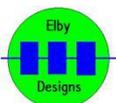




MIDI-Retrofit-8 8-channel MIDI to TRIGGER Module

Construction Guide V1.7

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MIDI-Retrofit-8 - MIDI to Trigger Module

Construction Notes

Construction of the [MIDI-Retrofit-8 \(3D Model\)](#) is pretty 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.

Construction should follow these simple steps:-

- a) dress the [MIDI-Retrofit-8 PCB](#) with all components as required – see Build Options
- b) install the board using the four mounting points
- c) install all required panel components
- d) connect panel components to the board using equipment wiring and the supplied crimp terminals

C102 should either be soldered to the terminals of S101 on the underside of the PCB or the [LEARN] terminals.

Build Options

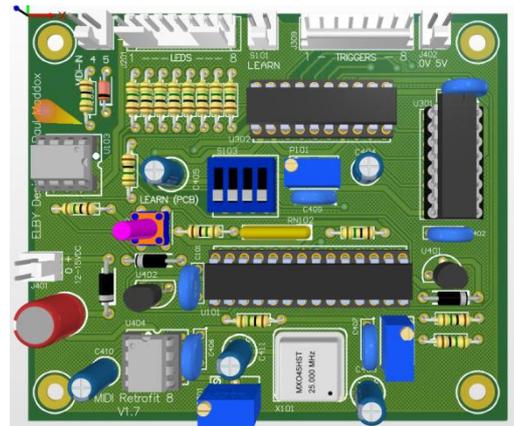
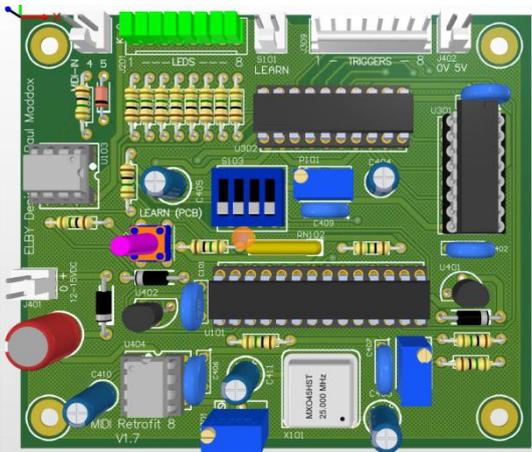
There are a couple of build options that will be decided on how you will be installing the MIDI-Retrofit-8 and will affect the selection of some components on the PCB.

LED Indicators

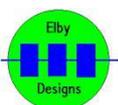
The LED Indicators serve 2 functions:

1. The LEDs flash whenever their respective TRIGGER Output is fired and so allow the user to observe the 'trigger pattern'
2. The LEDs provide a 'progress indication' during the [LEARN] mode

If you intend to re-assign the TRIGGER Channels on a regular basis then we recommend that the LEDs be fitted external to the PCB in an easily viewable location along with the [LEARN] switch. Install the 8-way MTA header as shown at right. An external momentary pushbutton switch should also be connected to S101.



If you intend to re-assign the TRIGGER Channels only once or rarely, then mounting the LEDs on the PCB is recommended. The external [LEARN] switch is not needed as the internal switch is provided for that purpose. Install 8x LEDs as shown at left.

