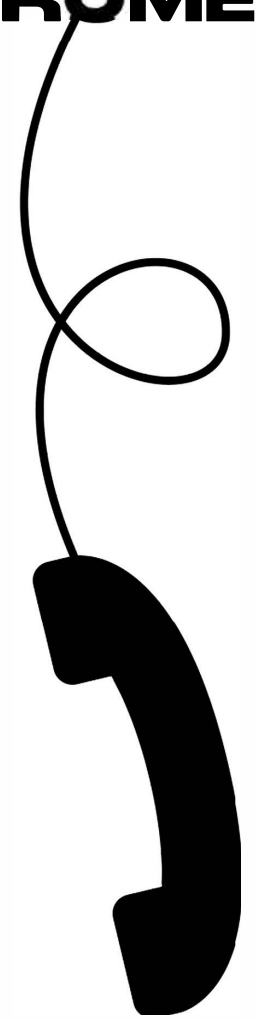
B1999

BASTL MIDI CONNECTIVITY

BASTL INSTRUMENTS

USER MANUAL



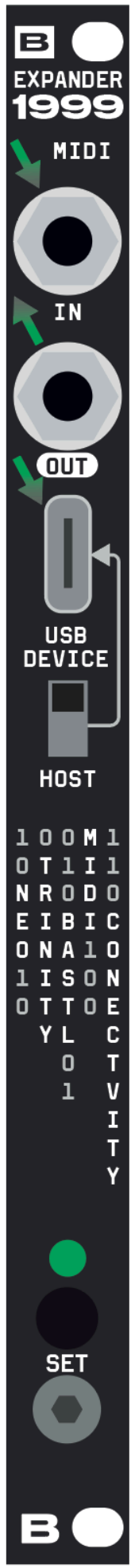
1999 is a TRS and USB MIDI expander for the Neo Trinity modulation hub, turning it into a powerful piece of studio infrastructure by making it easy to integrate with external MIDI gear. Classic TRS MIDI IN and OUT bring MIDI connectivity to your modular setup. The USB-C port can be switched between DEVICE and HOST modes, allowing you to connect a wide range of USB MIDI devices and even power hosted devices directly from your modular system.
1999 also takes care of MIDI clock management, automatically detecting the available clock source while allowing you to select your preferred source. It can forward MIDI clock or convert the Neo Trinity's internal clock or incoming analog clock into MIDI clock, including Start and Stop messages.
The TRS MIDI input is optically isolated so in case you run into USB ground-loop noise it gives you an alternate way to bring the setup together.

1999 FEATURES:

- TRS MIDI In/Out (Type A) and USB MIDI connectivity
- Switchable USB Device and Host modes for connecting computers, phones, MIDI controllers, and synths
- USB Host mode provides up to 5V / 0.75A power to connected devices
- MIDI routing to one or multiple Neo Trinity modules via the rear expansion headers
- Extended Neo Trinity MIDI control, including MIDI-to-CV/Gate, parameter automation via MIDI CC, and bank changes
- Real-time recording of MIDI-driven CV/Gate sequences when paired Neo Trinity
- MIDI clock source selection between TRS MIDI and USB MIDI
- Converting Neo Trinity’s internal clock or external analog clock into MIDI Clock, including Start/Stop messages
- Optically isolated TRS MIDI input to help prevent USB grounding noise
- Forced USB Host mode without supplying bus power, helping reduce noise in certain setups
- USB-C firmware updates

TECHNICAL DETAILS

- 2 HP
- PTC fuse and diode protected 10 pin power connector
- 24 mm deep
- Current consumption: +12 V: <25 mA (<800 mA as USB Host); -12 V: 0 mA


EXPANDER
1999
MIDI
IN
OUT
USB
DEVICE
HOST
100MBIT1011
ONEBASET01
MIDI1ONE01
CONNECTIVITY
SET

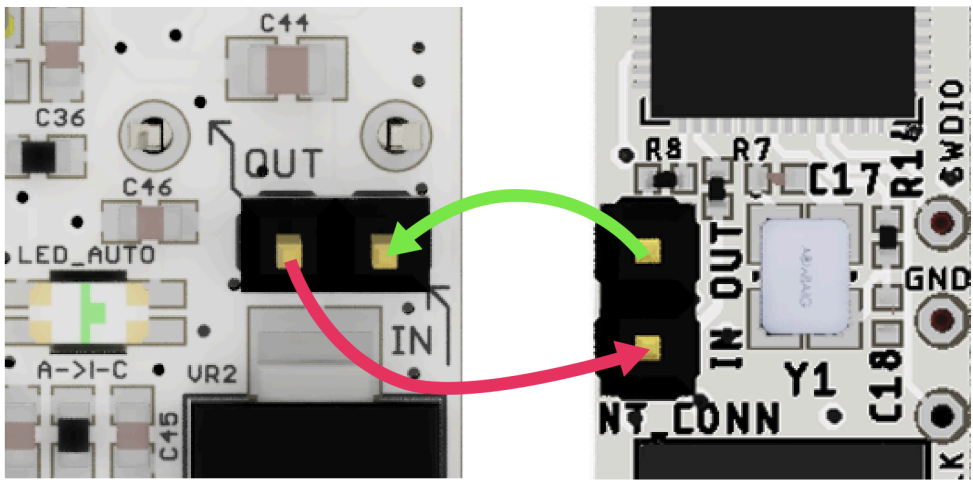
HOW TO CONNECT

Always connect module IN to OUT and vice versa. Only one 1999 Expander per chain is allowed.

