



## *Installation and Operation Manual*



### **SS 8.2** ***Eight Input, Dual Output Stereo Audio Matrix Switcher***

Software Version 01.37 or above

Manual Update: 02/10/2004

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## INTRODUCTION

Thank you for your purchase of a Broadcast Tools® SS 8.2 Eight Input, Dual Output Stereo Audio Matrix Switcher (referred to as the SS 8.2 throughout this manual). We're confident that this product will give you many years of dependable service. This manual is intended to give you all the information needed to install and operate the Broadcast Tools® SS 8.2.

## SAFETY INFORMATION

Only qualified personnel should install Broadcast Tools® products. Incorrect or inappropriate use and/or installation could result in a hazardous condition.

## WHO TO CONTACT FOR HELP

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If you would like more information about Broadcast Tools® products, you may reach us at:

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### CAUTION!

**Broadcast Tools®** Products, as with any electronic device, can fail without warning. Do not use this product in applications where a life threatening condition could result due to failure.



### NOTE:

This manual should be read thoroughly before installation and operation.

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### PRODUCT DESCRIPTION

#### Front Panel:

The SS 8.2 is a 1-rack unit device (19" w x 1.75" h x 10" d). The front panel supports eleven selection switches, 44 LED indicators, monitor selection switch, headphone jack, headphone level control and a powered speaker level control.

#### Rear Panel:

Installation is simplified with pluggable screw terminal connectors. The SS 8.2 may be pre-wired and installed in minutes. All remote control connections are via 2 – 25 pin D-sub connections with supplied mating connectors. The multi-drop RS-232 modular connection, cable and adapter are provided. A 7-pin "DIN" power connector is provided for the supplied "Lump in the Line" power supply.

#### Switches:

The front panel of the SS 8.2 contains a push-push switch for monitoring the two output channels. Eleven pushbutton switches that may be used to mute or select input and output audio channels. The input channels may be programmed for the following operations:

- Overlap - Overlap one audio source with another while the button for the second source is held down. Both channels will be fed to the output until the second button is released, at which time the first audio source will be switched off.
- Mix - May connect more than one input at a time to any given output - Push once to connect input, again to disconnect.
- Interlock - Connecting one input to any output disconnects all other inputs from that output.

#### LED Indicators:

The SS 8.2's front panel LED indicators provide operational display of the following information:

- Two indicators per input channel display which output channel the input is connected to.
- One indicator on each of the F1/F2 switches. The F1 and F2 indicators flash when the front panel is LOCKED.
- The mute indicator is lit when all audio is off.
- Two "DOT" graph VU meters indicating left and right channel level for the selected channel.
- Unit power.
- "PIP" Parallel Input Port active, indicating any change with the 16 input "Pulse Stretcher" ports.
- Left silence sensor alarm.
- Right silence sensor alarm.
- SS 8.2 selected or active indicates that the multi-drop RS-232 or RS-485 serial port has been addressed.

### Controls:

- Output monitoring switch for the dot graph VU meters, headphone and powered speaker amplifiers.
- Headphone jack.
- Headphone level control.
- Powered speaker level control. This line level output may be muted.

### Audio Inputs:

Each of the 8 stereo inputs are balanced bridging ( $20K\Omega$ ) at a nominal line level of +4dBv. Sufficient gain is provided for unbalanced consumer level products. Multi-turn level controls are provided for each channel. Solder pads are provided for terminating resistor, if needed.

### Audio Outputs:

The SS 8.2 provides two selectable balanced stereo outputs. Two balanced monaural outputs are also provided which follow their respective stereo outputs. The output “0” VU level is set at +4dBm @  $47\ \Omega$  and may be adjusted from off to + 24 dBm.

### Silence Sensor:

The SS 8.2 contains individual silence sensors, which may be configured to monitor either of the two stereo output channels. For each channel, a peak-detect circuit drives A/D converters on the microprocessor. The factory default delay is set at 10 seconds, with a threshold of 20 dB below program and may be set via a NON-dedicated computer. Upon silence detection, the “Silence Sensor” SPDT relay is closed for the duration of the silence, and the corresponding (L or R) LED is lit for the duration of the silence. The sensor may be programmed for:

- Number of seconds of silence that must be present before an alarm state is reached or terminated.
- Level to be considered silence. This is achieved by feeding a stereo audio tone or program material to the desired threshold of silence and then entering a menu or burst command.

