TRANSMUTER

USER MANUAL

VERSION 1.0

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Basic Overview / Quickstart

LED 1 to 8 - The LEDs are activity indicators and light when activity occurs on either associated TRIG IN or TRIG OUT

CV OUT 1 & II - CV OUT I accompanies TRIG out 1 and CV OUT II accompainies TRIG out 2.
These analog outputs can be used for Velocity, Continuous Controller, Pitch Wheel, Program Change, After Touch and Channel Pressure data associated with messaged mapped to TRIG1 and TRIG2.

TRIG IN- The eight trigger inputs are converted to MIDI messages based on the current preset.
Six Inputs (1 through 6) are analog capable and can be used to control velocity, pitchwheel and continuous controller messages.
Inputs can be configured to:
Drum Trigger (Note ON only)
Gate (Note ON + OFF)
Control Change
Pitch Wheel
After Touch
Channel Pressure
Program Change
MIDI Clock
Chords
Quantized Scales
MIDI Real-Time
- Start
- Stop
- Continue
- Song Reset

MIDI IN - 3.5mm TRS MIDI input for connection to recieve MIDI data from external MIDI devices. Configuration jumpers allow for selection between the two main MIDI TRS cable standards.

MIDI OUT - 3.5mm TRS MIDI output for connection to send MIDI data to external MIDI devices. Configuration jumpers allow for selection between the two main MIDI TRS cable standards.

LOAD / LEARN - pressing the button for 2 seconds enters preset load mode which allows selection from one of 8 presets.
Pressing the button for 5 seconds puts Transmuter into MIDI learn mode.

TRIG OUT - The first two of the eight outputs have an accompanying CV output and can be mapped to recieve Note ON (with velocity), Pitch Wheel, Continuous Controller (Volume, Pan, Modulation etc), Program Change, Channel Pressure, After Touch or Real Time messages (Start, Stop, Continue, song Reset or Clock). The following six outputs can be mapped to recieve Note ON and Real Time messages. MIDI clock is 24 ticks per quarter note but a divider can be applied to the MIDI clock to also provide 12, 8, 6 , 4, or 1 TPQN. Additionally a divide by 96 option is provide to give one "tick" (or clock pulse) per four quater notes.
Each preset has the option of passing Clock and/or other MIDI real-time transport messages (Start, Stop, Continue and Song Reset) from the MIDI input to the MIDI output so that everything can stay in sync).

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CV/Trigger Inputs to MIDI OUT

Transmuter has eight CV/trigger inputs which are converted into MIDI messages and sent via the **MIDI OUT** TRS output.

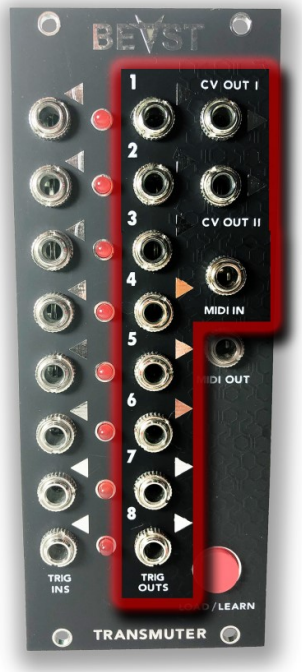
Inputs 1 to 6 are analog and can detect and transform CV between 0-5v. Input voltages below 0v will be clipped to 0v and voltages above 5v will be clipped to 5v. Analog inputs can be used for velocity sensitive NOTE ON messages , Continuous Controller messages, After Touch messages etc.

Trigger signals can for example be run through a VCA before connection to Transmuter to allow the trigger signal/level to be modifed and affect the velocity of the MIDI notes generated. This allows the introduction of dynamics which can greatly enhance musicallity.

The analog inputs can also function as digital inputs (Program Change, Clock, Transport etc) if CV functionality is not required.

Inputs 7 & 8 are digital and can only send Note On, Program Change, Clock and Transport messages.

MIDI IN to CV/Trigger Outputs



Transmuter has eight CV/trigger outputs which are controlled from MIDI messages supplied to the **MIDI IN** TRS input.

Outputs 1 and 2 have an accompanying CV output and can be used to convert MIDI note velocity, continuous controller (Pitchbend, Mod Wheel etc), Aftertouch etc into a CV signal between 0 and 5v.

Oututs 3 to 8 are digital only and can only be used for trigger/gate signal generation for MIDI Note On, Clock and Transport (Start/Stop/Continue) messages.

Outputs can be set to Gate or Trigger with configurable pulse length (1ms, 2ms, 5ms, 10ms or 50ms).

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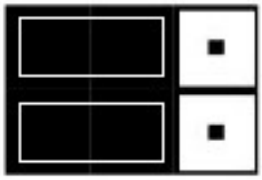
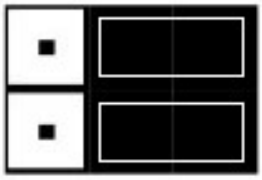
Jumper Settings / Cable Selection

The Beast-Tek cables supplied with the kit are MIDI TRS Type A cables. Type A is the MIDI standard. Some manufacturers use the opposite wiring which is known as type B. Transmuter can be configured to operate with either Type A or Type B by configuration jumpers on the back. The following jumper settings are looking at the back of the module, with the module upright:

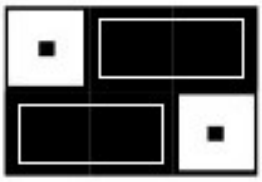
Type A The Beast-Tek MIDI TRS cables are type A. Use this setting for the cables supplied with Transmuter.

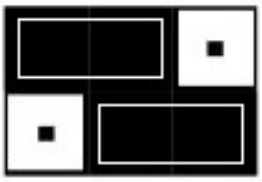


Type B is for interoperability with cables from other manufacturers. This setting will not work with the supplied cables.



The following jumper settings are **invalid** and *will not work*:





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Basic Operation (Preset selection and MIDI learn without PC)

The Load/Learn button allows basic programming of transmuter without a PC. MIDI Learn mode without a PC will map a note or CC (I/O 1 & 2 only) to both the MIDI to trigger output and the MIDI to trigger input.

This can be handy for setting up Drum Machines, Samplers and Controllers. For more complex configurations the PC application must be used.

The single Load/Learn button on the front panel responds to different length presses. The button must be pressed down and held for a certain duration.

Short Press – Less than 0.9 seconds (or 900 msec)

Medium Press – More than 0.9 seconds and less than 3.5 seconds (900 - 3500 msec)

Long Press – More than 5 seconds (5000 msec +)

Loading a Preset

A medium press of the load/learn button will enter preset load mode. When preset load mode is entered, LEDs 1 through 8 will flash sequentially then LEDs 8 through 1 sequentially to indicate preset load mode has been selected. Once the brief flashing sequence has completed the LED of the current preset will remain illuminated. For example: if preset 5 is active, then LED 5 will be illuminated.

A **short** press can now be used to cycle between the eight presets., with the LED of the selected preset number being illuminated. Once the desired preset has been selected, a **medium** press will load the selected preset. The selected preset LED will flash quickly for approx 1 second and then load.

If preset load mode has been selected by accident, a **long** press will cancel. The the of the previously loaded preset will flash quickly for approx 1 second and then preset load mode will be cancelled.

Midi Learn (and saving to a preset)

A long press of the load/learn button will enter MIDI learn mode. LEDs 1 through 8 will flash sequentially twice to indicate MIDI learn mode has been entered.

