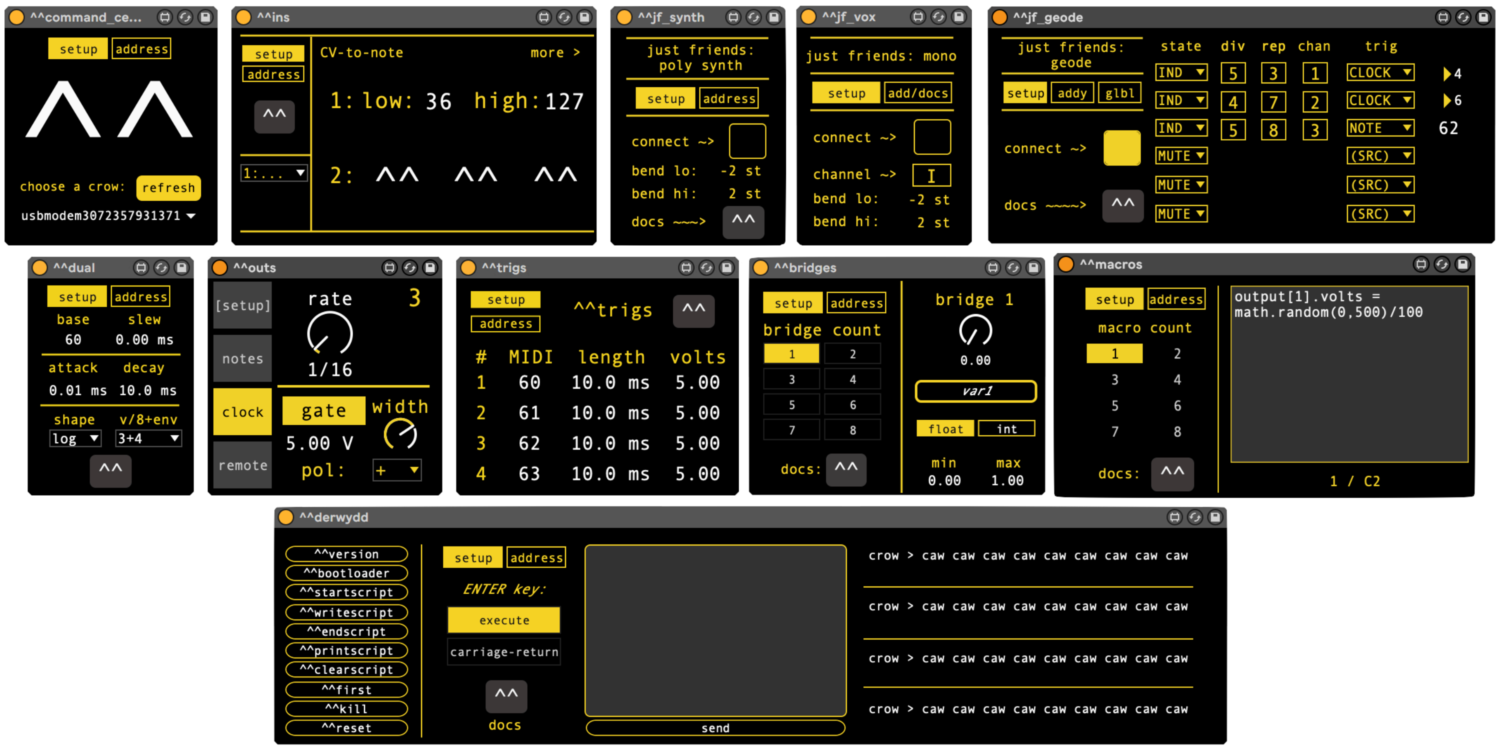
^^

m4l devices for crow



crow 4.0+

updated: 230310

crow is a 2hp eurorack module made by whimsical raps + monome which connects to norns and computers running Max, Max for Live, and other serial-enabled applications through USB.

This guide covers a bundle of Max for Live devices made by monome + whimsical raps to integrate Ableton Live and your modular synth through a variety of use-cases.

requirements:
· crow module with firmware v4.0+
· Ableton Live Suite (tested with 11, though other versions may work) (Mac/Win)
· Max for Live

To get started, visit https://github.com/monome/crow-max-and-m4l and select “Clone or download”. This will download everything you need to get started with crow, Max, and Max for Live. After downloading the entire crow-max-and-m4l repo, extract the zip file and you should get two unique folders: crow_max and crow_m4l.

