

DAX-602/802

Digital to Analog Converter

INSTRUCTION MANUAL



Precision Sound • Light • Color

181 Bonetti Drive
San Luis Obispo CA 93401
Ph. 805-549-0161
Fax. 805-549-0163
email: uslinc@uslinc.com
www.uslinc.com

TABLE OF CONTENTS

Warranty	3
Safety Instructions.....	4
DAX Background.....	5
Front Panel Designations	6
Rear Panel Designations.....	6
Delay Settings.....	7
Channel Assignments	7
Difference Between 602, 802	7
AES Channel Assignments	8
Connector Tables.....	9-10
Software:	
Introduction-Configuration.....	10
DHCP/NETBIOS.....	10
Configuration Page.....	11
Surround Delay	12
Auditorium Data.....	12
Password Change.....	12
Firmware Update	13
Restoring Factory Defaults	14

One Year Limited Warranty



USL, Inc. warrants that each product manufactured by it will be free from defects in material and workmanship under normal usage for a period of one (1) year after its purchase new from an authorized dealer. Our obligation under this warranty is limited to repairing or replacing any product or component which, we are satisfied does not conform with the foregoing warranty and which is returned to our factory, freight paid, or serviced by one of our authorized contractors. The foregoing warranty is exclusive and in lieu of all other warranties, whether expressed or implied. Such warranty shall not apply to any product or component (A) repaired or altered by anyone other than USL, Inc. or an authorized service contractor, (B) tampered with or altered in any way or subjected to misuse, negligence or accident or (C) which has been improperly connected installed or adjusted other than in accordance with USL, Inc.'s instruction.

Important Safety Instructions

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with a dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 10) Only use attachments/accessories specified by the manufacturer.
- 11) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 12) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
- 13) **WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.**
- 14) **DO NOT EXPOSE TO DRIPPING OR SPLASHING. DO NOT PLACE OBJECTS FILLED WITH LIQUID, SUCH AS VASES, ON THIS APPARATUS.**

WATCH FOR THESE SYMBOLS:



The lightning bolt triangle is used to alert the user to the risk of electric shock.

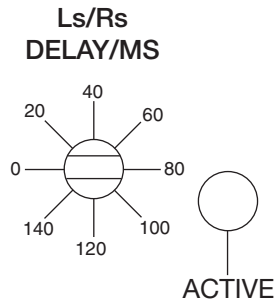


The exclamation point triangle is used to alert the user to important operating or maintenance instructions.

DAX Background

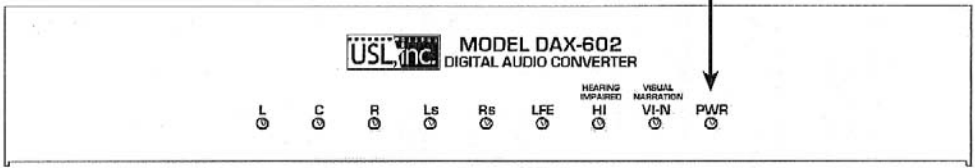
The DAX unit was designed as a simple Digital to Analog Converter which would accept up to 10AES-EBU conforming signals and convert them into multi-channel analog audio. There are two versions available. The DAX-802 converts 5 screen channels, 2 surrounds and the subwoofer/LFE. The DAX-602 is almost the same but does not convert LC and RC screen channels. Both versions convert the Hearing Impaired/Visual Narration channels without sacrificing any of the normal cinema channels. The output of the DAX unit may connect to any cinema processor that has a multi-channel analog input.

Additionally, the surround channels may be delayed by up to 150ms to accommodate different size theaters.

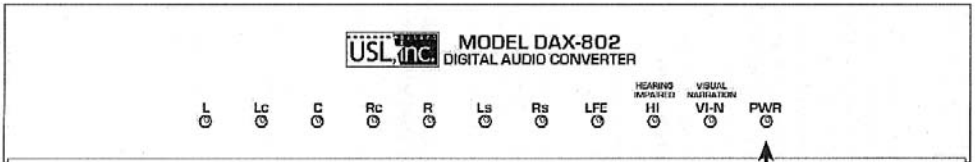


Although the DAX unit is designed to be a stand alone type of device, a web browser can be used to monitor and control the device.