MIDI Learn mode will listen for Note On, Note Off and CC messages on any channel. Note: CC messages are available on 1 and 2 as these are the only I/O groups with CV outputs. CC messages on 3-8 will be ignored.

Gate Signals: If a MIDI Note On and Note Off message is received then this note will be learned as a GATE signal.

Eg. MIDI to trigger output will be HIGH until a note off message is received

Trigger Signals: If a MIDI Note On is received and another MIDI Note On is received before a Note Off message, then it will be learned as a TRIGGER signal with a 5ms pulse width.

Once a note/cc has been learned, the LED for that I/O will illuminate to indicate it has been learned.

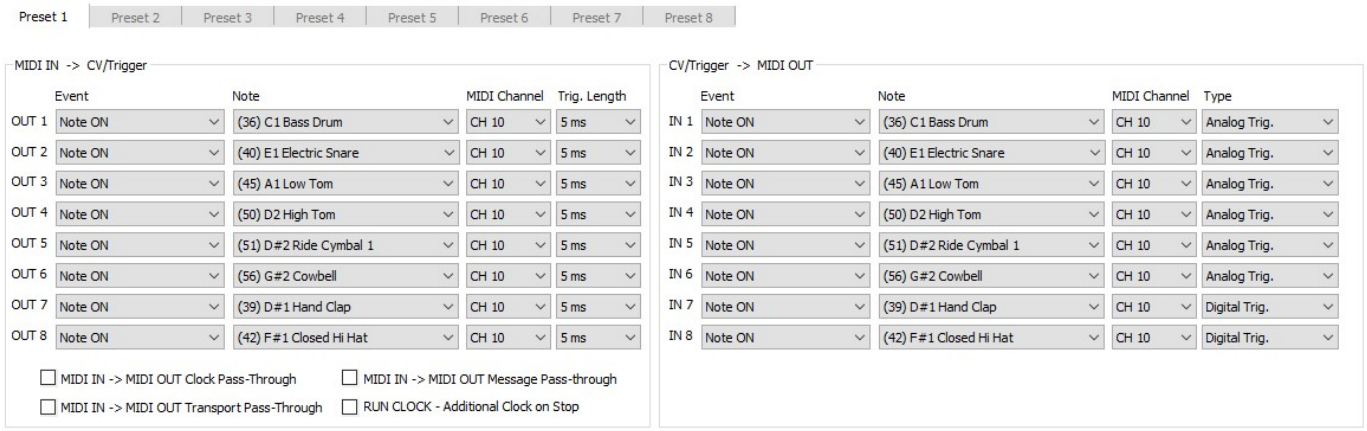
This process repeats until all 8 I/Os have been learned/mapped. All 8 LEDs are illuminated and flash rapidly for 1 second to indicate the learn process has been completed. The learned configuration must now be saved into one of the 8 preset slots available. LED 1 is illuminated to indicate that preset slot 1 is selected. Use short presses of the load/learn button to cycle between preset slots. Once the desired preset slot is chosen, perform a medium press of the load/learn button to save this configuration into that preset slot. The LED of the selected LED will flash quickly during the save process and when the LED stops flashing, the preset is active and ready for use.

Alternatively, if there was a mistake made during learn process. A long press of the load/learn button during the selection of the preset save slot will abort the learn process and re-load the last active preset.

Factory Presets

1. Behringer RD8

Preset 1 is configured for MIDI IN/OUT with the Behringer RD8 set to MIDI Channel 10. The sequencer can be used to generate eurorack trigger signals via MIDI IN and eurorack triggers can trigger sounds on the RD8 via MIDI OUT.



Preset 1 | Preset 2 | Preset 3 | Preset 4 | Preset 5 | Preset 6 | Preset 7 | Preset 8

MIDI IN -> CV/Trigger

	Event	Note	MIDI Channel	Trig. Length
OUT 1	Note ON	(36) C1 Bass Drum	CH 10	5 ms
OUT 2	Note ON	(40) E1 Electric Snare	CH 10	5 ms
OUT 3	Note ON	(45) A1 Low Tom	CH 10	5 ms
OUT 4	Note ON	(50) D2 High Tom	CH 10	5 ms
OUT 5	Note ON	(51) D#2 Ride Cymbal 1	CH 10	5 ms
OUT 6	Note ON	(56) G#2 Cowbell	CH 10	5 ms
OUT 7	Note ON	(39) D#1 Hand Clap	CH 10	5 ms
OUT 8	Note ON	(42) F#1 Closed Hi Hat	CH 10	5 ms

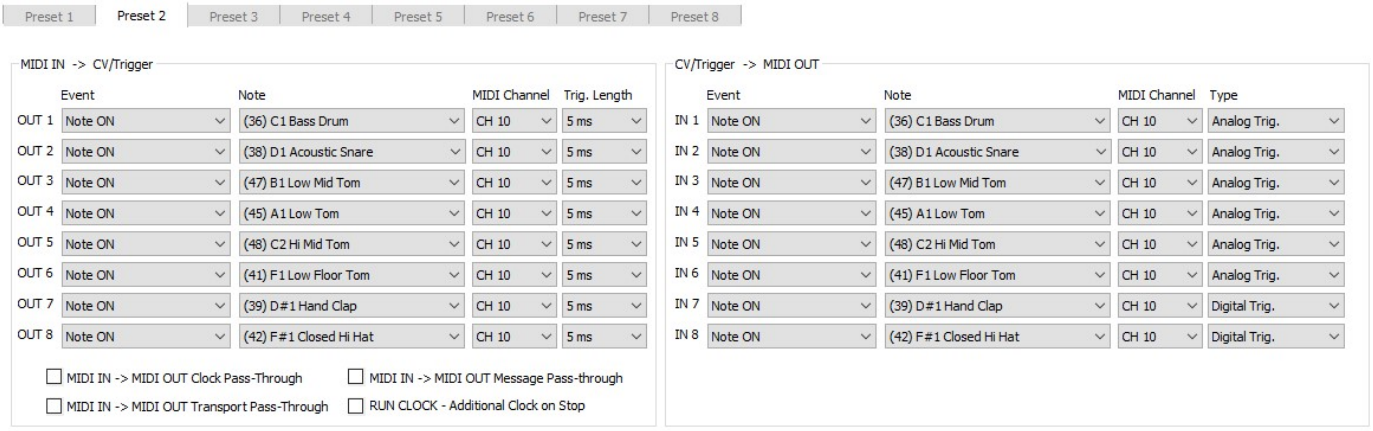
☐ MIDI IN -> MIDI OUT Clock Pass-Through ☐ MIDI IN -> MIDI OUT Message Pass-through
☐ MIDI IN -> MIDI OUT Transport Pass-Through ☐ RUN CLOCK - Additional Clock on Stop

CV/Trigger -> MIDI OUT

	Event	Note	MIDI Channel	Type
IN 1	Note ON	(36) C1 Bass Drum	CH 10	Analog Trig.
IN 2	Note ON	(40) E1 Electric Snare	CH 10	Analog Trig.
IN 3	Note ON	(45) A1 Low Tom	CH 10	Analog Trig.
IN 4	Note ON	(50) D2 High Tom	CH 10	Analog Trig.
IN 5	Note ON	(51) D#2 Ride Cymbal 1	CH 10	Analog Trig.
IN 6	Note ON	(56) G#2 Cowbell	CH 10	Analog Trig.
IN 7	Note ON	(39) D#1 Hand Clap	CH 10	Digital Trig.
IN 8	Note ON	(42) F#1 Closed Hi Hat	CH 10	Digital Trig.