Place the crow_m4l folder wherever you’d prefer it living longterm on your hard drive. Then, open Live and drag the folder into Live’s browser, under PLACES. If you are updating a previous installation, just replace the previous crow_m4l folder’s contents with the new files.

Need help? Want to share what you’re making? Visit the crow m4l thread on lines.

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^^command_center routes messages between Live and crow. The devices will not connect to crow unless ^^command_center is properly initialized.

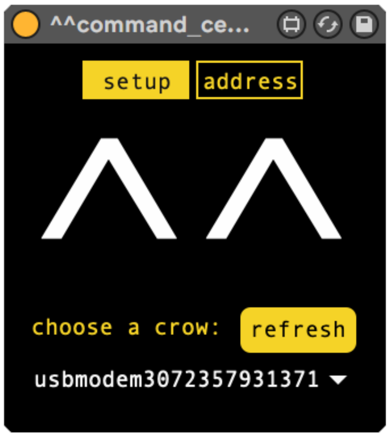
voice control:
^^dual: translate MIDI data from Live to v/8 and variable envelope voltages
^^ins: translate incoming v/8 and triggers through crow to MIDI notes
^^jf_synth + ^^jf_vox: MIDI-to-i2c output to play a connected Just Friends module

modulation + events:
^^outs: a single MIDI-to-CV output device that collects multiple utilities
^^ins: translate incoming CV through crow to useful MIDI data for Live
^^trigs: a four-channel MIDI trigger-to-pulse device, useful for rhythmic events
^^tport: sync Live to your modular system with transport + tempo controls

crow programming:
^^bridges: translate multiple mappable knobs in Live into data for crow
^^derwydd: send Lua code to crow to execute + modify crow code in real-time
^^macros: store code snippets which can be sent to crow as macros on the fly

^^command_center, when properly initialized, connects the other Max for Live devices connect to crow.

^^command_center setup:
· load onto any MIDI track
· select your connected crow device from the dropdown
· don't see your crow? hit [refresh]



CONNECTING MANY CROW? EACH NEEDS AN ADDRESS!

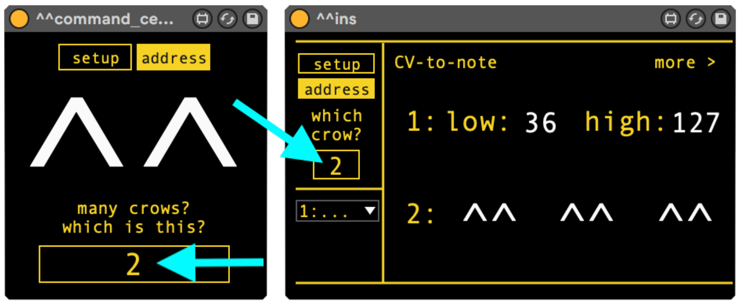
nb. If you are NOT connecting more than one crow to Live, you do not need to perform the actions outlined in this section. They do not apply to a single-crow configuration.

If you'd like to connect more than one physical crow module to the m4l devices, you'll need to instantiate a unique ^^command_center for each crow and give it a Live address. You'll also have to tell the other m4l devices to which address they should send messages. Don't worry, these addresses will all save with your Live Set.

Every ^^command_center defaults to address 1. To make sure messages from the m4l devices get to the right crow, toggle from [setup] to [address] and you'll be able to change ^^command_center's address.

A typical two-crow setup:
· connect each crow to your computer through USB
· instantiate two ^^command_center devices
· use the dropdown on the [setup] page to connect each ^^command_center to a different crow
· toggle to [address] and make sure that one ^^command_center has address 1 and the other has address 2
· on each of the other m4l devices, toggle [address] to direct the flow of traffic from the device back to the correct ^^command_center.

