VAC SD/HD SDI DA Manual

(Rev D)

VAC #13-111-102-A (Two Output DA)
VAC #13-111-104-A (Four Output DA)

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Two Year Limited Warranty

All Video Accessory Corporation (VAC) products have a full two year limited warranty. Exclusions to the warranty include but are not limited to damage to external components, power LED failure where the product continues to function, and electrical damage due to lightning. The warranty shall be void if any alteration or repair of a VAC product is attempted by anyone not authorized by VAC. This warranty is expressly in lieu of all other warranties express or implied, including warranties of merchantability and fitness for use, and of all other obligations or liabilities on the part of VAC, and it neither assumes nor authorizes any other person to assume for it any liability in connection with the sale of this product. This warranty shall not apply to the product or any part thereof subjected to accident, negligence, alteration, abuse, or misuse. No warranty whatsoever is made with respect to accessories or parts supplied by anyone other than VAC, and this warranty shall extend only to the original purchaser of this product. The warranty provided in this article is exclusive and in lieu of, and buyer hereby waives, all other remedies, express or implied, arising by law or otherwise, including consequential damages, whether or not occasioned by negligence of VAC. This warranty shall not be extended, altered or varied except by written instrument signed by VAC and buyer, and shall only apply within the boundaries of the continental United States. Liability of VAC is limited to repair or replacement at the option of VAC. Warranty work is to be sent to VAC. Freight charges will be the responsibility of the purchaser.

Document History

REV	Date	Action
A	Nov. 15, 2011	Original document.
B	Jan. 29, 2012	Added Maintenance Mode commands.
C	June 22, 2012	Added additional power connector pin functions information. Added connector ‘J’ reference numbers.
D	March 21, 2013	Added actual power current values Added detail to power supply section

1.0 Basic Operation

The SD/HD SDI DA's included in this manual provide a way to distribute one SDI signal to two or four other devices. A USB port permits the user to view internal status registers and set operating parameters. The units use an isolated power system so ground loops can be controlled. The unit also uses a power connector that has screw flange attachments for high vibration environments

2.0 Basic Functions

The following SDI formats are supported:

SMPTE 292M	(1.48Gbit/s)
SMPTE 259M	(270/360Mbit/s)
SMPTE 424M	(2.97Gbit/s)

BNC connectors are used for the signal connectors. Depending on the unit there will be 1 input signal connection and 2 or 4 output connections.

The units have a single bi-color power-on/signal LED.

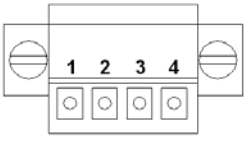
A mini-USB connector is present to connect the units to a laptop computer for configuration or checking internal status registers. One of Five control modes can be selected.

The unit is based on the following major integrated circuits:

Linear Technology LT3748 flyback controller
National Semiconductor LMH0387 adaptive cable equalizer/driver
National Semiconductor LMH0346 re-clocker
National Semiconductor DS25BR204 1X4 LVDS repeater

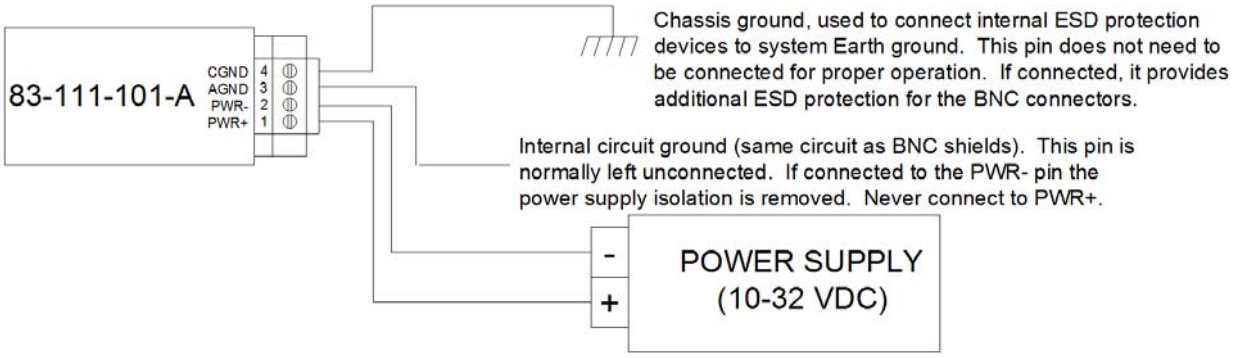
3.0 Power Requirements

This unit has an internal switching supply that isolates supply power from the internal power and I/O. Units will operate correctly when powered by 10-32 VDC or 10-28 VAC. The unit is equipped with full wave rectification, so power may be applied between Pins 1 & 2 using either polarity.



