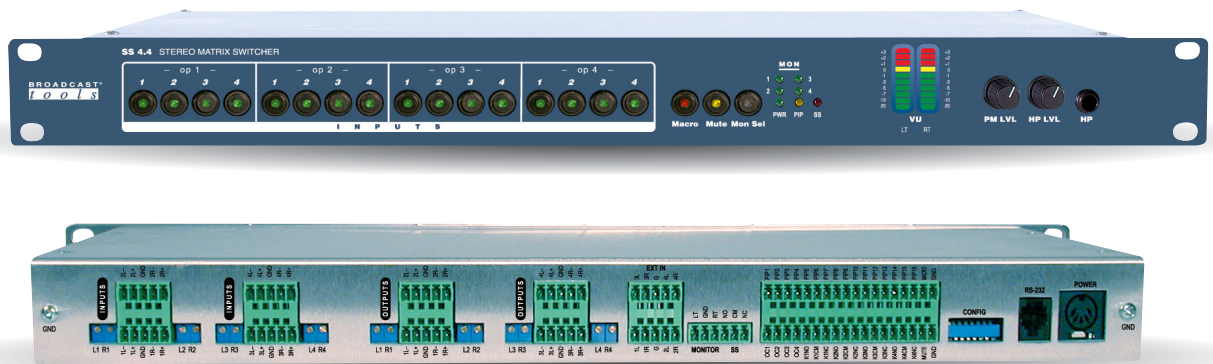# BROADCAST tools®inc

Installation and Operation Manual

SS 4x4 *Stereo Audio Matrix Switcher*

Firmware Version 1.16
Manual Update: 10/18/17

Due to the dynamic nature of product design, the information contained in this document is subject to change without notice. Broadcast Tools, Inc., assumes no responsibility for errors and/or omissions contained in this document. Revisions of this information or new editions may be issued to incorporate such changes.

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Table of Contents

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e-mail: support@broadcasttools.com   voice: 360.854.9559   fax: 866.783.1742

INTRODUCTION

Thank you for your purchase of a Broadcast Tools® SS 4.4 Four Input, Four Output Stereo Audio Matrix Switcher (referred to as the SS 4.4 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 4.4.

SAFETY INFORMATION

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

Broadcast Tools, Inc., is unable to support NON-Broadcast Tools software, hardware or NON-Broadcast Tools computer/hardware/software problems. If you experience these problems, please research your hardware/software instruction manuals or contact the manufacturers technical support department.

WHO TO CONTACT FOR HELP

If you have any questions regarding your product or you need assistance, please contact your distributor from whom you purchased this equipment.

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

Broadcast Tools, Inc.
131 State Street
Sedro-Woolley, WA 98284-1540 USA
Voice: 360.854.9559
Fax: 866.783.1742

Internet Home Page: www.broadcasttools.com
E-mail: support@broadcasttools.com

THANK YOU FOR CHOOSING
BROADCAST TOOLS® BRAND PRODUCTS!

Designed, Assembled and Tested in Washington State, USA.

Broadcast Tools is a Veteran Owned Business

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.
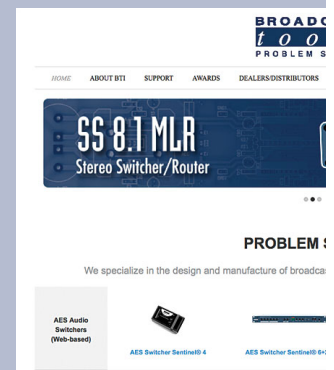
NOTE:

This manual should be read thoroughly before installation and operation.

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Product Description

The Broadcast Tools® SS 4.4 provides matrix audio switching of 4 stereo inputs to 4 stereo outputs. Matrix switching allows any/or all inputs to be assigned to any/or all outputs. The SS 4.4 may be controlled via front panel switches, contact closures, open collectors, logic and/or the multi-drop RS-232 serial port (USB or Ethernet optional). Installation is simplified with plug-in euroblock screw terminals.