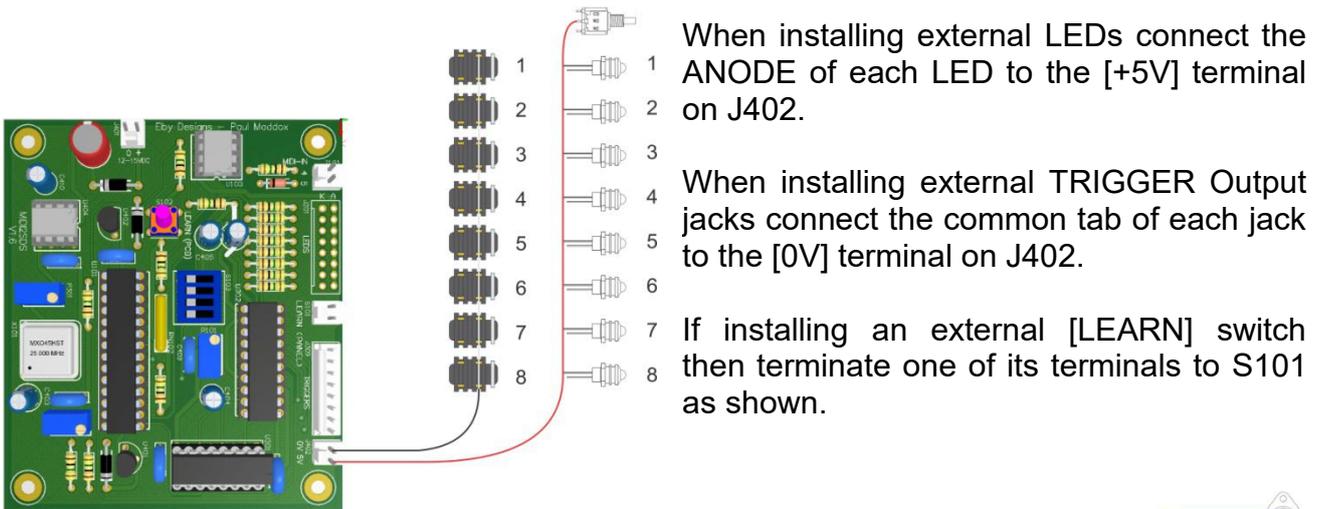


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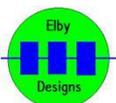
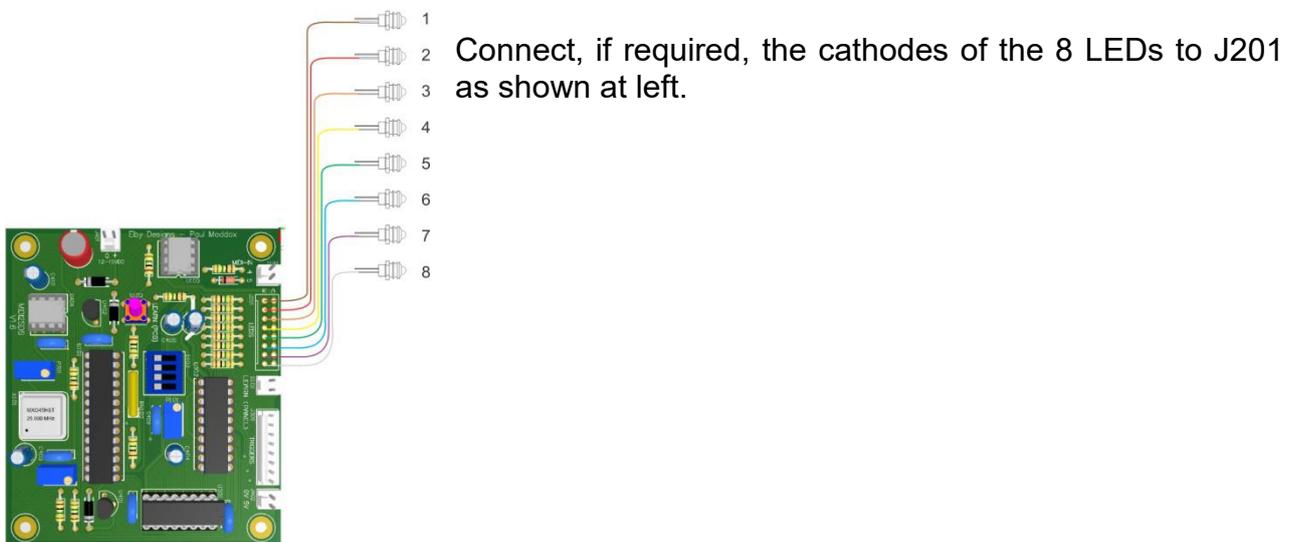
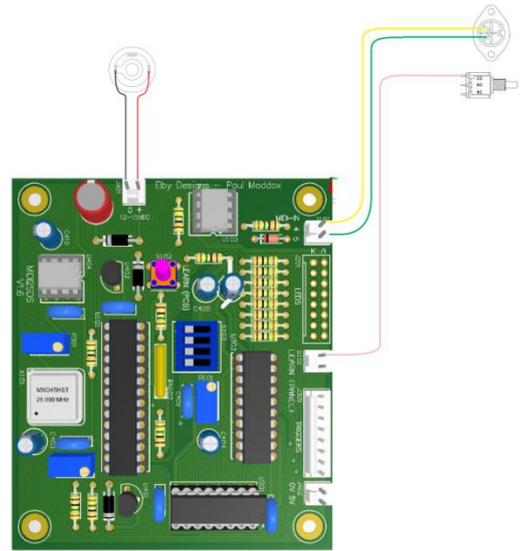
J402 is used to provide 0V and 5V to the external TRIGGER jacks (if fitted) and the LED anodes (if external LEDs are fitted). This should not be used as a 5V power supply for external equipment and you must NOT connect this to an external 5V supply.