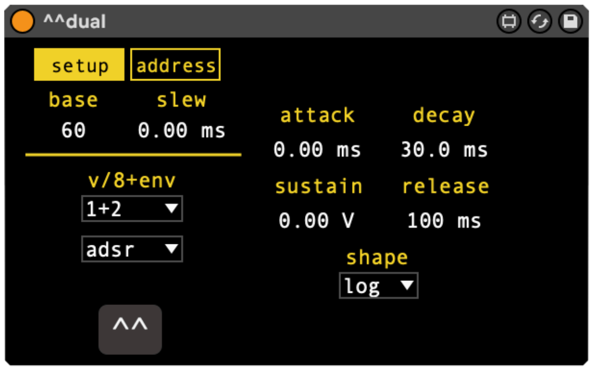
If I want to use ^^ins with crow 2, I would have to specify 2 as ^^ins address:



^^dual translates MIDI note data from Live to v/8 and envelope voltages. Load it onto any MIDI track and arm it for recording or set the track's monitoring to *in*.

overview

base	the MIDI pitch which equals 0V
slew	add glide between MIDI pitches
attack	define output envelope's attack time
decay	define output envelope's decay time
v/8 + env	identify which duo of outputs to use for v/8 and envelope
shape	specify envelope shape: log, lin, or exp



base 60
slew 0.00 ms
attack 0.00 ms
decay 30.0 ms
sustain 0.00 V
release 100 ms
v/8+env 1+2
adsr
shape log

crow outputs

output 1 or 3	v/8 from MIDI pitch
output 2 or 4	envelope triggered from MIDI note-on

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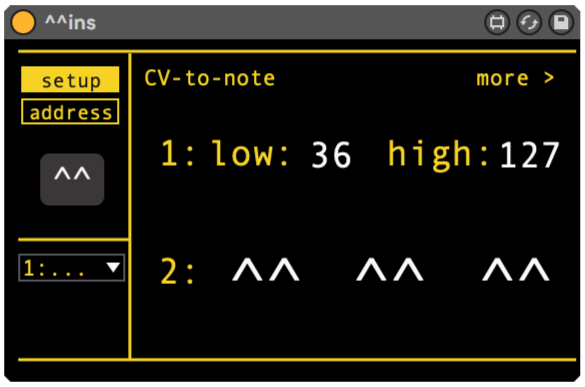
^^ins translates incoming CV to MIDI data. There are two modes — Mode 1 can be used to sequence a synth or VST in Live.

MODE 1: CV-to-note
CV-to-note mode translates incoming v/8 and triggers to create MIDI note events.

overview

low	set the desired floor for CV-to-MIDI pitch, default is 0V == 36
high	set the desired ceiling for CV-to-MIDI pitch, default is 127
^^	trigger indicators (passive)



CV-to-note
1: low: 36 high:127
1:...

crow inputs

input 1	expects v/8
input 2	expects trigger (5V)

voice control: ^^jf_synth + ^^jf_vox

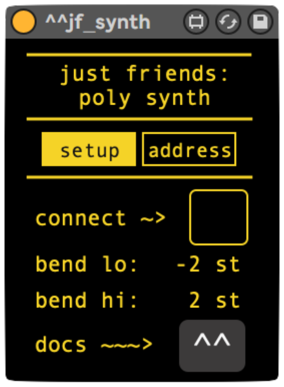
^^jf_synth and **^^jf_vox** are two devices which send MIDI data from Live through crow to control an i2c-connected Just Friends module. Load it onto any MIDI track and either arm it for recording or set the track's monitoring to *in*.

More info about i2c
More info about Just Friends

^^jf_synth addresses Just Friends as a 6-voice polyphonic synth. Notes are distributed I -> 6N, depending on how many are held down. Great for traditional keyboard playing + chords. Just Friends can be in *transient* or *sustain* mode.

overview

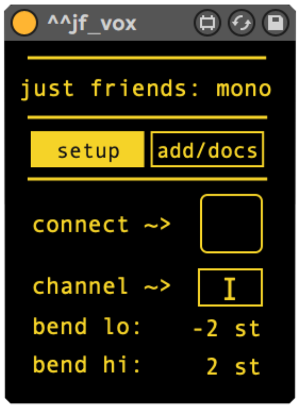
connect	toggle to connect to Just Friends *nb. if you see a √, Just Friends is already connected!*
bend lo	lowest pitch bend message target
bend hi	highest pitch bend message target



^^jf_vox addresses individual voices of Just Friends. It is great for monophonic sequencing. It is particularly rewarding to address many individual voices at once. Just Friends can be in *transient* or *sustain* mode.