SINGLE NEO TRINITY AND EXPANDER

NEO TRINITY

1999

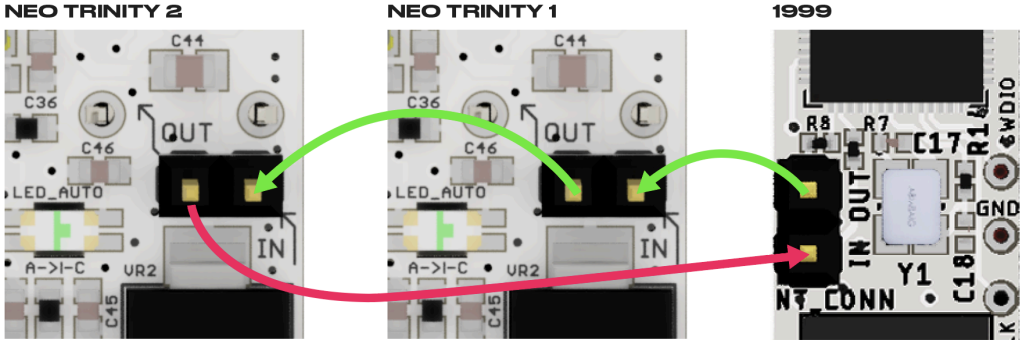


TWO OR MORE NEO TRINITY MODULES AND EXPANDER

NEO TRINITY 2

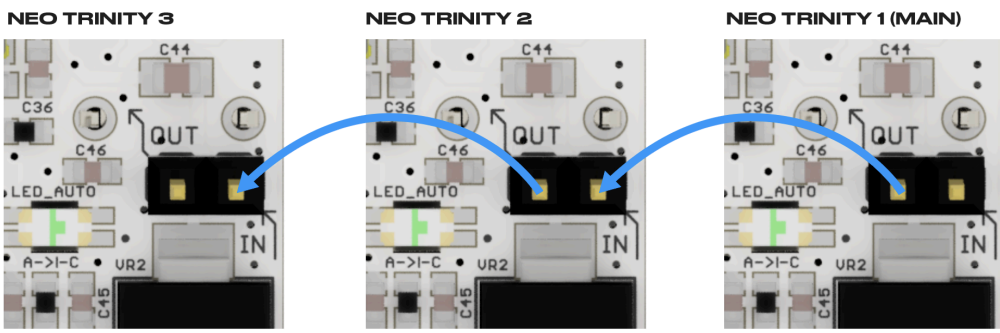
NEO TRINITY 1

1999



TWO OR MORE NEO TRINITY MODULES WITHOUT EXPANDER

Use this to share the clock. The Neo Trinity #1 is the clock source, use it to start/stop the clock etc. Patch an analog clock into the #1 to distribute it between the others.



***Don't make a looped connection**: When using Neo Trinity modules without Expander don't connect the output of the last one to the input of the first one to prevent an infinite MIDI messages loop.*

!! POWER !!

Before connecting the ribbon cable to this module, disconnect your system from power! Double-check the polarity of the ribbon cable and that it is not misaligned in any direction. The red wire should match the -12V rail both on the module and the bus board.

! please make sure of the following:
- you have a standard pinout eurorack bus board
- you have +12V and -12V rails on your bus board
- the power rails are not overloaded by current
- this module requires current: +12V: <25 mA; -12V: 0 mA

Although there are protection circuits on this device, we do not accept any responsibility for damages caused by the wrong power supply connection.
After you've connected everything, double-checked it, and closed your system (so no power lines can be touched by hand), turn on your system and test the module.

HOW TO UPDATE 1999 FIRMWARE (RECOMMENDED METHOD)

1. Turn off your eurorack.
2. Disconnect the module.
3. **Set the DEVICE/HOST slider switch to the top position (DEVICE).**
4. While holding the SET button, connect the module to your computer using the front USB-C.
5. Copy the UF2 firmware file onto the RPI-RP2 drive.
6. After the file is uploaded, the drive disconnects itself and the module LEDs will quickly flash.
7. Reconnect the module to the eurorack and turn it on.

HOW TO UPDATE 1999 FIRMWARE (QUICK METHOD)

1. Turn off your eurorack.
2. **Set the DEVICE/HOST slider switch to the top position (DEVICE).**
3. While holding the SET button, connect the module to your computer using the front USB-C.
4. Copy the UF2 firmware file onto the RPI-RP2 drive.
5. After the file is uploaded, the drive disconnects itself.
6. Turn on your eurorack.

HOW TO UPDATE NEO TRINITY

1. Disconnect Neo Trinity from your rack
2. Connect a USB cable to the Neo Trinity module.
   (Make sure it's a data cable and not just a power cable.)
3. Hold the REC button and plug the USB into your computer
4. Drag the UF2 file onto the "NEOTRINITY" drive
5. After a successful update, disconnect the USB and install the Neo Trinity module in your rack

TRS MIDI

TRS MIDI In and Out are both Type A connections and require TRS 3.5mm stereo jack cables to work.
To use with 5 DIN MIDI you will need a Type A adapter.
The TRS MIDI input does not share ground with the modular system and is optically isolated, therefore avoids most USB ground noise issues.

USB MIDI

The USB connector has a switch with two modes:
USB Device Mode is used when connecting to USB Host inputs: your computer, phone or some other devices that support the Host functionality. Typically a USB Device would be your MIDI Controller or a synth, so the 1999 will be seen as such device and it will receive and send MIDI.

USB Host Mode is perfect if you want to connect a USB Device to your modular system. That can be your MIDI Controller or a synth. The 1999 will supply up to 5V 0.75A power for the device and will receive and send MIDI Information.

!DO NOT use **USB Host Mode** when **connecting** to another **USB Host** such as your computer**!**
NOTE: Technically you can connect a USB hub in the host mode and connect your device to it. However it will only pick the first connected device since it can only handle one USB device at a time.

TIP: If you are running into grounding USB noise issues consider using the TRS MIDI Input instead of USB MIDI.