Features

- Separate input selection pushbuttons are provided for each output channel.
- Three switching modes; Interlock, overlap and mix.
- Internal silence sensor monitors output one and is equipped with a front panel LED indicator; SPDT alarm relay and adjustable SS alarm delay and restore timing duration.
- Stereo LED VU meters with front panel output selection switch.
- Stereo headphone amplifier with front panel output selection switch, headphone jack and level control.
- Stereo powered monitor output with front panel output selection switch and level control.
- Power-up selection of inputs to outputs, mute or last source selected.
- Most configuration options via rear panel dipswitches.
- 16 input "PIP" (GPI / Triggers) port (or remote control) with front panel LED indicator.
- Four open collector status outputs or programmable via burst commands.
- Four SPDT relays with selectable multiplex function on inputs assigned to output two.
- Multi-turn input and output level controls.
- Electronically balanced stereo inputs and outputs with low noise and distortion circuitry.
- Multi-drop RS-232 serial port (USB and/or Ethernet optional) with power and data activity LED.
- Multiple units may be cascaded to expand inputs.
- Plug-in euroblock screw terminals for ALL audio I/O and remote control connections.
- 1-RU aluminum enclosure.
- Universal switching power supply.

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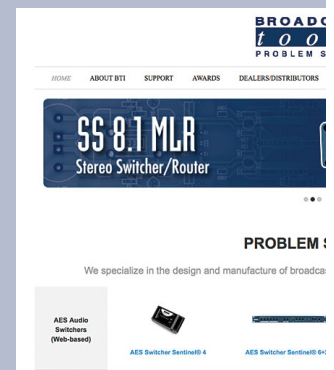
DESCRIPTION

Function Description

Front Panel
The SS 4.4 is a 1-rack unit device (19"w x 1.75"h x 6.0"d). The front panel supports 19 selection switches, 24 LED indicators, headphone, powered monitor and LED VU meter selection switch, ¼" T/R/S jack and level controls.

Rear Panel
Installation is simplified with plug-in euroblock screw terminals. The rear panel hosts the connectors, input/output level trimmers, "OPTIONS" Dip-switch, multi-drop RS-232 modular connector and 5-pin DIN universal power supply connector.

Switches
The front panel of the SS 4.4 contains separate input selection pushbuttons for each of the four output channels.
A mute switch is provided to turn off each audio channel, while the macro switch allows the user to program or select up to 16 macros.
A front panel monitor selection switch, level controls and led indicators are furnished for powered monitors, LED VU meters and headphone monitoring of the four output 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, then hold the MUTE switch and press the selected input again to disconnect.
- Interlock - Connecting one input to any output disconnects all other inputs from that output

LED Indicators
The SS 4.4's front panel LED indicators provide operational display of the following information:

- Led indicators on each input channel switch.
- Four "MON" led's displaying which output channel is currently being monitored.
- The "MACRO" led indicator will flicker when activated.
- The "MUTE" indicator is lit when all channels are off.
- The "ACT" led indicating audio activity for output channel one. Trip level set at –25db.
- One "SS" led indicating when output ONE has a silence sensor alarm.
- "PIP" (Triggers) active. Flickers, indicating any change with any of the 16 trigger inputs.
- "PWR" led which indicates valid power and will flash when the serial RS-232 port is receiving or transmitting data.

Controls

Front panel powered monitor level control.
Front panel headphone level control.

Audio Inputs

Each of the four stereo inputs are balanced bridging (20KΩ) at a nominal line level of +4dBu. Ample system gain is provided to accommodate most unbalanced consumer level products. Multi-turn level trimmers are provided for each channel.

Audio Outputs

The SS 4.4 provides four balanced low impedance stereo outputs. The outputs may be adjusted with the multi-turn trimmers.

Silence Sensor

The SS 4.4 contains a silence sensor for stereo output one. A detector monitors the sum of stereo output one. The factory default delay is set at 10 seconds, with a threshold of -25 dB, while the restore time is set at two seconds. Upon silence delay detection, the "SS" led will illuminate and the SPDT SS relay will close 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.
  • Number of seconds that valid audio must be present before an alarm state is cleared.

