neuzeit INSTRUMENTS

DROP

Manual

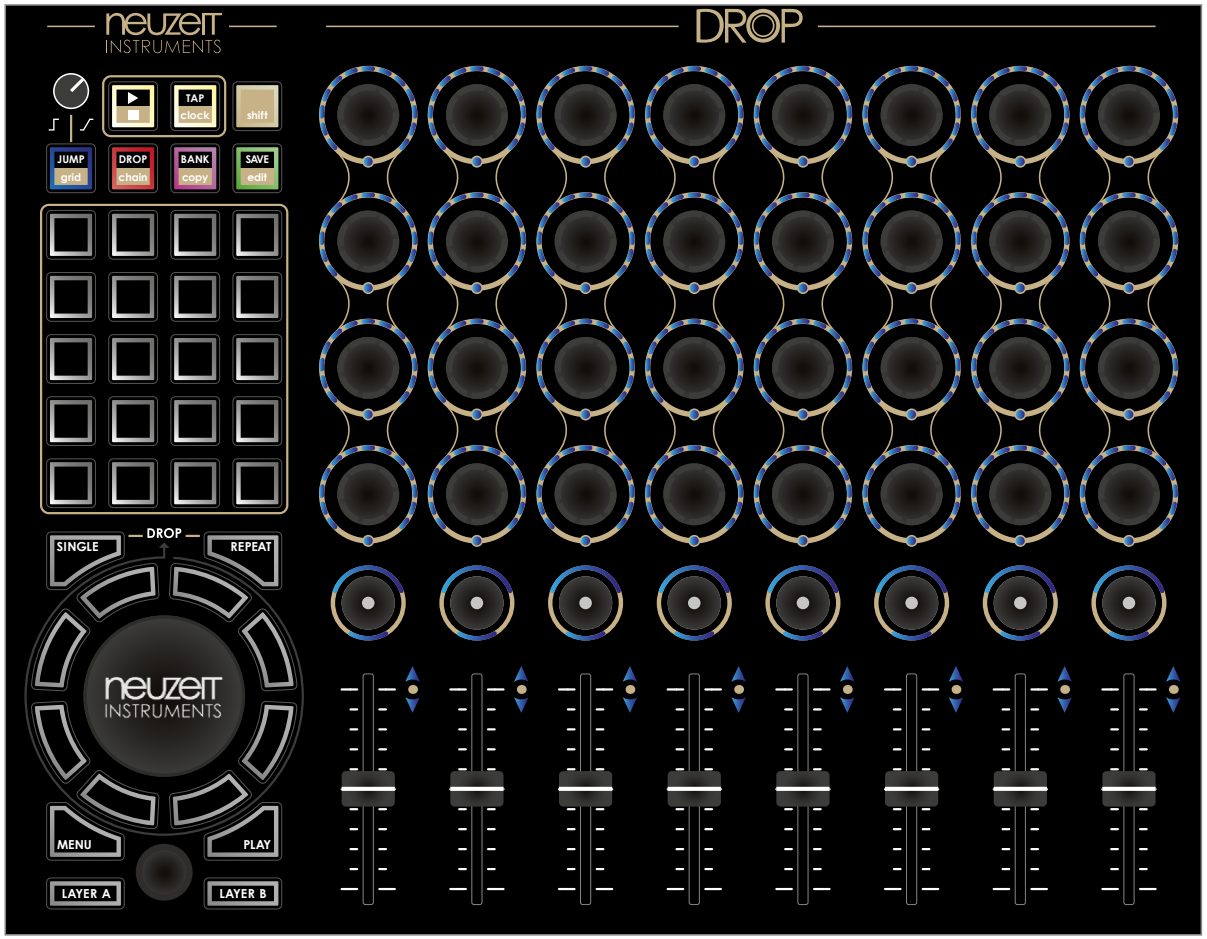
Firmware version 1.07

www.neuzeit-instruments.com

Table of Contents

Device overview

Power Power supply included, 12VDC 1500mA
USB1-2 Host or device auto-detection. USB1 can also be used as power input.
TRS1-4 MIDI Out has a switch for TRS type A or B, Input accepts both types.
CV1-2 Two CV inputs and outputs. Used for clock signals or variable 0-5 Volts.
Micro SD Holds all projects and the MIDI CC database, used for firmware updates.



Rotary knobs

8x4 endless encoders, no detents, with push function.
RGB LED-rings with 13 LEDs around the knob to visualize the rotary knob's value.
A separate RGB LED below the knob to show the value of the push function.
The push can be configured as an independent button or in connection with the rotary knob.

Mute buttons

8 momentary buttons with click.
A white LED in the middle and two RGB LEDs on top and bottom are used for color coding and to show the On/Off value.

Faders

8 faders with 45mm travel distance.
Two RGB LEDs are used for color coding and to show if the catch-value is above or below the physical position.

Move fader up

Move fader down

Value is caught

Fade time for snapshot Jump
Maximum duration is configurable in settings

START clock
STOP clock

TAP tap in the tempo by hand
CLOCK bpm and clock config

SHIFT access the
secondary functions

JUMP
Fire snapshots in jump mode.
GRID
Use the button matrix to launch clips in a DAW or
play notes like on a keyboard.

SAVE Save snapshot
EDIT Edit snapshot

DROP
Schedule snapshots in Drop mode at the end of a cycle.
CHAIN
Arrange snapshots on a timeline.

BANK
Select snapshot bank
COPY
Copy snapshot

Button matrix
Function depending on mode.
Fire snapshots, select bank, trigger
clips in DAW using grid mode.

Single or Repeat
execution of snapshots in Drop mode.

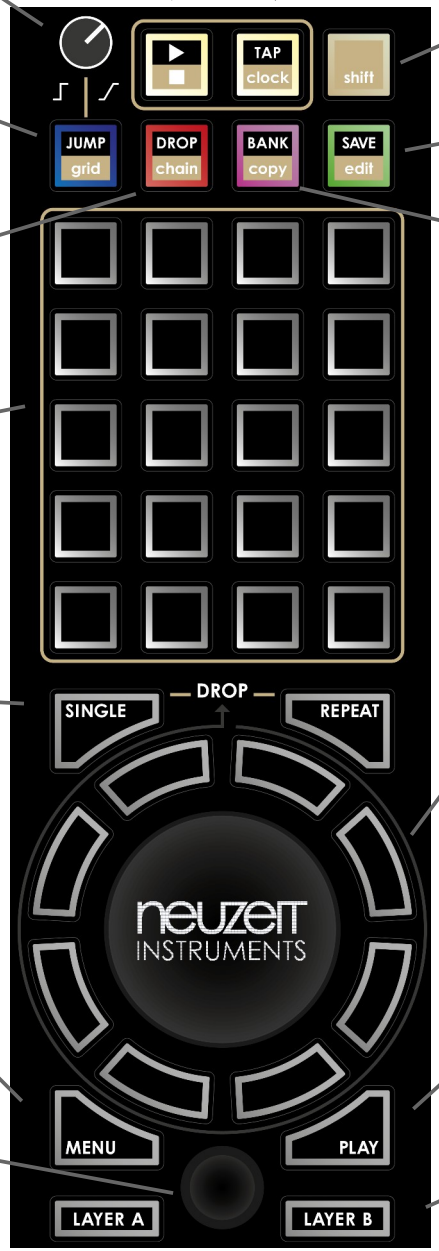
Cycle buttons
A *cycle has a length of 1-32 bars*.
The button's LEDs show the
playback position within the cycle,
also signaling ongoing Jumps or
Drops by turning blue or red.

MENU
Opens the main menu for configuration and
setup. Also used to go *back* in some menus.

PLAY
Opens the performance views.

MENU encoder
Turn and push for navigation.

LAYER A / B
Switch between two layers
of the control elements.



What’s in the box

Drop ships with some useful accessories to get you started.

- Power supply 12V 1500mA, with adaptors for EU, USA, AU, UK
- USB-C to USB-C cable, can also be used to power the device
- USB-C male to USB-A female adaptor when Drop is USB host
- MIDI adaptor TRS to DIN female
- 2 x MIDI TRS cable 120cm, braided gold-black
- Micro SD-card adaptor to regular sized SD-card

Firmware updates

Download the latest firmware from our website and save it on your computer.

1) Put Drop's SD-card into your computer.
2) Copy the firmware file into the */Firmwares* folder on the SD-card.
3) Turn off Drop, reinsert the SD-card.
4) While powering on Drop, press and hold the Shift button until the display shows up.
5) Use the menu encoder to select the firmware file and push to update the firmware.

Power

Power Drop using the *included power supply* or via the *USB1 port*. The benefit of using the included 12V power supply is that you still have both USB-C ports available to connect other gear. It is also the best choice to suppress audible noise caused by ground loops.

Power input:	*12V DC, 1200 mA min*	*what Drop requires when powered via external power supply*
USB1 input:	*5V DC, 1500 mA min*	*what Drop requires when powered via USB1*
USB1 output:	*5V DC, 1500 mA max*	*when Drop is used as USB host to power other gear via USB (automatic host role detection)*
USB2 output:	*5V DC, 500 mA max*	*when Drop is used as USB host to power other gear via USB (automatic host role detection)*

If you are using USB-C, you must use the USB1 port with the little flash symbol next to it. You also need a USB-C-to-C connection and your USB host must be able to supply at least 1500mA. Computer USB-C ports usually can supply twice as much current.

> *Only USB-C to USB-C cables in conjunction with a USB-C host or power supply can be used to power Drop. USB-A cables and USB-A power supplies will NOT work for power, even if the power supply meets the electrical requirements. The USB-A socket does not allow the necessary power negotiation between Drop and power supply.*

Does not work for powering

Works for powering from USB-C host with min 1500mA output

Does not work for powering, no matter how much current out

Works for powering, if min 1500mA output current

Connectivity

Drop can control up to eight other MIDI devices with its user interface. Drop features 2x USB and 4x TRS MIDI ports, so that each device benefits from *its own connection*, providing full data bandwidth and its own clock signal with individual micro-delay.

In this example...

The laptop (*DAW*) only offers USB connections, so it is obvious to connect it via USB. The laptop may also power Drop via its USB1 port.

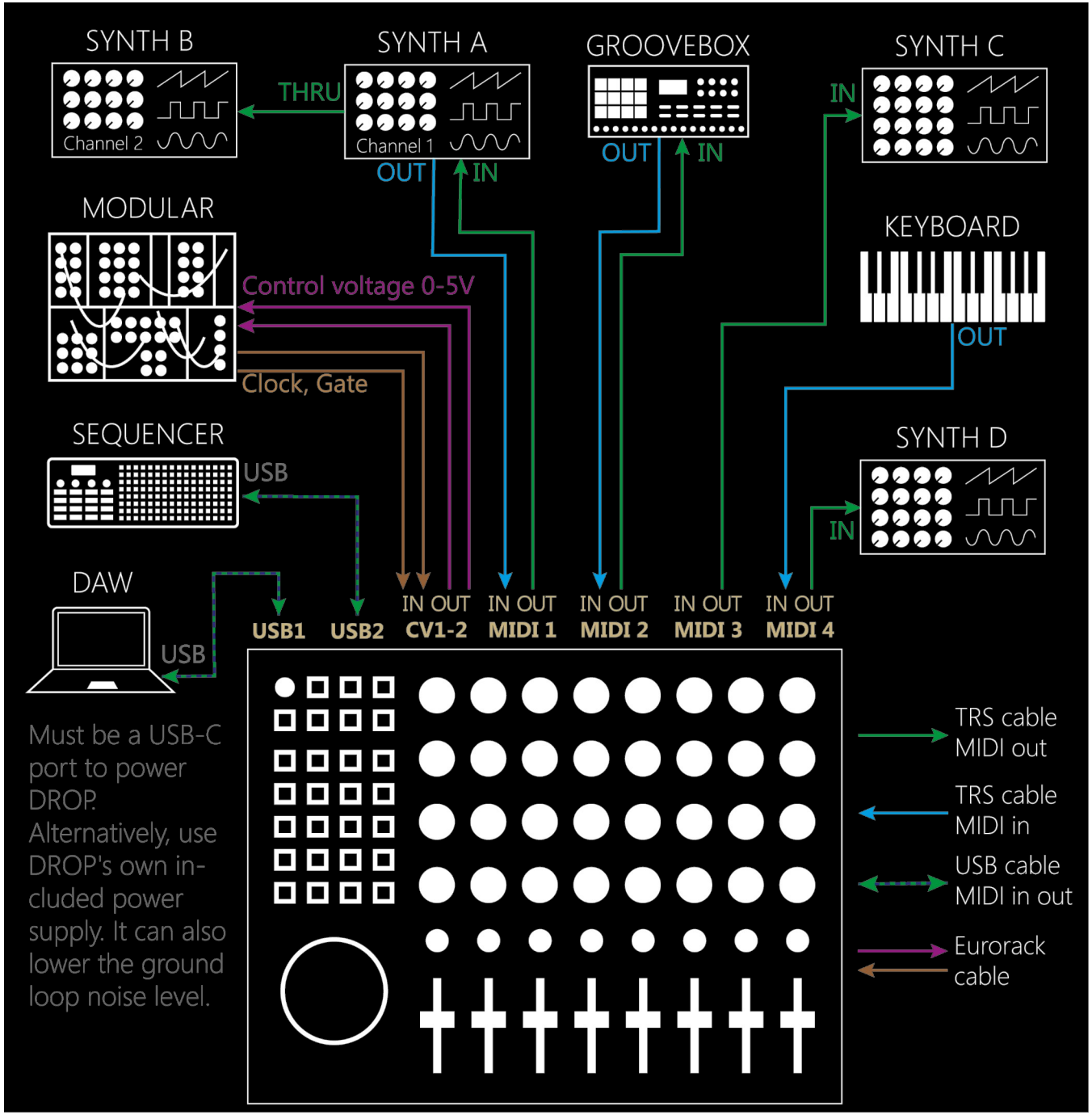
The *SEQUENCER* may send a lot of MIDI data, so it may be a good choice to connect it via USB. Also, Drop can eventually power the sequencer via USB.

Incoming MIDI, e.g. from KEYBOARD, GROOVEBOX, DAW, SEQUENCER, SYNTH A, can be distributed to other devices using Drop's *Device Merger* function.

Drop's MIDI *In and Out ports are not related* to each other and can be used for different devices, like KEYBOARD and SYNTH D in this example.

It is still possible to connect devices in classic daisy-chain cabling, using MIDI Thru, like SYNTH A and B.

Drop's two *CV inputs and outputs* are mostly used for clock and timing. The outputs can also be variable 0-5V control voltages (12-bit DAC).



USB, TRS, CV pros and cons

USB-MIDI: High data rate, not so precise with MIDI clock timing. Requires class-compliant MIDI gear if Drop is used as USB host.
TRS-MIDI: Low data rate, but mostly sufficient, especially when each device has its own cable carrying only the device's data. Precise clock timing.
CV: On Drop, same clock timing precision as TRS-MIDI.

2x USB-C

USB MIDI

Connect laptops or class-compliant MIDI devices to Drop. With USB, there is always host and device role to be negotiated. Drop will automatically detect which mode is necessary and can also act as a MIDI host for other controllers and instruments. In MENU > Settings, you can switch the mode for each port from "Host + Device" auto-detection to "Device Only". As a MIDI host, Drop can supply 5V on each port to power the connected device. USB1 can supply up to 1500mA and USB2 up to 500mA. The specs are also printed on Drop's bottom side. You can also use the included USB-C to USB-A adaptor if your device requires an oldschool USB-A/B cable.

USB-hubs are not supported, so you can only connect one USB device per port.

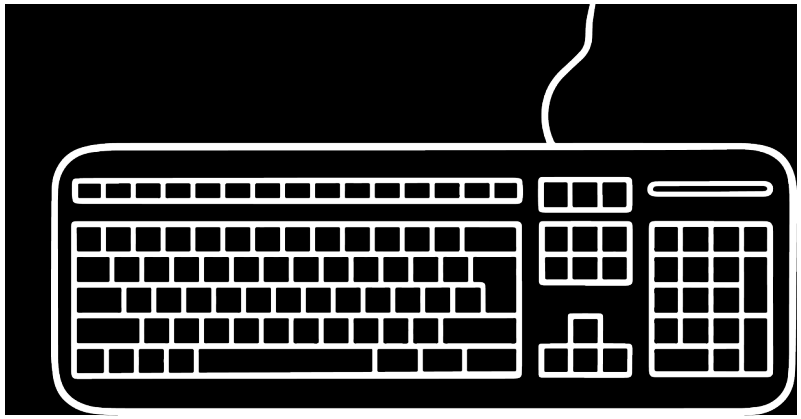
To connect to MIDI devices via USB, your device must be class-compliant. This means, that no driver needs to be installed to use it, which applies to most gear out on the market. However, some manufacturers (e.g. Roland) still require a driver for their USB-MIDI gear. To use their devices with Drop, you need to use the classic MIDI TRS/DIN connection. Drop will show you a popup message if the USB gear connected is not class-compliant.

USB keyboard

Connect a USB computer keyboard for navigation and to name devices, controls and snapshots.

In Menu > Settings, select the approriate layout (e.g. QWERTY, QWERTZ, AZERTY).

Navigation = Arrow keys, Escape, Enter, Backspace.
Change slot = Shift + Arrow keys
CTRL+9 = MENU button
CTRL+0 = PLAY button
CTRL+1-8 = Buttons around the display, clockwise



4x MIDI TRS In, 4x MIDI TRS Out

Use these ports to connect any MIDI equipment to Drop. Four ports enable you to connect one device per port in a star-topology instead of daisy chaining the MIDI signal from device to device. The star-topology enables high data throughput and individual MIDI clock delays per device.

> *Use the small switches on the back to select TRS type A or B for Drop's MIDI output. If you pick the wrong mode, your device may not receive MIDI data from Drop.*

2x CV out

Drop's CV inputs and outputs support a voltage range between 0,0 and 5,0 Volts.

The outputs can be used independently to send different kinds of clock signals, triggers and gates to sync analogue gear. They can also be used as a simple continuous voltage outputs that can be assigned to any of Drop's controls. The resolution is 12 bits (4096 steps).

2x CV in

Use CV inputs 1 and 2 to connect Drop to an external analogue clock source. CV1 expects the clock signal (16^{th} or 8^{th} notes) and CV2 can be configured to receive a dedicated start and stop trigger or gate signal.

There is also another mode available that lets you use the CV1 and 2 inputs to fire snapshots from external modular gear, where CV In 1 receives triggers and CV In 2 receives a control voltage to select a snapshot. You can enable this mode in the *CV Config* menu.

If you are planning to control your modular rack with Drop, we recommend to use a dedicated MIDI-to-CV-out converter module.

Step-by-step workflow

1) Decide which gear to use

Before getting into Drop, you should have an idea of what kind of setup you want to build and what gear you want to connect to Drop. Ideally, you already have your grooveboxes or synths play a loop, and now it is time to create an accessible user interface for them on Drop.

2) Init your project

Select *Project* > *Clean Init*. You now have an empty project that does absolutely nothing – the perfect starting point for a *setup with hardware gear*, where mapping is all done in Drop.
For a DAW-only setup, *Project* > *DAW Init* is a one-click init option that applies a default mapping to Drop, so that every control element sends out a default CC message over USB1. From there, you can map everything in your DAW. You can skip steps 3 and 4.

3) Create and configure devices

Go to the *Devices* menu and add the devices you want to use in your live set (up to 8 devices max). Even if your device uses multiple MIDI channels, you only need to list it as one device in Drop. Also hook up keyboards and sequencers that merge their data with Drop's data and send it out to other connected gear. You should also configure clocks in this step.

4) Mapping on Drop

Each of Drop's controls can send out up to 8 different MIDI messages with different curves which allows flexible macro mapping. Each control offers 8 Slots to set up different kind of MIDI messages. This is an essential and powerful feature to create a user interface that speaks across multiple devices in your setup.

Use the *Mapping* menu to configure the controls you want to use. Depending on your target device, you can either enter the MIDI parameters by hand, use MIDI Learn, or use the included MIDI CC and NRPN database if it contains your target device.

5) Snapshots

By now, you should have developed a feeling for your newly created user interface. It is time to create some snapshots! These can either be fallback safety net points, peak moments, snapshots that only affect a subset of controls so you can combine them later, a fixed chain of snapshots that follow your song's arrangement, or you simply skip snapshots and use them spontaneously on stage as save-and-recall points.

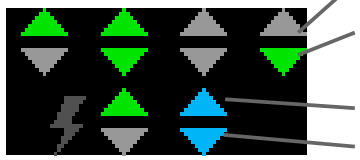
PLAY view

Beatjump

This view controls and shows the playback position inside the current cycle. Use the eight buttons around the display to jump to another playback position while playing.

Note: Performing a beatjump also sends a Song Position message to all devices, that have the according check mark set in the clock menu.

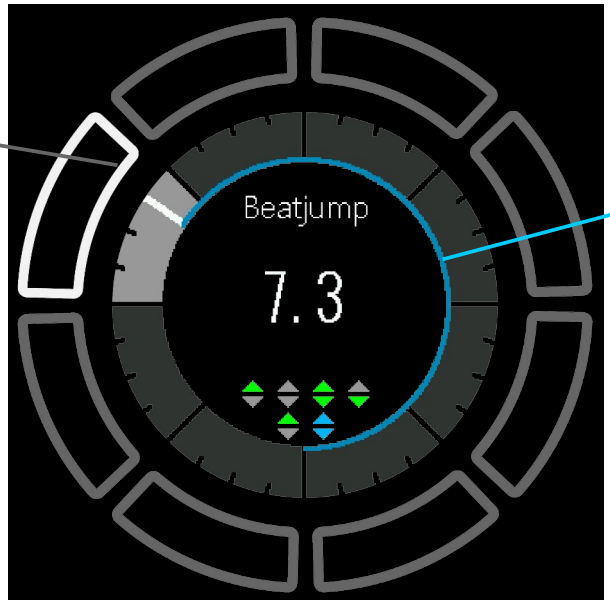
MIDI traffic monitor



dark green	= only clock and system data
green	= data
light grey	= no traffic
red	= data overflow, lose packets
dark grey	= nothing connected
blue	= USB keyboard connected
Flash symbol	= USB port serves as host, delivers 5V power to the connected device.

Change the playback position
Push the eight cycle buttons to change the playback position. This is useful for example, if you have scheduled a Drop, and need to shorten or extend the time until it fires.

Cycle end = Drop time
The 12 o'clock position marks the start and end of a cycle. It also marks the time when a snapshot in Drop mode is executed.



Current playback position
Here: bar nr 7 quarter note 3

Current Jump fade time
Changes its length depending on the fade time potentiometer. If you push a snapshot in Jump mode right now, this is the time it needs to fade to it.

Blinking cycle button
No matter which menu you are in, the corresponding button will always blink so you always know the playback position

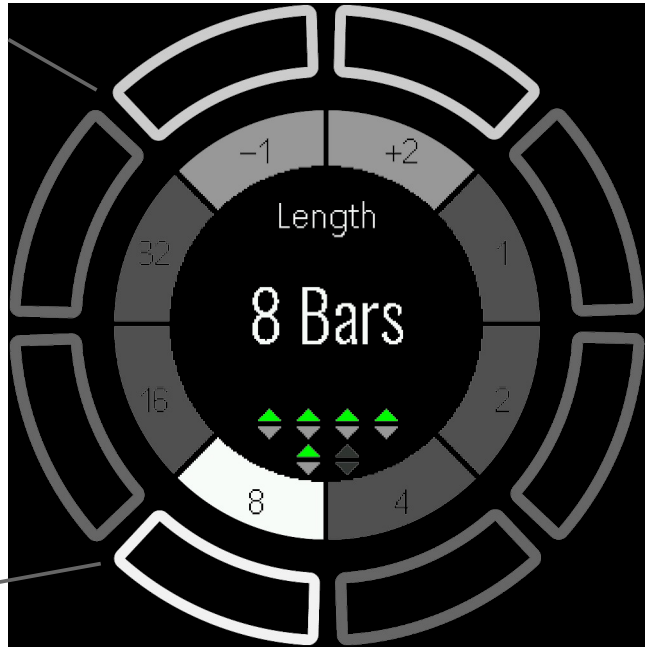
Cycle length

The cycle length can be set from 1 to 32 bars.

Drop is not a sequencer itself, but you can connect other sequencers or grooveboxes with their internal sequencers to Drop. These other devices can run their own sequencers with their own time signature. Drop on the other hand simply keeps a global time measure.

Internally, Drop uses 16 sixteenth notes per bar. But this only plays a role for clock signals.