2. Arturia Drumbrute

Preset 1 is configured for MIDI IN/OUT with the Arturia Drumbute set to MIDI Channel 10. The sequencer can be used to generate eurorack trigger signals via MIDI IN and eurorack triggers can trigger sounds on the Drumbrute via MIDI OUT.



Preset 1 | Preset 2 | Preset 3 | Preset 4 | Preset 5 | Preset 6 | Preset 7 | Preset 8

MIDI IN -> CV/Trigger

	Event	Note	MIDI Channel	Trig. Length
OUT 1	Note ON	(36) C1 Bass Drum	CH 10	5 ms
OUT 2	Note ON	(38) D1 Acoustic Snare	CH 10	5 ms
OUT 3	Note ON	(47) B1 Low Mid Tom	CH 10	5 ms
OUT 4	Note ON	(45) A1 Low Tom	CH 10	5 ms
OUT 5	Note ON	(48) C2 Hi Mid Tom	CH 10	5 ms
OUT 6	Note ON	(41) F1 Low Floor Tom	CH 10	5 ms
OUT 7	Note ON	(39) D#1 Hand Clap	CH 10	5 ms
OUT 8	Note ON	(42) F#1 Closed Hi Hat	CH 10	5 ms

☐ MIDI IN -> MIDI OUT Clock Pass-Through ☐ MIDI IN -> MIDI OUT Message Pass-through
☐ MIDI IN -> MIDI OUT Transport Pass-Through ☐ RUN CLOCK - Additional Clock on Stop

CV/Trigger -> MIDI OUT

	Event	Note	MIDI Channel	Type
IN 1	Note ON	(36) C1 Bass Drum	CH 10	Analog Trig.
IN 2	Note ON	(38) D1 Acoustic Snare	CH 10	Analog Trig.
IN 3	Note ON	(47) B1 Low Mid Tom	CH 10	Analog Trig.
IN 4	Note ON	(45) A1 Low Tom	CH 10	Analog Trig.
IN 5	Note ON	(48) C2 Hi Mid Tom	CH 10	Analog Trig.
IN 6	Note ON	(41) F1 Low Floor Tom	CH 10	Analog Trig.
IN 7	Note ON	(39) D#1 Hand Clap	CH 10	Digital Trig.
IN 8	Note ON	(42) F#1 Closed Hi Hat	CH 10	Digital Trig.

3. Transport + Clock / SP404SX

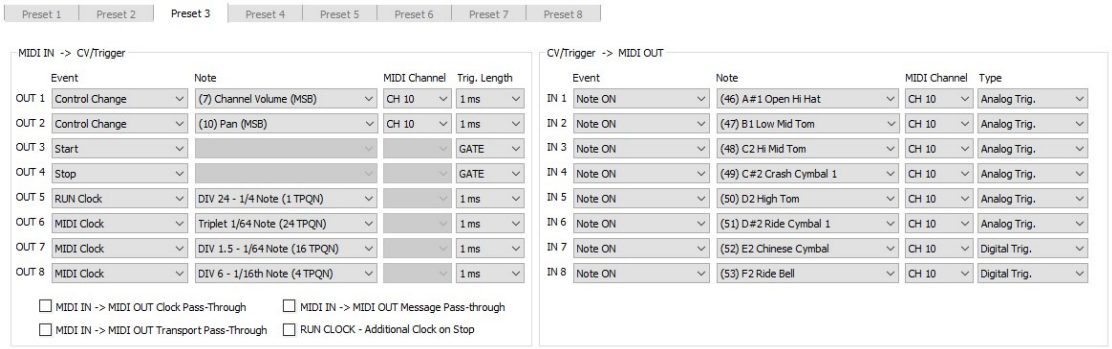
MIDI IN -> TRIG/CV OUT MIDI Input is configued to allow a MIDI sequencer to sync with eurorack sequencers/modules.

OUT1 & OUT2 are configured for Volume and Pan MIDI CC messages on Channel 10. Volume and Pan CC messages will set the CVs on CV OUT 1 and CV OUT2 between 0v and 5v.

OUT3 is a gate signal that goes high when START is pressed and will stay high until stop is pressed. OUT4 is configured as the inverse of OUT3.

OUT5 through OUT8 are different divisions of the MIDI clock 24, 16 and 1TPQN.

TRIG IN -> MIDI OUT Preset 3 Is configured for eurorack triggers to trigger sounds on a Roland SP404SX via MIDI OUT.



4. Transport + Clock / MIDI Drum

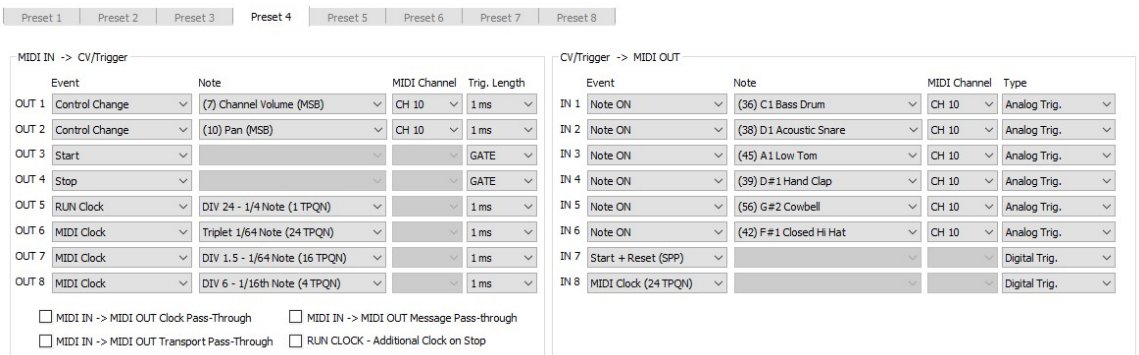
MIDI IN -> TRIG/CV OUT MIDI Input is configued to allow a MIDI sequencer to sync with eurorack sequencers/modules.

OUT1 & OUT2 are configured for Volume and Pan MIDI CC messages on Channel 10. Volume and Pan CC messages will set the CVs on CV OUT 1 and CV OUT2 between 0v and 5v.

OUT3 is a gate signal that goes high when START is pressed and will stay high until stop is pressed. OUT4 is configured as the inverse of OUT3.

OUT5 through OUT8 are different divisions of the MIDI clock 24, 16 and 1TPQN.

TRIG IN -> MIDI OUT Preset 3 Is configured for eurorack triggers to trigger sounds on most generic drum machines via MIDI OUT.



