. For a more operational environment the AV-2E/AV-4 may be supplied with a desk mounting FP-10 or remotely sited FP-9. For detailed information on connecting remote panels refer to the section "Connection of Remote Panels to a flexiBox" in the geNETics Hardware Installation Guide.

Below is shown a typical system consisting of an AV-2E/AV-4 in a flexiBox controlled by a remotely mounted FP-9.



** The I-BUS Network requires terminating with 100 Ohms at each extreme end of the network. Ensure that this is done either by an external 100 ohm resistor OR ONE Panel/Product at each end has the termination set. See the "Genetics User Guide" Under the sections "Flexipanel Power/I-BUS Jumpers". For the 4RU Panels see "4RU Panel (FP-10) Jumpers for I-BUS" and "4RU Panel (VP-10, SW-10, AP-10) Jumpers for I-BUS". Alternatively The termination can be set on a Product (ie the AD-2/AD-2E module). Information about this is given in this manual.

Figure 2-9 I-Bus connection from chassis to panel

N.B. From 1/10/02 Eyeheight introduced a change in the flexiBox Chassis. Most versions now have two 9 way connectors on the rear labelled "I-Bus" and "D-Bus". The "I-Bus" connector is the same as the previously labelled "Can-B" connector. Although a maxiBox is shown in this diagram the same arrangement applies for a flexiBox chassis.

3 Operation

3.1 Manual control of the AV-2E/AV-4

Manual Control of the AV-2E/AV-4 is done using one or more of the following control surfaces:

- The 1RU FP-9 flexiPanel.
- The FP10 Desk mounting panel

The FP-9 and the FP-10 have identical manual control systems. (The FP-10 is simply a desktop version of the FP-9).

The AV-2E/AV-4 is, as are all genetics modules, controlled using a set of MENUS. Each of these menus contains up to 3 parameters that are adjusted using the rotary digipots. The Menus define all of the adjustable operational parameters in the AV-2E/AV-4. Pressing the rotary digipots brings the parameter to its default value. Device selection is done using the device select switches which, when pressed, will offer the name of the device in the LCD Window. Modules can be acquired and then de-acquired using the set-up switch. For a full description of the operation philosophy of the geNETics system refer to the “geNETics User Guide” (section “Operation of the flexiPanel”)

A full list of the Menus and their functions are given in section 3 of this chapter.

3.2 Automation Control of the AV-2E/AV-4

Automation of the geNETics products is achieved via an RS422 port.** This port is marked RS422 on the rear of a flexiBox. For the port to work a flexiPanel MUST be connected locally on the front of the flexiBox.

Automation control of the AV-2E/AV-4 can be done using two protocol methods:

- geNETics Automation Protocol.
- PresTX Automation Protocol.

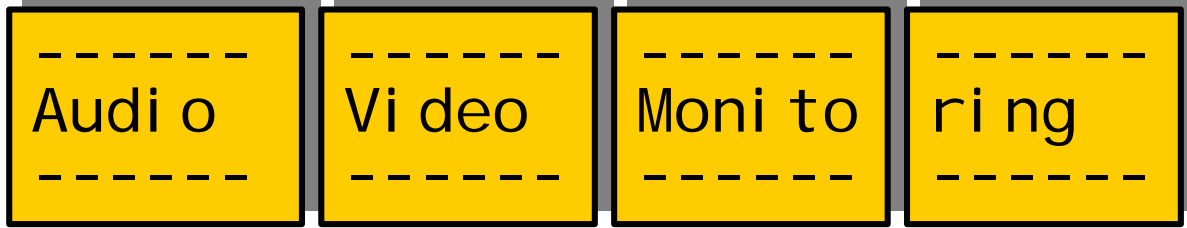
Genetics protocol is described in detail in the “GeNETics User Guide” section titled “Automation Protocol on the geNETics Platform”. The menu list in section 3 of this chapter contains the data information for the protocol.

PresTX Automation Protocol is used only for the PresTX Presentation Mixer and channel branding system. In this case an AU-2 Automation card is also required. Refer to the PresTX Product manual

**On most flexiBoxes later than 1/10/02 the RS422 port has been replaced by a “D-Bus” Port. The D-Bus port is for High Speed data transfer and is not used for serial control. In order to achieve serial control of any products on an I-Bus network Eyeheight Ltd have developed a RS232→I-bus converter “dongle”, (DG-9) which enables greater flexibility of products on the I-Bus network whilst using the same protocols as the RS422 port. Please refer to the “User guide for the DG-9 eyeheight dongle and set-up software.