overview

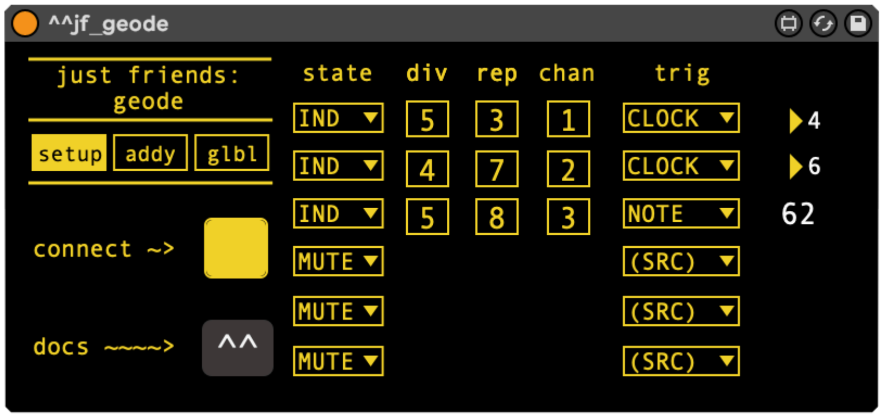
connect	toggle to connect to Just Friends *nb. if you see a √, Just Friends is already connected!*
channel	the channel (I -> 6 or all) which you'd like to play *nb. engage on only* **one** *copy of ^^jf_vox, otherwise Just Friends will disconnect*
bend lo	lowest pitch bend message target
bend hi	highest pitch bend message target



^^jf_geode controls GEODE mode on an i2c-connected Just Friends module. Load it onto any MIDI track and either arm it for recording or set the track's monitoring to *in*.

More info about GEODE

^^jf_geode addresses Just Friends as a 6-voice tempo-responsive polyphonic rhythm machine. There are six sequencer channels, which can be sent to a specific hardware channel (IDENTITY -> 6N) or allocated in round robin. Just Friends can be in *transient*, *sustain*, or *cycle*.

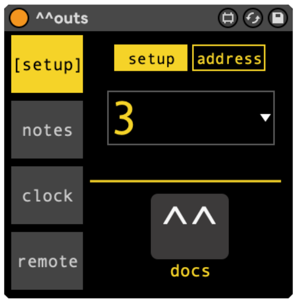


state	div	rep	chan	trig	
IND	5	3	1	CLOCK	▶4
IND	4	7	2	CLOCK	▶6
IND	5	8	3	NOTE	62
MUTE				(SRC)	
MUTE				(SRC)	
MUTE				(SRC)	

overview

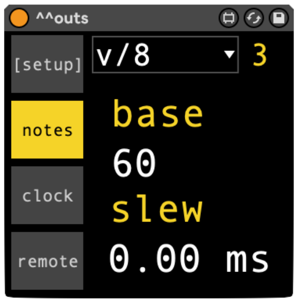
setup	
connect	toggle to connect to Just Friends *nb. if you see a √, Just Friends is already connected!*
state	**IND**ividual or **R**ound**R**obin
div	how many ticks per measure (4 beats), eg. 4 means 1 tick per beat
rep	number of times to retriever the envelope (-1 to run forever)
chan	select the channel to assign the rhythmic stream (0 for all)
trig	trigger the rhythmic stream either by a clock beat or a MIDI note
addy	for multi-crow setups, specify which crow to communicate with
glbl	
q.div	quantize Geode events to *divisions* of a measure — if you need your rhythms to stay on a regular grid, activate that grid with q.div
clk rate	specifies the division of the main clock which CLOCK trig = 1 adheres to
run?	enable RUN mode control
volts	applying RUN voltage emphasizes every 2nd then 3rd then 4th event, however all the in-between beats are available too. subtle shifts allow for a variation of groove with nothing but volume manipulation.

^^outs is a Swiss Army device — it holds a number of useful output utilities. Load it onto any MIDI track and arm it for recording or set the track's monitoring to *in*.
nb. you can instantiate this device up to 4x in a Live set, for each crow output