J401 is the power connection for the MIDI-Retrofit-8. The supply should, ideally, be in the range of 12VDC to 15VDC. If available within the unit then terminate a lead from J401 to suitable points in the unit. If using an external supply, then terminate a lead from J401 to a suitable DC connector.

J101 is the MIDI IN connector. A lead from J101 should be terminated on a suitable MIDI IN connector as required.

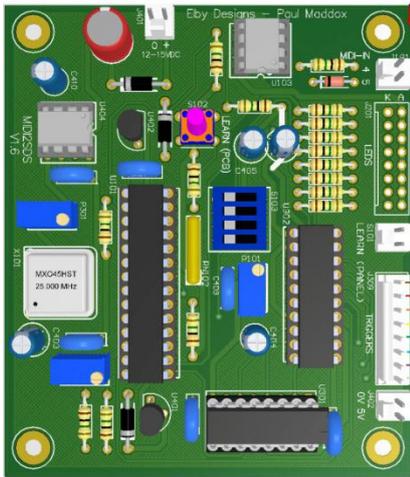
If an external [LEARN] switch is being installed, connect one of its terminals to S101 as shown at right.



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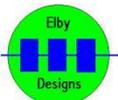


1 If installing external TRIGGER Output jacks, then terminate their 'signal' contacts to J309 as shown at left.

2
3 If installing in to a unit, then terminate leads from J309 to suitable points in the unit.

4
5 ***It is important to confirm that the points being used within the unit are suitable for connection to a direct logic-drive output.***

6
7
8 ***If not, you may damaged both the MIDI-Retrofit-8 and the unit.***



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Setting-up the MIDI-Retrofit-8

There are 3 adjustments that can be made on the MIDI-Retrofit-8

To allow calibration for steps (2) and (3) it is necessary to have a MIDI controller connected and for the MIDI-Retrofit-8 to respond to the controller. If your MIDI controller cannot be set to generate MIDI Channel 10 messages then you will need to go through the [LEARN] Mode and set at least the assignment for [TRIGGER 1].

The following procedure assumes a positive trigger output (DIPSWITCH #1 = OFF).

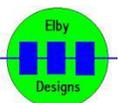
- (1) This adjustment is used to set the lower voltage level of the output trigger pulse.
 1. Set all dipswitches 2, 3 & 4 to the OFF position.
 2. Monitor the output of TRIGGER 1 with a multimeter and adjust P301 to set the 'OFF' trigger pulse voltage to the desired level which is, normally, 0V(*).

