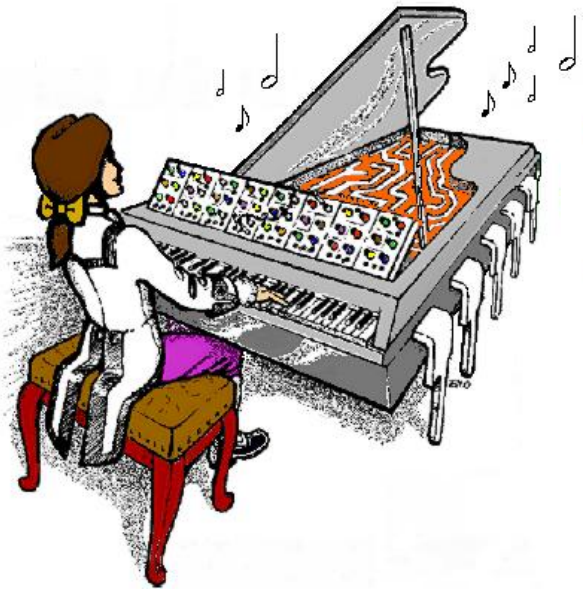
MIDI2SDS(X) MIDI to Trigger Module



Congratulations on your purchase of this MIDI2SDS(X) product.

The enclosed CDROM includes all the schematics, component overlays, Bills Of Materials and assembly documentation (in Acrobat PDF format) but readers are requested to visit my website to check for latest updates and Paul's website at:-

http://www.vacoloco.net/synths/midi2sds

Please feel free to email me with any enquiries you may have regarding this or any other related product.

You will require an Acrobat PDF viewer for the schematics and documentation.

MIDI2SDS(X) MIDI to Trigger Module

MIDI2SDS is an 8-channel MIDI note to Trigger unit suitable for use with a variety of drum machines including the SDS range from Simmons for which it was originally designed.

The unit has 8, velocity sensitive, trigger outputs which can be assigned to a specific MIDI Note using the `LEARN' mode.

The period of the gate-on time can be adjusted using the onboard trimpot (P101) from approximately 1mS to approximately 130mS.

It also has a 'learn' mode, which lets you assign different notes and channels to different triggers. You could, for example, have four triggers on channel 10, two more on channel 11, one on channel 15 and one on channel 2.

To use the `learn' mode, you simply hold down the LEARN button until all the LED's come on. Then the LED for the first channel to be set will flash once every second, indicating that it is waiting for a note to be assigned to trigger it. Once received it will then wait for the associated NOTE OFF command before triggering its output, and then moving on to the next channel.

Repeat for all 8 triggers, if you don't want to reprogram all the outputs then simply wait, the unit will time out after roughly 4 seconds, saving any changes to trigger notes in FLASH memory.

MIDI2SDS also has 8 LED's which indicate the status of each of the output triggers and are also used during LEARN mode to assist the user whilst programming the board. These LED's can either be mounted directly on the board or, if required, panel mounted.

MIDI2SDS can be powered in 2 ways:-

1. using a dual +/12V regulated supply at approximately 50mA per rail. In this configuration the TRIGGER outputs can be adjusted to come down to 0V
2. using a single 9V-12VDC supply. In this configuration the MIDI2SDS(X) performance specification matches that of the original MIDI2SDS where the TRIGGER outputs drop to approximately 2V.

NOTE: The ED103-MIDI2SDS(X) incorporates additional circuitry that allows the upper voltage level to be adjusted up to approximately 10V – the factory default setting is 5V.

MIDI2SDS(X) Firmware

The latest release of the MIDI2SDS(X) firmware (version 3.8 and later) includes the following 2 features:-

1. Positive/negative outputs: This dipswitch allows the outputs to be inverted so that they are either positive-going (from 0V to 4*V) or negative-going (from 4*V to 0V). Note that the actual maximum excursion in either mode is determined by the Velocity value received for each channel i.e. a Velocity value of 127 will result in the maximum excursion of 4*V while, for example, a Velocity value of 64 will result in a 2*V excursion.
2. Trigger/Gate mode: This dipswitch determines how and/or when a triggered output will turn OFF. In the TRIGGER Mode the output pulse width is determined by the setting of the pulse-width trimmer (P101). In the GATE Mode the output will only turn OFF when an associated NOTE OFF command is received.