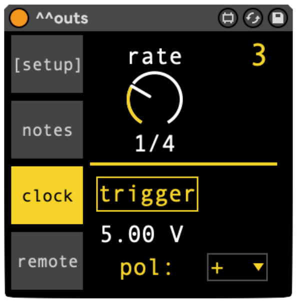
overview

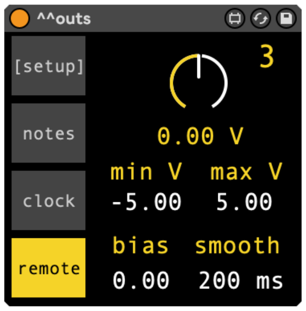
(out)	identify which hardware output you'd like to use *nb. the device will display the selected output in the top right corner of the module screens*



notes	*decoupled pitch cv or note-on trigger*
[dropdown]	choose v/8 or trigger signal
base	the base point for MIDI-to-CV conversion, default is MIDI note 60 = 0V
slew	adds glide between notes, default is none
length	when in trig mode, length of the trigger pulse

clock	*clock-synced pulses at variable rates*
rate	clock pulse rate, synced to Live's transport
trigger	set the max voltage for the signal, default 5V
gate	toggle behavior for trigger which will reveal % duty cycle of current clock rate, default 50%
polarity	whether triggers are a burst of voltage (default) or an absence of voltage in a continuous on-state



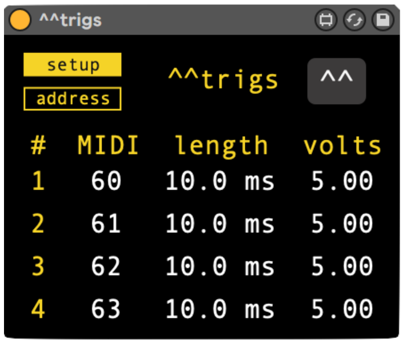


remote	*a knob which sends any movement out as CV*
min V + max V	the min/max voltage the knob can put out when the needle is far-left, default min: -5V, max: +5V
offset	adds voltage to the knob's current position, default 0V
smooth	adds glide between knob values, default 50ms

nb. to send an LFO to any of crow's outputs, map the **remote** *knob to Live's built-in LFO device (or any of the community devices you prefer)*

modulation + events: ^^trigs + ^^ins

^^trigs converts note-on events for up to four different MIDI notes to voltage triggers from crow. Helpful for converting drum-centric sequences to pulse events.



#	MIDI	length	volts
1	60	10.0 ms	5.00
2	61	10.0 ms	5.00
3	62	10.0 ms	5.00
4	63	10.0 ms	5.00

overview

MIDI	specify which MIDI notes should have note-ons translated to triggers
length	the length of the trigger pulse
volts	the voltage peak of the trigger

nb. if you don't want to use this device for all four outputs, just set the unused outputs' MIDI to 0 to avoid accidentally triggering the device

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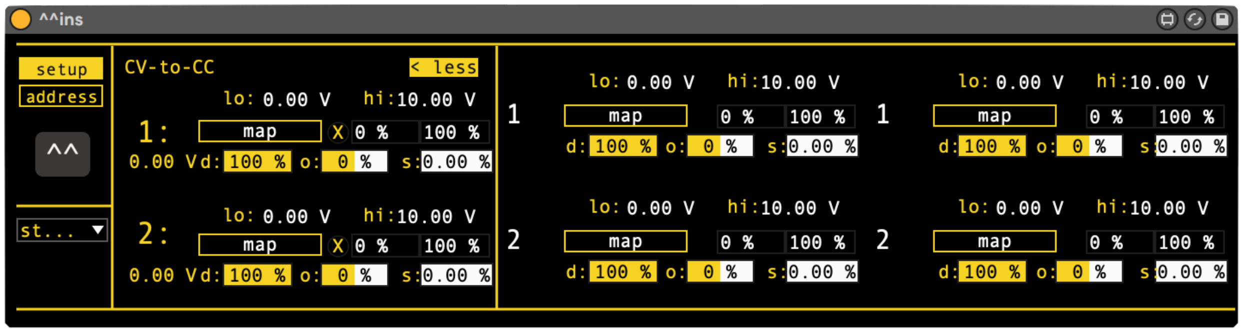
^^ins MODE 2: streams, CV-to-CC