### PIP Input:

The Parallel Input Port with the Programmable Pulse Stretcher provides 16 pulse-stretched parallel 5 volt TTL/CMOS compatible inputs. The inputs are pulled high to 5 volts through a  $10K\Omega$  resistor and are activated by pulling the input to ground. These inputs supply status to any serial polling device (when the unit ID is set to 0, no polling of inputs is required). For each channel, a pulse of specified minimum input duration (000 to 2.55 seconds) causes the status to go true until the longer of the minimum specified length (0.000 - 9.99 seconds) or the end of the input pulse. The pulse width may vary between the specified value and 10 ms less than that value. This allows the polling computer more time to detect an input change.

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### DESCRIPTION

### **“Open Collector” Status Outputs, 8 Port Output Control**

The SS 8.2 provides eight open collector status outputs. The status outputs may be configured to operate in one of two modes:

- The status outputs follow the associated channel.
- The status outputs a half-second pulse when the associated channel is selected.

### **Relay Outputs, 8 Port Output Control:**

The SS 8.2 contains 8 SPST (normally open) relays. Each relay may be latched on, latched off or momentarily turned on by a non-dedicated computer. The “pulse” time may be set from 100msec to three seconds. The default pulse length is one half second.

### **Serial Communication:**

The SS 8.2’s serial communication may be configured for either multi-drop RS-232 or RS-485, allowing up to seven SS 8.2’s on the same computer’s serial port. Commands may be entered either via a menu (menu mode) or a short form code (burst mode). All commands and responses use normal ASCII characters, facilitating scripting. A burst mode command starts with an asterisk (“\*”) followed by the device (ID) address as a single decimal digit. The command to enter menu mode starts with a space (“ ”) followed by the device (ID) address as a single decimal digit. The menu mode displays certain parameters, and allows the setting of the command serial communications rate (“baud rate”), front panel lockout mode, silence sensor delay, silence sensor threshold and the selection of audio inputs and outputs.

### **User Programming:**

The SS 8.2 programming is stored in non-volatile memory. Configurations are set with selection dip switches and computer commands.

## INSTALLATION GUIDELINES

### Inspection:

Please examine your SS 8.2 carefully for any damage that may have been sustained during shipping. If any is noted, please notify the shipper immediately. Retain the packaging for inspection by the shipper. The package contains the SS 8.2, “Lump in the line” power transformer, installation manual, two 25 pin D-connectors/shells and a modular serial cable with a 9-pin D-Sub adapter.

### Setting Operation “DIP” Switches:

The SS 8.2 is equipped with a 10-position “FUNCTION” DIP switch. The DIP switch specifies audio modes (mix, interlock, overlap), 3 bit unit ID and other features listed below. Remove the cover to access this switch. Follow the description below.

**DIP (SW-14) Switch Functions**

Switch Number	Default Setting	Function
1	OFF	Add 1 to Address (base address is 0)
2	OFF	Add 2 to Address (base address is 0)
3	OFF	Add 4 to Address (base address is 0)
4	OFF	Mode bit 0 (see <a href="#">Stereo Audio Switching</a> )
5	OFF	Mode bit 1 (see <a href="#">Stereo Audio Switching</a> )
6	OFF	Output Port Control (see <a href="#">Output Port Control</a> )
7	N/A	N/A
8	OFF	(ON) “PIP” Pulse Stretcher is Disabled (see <a href="#">Programmable Pulse Stretcher</a> )
9	OFF	Front Panel Mode (see <a href="#">Front Panel Switches</a> )
10	OFF	Use Digital Inputs as Remote Front Panel Switches (see <a href="#">digital Inputs</a> )

**Audio Switch Mode DIP Switches**

SW14-4	SW14-5	Mode
Off	Off	Overlap
Off	On	Interlock
On	Off	Interlock
On	On	Mix

**Front Panel Switches**

Switch(es)	Function
1-8	Channel Select
F1, F2	Output select and/or Function Modifiers
MUTE	Mutes Channel