PIP (Trigger) Inputs

The 16 input "PIP" (GPI/Triggers) are used to monitor closures and pass that information back to the control computer. Response time is set for 50ms, but may be configured from 40ms to 2.54 seconds. The inputs are pulled high (5 volts through a 20KΩ resistor) and activated by forcing the input to ground. These inputs supply status to any serial polling device (when the unit ID is set to 0 (ZERO), no polling of inputs is required).

"Open Collector" Status Outputs, 4 Port Output Control

The SS 4.4 provides four open collector status outputs. The status outputs may be configured to operate in one of three modes:
The status outputs follow the associated channel.
The status outputs a one-second pulse when the associated channel is selected.
Software control

Relay Outputs, 4 Port Output Control

The SS 4.4 contains four SPDT relays. Each relay may be latched on, latched off or momentarily turned on by an attached control computer. The "pulse" time may be set from 100 msec to 9.9 seconds. The default pulse length is one-second. The relays may be set for "MPX" mode. In the "MPX" multiplex mode, the relay follows the associated input channel assigned to output two.

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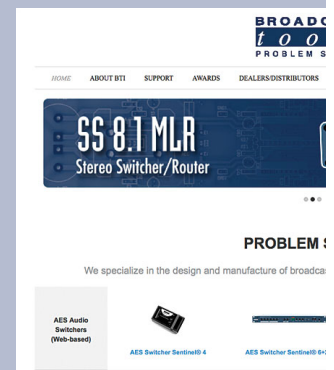
DESCRIPTION

Serial Communication

The SS 4.4's serial communication is supplied with a multi-drop RS-232 port, allowing up to four SS 4.4's on the same computers serial port. Commands may be entered either via a menu (menu mode) or a short form code (ASCII serial string-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, then the command. The command to enter menu mode is: *0MM. The menu mode displays certain parameters, and allows for the control and/or configuration of most switcher functions.

User Programming

The SS 4.4 programming is stored in non-volatile memory. Configuration is set with selection dipswitches and computer commands.

Inspection

Please examine your SS 4.4 carefully for any damage that may have been sustained during shipping. If any is noted, please notify the shipper immediately and retain the packaging for inspection by the shipper.

The package contains the SS 4.4, universal input, multi-voltage DC switching power supply, Installation manual or CD and a reversed modular serial cable with the "S9" 9-pin D-Sub adapter (manuals are also downloadable from our web site).

Installation Guidelines

Setting "OPTION" Dipswitches

The SS 4.4 is equipped with an 8-position "OPTIONS" dipswitch. The dipswitch specifies 2-bit unit ID, baud, audio modes (mix, interlock, overlap), and other features listed below. Access to this switch is on the rear panel. Follow the description below.

CAUTION! The DIPswitches are read from RIGHT to LEFT (SW 8 on the left and SW 1 on the right). You will also need to use small needle-nose pliers to turn the switches ON. In later versions of the PCB assembly, this will be corrected.

"OPTIONS" Dipswitch Functions

Switch Number	Default Setting	Function
1	OFF	Binary address 1 (Default ID = 0)
2	OFF	Binary address 2
3	OFF	Baud rate (Default) OFF = 9600 / ON = 38400)
4	OFF	Stereo Audio Switching (Default = Overlap)
5	OFF	Stereo Audio Switching (Default = Overlap)
6	OFF	Open Collector and Relay configuration
7	OFF	Power up modes (Default = Last source selected)
8	OFF	Remote Control (Default) / "PIP" (Triggers)

Address (Unit ID) DIP Switches

Switch-1	Switch-2	Mode
OFF	OFF	ID = 0
ON	OFF	ID = 1
OFF	ON	ID = 2
ON	ON	ID = 3

Baud Rate DIP Switch

Switch 3	Mode
OFF	9600
ON	38400

Audio Switch Mode DIP Switches

Switch 4	Switch 5	Mode
OFF	OFF	Overlap
ON	OFF	Interlock
OFF	ON	Interlock
ON	ON	MIX

Open Collector/Relay Mode DIP Switch

Switch 6	Function
OFF	Burst mode control.
ON	Follow / MUX mode.

