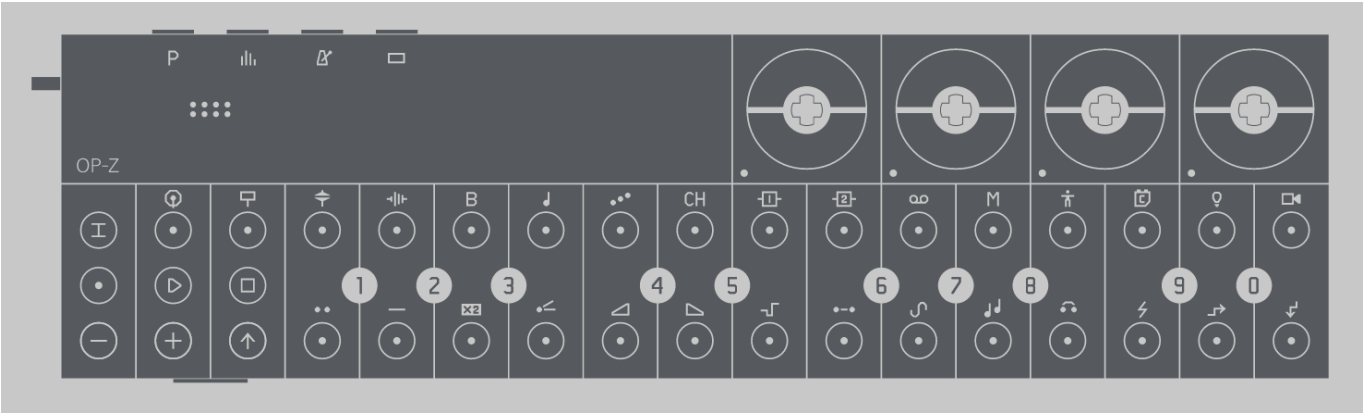
OP-Z

portable synthesizer

user guide

ガイド

v.1.2.14



Contents

OS updates and changelogs

1.2.17 (Dec 17th 2019)

- module stability improvements
- app file transfer improvements
- exponential lfo depth knob
- add "generous_chords" option for 6 note poly on chord track. read more here.
- fix occasional false low battery warning

1.2.14 (Nov 15th 2019)

- improve sample preloading, less likely to miss first note when switching pattern
- switch pattern immediately on incoming program change (instead of waiting until next step)
- change trig driven tracks to play upon entering step instead of exiting
- truncate overlapping sequencer trigs if same note
- fix crash when connecting to app with certain patterns
- fix bug where pressing play caused pitch change in sample mode
- fix bug where triggers on fx2 would affect tape track
- show correct led color for last six LFO shapes

1.2.12 (Nov 5th 2019)

- redesigned lfo with new shapes, tempo sync and accelero-meter support. read about it here.
- add lfo to effect tracks
- add note style option to master track (latch, free). read about it here.
- add low battery led indication. read about it here.
- add setting to disable arpeggio. read about it here.
- softer pop at shortest envelope release setting
- fix crash when killing notes (TRACK+STOP) on tracks other than the first 8.
- fix flipped usb audio L/R signal
- fix occasional pop/noise on tape track
- fix bug where polyphony note stealing sometimes chose wrong note
- don't stall midi output when switching projects while connected to app
- disregard 'channel_one_to_active' setting when processing incoming UI group CC messages

1.2.8 (Sept 6th 2019)

- fixed bug that would cause files to disappear/get corrupted
- detect microphone signal from splitter adapters
- new input selection functionality (beta). read about it here.
- new audio interface monitor mode
- fix broken incoming program change handling
- add cc for changing/switching to next/prev pattern. read about it here.
- make microphone mode work when usb audio is active
- allow octave shifting on all tracks
- fix drone notes to work properly with legato

1.2.5 (July 1st 2019)

- new sampling mode
- 2 channel audio interface
- full OP-1 sample format support (pitch, gain, playmode, reverse)
- improved stability
- support importing raw samples to drum tracks
- apply track gain before fx sends
- don't allow copying empty steps
- restart arpeggio with TRACK + PLAY on arpeggio track
- don't trigger gate step component if track is muted
- toggle headset input with SCREEN + SHIFT
- send clock out if enabled even though midi out is disabled
- don't lose clock sync when switching project via pattern change
- fix broken parameter spark random setting
- fix force save not working on project 1
- fix inverted headphone gain levels dep. on impedance

note!
this firmware adds support for the gain, play direction and playmode settings of the OP-1 sample format. in older firmwares, these settings were ignored. this might lead to your patterns sounding different if you are using custom samplepacks. the most likely culprit will be the playmode setting. the OP-1 defaults to GATE, while the OP-Z used to treat everything as RETRIG. Adjust your playmode setting on each sample to RETRIG, to get it sounding like before.
if your track levels change due to the gain setting, either adjust the track volume, or adjust the per sample gain value.

1.1.27 (April 5th 2019)

- now supporting two midi devices when using a powered USB hub
- improved compatibility with a number of usb devices
- improved usb midi throughput (reduce risk of lost notes)
- handle importing WAV and AIF files without meta data to synth tracks
- fix crash when connecting to app with certain patterns active
- fix synth sampler noise bug with certain samples
- more descriptive error messages in sample import
- add general.json setting to latch notes using shift. Release notes while holding shift to latch (latch_notes_with_shift)
- add general.json setting to disable auto-added FX A when applying temporary parameter tweaks (temp_param_add_fx_a)

1.1.23 (Feb 22nd 2019)

- allow programming steps with external controller
- support velocity on arpeggiator track
- change step length setting 9x to be 16x long
- add full octave range to drum tracks
- pass incoming midi start/continue/stop to other ports
- improved stability
- copy step now works on all tracks
- change default tape volume and reverb parameter 2
- fix noisy resampling in synth sampler
- keep sending audio to fx1/fx2 if audio muted
- improve midi continue behaviour (works better with OP-1)
- change maximum recording note length based on step length
- show pattern position from solo mute context (same as pattern context)
- properly reset parameters after releasing shift (temporary tweak mode)
- “enable_program_change” setting now saved between reboots
- don't play trigger driven tracks when muted
- gate trigger step component trigger on entering step instead of exiting
- fix hanging notes from linked tracks when pressing shift before releasing note
- fix hanging punch in notes when releasing shift before releasing note
- remove track clear wipe animation

1.1.17 (Dec 7th 2018)

- add option to disable USB charging with SCREEN+E2 (to remove ground noise)
- improve headphone / line jack detect (solves issues like getting mono with stereo cable)
- add option to keep parameter page when switching track ("disable_param_ page_reset" setting to general.json)
- clear step parameter locks with STEP+STOP
- make temporary parameter changes (holding shift) available for all tracks
- smoother volume knob interpolation
- hard kill active track notes on double press TRACK+STOP
- separate battery animations depending on USB state
- minor bug fixes

1.1.12 (Nov 13th 2018)

- reduced cpu consumption, improves battery life by 5-10%

fixed bugs:

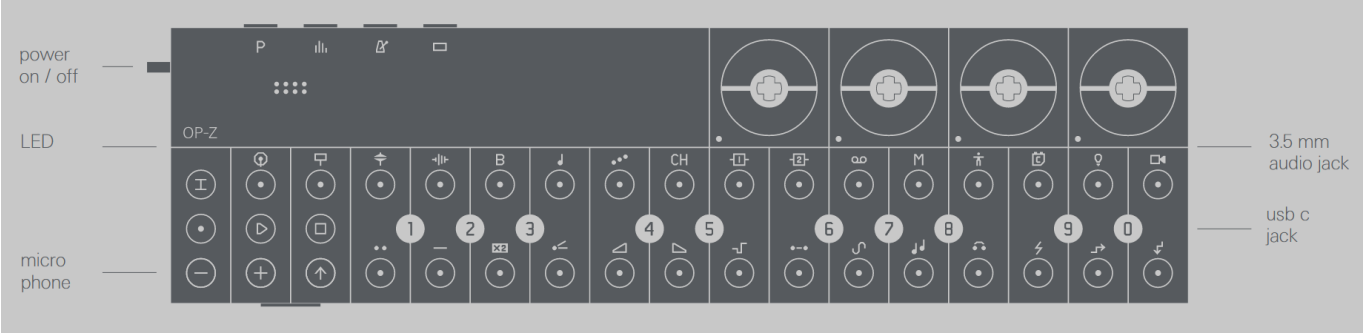
- occasional hang when removing a connected usb device
- occasional crash when recieving midi identity request on startup
- sequencer stalling when connecting a usb device
- configurator sometimes causing pops in downloaded samples
- imported sample packs to slot 10 lost after reboot
- outgoing program change had inverted "alt_program_change" setting
- app->synth connection lost when disabling midi out under midi settings
- sequencer sometimes starting on last step when step by step recording

oplab-module OS updates and changelogs

1.1.1 (Dec 17th 2019)

- rewritten OP-Z-to-module communication, significantly improving midi reliability
- speed optimizations
- lower power consumption
- add LED start-up animation

1. hardware overview



1.1 power on / off

to power on your OP-Z, turn the yellow knob located on the left side of the unit clockwise, until you feel and hear a click. the track leds will light up in a rainbow pattern and the internal speaker will play a startup sound. OP-Z is now ready to be used.

keep turning the knob to adjust the master volume. always make sure to be careful with your ears.

to power off OP-Z, turn the knob counterclockwise, past the click.

note: all OP-Z data is stored on-the-fly, so everything will still be there next time you power on your unit.

it's a good habit to occasionally back-up OP-Z using disk mode.

1.2 charging the battery

OP-Z has an internal rechargeable battery which can be charged using the included usb-c cable. connect the unit to a computer or any standard usb charger.

keep OP-Z connected for as long as you want to charge. while charging and turned off the motion led will be blinking green.

when connected and fully charged the motion led will be solid green.

to check the battery level press and hold screen. the track led lights will light up to indicate the charge level, from 1 to 16.
note: when paired with the app, battery level is shown in the main interface.

pro-tip: usb charging can be disabled by holding screen and pressing e2 (the right-most piano key). this can sometimes cancel noise related to usb.
when holding screen in this mode the track led lights are yellow.

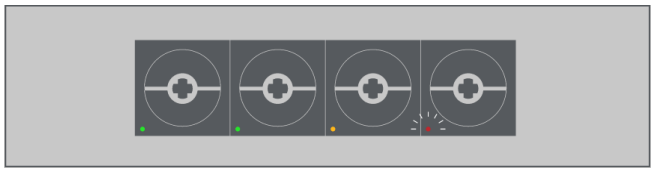
1.3 replacing the battery

the internal battery is easy to replace. simply remove the back plate to access it.

OP-Z uses a custom battery design. do not attempt to use any other battery to power your unit.

replacement / backup batteries are sold separately.

1.4 low battery indicator



(available since os 1.2.12)

when OP-Z is about to run out of battery, it displays a led animation every 30 seconds. time to charge!

1.5 inputs and outputs

in its standard configuration OP-Z has two ports located on the right hand side of the unit:

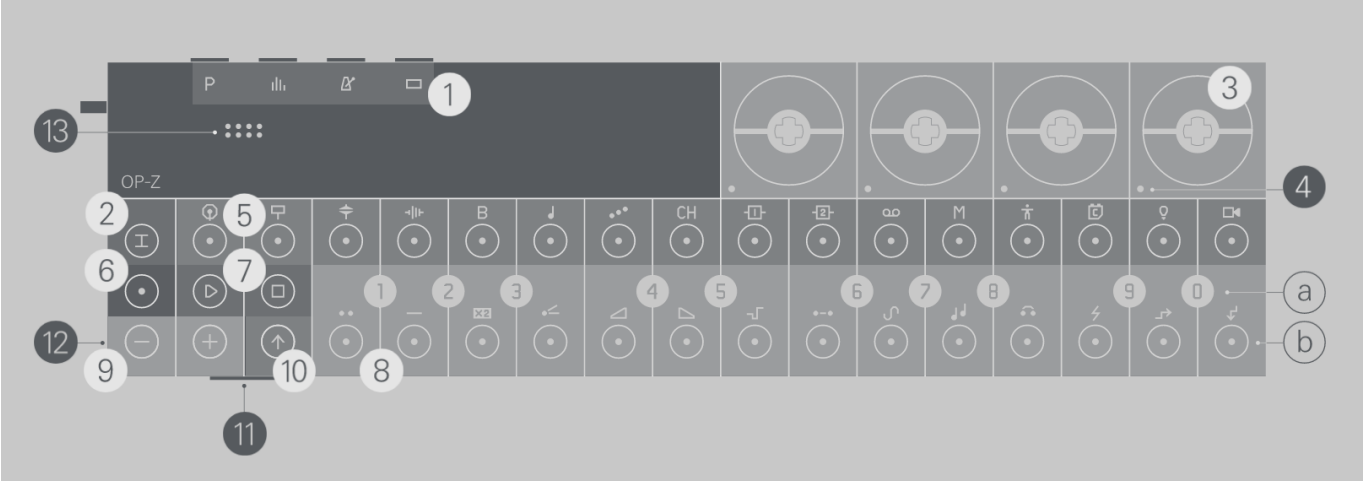
- main audio for headphones, headset or line out.
- usb-c port for charging, file transfers and midi.

on the top side you find four expansion ports, for use with a physical hardware module (sold separately). more info about the modules and how to expand the hardware will be available soon.

on the left side, next to the volume knob, is the microphone and mic led indicator.
read more about how to use the microphone here.

note: make sure never to feed phantom power in to OP-Z as this will damage the electronics and void the warranty.

2. interface overview



the OP-Z interface can be divided into different sections for easy reading and intuitive workflow.

all the main sections are listed above, with links to their own chapters below.

click on a section to find out more about its use and operation.

the OP-Z app is covered in a chapter of its own.

1. index buttons: project, mixer, tempo, screen
2. track selection button
3. color dials: green, blue, yellow, red
4. parameter leds
5. tracks: audio tracks, control tracks, patterns, step buttons
6. record button
7. transport buttons: play/stop
8. musical keyboard: piano keys, value keys [a], component keys [b]
9. transpose buttons
10. shift button
11. pitch bend
12. microphone
13. speaker

the main OP-Z functionality can be arranged into the following hierarchy:

projects	patterns	tracks	steps
10 projects	16 patterns per project	16 tracks per pattern	16 steps per track
14 pattern chains / project			14 step components
10 mute groups /project			24 ticks per step

2.1 index buttons

the four index buttons are central for operating your OP-Z. they have a lot of usage and are presented below, with links to each individual chapter for detailed information. generally press and hold the buttons to toggle their unique temporary context for the interface.

project

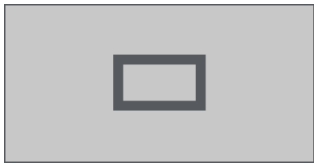
the project button is used for selecting projects, patterns and slots, as well as for certain power functions. read more here.

mixer

mixer is used for muting or unmuting tracks, for group and master gain control and for the master compressor. read more here.

tempo

the tempo button is used for tempo / bpm, swing and metronome settings. read more here.



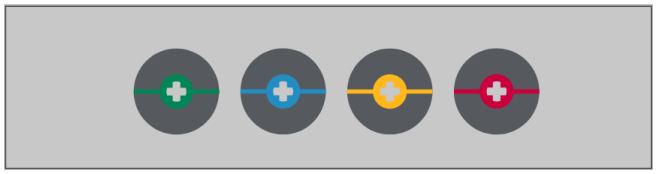
screen

hold the screen button to display the battery charge, to navigate the app and to activate photomatic. read more here.

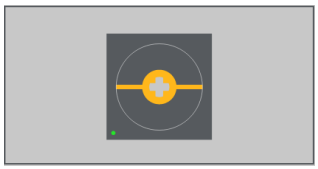
2.2 color dials

turning the color dials is the main way to control the parameters of OP-Z. there are four color coded endless dials which are often used in combinations with other buttons.

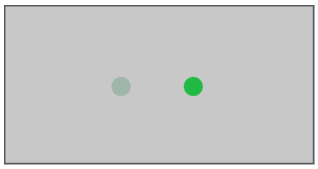
generally there are four different pages for these dials, allowing each dial to control a number of settings. read more about the color dials and parameter pages here.



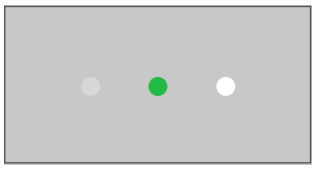
2.3 parameter leds



the led next to each dial is used to show the value of the corresponding dial, in any of the following ways:



a gradual min – max level, where led brightness represent dial value.



a gradual min – max level, with a default / neutral / mid green state at 50 %.

through different color segments, for toggled static values.

2.4 parameter pages

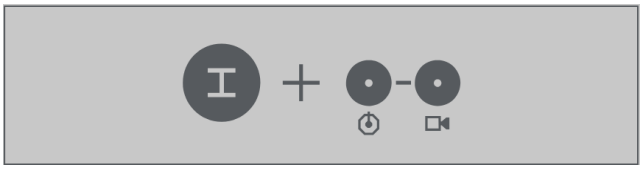
each track can have up to four pages of parameters. each page is color coded so you always know what you're controlling.

learning these colors will help you to navigate the interface and to find the setting you want.

press and release shift to toggle parameter page.

2.5 track select button

use the track select button or just 'track' to select which track is active.



press and hold track and press any of the track buttons to select that track.

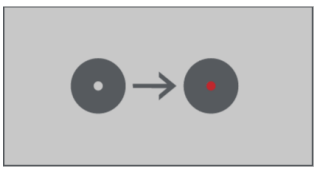
the currently selected track is indicated by a white led when track is held.

2.6 tracks / patterns / step buttons

the top row buttons act both as track buttons, as pattern select buttons and as steps in the sequencer.

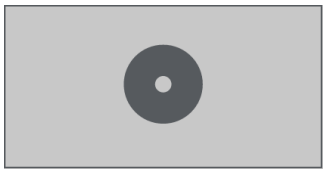
the functionality depend on what button combination you are pressing.

holding project will allow you to select patterns, while holding track will allow you to select track.



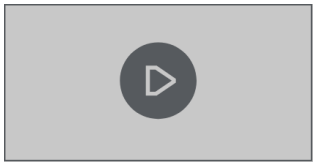
pressing them alone will place a trigger on a step in the sequencer.

2.7 record button



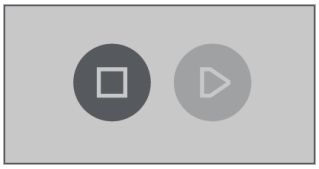
the record button, 'rec', is used for recording events into the sequencer.
Read more about different ways to record here.

2.8 transport buttons



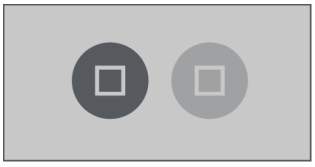
play

press play to start playback from the start of the active pattern. while playing you can press play to restart playback.



stop

press stop while the sequencer is playing to stop playback.



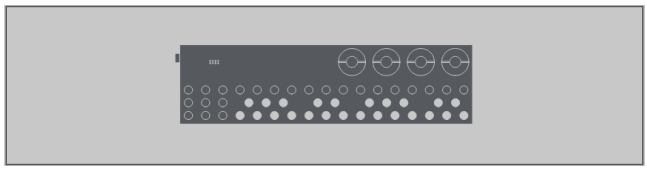
panic

press stop while sequencer is stopped to end all active notes.

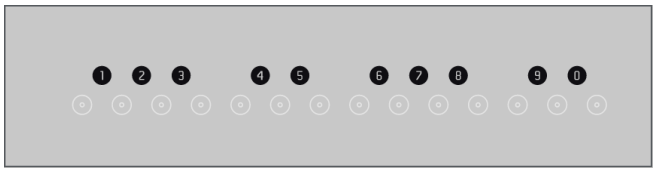
super panic

pressing stop twice while sequencer is stopped will also clear all audio buffers.

2.9 musical keyboard



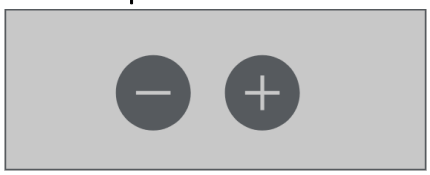
OP-Z features a two octave musical keyboard, used for playing and programming the unit. use the piano keys to trigger and play sounds from the currently selected track.



the keyboard and its piano keys can be divided into two sections. the black keys are also called value keys,

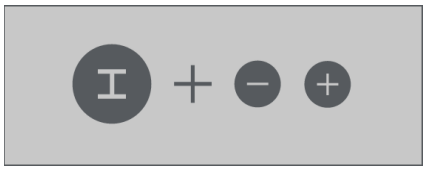
and the white keys are also called component keys.

2.10 transpose buttons



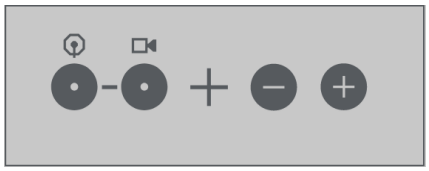
change octave

press – or + to transpose the musical keyboard, and change the current octave, visualized by the value keys.



offset track

press and hold track together with – or + to shift all notes on the active track one step left or right.



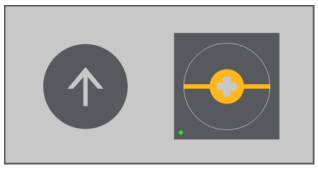
offset steps / micro timing

press and hold a step and repeatedly press – or + to shift timing of that step, 1 tick back or forth, visualized by a purple led next to the active step. each step has a resolution of 24 ticks.

pro-tip: the more purple the led, the further the trigger is from step center.