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### INSTALLATION

<b>Standard SS 8.2 Mode - DIP Switch SW14-9 is OFF</b>	
<i>Action</i>	<i>Result</i>
<ol style="list-style-type: none"> <li>1. Hold Button F1</li> <li>2. Push Channel Button</li> </ol>	Channel is connected to output 1. To mute the active channel, simultaneously hold down the mute switch.
<ol style="list-style-type: none"> <li>1. Hold Button F2</li> <li>2. Push Channel Button</li> </ol>	Channel is connected to output 2. To mute the active channel, simultaneously hold down the mute switch.
<ol style="list-style-type: none"> <li>1. Hold Buttons F1 and F2</li> <li>2. Push Channel Button</li> </ol>	Channel is connected to both outputs.

<b>Below: Alternate Mode - DIP Switch SW14-9 is ON</b>	
<i>Action</i>	<i>Result</i>
<ol style="list-style-type: none"> <li>1. Push Channel Button</li> </ol>	Channel is connected to output 1.
<ol style="list-style-type: none"> <li>1. Hold Button F2</li> <li>2. Push Channel Button</li> </ol>	Channel is connected to channel 2 or both outputs.

### Power-Up Feature:

To select a channel configuration at power-up, select the desired input and output channels and in **SEQUENCE**, press and hold down the F1, F2 and MUTE button for 1 second. Your channel setup is now saved. To select **NO** channels at power-up, turn off ALL channels and in **SEQUENCE**, press and hold down the F1, F2 and MUTE button for 1 second. Your channel setup is now saved. This is the **DEFAULT** mode.

### Mounting:

The SS 8.2 is designed to be rack mounted in a standard 19" rack. It should be mounted in an area that is accessible from the rear and preferably away from sources of heat. We recommend before permanently installing the SS 8.2, you bench test and become familiar with the operation of the unit.

### Power Supply Connection:

Install the 7-pin "DIN" connector into the DIN receptacle on the SS 8.2. Mount the "LUMP" in a convenient location. When ready, plug the "Lump in the Line" AC cord into the appropriate AC receptacle.

### Connecting the Audio Inputs, Outputs, Status Inputs and OC/Relays:

The input channels are numbered from 1 through 8 on the rear panel and correspond to the 8 switches on the front panel from left to right. (The left-most switch on the front panel is channel 1 and is labeled 1).



The SS 8.2 interfaces to your audio equipment through plug-in euroblock rear panel screw terminals. Follow the legends for the desired audio input and output connections, which appear on the rear side of the printed circuit board. Remove each screw terminal, strip each conductor, insert the conductor into the terminal and screw down the capture screw. The terminals accommodate wire sizes from 16 - 28 AWG solid or stranded wire. Connections may be made to the + and - inputs for balanced operation, or to the + input and grounding the - side for unbalanced input operation. Connections can be made to the + and - outputs for balanced operation, or to the + output and ground for unbalanced output operation.

The input impedance is 20K $\Omega$ ; 600 $\Omega$  termination may be installed in the solder pads provided internally.

It is recommended that all cables connected to the **SS 8.2** be looped through ferrite cores to suppress RF. Surge protection with RF filtering such as the Tripp Lite "ISO-BAR 4" is also suggested for the power transformer. The purchase of an inexpensive uninterruptible power supply (UPS) will provide back up in case of power outages.

### Adjusting Input and Output Levels:

Once the input and output connections have been made, the input levels can be set. The switcher is factory set for unity. Recommended input levels are in the range of -15 dBu to +10 dBu. Should input levels need to be changed, they are accessible from the rear panel. Each stereo input and output is labeled and has one adjustment per channel.

### Adjusting VU Dot Graph Levels:

The factory setting of 0 VU represents an input of +4 dBm. To read, just remove the cover on the SS 8.2. Feed a stereo tone of 400 hz on channel of the desired level. Locate R411, R421. Adjust the appropriate VU trimmer to the required setting. Replace the cover.