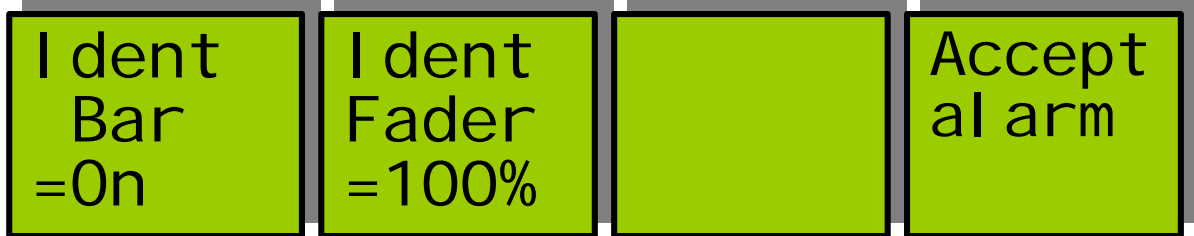
3.3 Operational Menus for the AV-2E/AV-4

Menus 00-03 Top Level Menus



Menus 04-07, ident bar and audio alarm accept.

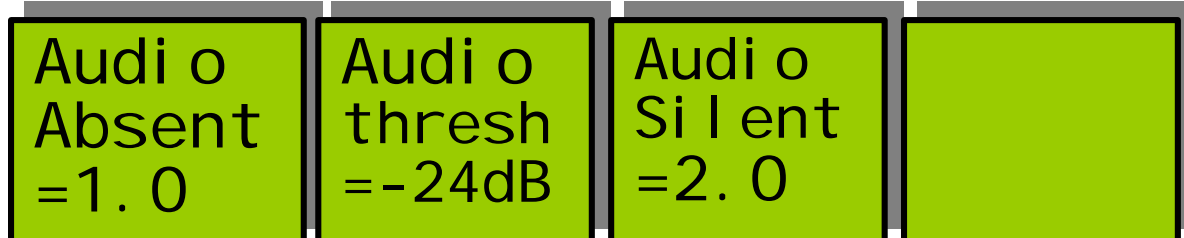
(Press NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
4	Ident Bar	Off=0,On=1 Default is On	Pressing this will turn on or off the Ident Bar.
5	Ident Fader	0-296 Default is 296	The fade level of the Ident bar overlaid on to the video image.
6	Not used		
7	Accept alarm	none	Pressing this accepts the current alarm.

Menus 08-11 Audio error parameters.

(Press NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
8	Audio absent	1-999 Default is 10	The length of time the audio channels are absent before tripping an alarm in units of Sec.
9	Audio thresh	-21db – -60db Default is -24db	The threshold, below which the audio is considered to be silent.
10	Audio silent	1-999 Default is 100	The length of time an audio channel is silent before an alarm is triggered in units of of a sec.
11	none	none	none

Menus 12-15 Video error parameters

(Press NEXT/PREV to navigate)

Vi deo Absent =1.0	Vi deo Thresh =64	Vi deo Severe =1000	Vi deo Bl ack =5.0
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Menu Num.	Heading	Automatio n	Function
12	Video absent	1-999 Default is 2	Video absent before tripping an alarm in units of Sec.
13	Video thresh	1-511 Default is 64	The threshold, below which the video is considered to be black.
14	Video severe	1-6000 Default is 2	The number of pixels above the black threshold before black video is not detected.
15	Video Black	1-999 Default is 50	Video black before tripping an alarm in units of Sec.

Menus 16-19 Video Frozen error parameters

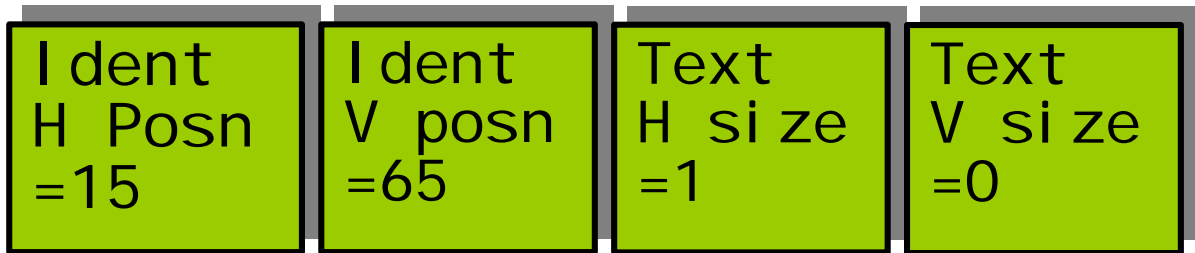
(Press NEXT/PREV to navigate)