2.11 shift button

the shift button is often used in combination with other buttons. there is a difference between holding and momentarily pressing shift.

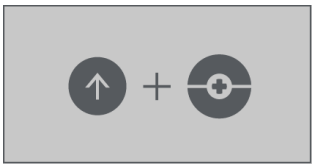


next parameter page

press and release shift to toggle parameter page, indicated by different color parameter leds.

add punch-in effects

press and hold shift and the piano keys to momentarily add punch-in effects on the active track.



pro-tip: use shift combined with the color dials for temporary tweaking of a parameter. release shift to revert back to previous setting. this is great when live jamming!

2.12 pitch bend

applying pressure to the pitch bend control will allow you to gradually change pitch of the current selected audio track.

you can also use it on the tape track and master track.

pro-tip: try using pitch bend on the tape track to add a live tape stop effect.

pro-tip: holding a lit step and using the pitch bend lets you modify the velocity for that step.

2.13 microphone

OP-Z features a built-in microphone and can also be used together with a headset.

read about this here.

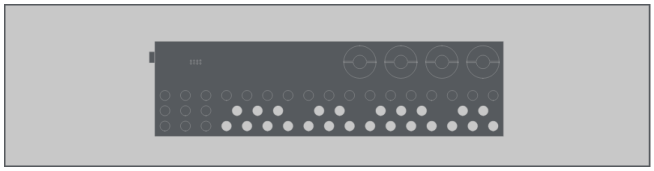
2.14 speaker

the built-in speaker on OP-Z is used to play the startup sound, and to play the main sound, if no headphones or speakers are connected in the line out.

control the volume of the built in speaker using the main volume knob.

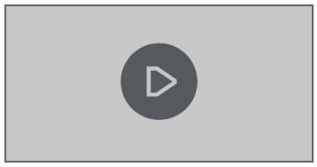
3. general operation

3.1 playing notes



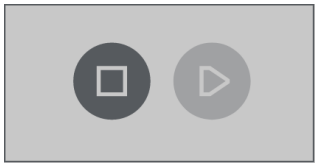
use the two octave keyboard to play notes on the currently selected track.

3.2 playback



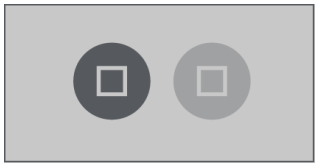
play

press play to start playback from the start of the active pattern. while playing you can press play to restart playback.



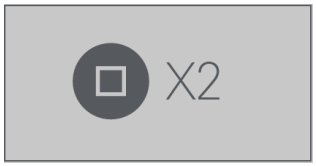
stop

press stop while the sequencer is playing to stop playback.



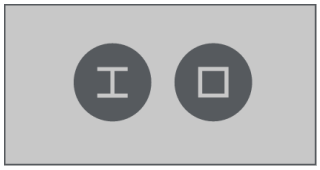
panic

press stop while sequencer is stopped to end all active notes.



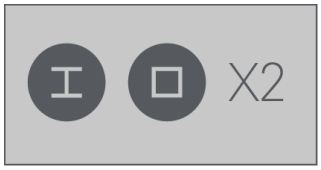
super panic

pressing stop twice while sequencer is stopped will also clear all audio buffers.



track panic

hold track and press stop to fade out hanging notes on the active track.



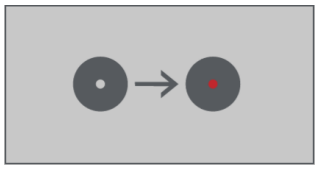
track super panic

hold track and press stop twice to kill sound on the active track.

3.3 editing

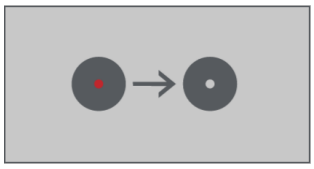
there are many ways to edit your recorded or programmed material. here is an overview of the various edit operations.

3.4 editing operations



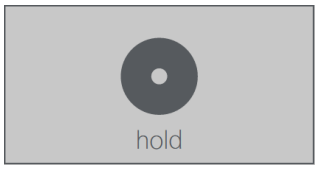
add note

press an empty step to add the last played note to that step.



clear step

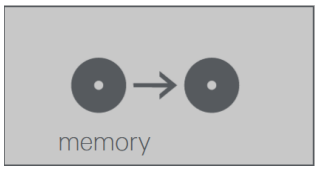
press a lit step (indicated by red light) to clear it.



copy step

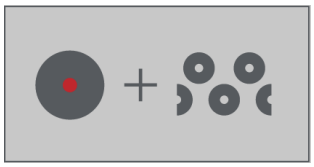
press and hold a lit step to copy it to memory.

copying another note or playing a note using the musical keyboard replaces the copied step in memory.



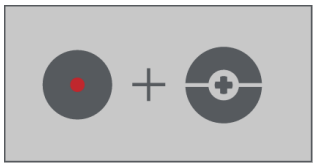
paste step

whenever a step is copied to memory, pressing any empty step will paste it.



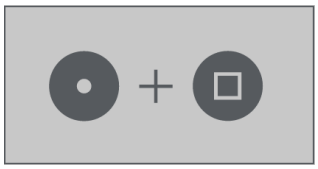
edit step note

hold a lit step and press notes to change the notes for that step.



add parameter lock

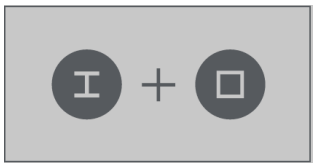
hold a lit step and turn any dial to set or edit the dial parameter for that step.



clear parameter locks

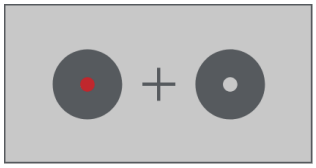
hold rec and stop and wait until all steps are lit. this will clear all parameter locks on the current track. release before to abort.

to clear parameter locks per step hold the step and hold stop until all steps are lit.



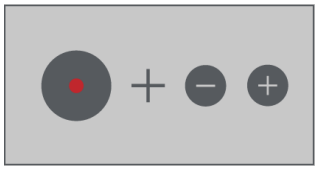
clear track

hold track and stop and wait until all step lights are lit. this will clear all triggers on the current track. release before to abort.



note length

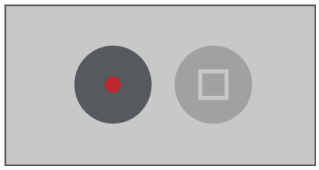
hold a lit step and press another step to set the duration of the held step.



micro timing

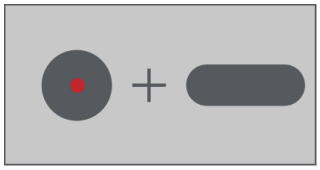
press and hold a step and press – or + to shift timing of that step 1 tick back or forward.

each step has a resolution of 24 ticks.



preview step

holding a lit step while the sequencer is stopped will play a preview of that step, as well as copy it to memory.



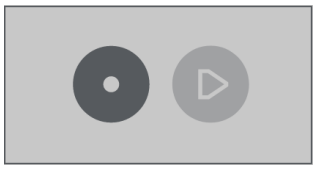
change velocity

hold a lit step and use the pitch bend to modify the velocity for that step.

3.5 recording

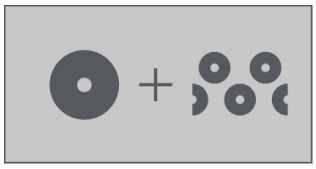
one of the most powerful features of the OP-Z is its many possibilities to record your tweaks and operations, whether it is through live recording or through careful step by step recording.

3.6 how to record



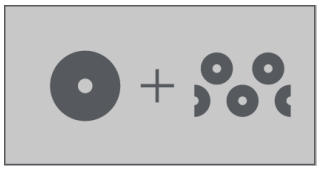
the record button

the record button, or 'rec' is used for example when live recording events into the sequencer.



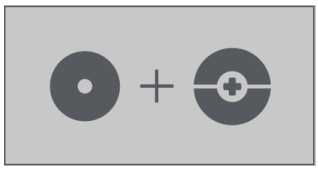
record

hold record while the sequencer is running to record all input from the piano keys.



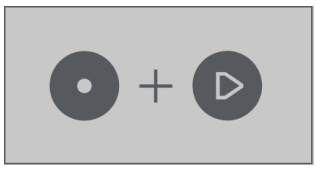
step by step recording

hold record while the sequencer is stopped and use the musical keyboard to record notes step by step.



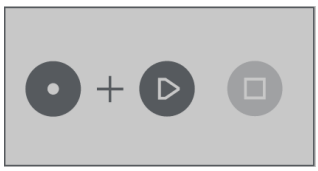
parameter lock

hold record and turn a dial while the sequencer is running to record that parameter to the steps.



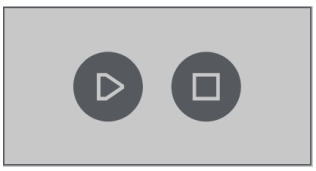
record lock

hold rec + play to lock recording mode. all input is recorded without the need for holding down rec.



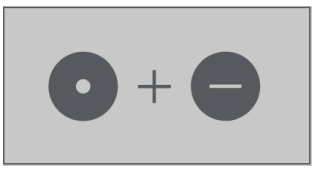
record arm

if the sequencer is stopped when holding rec + play then recording will be armed and any note will start record lock mode.



release record lock

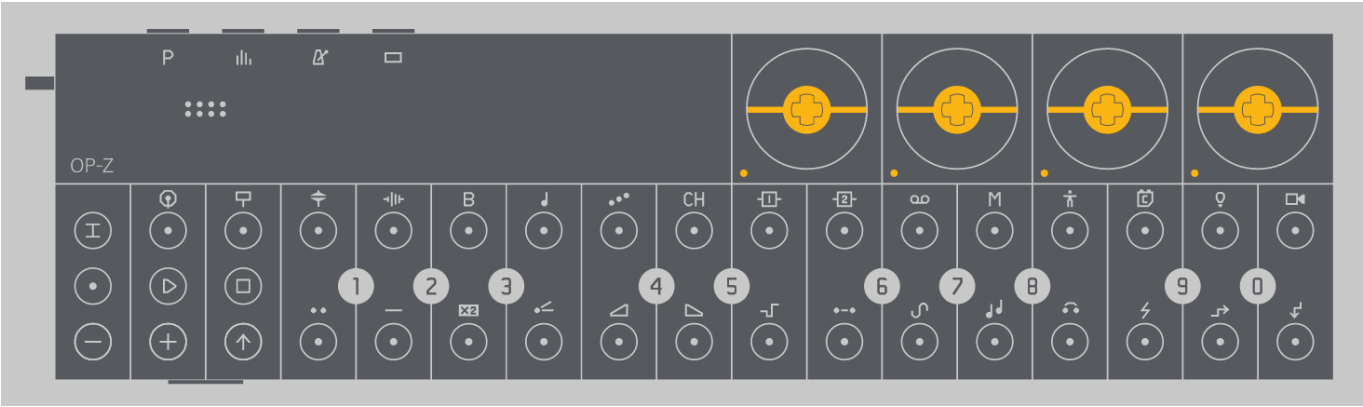
press play or stop to release record lock if engaged.



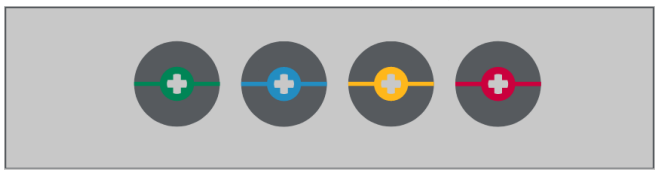
subtractive recording

press – while holding rec for subtractive recording mode. held notes will now be removed from active steps.

4. parameter pages

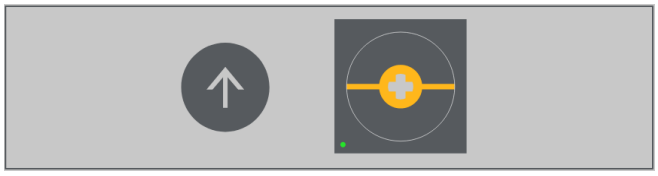


4.1 introduction to parameter pages



turning the color dials is the main way to control the parameters of OP-Z. there are four color coded endless dials and the tracks can have up to four pages of parameters, each having its unique color. by learning to navigate these pages you'll become fluent with the OP-Z in no time.

4.2 toggle pages



press and release shift to toggle parameter page. the parameter led lights indicate by color which page you are on.

4. reference chart

this chart shows what is affected on each parameter when in different pages. The pages are illustrated by color and the features change depending on track.

kick / snare / hihat / perc				
led color	green dial	blue dial	yellow dial	red dial
○	pitch	reverse	filter	resonance
●	attack	decay	sustain	release
●	lfo amount	lfo speed	lfo target	lfo shape
●	fx1 send	fx2 send	pan	level

bass / lead / chord				
led color	green dial	blue dial	yellow dial	red dial
○	param 1	param 2	filter	resonance
●	attack	decay	sustain	release
●	lfo amount	lfo speed	lfo target	lfo shape
●	fx1 send	fx2 send	pan	level

arp				
led color	green dial	blue dial	yellow dial	red dial
○	param 1	param 2	filter	resonance
●	attack	decay	sustain	release
●	arp speed	arp pattern	arp style	arp range
●	fx1 send	fx2 send	pan	level

fx1 fx2				
led color	green dial	blue dial	yellow dial	red dial
○	param 1	param 2	filter	resonance

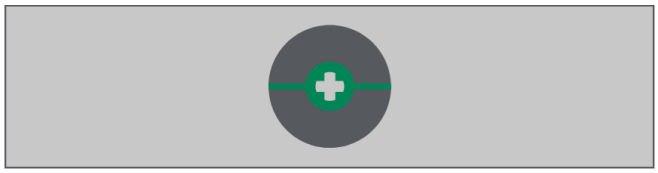
tape				
led color	green dial	blue dial	yellow dial	red dial
○	speed	fine tune	filter	resonance
●	fx1 send	fx2 send	pan	level

master				
led color	green dial	blue dial	yellow dial	red dial
○	chorus	drive	filter	resonance

module motion				
led color	green dial	blue dial	yellow dial	red dial
○	1	2	3	4
●	5	6	7	8
●	9	10	11	12
●	13	14	15	16

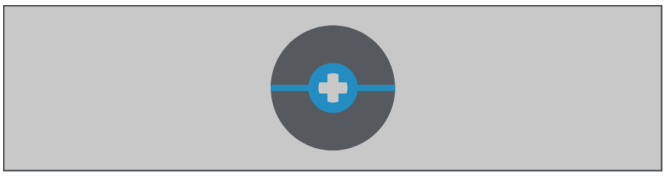
lights				
led color	green dial	blue dial	yellow dial	red dial
○	color	alt color	speed	intensity
●	5	6	7	8

4.4 lfo



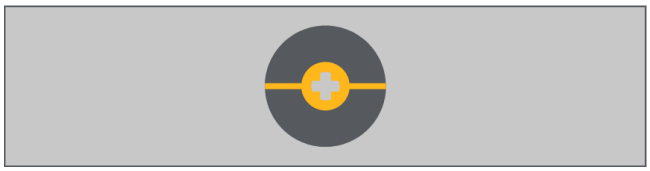
depth

this dial controls how the lfo is applied to the target parameter. In its middle position it does nothing and the LFO is disabled. Turn right to add the LFO to the target parameter, turn left to subtract. Some LFO signals oscillate between positive and negative values, in this case the depth direction determines which way it goes first.



rate

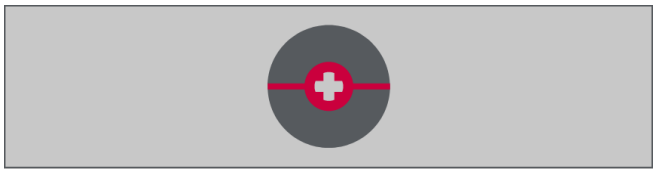
the rate dial is divided into tempo synced rates:1/64, 1/32, 1/16, 1/8, 1/4, 1/2, 1/1, 2/1, to the left from the center position. Turning right controls the free rate which is not tempo synced.



destination

the destination dial cycles between eight targets.
see the chart below.

led color	destination
●	parameter 1
●	parameter 2
●	filter cutoff
●	filter resonance
●	attack
●	pitch
●	pan
●	volume



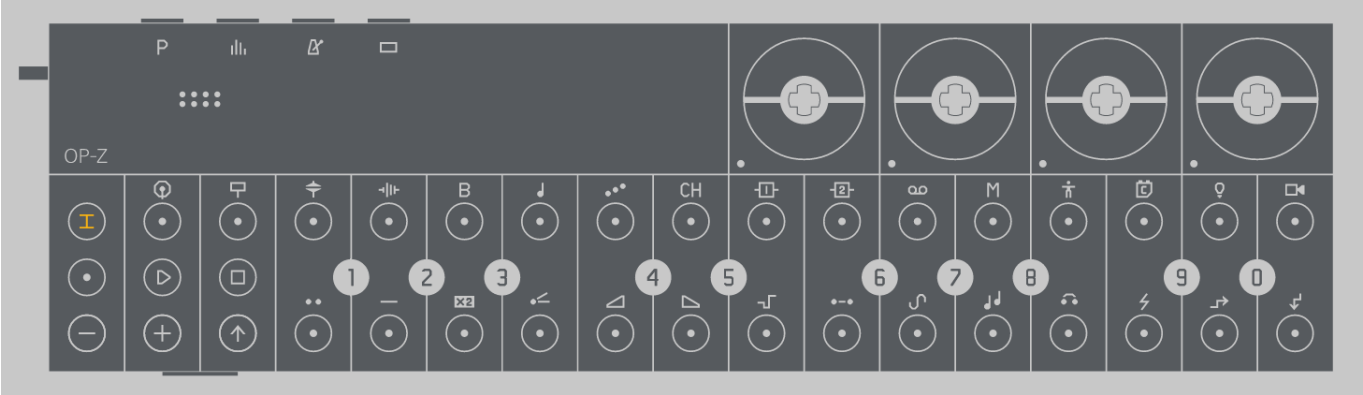
shape

The shape dial controls the shape if the LFO signal. The first six values are free, the last six are triggered, meaning that they restart every time a note is played.

led color	shape
●	sine
●	triangle
●	square
●	saw
●	random
●	gyro

led color	shape
●	bell
●	triangle
●	square
●	saw
●	random
●	saw (single)

5. track

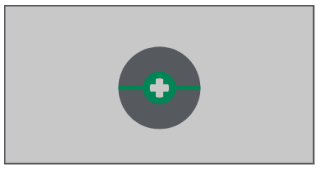


5.1 track introduction

the track select button, or 'track', is an important button with a lot of functionality. its main use is for selecting tracks, for setting track and note length, and for working with presets.

you also use track when for example adjusting quantize and portamento. usually press and hold track to access its features.

5.2 track parameters

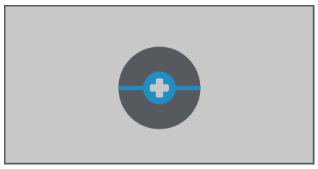


note length

note length controls the duration of notes that are of default note length. all other notes remain unaffected.

hold track and turn the green dial to set note length from 1/64 notes to a whole bar.

turning all the way to the right enables drone mode.



note style

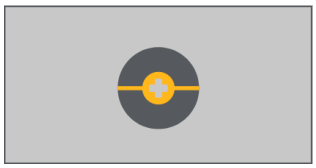
note style is set using track together with the blue dial.

settings for drum tracks:

- retrig
- gate
- loop

settings for synth tracks:

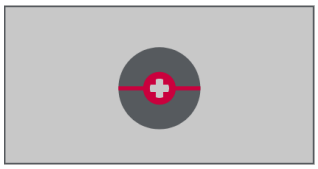
- poly
- mono
- legato



quantize

quantize live recorded notes by holding track and turning the yellow dial.

this lets you control quantization amount per track, from 0 – 100 %.



portamento

portamento adds glide between notes.

hold track and turn the red dial to adjust portamento.

0 is no portamento and 100 is very slow.

5.3 step count

with step count you can decide the number of steps that a track will use.

for example, if you choose step number four, the track will loop across the first four steps.

each of the 16 tracks can have a different step count.

5.4 step length

you can set a step length multiplier to extend the duration of each step. this will essentially change the playback speed of the track.

hold track and shift and press the value key that corresponds to the desired length of the track.

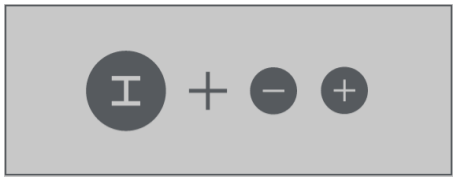
for example: having a step count of 16 and a step length of 4 will extend the current track to play across four bars.

note: setting the multiplier to 9 makes the track 16 times longer.

note: increasing the step length also lowers the timing resolution for each note.

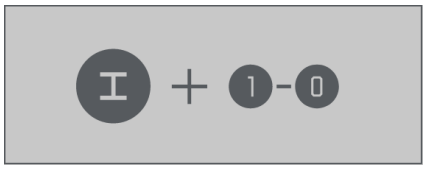
pro-tip: setting the multiplier to 0 makes the track trig driven, advancing one step whenever a trig is received into the oplab module, or whenever any jump step component is triggered with a value of 0.