### Input Channel Expansion:

Input expansion may be accomplished by connecting a shielded cable between the first unit's EXT 1+ input terminal and the second unit's + unbalanced output (1/2 of the balanced output). The shield should be connected to the ground terminal. Follow the same procedure for the EXT +1 right channel. The above example provides 16 inputs, with the first SS 8.2 providing the main output.



### CAUTION!

*In no case should either the + or - outputs be connected to ground.*

*Installation of the SS 8.2 in high RF environments should be performed with care. Shielded cable is suggested for all control, audio inputs and outputs. All shields should be tied to the "CH GND" terminal on each channel. The station ground should be connected to the chassis ground screw (CH1) located behind P17 as viewed from the rear.*

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### INSTALLATION

### Remote Control:

All functions on the SS 8.2 may be remote controlled via the two 25 pin D-connectors located on the rear panel. The SS 8.2 accepts momentary contact closures, open collector or TTL/CMOS logic levels. Open collector status/tally is also provided and follows the action of the front panel LED's. The remote connector provides a step input. By pulsing the STEP input to ground, the unit will increment one source for each low to high transition. The step input is helpful in freeing up valuable remote control channels.

### Serial Interface:

The Serial Interface is jumper selectable. It uses either a multi-drop RS-232 transceiver, or a RS-485 transceiver (SP-483). It is assumed to always be in a multi-drop configuration. Software does not distinguish between RS-232 and RS-485 operation. It always switches both transceivers between transmit and receive mode, unless the unit ID is zero. In that case, the unit will always leave the RS-232 transceiver enabled. This is the correct setting for a single unit controlled via RS-232.

#### Front Panel LED's:

Front Panel LED's	Number Of LED's	Activation Event/Mode	Activation Behavior
Inputs connected to Output 1	8 Green	State of Connection	On if connected
Inputs connected to Output 2	8 Red	State of Connection	On if connected
Left Silence Alarm	1 Red	Duration of Silence	On if alarmed
Right Silence Alarm	1 Red	Duration of Silence	On if alarmed
"PIP" Pulse Active	1 Yellow	Any valid input	On
Communications	1 Green	Receive or Send for this unit	On
Power Status	1 Green	Valid Power	On
Mute	1 Red	System Mute Status	On
F1, F2	2 Red	Front Panel Locked Out	Flash

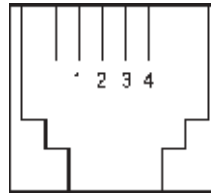
#### Front Panel Switches:

Switch(es)	Function
1-8	Input Channel 1-8
F1	Output 1 select and/or Function Modifier
F2	Output 2 select and/or Function Modifier
MUTE	Mute either or both Outputs

## Connecting the RS-232 Serial Port:

Use the provided modular 9-pin D-sub connector adapter and modular cord to connect the SS 8.2's serial connector to your serial port.

RJ-11 Adapter Pin	DB-9 D-Sub	SS 8.2 (Point of view)
4	3	RS-232 Receive
3	2	RS-232 Transmit
2	5	Ground



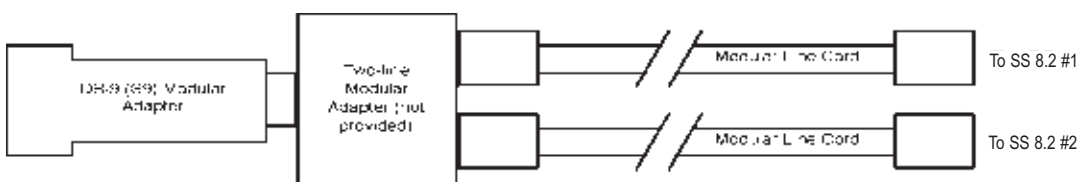
Modular Jack Pin Numbers

The pin out of the adapter is shown at right.

The SS 8.2 is supplied with a modular cable and a 9-pin D-connector modular adapter for serial control. Only use the modular cord that is supplied with the SS 8.2 or a replacement that reverses, such as Radio Shack Cat No. 279-347. Connect the cable between the SS 8.2 and your computer. The SS 8.2 may operate at baud rates from 2400 to 38400 baud. The unit is shipped set for 9600 baud, with 8 data bits, no parity and one stop bit. Load your favorite communication software package (Procomm, Bitcom, Windows 3.1/3.11 Terminal, Windows 95/98/NT Hyper Terminal, etc.) using the protocol of 9600-N-8-1. Set the mode to: DIRECT, Flow Control to: NONE and emulation to: ANSI. Press the space bar ONCE along with the unit ID. Follow the prompts on the pop-up menu.