Forced USB Host mode is a special non-standard USB mode where the 1999 can be in the USB Host mode without providing power to the hosted device. This can help reduce USB noise in some setups where the noise doesn't come from the ground loop but from the power line. To activate it, hold the SET button for over 60 seconds. When activated the SET light will always be red when holding the SET button.
Now you can turn off the power for the hosted device by setting the switch to the upper (DEVICE) position.
To deactivate hold it again for 60 seconds.

DISPLAYING MIDI

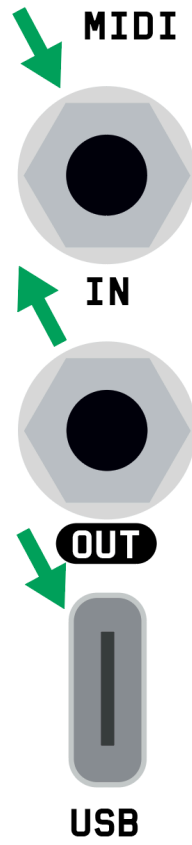
3 lights show MIDI information, helping to understand and troubleshoot the stream of MIDI data.
TRS MIDI In light shows the incoming MIDI traffic on this input, displaying both clock and other messages such as notes, CCs, pitch bend etc.
TRS MIDI Out light displays outgoing MIDI traffic from the Neo Trinity. USB MIDI In light displays **incoming** MIDI traffic on this input.

NOTE: Because USB MIDI is both input and output, Neo Trinity MIDI Out is also sent via USB. However it is the same MIDI as on the TRS MIDI OUT so it is only displayed on that light only. Both connections can be used simultaneously.

displays TRS MIDI IN

displays TRS MIDI OUT

displays USB MIDI IN



Main MIDI messages are displayed by a brief green blink.
MIDI clock messages are displayed with dimmed green light.
If MIDI clock is ignored on specific TRS or USB input it will be still displayed, but in a dimmed orange color.

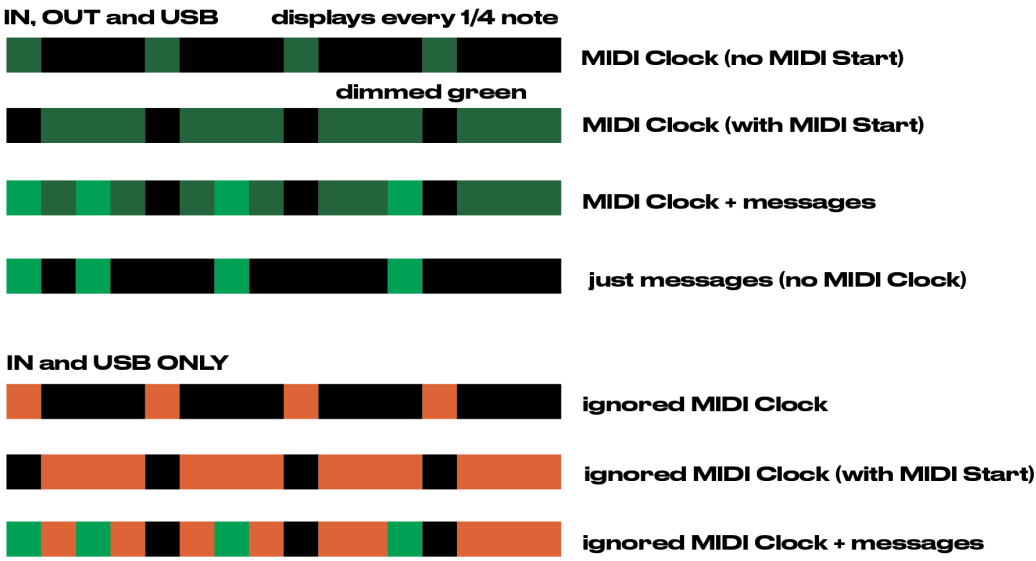
Note On/Off, MIDI CC, Pitch Bend

MIDI Clock

ignored MIDI Clock

running MIDI Clock

stopped MIDI Clock



NEO TRINITY CLOCK

Neo Trinity has the following clock prioritisation:

CLK IN > MIDI Clock > Internal clock

If you want to use CLK IN you simply plug in a cable and it will automatically switch to it.

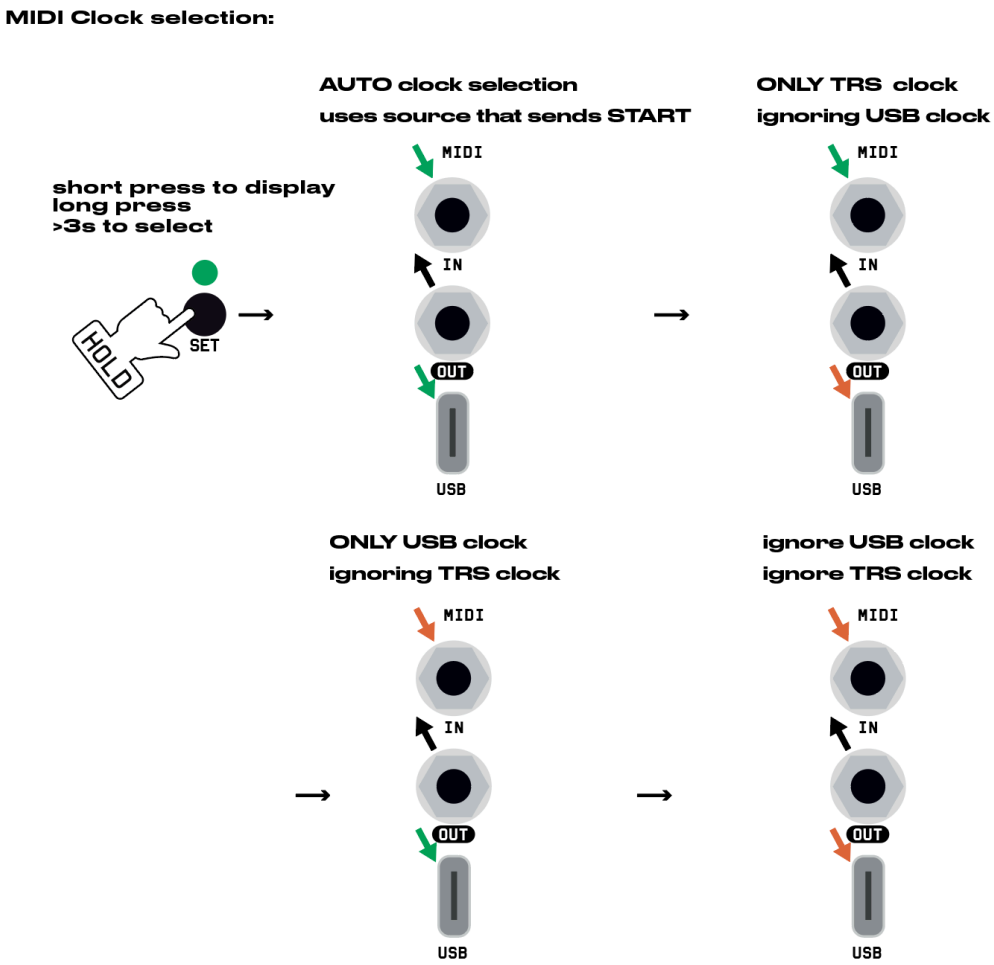
Using **MIDI Clock** as your source It will only work if **CLK IN jack is NOT connected**.