Power-up Mode DIP Switch

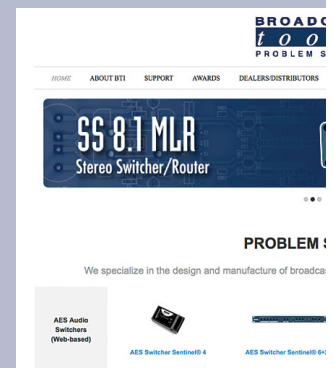| Switch 7	Function
OFF	Last Source Selected
ON	Use the "Burst" mode serial command *0CPS to store the current selected input/output configuration.

Remote / "PIP" (Triggers) Mode DIP Switch

Switch 8	Function
OFF	Remote Control
ON	"PIP"/Triggers enabled

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INSTALLATION

8

Mounting

The SS 4.4 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 4.4, you bench test and become familiar with the operation of the unit.

Power Supply Connection

Insert the universal AC input, multi-voltage DC switching power supply's 5-pin DIN connector into the power receptacle on the rear panel of the SS 4.4. When ready, plug the power supply into the appropriate AC receptacle.
CAUTION! Only use the power supply provided with this product.

Connecting the audio inputs, outputs and remote control devices

It is recommended that all cables connected to the SS 4.4 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 AC in case of power outages. Check out our web site for lightning protection links.

Connecting the audio Inputs and Outputs

The input channels are numbered from 1 through 4 on the rear panel from left to right. The SS 4.4 interfaces to your audio equipment through plug-in euroblock screw terminals. Follow the legends for the desired audio input and output connections, which appear on the rear of the unit. Before installing a wire, remove the plug-in euroblock screw terminal and turn each capture screw fully counterclockwise. Strip each conductor to a length of 0.25" and insert the conductor fully into the terminal. Turn the capture screw fully clockwise to secure the conductor. 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. The input impedance is 22KΩ, 600Ω terminations may be installed on the connector if required.

Connections can be made to the + and - outputs for balanced operation, or to the + output and ground for unbalanced output operation.
CAUTION! In no case should either the + or - OUTPUTS be connected to ground.

INSTALLATION

Connecting the remote control, PIP / Trigger Inputs and OC/Relays

Most front panel functions of the SS 4.4 may be remote controlled via the pluggable euroblock screw terminals located on the rear panel. The SS 4.4 accepts momentary contact closures; open collector or TTL/CMOS input logic levels. Open collectors and relay connections are provided on the lower rear panel 18 position connector TB-6. Each relay and/or open collector and mute input is labeled. Connections to the remote control and/or PIP (trigger) inputs are made on the top of the 18-position connector TB-6. The following information is a comparison chart to be used when connecting external devices.

Pin	Function (DIPSw 8 = OFF).	Function (DIPSw 8 = ON)
1	IN 1 to OP 1	PIP 1
2	IN 2 to OP 1	PIP 2
3	IN 3 to OP 1	PIP 3
4	IN 4 to OP 1	PIP 4
5	IN 1 to OP 2	PIP 5
6	IN 2 to OP 2	PIP 6
7	IN 3 to OP 2	PIP 7
8	IN 4 to OP 2	PIP 8
9	IN 1 to OP 3	PIP 9
10	IN 2 to OP 3	PIP 10
11	IN 3 to OP 3	PIP 11
12	IN 4 to OP 3	PIP 12
13	IN 1 to OP 4	PIP 13
14	IN 2 to OP 4	PIP 14
15	IN 3 to OP 4	PIP 15
16	IN 4 to OP 4	PIP 16
17	Macro	N/A
18	Ground	Ground

Relay Control

Four SPDT relays may be controlled by software. Each relay may be commanded to:

Latch On	Turns on and stays on (through power failures) until turned off.
Latch Off	Turns off and stays off (through power failures) until turned on.
Pulse On	Overrides latch; turns on for (default) second, then latches off.
Multiplex	(See dipswitch 6)
	In the ("MPX") multiplex mode, each relay follows the associated input channel assigned to output two.
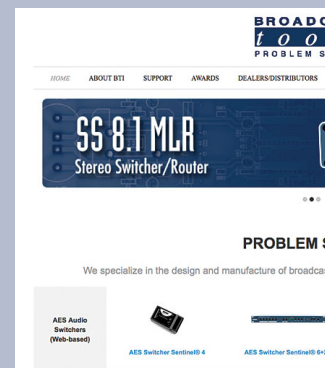
Adjusting Input and Output Levels

Once the input and output connections have been made, the input levels can be set. The switcher is factory set for unity, but has about 10 dB of system gain. Recommended input levels would be in the range of -6 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 have two trimmers per stereo channel.