## Connecting Two SS 8.2's to a Single Computer's Serial Port:

Multiple SS 8.2's may be cascaded serially to operate from the same serial port. The first step is to assign ID's (passwords) to each SS 8.2. One suggestion is to assign 1 to the first SS 8.2 and 2 to the second switcher. The second step is to parallel the serial ports of the SS 8.2's. Plug the male end of the duplex modular adapter into the supplied female DB-9 to RJ-11 adapter, then attach the supplied modular line cords into each of the duplex modular adapter receptacles (Radio Shack Cat No. 279-407) and the other ends into each SS 8.2 modular receptacle. See the diagram below. NOTE: Three or more SS 8.2's may be daisy chained by using the above description and a Radio Shack Cat No. 279-410, 5-jack modular adapter.



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### Serial Control:

The unit is controlled in either Menu or Burst mode. It can run at the following data rates:

- 2400
- 9600 Default
- 19,200
- 38,400

Serial communications is either multi-drop RS-232 or RS-485, jumper selectable. Commands may be entered either via a menu (menu mode) or a short form code (burst mode). All commands and responses use normal ASCII characters, facilitating scripting. A burst mode command starts with an asterisk (“\*”) followed by the device (ID) address as a single decimal digit. A burst mode command must be entered within 5 seconds, or it will time out. The command to enter menu mode starts with a space (“ ”) followed by the device (ID) address as a single decimal digit. The menu mode displays certain parameters, and allows the setting of the command serial communications rate (“baud rate”), front panel lockout mode, silence sensor delay, silence sensor threshold and the selection of audio inputs and outputs. In both cases, device (ID) address (0-7) is specified in the on-board DIP switches.

### Serial Burst Mode Commands:

Burst mode allows a computer or ASCII terminal to control and interrogate the unit. This section defines all burst mode commands. Each burst mode commands starts with an asterisk (“\*”). Next is a single decimal digit that corresponds to the unit (ID) address 0-7. Following that are one or more ASCII characters specifying the command. No carriage-return or line-feed is required to terminate the command except for those few commands of variable length, if the maximum length is not sent. If the command requested a response, the response will consist of an upper case “S”, followed by the unit address, and then the specific response. If acknowledgements are enabled, successful commands are responded to with “RRR,” while errors get an “EEE” response. The syntax of each command is given below. The syntax shows the command exactly as it should be sent, except that lower case characters represent values that should be substituted:

### Glossary Of Command Notation:

Character String	Meaning	Allowable Values
U	Unit ID	0-7
Ii	Input Number	01-08
O	Output Number	1-2
R	Output Relay	1-8

### Set-up Commands:

- \*uC4x - Set RS-232/RS-485 mode timings:  
x = 1, Turn ON RS-232/RS-485 mode NO delays on sending data.  
x = 0, Turn OFF RS-232/RS-485 mode (delay for RS-232 charge pump startup before sending response, unless ID = 0).
- \*uCCx - Set Serial Speed. x = 0:2400 1:9600 2:19200 3:38400
- \*uCEx - Enable Error and Good Responses - Where x = Y to enable and N = disable. In this mode, when a command is sent that is in error, the unit will reply (possibly before receiving the entire command) with "EEE." If the command is sent correctly, the unit will reply with "RRR."
- \*uCIIttt - Set "PIP" Programmable Pulse Stretcher Input Duration = ttt: 000 – 255 hundredths of a seconds (255 = 2.55 seconds)
- \*uCIOiittt - Set "PIP" Programmable Pulse Stretcher True Duration By Channel – ii = channel, ttt = 0 – 999 corresponds to 000 - 9.99 seconds
- \*uCLx - Lock Front Panel if x is "L". Unlock Front Panel if x is "U"
- \*uCRtt - Set Relay Momentary Pulse Length – tt:00-99 for 00 – 9.9 seconds
- \*uCSDttt - Set Silence Sensor Delay – ttt: 0-255 seconds
- \*uCST - Set Silence threshold to audio level currently being passed
- \*uCSVttt - Set Silence threshold, where ttt is the value 0 – 255.