Pin 1 **PWR+ (10-32V Supply Connection +V)**
Pin 2 **PWR- (10-32V Return Connection –V/GND)**
Pin 3 **AGND/Circuit Ground (Same as BNC Shields)**
Pin 4 **CGND/Chassis Ground (ESD Protection Ground)**

Internal Circuit ground (AGND/Pin-3) is the ground reference for the internal circuits and BNC shields. It is NOT the input voltage return path of pins 1 and 2. The user has the option of floating internal circuits, with respect to any system ground, by not connecting to this pin. The user also has the option to connect the circuit ground to the chassis ground or the input power ground (or both). This power connector pin-out permits the user to define the grounding environment the unit is used in. The following diagram shows the basic power connector connections.



Chassis ground (CGND/Pin-4) is connected to internal ESD protection devices. The chassis ground does not need to be connected for proper operation. Secondary ESD protection connections exist between the input and output video signals and internal circuit ground.

The power connector (J3) is a 4 pin 3.5mm center header (Phoenix Contact #1897267) and mating power plug (Phoenix Contact #1847071) with screw flanges for vibration and shock resistance.

The unit has a multi-color LED (green/orange/yellow) to indicate power is connected and the internal uP is running.

4.0 USB Interface and Control

Each unit has a USB interface to permit the user to view internal status registers and set operating parameters. The USB port connects to a USB-UART bridge IC. HyperTerminal is used to enter configuration parameters. The configuration can be saved in FLASH memory so the unit enters the correct configuration at power-up.

The unit uses a Microchip PIC18F67K22 for internal control, communicating with the USB interface by a Silicon Labs CP2102 USB-UART bridge.

5.0 Maintenance Mode Commands

These units have a USB port to permit the user to retrieve information, change parameters, and select specific inputs for system debug. The intent of this port is for it to be connected to a laptop computer and use HyperTerminal to communicate with the internal processor. The USB ports uses a Silicon Labs CP2102 USB-to-UART (RS232) bridge IC. HyperTerminal must be configured as shown below using the virtual Comm port formed by the CP2102. The drivers for the CP2102 can be downloaded from the Silicon Labs web site.

8 bit data
9600 baud
1 stop
No parity
XON/OFF flow control

The XON/XOFF flow control is used during the download of new code so the data transfer can be stopped while the processor internal FLASH memory to loaded.

The unit should be powered up before the USB cable is plugged in. Once the laptop connects to the CP2102 HyperTerminal can be started and the comm port configured. At unit power up the used can enter the Maintenance Mode by entering NO when asked if the user wants to download new code. Once the unit is up and running, any key will indicate to the code that the user wants to enter Maintenance Mode. Two CR characters are required to enter the Maintenance Mode. If the two characters are not received within 30 sec., the unit will time out and jump back to the RUN mode. While in the Maintenance Mode, if no key activity is detected for 30 sec., the code will jump to the RUN mode.

The following shows the different commands available in Maintenance Mode. The commands are not case sensitive.

5.1 HELP Command Format > HELP<CR>

The Help command provides a list of the valid Maintenance Mode Commands.

5.2 INFO Command Format > INFO<CR>

The INFO commands provides the user with unit information like part number, serial number, code revision level, default Option number, default Timer number, and code CRC values.

5.3 RUN Command Format > RUN<CR>

The RUN command causes the code to jump to the main application and exit the Maintenance Mode.