Input Channel Expansion

Input expansion may be accomplished by connecting a shielded cable between the first units EXT 1+ input terminal and the second units unbalanced output. The shield should be connected to the ground terminal. Follow the same procedure for the EXT +1 right channel. The above example provides 8 inputs, with the first switcher providing the main output.

Connecting the RS-232 Serial Port

The multi-drop RS-232 transceiver always switches between transmit and receive mode, unless the unit ID is zero. In that case, the unit will always leave the RS-232 transceiver enabled. Use the provided modular (S9) 9-pin D-sub connector adapter and reversed modular cord to connect the SS 4.4's serial connector to your serial port.

Modular Jack Pin Numbers

The pin out of the adapter is shown below

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
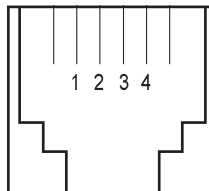
Modular Jack
Pin Numbers

The SS 4.4 is supplied with a X-over modular cable and a (S9) 9-pin female D-sub modular adapter for serial control. Only use the modular cord that is supplied with the SS 4.4 or a replacement that reverses (X-over), such as Radio Shack Cat No. 279-0347. Connect the cable between the SS 4.4 and your computers COM port or USB adapter cable (optional). The SS 4.4 may be serially controlled at baud rates of 9600 or 38400 baud. The unit is shipped set for 9600 baud, with 8 data bits, no parity and one stop bit. Load Windows "HyperTerminal" using the protocol of 9600-N-8-1. Set the mode to: DIRECT, Flow Control to: NONE and emulation to: ANSI. HyperTerminal set up instructions are available on our web site under "Downloads".

INSTALLATION
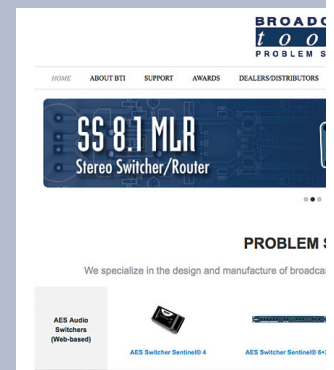
Connecting Two SS 4.4's To A Single Computers Serial Port
Multiple SS 4.4's may be cascaded serially to operate from the same serial port. The first step is to assign unit ID's to each SS 4.4. One suggestion is to assign unit ID 1 to the first SS 4.4 and unit ID 2 to the second switcher. The second step is to parallel the serial ports of the SS 4.4's. Plug the male end of the duplex modular adapter into the supplied female (S9) 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. 279-0357) and the other ends into each SS 4.4 modular receptacles. See the diagram below. NOTE: Three or more SS 4.4's may be daisy chained by using the above description and a Radio Shack Cat No. 279-0410, 5-jack modular adapter.

DB-9 (S9) Modular Adapter — Two-line Modular Adapter (not provided) — Modular Line Cord — To SS 4.4 #1

Modular Line Cord — To SS 4.4 #2
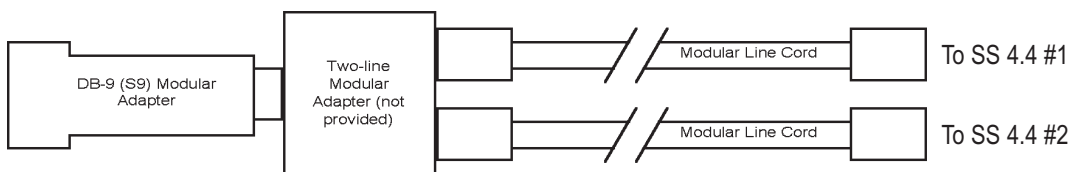
INSTALLATION
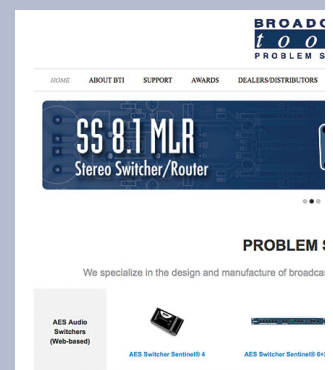
Operation Guidelines