### Real Time Control Commands:

- \*uDxx - Delay xx seconds before processing next command.
- \*uMS - Mute powered speaker line output.
- \*uN - Un-mute powered speaker line output.
- \*uZx - Echo character "x" to serial control port. This is useful in debugging command strings.

### Relay and Output Control Commands:

- \*uORrL - Latch output relay "r"
- \*uORrF - Unlatch output relay "r"
- \*uORrP - Pulse output relay "r"
- \*uOOrF - Set open collector "r" to follow input
- \*uOOrP - Set open collector "r" to pulse when input is set

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### INSTALLATION



## Information Retrieval Commands: Continued

- \*uSS - Send status of silence sensor. Response is “SuS,l,r <CR><LF>”  
Where “l” is 1 if the left channel is not silent, and “r” is 1 if the right channel is not silent.
- \*OSA - Send silence sensor value
- \*uU - Send Unit Information:<name(SS 8.2)><version><CR><LF>

**CAUTION!** The following commands are reserved for factory testing only. Use of these commands may cause unpredictable results.

- \*uYA
- \*uYE
- \*uYI

## Output Port Control:

There are 8 open collector outputs. In stand-alone mode (DIP Switch SW14-6 is OFF), they correspond to the state of the inputs as follows:

Input connected to output 1	Continuous Active
Input connected to output 2	Flashes Slowly
Input connected to both outputs	Flashes Quickly

In Computer Mode (DIP Switch SW14-6 is ON), each can be set independently to one of the following modes:

- Follow the currently selected input channel(s).
- Allows a .5 second pulse when the associated input channel is selected.

8 SPST relay outputs may be controlled by software. Each relay may be commanded to:

<b>Latch On</b>	Turns on and stays on (through power failures) until turned off. Note 1
<b>Latch Off</b>	Turns off and stays off (through power failures) until turned on. Note 1
<b>Momentary On</b>	Overrides latch; turns on for .5 (default) second, then latches off. Note 2
<b>Send Status of Relay</b>	Sends Relay Status (Please see “Notes” on following page.)

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**NOTE 1:** Non-mechanical latching relays. When power is removed, each relay will open. When power is restored, each relay will return to the pre-power failure state.

**NOTE 2:** In burst mode, momentary timing on each relay can be set from .1 to 3 seconds.

**J-17 “Relay/OC” Output Connector Pin Out** (Right connector as viewed from the rear).

<b>Pin Number:</b>	<b>Description:</b>	<b>Pin Number:</b>	<b>Description:</b>
1	K1, N.O.	7	K7, N.O.
14	K1, COM	20	K7, COM
2	K2, N.O.	8	K8, N.O.
15	K2, COM	21	K8, COM
3	K3, N.O.	22	Open Collector 1
16	K3, COM	10	Open Collector 2
4	K4, N.O.	23	Open Collector 3
17	K4, COM	11	Open Collector 4
5	K5, N.O.	24	Open Collector 5
18	K5, COM	12	Open Collector 6
6	K6, N.O.	25	Open Collector 7
19	K6, Com	13	Open Collector 8
		9	Ground

**“PIP” with Programmable Pulse Stretcher:**

If DIP Switch SW14-8 is ON, the Programmable Pulse Stretcher (PIP) provides a 16 channel, pulse-stretched serial input that supplies its status to any polling device, and has no other function. For each channel, a pulse of specified minimum input duration causes the status to go true until the longer of the minimum specified length or the end of the input pulse. The pulse width will vary between the specified value and 10 milli-seconds less than that value.

**NOTE: When the unit ID is set to 0, no polling of inputs is required. If DIP Switch SW14-8 is OFF, the inputs function according to the chart on the next page.**



**DIP Switch SW14-8 - OFF - Programmable Pulse Stretcher Parameters:**

Parameter	Burst Mode Set	Poll (Burst)Read	Applies to all channels	Specified separately for each channel
Minimum Input Duration	X		X	
Minimum True Status Duration	X			X
Channel Status		X		

**Miscellaneous Digital Inputs:**

A low pulse on the **Step** input causes the selected input channel to step by 1.