5. Transport + Clock / Elektron Model Samples/Cycles

TODO cycles/volca drum / sAMPLES

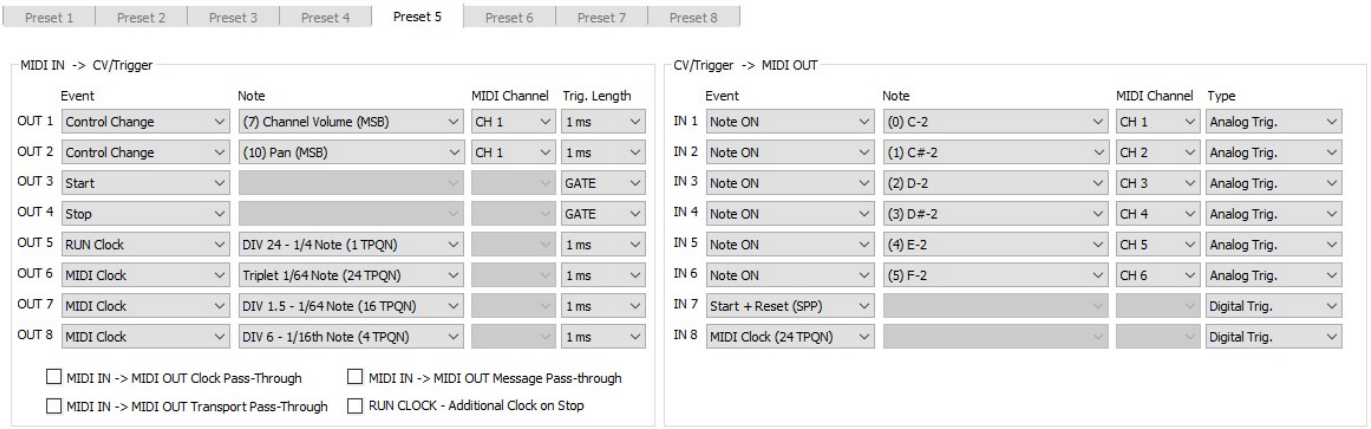
MIDI IN -> TRIG/CV OUT MIDI Input is configued to allow a MIDI sequencer to sync with eurorack sequencers/modules.

OUT1 & OUT2 are configured for Volume and Pan MIDI CC messages on Channel 10. Volume and Pan CC messages will set the CVs on CV OUT 1 and CV OUT2 between 0v and 5v.

OUT3 is a gate signal that goes high when START is pressed and will stay high until stop is pressed. OUT4 is configured as the inverse of OUT3.

OUT5 through OUT8 are different divisions of the MIDI clock 24, 16 and 1TPQN.

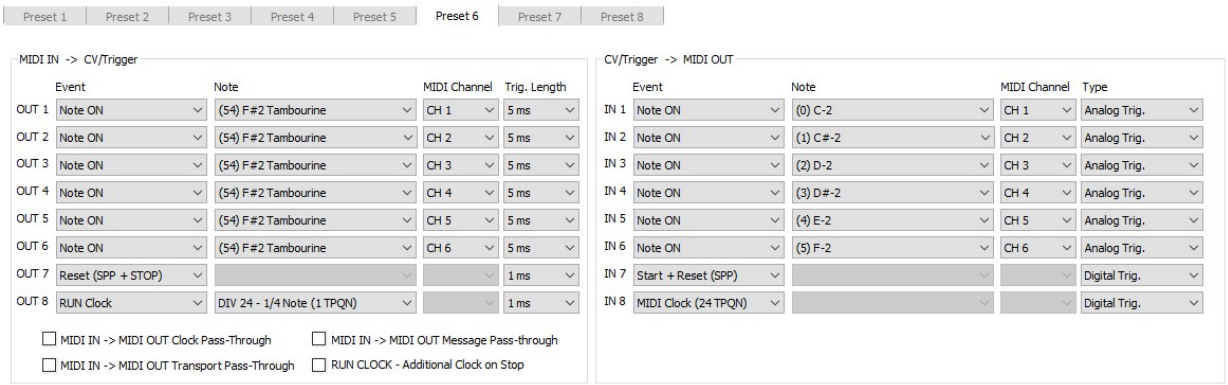
TRIG IN -> MIDI OUT is configured so that the Elektron sequencer can be controlled and sounds triggered from eurorack.



6. Elektron Model Samples/Cycles

MIDI IN -> TRIG/CV OUT is configured so that the Elektron sequencer can generate eurorack triggers and clock/reset to drive eurorack modules and sequencers.

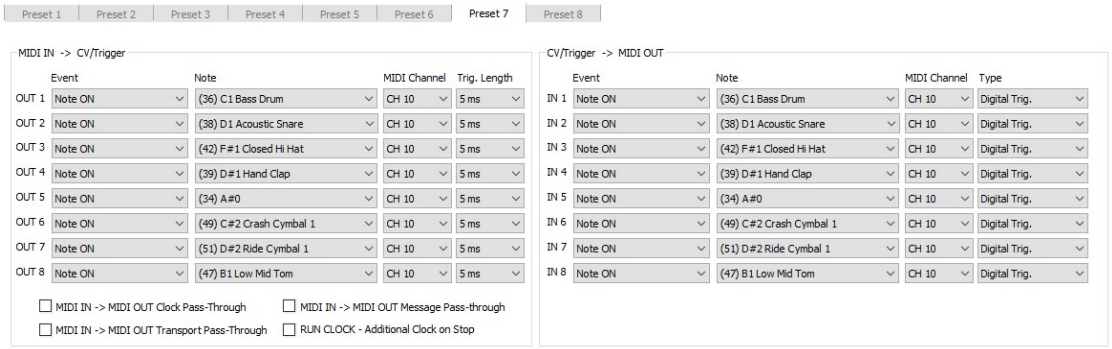
TRIG IN -> MIDI OUT is configured so that the Elektron sequencer can be controlled and sounds triggered from eurorack.



7. NAVA

MIDI IN -> TRIG/CV OUT MIDI Input is configured to convert MIDI Note On messages generated by Nava into eurorack triggers.

TRIG IN -> MIDI OUT MIDI Output is configured to convert eurorack triggers to control drum voices on Nava.



8. Transport + Clock / Quantized Scaled and Chords

MIDI IN -> TRIG/CV OUT

MIDI Input is configued to allow a MIDI sequencer to sync with eurorack sequencers/modules. OUT1 is a gate signal that goes high when START is pressed and will stay high until stop is pressed. OUT2 is configured as the inverse of OUT1.

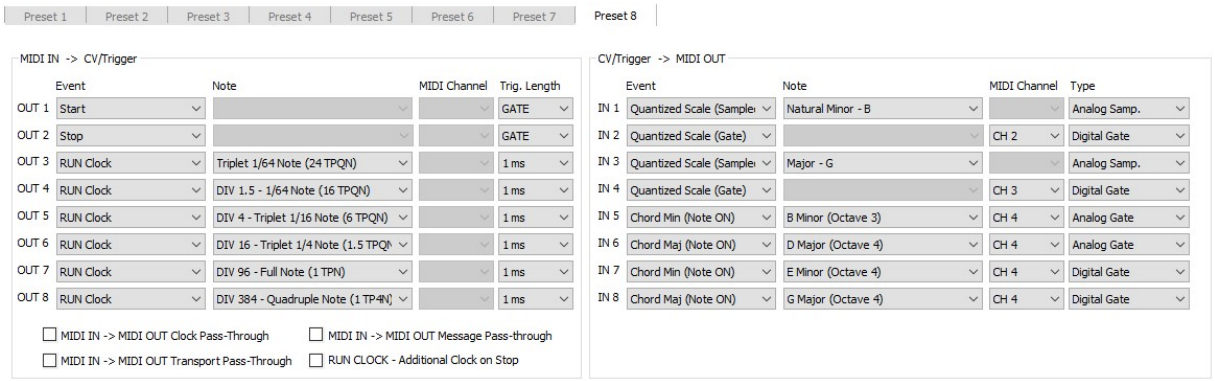
OUT3 through OUT8 are different divisions of the MIDI clock 24, 16, 6, 1.5, 1TPQN and 1 TP4N.