Front Panel LED's

Front Panel LED's	Number Of LED's	Activation Event/Mode	Activation Behavior
Input connected to "OP 1"	4Green	State of connection	ON if connected
Input connected to "OP 2"	4 Green	State of connection	ON if connected
Input connected to "OP 3"	4 Green	State of connection	ON if connected
Input connected to "OP 4"	4 Green	State of connection	ON if connected
"MUTE"	1 Green	ALL inputs are OFF	ON
"MACRO"	1 Green	Used to set or playback a macro	Flickers when active
"ACT" Audio activity on output ONE only.	1 Green	Valid audio on output ONE only.	ON if audio for output ONE is above –25dB.
"SS", Silence Alarm on output ONE only.	1 Red	Duration of silence	In an alarm condition when ON.
"PIP" (Triggers) input activated.	1 Yellow	Any valid "PIP" / Trigger input, when enabled.	Flickers when active.
"PWR" Status	1 Green	Valid power and/or serial data.	ON, but flickers with serial data activity.

SS 4.4 Front Panel switch operation

Action	Result
Push the desired Input switch in the "OP-1" area.	The selected input is connected to output 1. To mute the active channel, simultaneously hold down the mute switch and the desired input channel.
Push the desired Input switch in the "OP-2" area.	The selected input is connected to output 2. To mute the active channel, simultaneously hold down the mute switch and the desired input channel.
Push the desired Input switch in the "OP-3" area.	The selected input is connected to output 3. To mute the active channel, simultaneously hold down the mute switch and the desired input channel.
Push the desired Input switch in the "OP-4" area.	The selected input is connected to output 4. To mute the active channel, simultaneously hold down the mute switch and the desired input channel.

Switches	Function
Input channels 1 through 4 for each four-outputs.	Selects Input channel's one through four.
"MUTE"	Mutes any of the four outputs.
"MACRO"	To record a macro: Set up the desired input/output configuration, then hold down the macro & mute switches (the macro led will flash), next press one of the 16 input switches.
	To play back: Hold the macro switch (the macro led will flash until released) and then select one of the 16 desired macro input switches.
"MON"	Used to select which of the four outputs are monitored.

Serial Control

The unit is controlled in either Menu or Burst mode. It can run at the following data rates: 9600 Default or 38.4K baud. The SS 4.4's serial communication is supplied with a multi-drop RS-232 port, allowing a maximum of four SS 4.4's on a single PC's COM port. Commands may be entered either via a menu (menu mode) or a short form code (ASCII serial string-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, then the command.

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OPERATION

The command to enter menu mode is: *0MM. The menu mode displays certain parameters, and allows for the control and/or configuration of most switcher functions.

```
9600 - HyperTerminal                                              _|□|x|
File  Edit  View  Call  Transfer  Help
D|ε| ε|3| □|δ| ε|

Broadcast Tools(R) SS4.4, v1.7 - Setup Menu

1 - Set PIP Minimum Hold Time(0 - 2.55 sec) - Now:0.05
2 - Set Open Collector/Relays Mode          - Now:FOLLOW
3 - Set O/C, Relay Pulse Time (0-25.5 sec)  - Now:1.0
4 - Set Silence Sense Acquire Delay (sec)   - Now: 10
5 - Set Silence Sense Restore Delay (sec)   - Now:  2
6 - Set Monitor Channel                     - Now:  1
7 - Lock/Unlock Front Panel                 - Now:UNLOCKED

A - Activate Audio Macro
S - Turn ON audio XPOINT
M - Turn OFF audio XPOINT                    |

V - Save Audio State for Power Up
C - Show Configuration and Status
F - Set Factory Defaults

Audio Status:SILENT
1->1

Enter Selection, or Q to quit:_

Connected 10:29:34   ANSI   9600 8-N-1   SCROLL  CAPS  NUM  Capture  Print echo
```

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 0-3. 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	0-3
ii	Input Number	01-04
o	Output Number	1-4
r	Output Relay	1-4
o	Open Collector	1-4

Set-up Commands

*uMM - Open up Menu

*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."