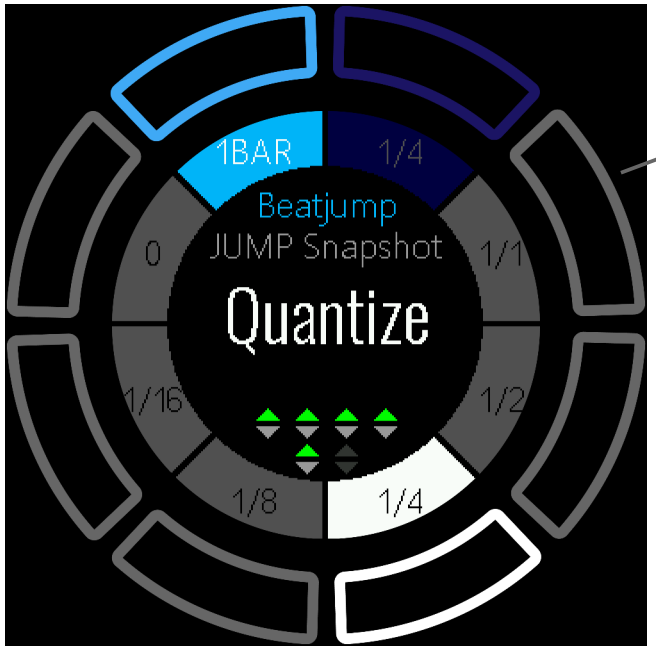
Increase and decrease cycle length
Selectable lengths are 1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 14, 16, 20, 24, 28, 32 bars



Cycle length in bars
Quick select values 1, 2, 4, 8, 16, 32 bars

Quantization

Beatjump quantization
Select between 1 bar and 1/4th note quantization when pushing the cycle buttons to change the playback position.

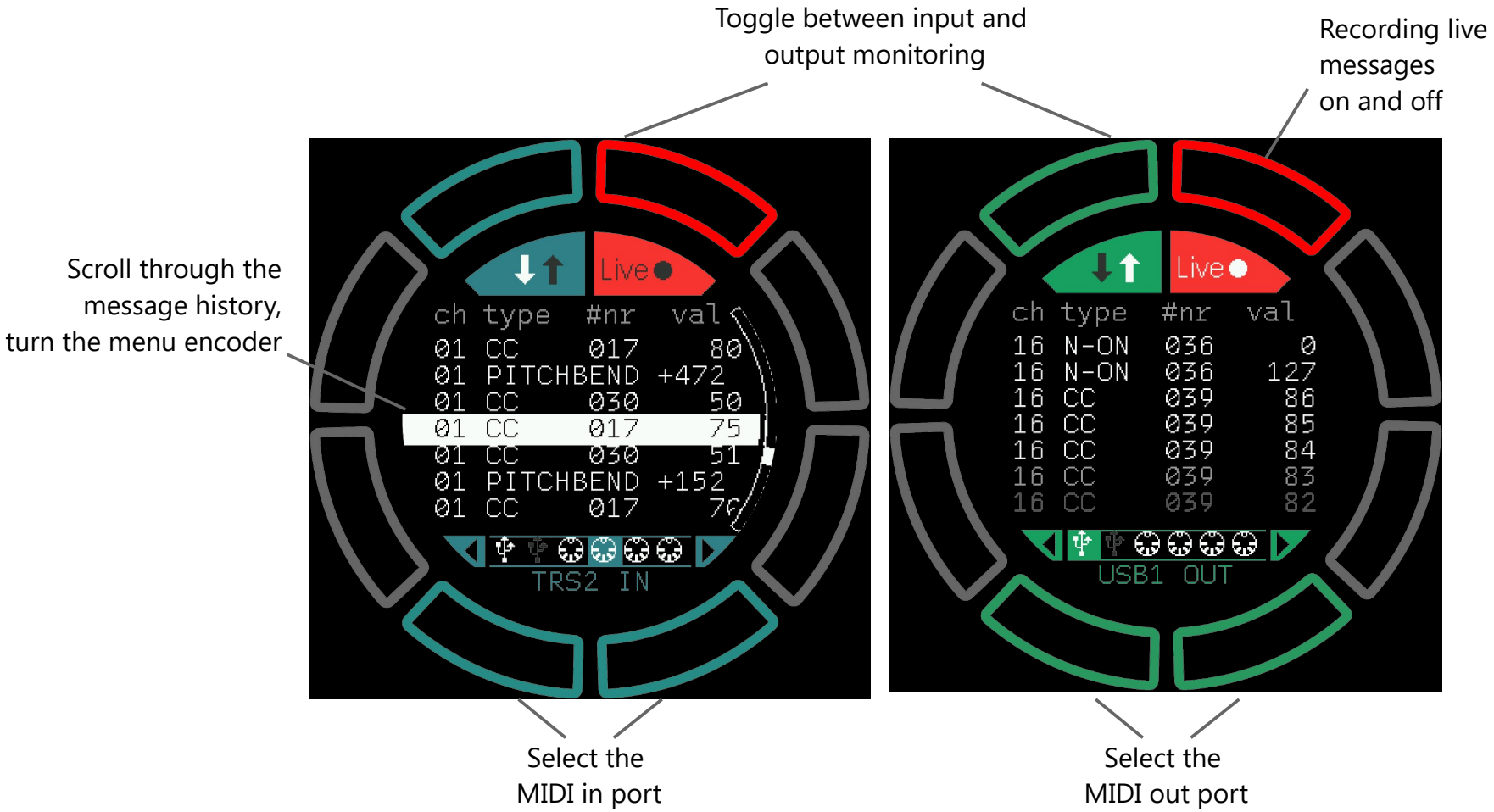


JUMP snapshot quantization
Use the other six buttons to select the quantization for firing a snapshot in Jump mode.

Monitor

The MIDI monitor helps to see and debug what is going on between Drop and a connected MIDI device.

- Verify, that Drop sends out the data your device expects.
- Verify, that the connected device sends data back.
- Check if a device sends unnecessary data that can be filtered out in the MIDI merge filter.



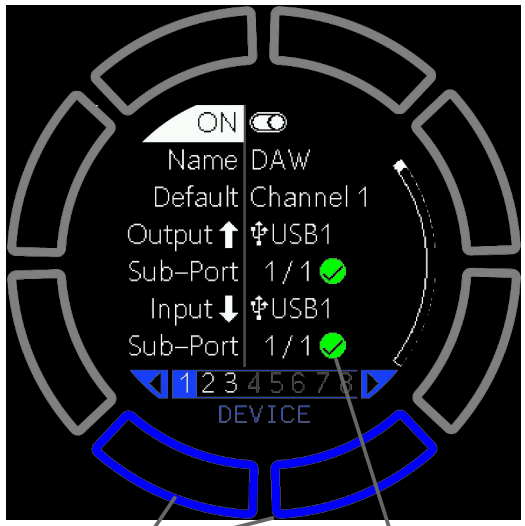
MENU view

Devices

Setting up devices is the first step you should do when creating a new live set. In this menu, up to 8 MIDI devices can be configured that Drop can interact with at the same time.

Decide, to which port you want to connect your device and if it needs MIDI output, input, or both.

You can verify proper communication using the MIDI Monitor in the PLAY view.



Select the device

Green = connected via USB

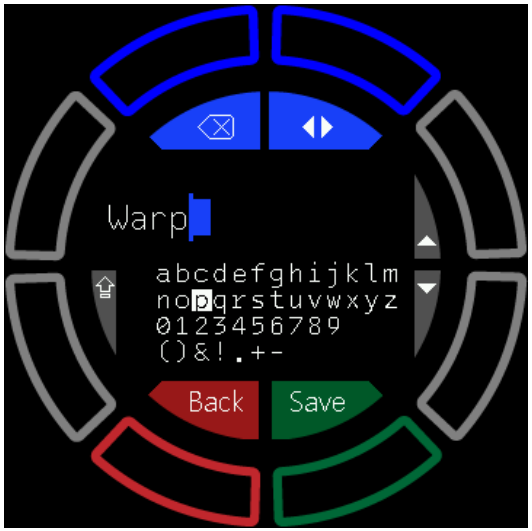
ON Activate or deactivate the device and the control elements linked to it.

Name Enter the name of your device, for convenience during the mapping process.

Default Channel The default MIDI channel number. Each control that maps to this device can either send to the default channel or a specific channel 1-16. If your device only uses one channel, use the default channel in the mapping. That way, if you want to switch the channel at a later point, you only have to change it in the device menu instead of changing it in each control.

If you connect a device that uses multiple channels, you should still set up only one device for it.

You can select each control element's channel in that element's mapping specifically. The channel you set in the device is just a default value.

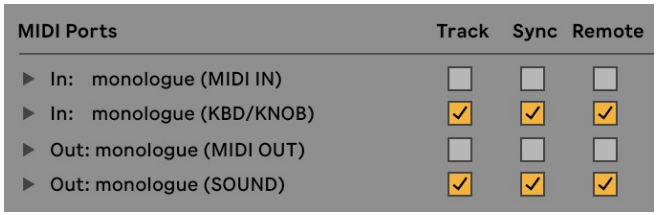


Enter the device's name

Output The physical port USB1-2 or TRS1-4 on which Drop sends MIDI out to the device

Input The physical port USB1-2 or TRS1-4 on which Drop receives data from the device.

Sub-Port Only relevant when the device is connected via USB. Some USB devices offer multiple internal Sub-Ports for communication. Sub-Port 1 works just fine for most USB gear.



Example: This is how a synth with two USB sub-ports shows up in Ableton Live.

> *If communication to your USB device fails and it offers more than one Sub-Port, try another one. Unfortunately, sub-ports are often not documented in the device's user manual. You simply have to try.*

For the nerds: The Sub-Port corresponds to the cable number CN in the USB MIDI protocol. Sub-ports are also reffered to as virtual cables.

Note: In the clock menu, you can specify to which sub-ports clock and transport messages are being sent.

Gear with MIDI mapping table - Synths and grooveboxes

Enable MIDI Output, and only enable MIDI Input if needed: For example, if the device can send MIDI data back to Drop when turning its knobs, you can use convenient MIDI Learn for mapping. You should also enable the MIDI Input, if the device includes a MIDI sequencer or a keyboard whose notes you want to forward to other connected devices.

Gear for MIDI Input only - Keyboards

Usually there is no need to enable MIDI Output, picking only a MIDI Input port is sufficient. To setup MIDI forwarding to another device, use the target device's MERGER function, described on the following pages.

Gear with own MIDI mapping - DAWs and workstations

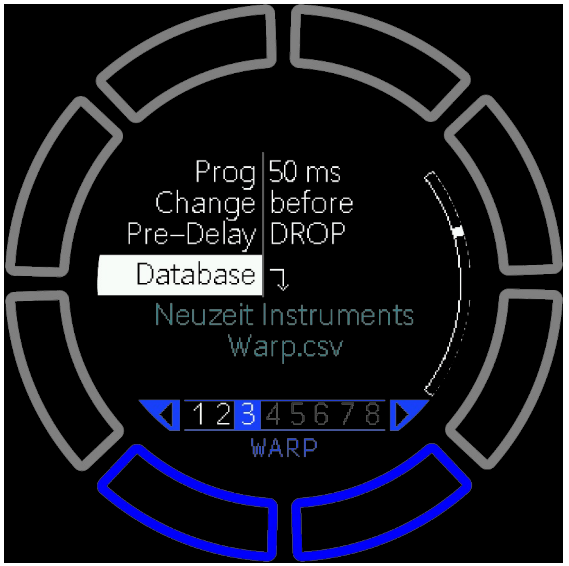
Generally, you should enable both, MIDI Input and Output, and do the mapping on your DAW or workstation. You might also prefer USB over TRS MIDI. Usually, DAWs and workstations offer their own internal MIDI Learn function and parameter mapping. Use *MENU* > *Project* > *DAW Init* to quickly apply a default initialization for use with a DAW.

Program Change Pre-Delay This is a useful feature for grooveboxes that need to receive program change messages just a little bit before their internal sequencer's pattern ends.

Let's assume, you schedule a snapshot in Drop mode (fires at the end of a cycle) and that snapshot contains a program change message to tell your groovebox to switch to the next pattern. The groovebox may need to know about the pattern change a little earlier, just before the pattern ends, so it has some time left to prepare everything for the pattern change. This is what we call a pre-delay. You can select from different values, like a fixed number of milliseconds or tempo-dependent values like 3/16th notes.

> *You want the Program Change Pre-Delay to be as small as possible and as large as necessary. Sequencer-based devices (grooveboxes) may need a time-related value like 3/16th notes, while synths may need a fixed amount of time to load a new preset.*

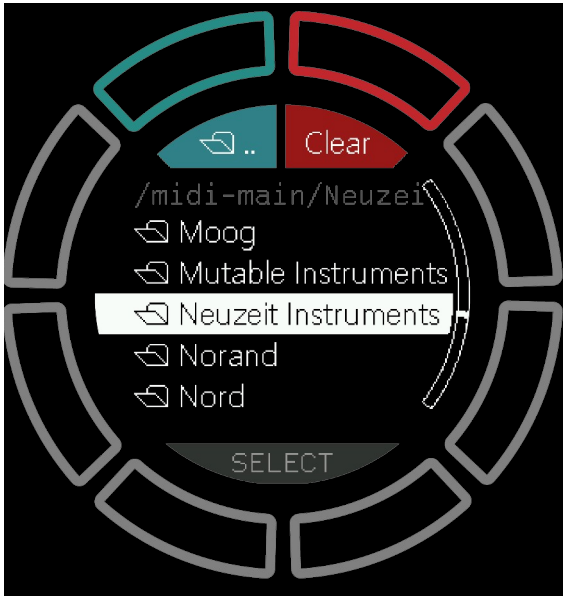
You simply have to try out which pre-delay value works best for your device.



Database Drop ships with the open-source MIDI CC & NRPN database from Pencil Research on its SD-card. This database contains mapping tables of popular MIDI gear and simplifies the mapping process. Navigate through the database and check if your device is supported. If so, selecting it can make mapping more convenient.

The database can be found on https://github.com/pencilresearch/midi

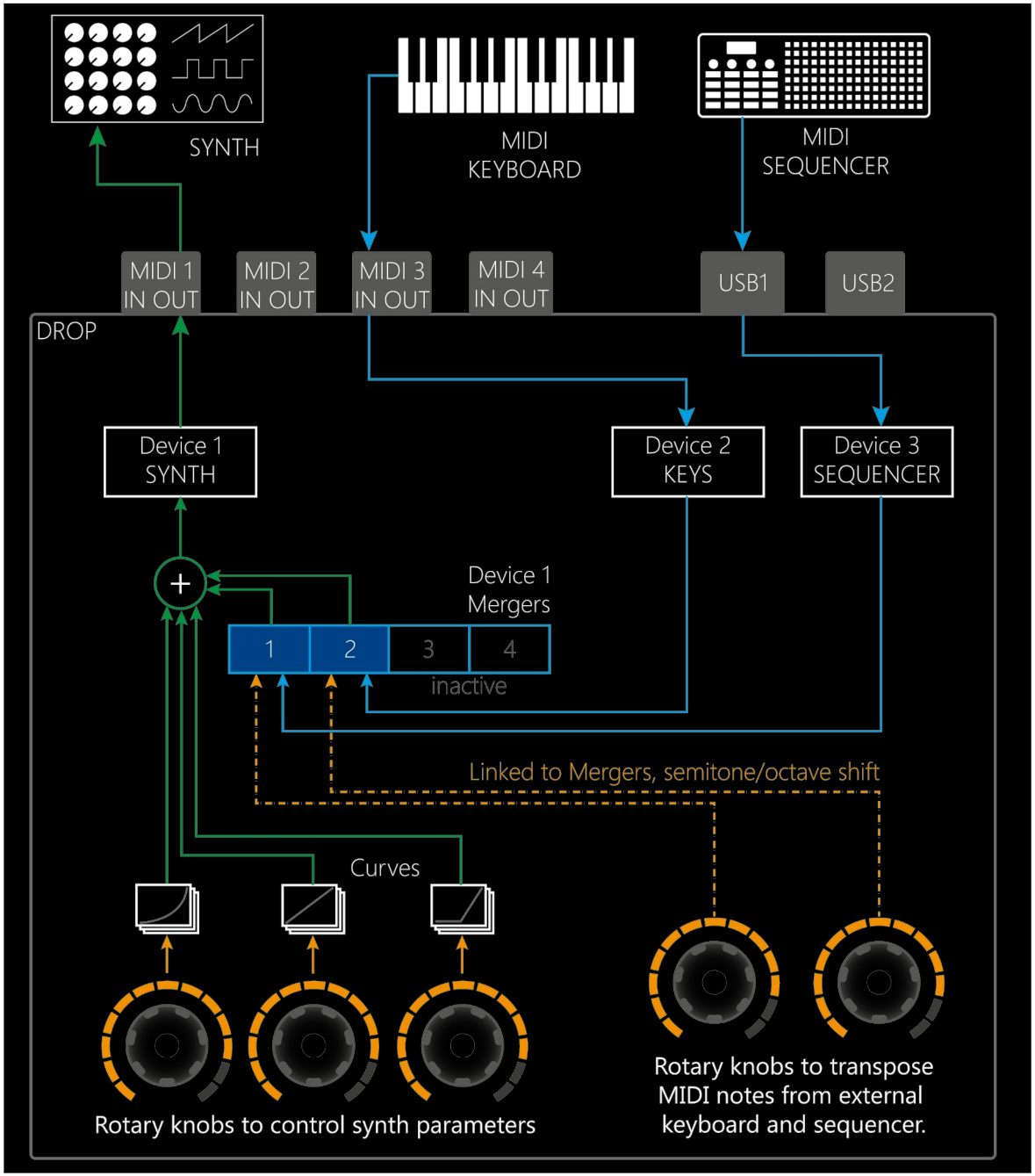
To get the latest version of the database, simply open the link on your computer, click on the green button *Code > download ZIP*. Then extract the folder on your computer and move it into the root folder of Drop's SD-card. The database folder must be named */midi-main* which is the default name the database already has when downloading it.



Navigate through the CC & NRPN mapping database and check if your device is included.

Drop's MIDI merger allows you to forward MIDI input data to a MIDI output. You can even modify incoming data before it gets forwarded, like transposing MIDI notes.

Use case:
You want to control your synth by Drop's controls, but it should also receive notes from a MIDI keyboard. However, your synth only has one MIDI-In port. This means, the MIDI data from Drop's controls must be merged together with the MIDI data from the keyboard.



In order to do this, you need to create two devices on Drop: One for the synth and one for the keyboard. The synth device needs to have a MIDI Output port selected, the keyboard must have a MIDI Input port.

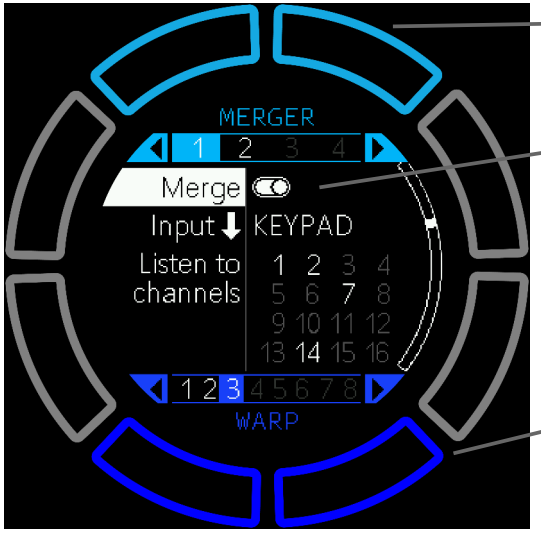
Now, in the *Devices* menu, select the receiving device (the synth) with the lower two buttons (dark blue). Scroll down to the MERGER part. Select Merger 1-4 with the upper buttons (light blue) and turn the switch ON to activate the Merger.

> *Each device has its own 4 Merger instances. That means, per device you can forward up to 4 different MIDI input streams, which come from other connected devices.*

Merge Activate the merger instance.

Input The device from which this merger instance receives incoming MIDI data. Obviously, the selected device must have a MIDI Input enabled.

Listen to Channels Select the MIDI channels on which the input device sends the relevant data. This does not necessarily have to match the receiver's MIDI channel. It should simply cover the channels which carry the data that is relevant for the MIDI stream you want to capture.



> *Use Drop's MIDI monitor to inspect the MIDI data that comes in. Set the message filters and channel selection in a way, so that the receiving device only gets MIDI data it actually understands. Avoid unnecessary MIDI traffic for best responsiveness.*

> *Note: Incoming SysEx messages are not forwarded to the receiver. This is because SysEx could potentially block the whole traffic as long as the sender wants.*

As a best-practice, you should configure your input device first, so that it only sends relevant data and does not spam unnecessary messages around. Do this as far as possible, and filter out the rest in Drop's MIDI Merger.

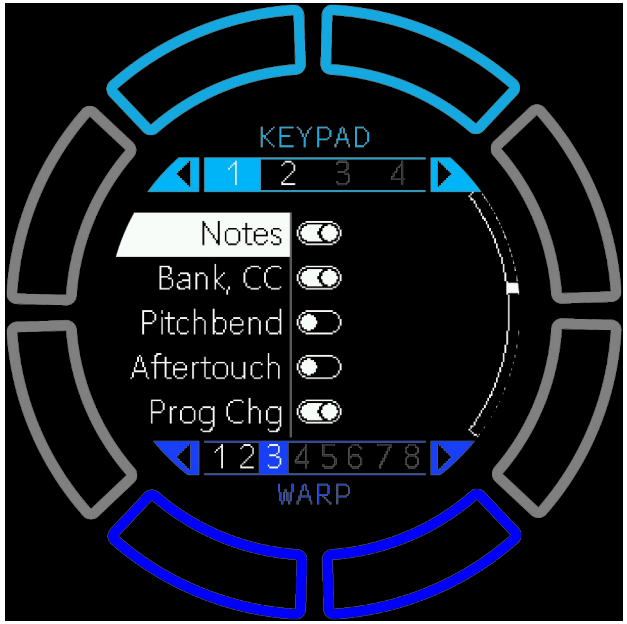
Notes Filter On/Off for MIDI note events

Bank, CC Filter On/Off for CC messages. This also includes 14-bit CC messages, NRPN messages and Bank Select messages.

Pitchbend On/Off filter MIDI pitchbend data.

Aftertouch On/Off filter MIDI aftertouch, including channel pressure and polyphonic key pressure.

Prog Chg On/Off filter MIDI program change messages



Enable only the MIDI message types your target synth should receive

Target Channel

No Change: Leave the MIDI channel as it comes in.

By Device: Modify the channel to the device's Default Channel.

Channel 1-16: Modify the channel to this channel number.

Note Gate Enables mute/unmute functionality for incoming MIDI notes.

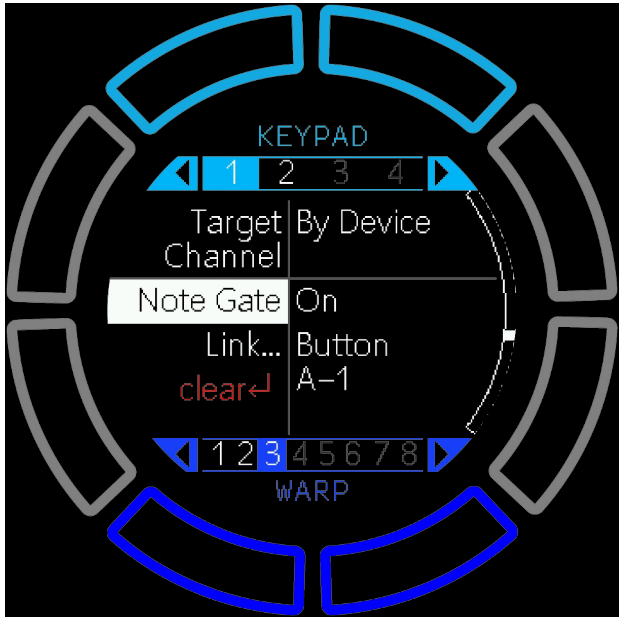
Off: Note Gate function disabled.

On: Note Gate enabled. Control element max value = notes pass, min = blocked

On, inverted: Note Gate enabled. Control element max = notes blocked, min = pass.

Link Link one of the control elements to the Note Gate function. Press "Link…", so the control elements will start to blink. Then, turn/move/push the control element you want to assign.

clear Push the menu encoder to clear the assigned control element.



The merger also offers note transposition. Notes can be shifted by semitones and octaves. Both menus are similar.

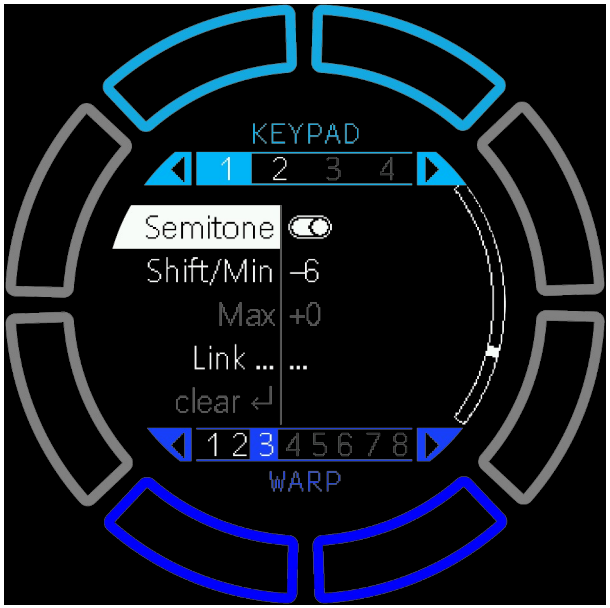
Semitone / Octave Enables note semitone/octave shifting functionality for incoming MIDI notes.