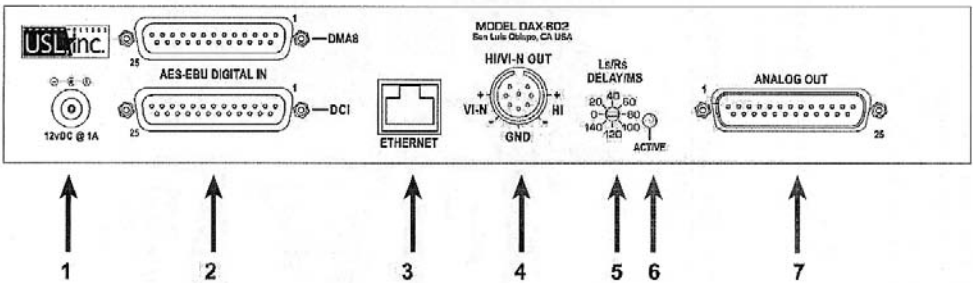
Power Indicator - Indicates when unit is powered on.



Signal Presence Indicators - indicates when signal exceeds - 30dB



Power Indicator - Indicates when unit is powered on.



1. Input Power - 12VDC @ 1 A power supply
2. Digital Input -AES balanced line input. Both DCI and DMA8 connector formats are supported.
3. Ethernet Port - For communication with the user interface.
4. Hearing Impaired / Vocal Narration Output - Balanced or unbalanced line audio output.
5. Surround Delay Select Switch -Allows the audio to be delayed.
6. Delay Active LED - Indicates when the delay switch is actual delay setting.
7. Analog Output- Sends balanced or unbalanced line audio outputs to the Cinema Processor.

Setting the Surround Delay

The LS/RS channels may be delayed between 0 and 150ms in 10ms steps.

Calculate the surround delay by using the following formula:

Length (feet) of theater - (width (feet) of theatre/2) +20 = Delay in ms

Using a small, flat bladed screwdriver, set the LS/RS DELAY control to the value closest to the calculated value.

Differences between -the DAX 802 and 602

The DAX 802 is the full featured version, while the 602 provides economy but versatility.

Channel assignments:

DAX 802 Output	DCI Input	DMA-8 Input
Left (L)/Right (R)	AES1/2	AES1/2
Center(C)/Subwoofer (SW/LFE)	AES3/4	AES3/4
Left Surr. (LS)/Right Surr. (RS)	AES5/6	AES5/6
Left Center (LC)/ Right Center (RC)	AES7/8	AES7/8
Hearing Impaired (HI)/ Visual Narration (VN)	AES15/16	Undefined, may be factory jumped as requested

DAX 602 Output	DCI Input	DMA-8 Input
Left (L)/Right (R)	AES1/2	AES1/2
Center(C)/Subwoofer (SW/LFE)	AES3/4	AES3/4
Left Surr. (LS)/Right Surr. (RS)	AES5/6	AES5/6
Hearing Impaired (HI)/ Visual Narration (VN)	AES7/8	AES7/8

* In the 602's Mono/Surround mode:

(established by internal jumpers and a setting in the software)

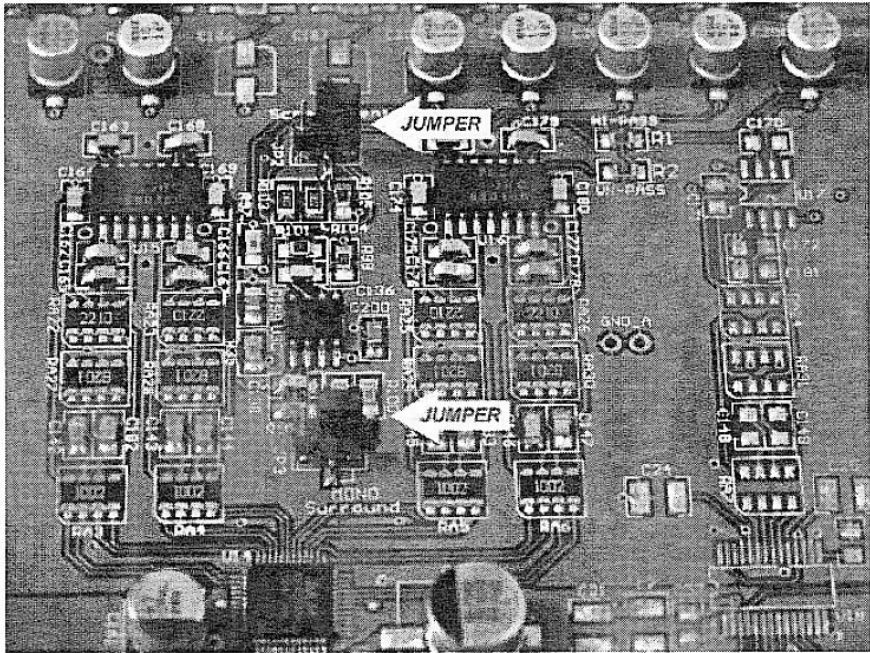
The Center output is normally composed of -3dB of the Center, -6dB of the Left and Right and -9dB of the SW but may be adjusted by the software.

