



Crosspoint Audio
Switch 8 by 8 Stereo

Manual Version 2.01



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AS8x8

Crosspoint Audio Switch 8 by 8 Configuration



Product description

The AS8x8 Audio Crosspoint Switch is a digitally controlled matrix of 64 T-Switches that can connect any one of eight stereo audio inputs to any, or all, of eight audio outputs. The switch matrix utilizes monolithic, CMOS matrix IC's to achieve minimal crosstalk.

The AS8x8 can be manually controlled using the front panel controls or remotely controlled via a standard, asynchronous RS232 Serial Interface.

The eight audio inputs are fully buffered.

The eight audio outputs are driven by high quality stable audio amplifiers that are capable of driving 600 Ohm loads.

The system features a unique and simple programming operation which allows the user to specify various operating parameters, i.e., mode of operation, baud rate, unit ID code, etc. Programmed information is stored in an internal EEPROM to prevent inadvertent loss of data caused by the loss of power.

Power Supply

The unit is shipped with a wall mount DC power supply rated at 12 volts, 500 mA. Other suitable power supplies in the range of 9 to 15 volts may also be used. The unit has an internal bridge rectifier on the power supply input so that the user need not be concerned with the polarity of the power connector being used.

Audio Connections

The eight stereo audio inputs and eight stereo audio outputs are located on the rear panel of the device. The connectors are phono (RCA) style unbalanced.



Serial Interface

The RS232 Interface connections use RJ11 type connectors located on the rear panel. The unit is supplied with a cable adapter for connecting the system to standard DB9 Serial Comm Ports. The two RJ11 connectors on the rear panel of the system are labeled HOST, and LOOP. The cable adapter is configured for connection to a standard DTE Serial Interface common to most all personal computers. Refer to the Appendix section, for detailed information on the serial interface connections. For systems employing a single AS8x8 unit, the serial cable is connected to the rear panel RJ11 connector labeled HOST. For systems using multiple AS8x8's, the systems are "daisy-chained" by connecting the LOOP connector of each unit to the HOST connector of the next successive unit.

System Configuration

Prior to operation, the unit must first be configured by programming various operating parameters and storing them in the internal EEPROM memory. The unit is programmed with the following parameters.

1. Operating Mode
2. Serial Port Baud Rate
3. Unit Identification Code

Operating Mode



The operating mode is selected by setting the front panel thumbwheel switch labeled Audio Output Channel 1. The unit supports two Manual Modes and two Remote Modes. In Manual Mode, the unit switches the audio signals under control of the front panel thumbwheel switches. In Remote Mode, all audio switching is controlled by commands sent to the unit using the RS232 interface.

The mode settings are as follows:

Mode 1: Scanned Manual Mode

In this mode, the front panel thumbwheel switches are continuously scanned for any changes. When a change is detected, the unit automatically switches the audio switch setting.

Mode 2: Triggered Manual Mode

This mode is similar to the Scanned Manual Mode, in that the unit continuously checks the front panel switches for any change. When a change is detected, the unit then waits for the operator to press the LOAD pushbutton before switching the audio.

Mode 3: Single Unit Remote Mode

In this mode, all audio switching is accomplished by sending commands via the RS232 Serial Interface. See **BAUD Rate** for setting the communication speed.

Mode 4: Multiple Unit Remote Mode

This mode is the same as Mode 3, but also supports multiple units on the same RS232 interface. Each unit must have a unique Unit Identification Code, and requires address commands to be sent from the host computer prior to any switching commands. See **BAUD Rate** for setting the communication speed.

BAUD Rate

The front panel thumbwheel switch labeled Channel 2 is used to program the baud rate for the RS232 interface. The serial interface parameters are 1 stop bit, 8 data bits, and no parity. The AS8x8 supports the following baud rates:

Switch Setting	BAUD Rate
1	9600
2	4800
3	2400
4	1200
5	600
6	300
7	150

Unit Identification Code

The next two front panel thumbwheel switches (Channels 3 and 4) are used to program the Unit Identification Code. In a single unit system (Mode 3), changes to these values are irrelevant. In multiple unit remote configurations, this value can be any number from 01 to 99, but care must be taken to insure that all units have a unique ID code.

Programming

Programming the configuration information into internal EEPROM is accomplished by first setting the front panel thumbwheel switches (Channel 1-4) to the desired setting. The unit is then powered up while depressing the front panel LOAD pushbutton. Upon power up, the internal microprocessor detects the depression of the LOAD switch, and then programs the internal EEPROM memory with the selected values. The unit will flash the front panel SET LED for a few seconds to indicate that it is programming the system EEPROM, and will then enter the operating mode. The unit will now enter the appropriate operating mode whenever it is powered up. The unit can be reprogrammed any time the user desires, and the internal EEPROM is rated for an excess of 10,000 write operations.

Operation

The following paragraphs detail the operating procedures for each of the four operating modes that can be programmed into the AS8x8 Audio Crosspoint Switch.