NB: These settings are global and apply to all 8 outputs

* the ED103 version of the MIDI2SDS(X) has additional circuitry that allows this upper voltage to be adjusted up to approximately 10V

Construction Notes

Construction of the MIDI2SDS(X) is very straight forward. Attention must be paid, as usual, to the orientation of polarized components and the usual ESD procedures should be in place when handling sensitive components.

Depending upon the method chosen to power the board some component locations on the pcb may not be used. The standard MIDI2SDS(X) Component Kit assumes that a single 9-12VDC supply will be used as per the original MIDI2SDS design.

With the board dressed we need to attend to the installation of the board in to your system. The available space and your requirements will dictate how this will actually be done. The first decision is to how many of the I/O components will be panel mounted away from the board. As a minimum you will need to be installing a MIDI-IN socket, LEARN switch and up to 8 trigger outputs. As an option there are also 8 LEDs which, if not used for showing TRIGGER status, are useful when using the LEARN mode. The LEDs, MIDI-IN socket and LEARN switch are all on one edge of the MIDI2SDS(X) pcb as these items usually need to be panel mounted. TRIGGER outputs can either be hardwired directly in to your system or bought out on to a patching panel.

If, as suggested, the MIDI-IN, LEARN and LED's are all mounted together on a front panel then you can use the supplied template to locate the positions of the 10 holes that will require to be drilled. The standard MIDI2SDS(X) kit contains a panel mounted MIDI-IN socket and LEARN switch which will need to be wired to the pcb. The LEDs supplied come with chrome bezels and these will need to be mounted to the panel before they are solder to the pcb. Construction should follow these simple steps:-

1. dress the MIDI2SDS(X) pcb with all components excluding the MIDI-IN socket, LEARN switch, LEDs and TRIGGER outputs
2. connect flying leads to the TRIGGER outputs
3. connect power leads to the POWER pads
4. having drilled the 10 holes for the panel components, install the 8 LED's ensuring that the orientation of the legs matches the orientation on the pcb. It is recommended that the LED legs be bent at right-angles about 2mm from the plastic moulding (being careful not to stress the component), this will allow the pcb to sit at right-angles to the front panel thus providing easier access to the trimmers.
5. mount the LEARN switch and MIDI-IN sockets
6. offer the MIDI2SDS(X) assembly up to the front panel guiding the LED legs in to their correct positions. When satisfied with the positioning of the pcb solder the LED legs to the pcb
7. use stiff wire to wire the LEARN switch and MIDI-IN sockets to the pcb. Refer to the component overlay for identification of the relevant pads
8. run the TRIGGER leads to the required position and terminate. In addition to the 8 TRIGGER output wires you will usually need at least 1 COMMON (0V) connection
9. run the POWER leads to the required position and terminate.

Setting-up the MIDI2SDS(X)

There are 2 adjustments that can be made on the MIDI2SDS(X).

The 1st adjustment defines the pulse-width of the TRIGGER outputs. This should be set to the smallest time period possible consistent with reliable triggering and operation of the attached triggered devices. If the pulse is set too small then the triggered devices may not trigger reliably or some devices may not produce the full `sound' for which they were designed. Increasing the pulse-width over the optimum period will affect the speed at which MIDI2SDS(X) can accept repetitive triggers for the same output.

The 2nd adjustment is optional dependent upon the power supply configuration that is chosen. The original MIDI2SDS used a single (internal) supply of 5VDC which was powered from an external 9V to 12VDC supply. The MAX528 has a limitation that its outputs will not go from rail-to-rail and thus in the original MIDI2SDS the trigger outputs have a reduced voltage swing of between 1.5V and 2.75V. This is usually sufficient to trigger most devices. If the dual power rail option is installed then the lower voltage can be reduced to 0V or even lower. If installed, this trimmer should be adjusted so that RefLo is typically –1.5VDC (or at a level that results in the pulses reaching 0V).

Your unit should now be ready to operate. Apply power and note that the 8 LEDs display a running pattern that indicates the unit is functioning correctly.

NOTE: The ED103 version of the MIDI2SDS(X) has a 3rd trimmer that allows the upper voltage of the outputs to be adjusted up to approximately 10V and is factory set to generate 0V-5V outputs.