Vi deo Frozen =6.0	Acti ve Frozen =12.0		Edi t 0 Test-1 25N
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Menu Num.	Heading	Automation	Function
16	Video Frozen	1-999 Default is 250	Video frozen before tripping an alarm in units of Sec.
17	Active Frozen	1-999 Default is 500	Active video frozen before tripping an alarm in units of Sec.
18			Spare
19	Edit	None	<p>Pressing the return key switches the system into an editing mode. The memory to be edited is displayed on the top line this can be adjusted by pressing the display button or by turning the associated knob. The first 6 characters form the text of the message, the next two digits define the foreground and background colours. The last digit defines whether the text is flashing (F) or normal (N), the default is normal so the 'N' may be omitted.</p> <p>For AV-2e - The colours are defined as : 0=white, 1= yellow, 2=cyan, 3=green, 4=magenta, 5=red, 6= blue and 7=black. Defining either colour to be red, 5, will cause an alarm to be generated when that error message occurs.</p> <p>For AV-4 - The colours are defined as : 0=white, 1=cyan, 2= yellow, 3=green, 4=magenta, 5= blue, 6=red and 7=black. Defining either colour to be red, 5, will cause an alarm to be generated when that error message occurs.</p> <p>This does not apply to the channel ID. The memory locations are defined as : 0=ID, 1=video OK, 2=video absent, 3=video black, 4=video frozen, 5=active picture frozen, 6=audio OK, 7=audio absent, 8=audio silent. When editing of a message is complete pressing return will revert the system into normal mode.</p>

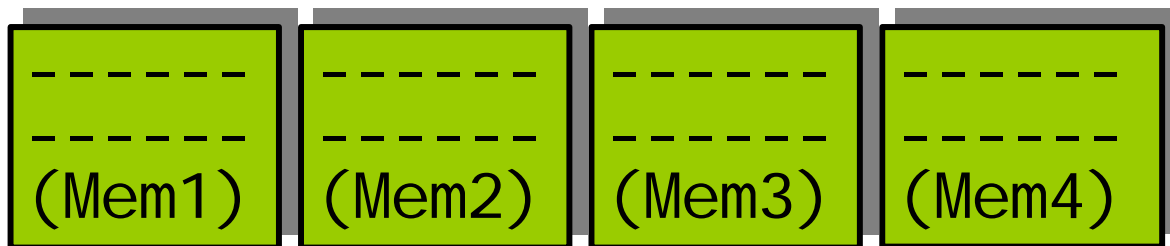
Menus 20-23 Ident size and position

(Press NEXT/PREV to navigate)



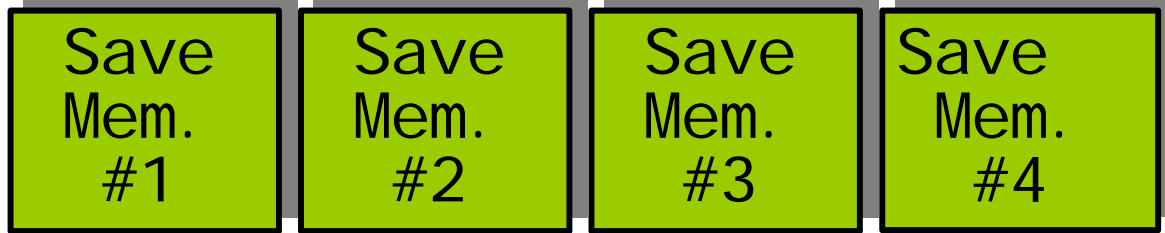
Menu Num.	Heading	Automation	Function
20	Ident H posn	0-999 Default is 15	This sets the horizontal position of the Ident bar on the video image.
21	Ident V posn	0-999 Default is 65	This sets the vertical position of the of the Ident bar on the video image.
22	Text H size	0-2, Default is 1	This sets the horizontal size of the text.
23	Text V size	0-1, Default is 0	This sets the vertical size of the text.