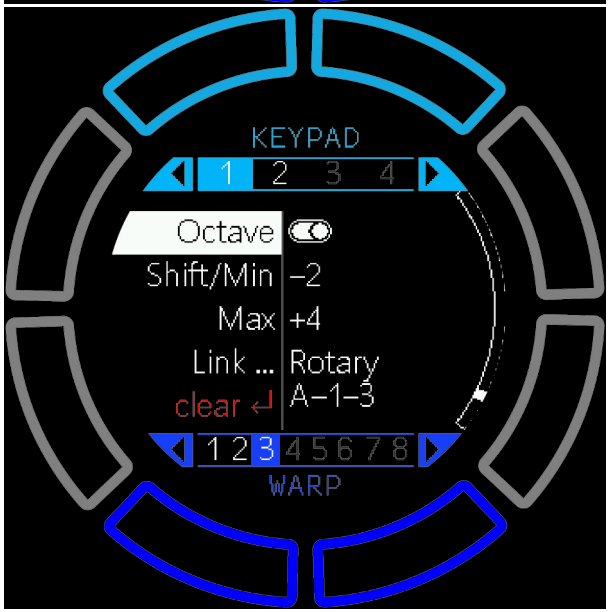
Shift/Min The lower boundary of the shifting range. If no Link is set, MIDI notes are always shifted by that number of semitones/octaves.

Max The upper boundary of the shifting range. If a Link is set, the MIDI note shifting range goes from the minimum to the maximum value.

Link Link one of the control elements to the octave shift function. Press "Link…", so the control elements will start to blink. Then, turn/move/push the control element you want to assign.

clear ← Push the menu encoder to clear the assigned control element.





Tip: When linking a rotary control to note shifting, you can also select one of the stepped LED feedback options, so the LED ring jumps in discrete steps instead of moving continuously. Additionally, you can assign the push function of the rotary control to reset the rotary knob to the center/left/right position and thereby reset the transposition.

Note: When the MIDI cable of a sequencer or keyboard is pulled out while some notes are still on, they will stay on forever as the receiving synth never receives the corresponding Note-Off message. This is a classic thing to happen with MIDI, and requires a "note panic" to be sent which will stop all notes. You can force a note panic by pushing Shift + MENU or stopping playback.

Mapping

Once you have set up your devices, we can start mapping the controls! But first things first… There are two main categories of MIDI receiving devices that you should be aware of.

Devices with fixed mapping table (synths, grooveboxes)

Most synths and grooveboxes offer a MIDI mapping table in their manual, which is a list of device parameters (e.g. volume, cutoff frequency, etc.) that can be remotely controlled via MIDI. The device expects a specific MIDI message (e.g. CC message #13 value range 0-127) per parameter and you need to configure your MIDI sender (Drop) to transmit exactly that message in order to control that parameter.

> *For devices with a fixed MIDI table, it is best practice to start off with an empty project and populate Drop's controls bit by bit.*

This kind of mapping can be quite a bit of work. Therefore, Drop offers different ways to help you get through this process as fast as possible.

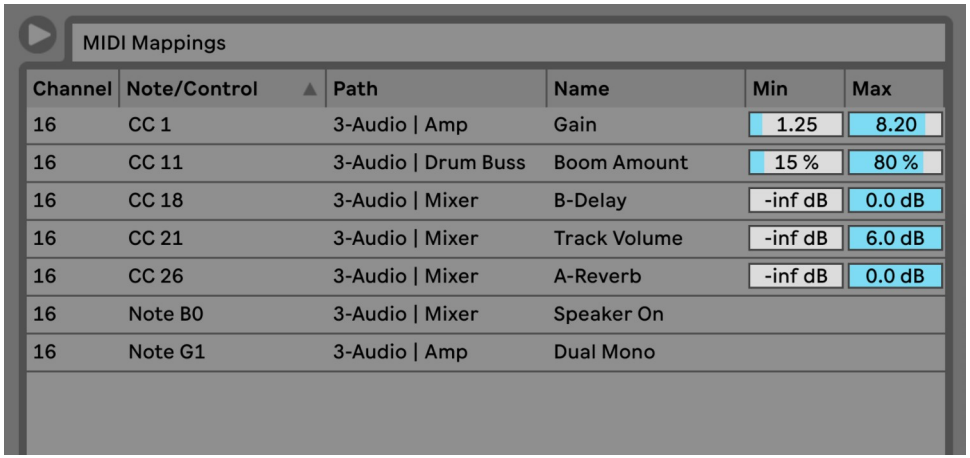
- Look up the MIDI mapping table of your synth and manually enter the MIDI message type, numbers, value ranges on Drop.
- Your device can send MIDI out when you turn its knobs? Great! You can use MIDI learn on Drop which significantly speeds up the mapping process. First, ensure your device actually sends MIDI data (often, this must be enabled in its settings) and connect the device's MIDI out to Drop's MIDI in, so that communication works in both directions. Also ensure that in Drop's Device settings, you enabled and selected the corresponding MIDI input. On Drop, you can go to *PLAY* > *Monitor* to check and verify the incoming and outgoing messages.
- If your device is listed in the Pencil Research MIDI database on Drop's SD-card, you can select the device parameter from the database. This is a convenient alternative to look up the parameter name in the device's manual and entering the MIDI control parameters by hand on Drop.

AMP				
Parameter	CC MSB	CC LSB	NRPN MSB	NRPN LSB
Amp Decay Time	80		1	26
Amp Overdrive	81		1	27
Amp Delay Send	82		1	28
Amp Reverb Send	83		1	29
Amp Pan	10		1	30
Amp Volume	7		1	31

Devices with MIDI learn (DAW, workstations)

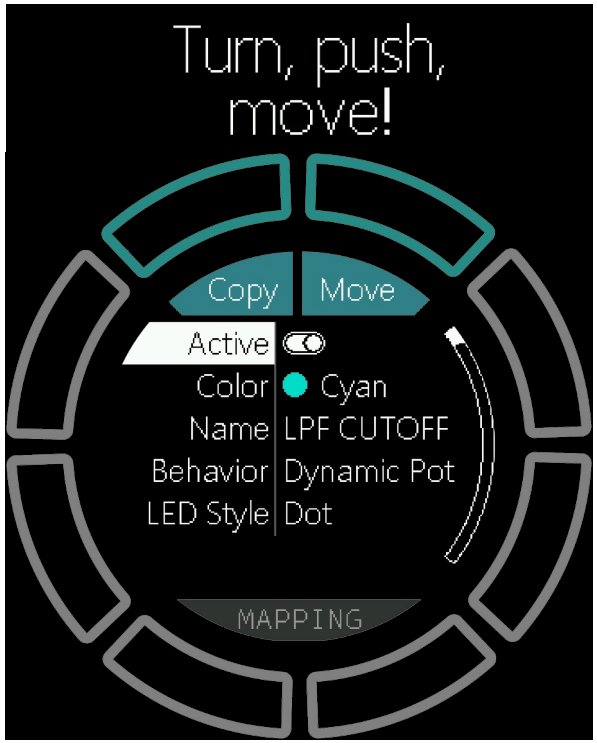
Software DAWs (e.g. Ableton Live) or hardware workstations (e.g. Akai MPC series) have so many parameters that it is just too many for a fixed mapping table. Instead, they offer a MIDI-Learn function to map parameters to incoming MIDI messages. For the DAW, it doesn't matter which specific MIDI message your controller sends, as long as it is a unique message per control.

Go to Project > DAW Init to quickly apply a default mapping to use Drop with a DAW. This function sets MIDI messages to each of Drop's control elements at once, so that each control element sends out a different MIDI CC or MIDI note message.



Example of MIDI mapping in a DAW (Ableton Live)

Control element configuration



Navigate to MENU > Mapping and **turn, push, move** the control element you want to configure.

On the first pages of the mapping menu, you can define the overall look and behavior of the control element.

Active Turn the control element on or off. If you re-activate a control element, it still remembers its settings from before.

Color Drop offers 9 colors for its control elements that are easy to distinguish from each other.

Name You can name the control element. This makes it easier for you to get back at your live set after a longer time if color coding is not enough to get used to it again. When you move a control element, its name is displayed on the screen when in PLAY view. You can disable this in the settings.

Behavior Describes the physical behavior of the control element. It is different, depending on the type of control element.

Rotary knob turn	*Precision*	Slow turning speed for precise adjustments.
	Dynamic Pot	Emulates potentiometer behavior, so that the physical position corresponds to the LED ring. When turning slowly, precise adjustments are possible, though.
	Dynamic Fast	Sensitive to manual movement. When turning slowly, precise adjustments are still possible, though.
Rotary knob push	*Toggle*	Pressing the rotary knob functions as a separate MIDI button. Each push alternately sends the MIDI min or max value and turns the button on or off.
	Temporary	Pressing the rotary knob functions as a separate MIDI button. When pressed, the MIDI maximum value is sent; when released, the minimum value is sent. *Use this setting with a DAW that sends MIDI feedback to Drop.*
	Quick Turn	While pressed, the turning knob speed is 4x faster.
	Reset Left/ Center/Right	Resets the rotary to its left/center/right position when pressed.

Mute button	*Toggle*	Each push alternately sends the MIDI min or max value and turns the button on or off.
	Temporary	When pressed, the MIDI maximum value is sent; when released, the minimum value is sent. Use this setting with a DAW that sends MIDI feedback to Drop.
Fader	*Layer AB dual*	Layer A and B offer their own separate faders, similar to Rotary knobs and Mute buttons.
	Layer A only	The fader of Layer A is in permanent operation, even when on Layer B. This setting is convenient if you do not need a separate fader on Layer B and want permanent access without value-catch to the fader on Layer A. As the faders can not automatically change their physical position, it is required to manually move the fader cap to the underlying virtual position before the fader reacts to manual movement.

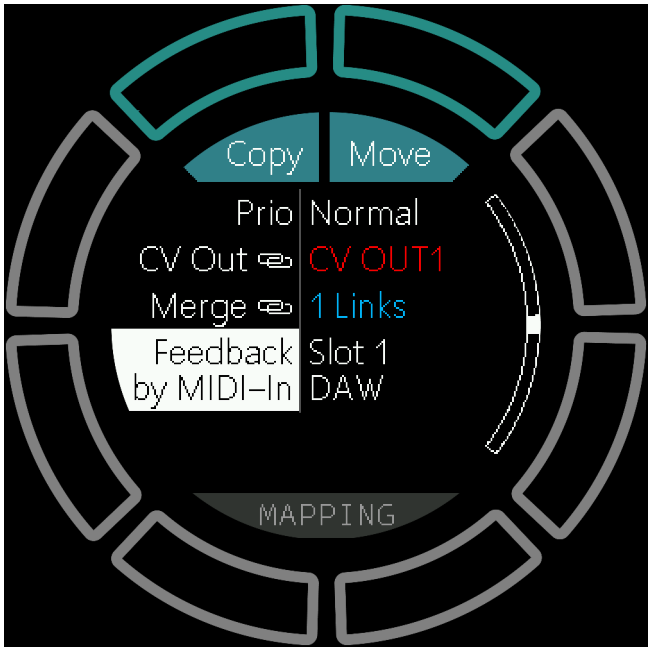
LED style Only accessible for rotary knob turn. Choose from different LED ring styles.

Rotary knob turn	*Line from left*	For 0-100% unidirectional values. A line of LEDs ranging from 0 to the knob's position.
	Line from center	For ±100% bidirectional values. A line of LEDs ranging from the top to knob's position on the left or right side.
	Dot	Universal minimalist setting that only shows an LED dot at the knob's internal position.
	1-25 Steps	Using the single LEDs of the LED ring to visualize discrete steps. *Example use case:* *Mapping a rotary knob to an oscillator's octave setting. Assume the range goes from -2 to +2 octaves, that makes 5 steps (-2, -1, 0, +1, +2) and you get a nice visualization with the 5 Steps setting.*
	Blank	The internal value is not shown at all. This LED style is useful in combination with the "Relative" MIDI output curve. In this mode, the rotary knob does not send its internal absolute position, but instead only its relative change if it is turned left or right. Your target application may require relative MIDI data for scrolling through DAW clip scenes or a file list in a browser. In such cases, the internal value of the rotary knob is also irrelevant, so we don't need to show it.

Drop Prio When the control element is used in a snapshot that is fired in Drop mode, you can select *Normal* or *PreDrop* priority. This affects micro timing of MIDI messages in a Drop.

Normal Use this by default. The MIDI output of the control element is sent right after the Drop.

PreDrop The MIDI output of the control element is sent right before the Drop and a second time right after the Drop.



Example use case:

The control element is mapped to the kick drum Mute function of a groovebox. The groovebox runs its own internal sequencer. You also have a snapshot that re-enables the kick drum.

When firing this snapshot in Drop mode, it musically releases the energy after a peak moment. With *Normal* priority, the MIDI message for Mute re-enable is sent an instant after the Drop moment, but it might be just too late and we might miss out the first kick at the downbeat of the new bar.

By enabling *PreDrop* priority, the Mute enable message is sent additionally just before the Drop moment, which ensures the kick is enabled at the downbeat of the next bar.

CV Out link Shows, if a control element is mapped to the CV OUT 1 or 2 jack.

You can use the control elements not only to send out MIDI, but also to control the two CV outputs. The CV outputs may be configured as clock signals, but they can also be used as simple variable linear voltage outputs in MENU > CV Config. There, you can also set the voltage range (0,0 to 5,0 Volts, 12-bit DAC).

The actual linkage of a control element to a CV output is in MENU > CV Config.

Merge link Shows, if the control element is linked to any parameter in a Device Merger.

You can use the control elements not only to send out MIDI, but also to manipulate incoming MIDI data that passes through the Device Merger. The Device Merger offers manipulation of incoming MIDI data before it is redirected to another device (e.g. note transposition). The manipulation parameters can be mapped to Drop's control elements.

The actual linkage of a control element to a Merger parameter is in MENU > Devices.

Feedback by MIDI-In

Drop's control elements can not only send out MIDI data, they can also be remotely controlled by receiving MIDI, also called Feedback. You can enable MIDI feedback separately for each control element.

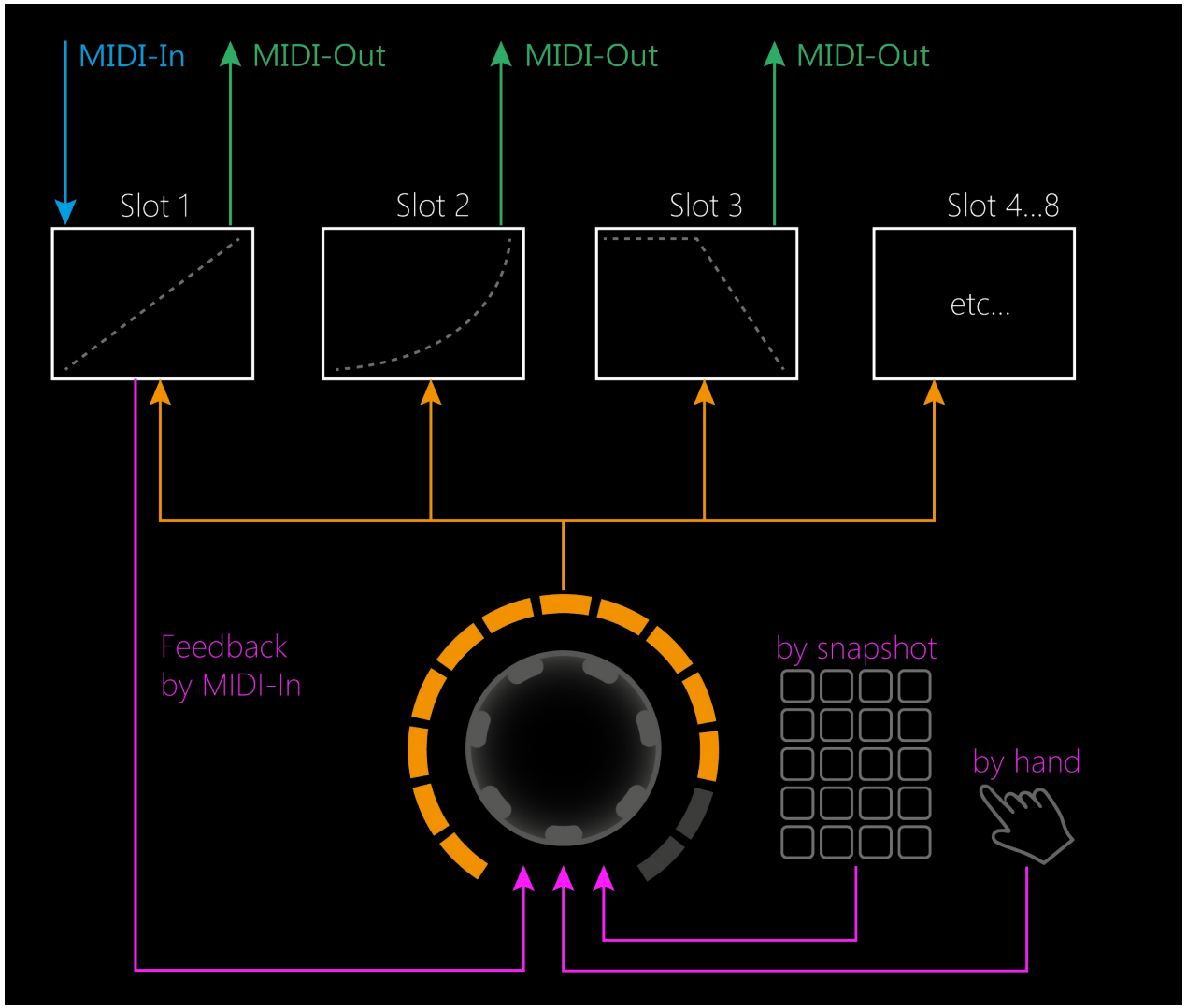
However, if you enable MIDI Feedback, it must always correspond to one of the slots for MIDI-Output. These are the requirements:

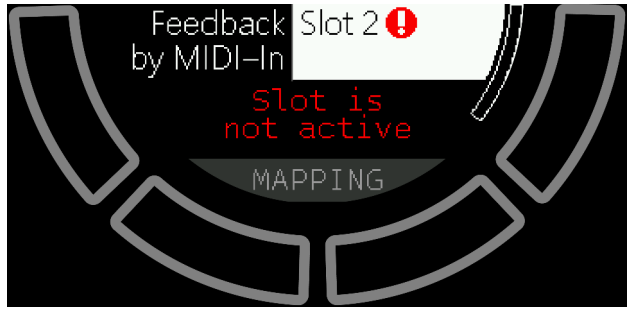
- The MIDI device linked to the slot must have a MIDI-Input port set in *MENU > Devices*.

- Slot curve should be set to *Linear*, as incoming feedback messages will also be mapped in a linear way back to the control element's position.

- NRPN messages are not supported for MIDI feedback

Hardware gear usually does not send MIDI feedback when switching programs/presets, as it would most likely cause traffic overload. MIDI feedback is only sent when turning a knob on the device. This raises the question, if MIDI feedback is necessary for hardware gear at all. DAWs however offer good support for MIDI feedback.





MIDI Output slots

Each control element offers eight slots for different MIDI Output messages to different devices.

Slot Activate the slot.

Device Select one of the eight devices configured in *MENU > Devices*

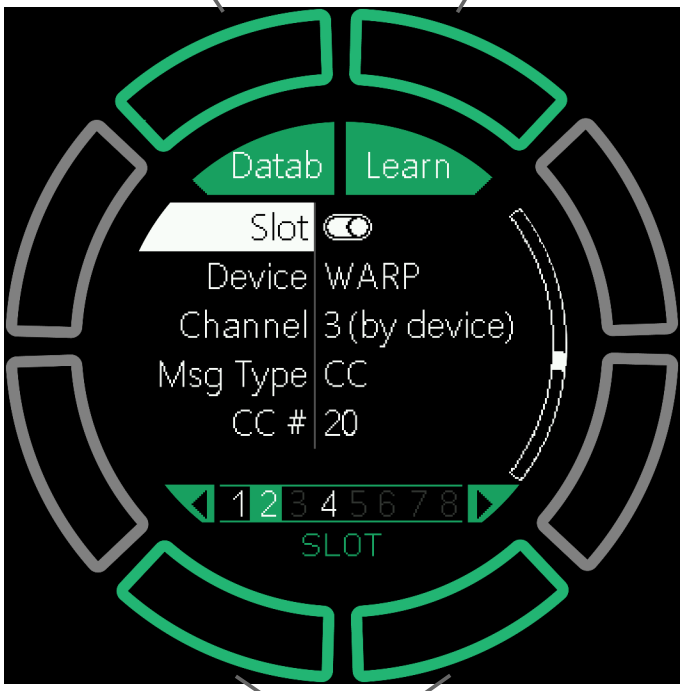
Channel The MIDI channel 1-16. Select “by device” to use the default channel of the device.

Msg Type The MIDI message type. These message types are available:

Note On	Buttons + snapshots only	Mostly used for on/off parameters.
CC	All controls + snapshots	Most commonly used control change message.
CC 14 *CC 14 LSB first*	All controls + snapshots	Two consecutive CC messages for high 14-bit resolution. Typically used for coarse and fine adjustment of a parameter. LSB or MSB first (default)
NRPN	All controls + snapshots	Some hardware devices offer NRPN access to their parameters, which offers high 14-bit resolution and more parameter numbers than CC. If your device offers both CC and NRPN for the same parameter, CC has lower resolution but is preferred for fast response times.
Pitchbend	All controls + snapshots	Pitchbend message type, 14-bit resolution.
Aftertouch	All controls + snapshots	Channel pressure message type.
ProgChg	Snapshots	Program change message, commonly used to switch presets or patterns, value range 0-127.
Prog + Bank	Snapshots	Bank select and program change afterwards. Required by some devices that offer more than 128 presets/patterns.

If your hardware device is featured in the database, this is an alternative to looking up MIDI parameters in device’s manual. Select the database file in the device menu first.

A convenient way to learn the MIDI parameters as the hardware device sends them. First, verify that the device sends MIDI back to Drop as you move its knobs.



Select the mapping slot
Here: Slot 2 out of 8. Slots 1, 2, 4 are set active.

Message # The message number. If the message type requires it, this may be split into MSB and LSB (most significant and least significant byte).

On the next page, the output range and curve of the slot can be set.

Max The upper limit of the output curve.

Min The lower limit of the output curve.

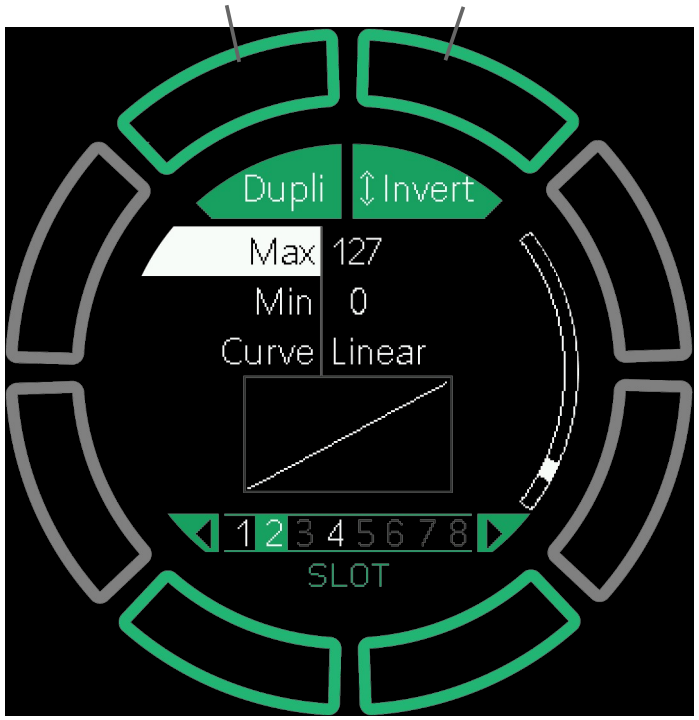
Depending on the message type, Min and Max may have different value ranges. For example, Note On and CC messages range from 0 to 127, while NRPN and CC 14-bit go from 0 to 16383 and pitchbend from -8192 to +8191. These are simply the values the MIDI protocol offers.

Shift + Turn the menu encoder to do coarse / fine value adjustments.

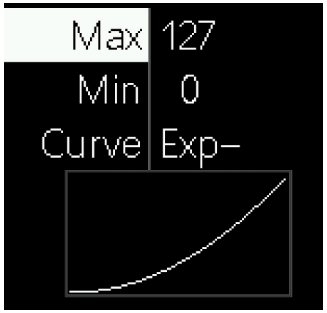
Curve Only available for faders and rotary knobs.

Select from several output curve types: Linear, Exponential, only the left or right half, On-Off curves with different thresholds, curves with 1-25 steps, relative encoder messages.