A sustained low on the **Powered speaker Mute** input causes the powered speakers unbalance line output to mute.

**The next page defines the digital input assignments.**



*Dip switch SW14-6 & 10 must be “ON” for PIP to function properly in Computer Mode.*

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**INSTALLATION**

**J-6, (“PIP”) Connector Digital Inputs: (Left connector as viewed from the rear).**

<b>J-6 pin out</b>	<b>Dip Switch SW14-10 - ON Function Name</b>	<b>Dip Switch SW14-10 - OFF Function Name (Default)</b>
13	PIP 1	Channel 1
25	PIP 2	Channel 2
12	PIP 3	Channel 3
24	PIP 4	Channel 4
11	PIP 5	Channel 5
23	PIP 6	Channel 6
10	PIP 7	Channel 7
22	PIP 8	Channel 8
9	PIP 9	Remote F1
21	PIP 10	Remote F2
8	PIP 11	Remote Mute
20	PIP 12	N/A
7	PIP 13	N/A
19	PIP 14	N/A
6	PIP 15	N/A
18	PIP 16	N/A
1	Powered Speaker Mute	Same
2	Step Input	Same
3	Silence Sensor Relay Com	Same
16	Silence Sensor Relay N.O.	Same
15	Silence Sensor Relay N.C.	Same
14	Open	Same
4,17	Grounds	Same

### SPECIFICATIONS

Input Levels:	Max + 27 dBu, balanced, bridging. > 20k $\Omega$ .
Output Levels:	Stereo balanced outputs 1 & 2, +24 dBm. @ 600 $\Omega$ . / +27dbu @ 10K $\Omega$ . Monaural balanced outputs 1 & 2, +24 dBm. @ 600 $\Omega$ . / +27dbu @ 10K $\Omega$ . Powered speaker output, +8 dBm @ 47 $\Omega$ . Headphone output, +4 dBm @ 47 $\Omega$
Gain:	12 dB.
Frequency Response:*	20 to 20 kHz; +/- .025dB
Signal/Noise Ratio:*	>85 dB nominal, weighted 20 to 22kHz, @ +27dBu.
Distortion: *	Less than 0.01% THD @ +27dBu.
IMD (250/7kHz): *	Less than 0.01% IMD @ +27 dBu.
Crosstalk: *	-80 dB @ 1kHz / -55 dB @ 10 kHz from adjacent off channel.
Mix Input:	Unbalanced summing inputs @ 10k $\Omega$ , 0 dBu.
Switching Method:	Digitally controlled professional level “clickless” analog switch arrays.
Logic:	Microprocessor / Non-volatile memory.
Operation Control:	Front Panel - Momentary switches. Remote - Momentary closure to ground. > 100ms. RS-232/RS-485 - Multi-drop Serial 2400 to 38.4 K baud, 8N1.
Status/Control:	Front Panel - LED indicators in switch. Control – 8 - SPST Relays / Silence Sensor – 1 – SPDT Remote – 8 - Open collector outputs (5 volts max). RS-232/RS-485 - Multi-drop Serial 2400 to 38.4 K baud, 8N1.
Interfacing:	Audio - Rear panel depluggable screw terminals. Accommodates 16 – 28 AWG wire. Mating connectors supplied. Remote Control – 2 - Male 25 pin “D” connector, mates supplied. RS-232 Serial - RJ-11/6P4C Modular, Adapters & cable supplied. RS-485 Serial – Depluggable screw terminals.
Power:	34.5 Vac/ct @ 500 ma / 10.5 Vac @ 1 amp, 120 Vac 50-60 Hz “Lump in the line” power transformer. Supplied. (240 Vac 50-60 Hz optional)
Mechanical:	19” X 1.75” X 10.0” (WHD) / Weight: 9.0 lbs.

### WEBSITE:

Visit our web site for product updates and additional information



### SPECIFICATIONS

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