5.5 offset notes



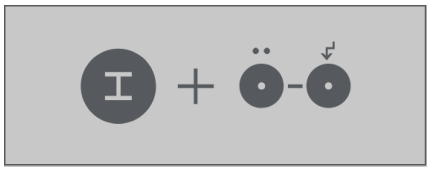
to offset notes press and hold track together with – or + to move all notes on the active track one step left or right.

5.6 select plug / preset



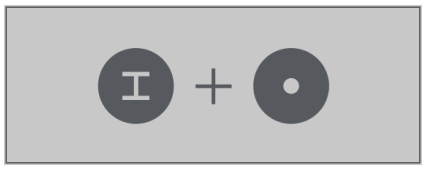
if a slot is lit it contains a plug, such as a sample kit, synth engine or effect.

to select a plug hold track and press the black value keys.



to select a preset for the active plug, hold track and press any of the lit white piano keys.

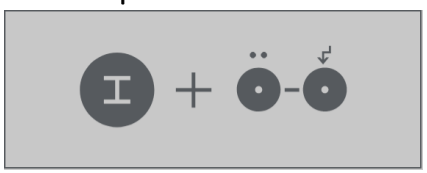
5.7 randomize preset



to randomize a new preset hold track and press rec.

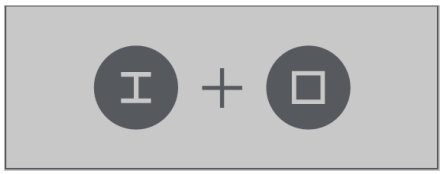
this is a great way to come up with new sounds.

5.8 store preset



press and hold track together with any of the white piano keys for two seconds, to store the current parameters as a preset on the held key position. a maximum of 14 presets can be stored per plug.

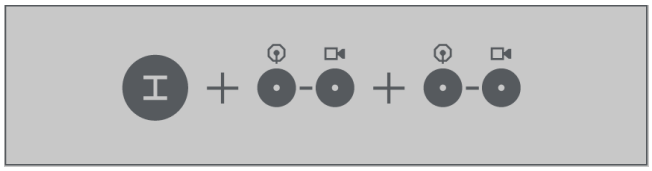
5.9 kill track notes



while the sequencer is playing you can hold track and press stop to kill all active notes on the current track.

playback will continue but notes with long release or drone notes will be silenced.

5.10 link / unlink tracks



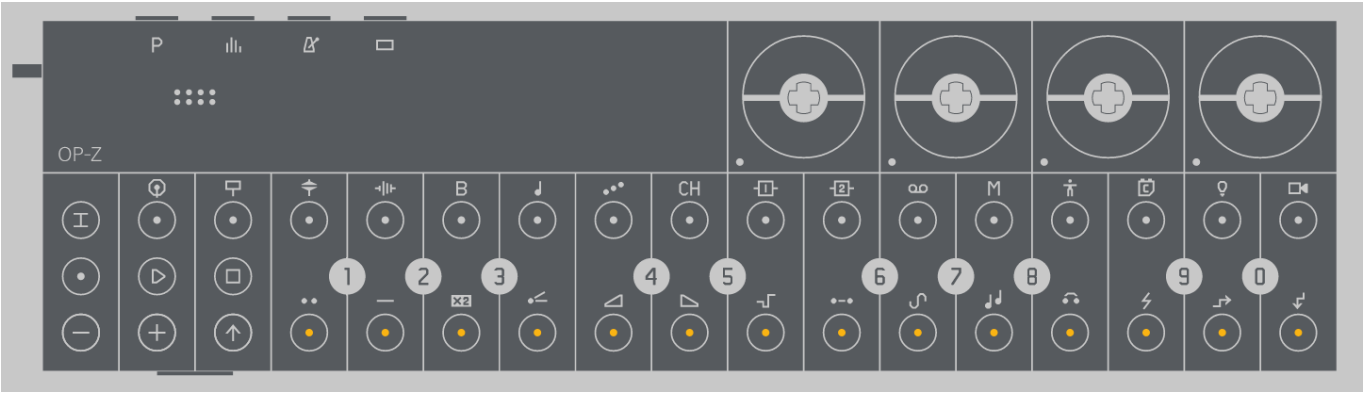
press and hold track together with the current active track, then press additional track buttons to link these tracks together with the first. the originally selected track will be solid white, and the linked tracks will be blinking.

playing and triggering the original track will now also trigger linked tracks.

to unlink the tracks select the original track again.

pro-tip: try linking audio tracks together with the motion track for tightly integrated audio / graphics.

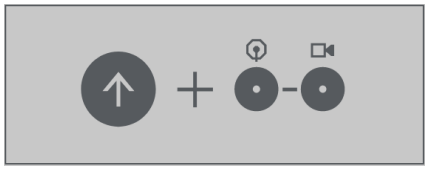
6. step components



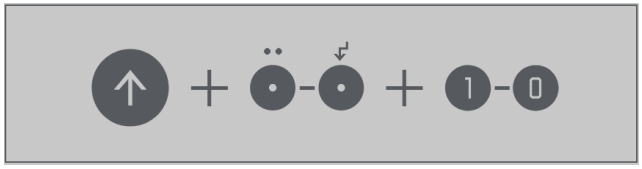
6.1 step components introduction

using step components in your programming opens up new possibilities for creative sequencing. step components can be applied to any of the audio tracks, tracks 1 – 8. each step can have multiple step components, adding unique playback behavior per step.

6.2 using step components



press and hold shift and select the steps you wish to apply step components to. the leds of these steps will change to green indicating marked steps.



keep holding shift and select the component you wish to add by pressing the corresponding white piano key. then select the desired component setting with the value keys 1–0.

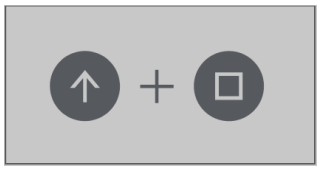
release shift and your step component is added.

alternatively, if you continue holding shift you can add a further component. you can also adjust the setting of a component by momentarily holding its corresponding white piano key.

quickly pressing an applied component will remove it.

pro-tip: try combining the last three step components (spark components) with the note-based step components. it's possible to get some very interesting results.

6.3 clear step components



press and hold shift and stop to clear all the step components on current track.

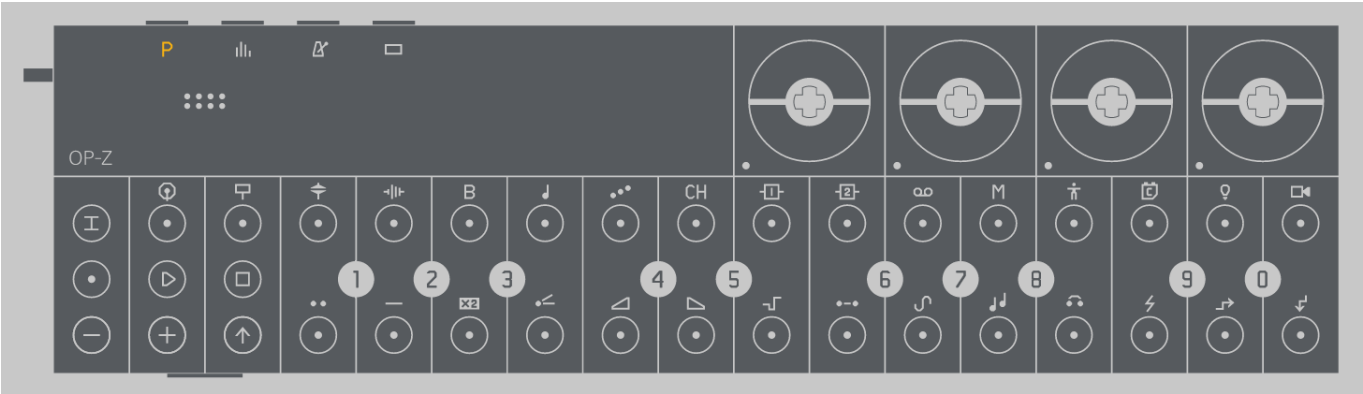
6.4 step component reference chart

	component	1	2	3	4	5	6	7	8	9	0
••	pulse	count: 1	count: 2	count: 3	count: 4	count: 5	count: 6	count: 7	count: 8	count: 9	random
—	pulse hold	count: 1	count: 2	count: 3	count: 4	count: 5	count: 6	count: 7	count: 8	count: 9	random
x2	multiply	X1	X2	X3	X4	X5	X6	X7	X8	broken chord	quantize
	velocity	-4	-3	-2	-1	default	+1	+2	+3	mute	random
	ramp up	2 steps 1 octave	3 steps 1 octave	4 steps 1 octave	5 steps 1 octave	6 steps 1 octave	2 steps 3 octaves	3 steps 3 octaves	4 steps 3 octaves	5 steps 3 octaves	6 steps 3 octaves
	ramp down	2 steps 1 octave	3 steps 1 octave	4 steps 1 octave	5 steps 1 octave	6 steps 1 octave	2 steps 3 octaves	3 steps 3 octaves	4 steps 3 octaves	5 steps 3 octaves	6 steps 3 octaves
	random	2 steps 1 octave	3 steps 1 octave	4 steps 1 octave	5 steps 1 octave	6 steps 1 octave	2 steps 3 octaves	3 steps 3 octaves	4 steps 3 octaves	5 steps 3 octaves	6 steps 3 octaves
•–•	portamento	glide 1	glide 2	glide 3	glide 4	glide 5	glide 6	glide 7	glide 8	direct	random
	sweep	filter up	filter down	synth up	synth down	pan	filter up long	filter down long	synth up long	synth down long	pan
	tonality	ignore chord progression	transpose only	offset octave	offset fifth	offset third	chromatic up	chromatic down	quantize 1	quantize 2	quantize 3
	jump	jump to start	jump to 2/4	jump to 3/4	jump to 4/4	jump forward	jump back	jump to random	stay	align to global track	gate step
	parameter spark	1	1 2	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3 4 5 6	1 2 3 4 5 6 7	1 2 3 4 5 6 7 8	random	reset counter
	component spark	1	1 2	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3 4 5 6	1 2 3 4 5 6 7	1 2 3 4 5 6 7 8	random	reset counter
	trigger spark	1	1 2	1 2 3	1 2 3 4	1 2 3 4 5	1 2 3 4 5 6	1 2 3 4 5 6 7	1 2 3 4 5 6 7 8	random	reset counter

6.5 step components + app

while using OP-Z paired with the app, and using the main OP-Z interface, you will get a visual guide briefly explaining the step components.

7. project



7.1 project introduction

project is the first of the four index buttons, on the top side of OP-Z. this is where you select the project and pattern that you wish to work on. each of the 10 projects holds 16 pattern. switch patterns instantly or create patterns chains to make longer compositions. you can also perform operations such as copying patterns and settings and more.

7.2 select project

press and hold project and press the value keys 1-0 to select a project.

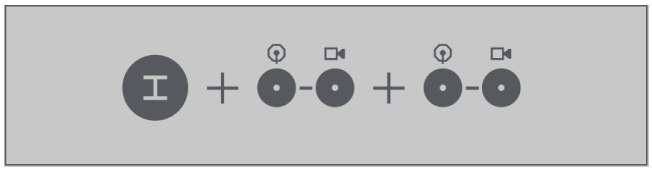
pro-tip: while playing, press play before selecting a new project to delay the switch until the end of the current bar

7.3 select pattern

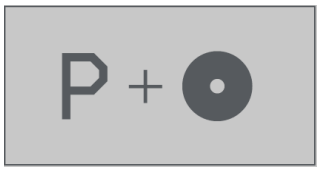
press and hold project and press the pattern keys 1-16 to select a pattern.

if the sequencer is playing, the patterns switches instantly, maintaining the current step position for all tracks.

7.4 chain patterns



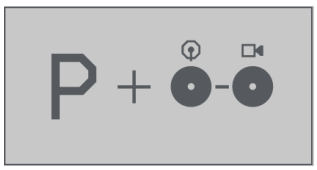
press and hold project and press play to enter chain mode. keep holding project and select up to 32 patterns to create a pattern chain or song sequence.



active pattern chains can be saved by holding project together with a white piano key.

7.5 copy pattern

press and hold project and press shift once to copy the currently active pattern.

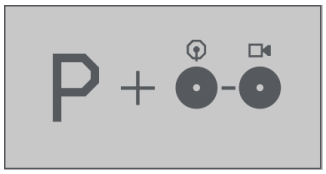


keep holding project and press the destination pattern 1–16 to paste it.

pro-tip: keep holding project and select multiple patterns to quickly copy the pattern to multiple slots.

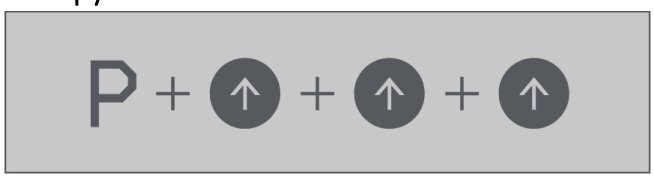
7.6 copy settings

press and hold project and press shift twice to copy the currently active pattern settings.

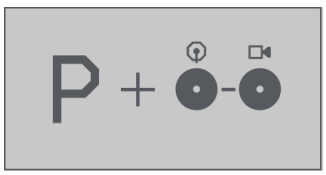


keep holding project and press the destination pattern 1–16 to paste the settings.

7.7 copy track



press and hold project and press shift twice to copy the currently active pattern settings.

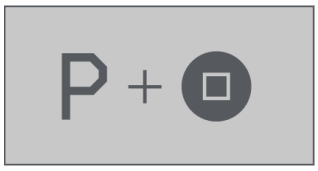


keep holding project and press the destination pattern 1–16 to paste the settings.

7.8 copy project

press and hold project and any value key 1-0 to save the active project to the slot corresponding to the pressed key.

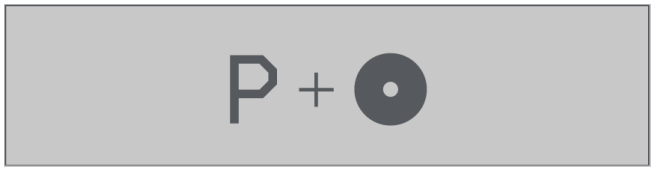
7.9 clear pattern



press and hold project and stop and wait for the bar to fill up. when full the pattern is cleared. release before full to cancel the operation.

press and hold project and stop and shift to clear the entire project.

7.10. bounce pattern



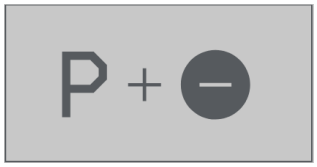
press and hold project and rec to render a 10 second audio file of the current pattern. the audio file will be saved to disk along with a copy of the project.

you can store up to 5 bounces. trying to store more than 5 bounces will result in a red led flash. use content mode to access your bounces.

pro-tip: if you have an active pattern chain this will be bounced to disk. (still limited to 10 sec)

7.11 snapshot

hold project and + to store a snapshot of the current project. any previous snapshot will be overwritten.

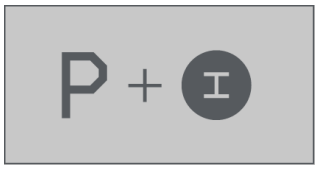


hold Project and – to recall the stored project snapshot. any changes made since storing the snapshot will be overwritten.

7.12 saving

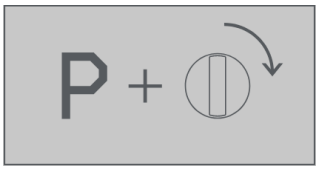
auto save

by default, any changes to a project is automatically saved and there is no need to save manually.



manual save mode

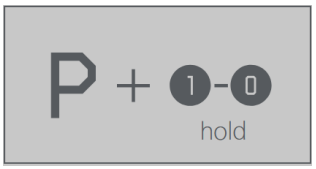
you can toggle manual save mode and disable auto save by holding project and track for a few seconds.



manual save mode (alt.)

you can also hold project while turning on the power on OP-Z to start in manual save mode.

this can handy when lending your OP-Z to your friends and not risk losing any of your patterns.



manual save

to manually save a project press and hold project and hold the desired project slot using the value keys 1-0.

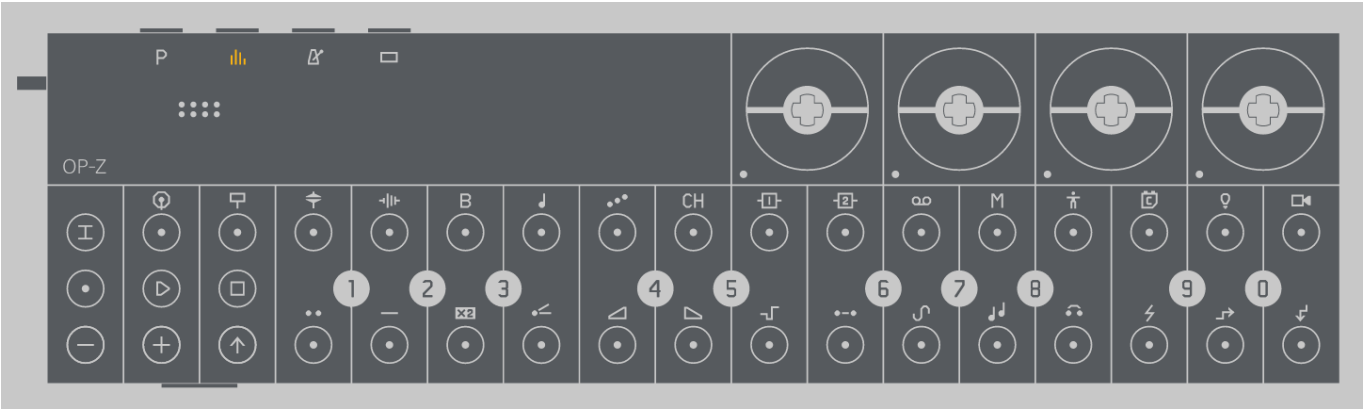
7.13 project + app

when paired with the OP-Z app, holding project will display the project page.

the project page gives an overview of the current project, pattern and pattern chain.

there are also some handy shortcut hints for button combinations, as well as visual progress feedback when performing operations.

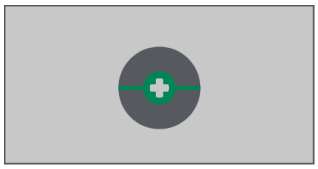
8. mixer



8.1 mixer introduction

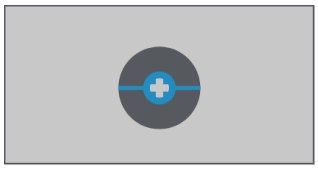
the mixer button is the second index button on the top side of the device, and is represented by the mixer symbol ıllı. using mixer you can mute and unmute tracks, select different mute groups, control the gain for the drum group and synth group respectively, as well as control the master compressor and overall project gain. press and hold this button to access the project-wide mixer functions.

8.2 mixer parameters



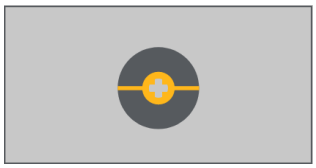
drum group

adjust gain for tracks 1–4 as a single group.



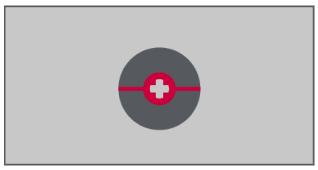
synth group

adjust gain for tracks 5–8 as a single group.



punch

adjust the master compressor.

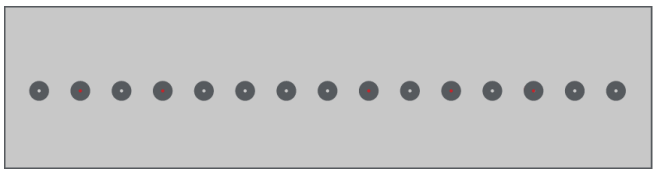


master

adjust the master gain level.

8.3 mute track

while holding mixer, the track keys 1–16 act as toggles for muting and unmuting the corresponding tracks.



tracks that are lit are active, playing audio and sending midi information by default. tracks that are unlit are muted.

8.4 mute groups

mute groups allow you to store different mute configurations. each project holds 10 mute groups. use the value keys 1–0 to select which mute group to be active. the active mute group is stored per pattern.

8.5 mute audio

by default, muting a track will stop any notes from being triggered. however, it is possible to mute only the audio signal sent to the master bus. the track will still output midi and audio signal to the effect and tape tracks.

to do this, while holding the mixer button, press the shift key. the shift key will light red. now when muting tracks they will turn red when muted. this will mute only the track audio but not the outgoing midi.

pro-tip: you can mix and match the two mute types, and store these settings across multiple mute groups.