*uCDEF - Set factory defaults

*uCIIttt - Set "PIP" Programmable Pulse Stretcher Input Duration = ttt: 000 –> 255 hundredths of seconds (255 = 2.55 Seconds)

*uCLx - Lock Front Panel if x is "L". Unlock Front Panel if x is "U"

*uCPR - Power up audio state: Restore audio from power up state

*uCPS - Power up audio state: Save power up state

*uCRtt - Set Relay Momentary Pulse Length – tt: 00-99 for 00 –> 9.9 Seconds

Set-up Commands

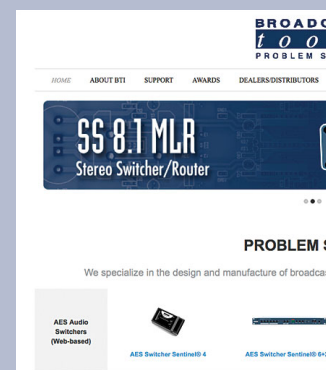*uCSAtttt - Set silence sensor time delay to tttt seconds (0002 – 9999), 0000 = OFF

*uCSBtttt - Set silence sensor restore delay to tttt seconds (0002 – 9999), 0000 = OFF

Relay and Open Collector Commands

*uORrF - Unlatch output relay "r"

*uORrL - Latch output relay "r"

*uORrP - Pulse output relay "r"

Relay and Open Collector Commands

*uOOoF - Unlatch open collector "o" (Only works in NON-Remote mode

*uOOoL - Latch open collector "o" (Only works in NON-Remote mode

*uOOoP - Pulse open collector "o" (Only works in NON-Remote mode

Audio Switch Control Commands

*uiio - Apply input "ii" to output "o"

*uiiA - Apply input "ii" to ALL outputs

*uiiEott - Start overlap - Apply input ii to output o. After tt tenths of a second, remove all other inputs from output o.
NOTE: Only one at a time can be pending per output. Max time 9.9 seconds

*uE - End overlap if in overlap mode. This applies to all outputs that have changed since the last "end overlap" command was issued.

*uiiMA - Mute input "ii" for all outputs

*uiiMo - Mute input "ii" for output "o"

*uMo - Mute output "o"

*uMA - Mute all outputs

Audio Switch Control Commands

*uB,a,a,a,a Set all status ignoring mode: Lower 4 bits of A is channel #'s OR'd together + 1,   upper 4 bits is 41. NOTE: Input commands MUST be in CAPS.
     A = all off
     B = 1
     C = 2
     D = 1 + 2
     E = 3
     F = 3 + 1
     G = 3 + 2
     H = 3 + 2 + 1
     I = 4 etc

Special MIX mode commands (the switcher doesn't need to be in MIX mode).

*uiiO1   For input ii, set output 1 on without affecting any other
*uiiO2   For input ii, set output 2 on without affecting any other
*uiiO3   For input ii, set output 3 on without affecting any other
*uiiO4   For input ii, set output 4 on without affecting any other
*uiiO5   For input ii, set output 1 off without affecting any other
*uiiO6   For input ii, set output 2 off without affecting any other
*uiiO7   For input ii, set output 3 off without affecting any other
*uiiO8   For input ii, set output 4 off without affecting any other

Information Retrieval Commands

*POLL - Respond with unit (ID) address in appropriate time slot. If there are multiple units on the line, each will respond with a different delay after receipt of this command.

*uSL - Send Audio Status: SuLo,x,x,x,x<CR><LF>. "u" is unit ID, "o" is output, and "x" is "1"for connected; "0" for not connected for each respective input.

*uSPii - Send single input (GPI) PIP status. Response is "SuP,ii,x" where "x" is 0 if the corresponding input is high, 1 if low.