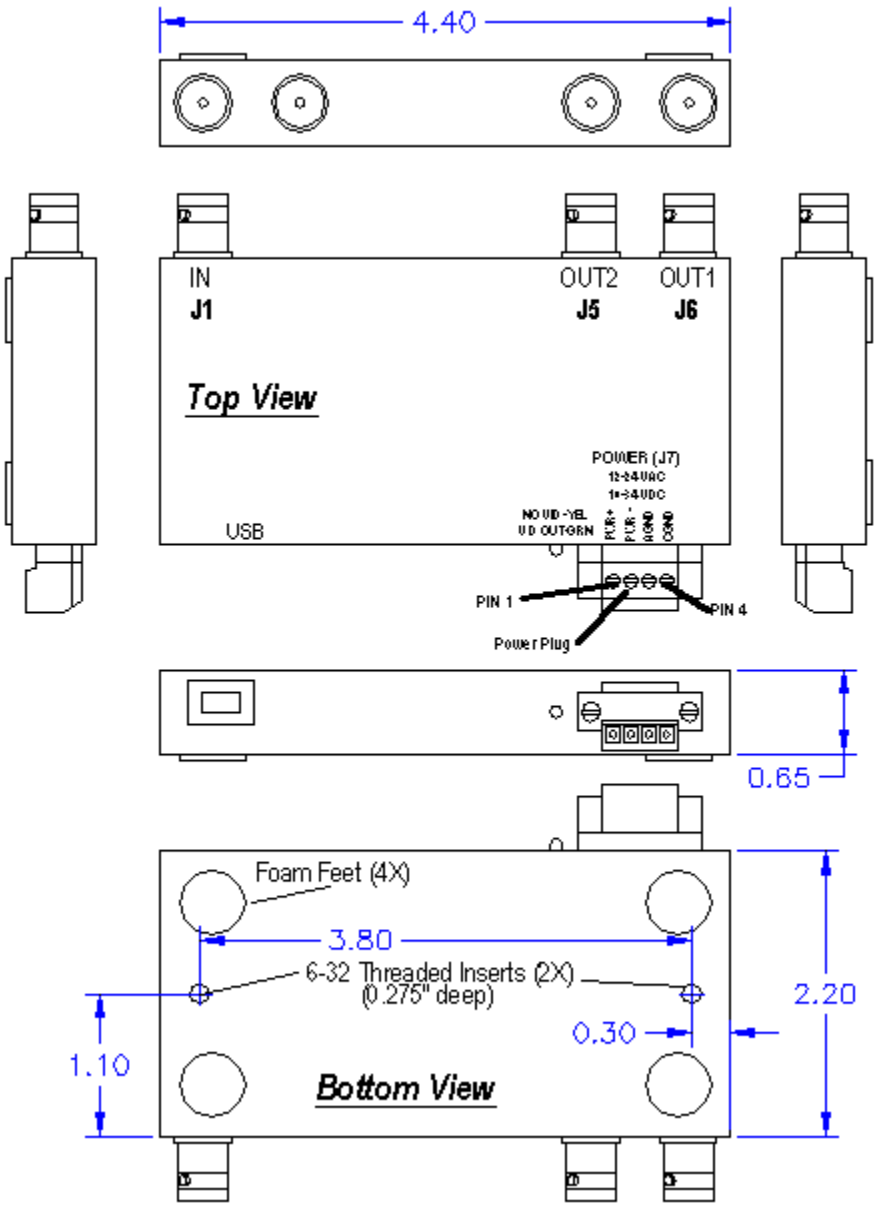
5.4 LOAD NEW CODE Command Format > LOAD NEW CODE<CR>

The LOAD NEW CODE permits the user to load a new revision of the processor code. The user must contact the factory for changes to the code and receive the required TXT file. Care must be taken when loading new code. Once the user answers YES to both questions the application FLASH is erased, new code must be loaded. It is the responsibility of the user to contact the factory before trying to load new code.