The MIDI Out on the 1999 will reflect the current clock source of the Neo Trinity, including sending Start and Stop messages. This means you can use CLK IN and RST with another sequencer and the Neo Trinity will translate it to MIDI clock.

NOTE: When the MIDI Clock stops arriving the Neo Trinity will switch back to Internal clock, but the Clock generator will be stopped. To restart the internal clock press the CLK button to go to the CLK channel and then press the blinking MODE button to start the clock. See Neo Trinity Clock channel for more information.

SWITCHING MIDI CLOCK SOURCE - TRS OR USB

1999 Expander will handle selecting the source of the MIDI Clock. Hold the SET button to display the source of MIDI Clock.
Hold the SET button for longer than 3s to change the priority:



TIP: If you want to prioritise the internal Clock of the Neo Trinity over MIDI Clock you will need to use 1999 to ignore both MIDI Clock sources.

Neo Trinity MIDI IMPLEMENTATION

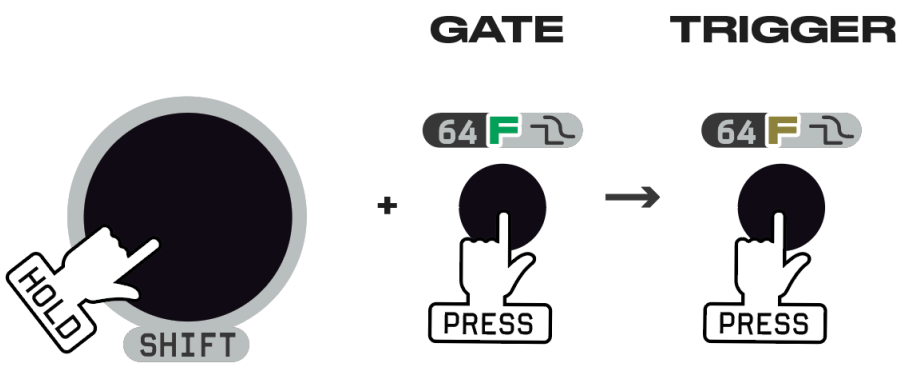
The MIDI implementation is designed to integrate well with grooveboxes that use MIDI output channels.
It assumes the groovebox or controller has MIDI settings allowing you to set the MIDI channel.

MIDI to CV FUNCTIONALITY

Channels A/B , C/D and E/F are CV/GATE pairs

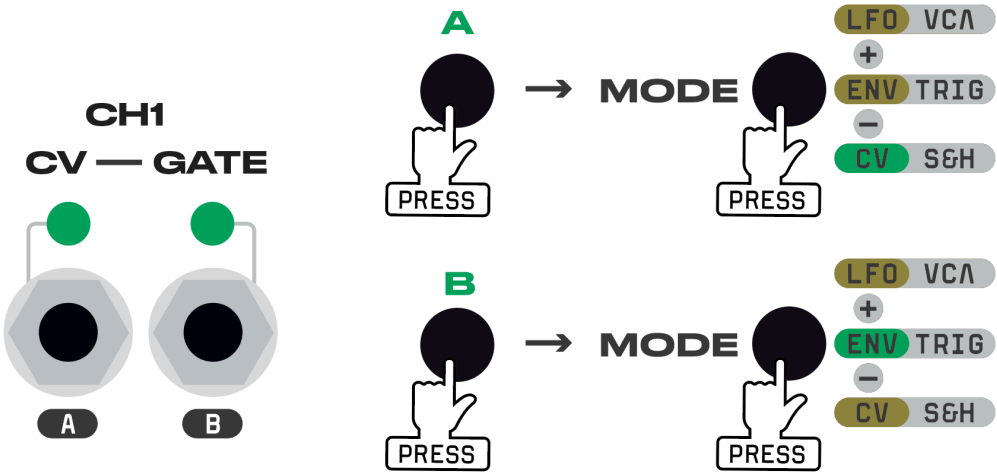
A,C,E will only output CV when in **CV mode.**
B,D,F will only output GATE/ENVELOPE when in **ENV mode.**

When **SLEW** mode is activated in the **ENV mode** the channels will create **gates** based on Note On and Note Off messages. Otherwise they will respond to **NOTE ON triggers**.

