



Setup for the Utah-400 DAC-400VB

UT400 DAC-400VB

High Level Description

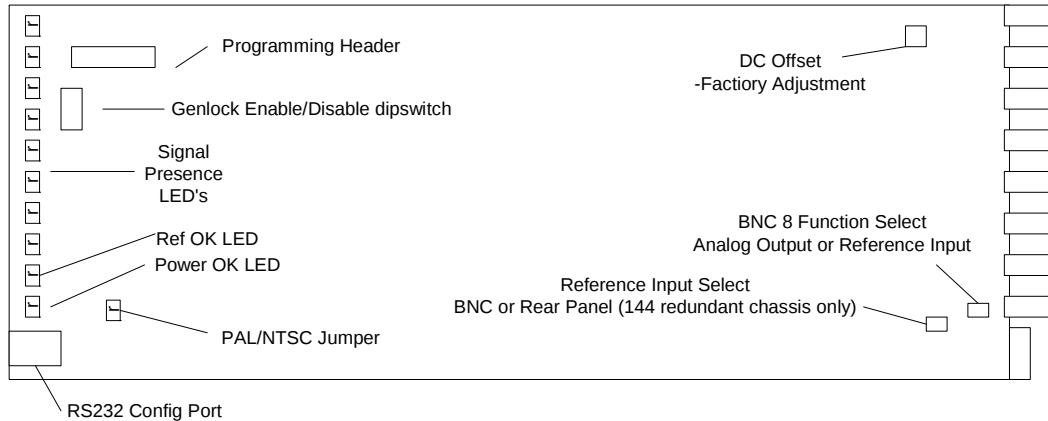
The UT400 DAC-400VB (USI PN 121128-1) is an 8 channel SD-SDI to Composite Analog Video converter module that occupies an output card slot in an UT400 digital video router.

This assembly supersedes the 121046-1 DAC-400V assembly.

The major differences are a better performing analog video section, more modern, 12 bit, 8x oversampling digital to analog converters, and a lower cost.

The major enhancement to this module over the previous generation DAC card is the integrated single line Time Base Corrector function, which allows the user to align the outgoing analog video channels to a user supplied reference, if desired.

Indicators and Controls



1. Programming Header

- This header is used to reload the operating firmware of the DAC400VB. If a field update is needed, in depth instructions will be provided.

2. Genlock Enable/Disable Dipswitch (SW1)

- This switch contains a switch for each output. Place in the 'REF' position to force that output to be retimed to the reference input. Place in the 'FREERUN' position for normal pass-thru operation.

3. RS232 Config Port

- Connection for a terminal emulation program running on a PC. (Teraterm™ or equivalent.) This allows the user to gather status from the card and to adjust horizontal timing.

4. PAL/NTSC Jumper (JP1)

- This determines the video standard the reference circuitry uses.
- Note that the card must be entirely PAL or entirely NTSC. No mixed operation is allowed because there is a single reference input for the entire board.

5. DC Offset Potentiometer

- Sets the DC level of blanking on the video outputs. This is typically factory adjusted.

6. BNC 8 Function Select (JP4)

- a. Selects the function of BNC number 8, either a standard output (in the case of no reference applied, or reference delivered via the rear panel in a 144 redundant crosspoint system) or a reference input.

7. Reference Input Select (JP3)

- a. Selects whether the reference is delivered via the number 8 BNC or via the rear panel, in the case of a 144 redundant crosspoint chassis.

8. Power OK LED

- a. Indicates that all on-board power supplies are within tolerance.

9. Reference OK LED

- a. Indicates that the reference clock generator part is locked. If this LED is off or flickering, Genlocked operation is not available.

10. Signal Presence LEDs

- a. Indicates that the De-serializers and NTSC encoders are locked to the signal coming from the crosspoint matrix.

Non-Referenced Operation

In a system that does not require a referenced output signal, the Genlock Enable dipswitches should all be placed in the 'FREERUN' position. In this mode, all output signals will be referenced to the digital signals they are converting to analog, and no re-alignment will be performed.

Referenced Operation

In a system that requires outputs to be horizontally aligned to a reference, several steps must be taken to ensure the analog outputs are aligned correctly. You must correctly apply reference to the board or system, enable genlock mode on the output or outputs you wish to be aligned, and then optionally use the terminal to do fine adjustments to the horizontal timing.

1. Supplying reference video to the DAC400VB.

- a. Determine which type of system you have. For a 144 x144 redundant chassis, reference video can be applied to the reference loop-thru input on the rear of the midplane of the system. The 144x144 redundant system is characterized by a 9RU chassis with two slots for horizontal crosspoint cards in the center. All other UT400 routers must have

reference supplied to the output 8 BNC on each DAC card where a referenced signal is desired.

- b. Set the jumpers for reference (JP3) and BNC 8 (JP4) appropriately.
 - i. For a redundant 144 router, JP4 should be set to 'OUT' and JP3 should be set to 'RP'.
 - ii. For all other routers, JP4 should be set to 'REF IN' and JP3 should be set to 'BNC'.
- c. Apply reference.
 - i. For a 144 redundant chassis, apply composite Black Burst to one of the Reference loop thru BNC's on the router midplane.
 - ii. For all other routers, apply composite Black Burst to the last output in each card that is required to run in a referenced mode.
- d. Verify Lock LED is illuminated.
 - i. Verify that the REF GENLOCK LED (DS9) is illuminated on the output card that has just been configured.

2. Set Genlock dipswitch.

- a. Set the outputs that you want to be referenced to the incoming Black Burst signal to the 'REF' position on SW1.

3. Adjust fine timing using the terminal.

See the following Terminal Operation Section for setup

- a. Press the 'H' menu key, and then the '+' or '-' keys to adjust coarse horizontal timing. Each step is roughly 45 degrees of subcarrier.
- b. Press the 'F' menu key, and then the '+' or '-' keys to adjust fine horizontal timing. Each step is roughly 2 degrees of subcarrier.

Terminal Operation

The terminal connection and setup is identical to that of the UT400 debug port, detailed in Appendix B of the UT400 manual.

1. Cabling. The connection between a 9 Pin PC serial port and the RS-232 debug port of the DAC400VB is made up of two parts:

- a. A standard CAT5 cable.
- b. A UT400 Debug Port Adapter, USI Part number 140000-8.

2. Terminal Software Setup.

- a. Baud rate is 38.4 KBaud.
- b. Start/Stop/Parity is 8, None, 1.
- c. Input translation for 'CR' should be set to 'CR/LF'.

For interface testing, press the spacebar once the terminal is cabled and configured. If the setup and connection is successful, the DAC400VB will respond with the following menu:

Sync Info - L=01 STD =041A

Menu-

I = Board Status

H = H Timing Coarse Adjustment

F = H Timing Fine Adjustment

From here, the status of the card can be read by pressing the 'I' key, or the horizontal phase can be adjusted by pressing the H or F keys and following the instructions.

Operational Limitations

The DAC400VB TBC functionality operates on a line basis only. It is not a frame synchronizer, and does not have the ability to align asynchronous sources to a reference. It simply aligns the output of each deserializer to the same line rate timing that the reference has. Sources that are early or late by more than 1 line time will still have that offset when they are driven out of the DAC400VB, but they will be horizontally aligned.

Circuit Description

Power Supplies

A list of the individual rails contains:

1. VCC, 5 VDC from system. This supply is mainly used for

- Input Stages
- De-Serialization
- NTSC/PAL Decoding
- Output Circuits
- Control/Scangate System Interface
- Reference Circuit