TRIG IN -> MIDI OUT

IN1 + **IN2** are set to sampled quantized scale on the B Natural minor scale.

IN3 + **IN4** are set to sampled quantized scale on the G Major scale.

IN5 through **IN8** are mapped to B Minor, D Major, E minor and G major chords.



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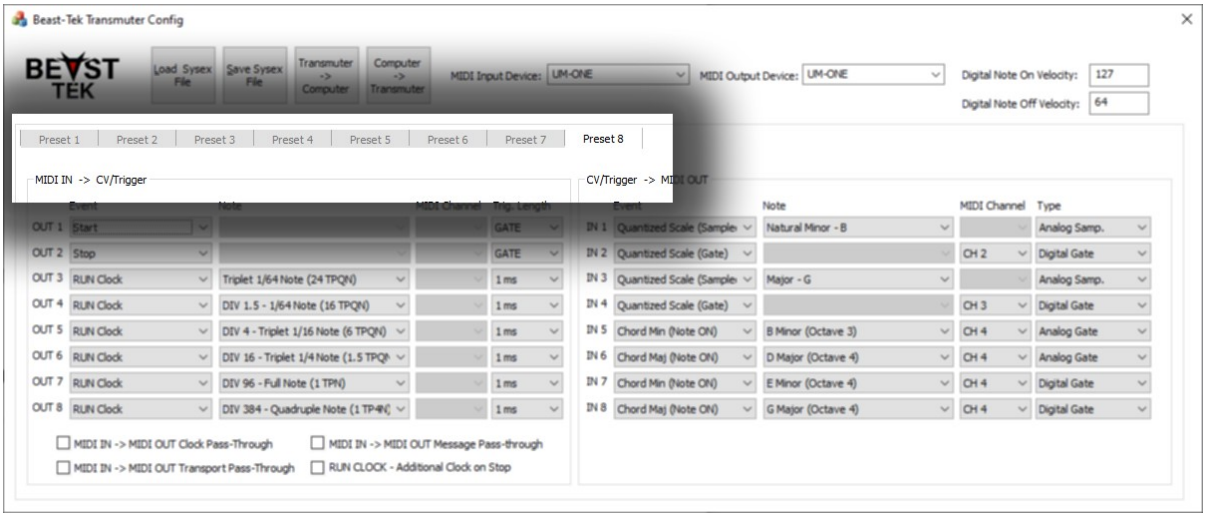
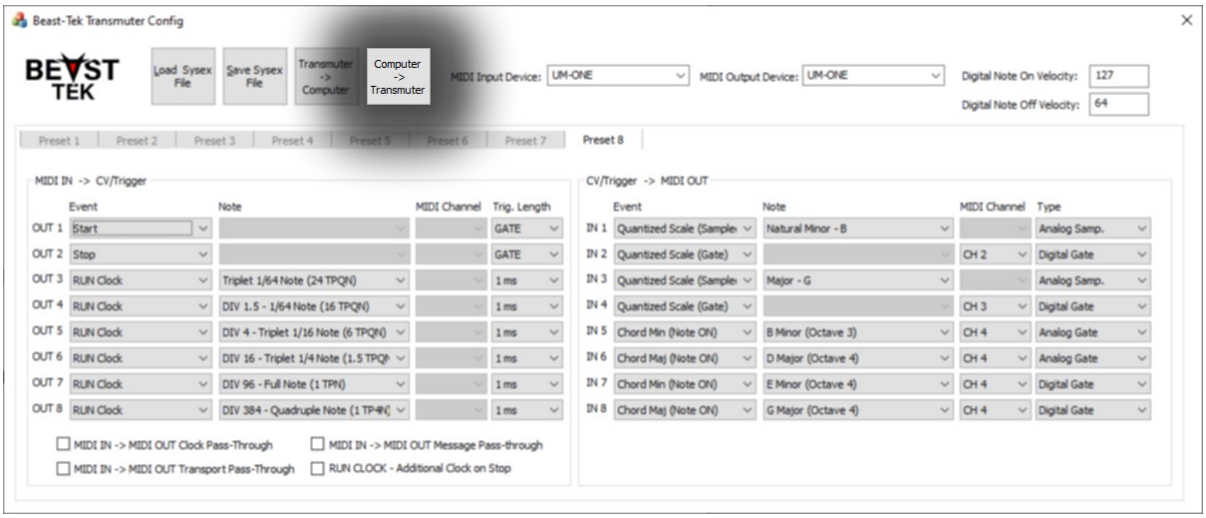
Transmuter Configuration Utility

The Transmuter Configuration Utility is a 32 bit Windows application. It has been tested on Windows 10 but may run on older versions (if you are lucky).

The Transmuter has 8 presets, each with its own set of configuration or “mappings”. The Tab control allows navigation between each of these mappings.
When the Transmuter Configuration Utility starts, factory default presets are loaded.



Using the button labled “Computer -> Transmuter” all 8 presets from inside the configuration utility will be transferred/written into the Transmuter Module.



Using the button labled “Transmuter -> Computer” all 8 presets from inside the Transmuter module will be transferred/read into the configuration utility for viewing/editing.

Using the button labled “Save Sysex File” will save all 8 presets into a .syx Sysex file that can be used as a backup, transferring presets to other people or programming the Transmuter module with other MIDI utilities that support syx files.

Using the button labled “Load Sysex File” will load all 8 presets from a .syx Sysex file into the Transmuter Configuration Utility for viewing/editing/transfer.

MIDI Note On and Note Off messages have a velocity which represents how hard/quickly the key was pressed or released.

Digital triggers are simply on or off and have no concept of velocity. The Digital Note On Velocity and Digital Note Off Velocity options specify the Velocity values that are used across all 8 presets for Digital triggers. Valid vaues are 0 – 127.

Note: a Note On with a Velocity of 0 is typically equivalent to a Note Off message.

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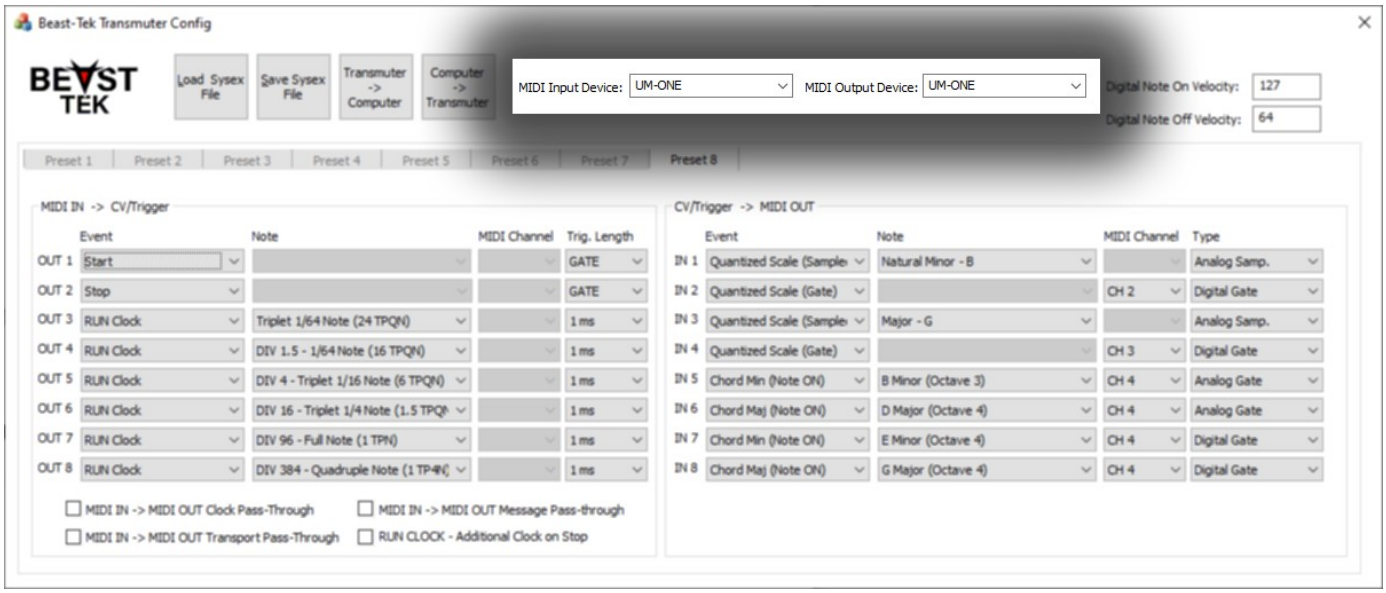
Transmuter Configuration Utility – MIDI Connection