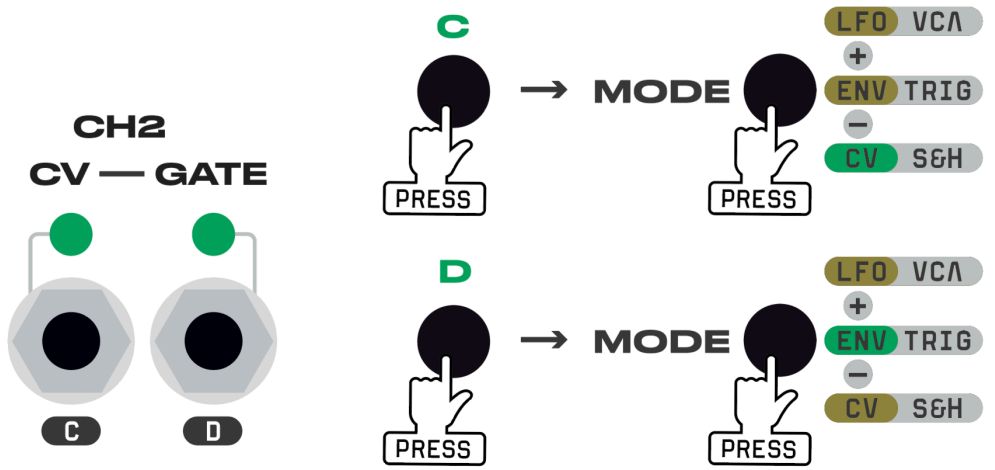


The Neo Trinity channels will respond to MIDI on different MIDI channels differently:
Simple CV/GATE

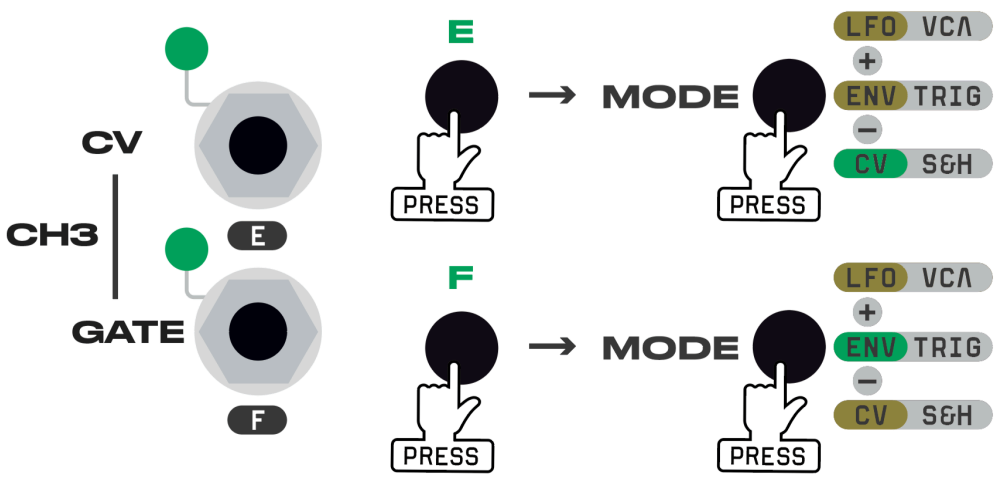
A/B pair is set to MIDI CH1



C/D pair is set to MIDI CH2



E/F pair is set to MIDI CH3



NOTE: If CV quantizer is turned ON on the CV channel the CV output will be quantized to a scale. SHIFT+D (activates and deactivates quantizer), while SHIFT+ABC (turning all lights on) is the chromatic quantizer.

Receiving a MIDI note on channels A, C and E in CV mode will overwrite the RATE knob position. Turning the knob or receiving CC02 will overwrite the note pitch CV.

TIP: Knowing the channels only respond to MIDI on specific MODES, you can disable the MIDI by using a different mode, or simply not send MIDI on their channels.

MIDI CCS

Sending mod wheel **CC01** (or CC22) on MIDI CH1 will directly set the position of the **RATE knob** on channel B, **CC02** will do the same on **channel A**. If automation is recorded this will offset the automation the same way the RATE knob would.
Similarly on MIDI Channel 2: **CC01** (or CC22) will set RATE on **channel D** and **CC01** will set RATE on **channel C**.
Similarly on MIDI Channel 3: **CC01** (or CC22) will set RATE on **channel F** and **CC01** will set RATE on **channel E**.

NOTE: The reason for CC01 to control the “gate” channel is that you can use the mod wheel to change the envelope decay or its rate. CC02 would overwrite the pitch information and that can be useful sometimes but not so widely.

CC00 is a **Bank Change** and it will be interpreted on any MIDI channel. It will load one of the 6 Neo Trinity banks.

More CCs are assigned to changing LFO/ENV shapes etc. See the full table.

SUSTAIN PEDAL – CC64

In the classic gate channels the CC64 controls the sustain pedal and will work as expected. It holds the note until the pedal is released. (Only affects incoming MIDI notes. Doesn't affect any internally generated stuff.)

PITCH BEND

When channels represent MIDI notes they react to pitch bend message on their channel with range of 7 semitones.