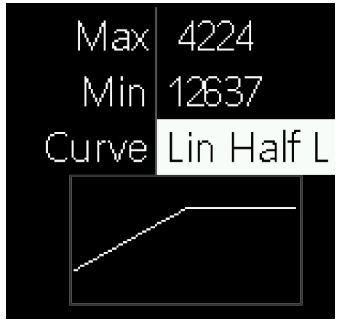
When sending MIDI to a DAW or workstation which offers internal mapping, use the default Linear curve with full value range to get the best resolution and correct MIDI feedback. Then, apply the desired value range and curves within the DAW's mapping.



Default Linear curve



Example:
- Exponential curve
- Full value range
- CC message type, which offers a value range of 0-127.



Example:
- Linear curve on the left half of the X-axis.
- Inverted Min ↔ Max
- NRPN message type, which offers a value range of 0-16383.

Tip: While holding Shift and turning/pushing/moving the control element, it only sends out the currently selected slot. This may help if you apply mapping on the target device (e.g. in a DAW).

MIDI Learn

Drop can listen to incoming MIDI messages, pick a message, and apply its parameters to a control element as outgoing MIDI message.
This is how it works: Some hardware devices can send MIDI on their output port when turning a potentiometer or changing a parameter. Usually, this is the same message type, channel and number which the device also expects as input to control the parameter.

First, *make sure the connected device actually sends MIDI output for parameter changes*. Many devices require this option to be activated in their settings first. Also, *connect the MIDI output of your hardware device to one of Drop's MIDI inputs*, or use USB instead.

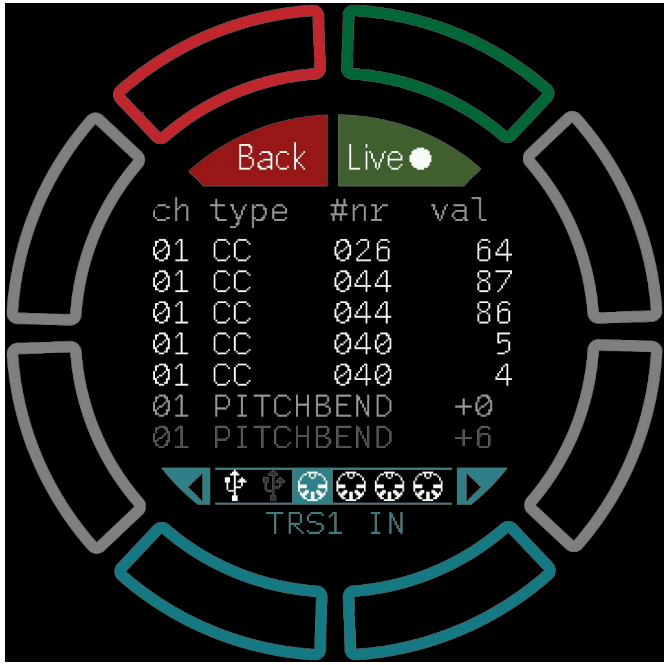
When in *MENU* > *Mapping*, enter the slot you want to map and push the *Learn button* on the top right.
Now, Drop shows live recording of incoming MIDI messages. *On the device, move the parameter you want to map*, and Drop should receive the corresponding MIDI messages. Use the lower two buttons to select another MIDI input port if necessary.

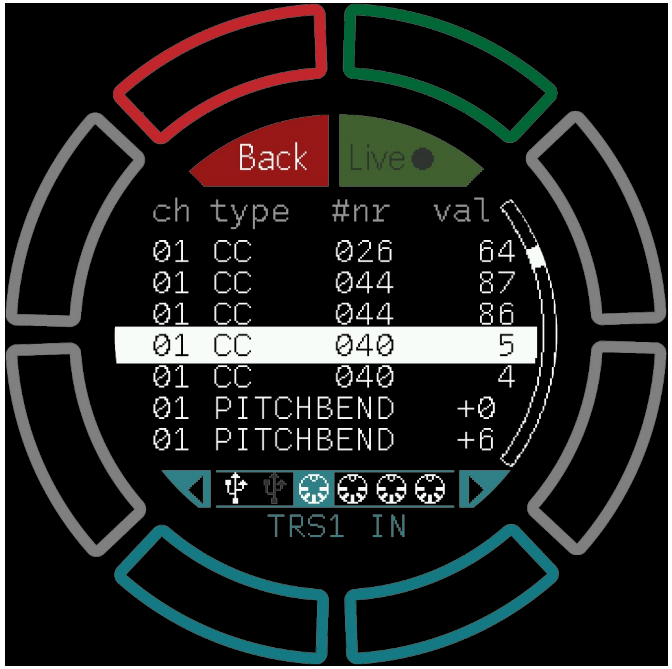
Press the upper right button to *stop live recording*, then scroll through the history list and *select the message you want to map* by pushing the menu encoder.

Usually, it is the newest message (top position), but sometimes a device parameter sends several messages at once, so you can select the right message from the history list.

If you only need your device's incoming MIDI messages for MIDI Learn, you can remove the cable again after mapping.

Note: Messages that can not be assigned to the control element are shown in red. E.g. Note messages can not be assigned to rotary encoders and faders.



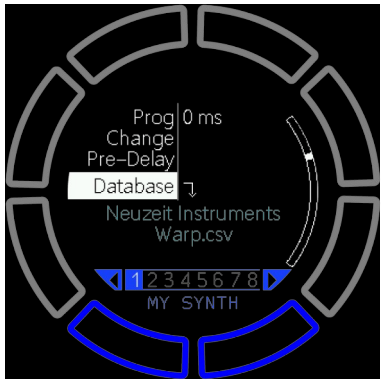


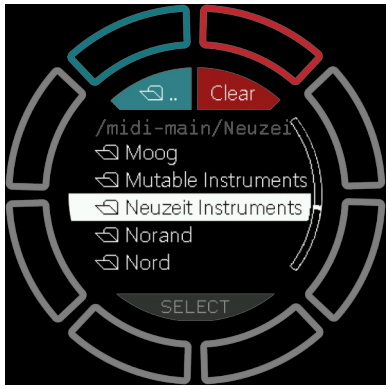
MIDI CC & NRPN database

Drop ships with an open-source MIDI database* on board, which contains the MIDI mapping tables of many popular devices.

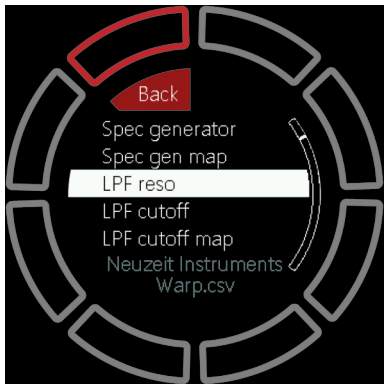
First, go to *MENU* > *Devices* > *Database* and scroll through the list to see if your hardware device is included. If you found it, select the file to assign it to the device.

Then, enter *MENU* > *Mapping*, turn, push, move the control element to map and scroll to the Slot page. Now, when you select the device with the newly assigned database file, the green „Database“ button is enabled. Push it to conveniently select the parameter you want to map from a list, instead of looking up its parameters in the manual.





Open the database and look for your target device.



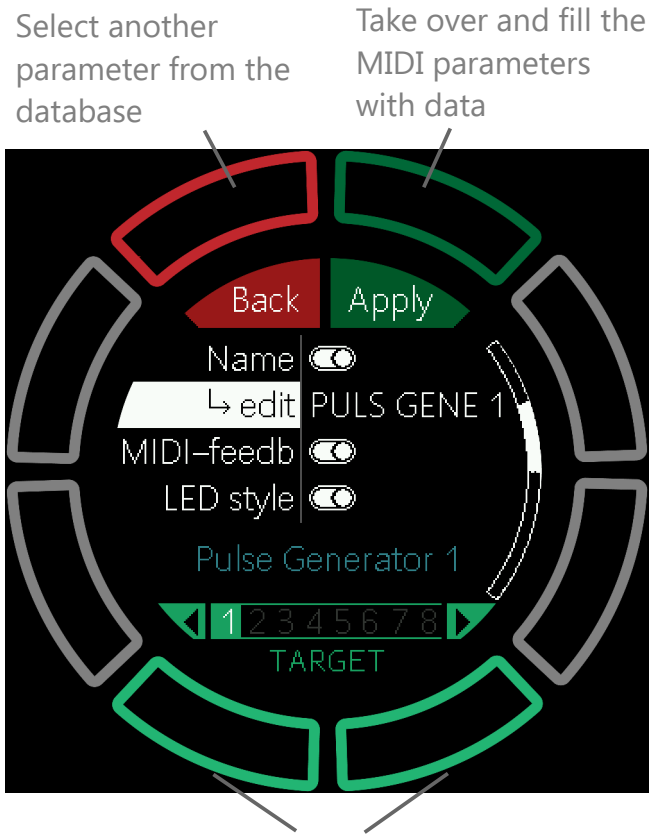
Press the Database button and select the parameter you want to assign.

Name If enabled, the name of the whole control element will be set according to the selected parameter. It may happen though, that the parameter's name is too long. Drop crops it into a short name.

→ edit Edit the new short name manually.

MIDI-feedb If set, the control element's MIDI feedback selection will be set to the newly assigned slot.

LED style If set, when mapping a rotary knob, the LED ring will be set to *Line from left* or *Line from center*, based on information the database entry.



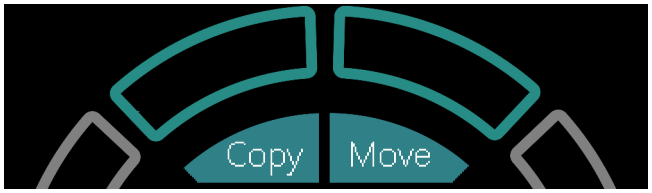
* https://github.com/pencilresearch/midi

Copy and Move a control element

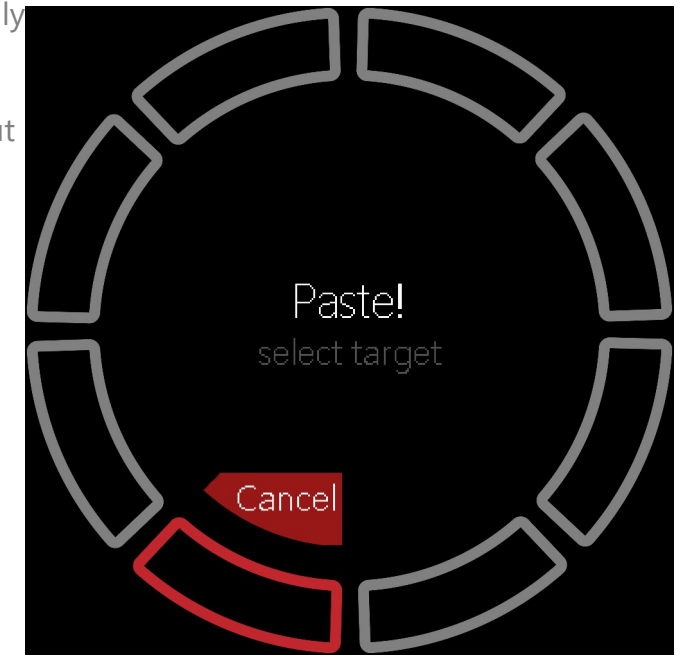
Once activated, control elements can me copied and moved *within their own category*. A fader can only be copied to another fader, a rotary knob can only be moved to another rotary knob.

Move Moves the whole control element with its mapping, also to another layer. Links to CV Out and Mergers also move.

COPY Copies the whole control element with its mapping, also to another layer. Links to CV Out and Mergers stay at the original control.



1: Push Copy or Move



2: Turn, push, move the target control element.

Snapshots

Snapshots are used to *save and recall* the state of *rotary positions, buttons on-off status and fader positions*.
A project contains 20 banks with 20 snapshots each.

They can contain *all of Drop's control elements or only a subset*. Snapshots enable you to automatically turn multiple control elements at once, which would not be possible with only two hands. You can also execute multiple snapshots at once and combine them.

In addition, snapshots can also *hold up to 8 MIDI messages* that are being sent as one-shot messages when the snapshot is executed. These MIDI messages can also contain *program change* and *bank select* messages to tell your devices to switch patterns or load the next preset.

Snapshots can be recalled in Jump mode or in Drop mode, *or both* at the same time. In Jump mode, snapshots are executed with an adjustable fade time, that can also be zero for immediate execution. In Drop mode, snapshots are scheduled in advance to be executed at the end of the current playback cycle, which marks the point where the current 1-32 bar pattern ends and the next one begins. In Drop mode, execution takes place with no fade time, and also automatically ends ongoing Jumps, resulting in a timed and immediate change in music.

With this behavior, the combination of Jumps and Drops makes it easy to create a *buildup followed by a sudden drop* in music, by virtually turning parameters on up to eight hardware devices.

You can even go one step further and prepare sequences of Jumps and Drops in advance, using CHAIN mode. That way, you can prepare a song arrangement using snapshots. Per project, there are 20 chains available with up to 64 snapshots each.

It is up to you as a musician, if and to what extent you want to use snapshots in your performance. *Here are some ideas*:

- Safety net when improvising and trying something “risky”.
- Saving the “hey, this sounds cool” moment for later, while jamming around.
- One-button solution for specific parameters, e.g. resetting effects across all devices.
- One-button solution to load presets and switch patterns on multiple devices at once.
- A “third hand” that can take care of a sub-task, so you can focus on the “fun part”.
- Step through your song arrangements manually, one snapshot after another, or fully automated.

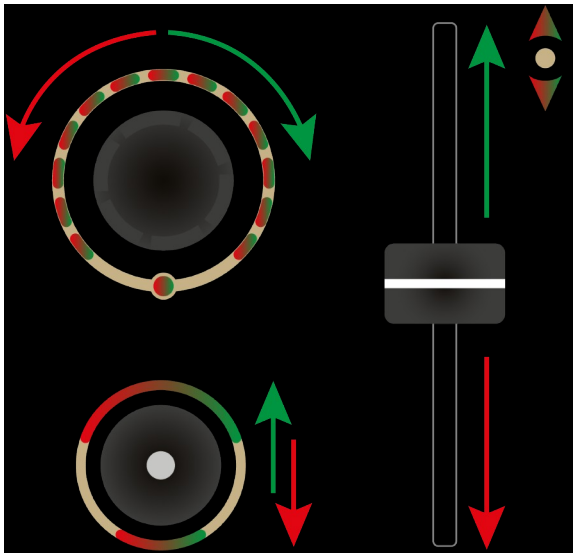
Save snapshots

To save the current state of the control elements, *push the SAVE button* to enter save view. The control elements will turn red or green, which indicates if the element will be saved into the snapshot or not.

GREEN: Selected, will be saved into snapshot. RED: Deselected, will not be saved into snapshot.

You can now change the state for each control element individually by turning, pushing or moving it.

To save the snapshot, simply press a snapshot button and you are done.
Selection groups help you to get the desired selection of control elements faster.



GROUP

The current selection is automatically stored inside one of eight groups. Use the two buttons to select another group and make a new selection of elements. When you go back to the previous group, the previous selection is also still there.
This is a fast way to switch between the selections you commonly use in your setup.

Rotary knob
Turn right: select, LEDs turn green
Turn left: deselect, LEDs turn red

Rotary push and Round buttons
Push: toggle selection status

Fader
Move up: select, LEDs turn green
Move down: deselect, LEDs turn red

Color

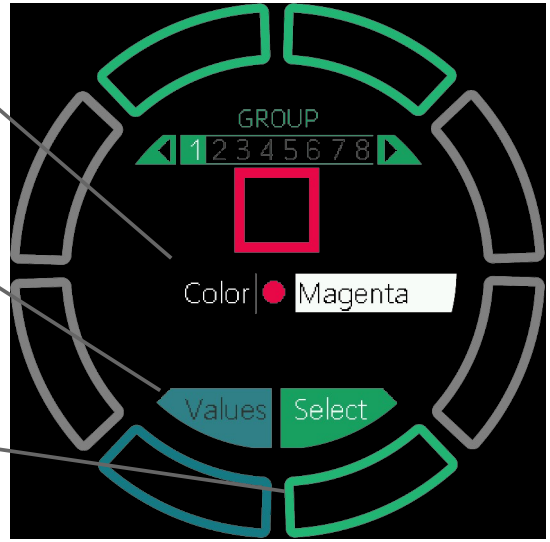
Set the color of the new snapshot by turning the menu encoder.

Values mode

Instead of selecting and deselecting control elements, operation changes their value as usual.

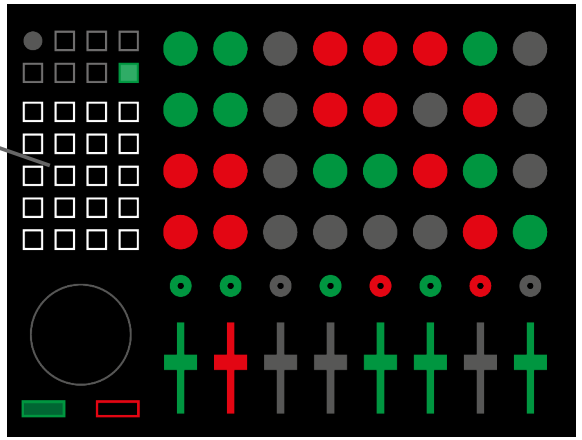
Select mode

By default, the SAVE view starts in Select mode, described above.



SAVE

Push the snapshot button where you want to save the current state with the current selection of control elements.



Edit snapshots

Edit existing snapshots. You can also enter MIDI messages that are sent as one-shots when the snapshot is executed.

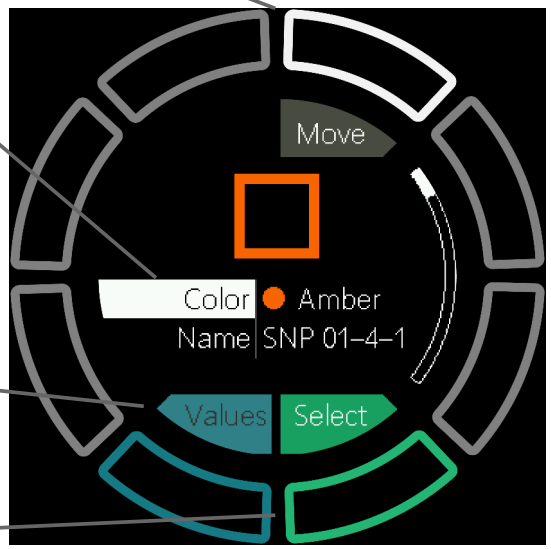
Move
Move the selected snapshot to another button.
Caution: Existing snapshots will be overwritten!

Color
Change the color of the snapshot by turning the menu encoder.

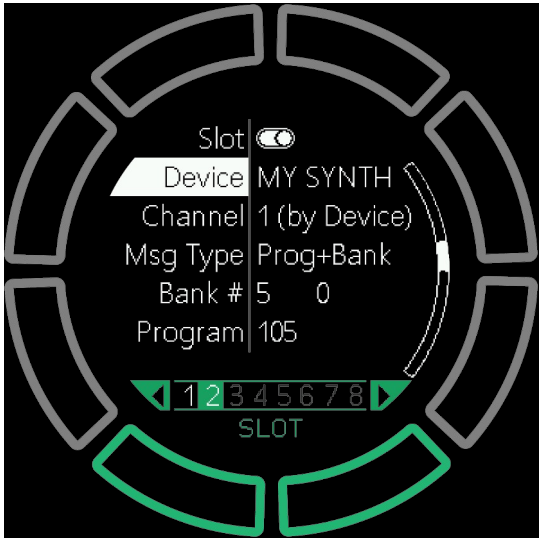
Name
Set a name for the snapshot, to remember or in CHAIN mode.

Values mode
Instead of selecting and deselecting control elements, operation changes their value as usual.

Select mode
By default, the EDIT view starts in Select mode, described on the previous page.



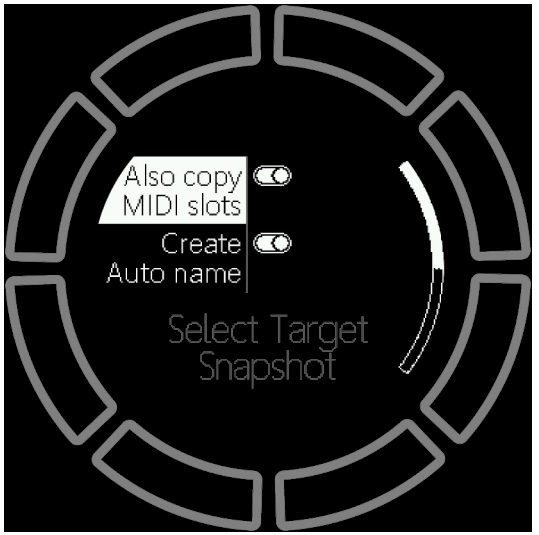
MIDI message slots
Activate up to 8 slots for different MIDI messages to be sent when the snapshot is executed. Besides all other common MIDI message types, you can also enable *Program Change and Bank Select* messages here. If you send them to a device running its own internal sequencer, you may want to set a Pre-Drop delay in *MENU > Devices*, so that the device receives the message just before the pattern ends. Entering a MIDI message here is *similar to MENU > Mapping*, except there are no curves. Instead, a *fixed message value is sent every time*. Note On messages are immediately followed by a Note Off message.



COPY snapshots

Press *Shift + copy* to select a source snapshot, then press the target snapshot. Press *Shift + copy* again to exit copy mode. Before pressing the target snapshot, you can select options for copying:

Also copy MIDI slots When active, also the MIDI message slots are copied.
Create Auto name When active, the target snapshot will get a default auto name. Otherwise, the source name will be copied, too.



Jump mode

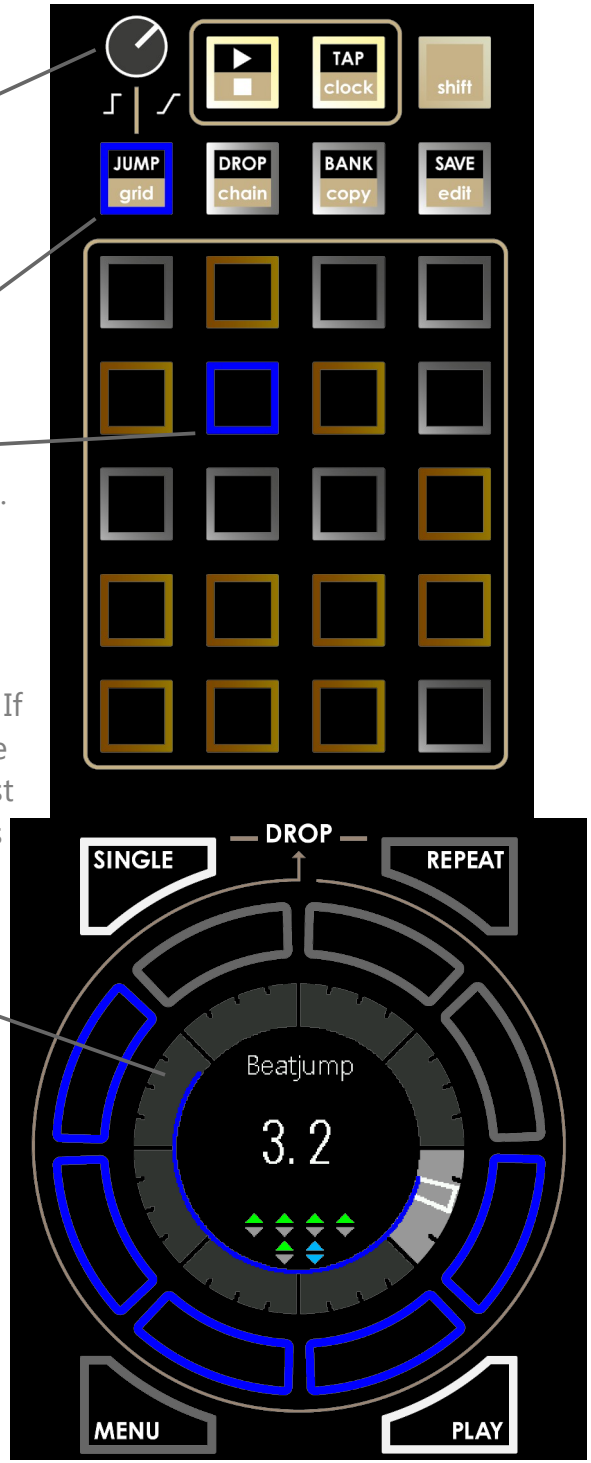
In Jump mode, snapshots are executed as soon as the snapshot button is pressed.

