



IUNGO

The IUNGO is in essence a CV to MIDI converter, but instead of acting as a direct translator, this module gives you voltage control of the MIDI data stored in banks and patches.

When installing the module into your eurorack system, pay careful attention to line up the -12v pins labelled on the PCB header with -12v on your bus board.



INPUTTING MIDI DATA

To input midi data into a bank, the midi in port must be connected via one of the supplied cables to the midi out of a device that can generate midi note data. This would typically be a midi keyboard or the midi output of a computer interface. Pressing the button of one of the banks 1 – 5 will cause its led to flash steadily. This signifies that the bank is in midi write mode. Midi note data received at the input will be stored in the active bank. Both note number and midi channel are stored for each note, up to a maximum of 16 notes per bank. Additionally a program change message can be stored in each bank by sending a program change message whilst in write mode.

For sequencer modes, rests can be programmed in by pressing any bank button other than the bank being written to. Pressing the active bank's button a second time will take you out of write mode, and all data input will be stored in that bank. If no data has been input and midi write mode is exited, no change will be made to the bank to prevent accidental clearing of data. Write mode can also be exited without storing the new data by pressing and holding the active bank's button for approximately 2 seconds.

TRANSMITTING MIDI DATA

To transmit midi data, the midi out port must be connected to the midi in of a device via one of the supplied cables. A gate signal applied to the gate input will activate a bank depending on the voltage applied at the cv input. The rising edge of the gate sends the note on data, the falling edge sends the note off data. This way note length can be controlled via the pulse width of the gate signal.

If nothing is patched to the cv input, a gate signal will activate bank 1. If a voltage is patched to the cv input, a voltage from 0 to 0.1v acts as a mute signal and no bank is activated by a gate. A voltage between 0.1 and 1v will select bank 1. A voltage between 1.1 and 2v will select bank 2 etc up to 5v. Both cv and gate inputs are diode protected against negative and over voltage.

The velocity of the note data transmitted corresponds to the amplitude of the gate signal applied. A gate signal of at least 2.5v is required to activate the bank, and this will generate note data with velocity of 1. Velocity will increase linearly with voltage to a maximum of 5v corresponding to a velocity of 127.

ADDITIONAL FUNCTIONS

- **LOAD** The 5 LEDs will light, pressing a button will load the patch saved to that location, including note data, program changes, of all 5 banks. This menu will exit once a patch is loaded, or if no button is pressed for a few seconds.

- **SAVE** The 5 LEDs will light, pressing a button will save the current note data, program changes, mode and mute status for all 5 banks to that location. This menu will exit when a patch is saved, or if no button is pressed for a few seconds.

- **CLEAR** The 5 LEDs will light, pressing one of the bank buttons will clear all data from that bank. This menu will exit if no button is pressed for a few seconds.

- **MUTE** LEDs will light depending on the current mute status of each bank. Any unmuted banks will be lit, any muted banks will be unlit. Pressing one of the buttons will switch the mute status of the corresponding bank. To exit this menu, press and hold the mute button again for around 2 seconds.

- **MODE** 2 LEDs will light signifying the current mode. The top LED signifies how the module treats incoming midi data, and the lower led shows the way in which midi data stored in banks is output. This menu will exit if no button is pressed for a few seconds.

THE MODE CORRESPONDS TO THE PLAIN TEXT BY EACH LED

CHORD – In this mode all midi data stored in a bank is output when that bank is activated. The bank is determined by the voltage present at the cv input as described in the “outputting midi data” section above. When the gate input goes high, note on messages are sent for all notes in the bank, and when the gate goes low the corresponding note off messages are sent.

SEQ – In this mode a single note is output each time a gate and cv signal activates a bank. The note order follows the order the notes were input into the bank, similar to the sequencer found in the SH101. If only 4 notes were saved in the bank, then the 5th gate will activate note 1. The length of each bank is independent, and each gate signal will advance all 5 banks at once. Sequences are reset when loading a patch and can also be reset manually by selecting “mode – seq”. It is possible to enter rests into sequences at the data input stage. When writing note data to a bank, pressing any button other than the one flashing will input a rest at that stage of the sequence.

CHORD + SEQ – A third mode is activated by pressing both “Chord” and “Seq” at the same time. In this mode a gate signal will play the current step in all 5 banks and advance each bank a step. As with seq mode all banks have independent lengths. 0 volts at the cv input will mute all banks, a cv signal between 0.1v and 2.5v will play the current stage and advance the sequence to the next stage. A voltage between 2.5v and 4.5v will play the current stage but not advance the sequence, and over 4.5v at the cv input will reset all banks to step 1.

THRU ON – In this mode midi data at midi in will be output from midi out.

THRU OFF – In this mode midi data at midi in will not be output from midi out, but can still be used to write data to banks.

TRANS – In this mode midi data at midi in will not be output from midi out, but can still be used to write data to banks. Note data will be used to transpose the chord or sequence being output. The transpose is calculated relevant to the first note stored in the active bank, such that the chord or sequence is shifted so that the first note stored in the bank corresponds to the note present at midi in.

It is possible to store the transposed version of a chord or sequence. With the desired midi note held down, enter the “midi write” mode by pressing the button of the bank you wish to transpose. With the midi note still held down, press the bank button again to exit midi write. The chord or sequence will now be saved in its transposed form and the note can be released.

MIDI CLOCK MODE

lungo can act as an analogue clock to MIDI clock interface. To access this function, press and hold the “Mode” button until all 5 leds light up. To return to the MIDI note modes press and hold the mode button until only LED 1 and 4 are lit. Note that lungo defaults to having MIDI though turned off when switching from clock mode to avoid potential feedback loops. If lungo is in clock mode when powered off, it will remain in clock mode when turned on again.

In MIDI clock mode, lungo transmits a MIDI clock byte every time the gate input goes high. This can be triggered from a modular derived gate, or from a click track coming from a soundcard with a +4dBu output. To clock MIDI sequencers at their intended resolution, a clock rate of 24ppqn (pulses per quarter note) is required. When the first gate signal is received, lungo sends a MIDI start message along with the clock signal. If no clock is received at the gate input for more than 1 second, a MIDI stop message is sent.

While sending MIDI clock, LED 3 will light. This is the visual centre for the clock stream. It is possible to shift the clock forward or back in time relative to this point by pressing buttons 1, 2, 4 or 5. Pressing button 3 switches between the two types of clock shifting, either musical divisions or individual clock pulses. When LED 3 is constantly lit shift amounts are musical ratios of $\pm 1/16$ th and $\pm 1/8$ th. When LED 3 is flashing, shift amounts are ± 1 clock byte and ± 2 clock bytes.

Shifting by musical divisions can be activated by a high voltage at the cv input. The amount shifted is determined by the last button to be pressed. Pressing button 3 will stop any cv controlled shifting.

Depending on how lungo is patched, it may be necessary to use the individual clock shifts to get the sync lined up initially. This is typically the case when using a clock multiplier to derive the 24ppqn, as the first pulse received at the gate input will not necessarily be “on the one”. A d-type flip flop and an and gate can be used to ensure the first gate from a multiplier is “on the one.” If dividing down from 24ppqn or syncing from an audio click source this is not typically an issue.

It is possible to change the shift mode that lungo starts in. In MIDI clock mode when not transmitting MIDI clock, pressing button 3 will switch between musical divisions (constantly lit) and individual clock bytes (flashing). Pressing and holding the save button until all 5 leds light will save the shifting mode, and, lungo will start in that mode when receiving gate signals, this setting is non volatile and will be stored when powered off.