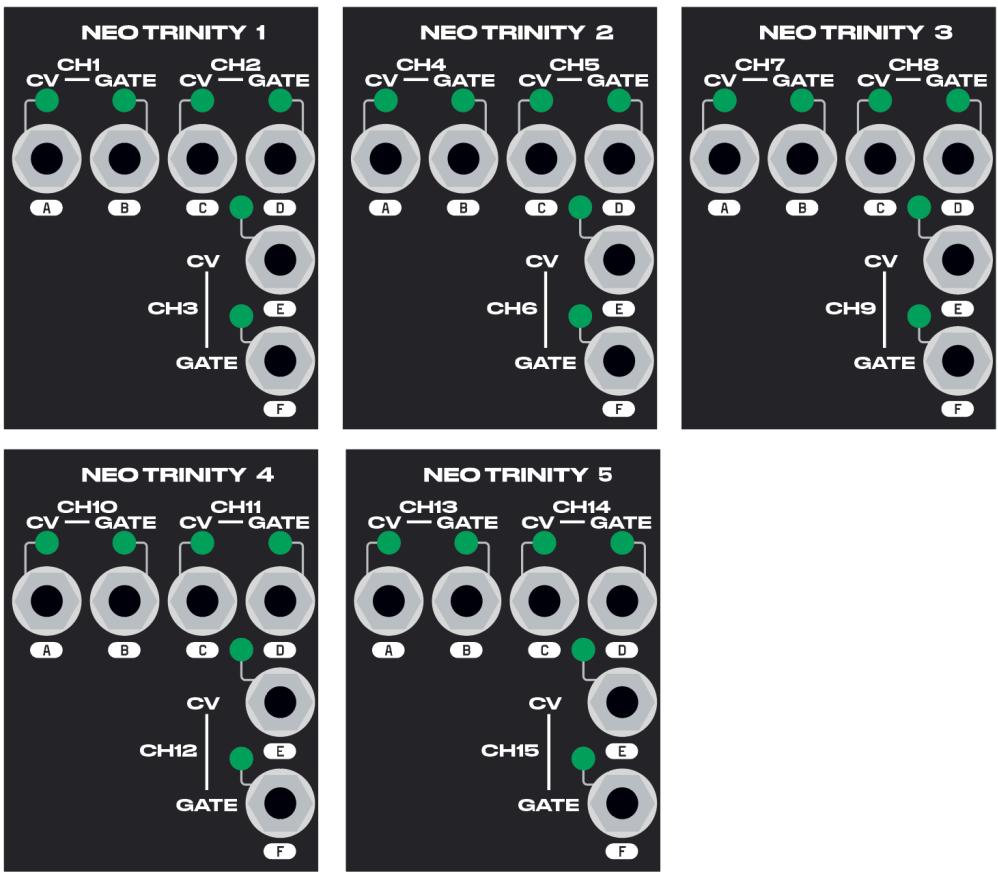
MIDI OUTPUT (TRS)

Clock/Start/Stop – always uses selected clock source: Either forwarding MIDI clock or converting external CLK IN clock or the internal clock to MIDI clock.
If channels A/B, C/D or E/F are used as CV/GATE pairs it will send **MIDI Notes** on their corresponding MIDI channels.
When **BANK** is changed CC00 on MIDI channel 1 is sent.

On the selected channel the position of the RATE knob is sent out as CCs. See the full table.

CHAINING SEVERAL NEO TRINITIES

When you connect the expander to more chained Neo Trinities, they will automatically be addressed on the following MIDI channels.



The MIDI channels on the first Neo Trinity will be 1,2,3, on the second module it will be 4,5,6, on third 7,8,9, and so on.

REALTIME RECORDING MIDI AND CV

Neo Trinity can now record CV/GATE sequences either from the MIDI input or on channels E/F from the CV inputs.

Always records a CV/GATE pair AB, CD, EF
For **CV/pitch** use channels **A**,**C** or **E**

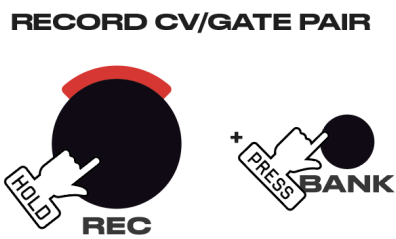
- set them to CV mode
- disable quantization (SHIFT+D)
- enable 5V range (SHIFT+E)

For **GATE/trigger/envelope** use channels **B**, **D**, or **F**

- set them to ENV mode
- for outputting gates/triggers select the square shape (SHIFT+D) or use other shapes for envelopes
- set to either trigger or gate (SHIFT+F)

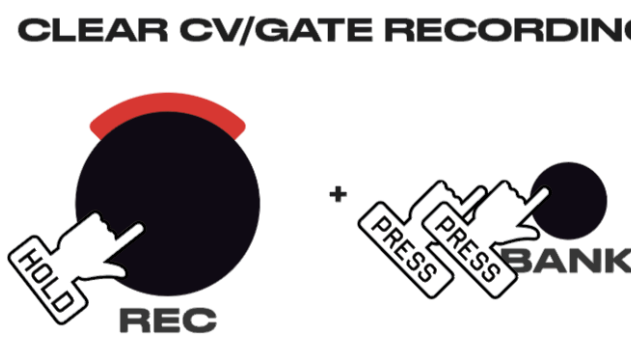
TIP: It is a good idea to set the same sequence length to both the CV and GATE channel, but their length is not restricted and can be set independently for more experimental sequencing.

REC+BANK - starts recording from input (keeps recording – REC blinks)





Pressing **REC** stops the recording.
REC+2xBANK clears recordings on both CV and gate outputs of the selected channel.



NOTE: Neo Trinity records on all the CV/GATE channels simultaneously. That means it would record to A/B pair even if channel C is selected. However it will only record if there are MIDI notes on these channels that means if there are no MIDI notes nothing gets recorded.

The recording overwrites the current CV automation and adds to the trigger automation.

On channels A,B,C and D it records only from MIDI input.
On channels E and F it records from both MIDI input and E IN/F IN CV inputs (CV takes priority).

NOTE: MIDI input is only recorded when selected channels actually respond to MIDI.
On the GATE (envelope) channel press SHIFT + F to change trig/gate recording behaviour:
Envelope in **trigger** mode records **triggers**

- doesn't overwrite triggers while a MIDI note is held.

Envelope in **slew** mode records **gates**

- overwrites gates while MIDI note is held.
- turns off time quantization (to prevent joining/merging notes). **NOTE:** When recording pitch sequence you should set the range of the CV channel to 5V (SHIFT+E). If the range is set to 2V the pitch will be still previewed in the 5V range when recording, but when played back the sequence will be limited to 2V. This can be also used creatively.