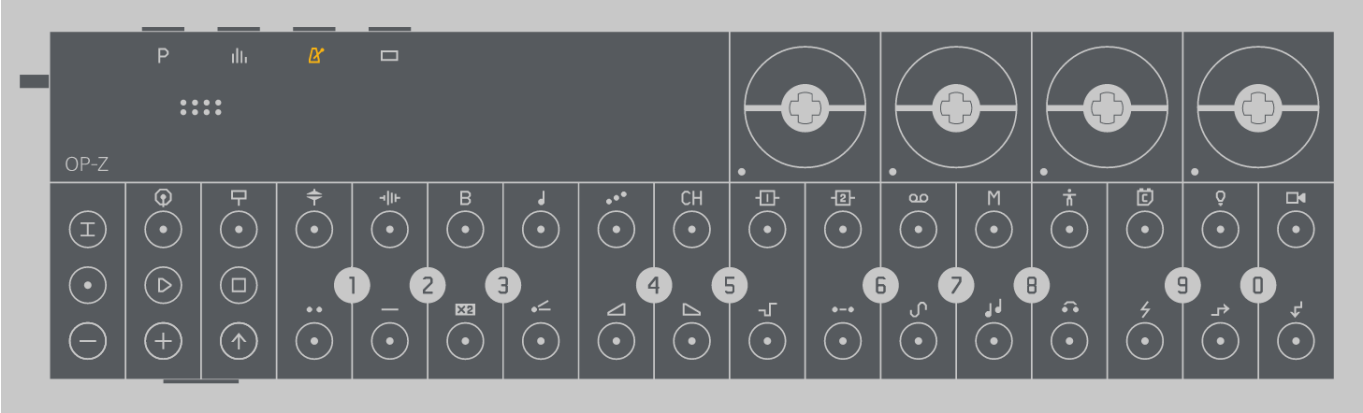
8.6 mixer + app

when paired with the OP-Z app, holding mixer will display the mixer page.

the mixer page gives an overview of your track levels. on this page it is possible to adjust the faders with your fingers much like a traditional mixing desk.

the buttons below the faders allow you to mute / unmute tracks. when muted the fader will be greyed out.

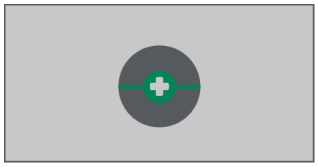
9. tempo



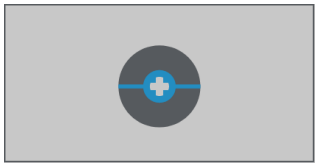
9.1 tempo introduction

the third index button on the top side of OP-Z is the tempo button. this is represented by a metronome symbol and is used for adjusting project-wide tempo in bpm, swing setting and the metronome sound and level. by pressing and holding tempo you access the different tempo functions.

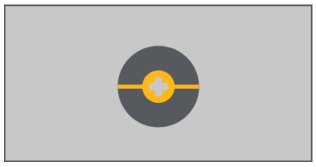
9.2 tempo parameters



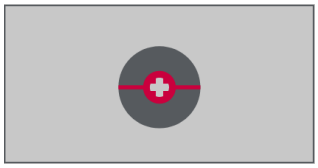
bpm



swing



metronome sound



metronome level

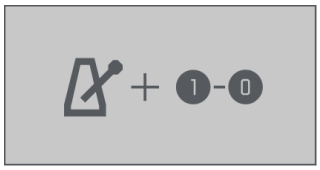
9.3 set tempo

tempo in OP-Z is set in beats per minutes (bpm). values between 40 – 200 bpm can be used.

use one of the following ways to set bpm on OP-Z.

turn dial

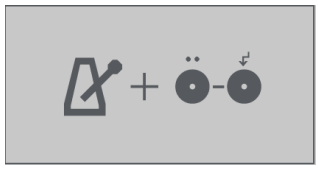
press and hold tempo and turn the green dial. current bpm is indicated by 0 - 9 leds.



enter value

press and hold tempo and enter the desired bpm with the value keys.

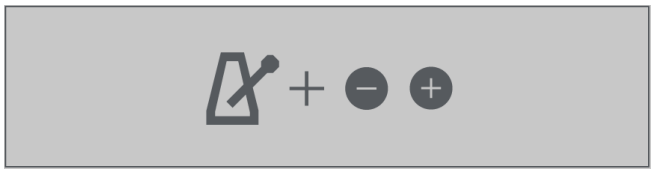
example: holding tempo and pressing 1 + 2 + 0 will set bpm to 120.



tap tempo

press and hold tempo and repeatedly tap any of the white piano keys.

9.4 tempo nudge

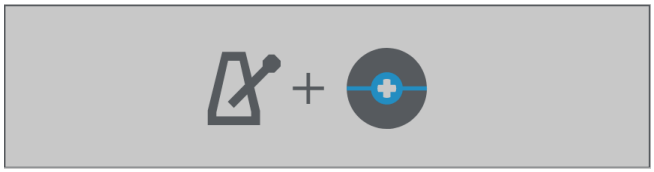


while the sequencer is running, press and hold tempo and momentarily press – / + to nudge tempo down or up. this can be handy when jamming together with others in a non synced setting.

9.5 lock tempo

to lock the current tempo, hold the tempo button and press shift. tempo won't change until unlocked by pressing shift again.

9.6 adjust swing

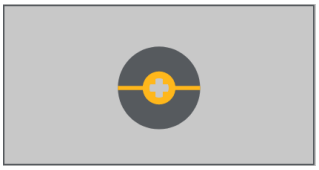


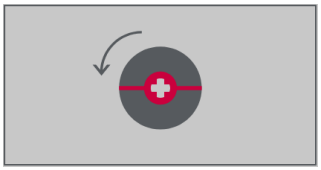
swing is a way to slightly alter the timing of notes played in a sequence. to add swing hold tempo and turn the blue dial. no swing is a 50% setting.

turn the dial as you wish and listen for that perfect groove.

note: swing is only applied to step-programmed and quantized live recorded notes.

9.7 using the metronome





to use the metronome when playing or recording make sure the sequencer is running and hold tempo.

turn up the metronome level by using the red dial.

select a sound for the metronome, ranging from click, swedish, english, german, japanese to italian, using the yellow dial.

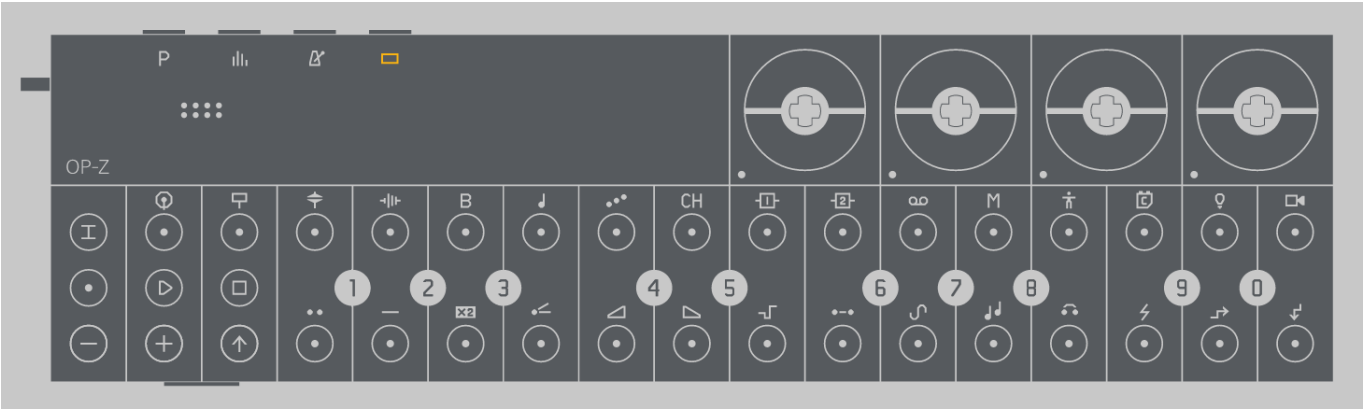
turn the red dial counterclockwise all the way to turn the metronome off again.

9.8 external sync

sending midi clock to OP-Z will automatically activate the external sync mode. this is indicated by the track leds 1-16 blinking green, in groups of four.

by default, incoming midi clock is disabled, this can be configured in the midi settings.

10. screen



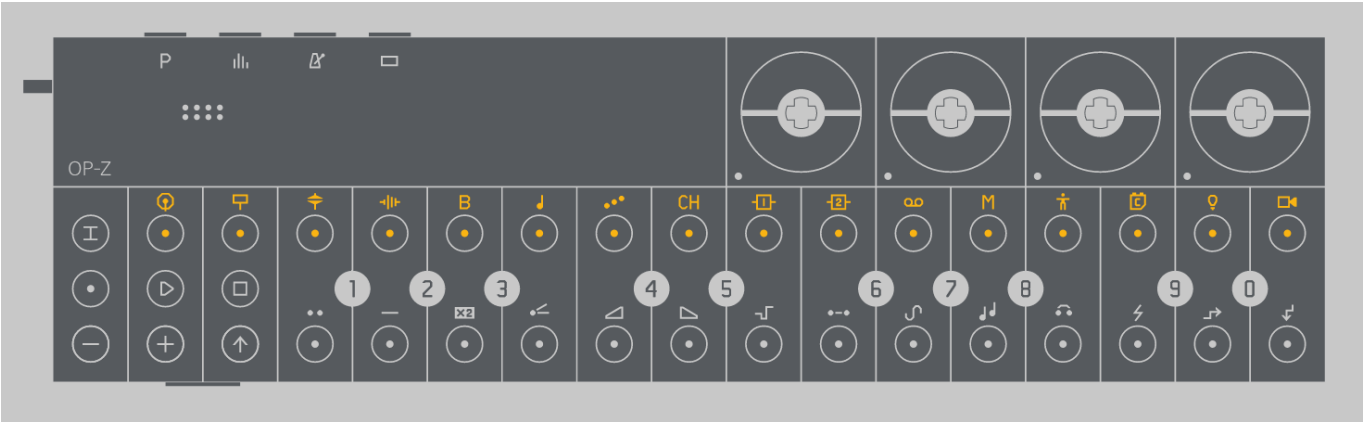
10.1 screen introduction

the fourth index button on the top side of OP-Z is called screen. the screen button is used to display the current battery charge, or used in conjunction with the app to navigate around or to display the current battery status.

when using the OP-Z standalone, you can press and hold screen to show the current battery level of the OP-Z internal battery.

when using the OP-Z connected to the app, holding screen and at the same time turning the dials will allow you to navigate through app pages.
screen is also used to activate the camera on photomatic.

11. tracks



11.1 introduction to tracks

OP-Z is a 16-track sequencer. it features eight audio tracks and eight control tracks. the audio tracks are divided into two groups, the drum group (track 1 – 4) and the synth group (track 5 – 8).

the eight control tracks can be sequenced just like any other track, and allow deep control over all parameters.in parallel, all 16 tracks can also send and receive midi, each on its own channel.

11.2 tracks overview

drum group	synth group	control tracks	
kick	bass	fx1	perform
snare	lead	fx2	module
perc	arp	tape	lights
sample	chord	master	motion

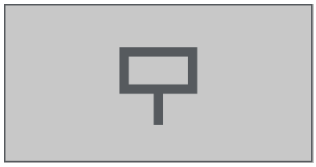
11.3 audio tracks 1-4 (drum group)

there are four drum tracks in the drum group. these are kick, snare, perc and sample. each track in this group has a two note polyphony per step.

they are all sample based and consist of 24 different sounds across the musical keyboard. this is called a kit and is compatible with the OP-1 drum kit file format.

four kits together is called a sample pack. load different packs using the app or by connecting to a computer and using content mode.


kick


snare


perc


sample

11.4 audio tracks 5-8 (synth group)

there are four audio tracks in the synth group. these are BASS, lead, arp and chord.

all tracks in the synth group can utilize any of the available synth engines, or load OP-1 format sample sounds.

each synth track behaves slightly differently.

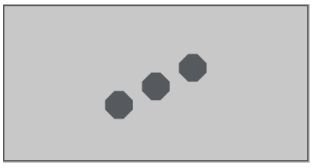
for bass, lead and chord the parameter pages are the same: synth, envelope, lfo and send.

arp has dedicated arp control, instead of the lfo.

for detailed information please refer to the bass, lead, arp and chord tracks respectively.

bass

lead



arp

chord

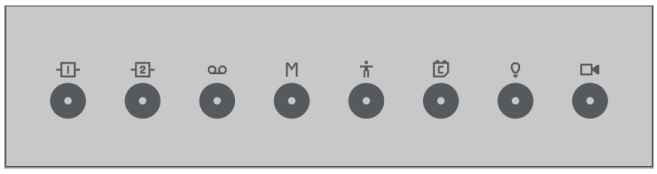
bass is an audio track dedicated to powerful bass lines. it is monophonic which means one note per step. this track is the main source for the master track transpose analysis.

lead is a track dedicated to synth leads. any note style can be used. the polyphony for this track is three, meaning maximum three notes per step.

the arp is an arpeggiator with dedicated arp control, replacing the lfo page. it is monophonic and any notes placed on the same step will be arpeggiated.

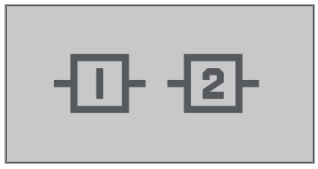
the chord track is great for adding harmony to your music, with its four note polyphony per step, for beautiful chords.

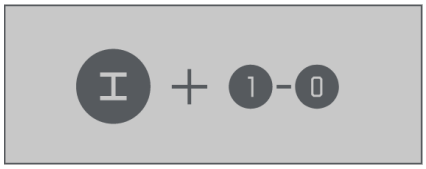
11.5 control tracks 9-16



there are a total of eight control tracks on the OP-Z. these are fx1, fx2, tape, master, perform, module, lights and motion.

11.6 fx



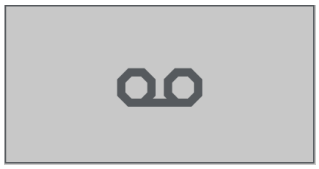


the two fx tracks are where you select your send effects. you can assign a different effect to any one of the two fx tracks.
check the reference page to see all available fx engines and parameters.

to select an effect: while on fx1/fx2 hold track and press one of the black keys. turn the dials to control fx parameters p1, p2, filter and filter resonance.

pro-tip: holding shift while on an fx track enables you to play the previously selected drum / synth track so that you can hear what that track sounds like with different fx settings.

11.7 tape



the tape track is an audio buffer that is constantly recording when in playback. it can be used for tape tricks and beat repeat style looping effects.

read more about it here.

11.8 master

the master track allows you to transpose selected tracks and add harmonic chord progressions.

like other control tracks the master track can be sequenced allowing you to record interesting key changes and harmonic chord progressions.

read more about it here.

11.9 performance

the performance track allows you to apply punch-in effects on all tracks at once.

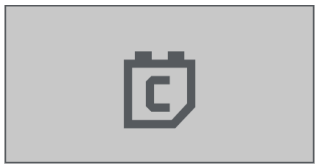
hold track and press perform to select the performance track.

hold the piano keys to add punch-in effects.

you can record, copy and delete punch-in effects in the same way you would work with notes on a drum/synth track..

read more about punch-in effects here.

11.10 module



the module track is used to control any OP-Z expansion modules. more information will be available as more modules are released.

modules are sold separately.

when no module is inserted the module track can act as a midi track with 16 independent midi CC values.

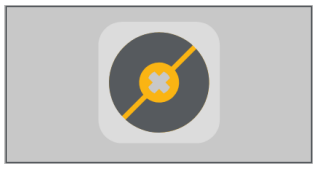
11.11 lights

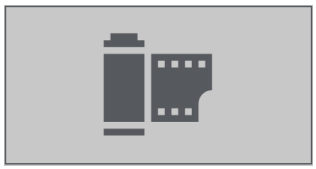
the OP-Z is capable of handling dmx which is the universal protocol for controlling lighting rigs.

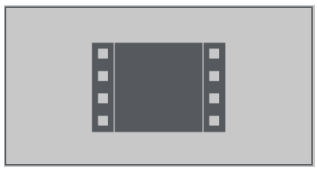
it is possible to sequence up to 16 fixtures or lights. you can use the OP-Z sequencer to control these fixtures.

learn all about it here.

11.12 motion







in addition to audio, midi and lights sequencing, OP-Z is also a powerful visual sequencer.

when using the OP-Z app you can sequence photos via photomatic, or visual graphics via motion, just as easy as sequencing on any other track.

photomatic is basically a camera app, connected to your OP-Z.

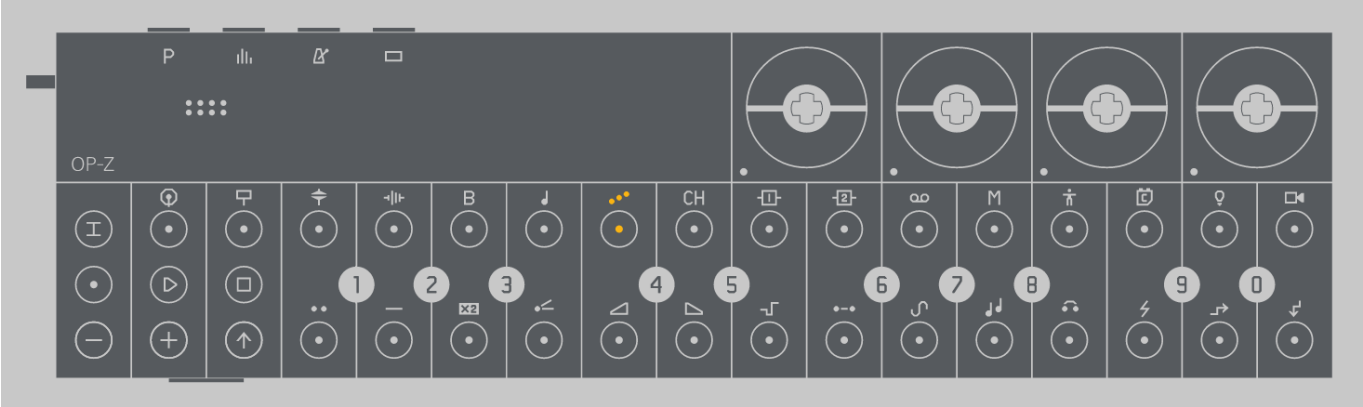
learn all about it here.

motion allows you to program and control live 2d or 3d graphics made in the unity real-time graphics engine.

here's how.

use your ios device or computer and sequence locally, or go big and program your entire live show using OP-Z.

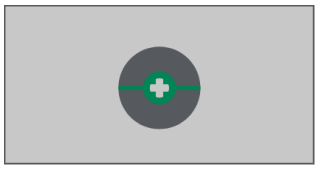
12. arp



12.1 arp introduction

the arp or arpeggio track functions slightly differently to other tracks. holding notes and chords will play an arpeggio pattern. the arp track has no lfo but instead has its own unique parameters.

12.2 arp parameters

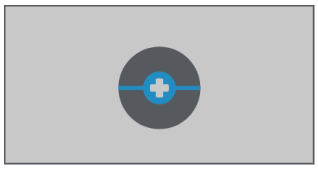


speed

turn the green dial to set the arpeggio speed, in eight different settings.

(available since os 1.2.12) turn the dial all the way to the left to completely disable arpeggio.

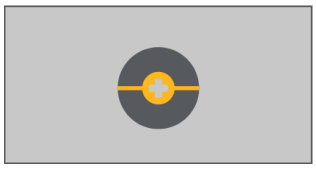
this allows the arpeggio track to act as a normal track.



pattern

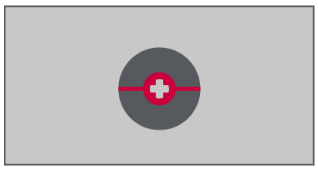
the blue dial sets the arpeggio pattern type:

- manual
- up
- down
- up/down
- down/up
- random



style

use the yellow dial to set arpeggio style. this allows you to choose different rhythmic patterns for the arpeggio. there are six different rhythms.

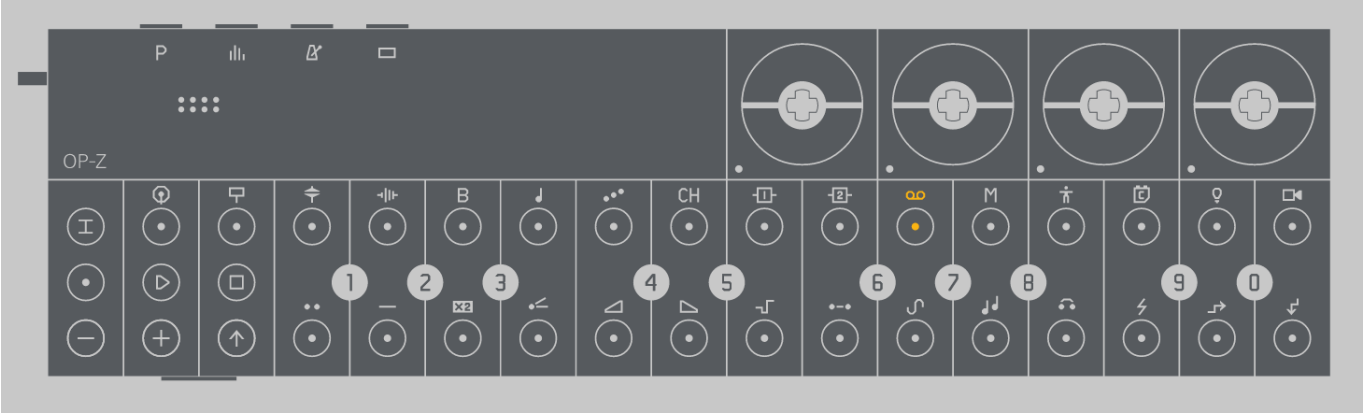


range

set the range of the arpeggio with the red dial. high values will add higher octaves to the pattern.

pro-tip: put the arpeggio track into mono mode then increase the portamento for a sliding arp.

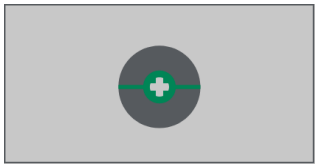
13. tape



13.1 tape introduction

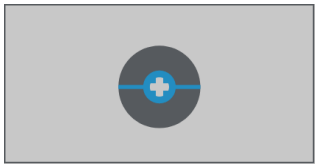
the tape track is an audio buffer that is constantly recording when in playback. it can be used for tape tricks and beat repeat style looping effects.