The left Surround output is normally composed of -6dB of the Left and Right Surrounds but may be adjusted by the software-

HI/VN outputs remain as is.

Setting up the 602's Mono/Surround mode:

- 1) Remove the four side screws that hold on the cover.
- 2) Place the two jumpers in the position shown in the picture below.
- 3) Replace the cover.
- 4) Use the GUI to select the Mono/Surround mode. This automatically turns down the audio levels to prevent overloading.
- 5) Adjust the levels as necessary.



AES Channel Assignments: The Digital Cinema Initiative (DCI) specification defines only channel pairs (1-16) and not audio locations (Left, Right, etc.). Until the relationship is specified, USL will use those established previously in the cinema industry. Since Dolby® equipment does not currently follow the DCI spec, USL has provided a connector that matches their DMA-8 pinout.

AES Channel Pair	DAX-802	DAX-602	Dolby® DMA-8
AES1/2	Left (L)/Right (R)	Left (L)/Right (R)	Left (L)/Right(R)
AES3/4 -	Center (C)/ Subwoofer (SW)	Center (C)/ Subwoofer (SW)	Center(C)/ LFE(SW)
AES5/6	Left Surr. (LS)/ Right Surr. (RS)	Left Surr. (LS)/ Right Surr. (RS)	Left Surr. (LS)/ Right Surr. (RS)
AES7/8	Left Center (LC)/ Right Center (RC)	Hearing Impaired (HI)/ Vocal Narration (VN)	Left Extra(LE)/ Right Extra(RE)
AES9/10	Undefined	Undefined	Undefined
AES11/12	Undefined	Undefined	Undefined
AES13/14	Undefined	Undefined	Undefined
AES15/16	Hearing Impaired (HI)/ Vocal Narration (VN)	Undefined	Undefined

AES-EBU Digital In (DMA8) (top 25 pin D sub Female)

Pin Number	Function	Pin Number	Function
1	Gnd	14	AES1/2+
2	AES1/2-	15	Gnd
3	AES3/4+	16	AES3/4-
4	Gnd	17	AES5/6+
5	AES5/6-	18	Gnd
6	AES7/8+	19	AES7/8-
7	Gnd	20	Gnd
8		21	
9	Gnd	22	
10		23	Gnd
11		24	
12	Gnd	25	
13			

AES-EBU Digital In (DCI) (bottom 25 pin D sub Female)

Pin Number	Function	Pin Number	Function
1	AES15/16+	14	AES15/16-
2	Gnd	15	
3		16	Gnd
4		17	
5	Gnd	18	
6		19	Gnd
7	AES7/8+	20	AES7/8-
8	Gnd	21	AES5/6+
9	AES5/6-	22	Gnd
10	AES3/4+	23	AES3/4-
11	Gnd	24	AES1/2+
12	AES1/2-	25	Gnd
13	Gnd		

Analog Output Connector: (25 Pin D sub Male) (Balanced or unbalanced line)

Note: In Unbalanced mode the negative signal MUST be connected to ground.

Note: In order to interface with existing cinema equipment, the DAX box uses the current Industry standard cable connection definition rather than the DCI spec.