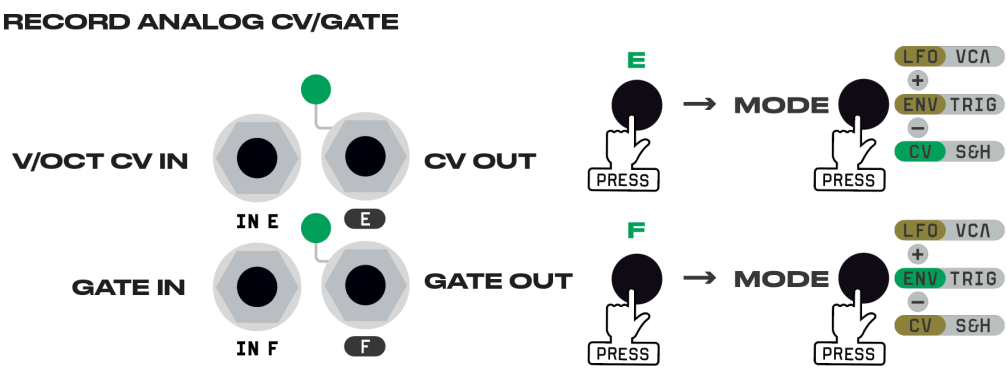
INTERACTION BETWEEN CV AUTOMATIONS AND MIDI

MIDI will temporarily override CV pitch automation while a MIDI note is held.
NOTE: if ENV is in SLEW mode it will override while note is held, otherwise it will send trigger and hold pitch until another trigger is dispatched by the Neo Trinity).

When interacting with the ENV channel outputting MIDI GATE the MIDI will simply mix with the automation and add triggers and gates.

RECORDING ANALOG CV/GATE FROM THE E IN AND F IN

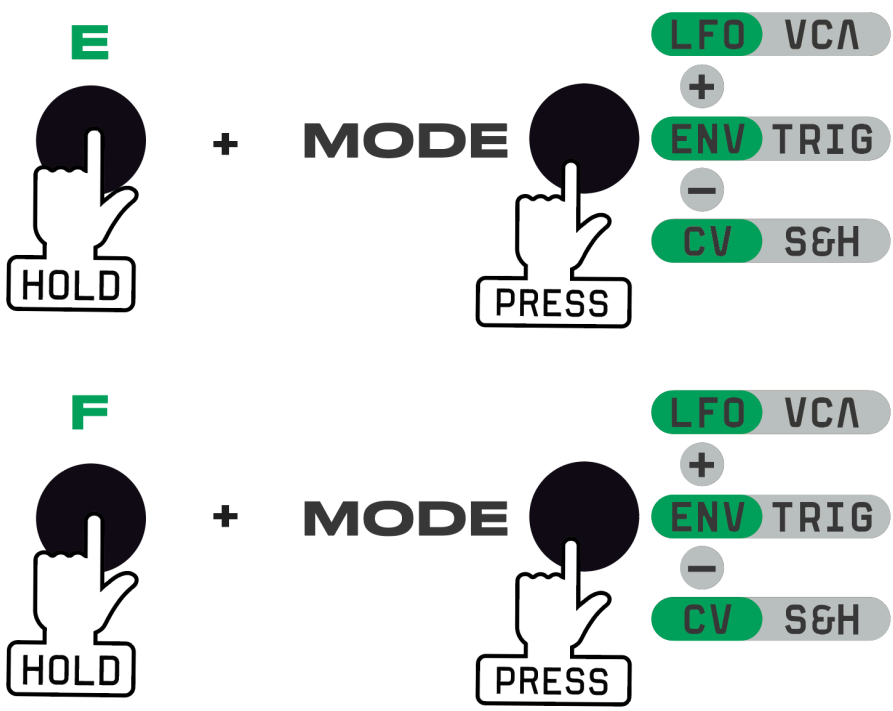
E is set to **CV**
F to **ENV**



E IN needs to be set to **ANALOG REC** mode (E+MODE until all 3 MODE lights are ON)

and

F IN needs to be set to **ANALOG REC** mode (F+MODE until all 3 MODE lights are ON)



On F channel enable/disable the slew option (SHIFT+F) to alter between TRIG and GATE recording:
In TRIG mode - keep recording CV until new trigger is played.
In GATE mode - keep recording CV until new gate is played.

REC+BANK will record the CV and GATE as a pair.

If a CV/GATE sequence has been recorded the CV/GATE will be overridden if a new TRIG/GATE note arrives.
In the TRIG mode - new TRIG on the input will take over recorded CV until another recorded TRIG is played.
In the GATE mode - high GATE on the input will take over recorded CV and GATE.

MIDI INPUT TABLE

NOTES AND GLOBAL MESSAGES

MESSAGE	MIDI CH	FUNCTION
Note On/Off	CH1	if A and B is CV/GATE(ENV) pair
Note On/Off	CH2	if C and D is CV/GATE(ENV) pair
Note On/Off	CH3	if E and F is CV/GATE(ENV) pair
CC00	any	load Bank
CC64	CH1/2/3	sustain pedal

MIDI CH1 – CHANNELS A AND B

CC	FUNCTION
CC01	B RATE knob (mod wheel)
	CHANNEL A – MODE COMMON
CC02	A RATE knob
CC03	A MODE
CC04	A MUTE
CC05	A BIPOLAR
CC06	A RESETABLE
CC07	A ATTENUVERSION
CC08	A QUANTIZE TRIGS
CC09	A SEQUENCE LENGTH
CC10	A TRIG GENERATOR MODE SELECTION (does not generate new sequence)
CC11	A TRIG GENERATOR VALUE (generates with every new CC, works in any mode)
	CHANNEL A – MODE SPECIFIC
CC12	A LFO SHAPE
CC13	A LFO SMOOTHING
CC14	A LFO SYNC
CC15	A ENV SHAPE