1: lo: 0.00 V hi: 10.00 V map X 0 % 100 % 0.00 V d: 100 % o: 0 % s: 0.00 %

2: lo: 0.00 V hi: 10.00 V map X 0 % 100 % 0.00 V d: 100 % o: 0 % s: 0.00 %

1 lo: 0.00 V hi: 10.00 V map 0 % 100 % d: 100 % o: 0 % s: 0.00 %

1 lo: 0.00 V hi: 10.00 V map 0 % 100 % d: 100 % o: 0 % s: 0.00 %

2 lo: 0.00 V hi: 10.00 V map 0 % 100 % d: 100 % o: 0 % s: 0.00 %

2 lo: 0.00 V hi: 10.00 V map 0 % 100 % d: 100 % o: 0 % s: 0.00 %

overview

low	set the desired floor for voltage-to-CC, default is 0V
high	set the desired ceiling for voltage-to-CC, default is 10V
map	map the incoming voltage to any MIDI-controllable parameter in Live
d	depth of cv-to-cc
o	offset the scaling of received cv values
s	slew the cv-to-cc conversion, to soften clickiness/steppiness when mapping to audio parameters (like panning, filter cutoff, gain, etc)
> more	open an additional 6 channels of mapping

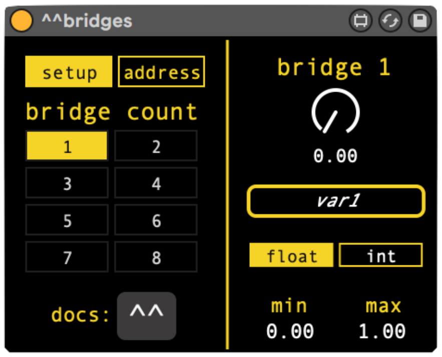
crow inputs

input 1	expects lfo / continuous voltage source
input 2	expects lfo / continuous voltage source

^^bridges translates multiple mappable knobs into data for a crow script; the primary use case is remote control over variables in a currently running script.

overview

bridge count	adds/removes bridges
varX	type in a name matching a variable in your script
knob	a remote control for varX
min / max	range of knob's affect on varX



tips:
· try automating the knob
· try MIDI mapping the knob with a MIDI controller
· try mapping the knob with another Max For Live Device

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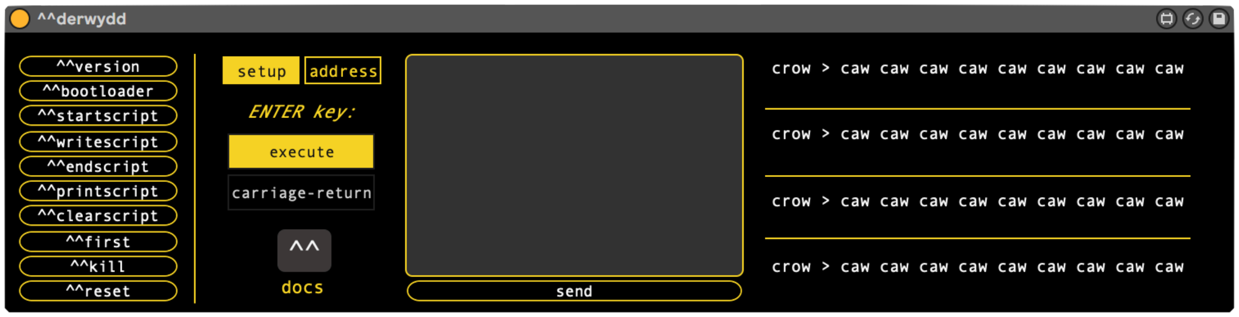
^^derwydd gives you access to crow's Lua read-eval-print loop, much like druid. Send Lua code to crow to execute on the fly, allowing you to modify crow's behavior in your real time. You can also use it to upload new scripts, erase scripts, and more.