13.2 tape parameters



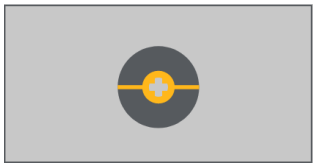
speed coarse

set the speed of the buffer playback. left plays back at regular speed. scrolling right increases the speed and then once again decreases to a full stop.



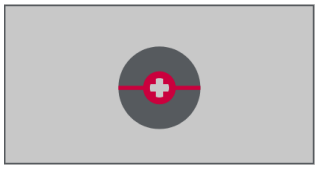
speed fine

the center position (led green) will play the buffer at normal speed. rotating left will play at half speed and rotating right will play at double speed.



filter

control the filter of the tape effect.

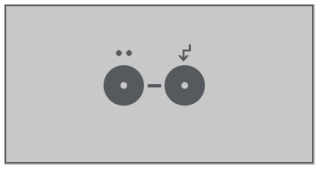


resonance

control the resonance on the tape filter.

pro-tip: sending midi cc simultaneously to parameters 1 and 2 can result in some cool scratching effects.

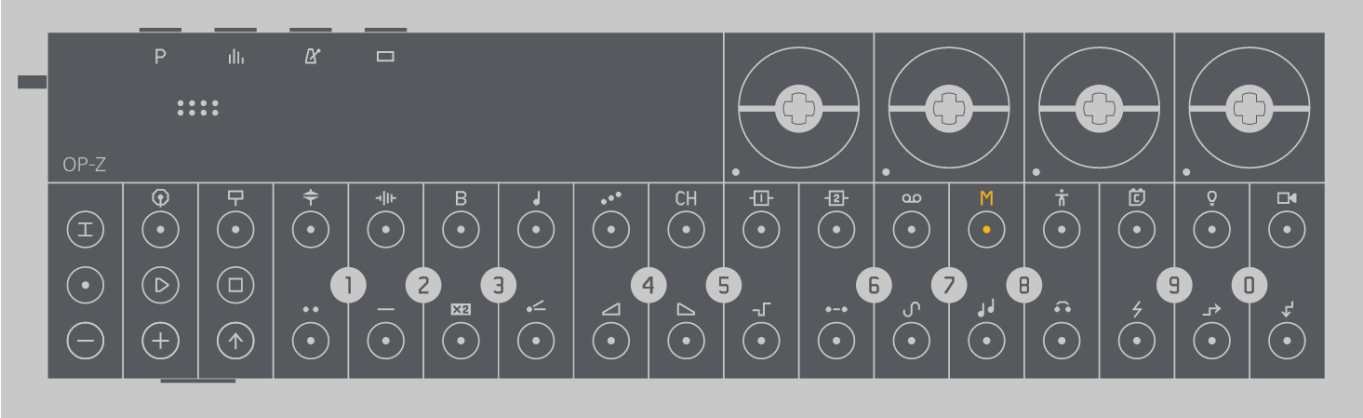
13.3 tape controls



the white keys are used to choose from which part of the buffer playback begins.

the black keys choose the length of the tape loop with 1 being the shortest and 0 being the longest.

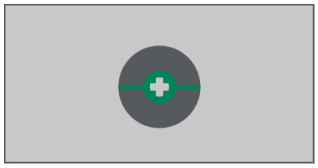
14. master



14.1 master introduction

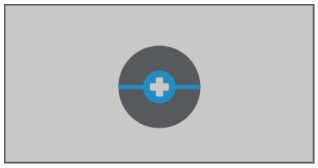
the master track allows you to transpose selected tracks and create harmonic chord progressions. the OP-Z automatically analyses the notes used in the bass, lead, arp and chord tracks to determine the key of the pattern. using the piano keys it is then possible to change key / mode. use the dials to control the master effects and filter.

14.2 master parameters



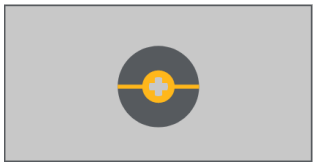
chorus

turn the green dial to adjust the master chorus effect. this will also add a subtle stereo effect.



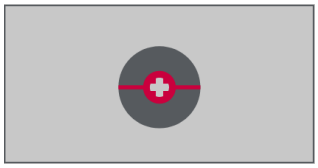
drive

the blue dial controls the master drive, adding a subtle overdrive to your mix.



filter

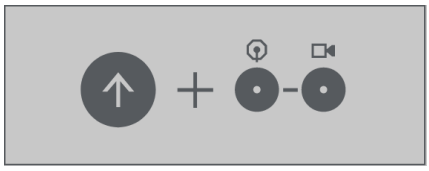
the yellow and red dials control the master filter.

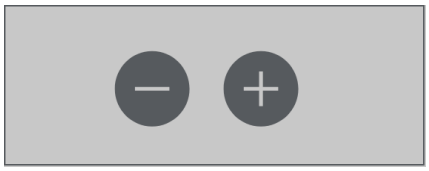


resonance

it's a combination high-pass / low-pass filter, with an unaffected neutral setting in the middle.

14.3 transpose tracks





OP-Z automatically analyses the notes used in the bass, lead, arp and chord tracks and detects the mode and key of the active pattern.

the bass track is the main source for this analysis.

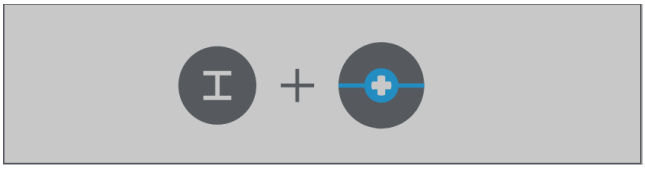
using the piano keys it is then possible to transpose the pattern and change its key and mode.

to choose which tracks to be included press and hold shift and press the different track buttons. to include a track make sure its track led is lit.

pro-tip: transposing drums can be a great way to do drum fills.

use the transpose buttons to change octave used (represented by the value keys).

14.4 chord progressions



by programming different chords onto the master track you can create chord progressions. program the master track just like any of the audio tracks.

pro-tip: extend the master track duration by lowering the playback speed to allow for longer sequences.

hold track + shift and choose playback speed using the value keys.

a setting of 4 gives you a four bar loop.

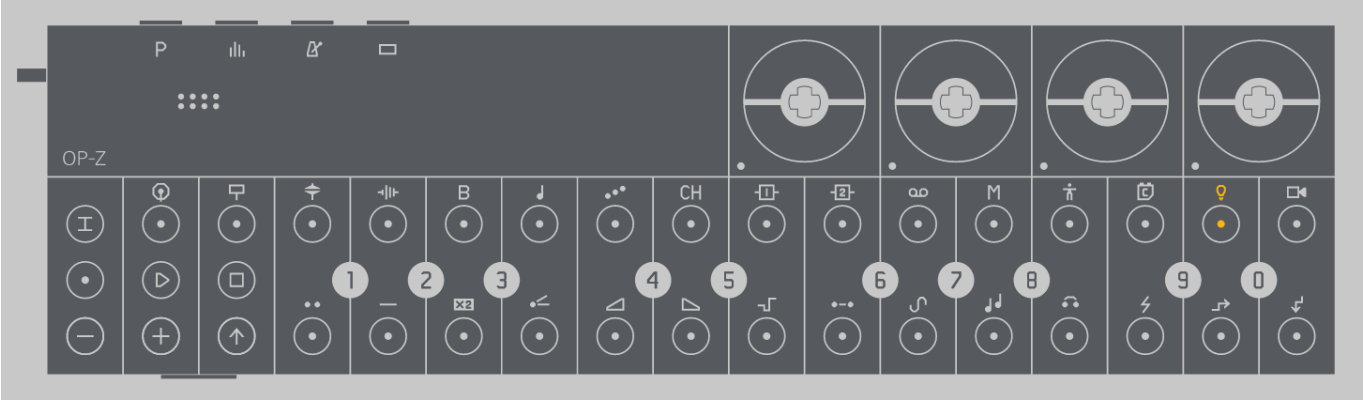
(available since os 1.2.12)

there are two note styles on the master track – latch and free. note style is set by holding track and turning the blue dial

latch quantizes to even steps without micro timing and programmed notes stay active until the end of the bar. free has micro timing and no latching.

led color	note style
●	latch
●	free

15. lights



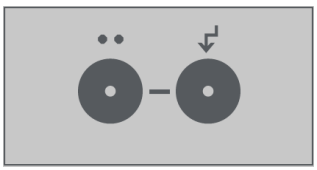
15.1 lights introduction

the OP-Z has a separate track dedicated entirely to controlling your light rig. you can program this track just like any other track on the OP-Z.

15.2 lights operation

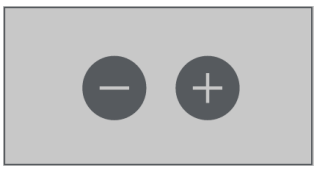
set pattern

use the value keys to select one of the 10 patterns.



effects

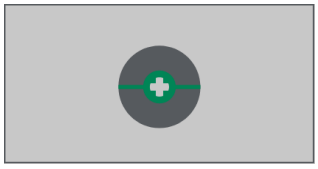
play the white keys to trigger effects and animations.



preview mode

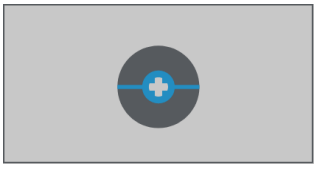
toggle between fixture preview and step view

15.3 lights parameters



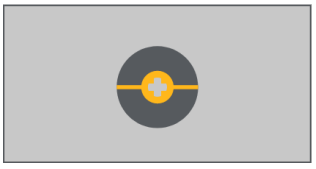
main color

the main color applied to all connected rgb fixtures



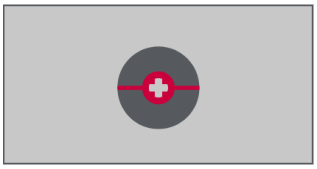
alternate color

used by certain effects to instantly switch color



pattern speed

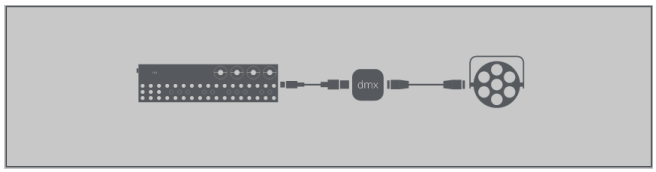
the scroll speed of the currently selected pattern

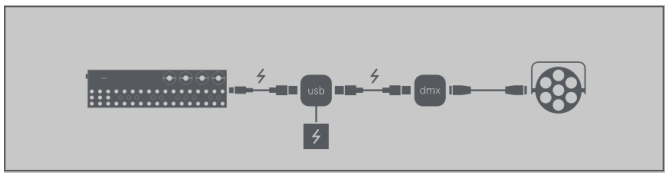


intensity

the default intensity of the currently lit fixtures

15.4 setup



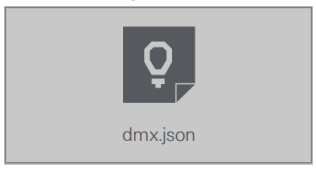


to control dmx you need a usb dmx interface connected to the OP-Z. It can be connected directly to the usb port.

connecting the dmx interface directly to you OP-Z is convenient but might deplete you battery faster than you want. in that case, use a powered hub.

refer to the usb chapter to learn which hubs and dmx interfaces that are compatible with OP-Z (sold separately).

15.5 configure dmx



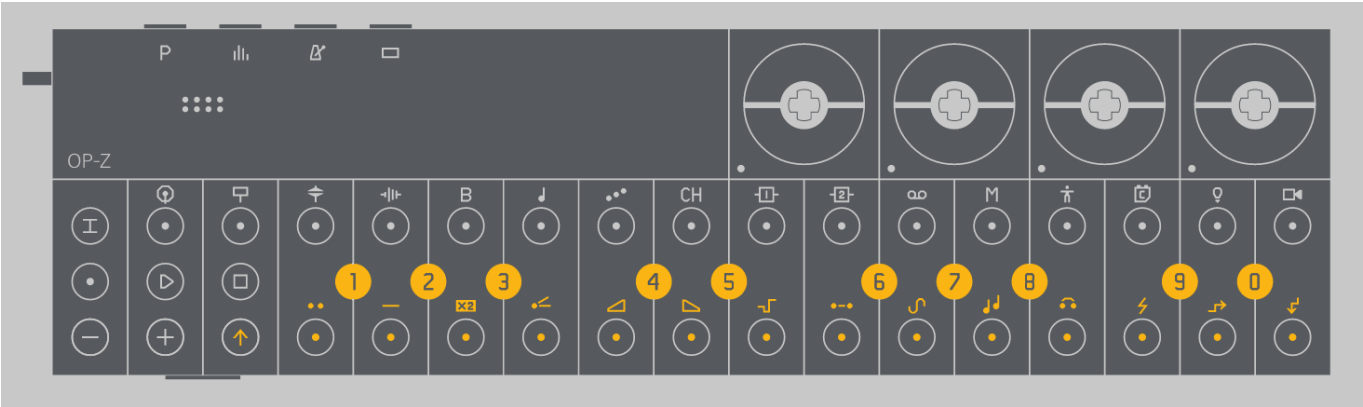
OP-Z can transform sequencer data to dmx channel data and send it out using a usb dmx interface. use the dmx.json file found in content mode to configure the outgoing channel data to correspond to your dmx fixture setup.

the maximum total number of channels that can be configured is 128.

the supported channel types are:

channel	range	description
red	0 – 255	red color
green	0 – 255	green color
blue	0 – 255	blue color
white	0 – 255	white color
color	0 – 255	color wheel
intensity	0 – 255	intensity / dimmer
fog	0, 255	triggered by animation 14
dial 1	0 – 255	green dial (page 1)
dial 2	0 – 255	blue dial (page 1)
dial 3	0 – 255	yellow dial (page 1)
dial 4	0 – 255	red dial (page 1)
dial 5	0 – 255	green dial (page 2)
dial 6	0 – 255	blue dial (page 2)
dial 7	0 – 255	yellow dial (page 2)
dial 8	0 – 255	red dial (page 2)
0 – 255	0 – 255	custom fixed value
on	255	always on
off	0	always off

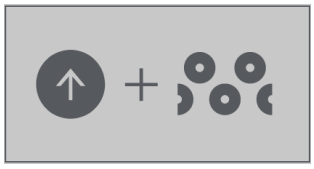
16. punch-in effects



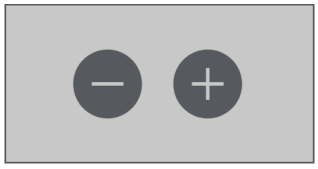
16.1 punch-in effects introduction

using punch-in effects is a fun way to add powerful on the fly effects to your OP-Z patterns. the approach is inspired by the pocket operators. select a track, hold shift and start jamming on the musical keyboard. the punch-in effects can be applied to any of the audio tracks, tracks 1 – 8, and can be recorded to the performance track.

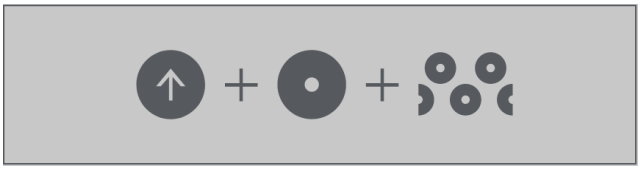
16.2 using punch-in effects



press and hold shift and hold any of the piano keys to add punch-in effects.



the low octave affects the current track, and the high octave affects the current track group: the drum group or the synth group.



record the punch-in effects by holding rec or using record lock.

this will be recorded on the performance track, and can be fully edited.

16.3 punch-in effect reference chart

key	effect
F	duck
F#	filter sweep
G	loop 1
G#	stereo
A	loop 2
Bb	pitch
B	follow / echo
C	ramp up / fill 1
C#	short
D	ramp down / fill 2
C#	long
E	random

16.4 punch-in effects + app

while using OP-Z paired with the app, and using the main OP-Z interface, you will get visual feedback when using the punch-in effects.

these graphics can be a striking way to add some visual action to your live performance.

17. sampling

17.1 introduction to sampling

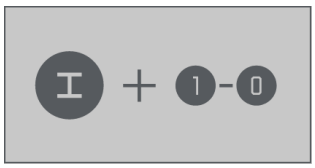
in addition to being a powerful sequencer, OP-Z is also a fully capable portable sampler. sampling on OP-Z is done using the built-in microphone, the headset microphone or via usb, and you can sample to any of the 8 instrumental tracks.

using the drum tracks you can easily create your own drum kits, while using the synth tracks you can turn any sound into a playable melodic instrument. capture the world around you and instantly turn it into music.

17.2 sampling overview

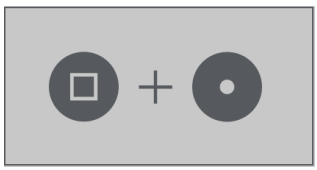
create user sample

hold track together with an empty slot 1-0 to create a new user sample pack.



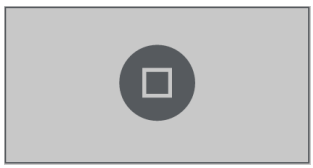
remove user sample

hold track together with an existing user slot 1-0 for three seconds to remove a sample pack.



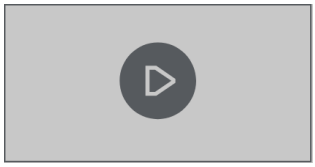
enter sample mode

press and hold stop + rec to enter sample mode. this is where you record and tweak your samples.



exit sample mode

press stop while in sample mode to exit and return to normal operation.

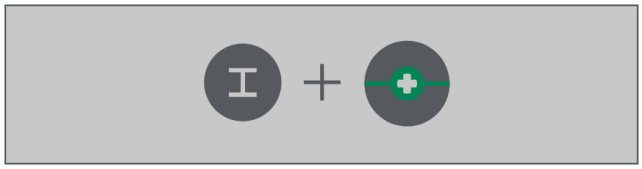


preview input

press play to toggle previewing of the active input source on or off.

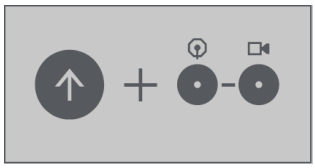
toggle test tone

press track to toggle a test tone of 440 hz on or off. this corresponds to the middle A note and can be used as a tuning reference when sampling.



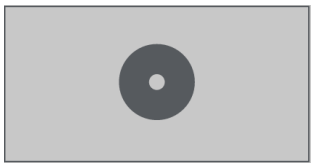
test tone volume

adjust the volume of the test tone by pressing and holding track while turning the green dial.



input gain

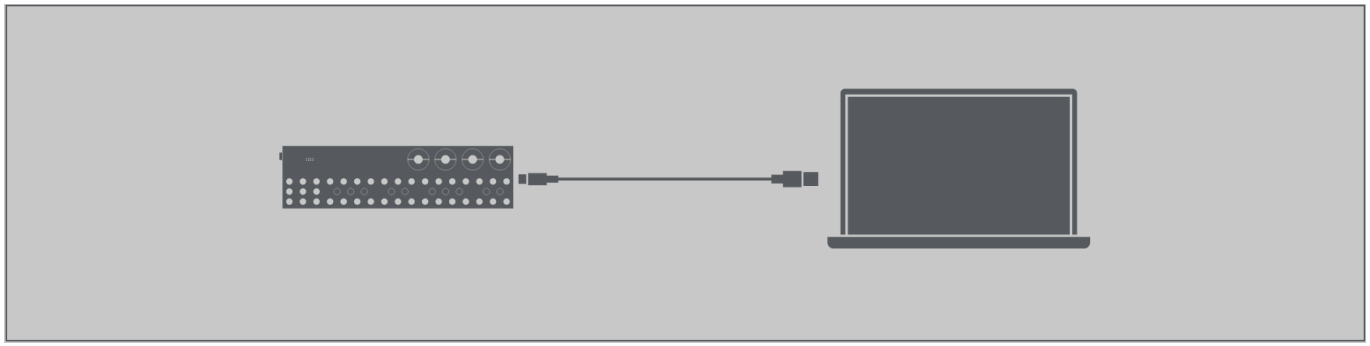
press and hold shift and press the top track buttons 1 - 16 to adjust input gain. button 4 (sample track) corresponds to 0 db.



sample

press and hold rec to start recording from the active input source. release rec to stop recording.

17.3 input sources



select usb source

to use usb as the active input source, first connect OP-Z to a mobile device or a computer, and then select OP-Z as the active audio output device. this enables you to sample digitally, via usb.

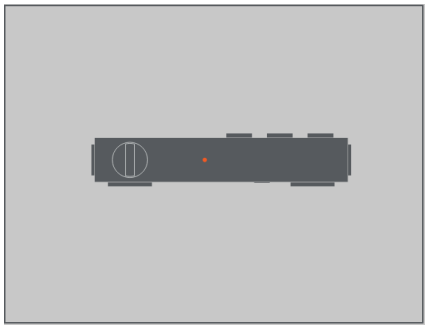
select microphone

the built-in microphone is the default input source for sampling and is active as long as no other source is selected.

select headset source

press the headset's button to toggle the headset as the active input source.

you can toggle the headset input manually, by pressing SCREEN+SHIFT

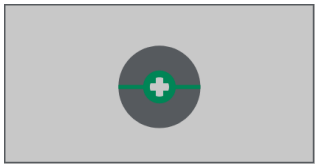


note the orange led on the left side of the unit.