Transfer between the Transmuter Configutation Utility and the transmuter Module occurs via MIDI. This means a computer MIDI interface (such as the Roland UM-1) is required.

The MIDI output from the computer is connected to the MIDI IN on transmuter and the MIDI input on the computer is connected to the MIDI output on the Transmuter module.

The correct MIDI Input Device and MIDI Output Device need to be set inside the Transmuter Config Utility, they should both match the MIDI interface that you are using to connect with the Transmuter Module.



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MIDI IN to CV/Trigger Outputs (TRIG OUT)

Background

Eurorack is the wild west as far as transport (start/stop/reset/run) and clocking is concerned. Because there is no standard for this, every possible combination has been implemented across many, many different modules.

MIDI Sequencers can also be vastly different. MIDI provides START, STOP, CONTINUE and Song Position Pointer messages.

Some MIDI sequencers implement only START and STOP. Others Implement START, STOP and CONTINUE where the STOP also performs a RESET. Others have a reset function via a button that looks like a rewind button. Sometimes STOP will reset the sequencer to the start of the song/pattern.

This inconsistency is frustrating and its for this reason that Transmuter provides the ability to configure the MIDI transport and clock messages into just about all of the possible combinations to allow eurorack sequencers and other modules to sync perfectly with MIDI gear.

Whilst MIDI has a clock resolution of 24 TPQN, many eurorack modules have a different colck resolution, often 8, 4, 2 or 1 TPQN. For this reason, Transmuter has a built in clock divider which can divide the MIDI clock down to the required clock resolution.

Digital Events – TRIG OUTS 1 through 8

Transmuter has eight Trig Outputs, Two of which are analog capable and the remaining six which are digital (trigger or GATE only). The two analog Outputs can also function as digital outputs if desired.

Note On

Probably the most common use of the transmuter is converting MIDI Note On messages from sequencers or drum machines into eurorack gate and trigger (aka pulse) signals. This is to enable MIDI sequencers/controllers to trigger drum/sampler modules and any other function that takes a trigger such as an ADSR/function generator etc.

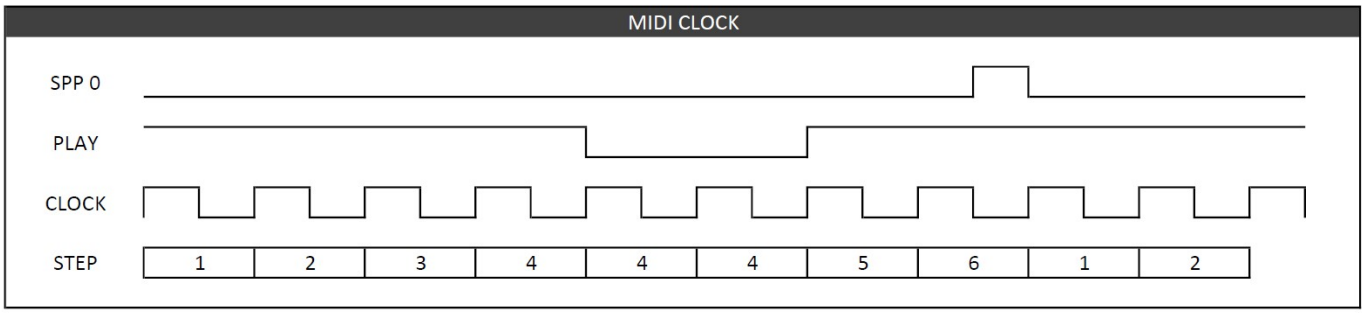
Each of the 8 transmuter outputs can be mapped to one specific MIDI note on any of the 16 MIDI channels.

MIDI Clock

The MIDI clock is always running. MIDI devices utilize START, STOP and CONTINUE along with SONG POSITION POINTER (SPP) messages to control sequencing and position within the sequence/song.

Some (mostly digital microcontroller based) modules can accept a 24 TPQN midi clock signal in conjunction with a RUN signal. Some modules expect an active high RUN signal and some expect an active low RUN signal. The required RUN signal can be generate by Transmuter with a either a START or STOP message configured as a GATE.

The diagram below illustrates MIDI clock along with PLAY as gate signal that goes high when MIDI Start is received and stays high until MIDI Stop is received. The diagram also illustrates a MIDI sequencer that performs reset by sending a SongPosition Pointer 0 message (on the 6th step).



Start and Stop

MIDI sequencers send a START message when a song or parttern has been activated, often by the pressing of a PLAY button. Transmuter can be configured to turn the START message into a trigger with a pulse length between 1 ms and 50ms OR a GATE signal that will stay active/high until a STOP message in encountered.

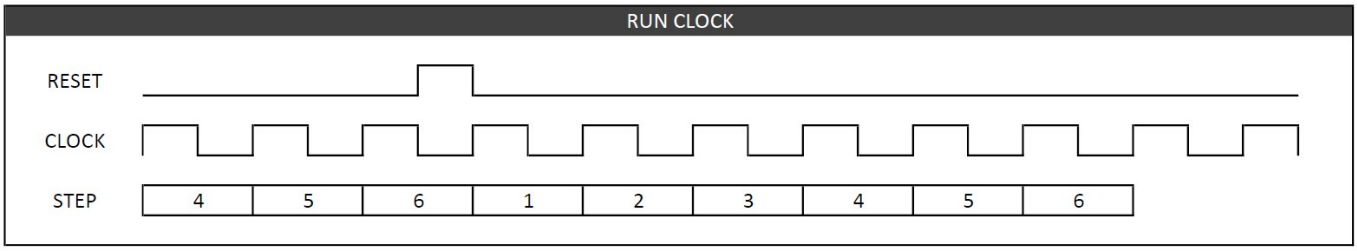
Conversley Transmuter can be configred to turn the STOP message into a trigger with aa pulse legth between 1 ms and 50 ms OR a GATE signal that will stay active/high while the sequencer is not playing.

RUN Clock

Many eurorack sequencers and modules are build with discrete logic chips (without microcontrollers or onboard computers) and expect the clock to be active while the song is playing. The RUN clock input is a combination of MIDI Clock and START/STOP messages. RUN Clock only produces clock pulses following a MIDI START message and continues to produce clock messages until a MIDI STOP message is received.