- (2) This adjustment is used to set the higher voltage level of the output trigger pulse.
 1. Set DIPSWITCH #2 to ON
 2. Connect a MIDI Controller to the MIDI IN socket
 3. Press and hold the note corresponding to [TRIGGER 1]. The note must have a MIDI Velocity ≥ 120
 4. Monitor the output of [TRIGGER 1] and adjust P401 to set the 'ON' trigger pulse voltage to the desired level which is, normally, around 5V(*).

- (3) This 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 MIDI-Retrofit-8 can accept repetitive triggers for the same output. If you do not know the optimal pulse width for your applications we suggest setting it to around 1mS
 1. Set all dipswitches to the OFF position
 2. Monitor the output of [TRIGGER 1] with an oscilloscope
 3. Repeatedly play the assigned note
 4. Adjust P101 to set the desired pulse width.

Your unit should now be ready to operate. Apply power and note that the 8x LEDs display a running pattern that indicates the unit is functioning correctly. If the unit has not been through the [LEARN] mode then the pattern will run from the centre triggers [TRIGGER 4] and [TRIGGER 5] to their respective end triggers ([TRIGGER 1] and [TRIGGER 8]) and then back to the centre triggers. If the unit has been through the [LEARN] mode then the pattern will run from [TRIGGER 1] to [TRIGGER 8] and then back to [TRIGGER 1].

(*) If you are going to use negative-trigger outputs then the voltages in (1) and (2) will need to be swapped i.e. the 'OFF' voltage will be 5V and the 'ON' voltage will be 0V.



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MIDI Trigger Assignments

The default TRIGGER assignments in the firmware are:-

Trigger	Note	Instrument	MIDI Note	MIDI Channel
1	C1	Bass Drum 1	36	9
2	D#1	Hand Clap	39	9
3	A1	Low Tom	45	9
4	C#2	Crash Cymbal 1	49	9
5	D2	High Tom	50	9
6	G#2	Cowbell	56	9
7	C3	Hi Bongo	60	9
8	D#4	Claves	75	9

Assign Factory Defaults

To reset the MIDI Note and MIDI Channel assignments to the above factory defaults, press and hold the LEARN button, continue holding while the MIDI-Retrofit-8 cycles through an LED pattern, the unit should now automatically load the factory defaults.

SYSEX Programming

The [TRIGGER] output assignments can be programmed using a SYSEX message of the following format:-

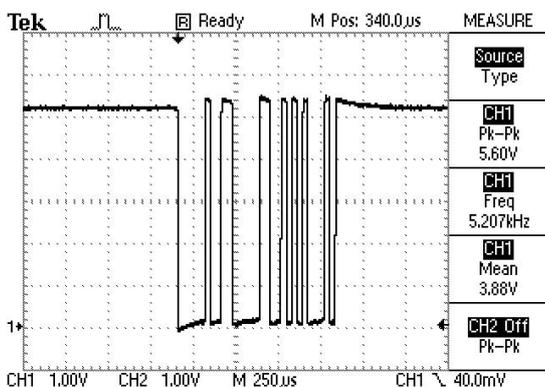
F0	00	20	69	02	00	00	16-bytes of data as below								F7
T1c	T1n	T2c	T2n	T3c	T3n	T4c	T4n	T5c	T5n	T6c	T6n	T7c	T7n	T8c	T8n

Where :-

Txc = MIDI Channel for trigger output x (00 = MIDI Channel 1)

Txn = MIDI Address for trigger output x (00 = MIDI Address 1)

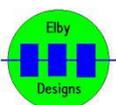
MIDI Signal



If you are having problems with the unit not responding to MIDI and you have access to an oscilloscope, then you can (carefully) probe U101_2 and check that you (a) have a signal and (b) that is within specification.

The signal should be sitting, nominally, at 5V and have negative-going pulses when MIDI data is being received. The pulse should have reasonably square edges.

If you are not seeing any pulses, check the wiring of your MIDI IN socket.



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