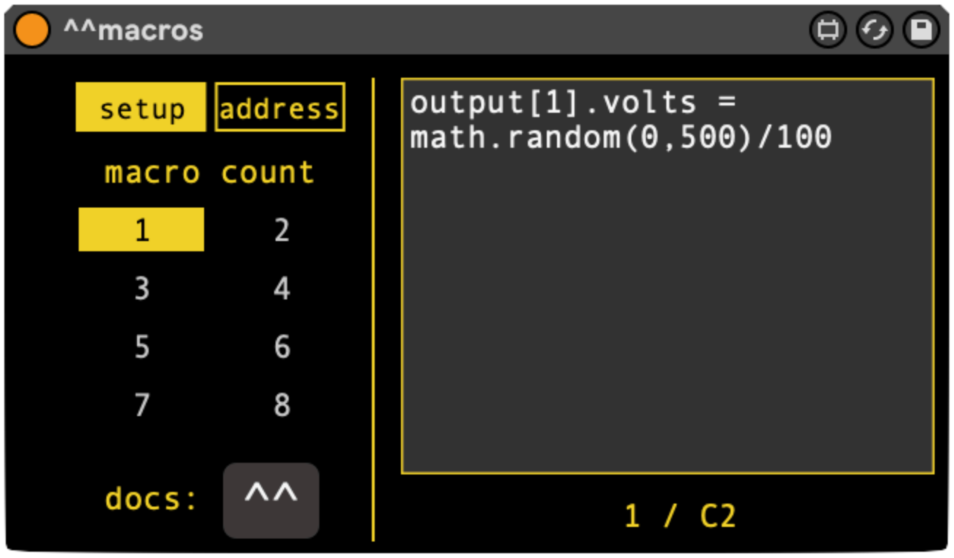
```
crow > caw caw caw caw caw caw caw caw caw
crow > caw caw caw caw caw caw caw caw caw
crow > caw caw caw caw caw caw caw caw caw
crow > caw caw caw caw caw caw caw caw caw
```

overview

^^ commands	executes system crow commands, hover over to learn more
ENTER key	toggle ENTER key behavior to execute codebox or add new line to allowing you to send more complex multi-line code snippets to crow
codebox	type in Lua code to send to crow
send	execute code in codebox

tips:
· use the up and down arrow keys to scroll through recently entered code snippets
· printouts and error messages from crow are displayed to the right of the codebox

^^macros sequences code snippets.Each snippet can be sent by selecting the device and pressing the corresponding number key on your keypad, or by sending the device the corresponding MIDI note. Code is saved with your Live set.

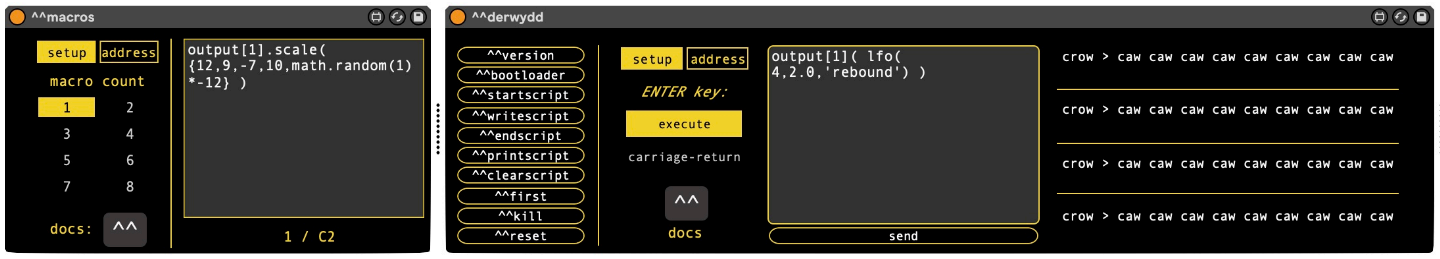


```
output[1].volts =
math.random(0,500)/100
```

overview

macro count	adds/removes macros
codebox	type in Lua code to send to crow
# / MIDI note	send the corresponding MIDI note to the device, or press the corresponding key on your keyboard to execute codebox *nb: when using number keys, make sure the device is highlighted*

The best practice with **^^macros** is to use one macro per line of code you wish to execute on-demand. For one-off commands, we recommend using **^^derwydd**, eg:



```
output[1].scale(
{12,9,-7,10,math.random(1)
*-12} )
```

```
output[1]( lfo(
4,2.0,'rebound') )
```

```
crow > caw caw caw caw caw caw caw caw caw
crow > caw caw caw caw caw caw caw caw caw
crow > caw caw caw caw caw caw caw caw caw
crow > caw caw caw caw caw caw caw caw caw
```

output[1].scale({0,3,5,9,2,10}) **– send via ^^derwydd**
*output[1].volts = math.random() * 3* **– send via ^^macros**

output[1]({ to(1,1), to(1.8,2), to(2.4,3),to(0,0.7) }) **– send via ^^derwydd**
output[1].scale({4,11,2,0,7,6}) **– change values on-the-fly and send via ^^macros**

output[1](lfo(4,2.0,'rebound')) **– send via ^^derwydd**
output[1].scale({12,9,-7,10,-12}) **– change values on-the-fly and send via ^^macros**