Menu 24-27: Memory Recall (Press NEXT/PREV to navigate)



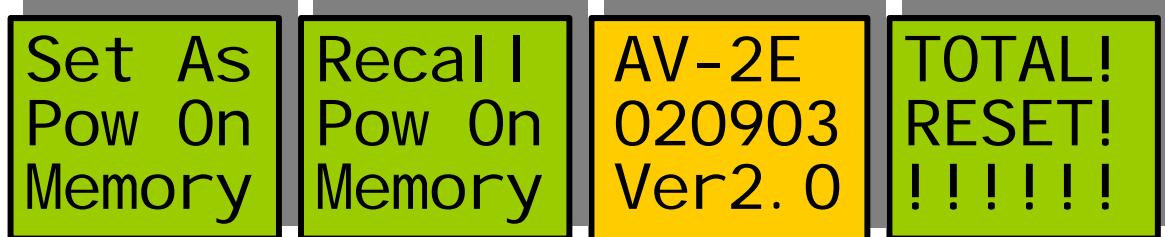
Menu Num.	Heading	Automation	Function
24	MEM1	1 recalls memory	Recalls configuration memory 1
25	MEM 2	1 recalls memory	Recalls configuration memory 2
26	MEM 3	1 recalls memory	Recalls configuration memory 3
27	MEM 4	1 recalls memory	Recalls configuration memory 3

Menu 28-31: Memory Save (Press NEXT/PREV to navigate)



Menu Num.	Heading	Automation	Function
28	SAVE MEM1	1 saves configuration	Saves current configuration as memory 1
29	SAVE MEM2	1 saves configuration	Saves current configuration as memory 2
30	SAVE MEM3	1 saves configuration	Saves current configuration as memory 3
31	SAVE MEM4	1 saves configuration	Saves current configuration as memory 4

Menu 32-35: Power On Memory (Press PREV to navigate)



Menu Num.	Heading	Automation	Function
32	Save Power On Memory	1 to save memory	Saves current configuration as Power On memory.
33	Recall Power On Memory	1 to recall memory	Recalls the Power On memory configuration.
34	"Total Reset".	1 to cause Total Reset	This puts all current and power on default settings to the factory default
35	Software version		This displays the current software version.

4 Technical Appendix

4.1 Technical Specification for the AV-2E

Video Input	1 off SDI with embedded audio.
Type of Inputs	SDI 270Mbit with embedded audio data
Video Outputs	1 off SDI with embedded audio data
Type Of Outputs	SDI 270Mbit for monitoring on screen display
Current Consumption	<800mA at +5V

4.2 Technical Specification for the GPI/Tally connector

GPI inputs	1 off, short to ground to activate for alarm accept
Relay closure outputs	4 off isolated relay closure outputs up to 1 Amp current flow. Two for Alarm and two for alarm accept.
Current Consumption	<300mA at +5V

4.3 Jumpering the I-BUS (CAN-BUS) Termination

The I-BUS Network is the "control system" under which all Products and Panels are networked together. Under certain circumstances it is necessary to terminate the network. This can be done on a Panel or a "Product". To terminate this product, locate J6 on the AD-2 Processor Card supplied which is between U1 (The large square "chip") and the Edge connector. (This is on the half of the card labelled "CHP-100 Spartan2 Processor"). Jumper this with a 2mm link.

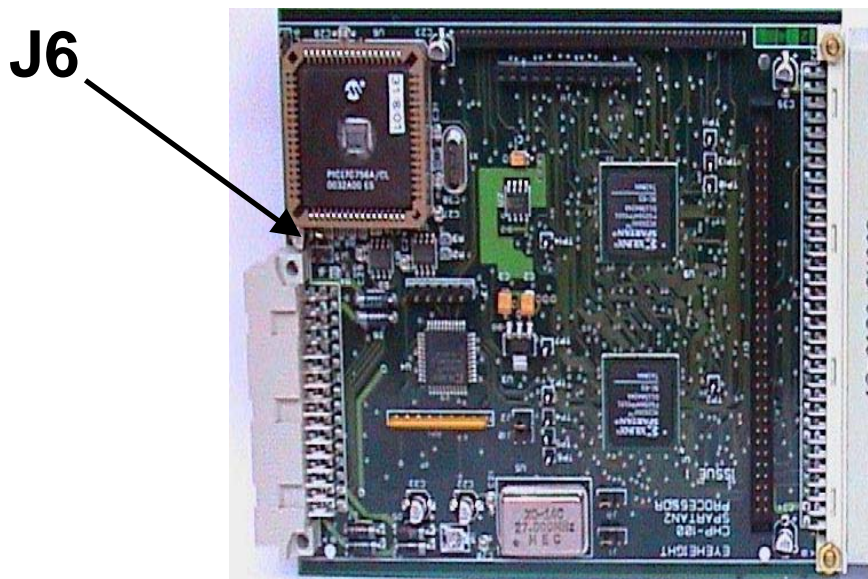


Figure 4-1 Location Of I-Bus Termination Link