Fade time potentiometer
The time it takes for the control elements to move their position from the current state to the snapshot.
When turned fully left:
No fade time, instant jump.
When turned fully right:
Maximum fade time, one full cycle by default, can be set in *MENU > Settings*

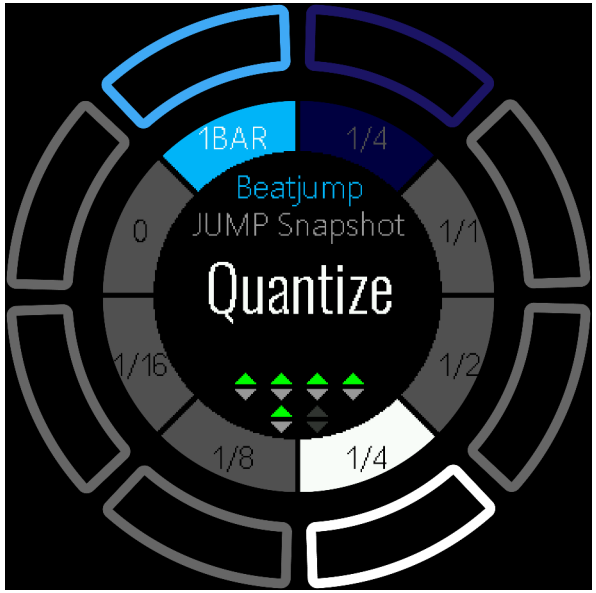
JUMP mode active
Push a snapshot to initiate the JUMP.
Blue = Currently executed in JUMP mode.

If enabled in *MENU > Settings*, also *multiple snapshots* can be active in parallel. If there is an overlap in the control elements, the last snapshot pushed counts for these controls.

Remaining time
The remaining fade time it takes for the Jump to finish.
You can alter the fade time with the potentiometer while the JUMP is already in progress.
The buttons will blink blue, no matter which view the display currently shows.
That way, you always get a clear feedback about the JUMP progress.



In the PLAY menu, you can set snapshot quantization in JUMP mode.
The quantization also applies if you trigger the snapshot remotely via MIDI.



In *MENU > Settings > Latest snapshot* you can enable, that the last snapshot pressed keeps blinking softly. This helps to remember when performing, how you got where you currently are.
The blinking can be stopped by stopping playback or by pressing the JUMP or DROP button again, depending in which mode you currently are.

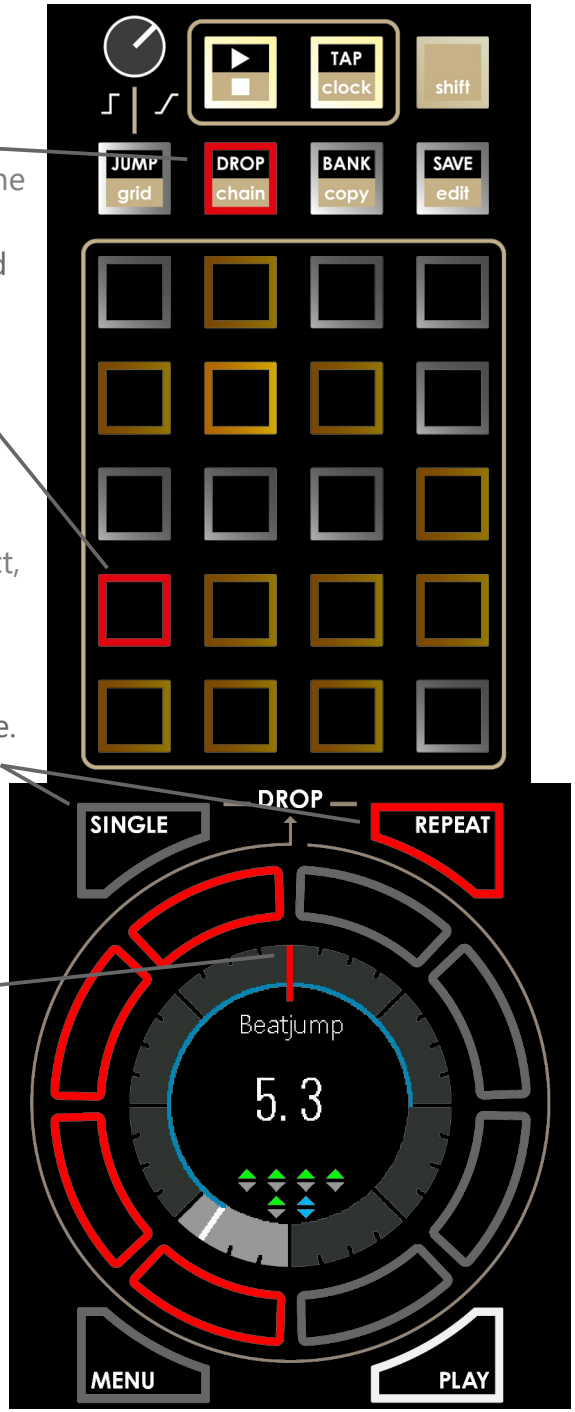
Drop mode

Drop mode active
Push a snapshot to schedule the Drop.
Red = The currently scheduled snapshot in Drop mode.

If enabled in
MENU > Settings,
also *multiple snapshots* can be scheduled at the same time. If their control elements intersect, the last one pushed overrides previously pushed ones.

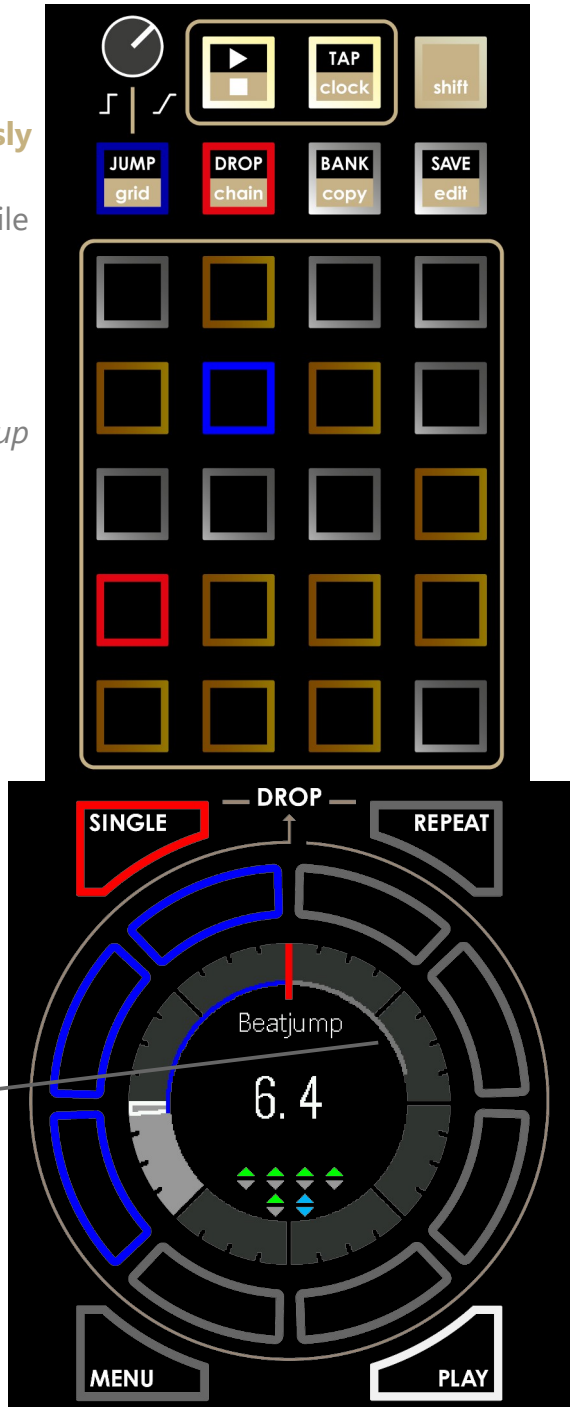
SINGLE Drop only occurs once.
REPEAT After the Drop has been executed, it gets automatically scheduled again for the next cycle.

DROP scheduled
The snapshot is scheduled to be *executed at the end of the cycle*, when the playback position reaches the red line at the top.
In DROP mode, there is *no fade time*. The changes happen instantly.



DROP and JUMP simultaneously
A snapshot is scheduled for a Drop at the end of the cycle, while another snapshot is currently fading in Jump mode.
A Drop will end the Jump automatically.
That way, you can *create a buildup with a Jump until the Drop* changes the whole set at once.

Jump fade time end
The grey line shows where the Jump would actually end after the Drop. However, the Drop will end the ongoing Jump in advance.



Manual fade mode

You can also use the small potentiometer to manually fade from the current state to another snapshot or a combination of snapshots.

First, hold the Jump button while pressing the snapshot you want to fade to. You can also select multiple snapshots at once, if it is enabled in *SETTINGS* > *multiple Jumps*. Also here, if there is an overlap between their control elements, then the ones from the last snapshot pressed count.

Then, you need to move the potentiometer all to the left in order to start the manual fade. As soon, as the leftmost position is reached, you can fade towards the selected snapshots by turning the potentiometer to the right. In the rightmost position, the snapshots are faded in at 100%.

Button presses and MIDI data from the snapshot itself (like program change messages, etc.) are sent out as soon as the potentiometer leaves the 0% position. If you turn the potentiometer back to 0%, only button values may change again, but snapshot-contained MIDI messages will not be sent out again.

There are several ways to leave manual fade mode:

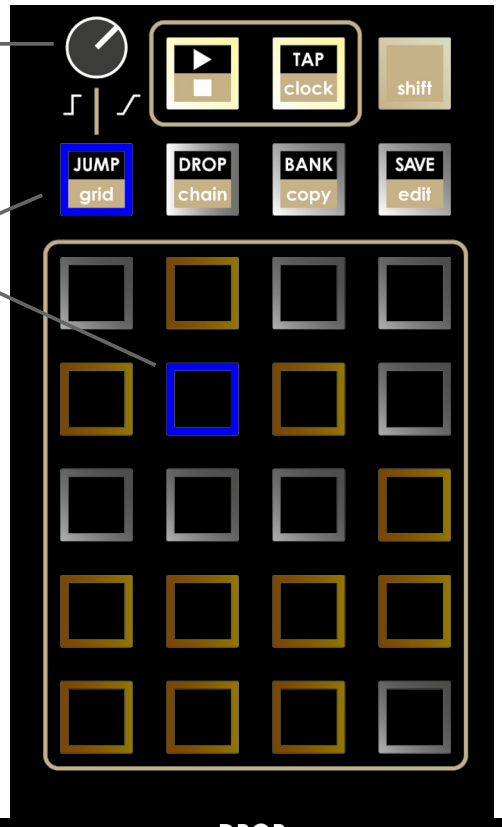
Push one of the bottom circle buttons to exit and leave the state as it is or leave and reset to the original state we had before the fade. Also, pushing the Jump button again stops the manual fade and leaves the state as it is.

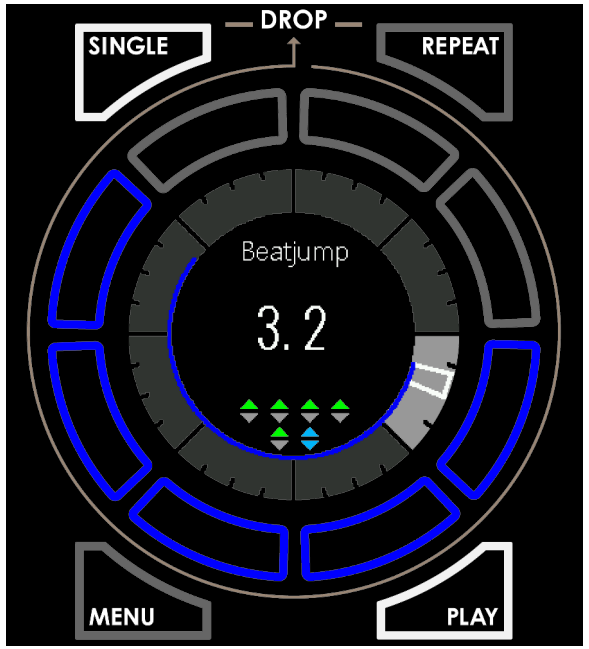
You can also schedule a Drop while the manual fade is in operation. A Drop will also leave the manual fade.

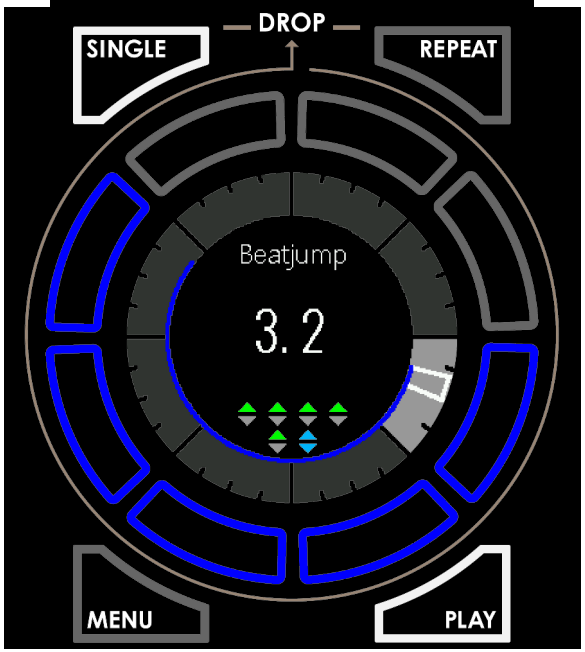
Fade to snapshot by hand
The *potentiometer* determines the fade amount.

Start manual fade
Push JUMP and a snapshot button simultaneously to enter manual fade mode.

Turn the potentiometer all to the left first to start the actual fade.
Then, turn the potentiometer towards 100% to fade from the current state to the selected snapshot(s).
Exit manual fade mode and leave everything as it is, or by resetting back to the initial state.







Chain

Workflow

The chain function allows you to *prepare and play back a series of snapshots in a specific order*. For example, if you are performing a song that follows a fixed arrangement, you can set the snapshot sequence here and then simply start the chain on stage instead of firing off the snapshots manually.

The chain function offers a high degree of automation. Automating an entire performance may not be the purpose of a live set, but you can, for example, automate tedious parts of your performance and outsource them to Drop so that you have your hands free for other, more creative tasks.

There are a total of 20 chains, just as there are 20 snapshot banks. If your performance is song-based, it can make sense to use one bank and one chain per song. In *MENU* > *Settings*, there are two switches to link banks to chains bidirectionally. Switching bank 1-20 may automatically select the corresponding chain 1-20, and vice versa.

In chain mode, *snapshots are always fired exclusively*. You can not trigger multiple snapshots at the same time with a single chain entry. However, *you can still manually fire snapshots during chain playback* without stopping the chain.

Each chain can be up to 64 snapshots long. The snapshots in a chain can belong to any of the 20 banks.

Chain mode

Push *Shift* + *chain* to enter the chain menu.
The snapshot buttons continue to work normally during chain playback.
The SINGLE and REPEAT buttons are blinking while a chain is playing.
Push *Shift* + *SINGLE* or *Shift* + *REPEAT to stop chain playback*, no matter in which menu.

Select

Switch to a different chain 1-20. Switching the chain will stop the currently active chain. In *MENU* > *Settings*, there is a switch to link chains and snapshot banks in both directions, so that selecting a bank also changes the chain and vice versa.

Name

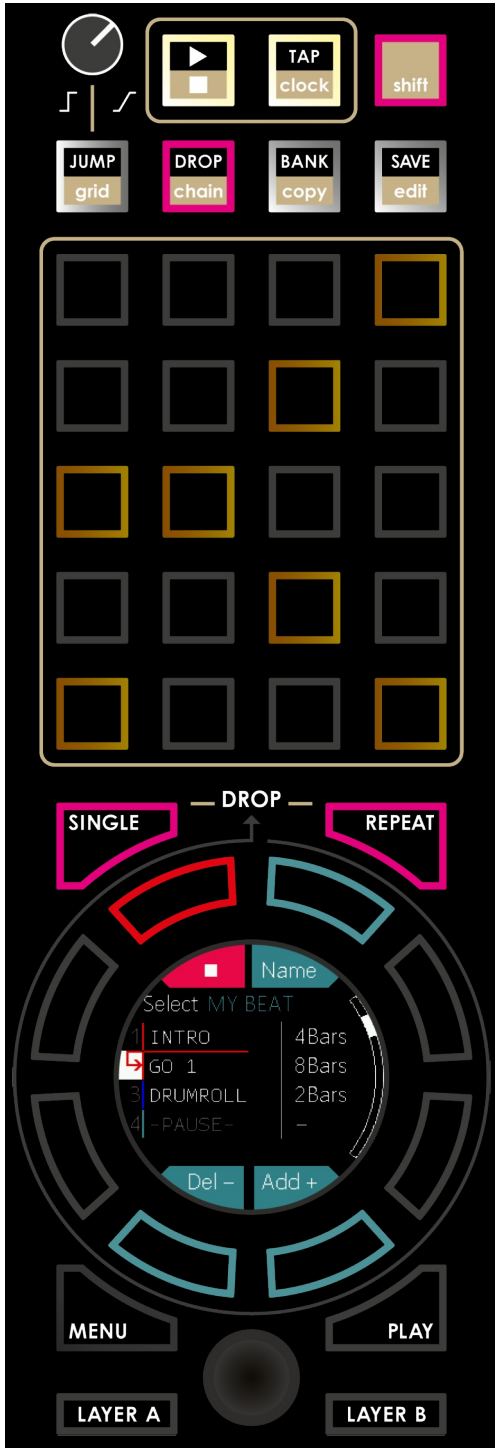
You can give each chain its own name. E.g. this could be the name of a song.

Add +

Push this button to add a snapshot to the chain. Use the encoder to select the insert position. Select “Pause” to insert a line without firing a snapshot.

Del -

Push this button to delete the currently selected entry.



Circle buttons

LED feedback is shown as usual red or blue when snapshots are executed in Drop or Jump mode.

Playback marker

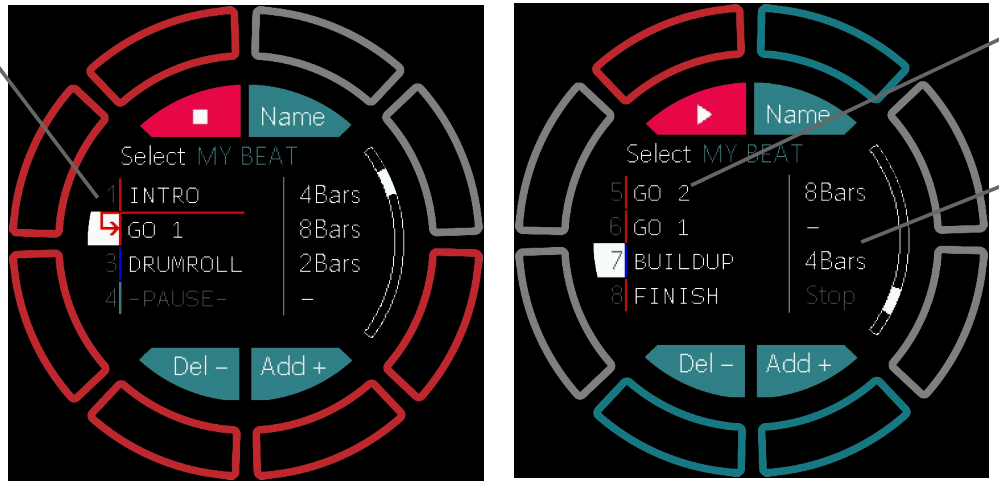
Snapshot “INTRO” was fired as a Drop. After the Drop, the cycle length was set to 4 bars. Now, the red line shows the time left until “GO 1” is executed as a Drop. After that, the cycle length will be 8 bars.

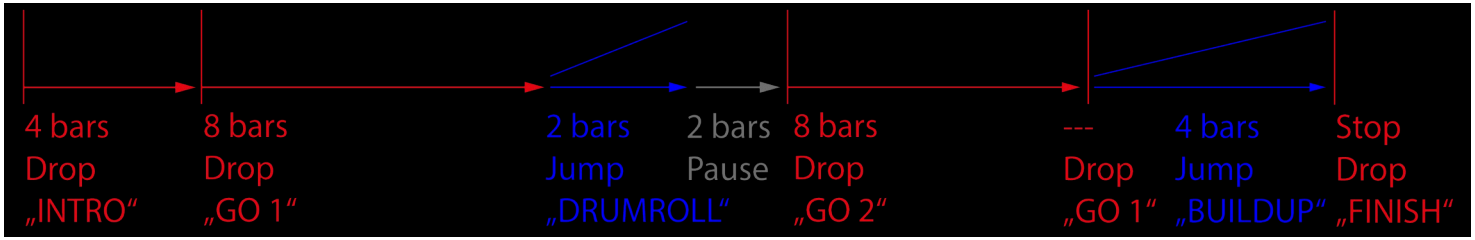
Color

Red = Drop, Blue = Jump, Grey = Pause

Start Stop

Use the upper left circle button to start chain playback at the current cursor position. You can also start a chain in the middle instead of at the beginning.





Snapshot name

Use *Shift + edit* to give snapshots a name.

Cycle length

“Stop“

Do not continue chain playback after this snapshot’s execution.

“-”

Leave the cycle length as it is.

“1-32 Bars”

Set the cycle length to the specified length after the snapshot was executed.

For each snapshot, you can select Jump or Drop mode, as well as the fade time and the number of beats per cycle that follow. A progress bar and LED feedback provide information about the playback position. Note: Entry “GO 1” is a Drop and has set its length to “---”, followed by “BUILDUP” which is a Jump.

Note: When the *Drop length is set to “-”, a following Jump will start right after the Drop* has been executed.

Push the encoder repeatedly to step through each entry's options.

Index
Scroll through the list.

Jump or Drop
Select the type of execution.

Cycle length
After the snapshot was executed. When the entry is a Jump, the specified length is also the fade time.

Move
Change the entry's position within the chain.

Link Chains and Banks

If you want to build your performance song by song and use one chain per song, it may also be useful to link snapshot banks and chains. For that reason, there are 20 snapshot banks and 20 chains available per project.

In *MENU* > *Settings*, you will find two options for linking.

Chain to Bank When active, selecting another chain in chain view will automatically select the corresponding snapshot bank.

Bank to Chain When active, switching banks using the BANK button will automatically select the corresponding chain.

Note: When switching chains, playback of the current chain is stopped.

Clock

Drop's timing can be synchronized with other devices using MIDI clock or CV clock signals. Drop can send MIDI and CV clock signals to other devices and sync its own tempo to incoming MIDI or CV clock. Push *Shift + clock* to enter the clock settings menu.

Clock settings

BPM Set the tempo in beats per minute.

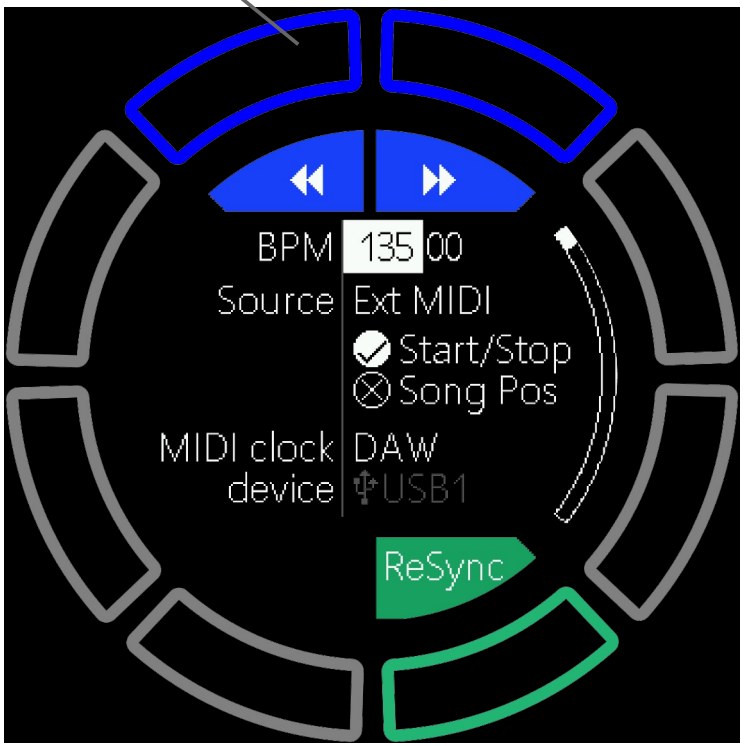
Source – Internal Use Drop as the master clock in your setup. Incoming MIDI and CV clock is ignored.

Source - Ext MIDI Drop syncs its tempo to an incoming MIDI clock signal.
Start/Stop determines, if Drop also listens to Start/Stop messages. If enabled, the Start and Stop buttons next to the clock button pushed remotely when a Start or Stop message is received. In Ext MIDI mode, Drop's own Start and Stop buttons still work.
If *Song Pos* is checked, Drop also reacts to incoming song position pointer messages, which causes a remotely controlled beat jump. Usually, DAWs send these kind of messages when changing the playback position in the timeline.
Note: When linking another Drop in *MENU > Remote Receive*, do not activate Song Position messages here. When syncing Drop from an external sequencer, you probably want to have Start/Stop enabled and Song Pos disabled.

Source - CV clock Drop syncs its own tempo to an incoming CV clock. CV1 is always the clock signal, while CV2 can be used as a separate trigger or gate signal. Clock speed and CV2's usage must be set in *MENU > CV In/Out*.