*uSPA - Send ALL input (GPI) PIP status. Response is:
"SuP,A,x,x,x,x,x,x,x,x,x,x,x,x,x,x,x<CR><LF > where input 0 is first and input 15 is last. "x" is 0 if the corresponding input is high, 1 if low.

*uSO - Send status of all Open Collectors. Response is: SuO,x,x,x,x<CR><LF> (0 = OFF).

*uSR - Send status of all relays. Response is: SuR,x,x,x,x<CR><LF> (0 = OFF).

*uSS - Send status of silence sensor: SuS,a<CR><LF> a = 0 (not silent), 1 = silent

Information Retrieval Commands

*uU - Send Unit Information:<name)><version (><cr><lf Example: SS4.4 V:1.7

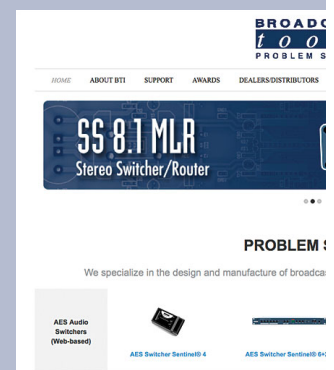*uY - Display configuration

Real Time Control Commands

*uDxx - Delay xx seconds before processing next command.

*uDLxxx - Delay xxx seconds before processing next command.

*uZx - Echo character "x" to serial control port. This is useful in debugging command strings.

Specifications

* Audio Precision Test Equipment

Input Levels:	Max + 27 dBu, balanced, bridging. 20k Ω.
Output Levels:	Four stereo balanced outputs, +24 dBm. @ 600 Ω. / +27dbu @ 10KΩ.
	Powered monitor unbalanced output, 0 dBm. @ 600 Ω. / +4dbu @ 10KΩ.
	Headphone output, 4.7 Ω. 100mw.
System Gain:	10 dB max.
Frequency Response: *	20 to 20 kHz; +/- .0.25dB
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.
Input expansion port:	Unbalanced summing inputs @ 10k Ω, 0 dBu.
Switching Method:	Digitally controlled professional level analog switch arrays.
Logic:	Flash microprocessor / Non-volatile memory.
Operation Control:	Front Panel - Momentary switches. Remote/"PIP"(Triggers) - Momentary (40ms to 2.54 seconds response time, compatible with CMOS/TTL logic, open collector or contact closures to ground. Serial - Multi-drop RS-232, 9600 or 38.4K, 8,N, 1.
Status/Control:	Front Panel - LED indicators. Control - 4 - SPDT Relays / Silence Sensor - 1 - SPDT Remote - 4 - Open collector outputs (6vdc @ 100ma). RS-232 - Multi-drop RS-232, 9600 or 38.4K, 8,N,1.
Interfacing:	Audio & Remote Control - Plug-in euroblock screw terminals. Accommodates 16 – 28 AWG wire. Mating connectors supplied. RS-232 Serial - RJ-11/6P4C reversed modular cable & "S9" female 9-pin D-Sub adapter supplied. USB-RS-232 Adapter cable and/or ESS-1 Ethernet to serial interface. Optional.
Power:	Universal AC (100-240 VAC, 46-63 Hz w/IEC) input, multi-voltage (+5vdc / +/-15vdc) DC switching power supply. CE. (supplied with domestic IEC AC cord).
Mechanical:	19" x 1.75" x 6.0" (WHD)
Weight:	5 lbs, (unit and accessories).
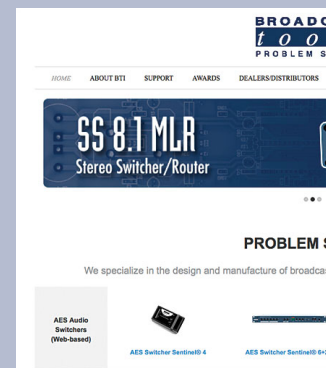
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Broadcast Tools, Inc.
131 State Street
Sedro-Woolley, WA 98284 • USA

360.854.9559 **voice** • 866.783.1742 **fax**
support@broadcasttools.com **e-mail**
www.broadcasttools.com **website**

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