Mode 1 (Scanned Manual Mode)

When operated in this mode, the user sets the front

panel thumbwheel switch corresponding to the specific output channel. Setting the thumbwheel switch to the values of 1 through 8 will connect that audio input to the specified output. Setting the thumbwheel switch to a value of 0 or 9 will turn off the output. When the unit detects a change on the front panel thumbwheel switches, it will switch immediately. In this mode the front panel SET LED is always on, indicating that the audio outputs are always corresponding with the thumbwheel settings.

Mode 2 (Triggered Manual Mode)

This mode is similar to the Scanned Manual Mode, with one exception. When a change is detected, the system will turn off the "SET" LED to indicate a disparity between the thumbwheel switches, and the actual audio signal routing. The unit then waits for the operator to initiate the new selection by pressing the front panel "LOAD" button. This mode prevents erratic audio outputs caused by scrolling the thumbwheel switches through the selections. Once the "LOAD" button is pressed, the unit then sets the new selection and then reactivates the "SET" LED to indicate that the new selection has been activated.

Mode 3 (Single Unit Remote Mode)

In this mode, the unit is controlled exclusively by the serial RS232 interface. Routing of the audio signals is accomplished by using a host computer to transmit simple commands to set the audio outputs. The following is a list of the commands used by the AS8x8. Each command must be terminated by a carriage return (hex 0D). All characters that are transmitted to the unit are echoed back to the host

computer.

Command Description

Sio (Set Input Output)

This command routes an input channel specified by i to and output channel specified by o. The i and o characters are single digit values from 0 to 8 (0 being channel off). There are no spaces allowed. The command must be followed by a carriage return. The unit switches immediately after receiving the carriage return.

R (READ)

This command causes the AS8x8 to transmit the current settings of all 8 audio outputs to the host computer. No carriage return is necessary.

L (LOCK)

When received , this command locks the current audio setting to prevent changes. Once locked the unit will then ignore any subsequent SET commands, and will display an appropriate error message. The audio setting can still be viewed using the READ command. The unit will stay in the locked mode until as ESC (1B hex) code is received. No carriage return is necessary.

M (MANUAL)

This command is used to place the unit in the Triggered Manual Mode (Mode 2) from the Remote Mode. Once initiated, the unit will remain in the Triggered Manual Mode. To return to the remote mode transmit an ESC (1B hex) to the unit. No carriage return is necessary.

Mode 4 (Multi Unit Remote Mode)

In this mode, several units are controlled exclusively by the serial RS232 interface. Routing of the audio signals is accomplished by using a host computer to transmit simple commands to set the audio outputs. Each unit to be controlled must be given a unique ID address to allow the host computer to distinguish which switcher is to be controlled. A user can use the same ID address to control multiple AS8x8 switchers simultaneously. The command structure for Mode 4 is identical to that of Mode 3 with the following exceptions.

Setting ID Address

As stated before, channel #1 sets the Mode of the AS8x8 and channel #2 sets the baud rate. Channel 3 and channel 4 become the ID address for an AS8x8. Set the Mode, Baudrate, and ID address, then hold the LOAD button during power up to set the AS8x8 into Mode 4. You must use both Channel 3 and Channel 4 to set the ID address. The range of ID address supported with the AS8x8 is 01 to 99. As you can see, ideally, nearly one hundred units can be controlled in this manner. However, with the delays involved with sending and receiving data through the AS8x8s, only about ten (10) units can be connected together on the same RS232 line.

WK,## (Wake Unit ID)

This command is the first command sent to an AS8x8 set to Mode 4. This command activates the communication between the host computer and the switcher. The syntax for this command is **WK,##** (where ## is the unique ID address, a comma (,) is

required between WK and ##, example; WK,01 will wake up ID address 01). A carriage return is required after this command is entered.

SP (Sleep)

This command is used to stop an AS8x8 from acting upon commands that may be sent to a different ID addressed AS8x8 connected to the same RS232 line. A sleep command is a global command, this means that the command will put all units connected to “sleep”. No carriage return is necessary.

Specifications



Audio Inputs

HiZ (100k) stereo unbalanced phono (RCA) connectors
Level: 0 dBm (775 mV)

Audio Outputs

Level: 1V p-p, nominal
Impedance: 75 Ohm

Serial Interface

Standard RS232 (4 wire)
8 data bits, No parity bit, 1 stop bit (8,N,1)
Speeds: 150, 300, 600, 1200, 2400, 4800, 9600 Baud

Performance

Distortion: .03% THD
Headroom: +12 dB
Bandwidth: 10 Hz to 40 kHz \pm 0.25 dB
S/N: 91 dBA

Electrical

Power Supply: 9-12 VDC @ 250 mA

Mechanical

Height: 1.75H x 16.5W x 6.0D inches
Rack Mount: RM-Ear

Notes