Pin Number	Function	Pin Number	Function
1	Left -	14	Left +
2	Right Surr. +	15	Left Surr. +
3	Right Surr. -	16	
4	Left Surr. -	17	Right +
5		18	
6	Right -	19	Chassis Gnd
7		20	Center +
8	Center -	21	
9	Gnd	22	Gnd
10	Gnd	23	Gnd
11	Gnd	24	Subwoofer +
12	Subwoofer -	25	
13	Gnd		

HI/VN Output Connector: (8 pin DIN Male) (Balanced or Unbalanced Line)

Note: In Unbalanced mode the negative signal MUST be connected to ground.

Pin Location (face of jack)	
Pin Number	Function
1	HI+
2	Gnd
3	VN+
4	HI-
5	VN-
6	
7	
8	

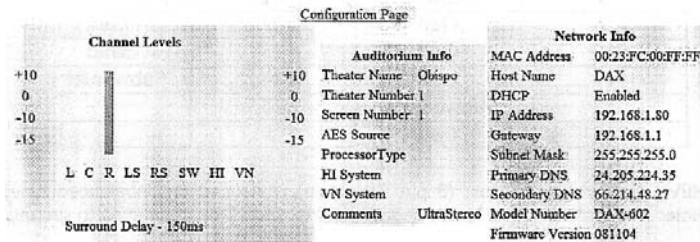
Introduction

The Ethernet interface on the DAX series allows remote monitoring and control of the device through a web interface. In addition, firmware upgrades are accomplished through the same web interface



Obispo - Screen 1

DAX-602 Status Page



Initial Configuration

The DAX units are shipped with a Dynamic Host Configuration Protocol client enabled. Further, the DAX supports the use of NETBIOS, so it is possible to connect to the device by name instead of by IP address.

Using DHCP and NETBIOS

If you have a network with a DHCP server, you should be able to plug the DAX in to the network. Then, open a web browser and type "DAX" in the address field. You should see the status page, similar to that shown above.

On the Configuration Page, you can change the Host Name (NETBIOS name) the device responds to. If you disable DHCP, you can set a static IP address, gateway, subnet mask, and DNS servers. DNS servers need not be specified. Once these are set, click on "Save IP Config and Reboot." The DAX will restart with the new configuration. You will need to key the new IP address in to the address field of your web browser to re-establish contact.

Changing Surround Delay

The surround delay can be changed on the Configuration Page. The delay can be between 0 and 150ms, inclusive, with a resolution of 1ms. Key the desired delay in to the appropriate field and click on "Save Audio Config" to save this value.

The DAX allows the surround delay to be set either on the unit itself (rear panel rotary switch) or through the web browser. Whichever setting was done most recently is the setting the system will use. The red "Active" LED next to the switch will light when the switch shows the current delay. If the LED is out, the delay has been set remotely. The switch setting can be changed to restore control to the switch (and the red LED will light).

Auditorium Data

Users can specify various pieces of auditorium data. Each field accepts up to 20 characters. The theater name and screen number are shown at the top of the status page so users can quickly identify which system they are viewing.

Change Password

To change the password required to reach the configuration screen, type the new password in the two fields. The two values must match for the new password to be accepted. Passwords are limited to 10 characters. Passwords are case sensitive. Should you lose the password, a system restore (described below) will be required to restore the default password.

Updating Firmware

The Configuration Page has a link to the Update Firmware page.

DAX-602 Firmware Update Page

[Status Page](#) | [Configuration Page](#)

Select the file supplied by USL to update the system. After the file uploads successfully, you should see the front panel LEDs flash, then the DAX-602 should reboot with the new firmware.

In the unlikely event the upload fails and you are unable to access the system, you can restore the factory firmware and settings by shorting pin 3 to pin 4 on J8, then supplying power to the system. The front panel LEDs should flash as the firmware is loaded. When they stop flashing, remove the short on J8 then apply power spin.

Select the update file provided by USL, then click on "Update DAX." The update process will take several minutes. When it is almost complete, you will see the LEDs on the front of the DAX flash. The web browser will then show an empty screen. You can then type the IP address or host name in the browser address field to re-establish communications with the unit.

Restore Factory Defaults

You can restore the original factory software, network settings, and configuration password by disconnecting the power to the DAX, removing the cover, shorting J8 pins 3 and 4, then connecting the power. During the restore, the LEDs will flash. When they stop flashing, remove power, remove the short, then apply power again. The original software and configuration have returned.