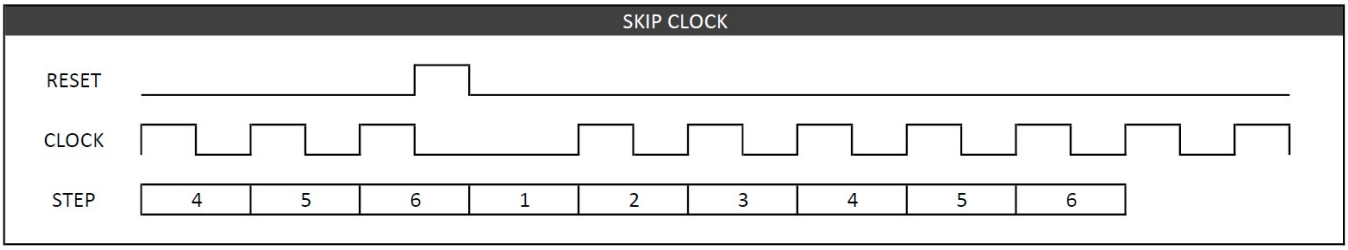
This sounds simple enough, however some sequencers require a clock pulse following a 'RESET' to move back to the first step of the sequence (sometimes called "Clock on first"). Others immediatley move to the first step following a 'RESET' and the transmission of the first clock would cause the sequencer to move to the second step (sometimes called "Clock on last").

Transmuter RUN Clock implements "Clock on first", generating the first clock pulse to transition back to the first step following a reset.



SKIP Clock

Transmuter SKIP Clock implementes "Clock on last", blocking the first clock pulse for sequencers that immediatley transition to the first step following a 'RESET'. See "RUN Clock" section for more explanation on this topic.



Reset SPP, Reset (SPP + START) and Reset (SPP + STOP)

MIDI has START, STOP, CONTINUE and Song Position Pointer transport messages for communication and synchronization with other MIDI gear. Unfortunately not all MIDI equipment implements all of the messages and often CONTINUE or SPP is overlooked. As mentioned in previous sections, different eurorack sequencers require different transport signals.

For there reasons, Transmuter provides 3 options for Reset messages.

Reset SPP – will generate a trigger or GATE signal when a Song Position Pointer (SPP) with a value of 0 is received.

Reset SPP + START – will generate a trigger or GATE signal when a Song Position Pointer (SPP) with a value of 0 OR when a MIDI Start message is received.

Reset SPP + STOP – will generate a trigger or GATE signal when a Song Position Pointer (SPP) with a value of 0 OR a MIDI Stop message is received.

Additionally you can utilize Start and Stop messages as trigger/gates for use as reset signals depending on the MIDI device and the eurorack modules being used.

<table>
<tr><th>Event</th><th>Note</th><th>MIDI Channel</th><th>Trig. Length</th></tr>
<tr><td>Note On</td><td>Selects the MIDI Note that will generate a trigger/pulse on the selected OUT jack.</td><td>Selects the MIDI Channel (1-16) for the Note On message.</td><td rowspan="10">Sets the length/width of the pulse (aka Trigger) that is generated when the selected MIDI event occurs.
Pulse/Trigger length can be 1, 2, 5, 10 or 50 milliseconds.
A GATE option is also available that can be used for Note On so that the Trig Out stays high until a Note Off message is received.
The GATE option can also be used with Start and Stop messages.</td></tr>
<tr><td>Start</td><td rowspan="5">N/A</td><td rowspan="5">N/A</td></tr>
<tr><td>Stop</td></tr>
<tr><td>Reset (SPP)</td></tr>
<tr><td>Reset (SPP + STOP)</td></tr>
<tr><td>Reset (SPP +START)</td></tr>
<tr><td>MIDI Clock</td><td rowspan="3">MIDI clock is 24 ticks (aka pulses) per quarter note. Transmuter can divide this clock down by 1.5, 2, 3, 4, 6, 8, 9, 12, 16, 18, 24, 36, 48, 72, 96, 192 or 384 to produce different clock rates either for compatibility with different sequencers, syncing LFO’s or even triggering kicks or hats etc.</td><td rowspan="3">N/A</td></tr>
<tr><td>RUN Clock</td></tr>
<tr><td>SKIP Clock</td></tr>
</table>

Clock and Transport - Putting It All Together …

Unfortunatley the answer here is that you need to know your sequencer(s). Manuals often have MIDI implementation charts and some module manuals explain the clocking nuances. Others don't.

MIDI utilities such as MIDI OX allow you to see the MIDI messages generated by your MIDI gear and numerous oscilloscope modules allow you to visualize the clock and reset signals for your eurorack sequencer.

By far the most compatible approach is to give up altogether on "CONTINUE" and focus only on Start and Stop – where stop is also a "Reset back to the beginning of the song" message.

You will need to know what clock resolution in TPQN your eurorack sequencer takes and use Transmuter to divide the MIDI clock down to the appropriate division.

Analog Events (TRIG OUTS 1 – 2 and CV OUT 1 – 2)

Transmuter has two CV outputs that are couled with the two corresponding TRIG OUTs.

TRIG OUT 1 and CV OUT 1 act as a pair named "OUT 1" inside the Transmuter Config Utility.

TRIG OUT 2 and CV OUT 2 also act as a pair named "OUT 2" inside the Transmuter Config Utility.

This means OUT 1 and OUT 2 are capable of generating analog CV signals in addition to digital trigger/gate signals.

Note On

Note On messages on OUT 1 and OUT 2 will also convert the Velocity of the midi note into a CV signal between 0v and 5v. Velocity 0 = 0v CV and Velocity 127 = 5v CV. This CV can be utilized to add dynamics into your music, for example hihats or claps can be "animated" using a VCA following the drum module/sampler output or using the ACCENT input (if your drum module has one).

Pitch Wheel, AfterTouch and Channel Pressure

Pitch Wheel, After Touch and Channel Pressure messages can be configured on OUT 1 and OUT 2, converting the Pitch message into a CV signal between 0v and 5v.

Control Change

Control Change or Continuous Controller (often reffered to as CC) messages exist in many different forms on sequencers and MIDI controllers, for Volume, Cutoff, Modulation and many other numerous purposes.

OUT 1 and OUT 2 can be mapped to any MIDI CC message and generate a CV between 0v and 5v.

Additional Per-Preset Options

MIDI IN -> MIDI OUT Clock Pass-Through

Enabling this option will cause MIDI clock messages received on MIDI IN to be output on the Transmuter MIDI OUT. This can be useful if you have a Master MIDI sequencer connected to the Transmuter MIDI In and other MIDI gear connected to the Transmuter OUT that you want to be synchronized to the Master clock for tempo sync of modulation, arpeggiators, sequencers etc.

MIDI IN -> MIDI OUT Transport Pass-Through

Enabling this option will cause MIDI transport messages received on MIDI IN to be output on the Transmuter MIDI OUT. This can be useful if you have a Master MIDI sequencer connected to the Transmuter MIDI In and other MIDI gear connected to the Transmuter OUT that you want to be controller by the Start/Stop transport messages generated by the Master.

MIDI IN -> MIDI Message Pass-Through

Enabling this will cause other MIDI messages receivied on the Transmuter MIDI IN to also be sent to the Transmuter MIDI OUT.