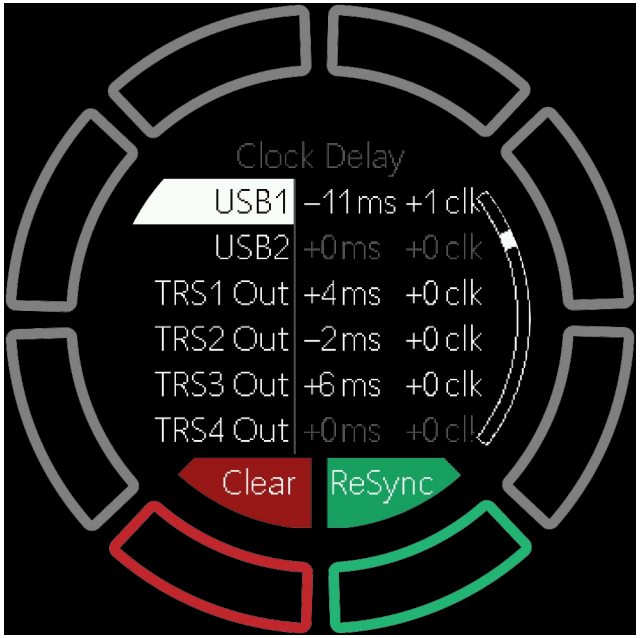
MIDI clock device
Select the MIDI clock source device.

Nudge BPM
Use the upper blue buttons to temporarily speed the tempo up or down. Only available if running on internal clock.



ReSync
When Drop sends MIDI clock to multiple other devices, they may still get out of sync due to different tempo change algorithms or accidentally pushing the stop button on one device.
ReSync *quickly sends a Stop + Start* message to all MIDI clock outputs at the beginning of the next bar, which is *usually inaudible and sets everything back in sync*.

Clock delays



Use clock delays to counteract different audio processing latencies of your connected gear.
If an instrument uses any kind of digital signal processing, it inevitably needs a little bit of time, also called latency, from when e.g. a MIDI note message is received until the sound appears at the device's audio output. Manufacturers try to keep the latency as low as possible and if you play only one instrument alone, you may not even notice. However, if you are running multiple devices in parallel, different latencies may become audible.

Left – clock delay in milliseconds

This delay time is independent of the tempo and *counteracts audio processing time*.

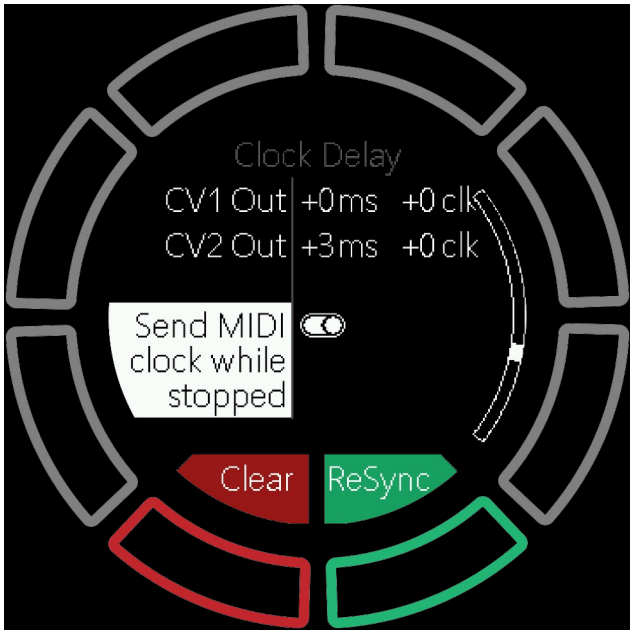
Right – clock delay in MIDI clocks

Only use this if you know what you are doing! Some DAWs and sequencers may not count the first MIDI clock packet, or also count the start message as a MIDI clock. Use this, to counteract such misbehavior.

Start off with all clock delays set to 0. Make sure, every device receives MIDI clock by Drop. Start playback and try to find out by ear if a device is constantly playing a little bit ahead or after. It gets a lot easier if your devices play the same musical pattern, e.g. a short plucky sound every quarter. If it is unclear, choose a reference device (the one you expect to have the largest latency), let it play a pattern and unmute other devices one by one. In our experience, hardware gear has very low latency in the 1-3 ms range. DAWs, however, can have significant and varying delay times, depending on CPU load and audio settings.
Positive delay times are preferred. You can also apply *negative delay* values. In this case, the clock will speed up a little bit after playback starts, until the target pre-delay has been reached. So, playback will only be in sync after a short amount of time. For that reason, it is recommended to use negative clock delays *only when necessary*.

Send MIDI clock while stopped

If this option is activated, Drop will send MIDI clock signal also while playback is stopped. This option should be enabled unless it disturbs a connected device. Sending MIDI clock while being stopped is typical groovebox behavior. It constantly updates the tempo information on the receiving device, and if the receiving device is smart enough, you get better timing precision right after starting the clock.



Clock send enable

On the next page, you can enable MIDI clock, transport and song position pointer output for every physical port separately.

The default setting with the *two left checkmarks enabled is the right choice* for most grooveboxes, synths and DAWs (send MIDI clock and transport).

Left – MIDI Clock

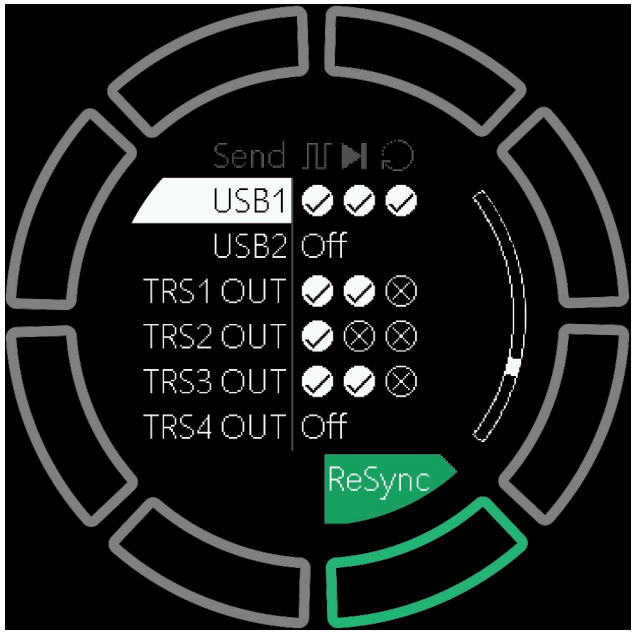
Sends clock messages, which contain tempo information.

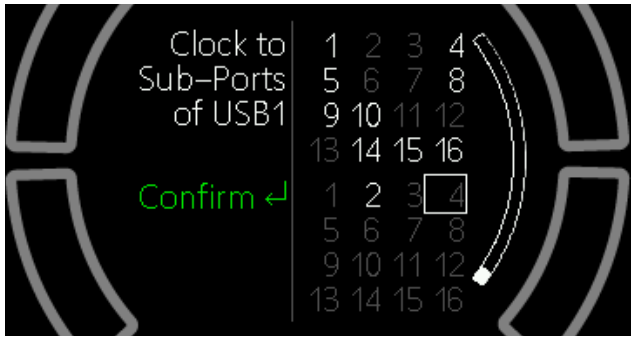
Middle – MIDI Transport

Sends start and stop messages, telling the connected device so start/stop playback.

Right – Song position pointer

Sends song position pointer messages, telling the connected device the playback position within Drop's playback cycle. These messages are sent when performing a beatjump. If the receiving sequencer supports it, it changes the playback position as well.
Note: If linking another Drop in MENU > Remote > Send, do not activate Song Position messages.



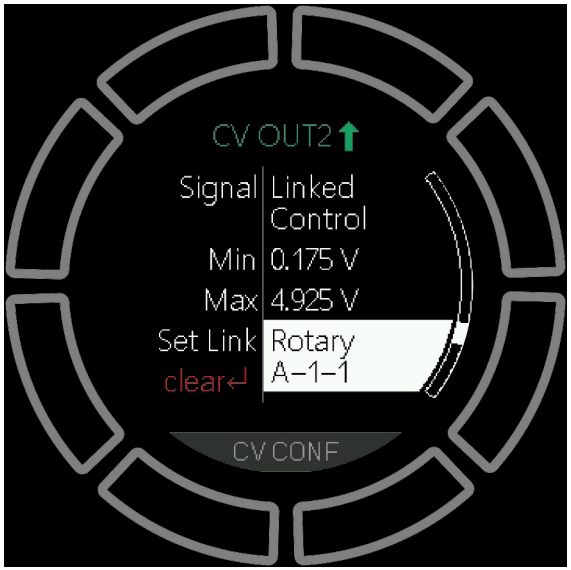


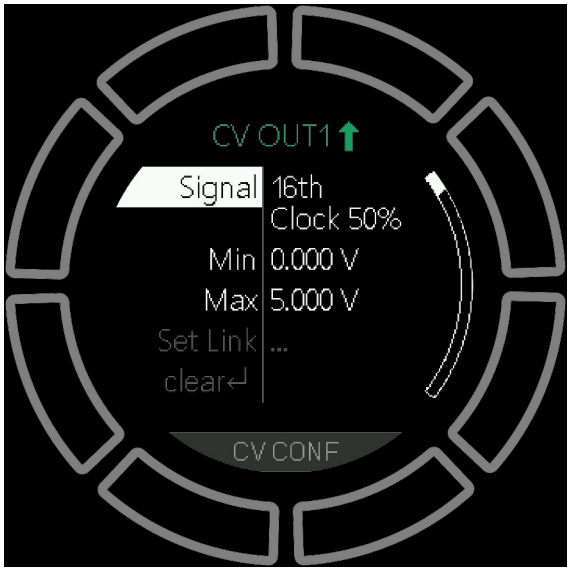
Clock to Sub-Ports of USB1/2

MIDI via USB offers up to 16 virtual cables (sub-ports). Some MIDI USB devices may offer more than one sub-port, but need to receive MIDI clock only on a specific one. Therefore, you can select to which sub-ports clock, transport and song position pointer messages are being sent and to which ones not.

CV Config

Drop has two control voltage (CV) inputs and outputs each that can be used in different ways. All four CV ports are designed for voltages from 0-5V. The outputs can create continuous voltages with a resolution of 12 bits (4096 steps). The CV inputs can read analog voltages with a resolution of 16 bits (65536 steps). To interface with a bigger modular system, you may want to use a Midi-to-CV converter module.





CV OUT 1+2

Signal

Linked Control	Assign any of the control elements directly to the CV output. Turning the corresponding rotary knob or moving the fader linearly changes the CV output value between the Min and Max voltage range. To assign a control element, select the **Set Link** option. Turn, push, move the control element you want to assign. Use the **clear** option to remove the link.
24/12/8/4/2 PPQN Clock	Clock signal with the specified number of pulses per quarter note (PPQN). Each pulse has a length of 5 ms.
16th/8th/4th/1Bar Clock 50%	Clock signal with the specified frequency. The PWM duty cycle is 50%.
Start Trig	Outputs a one-shot trigger when playback starts.
Is Running Gate	Outputs the Max voltage while playback is running, and Min when stopped.
Cycle Start Trig	Outputs a trigger at the start of each cycle.
Cycle/Bar Pos CV	Outputs a linearly rising voltage corresponding to the cycle/bar progress.
Jump Prog. Rise/Fall	Outputs a linearly rising/falling voltage corresponding to the progress within an ongoing Jump.

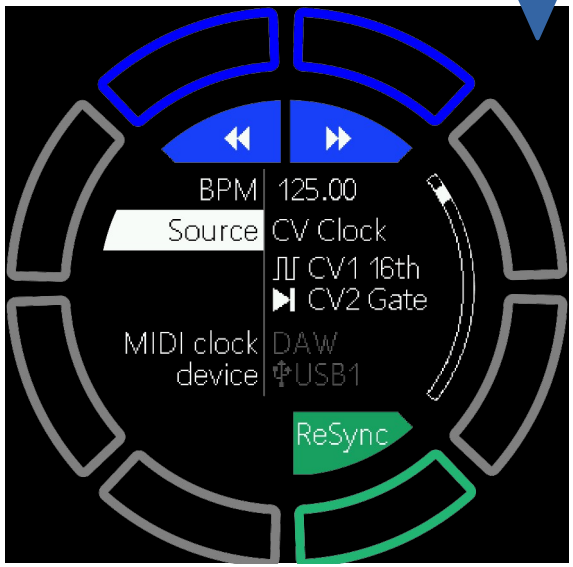
Min / Max Set the minimum and maximum output voltage range of the outgoing signals. Clock signals are *rising edge per default*. You can turn then into *falling edge by inverting Min and Max* voltage. Hold Shift while changing the parameter increases the step size, so the parameter changes faster.

CV IN 1+2

The CV inputs can either be used for clock signals or to trigger snapshots by external CV and gate signals.

CV IN1	*4PPQN (16th notes)* *2PPQN (8th notes)*	The incoming clock signal may have two different speeds.
CV IN2	*Without function*	With this setting, CV IN2 is ignored. When Drop is synced to CV1's clock input, playback will start with the first rising edge at CV IN1 and stop playback when the clock signal stops after a short timeout.
	Start Trigger	Starts the clock when a trigger occurs at CV IN2.
	Start/Stop Gate	Playback keeps running while the signal at CV IN2 is high and stops as soon as the signal goes low.
CV IN1+2	*Jump Snapshot Trig* *Jump Snapshot Select*	

This option is to connect the CV and gate output of a sequencer to Drop's CV IN1 and IN2 to select and fire snapshots in Jump mode. The voltage at CV IN2 selects the snapshot, with the voltage range from 0 to 5V is mapped to the 20 snapshots of the current bank. When there is a rising edge at CV IN1, the snapshot will be fired in Jump mode and the potentiometer determines the fade time.



Remote

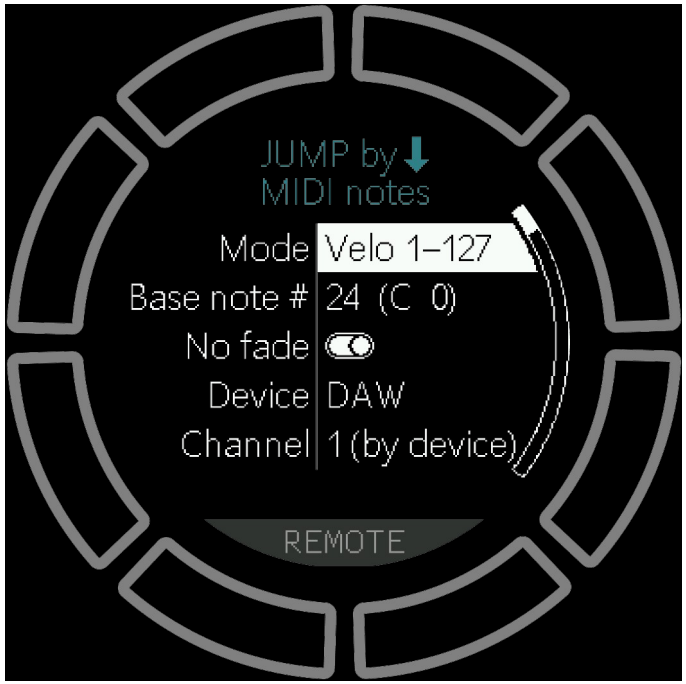
Drop can also be remotely controlled via MIDI. You can link two or more Drops to jam with your band members and keep the same timing, or expand the amount of available controls and connections, or use another MIDI device to control Drop's functions and embed it into a bigger setup.

Jump by MIDI notes

Fire *snapshots from an external MIDI source* like a sequencer or a keyboard. Only the 4x5 *snapshots of the current bank* are affected. Snapshots are fired in Jump mode, the fade potentiometer determines the fade time, and *PLAY* > *Quantization* is used for timing.

Mode

Off	Ignore notes.
By Pitch	The note number (pitch) determines chooses the snapshot. The Base Note and the 19 notes above are taken into account and are mapped to one snapshot each. Notes exceeding that range are cropped and treated like the base note or the highest note which is base note + 20. The base note corresponds to the lower left snapshot and the highest note to the upper right snapshot. If the incoming note does not exactly match a snapshot, the closest snapshot is selected. *Use this mode to connect a programmable MIDI sequencer.*
Velo 1-20	Only the base note is taken into account, other notes do not fire a snapshot. Choose the snapshot according to velocity values 1-20. If the incoming note has a velocity larger than 20, it is cropped and treated as velocity = 20. Also here, velocity = 0 corresponds to the lower left and velocity >= 20 to the upper right snapshot. *Use this mode to connect a programmable MIDI sequencer.*
Velo 1-127	Only the base note is taken into account, other notes do not fire a snapshot. The snapshot is selected using the velocity value, where the full velocity range 1-127 is spread evenly across snapshots. *Use this mode to connect a MIDI trigger pad played by hand.*



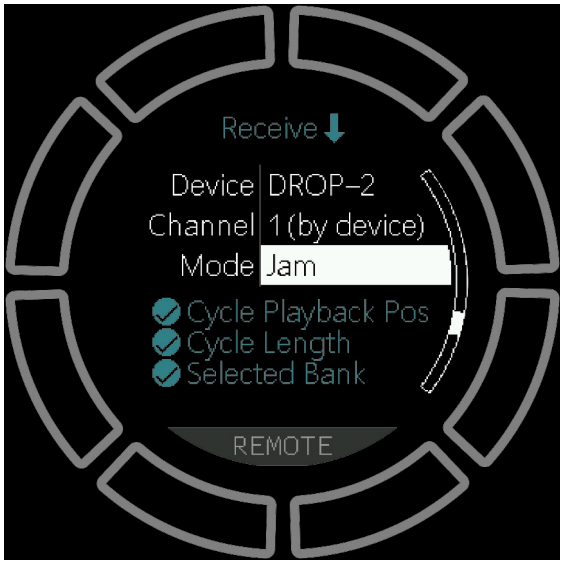
Receive and Send

Many of Drop's functions can be remotely accessed via MIDI CC messages. There are different levels of depth tailored to real-world use cases that enable remote control.

You can use these settings to *link two or more Drop units* to play along.

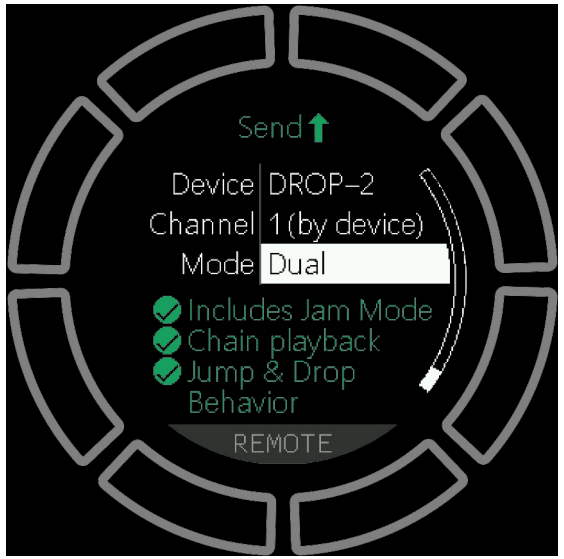
On both Drops, you need to add a Device for the other connected Drop and select a MIDI out and a MIDI input port. In MENU > Settings, you can enable Receive and Send independently and thereby have a master Drop. If both Drops should be able to set the remote parameters, you need to enable both Send and Receive on both Drops. also make sure, that for each data direction, the MIDI channel is identical.

You still need to *setup MIDI clock separately*.



Jam Mode

The intended use case for this mode is *playing a live set with a partner*. Both have their own independent setup with their own Drop as the master controller. Jam mode ensures that the Drop moment and the cycle playback position are in sync across both setups. Besides that, each of you can play their own setup independently.



Dual Mode

Choose this mode to use a second Drop unit as an *extension for more control elements* and hardware ports. By using this mode, the user interface and connectivity doubles in size. When selecting a Bank on the sender Drop, the receiver Drop will also switch the bank. Also, all snapshot related settings like quantization, exclusiveness, or the fade time potentiometer are overwritten on the receiver Drop by the sender Drop.

Full Mode

This mode goes one step further than Dual mode, so when scheduling or firing a Snapshot on the sender, it also *schedules and fires the same snapshot on the receiver* Drop.

MIDI table

<table>
<tr><th>CC number</th><th>Description</th><th>Jam</th><th>Dual</th><th>Full</th></tr>
<tr><td>#11-30</td><td>Fire snapshot in Jump mode.
CC number # Selects the snapshot: 1 = bottom left, 20 = top right.
<table>
<tr><td>Value 0</td><td>Do nothing.</td></tr>
<tr><td>Value 1-20</td><td>Emulate button push. Fires a snapshot or removes it from the selection if it is already in execution. Value selects bank number 1-20.</td></tr>
<tr><td>Value 21-40</td><td>Starts a manual fade with the selected snapshot. Value selects bank number 1-20.</td></tr>
<tr><td>Value 41-60</td><td>Force fire snapshot in Jump mode, fire again if already in execution. Value selects bank number.</td></tr>
<tr><td>Value 61</td><td>Same as value 1-20, but on currently active bank.</td></tr>
<tr><td>Value 62</td><td>Same as value 21-40, but on currently active bank.</td></tr>
<tr><td>Value 63</td><td>Same as value 41-60, but on currently active bank.</td></tr>
<tr><td>Value 64</td><td>Do nothing.</td></tr>
<tr><td>Value 65-84</td><td>Same as value 1-20, but allows only one snapshot exclusively.</td></tr>
<tr><td>Value 85-104</td><td>Same as value 21-40, but allows only one snapshot exclusively.</td></tr>
<tr><td>Value 105-124</td><td>Same as value 41-60, but allows only one snapshot exclusively.</td></tr>
<tr><td>Value 125</td><td>Same as value 1-20, but allows only one snapshot exclusively and on currently active bank.</td></tr>
<tr><td>Value 126</td><td>Same as value 41-60, but allows only one snapshot exclusively and on currently active bank.</td></tr>
<tr><td>Value 127</td><td>Same as value 61-80, but allows only one snapshot exclusively and on currently active bank.</td></tr>
</table></td><td>-</td><td>-</td><td>Yes</td></tr>
<tr><td>#31</td><td>Stop all ongoing Jumps.
<table>
<tr><td>Value 0</td><td>Do nothing</td></tr>
<tr><td>Value 1</td><td>Stop all Jumps. If in manual fade mode, Exit & Reset.</td></tr>
<tr><td>Value 2~127</td><td>Stop all Jumps. If in manual fade mode, Exit.</td></tr>
</table></td><td>-</td><td>-</td><td>Yes</td></tr>
</table>

<table>
<tr><th>CC number</th><th>Description</th><th>Jam</th><th>Dual</th><th>Full</th></tr>
<tr><td>#41-60</td><td>Schedule snapshot in Drop mode.
CC number # Selects the snapshot: 1 = bottom left, 20 = top right.<table>
<tr><td>Value 0</td><td>Do nothing.</td></tr>
<tr><td>Value 1-20</td><td>Emulate button push. Schedules a snapshot or removes it from the selection if already scheduled.
Value selects bank number 1-20.</td></tr>
<tr><td>Value 21-40</td><td>Remove snapshot from ongoing Drop and do nothing if not selected for Drop yet.
Value selects bank number 1-20.</td></tr>
<tr><td>Value 41-60</td><td>Force schedule snapshot in Drop mode.
Value selects bank number 1-20.</td></tr>
<tr><td>Value 61</td><td>Same as value 1-20, but on currently active bank.</td></tr>
<tr><td>Value 62</td><td>Same as value 21-40, but on currently active bank.</td></tr>
<tr><td>Value 63</td><td>Same as value 41-60, but on currently active bank.</td></tr>
<tr><td>Value 64</td><td>Do nothing.</td></tr>
<tr><td>Value 65-84</td><td>Same as value 1-20, but allows only one snapshot exclusively.</td></tr>
<tr><td>Value 85-104</td><td>Same as value 21-40, but allows only one snapshot exclusively.</td></tr>
<tr><td>Value 105-124</td><td>Same as value 41-60, but allows only one snapshot exclusively.</td></tr>
<tr><td>Value 125</td><td>Same as value 1-20, but allows only one snapshot exclusively and on currently active bank.</td></tr>
<tr><td>Value 126</td><td>Same as value 41-60, but allows only one snapshot exclusively and on currently active bank.</td></tr>
<tr><td>Value 127</td><td>Same as value 61-80, but allows only one snapshot exclusively and on currently active bank.</td></tr>
</table></td><td>-</td><td>-</td><td>Yes</td></tr>
<tr><td>#61</td><td>Stop all ongoing Drops.<table>
<tr><td>Value 0</td><td>Do nothing</td></tr>
<tr><td>Value 1~127</td><td>Un-schedule Drop.</td></tr>
</table></td><td>-</td><td>-</td><td>Yes</td></tr>
</table>