CC16	A ENV RETRIG
CC17	A ENV SLEWx
CC18	A CV QUANTIZER SCALE SELECT
CC19	A CV QUANTIZER ON/OFF
CC20	A CV RANGE
CC21	A CV SMOOTHING
	CHANNEL B – MODE COMMON
CC22	B RATE knob
CC23	B MODE
CC24	B MUTE
CC25	B BIPOLAR
CC26	B RESETABLE
CC27	B ATTENUVERSION
CC28	B QUANTIZE TRIGS
CC29	B SEQUENCE LENGTH
CC30	B TRIG GENERATOR MODE SELECTION (does not generate new sequence)
CC31	B TRIG GENERATOR VALUE (generates with every new CC, works in any mode)
	CHANNEL B – MODE SPECIFIC
CC32	B LFO SHAPE
CC33	B LFO SMOOTHING
CC34	B LFO SYNC
CC35	B ENV SHAPE
CC36	B ENV RETRIG
CC37	B ENV SLEW
CC38	B CV QUANTIZER SCALE SELECT
CC39	B CV QUANTIZER ON/OFF
CC40	B CV RANGE
CC41	B CV SMOOTHING

MIDI CH2 — CHANNELS C AND D

CC	FUNCTION
CC01	D RATE knob (mod wheel)
	CHANNEL C – MODE COMMON
CC02	C RATE knob
CC03	C MODE
CC04	C MUTE
CC05	C BIPOLAR
CC06	C RESETABLE
CC07	C ATTENUVERSION
CC08	C QUANTIZE TRIGS
CC09	C SEQUENCE LENGTH
CC10	C TRIG GENERATOR MODE SELECTION (does not generate new sequence)
CC11	C TRIG GENERATOR VALUE (generates with every new CC, works in any mode)
	CHANNEL C – MODE SPECIFIC
CC12	C LFO SHAPE
CC13	C LFO SMOOTHING
CC14	C LFO SYNC
CC15	C ENV SHAPE
CC16	C ENV RETRIG
CC17	C ENV SLEW
CC18	C CV QUANTIZER SCALE SELECT
CC19	C CV QUANTIZER ON/OFF
CC20	C CV RANGE
CC21	C CV SMOOTHING
	CHANNEL D – MODE COMMON
CC22	D RATE knob
CC23	D MODE
CC24	D MUTE
CC25	D BIPOLAR

CC26	D RESETABLE
CC27	D ATTENUVERSION
CC28	D QUANTIZE TRIGS
CC29	D SEQUENCE LENGTH
CC30	D TRIG GENERATOR MODE SELECTION (does not generate new sequence)
CC31	D TRIG GENERATOR VALUE (generates with every new CC, works in any mode)
	CHANNEL D – MODE SPECIFIC
CC32	D LFO SHAPE
CC33	D LFO SMOOTHING
CC34	D LFO SYNC
CC35	D ENV SHAPE
CC36	D ENV RETRIG
CC37	D ENV SLEW
CC38	D CV QUANTIZER SCALE SELECT
CC39	D CV QUANTIZER ON/OFF
CC40	D CV RANGE
CC41	D CV SMOOTHING

MIDI CH3 – CHANNELS E AND F

CC	FUNCTION
CC01	F RATE knob (mod wheel)
	CHANNEL E – MODE COMMON
CC02	E RATE knob
CC03	E MODE
CC04	E MUTE
CC05	E BIPOLAR
CC06	E RESETABLE
CC07	E ATTENUVERSION
CC08	E QUANTIZE TRIGS
CC09	E SEQUENCE LENGTH

CC10	E TRIG GENERATOR MODE SELECTION (does not generate new sequence)
CC11	E TRIG GENERATOR VALUE (generates with every new CC, works in any mode)
	CHANNEL E – MODE SPECIFIC
CC12	E LFO SHAPE
CC13	E LFO SMOOTHING
CC14	E LFO SYNC
CC15	E ENV SHAPE
CC16	E ENV RETRIG
CC17	E ENV SLEW
CC18	E CV QUANTIZER SCALE SELECT
CC19	E CV QUANTIZER ON/OFF
CC20	E CV RANGE
CC21	E CV SMOOTHING
	CHANNEL F – MODE COMMON
CC22	F RATE knob
CC23	F MODE
CC24	F MUTE
CC25	F BIPOLAR
CC26	F RESETABLE
CC27	F ATTENUVERSION
CC28	F QUANTIZE TRIGS
CC29	F SEQUENCE LENGTH
CC30	F TRIG GENERATOR MODE SELECTION (does not generate new sequence)
CC31	F TRIG GENERATOR VALUE (generates with every new CC, works in any mode)
	CHANNEL F – MODE SPECIFIC
CC32	F LFO SHAPE
CC33	F LFO SMOOTHING
CC34	F LFO SYNC
CC35	F ENV SHAPE

CC36	F ENV RETRIG
CC37	F ENV SLEW
CC38	F CV QUANTIZER SCALE SELECT
CC39	F CV QUANTIZER ON/OFF
CC40	F CV RANGE
CC41	F CV SMOOTHING

MIDI OUTPUT TABLE

MESSAGE	MIDI CH	FUNCTION
Note On/Off	CH1	if A and B is CV/GATE(ENV) pair
Note On/Off	CH2	if C and D is CV/GATE(ENV) pair
Note On/Off	CH3	if E and F is CV/GATE(ENV) pair
CC00	CH1	on BANK change
CC01	CH1	B RATE knob
CC02	CH1	A RATE knob
CC01	CH2	D RATE knob
CC02	CH2	C RATE knob
CC01	CH3	F RATE knob
CC02	CH3	E RATE knob

CREDITS

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