17.4 drum sampler

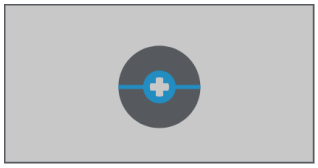
sampling to any of the drum tracks (kick, snare, perc and sample) will allow you to create a drum kit made up of 24 sounds, or slices, distributed across the musical keyboard.

the source is a single audio file, up to 12 seconds long and fully compatible with the OP-1 drum kit file format. use the color dials to adjust the parameters for each slice. here are the available primary parameters:



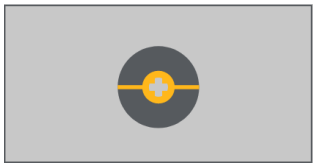
sample start

turn the green dial to adjust sample start for the active slice.



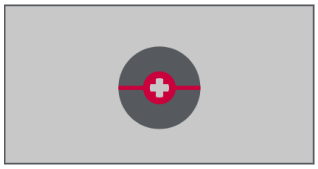
sample end

turn the blue dial to adjust sample end for the active slice.



sample pitch

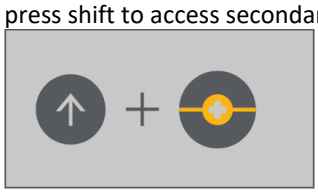
turn the yellow dial to adjust the pitch of the sample for the active slice.



sample gain

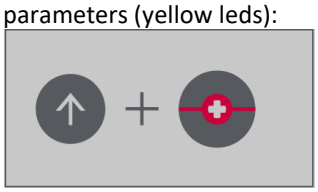
turn the red dial to adjust sample gain for the active slice.

press shift to access secondary parameters (yellow leds):



sample direction

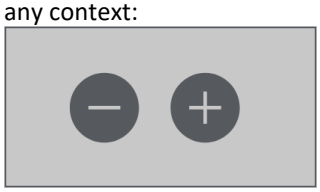
after pressing shift you can turn the yellow dial to adjust sample playback direction for the active slice: normal or reversed.



sample playmode

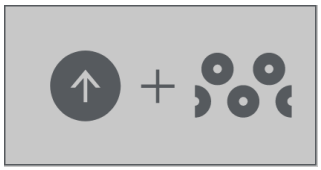
also while on the second parameter page, turn the red dial to adjust playmode for the slice between gate, trigger or loop.

any context:



sample pitch (in half notes)

press – or + to adjust the pitch in half note steps for the active slice.



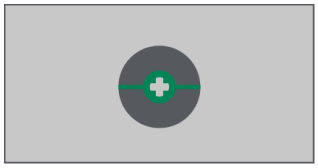
copy sample

press and hold shift and press any note to copy a slice from the active note position to the pressed one.

17.5 synth sampler

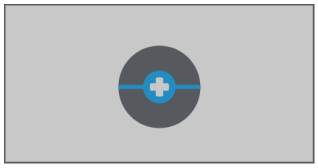
sampling to any of the synth tracks (BASS, lead, arp and chord) will give you an up to 6 second long chromatic sample.

use the synth sampler when you want an easy way to play melodic content. the main parameters are as follows:



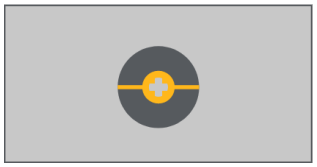
sample start

turn the green dial to adjust sample start for the active slice.



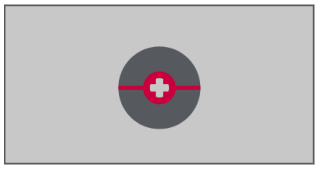
sample end

turn the blue dial to adjust sample end for the active slice.



sample pitch

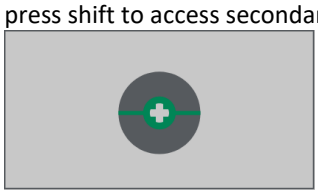
turn the yellow dial to adjust the pitch of the sample for the active slice.



sample gain

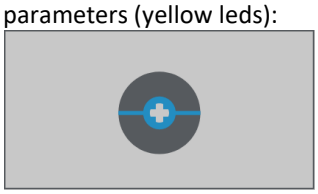
turn the red dial to adjust sample gain for the active slice.

press shift to access secondary parameters (yellow leds):



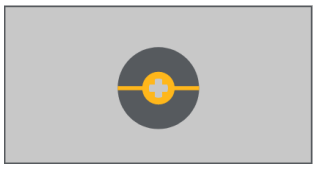
sample loop in

turn the green dial to adjust the sample loop in position.



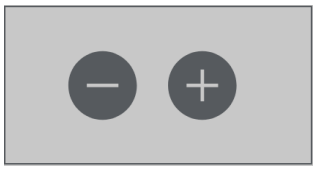
sample loop out

turn the blue dial to adjust the sample loop out position.



sample direction

turn the yellow dial to adjust playback direction: normal or reversed.



sample pitch (in half notes)

press – or + to adjust the pitch in half note steps.

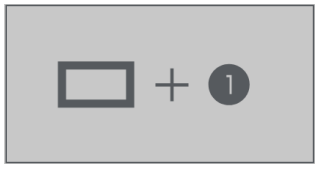
18. input section (beta)

18.1 introduction

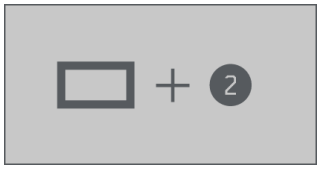
the input selector allows you to add an input signal into your mix. this signal runs through the effects, the same way an instrumental track does.

additionally, if a input signal is chosen, this choice overrides the automatic source selection in sample mode.

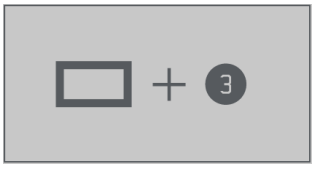
18.2 select source



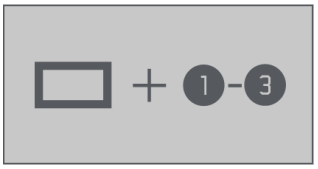
enables the internal microphone input signal.



enables the headset input signal.

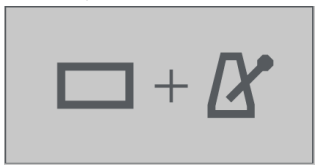


enables the incoming usb audio signal.



press the active source to disable it.

18.3 input source settings

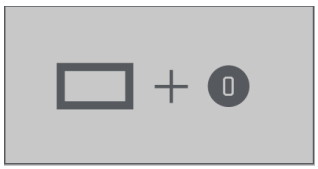


toggle between [fx1, fx2, fx1+fx2, clean].

decrease input signal volume.

increase input signal volume.

18.4 usb audio monitor mode



monitor the incoming usb audio signal. the op-z main out signal is muted in speaker/headphones. be careful, this signal can be a lot louder than your synth sound.

19. microphone

OP-Z has a built-in microphone. this can be found on the left side of the unit, next to the volume knob and the mic led indicator.

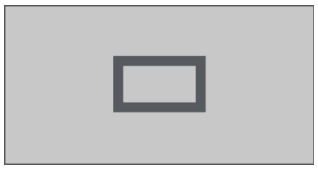
to activate the microphone, hold and tilt the unit, so that this left side is facing upwards. the mic led will be green.

19.1 microphone mode

press to increase microphone volume.

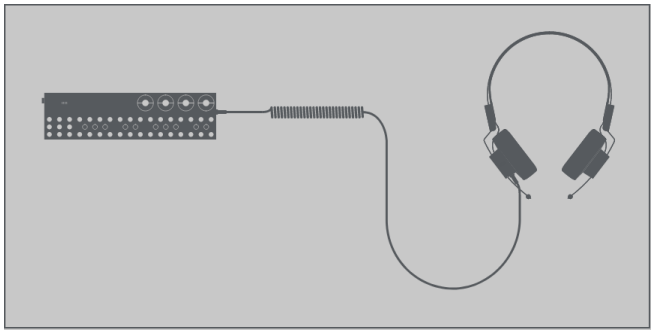
press to decrease microphone volume.

press to toggle between fx1, fx2, both FX1 & FX2, and no effect.



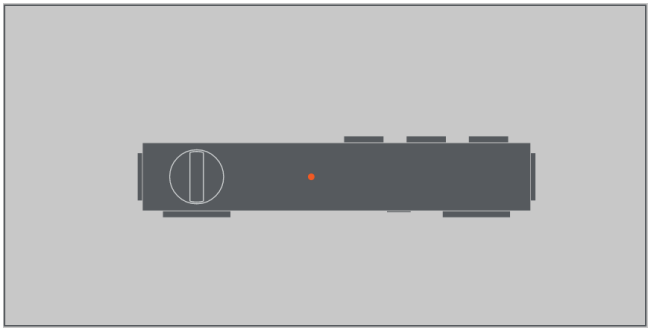
press and hold to enable the microphone. the mic led will be red.

19.2 headset mode



having a headset connected to OP-Z and pressing the headset answer button will toggle headset mode.

this will disable the built-in microphone and activate the headset mic.

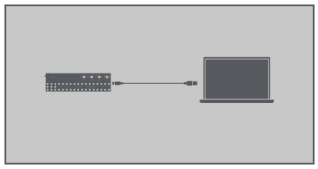


the mic led on OP-Z will be orange.

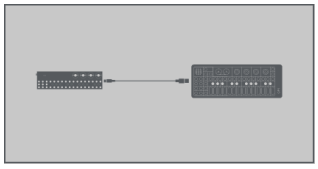
the volume and fx control buttons will function the same as in microphone mode, however the headset mic will be constantly enabled.

20. usb

20.1 usb introduction

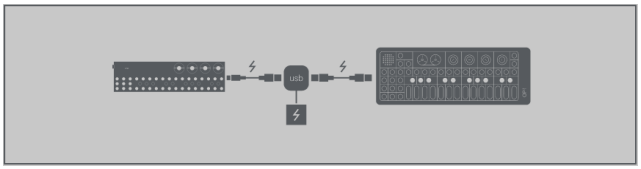


OP-Z can be controlled using the usb midi port. connect OP-Z to a computer or other usb host using the included C to A cable. if using a C to C cable, please make sure to use a high quality cable.



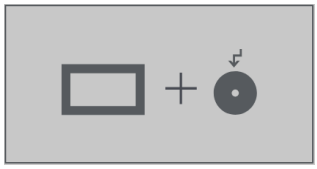
OP-Z has usb host functionality that allows you to connect usb devices directly into the usb-c port.

OP-Z supports most usb midi devices that adhere to the usb plug-and-play standard.

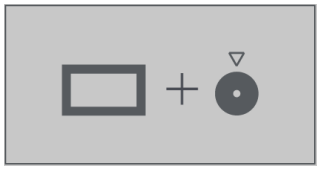


the OP-Z can provide a maximum of 100 mA which is not enough for some midi devices. for these cases, use a powered hub. please refer to the whitelist to see which hubs are supported.

some devices present themselves as more than one midi device, which currently is not supported by the OP-Z. please refer to our device whitelist if you want to be on the safe side. this list will be extended over time.



usb connection might create noises. connect your OP-Z without charging by holding the screen button + trigger spark. yellow led lights will confirm it is disabled



note: trigger spark has a different icon on earlier versions of the OP-Z.

20.2 supported devices

this list does not include all supported devices but rather the ones that we recommend and guarantee to work. the list will be extended over time.

midi device	direct	needs external power	comments
OP-1	yes	no	
oplab	yes	yes	
korg microkey air 25	yes	no	usb only

powered hub	direct	needs external power	comments
kingston nucleum	yes	yes	

usb adapter	direct	needs external power	comments
apple c to a	yes	no	
aukey c to a	yes	no	

dmx interface	direct	needs external power	comments
enttec dmxusb pro	yes	no	
enttec dmxusb pro mk2	yes	yes	

21. midi

21.1 midi introduction

each of the OP-Z's 16 tracks can both send and receive midi. the outgoing cc values of each parameter on each track can be assigned a custom control number. the outgoing channel of each track can also be customized.

21.2 external clock

sending a midi timing clock to your OP-Z will automatically put it into external sync mode. this is indicated by four green leds showing the current tempo when tempo button is held.

21.3 midi config shortcuts

midi settings for the OP-Z can be configured via the module track. first go to the module track by holding track and pressing module. the midi settings are turned on or off by holding shift and then pressing the corresponding keys while in the module track.

key combination	setting	description
shift + 1	channel one to active	any incoming midi on channel 1 is redirected to the currently active track
shift + 2	incoming midi	enable incoming midi
shift + 3	outgoing midi	enable outgoing midi
shift + 4	midi clock in	enable incoming midi clock
shift + 5	midi clock out	enable outgoing midi clock
shift + 6	alt program change	on: use bank 1–16 / program 1–16 to set active pattern. off: pattern 1–16 is activated with bank 1 / program 1–128 and bank 2 / program 1–32.
shift + 7	midi echo	echo incoming midi back on same port
shift + 8	enable program change	enable program change in/out
shift + track 1 - 16	mute track	mute the outgoing midi on the corresponding track.

21.4 midi config content mode

use the midi.json file found in content mode to customize the OP-Z midi configuration. the available settings are as follows:

setting	range	description
channel_one_to_active	true / false	any incoming midi on channel 1 is redirected to the currently active track
incoming_midi	true / false	enable incoming midi
outgoing_midi	true / false	enable outgoing midi
timing_clock_in	true / false	enable incoming midi clock
timing_clock_out	true / false	enable outgoing midi clock
enable_program_change	true / false	enable program change in/out
alt_program_change	true / false	true: use bank 1–16 / program 1–16 to set active pattern. false: pattern 1–160 is activated with bank 1 / program 1–128 and bank 2 / program 1–32.
midi_echo	true / false	echo incoming midi back on same port
track_enable	true / false	enable midi per track
track_channels	1 – 16	set outgoing channel per track
parameter_cc_out	0 – 255	set outgoing cc value per parameter per track

21.5 midi config via app

the OP-Z midi configuration can be set using the OP-Z app. using the app it is also possible to assign the midi cc values and midi send channels for each track.

read here for more information.

21.6 incoming midi table

parameters	absolute			relative		
name	cc	track/ channel	range	cc	track/ channel	range
parameter 1	1	1-16	0-127	32	1-16	1, 127
parameter 2	2	1-16	0-127	33	1-16	1, 127
filter cutoff	3	1-16	0-127	34	1-16	1, 127
filter resonance	4	1-16	0-127	35	1-16	1, 127
envelope attack	5	1-16	0-127	36	1-16	1, 127
envelope decay	6	1-16	0-127	37	1-16	1, 127
envelope sustain	7	1-16	0-127	38	1-16	1, 127
envelope release	8	1-16	0-127	39	1-16	1, 127
lfo depth	9	1-16	0-127	40	1-16	1, 127
lfo speed	10	1-16	0-127	41	1-16	1, 127
lfo target	11	1-16	0-127	42	1-16	1, 127
lfo shape	12	1-16	0-127	43	1-16	1, 127
fx 1 send	13	1-16	0-127	44	1-16	1, 127
fx 2 send	14	1-16	0-127	45	1-16	1, 127
pan	15	1-16	0-127	46	1-16	1, 127
volume	16	1-16	0-127	47	1-16	1, 127
portamento	17	1-16	0-127	48	1-16	1, 127
note style	18	1-16	0-127	49	1-16	1, 127

system			
name	cc	track/ channel	range
track gain	50	1-16	0-127
track gain (relative)	51	1-16	1, 127
reset track gains	52	any	any
mute	53	1-16	0-1
audio mute	54	1-16	0-1
mute group	55	any	0-9
tempo	56	any	0-127
swing	57	any	0-127
select pattern	103	1-10	0-15
next pattern	103	any	16
previous pattern	103	any	17

track			
name	cc	track/ channel	range
track step count	60	1-16	1-16
track step length	61	1-16	1-16
quantize	62	1-16	0-127
note length	63	1-16	0-127

other / real time			
name	cc	track/ channel	range
start			
stop			
continue			
program change		1-10	0-15
program change		1, 2	0-127
clock			
pitch bend		1-16	
song pointer		not used	
sense		not used	

ui			
name	cc	track/ channel	range
active track	102	0	0-15
parameter page	102	1	0-3

22. disk modes

22.1 introduction

there are a couple of ways to connect the OP-Z to a computer. to update the firmware of the unit or to perform a factory reset, you can use upgrade mode.

to add, remove or modify the OP-Z content, use content mode. both modes connect the OP-Z to a computer using usb.

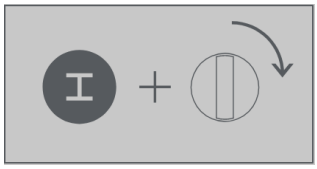
remember to always safely eject the OP-Z disk before disconnecting from the computer or unplugging usb. you can also eject the OP-Z by pressing play when in boot mode.

22.2 content mode

content mode allows you to backup and restore content on OP-Z, as well as adding custom content, such as adding your own sounds. this is also where you manage your projects and access your bounces.

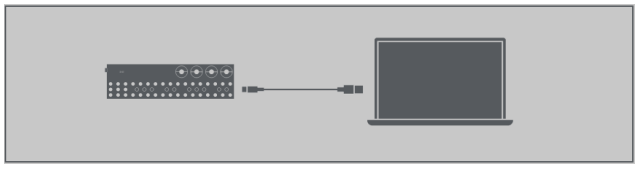
additionally, you can use content mode to configure midi and dmx.

enter content mode like this:



press and hold the track button while turning on the unit.

OP-Z will start in content mode, and all track leds will be green.



connect your OP-Z to your computer via the usb cable provided.

once connected it will show up in the computer as an external removable usb disk.

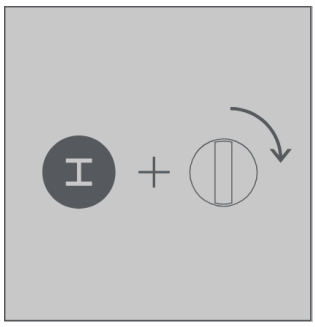
open the OP-Z disk on your computer to access the files.

note: remember to eject the disk before disconnecting. you can also eject the OP-Z by pressing play when in boot mode.

22.3 import sounds

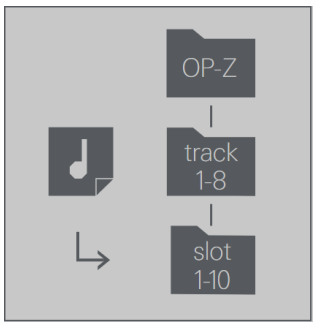
you can add your own sounds and sample packs to OP-Z. the supported file format is the OP-1 .aif sample format. for drum tracks it is the drum sample format and for synth tracks it is the synth sample format.

you can either export samples from OP-1, build your own packs using the OP-1 drum utility, or download packs from the web. to import sounds and sample packs into OP-Z do the following:



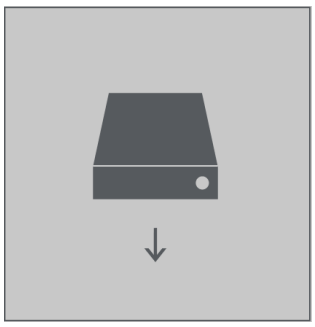
make sure OP-Z is in content mode by holding track when power cycling the unit. connect it to a computer. open the OP-Z disk and open the 'samplepacks' folder.

the 10 slots of a track are represented by ten sub folders for each track.



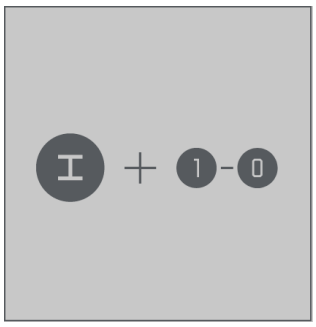
drag and drop your sound files to the different track folders 1–8 and slots 1–10.

choose a free slot folder and place your new sample pack there. only one sample pack per slot folder will be imported, any additionalones will be rejected.



safely eject the usb disk.

OP-Z will update and restart when ready. do not power off your device during this process.

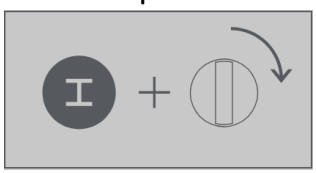


to access the new sounds in OP-Z select the corresponding track and slot.

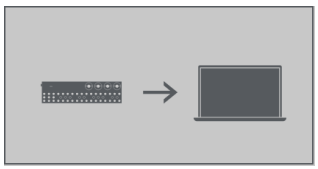
you can store a total of 24mb of sample data.

remove any sample files you do not use anymore to make room for new ones.

22.4 backup content

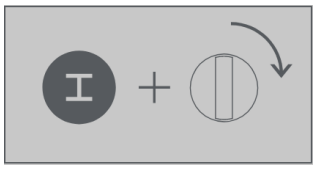


make sure OP-Z is in content mode and connected to a computer.

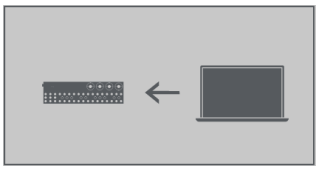


open the OP-Z disk and drag and drop the desired files from OP-Z to your computer.