<table>
<tr><th>CC number</th><th>Description</th><th>Jam</th><th>Dual</th><th>Full</th></tr>
<tr><td>#1</td><td>MENU > Settings > Multiple Jumps<table><tr><td>Value 0</td><td>Allowed</td></tr><tr><td>Value 1~127</td><td>Not allowed</td></tr></table></td><td>-</td><td>Yes</td><td>Yes</td></tr>
<tr><td>#2</td><td>MENU > Settings > Multiple Drops<table><tr><td>Value 0</td><td>Allowed</td></tr><tr><td>Value 1~127</td><td>Not allowed</td></tr></table></td><td>-</td><td>Yes</td><td>Yes</td></tr>
<tr><td>#3</td><td>Set fade time, overrides potentiometer. Potentiometer LED starts to blink, indicating that you need to catch the value to get it back into operation.<table><tr><td>Value 0-127</td><td>Fade time 0-100%</td></tr></table></td><td>-</td><td>Yes</td><td>Yes</td></tr>
<tr><td>#4</td><td>MENU > Settings > Jump time. Sets the maximum fade time of a Jump.<table><tr><td>Value 0</td><td>One full cycle</td></tr><tr><td>Value 1-6</td><td>1: 10 seconds; 2: 20 seconds; 3: 30 seconds; 4: 40 seconds; 5: 50 seconds; 6~127: 60 seconds;</td></tr></table></td><td>-</td><td>Yes</td><td>Yes</td></tr>
<tr><td>#5</td><td>PLAY > Length. Sets the number of bars per cycle.<table><tr><td>Value 0</td><td>Do nothing</td></tr><tr><td>Value 1-32</td><td>Nr of bars. If the chosen nr of bars is not allowed, the next lower number will be selected.</td></tr></table></td><td>Yes</td><td>Yes</td><td>Yes</td></tr>
<tr><td>#33</td><td>PLAY > Quantization, sets the quantization for Jump.<table><tr><td>Value 0-5</td><td>0: No quantization; 1: 1/16th; 2: 1/8th; 3: 1/4th; 4: 1/2th; 5~127: 1 bar</td></tr></table></td><td>-</td><td>Yes</td><td>Yes</td></tr>
<tr><td>#34</td><td>PLAY > Quantization, sets the quantization for Beatjump.<table><tr><td>Value 0</td><td>1 bar</td></tr><tr><td>Value 1~127</td><td>1/4th note</td></tr></table></td><td>Yes</td><td>Yes</td><td>Yes</td></tr>
</table>

<table>
<tr><th>CC number</th><th>Description</th><th>Jam</th><th>Dual</th><th>Full</th></tr>
<tr><td>#35</td><td>Drop mode<table><tr><td>Value 0</td><td>Single</td></tr><tr><td>Value 1~127</td><td>Repeat</td></tr></table></td><td>-</td><td>Yes</td><td>Yes</td></tr>
<tr><td>#36</td><td>Snapshot BANK select<table><tr><td>Value 0</td><td>Do nothing</td></tr><tr><td>Value 1-20</td><td>Bank number</td></tr></table></td><td>-</td><td>Yes</td><td>Yes</td></tr>
<tr><td>#37</td><td>Chain start and stop<table><tr><td>Value 0</td><td>Do nothing</td></tr><tr><td>Value 1-20</td><td>Chain number, (re-)start</td></tr><tr><td>Value 21</td><td>Stop current chain</td></tr></table></td><td>-</td><td>Yes</td><td>Yes</td></tr>
<tr><td>#39</td><td>Beatjump Button ID.<table><tr><td>Value 0</td><td>Do nothing</td></tr><tr><td>Value 1-8</td><td>Circle button ID</td></tr></table></td><td>Yes</td><td>Yes</td><td>Yes</td></tr>
<tr><td>#40</td><td>Layer select<table><tr><td>Value 0</td><td>Activate Layer A</td></tr><tr><td>Value 1~127</td><td>Activate Layer B</td></tr></table></td><td>-</td><td>-</td><td>Yes</td></tr>
</table>

Grid Mode

In Grid mode, Drop's button matrix can be used in two ways: As a mini keyboard or a clip launcher with a connected DAW.

Notes Mode

Use the buttons as a small keyboard to send MIDI notes to a connected synth.

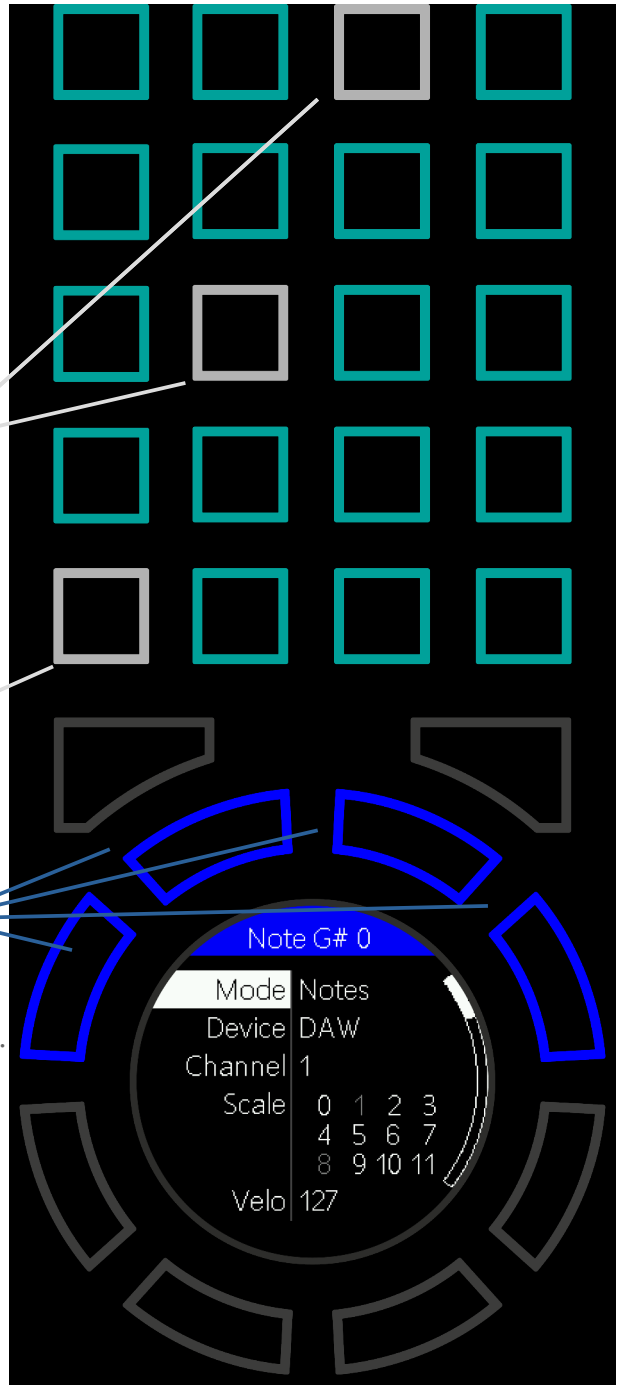
Device Select the MIDI device to which the MIDI notes should be sent.

Channel Set the MIDI channel on which the device receives the notes.

Scale Select the note scale in semitones that can be accessed with the buttons. Exclude notes that do not match the note scale of your music.

Velo The velocity value of the Note-On messages sent out.

Use the four blue buttons to change the root note (bottom left button) in octaves or semitones. For better orientation, the root note buttons light up white.



DAW Grid Mode

Use the buttons to launch clips and scenes within your DAW. Currently, *Bitwig* and *Ableton Live* are supported.

Clip buttons

Use the upper 4x4 buttons to launch clips in Bitwig or Ableton. The buttons show the clip color and the play, record and triggered status.

Track stop buttons

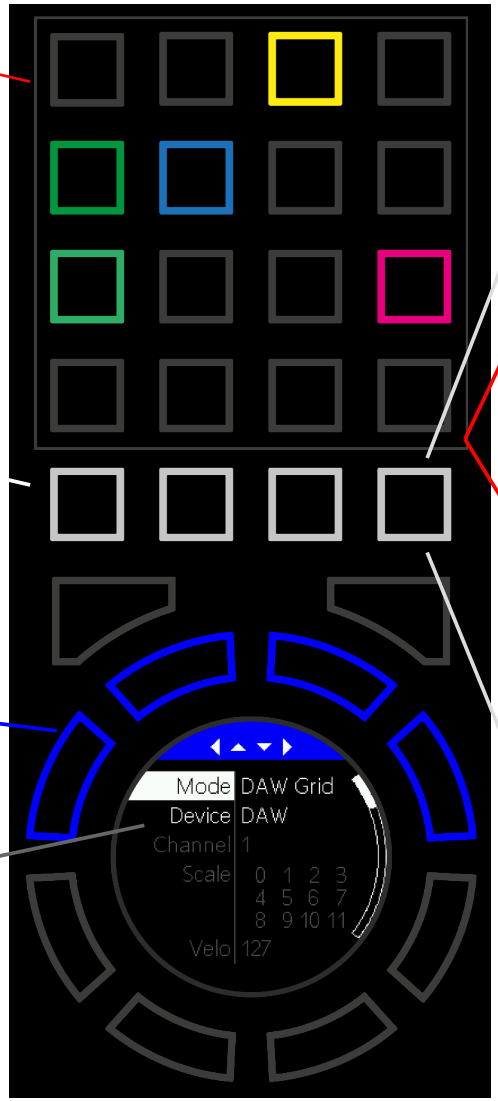
Use the lower white 4x1 buttons to stop the clip of a track.

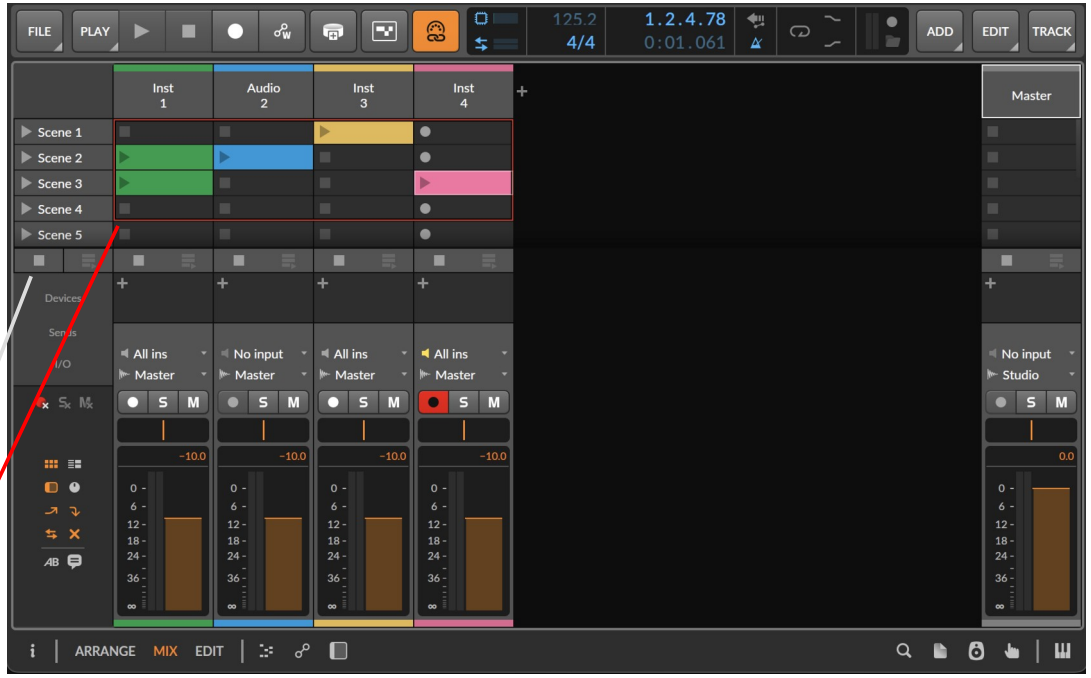
Grid move

Use the blue buttons to move the grid box.

Device

Select the device as which your computer with the DAW is connected to.

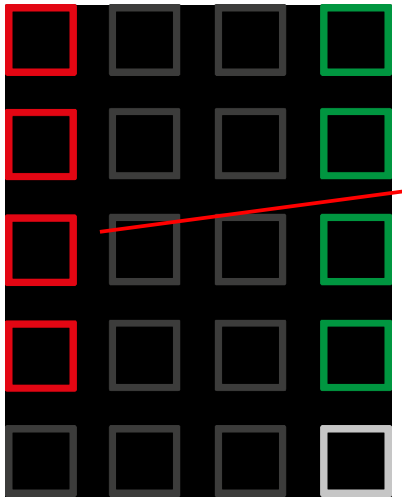




Press and *hold shift* to access a secondary layer with stop-all-clips button and *scene launch* buttons.

There are a few default MIDI channel uses when using Grid mode and a DAW:

Channel 1: Rotary encoder and fader, CC messages
Channel 2: Rotary and Track button push, Note messages
Channel 16: Clip launcher buttons and LED feedback, Note messages



Launch scene
Launch a scene with the DAW's timing.

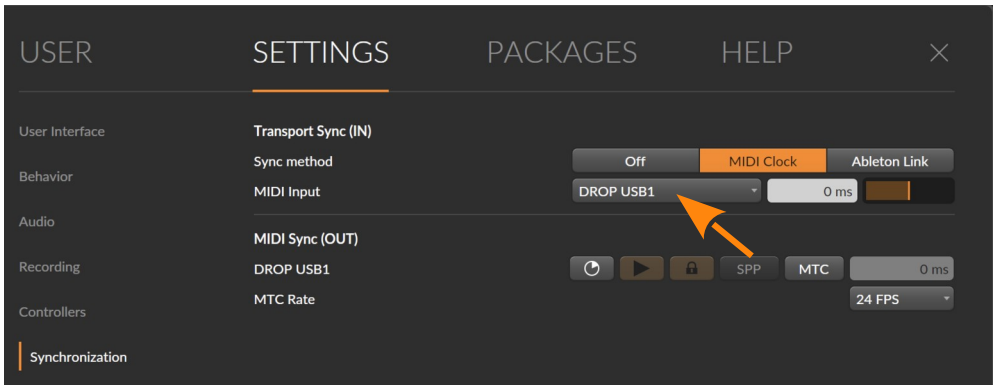
Launch scene as DROP
The red buttons schedule a scene launch for when the playback marker reaches the top and a DROP occurs.

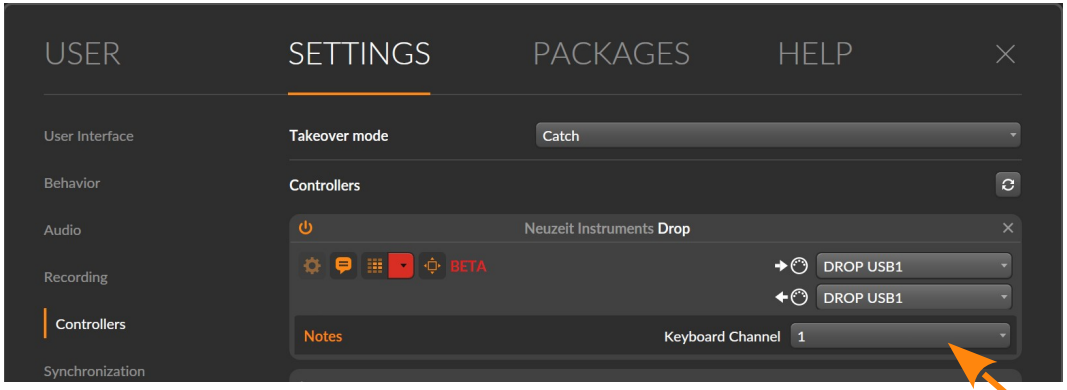
Stop all clips
The white button is used to stop all clips that are currently playing.

Bitwig setup

Bitwig natively supports Drop as a controller from version 6 on and later. For earlier versions, please download the file *Drop.bwextension* from our website and move it into Bitwig's extension folder (**link**).
Then in the Bitwig settings, select *Add Controller* > *Neuzeit Instruments* > *Drop*. Optionally, enable Drop as the clock source in Bitwig and make sure, that Drop also sends clock and transport messages to Bitwig.

The Bitwig extension is built to work with the default *PROJECT* > *DAW-Init* settings and also ensures correct LED feedback. Besides selecting Drop as MIDI input and output, the keyboard MIDI channel for Notes mode must be set in the *Keyboard Channel* field. When changing the keyboard channel, the extension must be switched off and on again in order to take it over.

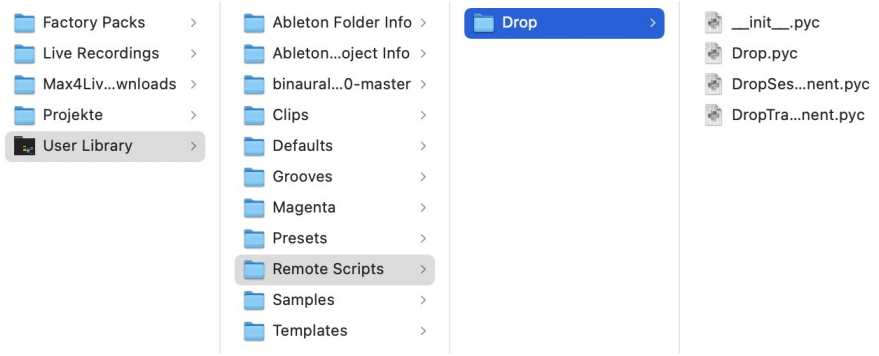




Ableton Live setup

First, you need to *download the remote script files* from our website and copy them into the required folder on your computer.

These are the paths in which the downloaded .pyc files need to be placed. You may need to create an empty folder “Remote Scripts” first, and also a subfolder “Drop”, in which the .pyc files go. When done, restart Ableton Live for the script to show up.

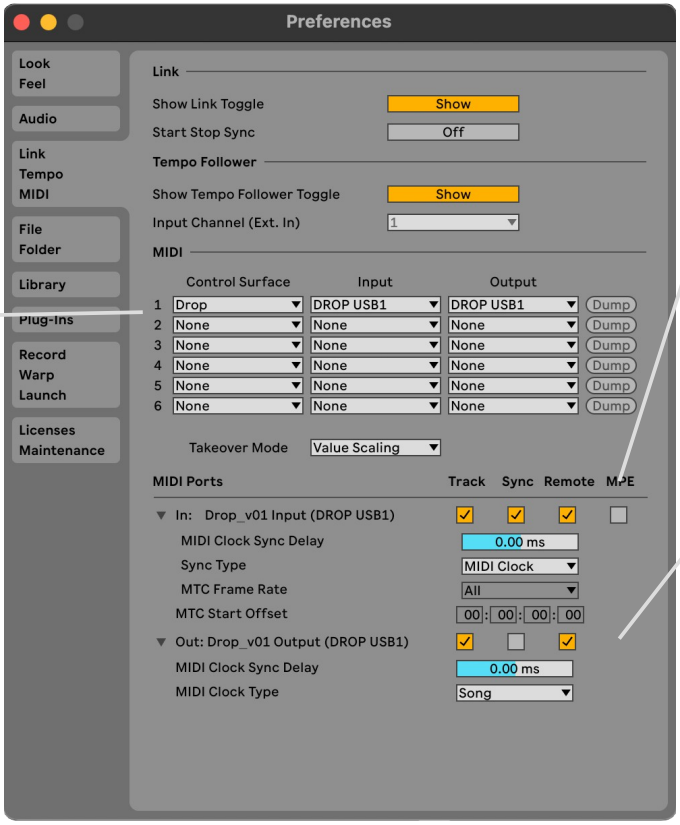


Windows folder: \Users\[username]\Documents\Ableton\User Library\Remote Scripts\Drop
Mac folder: Macintosh HD/Users/[username]/Music/Ableton/User Library/Remote Scripts/Drop

This **link** on Ableton’s website describes the installation of third-party remote scripts in more detail.

Control Surface

Select Drop as the control surface and activate its Input and Output when Drop is connected to the computer.
If Drop does not show up, the script files are not in the right place yet!



In

Activate *Remote* to map Drop’s control elements to parameters in Ableton Live.
Activate *Track* to forward MIDI notes from a Merger to Live’s MIDI tracks.
Activate *Sync* if you want to use Drop as the master clock for Ableton Live.

Out

Activate *Remote* to receive MIDI feedback from Ableton Live.
Activate *Track* to receive MIDI notes from Ableton Live’s clips and forward them through Drop’s Mergers.
Activate *Sync* if you want to use Ableton as the master clock for Drop.
Set *Song* as MIDI clock type if you want Drop to beatjump when jumping in Ableton’s timeline, otherwise use *Pattern*.

Settings

Options

Brightness	The overall LED and display brightness. Stored globally, not per project.
Default Color	When activating a new control element, this is the default LED color.
Keyboard layout	Tells if a connected USB keyboard has QWERTY or QWERTZ layout. Stored globally.
Moving shows	When moving a control element, the display can also *show the name and/or the value* of the control element. When playing in bright sunlight, the display's readability is usually better than the LEDs. Note: You can give each control element its own name, so when coming back to a project after some time it is easier to remember everything. To speed up naming and menu navigation, you can *connect a USB keyboard* to Drop.
Latest Snapshot	When executing a snapshot in Jump mode, Drop mode, or by editing it, its button keeps blinking softly. This helps to remember the last action during a performance and to keep track of everything.
MENU but returns to root	In some menus, the MENU button is also used as a back button. When this option is activated, the MENU button takes you back all the way to the root of the menu, otherwise it may only take you back one step. Deactivate this option if you feel familiar with Drop.
Multiple Drops	When activated, multiple snapshots can be combined to be *scheduled simultaneously as a Drop*. If two snapshots share the same control elements, the snapshot you press last has priority. When deactivated, only one snapshot can be *exclusively* scheduled as a Drop.
Multiple Jumps	When activated, multiple *snapshots can be combined in a Jump*. If two snapshots share the same control elements, the snapshot you press last has priority. Adding a snapshot to an ongoing Jump will re-start the fade time. When a Jump is already fading, you can also deselect snapshots from the fade one by one. When deactivated, only one snapshot can be *exclusively* be used for a Jump at a time.

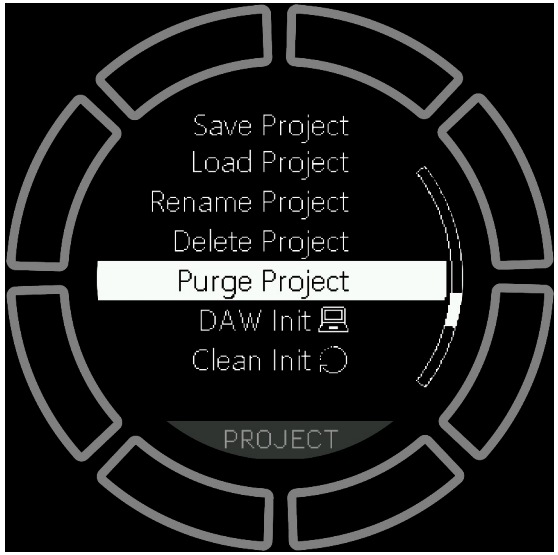
Jump time	The maximum Jump time when the fade time potentiometer is turned fully to the right. In the leftmost position, the fade time is always 0, resulting in an instant Jump. 1 cycle max: One full cycle, no matter how many bars or which tempo is currently set. 10...60 seconds: Fixed time, independent from tempo and number of bars per cycle.
Send all after load	When loading a project, all control element's current MIDI values and Remote TX messages are sent as one-shots. Note: Press *Shift + Play to force-send all MIDI and Remote TX* messages any time.
Chain to Bank	In chain mode, selecting a different chain 1-20 also changes the snapshot bank 1-20.
Bank to Chain	When selecting a different snapshot bank 1-20, the snapshot chain with the same number 1-20 is automatically selected. Note: Switching to a different chain will always stop playback of the currently active chain. Note: Bank ↔ Chain linkage is especially useful, when you arrange your set to perform up to 20 songs, using one chain and one snapshot bank per song.
USB1/2 port mode	Host + Device: When connected to another USB device, Drop auto detects if its USB port 1 or 2 should take host or device role. In Host mode, Drop also applies 5V power to the connected device. Device Only: Drop's USB port 1 or 2 is forced to stay in device role and does not supply power to the connected device.

Test mode

Push the "Test" button to enter a test mode in which you can verify that Drop's hardware works correctly. Turn the encoder to switch pages. Test mode allows you to see if all LEDs work as expected, lets you test all push buttons, encoders and faders and lets you test CV and TRS inputs and outputs.

Note: In test mode, CV and MIDI will not work. Test signals (0-5V ramp) and test messages are sent over all CV and TRS outputs which are not valid MIDI data.