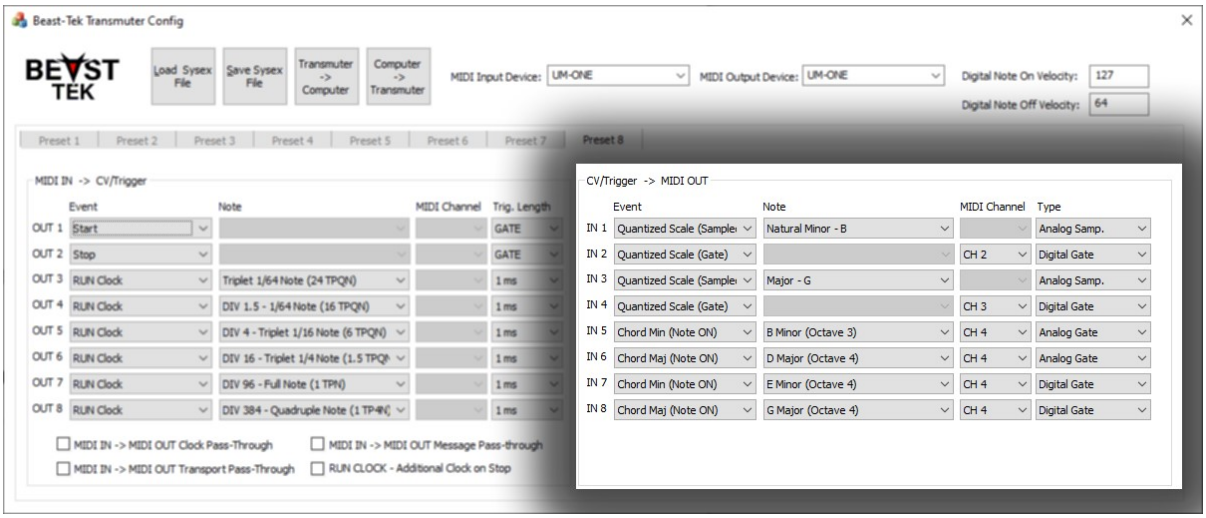
RUN CLOCK – Additional Clock On Stop

As previously described somewhere in this manual, some eurorack sequencers do not move back to first step until the next clock pulse following the reset. This option will generate one additional clock pulse on RUN CLOCK signals following a MIDI Stop message, to allow these sequencers to move back to the first step *before* a Start message to avoid weird jumps or glitches at the start of a song.

CV/Trigger Inputs (TRIG IN) to MIDI OUT

Transmuter has eight inputs (TRIG IN), the first six are analog capable and the remaining two (7 and 8) are digital only.

The six analog capable TRIG INS can also function as digital inputs if desired.



Digital Events – TRIG INS 1 through 8

Note On

Allows a eurorack trigger or gate signal to generate a MIDI note on the configured channel. The MIDI standard provides Note On messages when a key is pressed and Note off messages when a key is released. Some MIDI drum machines and samplers do not implement Note Off messages, using only Note On to trigger the playback of a sample or drum voice. Synthesizers on the other hand typically require a Note Off message to prevent the sound from playing forever.

Tramsuter can be configured as a GATE or Trigger. Trigger mode will only send a Note On message on the rising edge of the trigger pulse and never send a Note Off message. GATE mode will send a Note On message on the rising edge of the GATE signal and a MIDI note off message on the falling edge of the gate signal.

Program Change

Allows a eurorack CV/trigger signal to generate a MIDI Program Change message on the configured channel. Transmuter will generate the configured Program Change message on the rising edge of the signal.

Start

Allows a eurorack CV/trigger signal to generate a MIDI Start transport message. Transmuter will generate the configured Start message on the rising edge of the signal.

Continue

Allows a eurorack CV/trigger signal to generate a MIDI Continue transport message. Transmuter will generate the configured Continue message on the rising edge of the signal.

Stop

Allows a eurorack CV/trigger signal to generate a MIDI Stop transport message. Transmuter will generate the configured Stop message on the rising edge of the signal.

Reset (SPP)

Allows a eurorack CV/trigger signal to generate a MIDI Song Position Pointer transport message with a position of 0 (e.g move to the start of the sequence/song). Transmuter will generate the SPP 0 message on the rising edge of the signal.

Start + Reset(SPP)

Allows a eurorack CV/trigger signal to generate both a MIDI Song Position Pointer transport message with a position of 0 (e.g move to the start of the sequence/song) followed by a Start transport message. Transmuter will generate the SPP 0 message on the rising edge of the signal shortly followed by a Start message.

Stop + Reset(SPP)

Allows a eurorack CV/trigger signal to generate both a MIDI Stop message followed by a MIDI Song Position Pointer transport message with a position of 0 (e.g move to the start of the sequence/song) message. Transmuter will generate the STOP message on the rising edge of the signal shortly followed by a SPP 0 message.

MIDI Clock (24 TPQN)

Transmuter can translate eurorack clock signals with a resolution of 24 TPQN. Most digial sequecer modules will have an option to output a 24 TPQN clock signal. This can also be handy when the clock resolution doesn't matter –such as trying to sync effects with MIDI clock or arpeggiator to an arbitrary signal that is in sync with the eurorack clock where a mismatch clock resolution may not matter.

Chord Maj, Min, Dim, Aug, Sus4, Maj 7, Min 7 (Note On)

In addition to single Note On messages, Transmuter can generate multiple Notes On messageson the configured channel from a single trigger signal. This behaves exactly the same as Note On, except multiple notes are played together. This is very very handy for getting a MIDI poly synth to play chord progressions to accompany your eurorack tune.

Analog Events – TRIG INS 1 through 6 Only

Note On and Chord

Both Note on and Chord messages configured on IN 1 through IN 6 can be configured to Analog Gate or Analog Trig to take advantage of the analog capabilities. When configured as Analog, the Input will convert the level of the CV signal between 0v and 5v into a Velocity that is sent along with the Note On or Chord message.

This allows you to pass your trigger or gate signal through a VCA to control the dynamics of the triggered drum sound, sample or note(s).

Control Change

MIDI Control Change (Continuous Controller) messages allow changing the Volume, Cutoff, Resonance, Modulation and many other parameters on a MIDI enabled device. Some effects pedals also implement MIDI for changing parameters, modes and verious other settings.

When Control Change is configured on any input IN 1 through IN 6, the CV is converted into the number of Steps that have been set. Some manufactures (especially effects) split the CC resolution of 128 into a smaller number as they do not have this many modes available. Transmuter allows a common number of Steps for CC messages from 128 ann the way down to 2 steps which is typically used to toggle settings in some MIDI devices.

Pitch Wheel, After Touch and Channel Pressure

If IN1 through IN6 are configured to Pitch Wheel, After Touch or Channel Pressure then the CV signal will be converted into a MIDI value between 0 and 127 and the corresponding MIDI message will be sent everytime the CV level changes.

Quantized Scale (Freerun)

Analog capable inputs can be configured to Quantize the input CV signal into one of many configurable scales and keys. Quantization is linear (64 steps across 5v) and not 1v/oct. This allows for some very cool generative sequences from random CV sources. Freerun quantization mode sends a Note Off and Note On message each time the CV changes.

Quantized Scale (Sampled)

A more musically useful variation of the Freerun Quantizer is the Sampled mode – this mode however requires the use of a second transmuter Input. The first Input is the CV signal and the second is a digital trigger input. Each time a trigger signal is sent to the second input, the CV signal is sampled and a Note off / Note On message is sent to the MIDI device. Again, Quantization is linear (64 steps across 5v) and not 1v/oct as these modes are an “Easter Egg” feature intended for use with generative music.