22.5 restore content



make sure OP-Z is in content mode and connected to a computer.



open the OP-Z disk and drag and drop the desired files from your computer to the corresponding locations on the OP-Z disk.

type	add	modify	remove
projects	yes	yes	yes
sample packs	yes	yes	yes
bounces	no	no	yes
config	no	yes	no

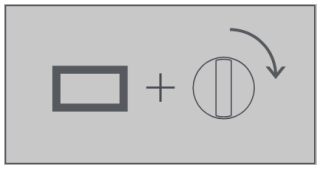
this chart shows which operations are available per type of content.

any changes you do to the files on the OP-Z disk are reflected on the unit after you eject the disk. wait for the unit to synchronize the content and restart in normal mode.

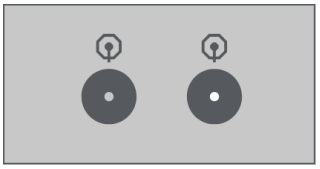
if any content was rejected, it will end up in a folder named 'rejected' on the OP-Z disk the next time content mode is entered.

note: please see the how_to_import.txt and how_to_dmx.txt files, both found on the content disk, for further reference.

22.6 upgrade mode

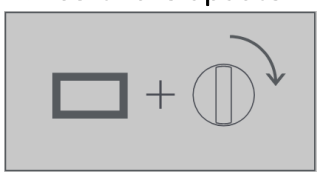


upgrade mode is used for updating the OP-Z firmware and for initiating a factory reset.
press and hold the screen button while turning on the unit.

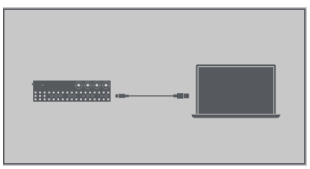


OP-Z will start in upgrade mode, the kick led will be blinking white and the parameter dial leds will all be white.

22.7 software update

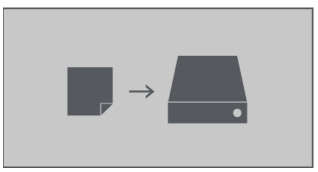


to update the OP-Z firmware, make sure OP-Z is in upgrade mode.

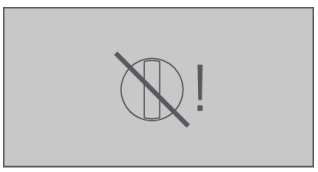


connect the unit to a computer using usb.

OP-Z will show up in the computer as an external removable usb disk.



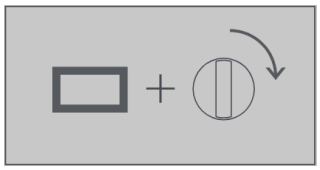
drag and drop the firmware file onto this disk and make sure it's copied in full.



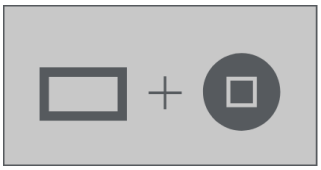
safely eject the usb disk. OP-Z will update and restart in normal mode when ready.

note: do not power off your device during this update process.

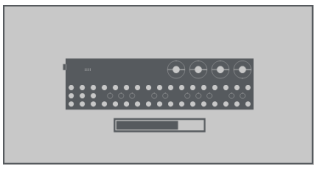
22.8 factory reset



upgrade mode can also be used to initiate a factory reset, restoring OP-Z to its original factory settings.

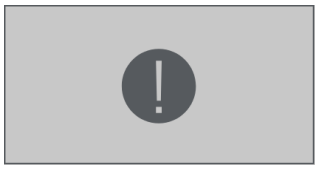


make sure OP-Z is in upgrade mode. press and hold screen and stop for a second.



this triggers a factory reset.

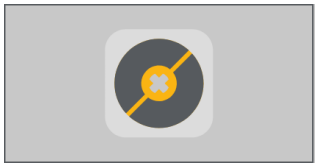
the process is finished when you see a blinking white led and four green leds. safely eject the unit and then power cycle it. OP-Z is now ready.



note: any custom user content will be removed when a factory reset is performed.

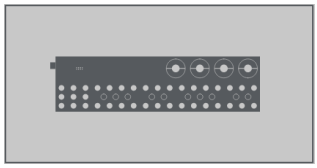
23. OP-Z app

23.1 app introduction

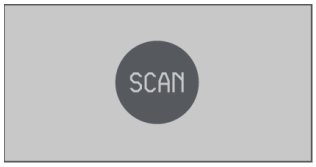


use the OP-Z app together with your OP-Z to get detailed info about your compositions, enable multi touch features and experience live 3d visuals. available for ios, mac and android. download from the relevant app store.

23.2 pairing with OP-Z

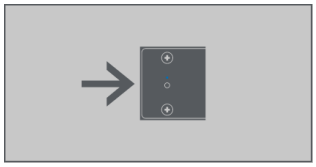


go to the devices screen in the app. if you have navigated somewhere else use the main menu to get there.

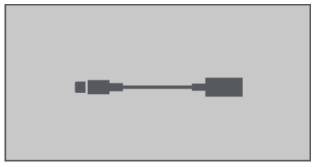


tap the scan button to show a list of ble devices available to your system.

this step is not necessary on android. note however that on android, location services permission is required for ble connection.



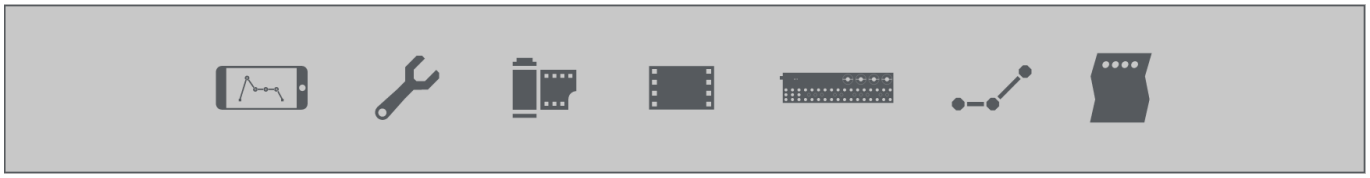
push the pair button on the backside of your OP-Z. tap to connect when it appears in the device list.



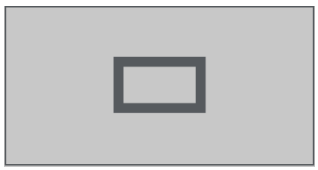
if you prefer you can use a usb-c to lightning adapter to get a wired connection.

on android with usb-c you can connect directly, otherwise use an otg adapter.

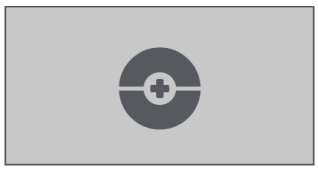
23.3 navigating the app



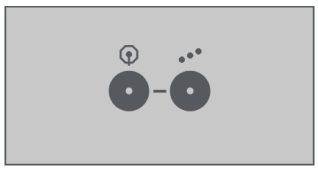
apart from acting as a screen for the OP-Z, the app provides a number of unique features of its own. everything can be accessed through the main menu.



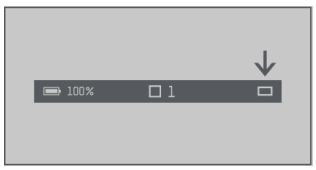
press and hold the screen key on the OP-Z to access the main menu.



use any color dial on the OP-Z to scroll the main menu.

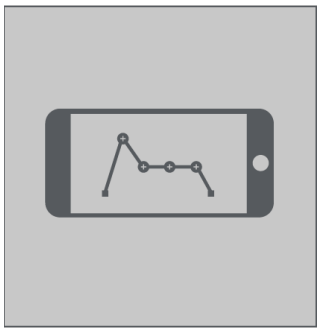


use the step keys to speed dial. release screen key to confirm your selection.

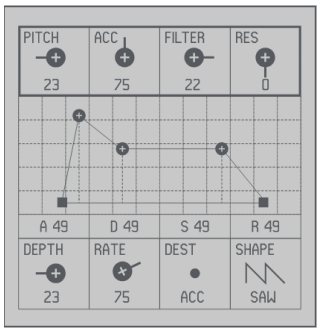


you can also access the main menu by tapping the screen icon in the status bar of the app. swipe to navigate the menu. tap to confirm your selection.

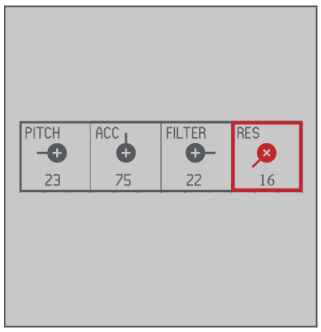
23.4 screen



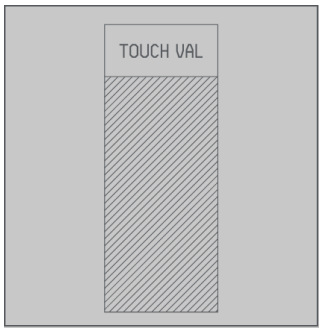
this is the OP-Z external screen and main user interface. view and tweak the multitude of parameters on your OP-Z.



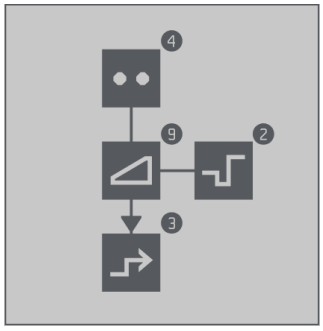
on most tracks you get an overview of all the control parameters. the parameter indicators are grouped into pages just like on the OP-Z itself.



tap any of the indicators to select the parameter for touch tweaking. notice how the dial led colors change to match the selected pagecolor.



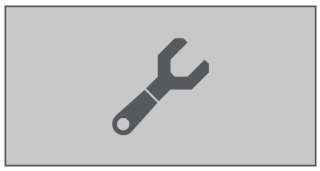
drag your finger over the touch pad area to make fine adjustments to the selected parameter.



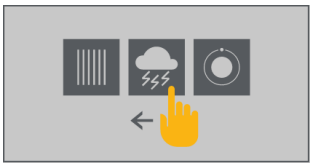
while editing step components on the OP-Z a wiring diagram will display temporarily on screen.

the performance track will show visual punch-in effects. punch-in effects are also overlain on the audio track screens when the shift key is held on OP-Z.

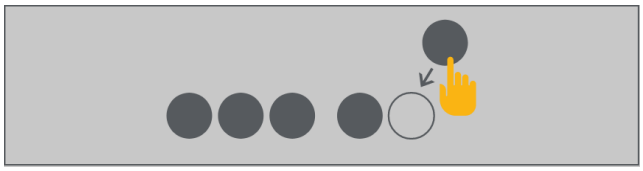
23.5 configurator



this is where you configure what plug goes in what slot on your OP-Z.



swipe to scroll through the list of available plugs for the active track.

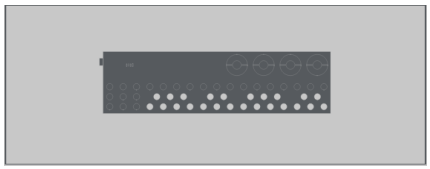


the round slots at the bottom of the screen correspond to the 10 value keys on the OP-Z. grab the current plug from round area in the center of the screen. drag & drop to the slot where you want it.

when you are happy with you slot configuration hit commit to transfer to the OP-Z.

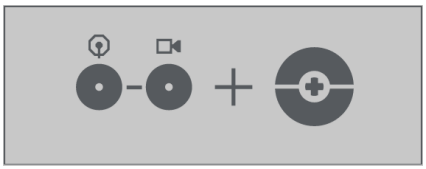
hit revert if you want to reload the configuration from your OP-Z.

23.6 photomatic



photomatic lets you snap and arrange photos with the camera on your ios device. you can sequence the images and apply effects using the OP-Z.

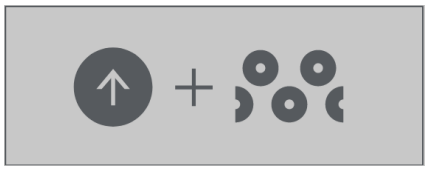
a photomatic camera roll consists of 24 image slots.play the 24 piano keys on track 16 to display the corresponding images. you can sequence these changes just like you sequences musical notes.



use the color dials on track 16 to apply photomatic adjustments to your images:

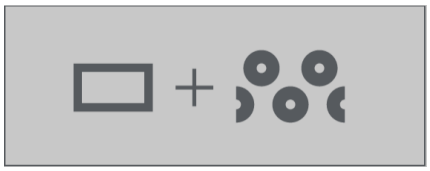
- hue
- saturation
- brightness
- contrast.

be careful, extreme settings on brightness and contrast can make your images appear too light or dark.

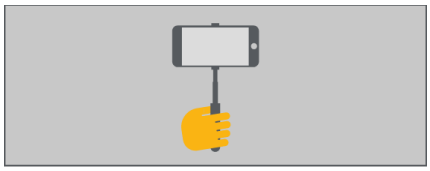


you can apply punch-in effects to photomatic too. the black keys switch between the 10 photomatic camera rolls. the white keys apply various effects:

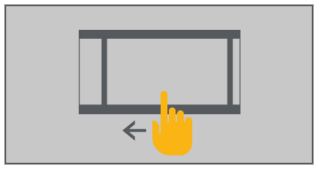
- previous image
- next image
- random image
- first image
- invert color
- flip horizontal
- flip vertical
- punch zoom
- white out
- black out
- sharpen
- kill red
- kill green
- kill blue



press and hold the screen index key to activate the photomatic remote shutter. press any of the 24 piano keys to snap photos with the camera on your ios device. photos will be saved to the corresponding slot in the photomatic camera roll.

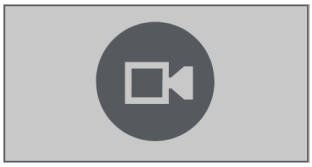


while using the OP-Z remote shutter feature use a camera stand or friendly bystander to hold your ios device.

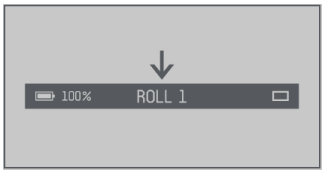


you can also use the touch screen to work with photomatic. swipe to scroll through the images. this will bring up a helpful touch button interface.

instead of snapping new photos you can load existing images from the photo library on your ios device.

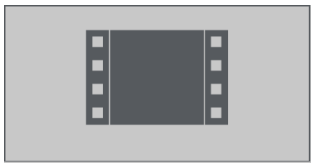


tap the camera button to toggle the camera on your ios device on/off. the flip button cycles available cameras. the snap button takes a photo and saves it to the current image slot.

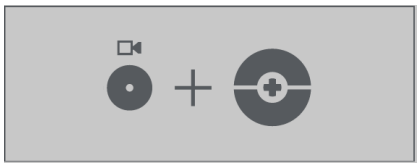


access the photomatic roll selection by tapping the current roll text in the status bar.

23.7 motion



display and control live 2d or 3d visuals. load one of the included videopaks, or load one you or your friend made using the free unity toolkit videolab.

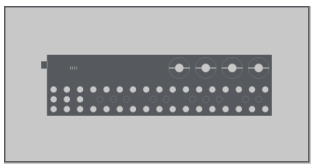


use the musical keyboard on track 16 to control the visuals. black keys make cuts between cameras. white keys apply various effects while held. you can sequence these changes just like you sequences musical notes.

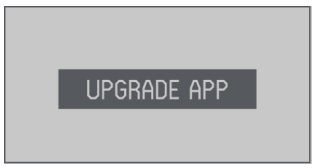
the color dials on track 16 can also be used to tweak various properties of the visuals.

access the selection of installed videopaks by tapping the current videopak text in the status bar.

23.8 devices



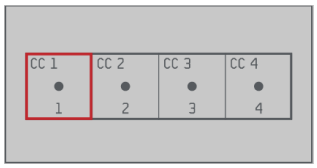
if you have multiple OP-Z devices available you can browse them and select which one to connect to the app.



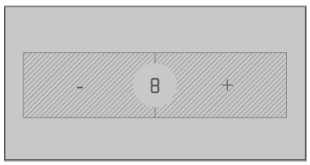
if your app is too old to work with the firmware of an available OP-Z you will get an option to upgrade the app. if the firmware is too old, visit the download page for instructions on how to upgrade your OP-Z.

23.9 midi setup

here you can tweak the midi connectivity settings of your OP-Z.



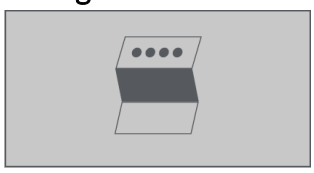
select a parameter indicator and use the touch pad to edit the midi control change number it sends out.



tap the + and – buttons to edit the midi channel used by this track.

toggle the global midi settings by tapping these boxes. refer to the midi reference section for detailed descriptions of these settings.

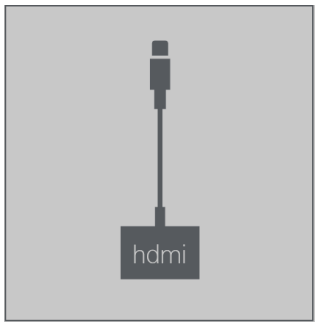
23.10 guide

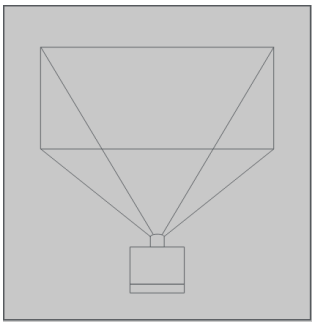


this very guide conveniently available inside the app. an internet connection is needed to access the guide.

this feature is currently not available on android.

23.11 video out



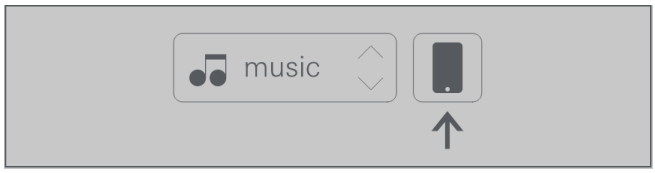


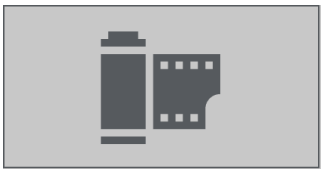
the OP-Z app supports external displays over the ios lightning to hdmi adapter. simply connect the adapter to your ios device and run an hdmi cable from the adapter to an external display or projector.

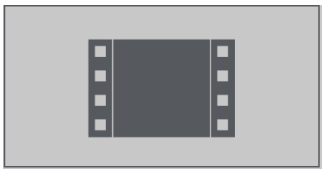
photomatic and motion will automatically render to the external display. the app user interface stays on the ios device screen.

on android refer to your device vendor on how to connect external displays.

23.12 file transfer







connect your ios device computer and launch itunes. click the minuscule device button next to the music dropdown in itunes.

in itunes click file sharing in the ios device panel to the left. select OP-Z in the list of available apps. under OP-Z documents to the right you will see a few folders.

the photomatic folder contains all your photomatic camera rolls. drag and drop the photomatic folder from itunes to your desktop. in the folder there are 10 subfolders, one for each photomatic camera roll. each roll folder contains up to 24 images and a simple configuration file called roll.json. if you edit the image content of a roll folder, trash the configuration file - the app will rebuild it once you relaunch. when you are done drag and drop the photomatic folder back to itunes to replace the old folder.

the motion folder is used to install custom videopaks. videopaks are designed in videolab, our unity toolkit. learn more about videolab on github.
to install a custom videopak simply drag and drop it into the videopaks folder in itunes.

on macos 10.15 catalina you can access ios files directly in finder. files are located in:
~/Library/Application Support/com.teenageengineering.te012.osx/

on android files are located in
/storage/emulated/0/Android/data/com.teenageengineering.te012/files
or wherever the device vendor places app files.