Project



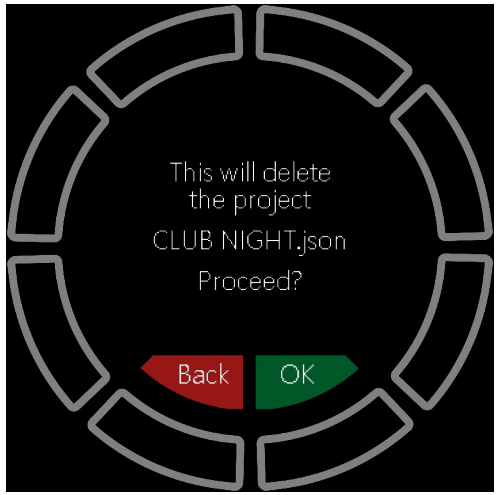
Management

In MENU > Project you can save, recall, create, rename and delete projects. Also, there are options to initialize a new project for either DAW-only use or hardware device use, as well as a purge function to help you clean up a cluttered project.

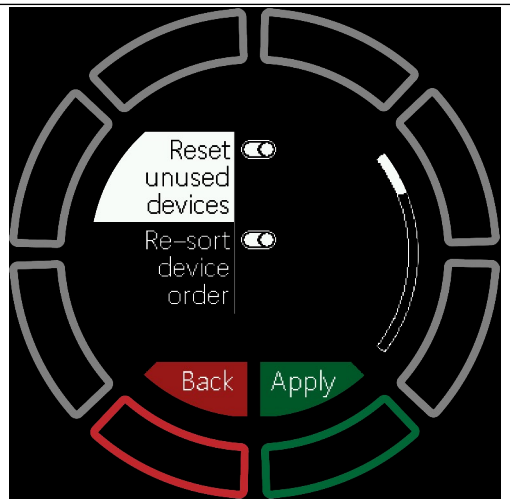
Projects are stored on Drop's Micro SD card in the /Projects folder. The file format is .json (JavaScript object notation) which means that it is a human-readable format that is open for future editing in a web environment.

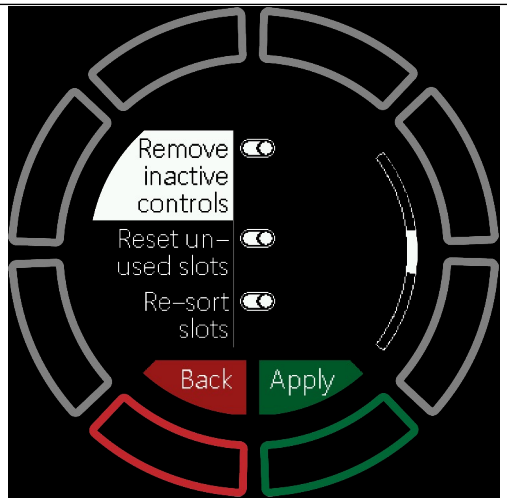
You can also navigate subfolders inside the /Projects directory if you need to, but you need to create them on the SD card using your computer.

Save Project	Store the current project. Push the NEW+ button to create a new project or select an existing project name. Leave the name as it is to overwrite the existing file or change the name to save a second version of the project.
Load Project	Select and load a project from the file system. Use the NEW+ button to start off with an empty project (same as "Clean Init").
Rename Project	Give an existing project a different name
Delete Project	Delete the selected project file from the SD card permanently. There is a safety step before the actual delete.



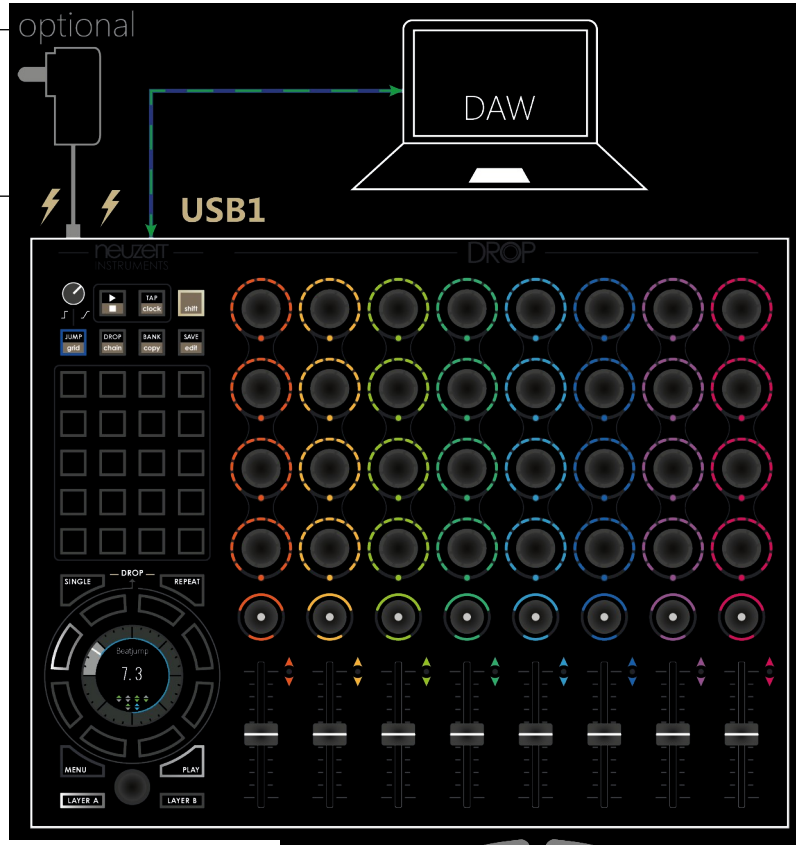
Purge Project	Helps you clean up a cluttered project. There are several tasks available that can be turned on or off separately before proceeding. The purge function does not change the functionality of your project, it simply cleans up unused parts and re-sorts slots.	
	Reset unused devices	The parameters of devices that are not turned ON in *MENU* > *Devices*, will be reset to their initial states. So if you turned on a device, changed some parameters, then turned it off again, the changed parameters still persist in case you want to re-enable the device later. This function resets the parameters of all devices that are not enabled.
	Re-sort device order	If there are gaps between active devices, active devices with higher slot numbers will be moved to lower slots, so that gaps are closed. E.g. if only devices 1, 3, 4, 7 are activated, they will be moved to slots 1, 2, 3, 4.
	Remove inactive controls	Checks for each control element if it is active but does not have any MIDI mapping or any internal link (CV out or Merger assignment). If the control element is not actively used, it will be turned off and reset to its initial state. Also snapshots are checked. If a snapshot is active but does not contain any data and does not have MIDI assigned, it will be turned off and reset to its initial state.
	Reset unused slots	Goes over all MIDI slots of all control elements and snapshots. If a slot is not used or has a mapping where the corresponding device is not active, the slot will be reset to its initial state.
	Re-sort slots	Goes over all MIDI slots of all control elements and snapshots. If there are gaps between active slots, slots with higher numbers will be moved to lower slots, so that gaps are closed.





DAW Initialization

DAW Init	Use this option to initialize Drop to be used with a DAW only. Each of Drop's control elements is activated and sends a MIDI message. After initialization, *do all the mapping in the DAW*.

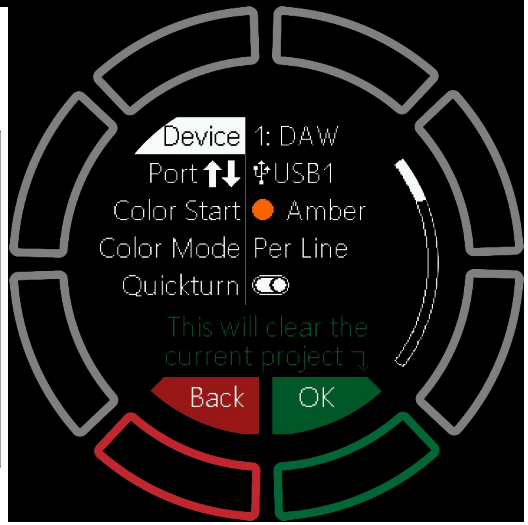


DAW stands for "digital audio workstation" and usually means a computer software like Bitwig, Ableton Live, Logic, etc. But also audio workstations like the Akai MPC or Akai Force series can be considered a DAW. Use DAW Init if your target *device offers its own MIDI mapping function* with MIDI learn, instead of having a fixed mapping table.

DAW Init gives you just a starting point for a fresh project. You can change everything afterwards as usual.

What DAW Init does on Drop:
- *Clears the whole project*, including mappings, devices, snapshots, snapshot groups, etc.
- Only one *Device* is activated, named "DAW" and set to the USB1 *port* by default.
- All of Drop's *control elements are activated*. Slot 1 is used on each control element to send a unique MIDI message to the DAW. CC and Note messages are being used on MIDI channels 1 and 2.
- "Feedback by MIDI-In" is activated and assigned to Slot 1. Moving a mapped control in your DAW also updates the control element on Drop.

There are a few options to customize DAW init.



Device	Defines the device slot ID used for the DAW device.
Port	Select the physical port for the DAW. If choosing TRS, make sure to connect Input and Output.
Color Start	Sets the color of the first line or row or all control elements, depending on color mode.
Color Mode	Set a color scheme, e.g. Per Line, Per Column or Same Color.
Quickturn	Active: The push function of all rotary knobs is set to Quickturn, no MIDI out. Inactive: Rotary push acts as a MIDI push button.

Hardware Initialization

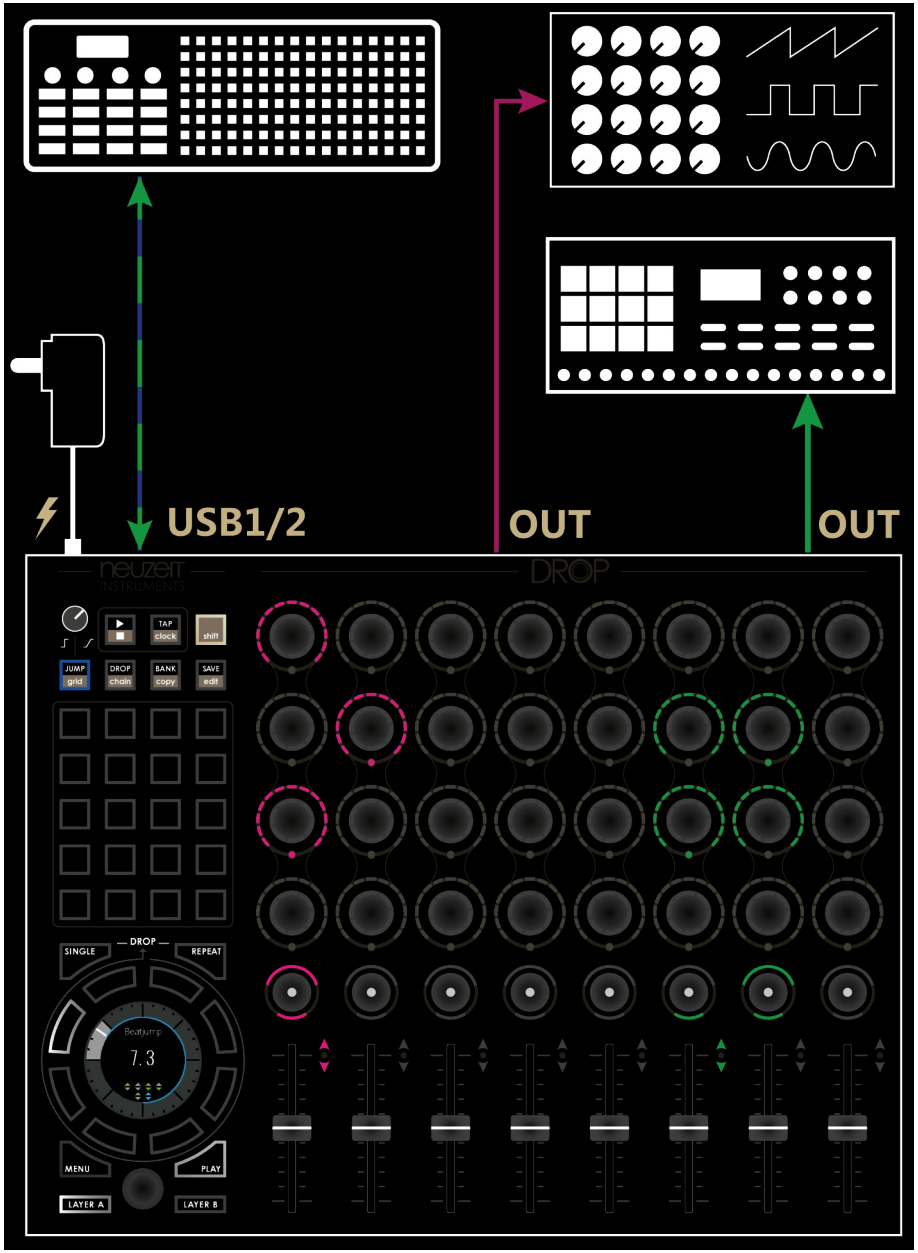
Clean Init	Use this as a starting point for a setup with other hardware devices.

With this initialization function, all control elements and devices are deactivated and reset, so Drop's control surface will be dark at first.

This is a clean starting point for a setup with *devices with a MIDI mapping table*. This applies to most synths and grooveboxes, so the device expects a specific message for each parameter and all mapping is done in Drop. You should only activate the control elements you actually need and set up the right MIDI messages the receiving device expects.

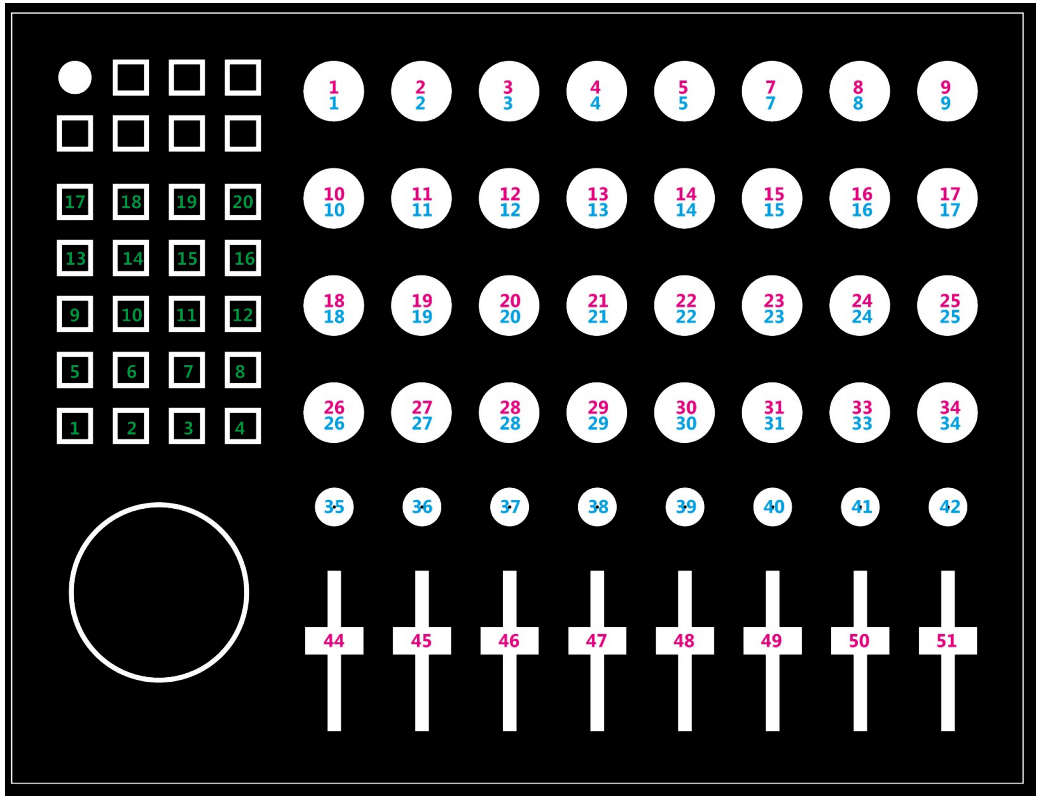
If you have a *MIDI device that has its own internal MIDI learn function*, you should still start off with an empty project. Then, just activate the needed controls and a MIDI slot and stick with the default unique message type and message number. Then, use the receiver's learn function.

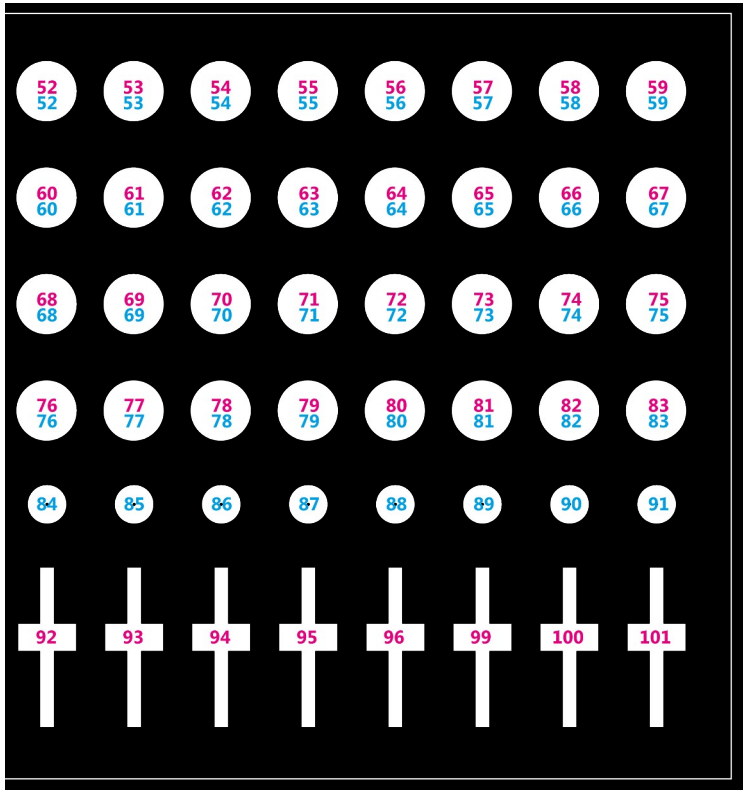
> *Starting with a blank project is usually the best way to create a clean and reactive setup with no MIDI message overhead.*



Default mapping

This is the default mapping applied to each control element when using the functions Purge Project, Create New, DAW Init or Clean Init. Except from DAW Init, the control elements may be disabled, but the MIDI messages are already set up under the hood, so you only need to activate the control element when you need it.





Pink MIDI CC message, channel 1.

Blue MIDI Note message, channel 2.

Green MIDI Note message, example. Slots are deactivated and snapshots do not send out MIDI by default. But the note numbers are already set up in the background. Note numbers 0-119 are applied, repeating after bank 7 starting with note number 0 again.

Note: Some CC numbers are missing (CC #0, #6, #32, #38, #97, #98) as they are used for NRPN and Bank Change messages. By skipping those numbers, the mapping does not intersect.

Troubleshooting

Setting up Drop is all about making two MIDI devices talk to each other the right way. This may not always be straight forward, so this is a list of common pitfalls and tips.

What messages does Drop actually send/receive?

Use the MIDI Monitor in the PLAY view to see what messages are going in and out of Drop at each MIDI port. Drop keeps a history of the past messages. You can stop recording and scroll through the history to see what is going on.

MIDI TRS type A or B

When using MIDI over TRS, there are historically two standards type A and B where the tip and the ring of the jack are physically switched. A receiving device may only understand one of the two types. Drop has a switch next to each MIDI Output TRS port to select either type A or B.

MIDI TRS to DIN adaptors also have one specific type A or B. If the wrong type is selected, the outgoing MIDI DIN signal does not work.

Drop can receive both type A and B on its input. The switch only affects the outgoing signal.

MIDI USB must be class-compliant

When using a MIDI device over USB, communication only works if the connected device supports class-compliant MIDI. Unfortunately, this is not the case for all MIDI devices. If your device needs a *driver to be installed, it is not class-compliant* and can not be used over USB with Drop. Use TRS MIDI instead. During our tests, we found that some Roland and Boss devices do not support class-compliant MIDI.

Drop may also show an error message and offer you to save a Log file. Before sending us the Log file, please double-check if the device really is supposed to be class-compliant.

USB sub-port

MIDI over USB uses sub-ports, also known as cable ID or virtual cable. The index ranges from 1 to 16. Per sub-port, another 16 MIDI channels can be sent. Most devices only use one cable ID, but some may also offer multiple ones. Make sure you set up the right one in MENU >Devices or simply try to find the one that works. The number of sub-ports the device offers is only shown when the MIDI device is connected.

MIDI channel

Make sure the channel on which Drop sends MIDI messages corresponds to the channel on the receiving device. Drop uses channel numbering 1-16 as the MIDI specification says. However, some devices may use a numbering scheme from 0-15 which is the actual data transmitted in the protocol.

USB hubs can not be used.

USB hubs are not supported by Drop. You can only use one direct USB connection from Drop to the device.

MIDI port selection in *MENU > Devices*

The MIDI Input and Output ports selected in *MENU > Devices* are simply the ports where your device is physically connected to and have nothing to do with routing MIDI from device A to device B.

If you want to route incoming MIDI notes from a keyboard or sequencer to a synth, the synth does not necessarily need the MIDI Input port enabled. Instead, set up a second Device for the keyboard or sequencer and use the Merger function of the synth Device to set up the routing.

You only need to enable the MIDI Input port, if
- your device is a keyboard or a sequencer
- your device is a groovebox or synth that sends MIDI feedback when turning its knobs and you also want to use it in Drop
- your device is a groovebox or synth that sends MIDI feedback when turning its knobs and you want to use MIDI Learn to set up the mapping.

Do not ignore warnings

Throughout all mapping and setup menus, Drop may show a “!” warning sign wherever it detects a misconfiguration. For example, when a mapping is applied to a Device that does not have an output port set, a warning sign is shown. Warning signs usually mean, that messages are not being sent or received.

Enable MIDI-Feedback only if really needed

Each of Drop’s control elements can react to incoming MIDI messages and be remotely turned, moved or pushed that way. The intention is that when you turn the mapped control on the receiver, the mapped control element on Drop also changes its value.

If the control element uses more than one slot and also sends messages to other devices, these messages are also sent when MIDI feedback is received.

For example: You macro-mapped a rotary knob to Synth-A's filter on Slot 1 and Synth-B's volume on Slot 2. The rotary knob's MIDI feedback is enabled and set to Slot 1. Assuming that Synth-A sends back MIDI when turning its filter knob, the rotary control thereby changes its value. To avoid a potential MIDI feedback loop, Drop will not respond by sending MIDI over Slot 1 on which it also receives incoming MIDI feedback from Synth-A, however it will still send MIDI out to Slot 2 so that Synth-B changes its volume.

Remote TX and RX accidentally enabled

Drop offers the option to be remotely controlled via MIDI which can be enabled in *MENU > Remote*. This function is also intended to link several Drop units, which is why Drop can also send the same MIDI messages out, such as the selected cycle length, quantization settings, beatjumps, and many more. Besides that, incoming MIDI notes can be used to trigger snapshots remotely, e.g. from a MIDI keyboard or sequencer.

Only enable the Remote functions if you really need them, otherwise incoming MIDI messages may change settings in Drop without you even noticing. The same way, Drop may send MIDI messages without intention.

MIDI feedback loops

A MIDI feedback loop is caused when a device receives a message which causes it to respond or pass it through and send another message back, which in turn causes the other device to also respond with a MIDI message again. By that, both devices end up sending messages back and forth in a loop and the whole MIDI communication gets stuck. Loops can also occur across three or more devices.

Drop already has some built-in features to prevent MIDI feedback, but it is still possible to create them.

There is no allround solution on how to prevent MIDI feedback loops, but the MIDI Monitor in the PLAY menu may help to find out what is going on.

Optimize for performance

It is good practice to make sure only the messages which are actually needed pass through your cables. This reduces errors and improves latency.

- Use the Merger's message filters and only enable what is actually needed.
- Send MIDI clock only to the ports and devices which actually make use of it. Also, double check if the receiving device needs and understands Start/Stop and Song Position messages and disable it when not needed.
- Disable all control elements that are not used. If an unused control element is part of a snapshot, it will send unnecessary MIDI data when executing the snapshot.

Miscellaneous

Warranty

This product is covered by a 24-month warranty starting from the date of purchase. The warranty covers material and manufacturing defects that occur during normal use.
Excluded from the warranty are: (1) Damage caused by improper handling, accidents, or modifications. (2) Normal wear and tear. (3) Damage resulting from using non-approved accessories or power supplies. In case of a warranty claim, please contact your dealer or our customer service. Please keep your purchase receipt as proof of warranty.

Safety Warnings

Only use the supplied power supply or a manufacturer-approved replacement.
Do not expose the device to moisture, rain, or extreme temperatures. Ensure sufficient ventilation and avoid placing the unit near heat sources. Disconnect the power supply when the device is not in use for long periods. Do not attempt to open or repair the device yourself; this may cause electric shock and void the warranty. Use the product only as described in this manual and in accordance with local electrical regulations. Keep the device out of reach of children.

Regulatory

This product is subject to the WEEE Directive. Do not dispose of the device in household waste. Please use local electronic waste collection points.

Contact

Feel free to join the discussion on our ModWiggler forum.
You can also contact us via Email contact@neuzeit-instruments.com

The latest firmware and version of this manual can be found on Drop's website: https://www.neuzeit-instruments.com/drop