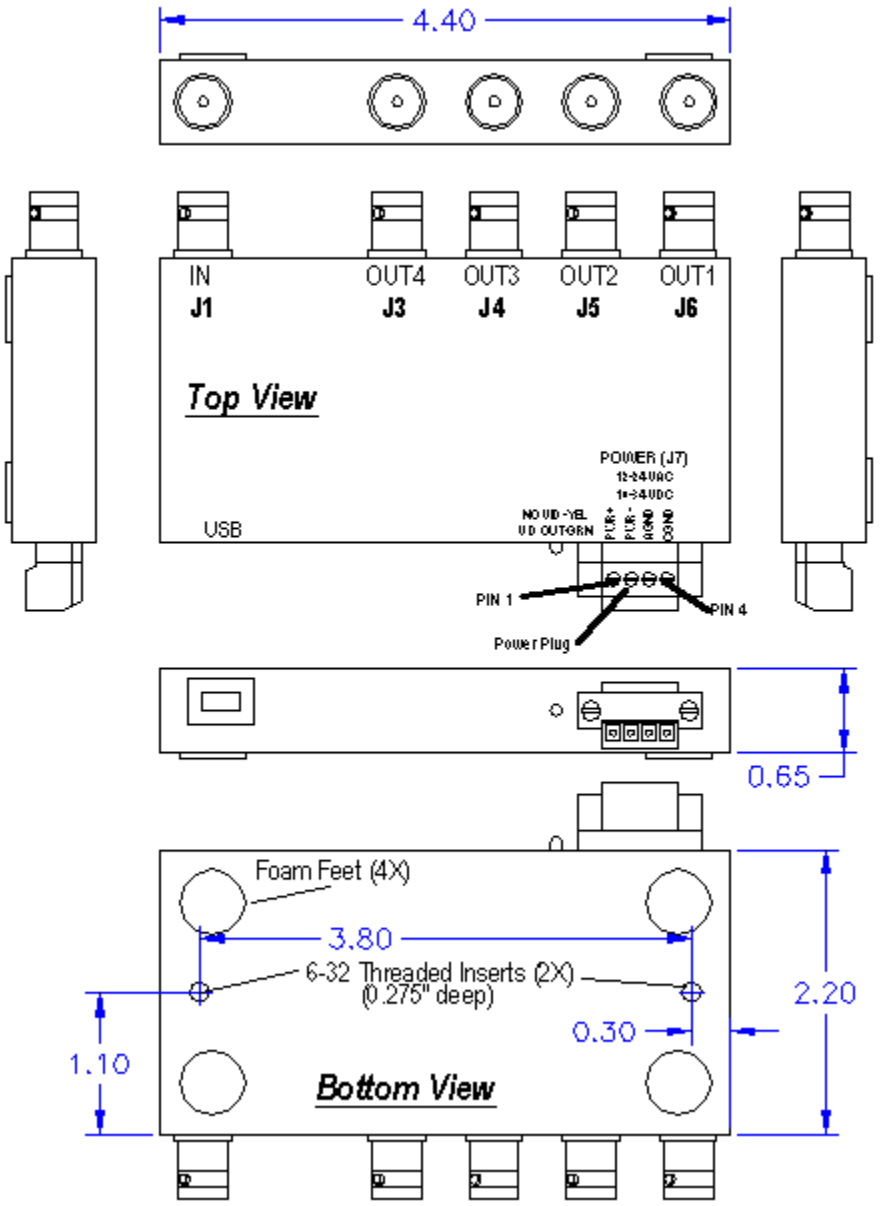
6.0 Overall Specifications

Video Formats:	SMPTE 292M	(1.48Gbit/s)	
	SMPTE 259M	(270/360Mbit/s)	
	SMPTE 424M	(2.97Gbit/s)	
Input Connectors	BNC		
Input Termination	75 Ohms		
Output Terminations:	75 Ohms (series), AC coupled		
Output Connector:	Two or Four BNC's		
USB Interface (ASCII data)	8 bit 9600 baud 1 stop No parity XON/XOFF flow control		
Power LED:	Green (Indicates uP is running, active input) Yellow (Indicates uP is running, no active video on input)		
Operating Temperature Range:	-40C to +85C		
Power:	10-28V AC, 10-32V DC (either polarity on PWR connector)		
Supply Current:	13-111-102-A	12 VDC	< 340 ma
		28 VDC	< 125 ma
	13-111-104-A	12 VDC	< 400 ma
		28 VDC	< 150 ma
Power Connector:	3.5mm 4 pin terminal block	(Phoenix Contact #1843813)	
	Mating plug	(Phoenix Contact #1847071)	
Package:	4.4" X 2.2" X 0.65"		
Mounting:	Two 6-32 threaded inserts		
Weight: (actual TBD)	8 oz.		

7.0 Packages



2 Output DA (13-111-102-A)



4 Output DA (13-111-104-A)