24. reference

24.1 synth engines

bow
string synthesis

tension | chorus

cluster
clustered oscillators

tone | gravity

digital
digital raw engine

octave | feedback

electric
complex and transforming

cross mod | x mod

saw
filtered waves

envelope | tone

shade
smooth piano

detune | drive

sample
pcm sample player

crush |

uranus
clean bass

tone | feedback

volt
multi oscillator electric synthesis

oscillator variation | oscillator modulation

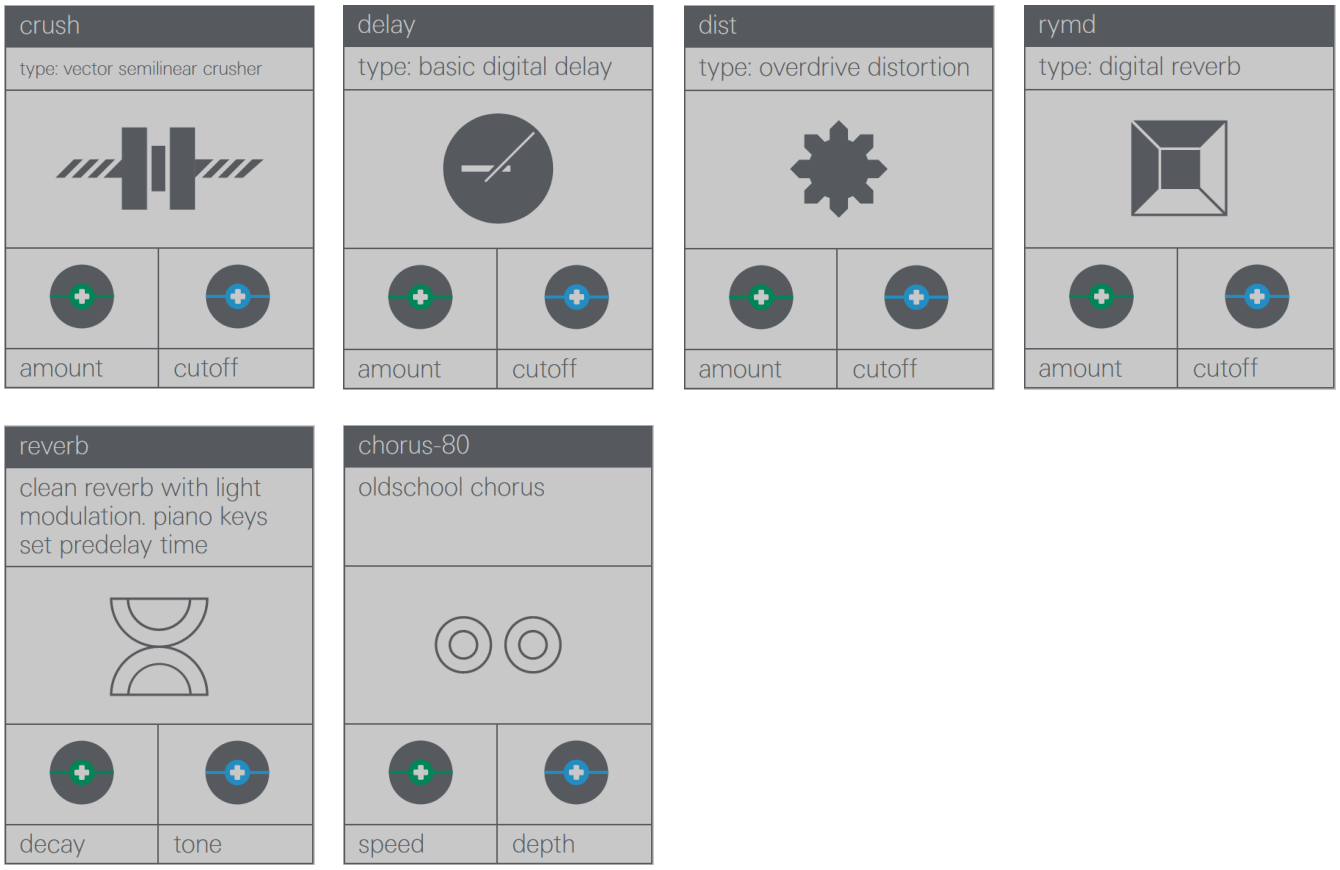
analog
saw, sub, noise with filter envelope

oscillator mix | envelope amount

organ
8 different fm organ algorithms

oscillator algorithm | algorithm tweak

24.2 fx engines



24.3 additional settings

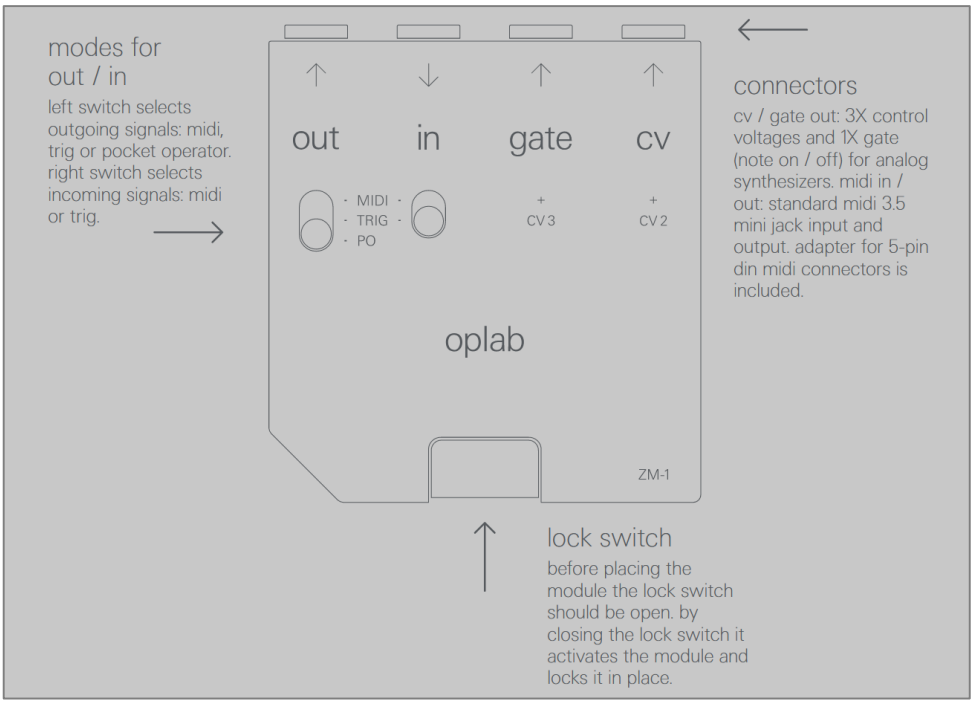
use the general.json file found in content mode to customize the OP-Z general configuration. the available settings are as follows:

setting	range	description
backlit_keys	true / false	all keys dimly lit for use in dark environments
disable_headphone_db_reduction	true / false	disable reducing outsignal level based on headphone impedance
disable_microphone_mode	true / false	disable engaging microphone when unit is tilted
disable_param_page_reset	true / false	do no reset to first parameter page when switching tracks
disable_start_sound	true / false	disable the sound playing when unit is powered on
disable_track_preview	true / false	disable playing a preview sound when selecting a track
generous_chords	true / false	increases the chord track polyphony from four to six notes. note: this doesn't affect the number of notes per step, which is still four.
latch_notes_with_shift	true / false	press notes then press shift and then release notes to latch notes
temp_param_add_fx_a	true / false	when doing temporary parameter tweaks (shift + knob) a slight fx a send is built up

25. modules

25.1 oplab module

25.1.1 interface and ratings



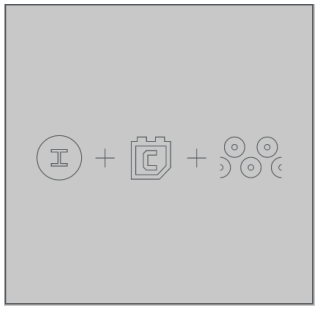
CV out: voltage range: 0 to +5V
CV 2 / 3 out: voltage range: -5 to +5V
gate out: voltage range: 0 to +5V
midi out: voltage range: 0 to +5V
trig out: voltage range 0 to +5V
po out: voltage range 0 to +5V
midi in: voltage range: -10 to +10V
trig in: voltage range: -10 to +10V

25.1.2 connector overview

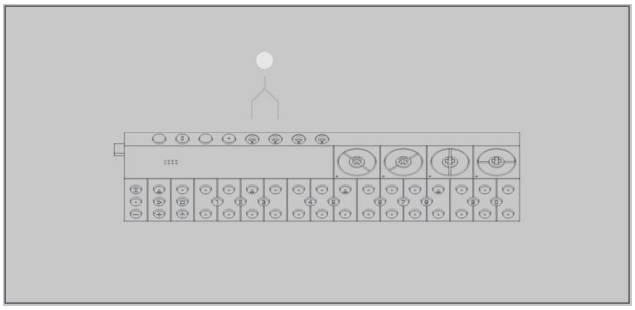
jack	cv	gate		in		out	
mode	–	–	midi	trig	po	midi	trig
tip	cv (note)	gate	source	trigger	sync	source	trigger
ring	cv 2	cv 3	sink	–	–	sink	–
sleeve	ground	ground	–	ground	ground	ground	ground

the CV interface sends on MIDI channel 1 and listens to channel 1 and 15.

25.1.3 using

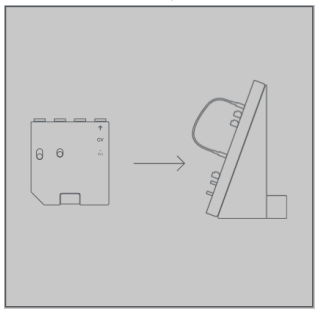


to send cv and gate out of your oplab module, select the module track, and play something on the musical keyboard.

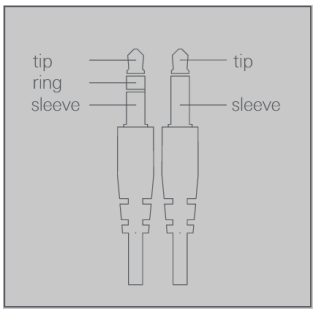


as you press the keys, note the blinking leds on the back side by the module outputs. each key press sends control voltage and gate signals straight out the back of you your OP-Z, ready to be used in any modular system, such as the pocket operator modular or a eurorack system.

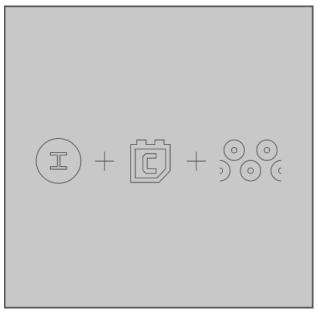
25.1.4 cv (output)



connect a cable from cv out to for example the 'control' or 'key' inputs of the po modular 400.

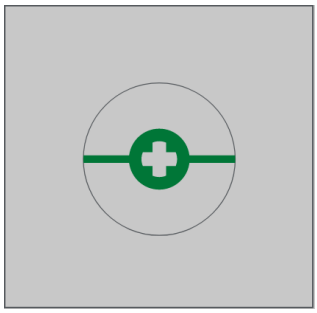


the cv out is a dual output connection using both channels of a stereo plug. using a mono cable is ok, but will only make use of the tip signal.



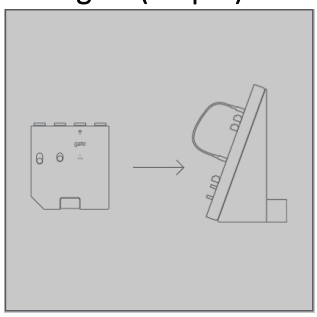
tip (left / white).

note cv (0 to +5V) control voltage for notes. this output will typically be connected to a voltage controlled oscillator (vco) on an analog synthesizer to control the pitch of that oscillator. this cv is controlled by notes played or sequenced on the module track of OP-Z.

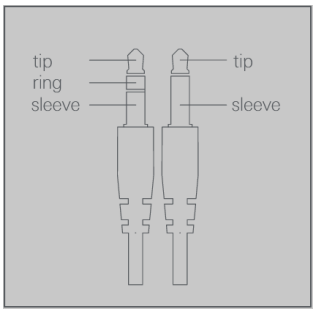


ring (red / right). cv 2 (-5 to +5V) auxiliary control voltage for anything on an analog synthesizer. this cv is controlled by the green dial on OP-Z when on the module track.

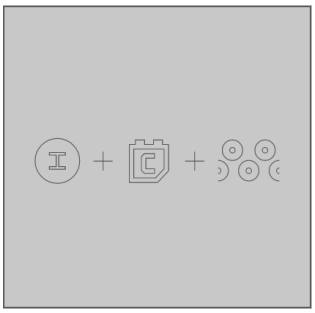
25.1.5 gate (output)



connect a cable from gate out to for example the sequencer 'clock' input or the envelope 'trig' input of the po modular 400.

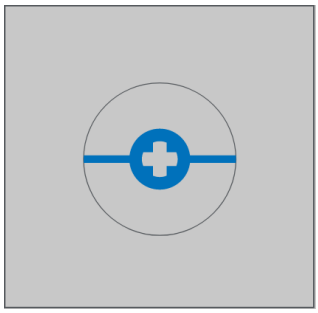


this is a dual output using both channels (tip and ring) of a stereo plug. using a mono cable is ok, but will only make use of the tip signal.



tip (left / white).

gate (0 or +5V) note on / off output for analog synthesizers. this output is controlled by notes played or sequenced on the module track of OP-Z. the output is high (+5V) when a note is played, and low (0V) when no note is played.

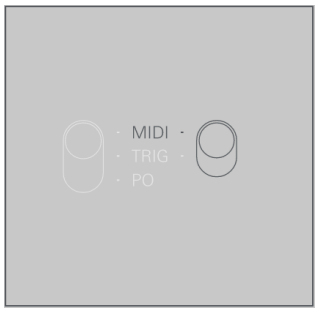


ring (red / right).

cv 3 (-5 to +5V) is same as cv 2, but using the blue dial on OP-Z.

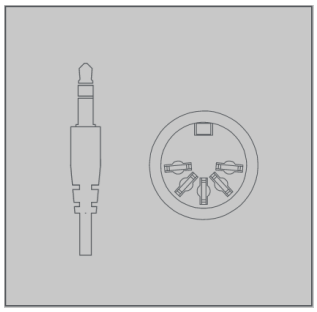
25.1.6 in

this input has two functions, selectable by the switch directly below.

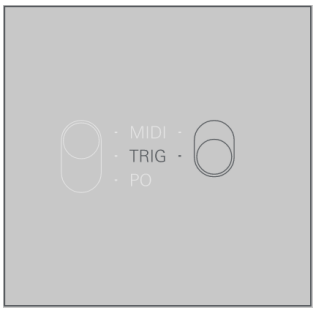


MIDI

midi input for controlling OP-Z. the input uses the standard midi 3.5 mm connector pinout (tip = source, ring = sink). a stereo cable must be used.

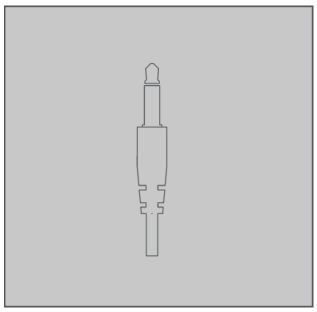


note that it is not compatible with some equipment which uses non-standard reverse pinout. an adapter cable for 5-pin din midi cables is included. refer to the OP-Z manual for details on midi control.



TRIG

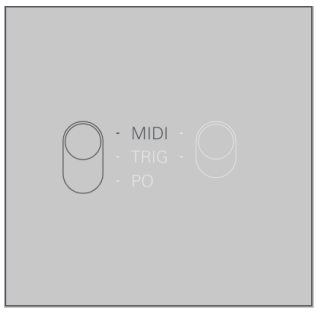
trigger input for OP-Z sequencer (0 to 10V). this input is used to single-step tracks in the OP-Z sequencer. to arm a track for single stepping, set the track length multiplier to 0. hold track and shift and press zero.



to single-step armed tracks, input a pulse of 5-10V on the jack. the 'gate' or 'trig' output from many synths or drum machines will work fine. the input uses only the tip of the connector, so a mono cable will work here.

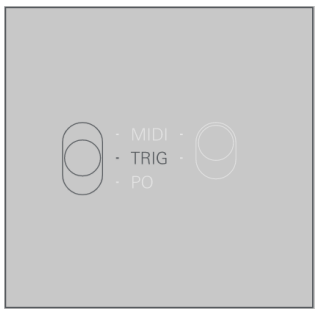
25.1.7 out

this output has three functions, selectable by the switch directly below.



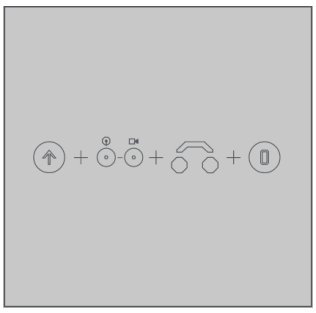
MIDI

midi output from OP-Z is same as for midi in, but out. it will output midi data from all tracks of OP-Z. please refer to OP-Z manual for details on midi implementation.



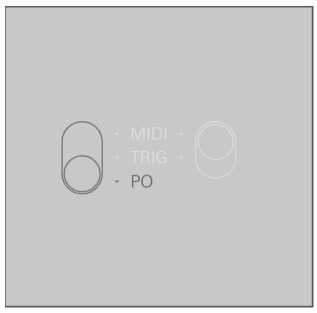
TRIG

trigger output (0 or +5V). this output emits a short pulse suitable for triggering drum synths, arpeggiators, gate inputs, etc. it uses the tip of the connector, so a mono cable is fine.



to make any a step output a trig pulse:

- select any audio track
- press and hold shift
- select step(s) 1-16
- press jump
- press value key 0
- release shift
- press play and verify led activity



PO

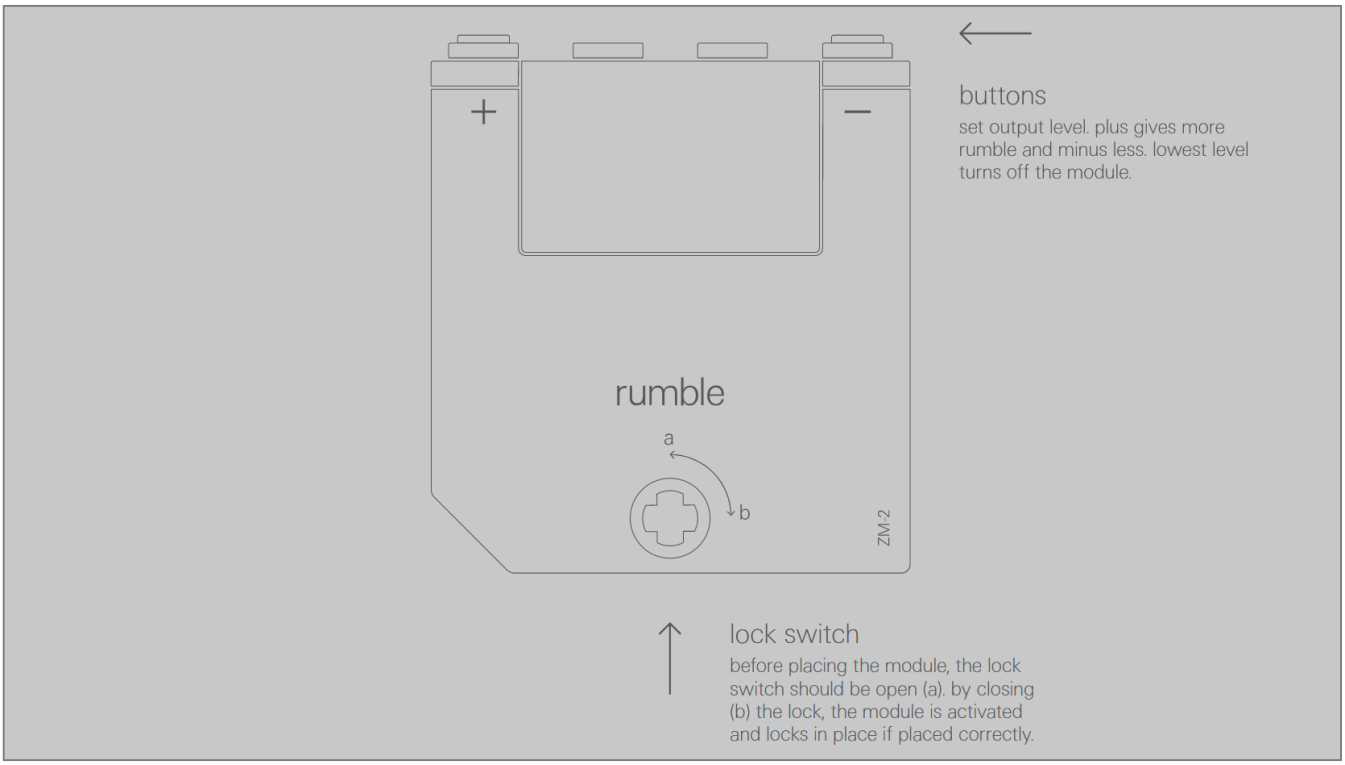
for pocket operators and compatible equipment, set the switch to PO on the oplab module.

to sync a pocket operator to an OP-Z:

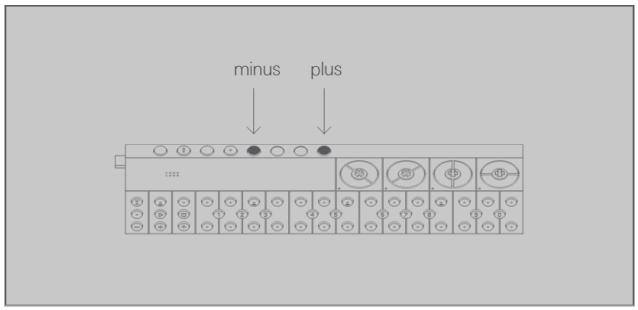
- connect oplab out with PO input (left side)
- set PO to SY2 or SY3
- press play on PO
- press play on OP-Z

25.2 rumble module

25.2.1 interface

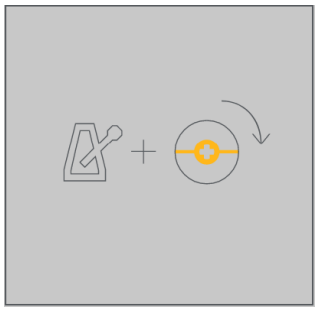


25.2.2 using



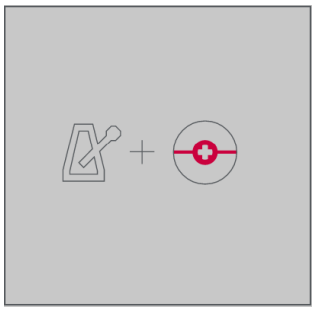
use the buttons to set output level. plus gives more rumble and minus less. lowest level turns off the module.

25.2.3 metronome



to activate the silent metronome, hold the tempo button and turn the yellow dial fully to the right.

note: the metronome needs to already be enabled.



mix sound and vibration level by holding the tempo button and turn the red dial in any direction.