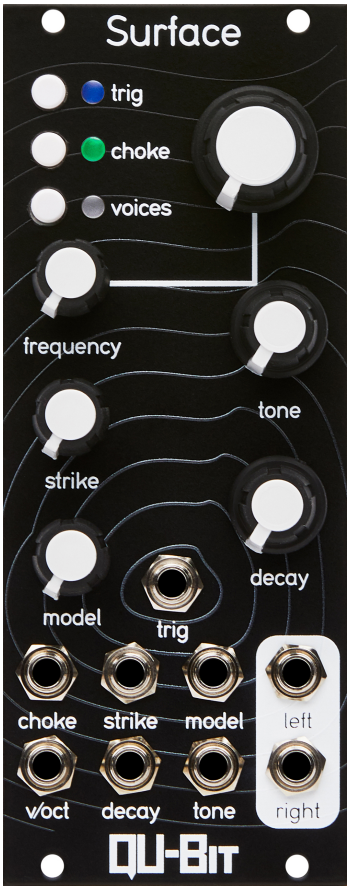
Surface


Surface
trig
choke
voices
frequency
tone
strike
decay
model
trig
choke
strike
model
left
v/oct
decay
tone
right
QU-Bit

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Description

Surface is a multi-timbral physical modeling voice capable of emulating the sonic qualities of acoustic instruments or morphing into otherworldly synthetic textures. Physical models contain plucked strings, prepared piano, and an assortment of melodic percussion, with up to 8 voices of polyphony. Creating a sense of space is easy with the true stereo outputs and their configurable spatialization modes.

Surface provides a unique take on physical modeling which blurs the line between emulation and synthesis to create entirely new worlds of sound.

- Multi-timbral Physical Modeling Voice
- Various sound models: plucked strings, prepared piano, tuned percussion, and waveguides
- 8 Voice Polyphony
- True stereo outputs with unique spatialization modes

Specs

Width: 10HP

Depth: 28mm

Power: +12V: 60mA, -12V: 60mA, +5V: 0mA

Marked Diagram

General Overview

1. Trig

Triggers a new voice, depending on the number of active voices and the Voices setting this will take over the oldest voice.

The LED for this will be indicated by the color of the active model.

2. Choke

Silence all voices by damping them.

The LED for this will be indicated by the color of the active model.

3. Frequency

Sets the pitch of the Root note of the active voice.

3a. Coarse

Quantized to semitones (5 octaves)

3b. Fine

Unquantized fine tune (+/- a perfect fourth from center.)

3c. V/Oct

1 volt per octave input for musical pitch tracking. Responds to +/-5V

4. Model

Selects the model to be used for the next triggered voice.

The following models are mapped evenly across the knob:

Model	Description	Split Model Output Routing	Color Indicator
Pluck	Plucked String (Karplus Strong)	Left	Purple
Bell	Modal Resonators that can morph from Vibraphone to Tabla	Left	Blue
E. Piano 1	Rhodes style Electric Piano	Left	Cyan
E. Piano 2	Wurlitzer style Electric Piano	Left	Green
Kick	Bass drum emulation with soft clipping saturation	Right	Yellow
Snare	Snare drum emulation	Right	ORANGE
Prepared Piano	Based on the Cageian prepared piano, modeled with waveguides	Right	Red

Pluck

Plucked String Model.

- **Tone:** Brightness, Filter Quality, and Cutoff
- **Strike:** Attack Strength
- **LED Color:** Purple

Bell

Modal Bar Model

- **Tone:** Controls ratios of the Bar to be struck. Transforms between Vibraphones and Tablas.
- **Strike:** Mallet Weight and Material
- **LED Color:** Blue

Bell Types (in order across the knob):

- Vibraphone
- Steel Drum
- Bayan Tabla
- Dahina Tabla

E. Piano 1

Rhodes-like Electric Piano Model

- **Tone:** Blend between two FM sources
- **Strike:** FM Index control for the secondary sound source (No effect when tone is all the way down)
- **LED Color:** Cyan

E. Piano 2

Wurlitzer-like Electric Piano Model

- **Tone:** FM Index Control
- **Strike:** Attack Amplitude (Click sound silenced when all the way down)
- **LED Color:** Green

Kick

Sine Wave based Kick Drum model with Saturation

- **Tone:** Amount of Saturation applied
- **Strike:** Attack time and Pitch Envelope amount (Slight audible attack time when all the way down)
- **LED Color:** Yellow

Snare

Snare Drum Model

- **Tone:** Noise Amount
- **Strike:** Pitch Envelope Amount
- **LED Color:** Orange

Prepared Piano

Prepared Piano Model

- **Tone:** Detune/Space Amount
- **Strike:** Semirandom Rattle/Restrike Amount
- **LED Color:** Red

5. Strike

Unique parameter for each model that affects the attack characteristics of the model.

See Each model for details.

6. Tone

Unique parameter for each model that has a general effect on the sound of the model.

See Each model for details.

7. Decay

Controls the decay time of the given model.

Generally in the range of 500 microseconds to 5 or 10 seconds (pluck and kick are on the longer side).

8. Voices

Controls the number of voices for the pseudo-polyphony

Pressing the button will advance to through the sequence of possible voice amounts

Number of Voices	Color
1	Blue
2	Cyan
4	Green
8	Purple

9. Outputs

Stereo Outputs. See Stereo Settings below for details on how these can be configured.

Average 10Vpp depending on settings.

Edit Functions

Accessing the Extra Settings Menu is as easy as holding down the voices button for longer than 1 second.

The Voices LED will begin to blink white while in this mode.

The mode can be exited immediately by pressing voices again, otherwise the mode will exit automatically if no buttons have been pressed for 30 seconds.

Change Output Behavior

Tapping the Choke button while in the Extra Settings Mode will switch between output modes, and display the corresponding color on the Choke LED.

Mode	Color	Description
Mono	Blue	Left/Right outputs are identical
Split Models	Green	All voices of a given model will output on a specific output
Split Voices	Purple	Even number voices will output from Left, and odd number voices output from the right
Random	Red	Each trigger will pan the new voices in a particular direction.

Regarding split model mode, the Model table in the section above includes which output will be used for each model.

Dark Mode

Tapping the Trig button while in the Extra Settings Mode will toggle between normal and Dark modes, and display the corresponding color on the Trig LED.

Mode	Color
Normal	Blue
Dark	Green

Dark mode features extreme parameter settings for all models. The settings here don't blend as well from model to model, butt make each model more versatile, or different on their own.

Calibration

1. With no jacks plugged into the CVs of the module, Hold the CHOKE button while you turn the module on. The Voices LED will begin to blink blue.
2. Insert 1V from a reliable source and tap voices again. The LED will begin blinking purple.
3. Insert 3V from a reliable source and tap voices again. The module is now calibrated.

If, for some reason, the module is accidentally calibrated incorrectly, and there are no available accurate CV sources to recalibrate it, the calibration can be reset to the default factory settings by pressing Trig from within the Calibration Mode.

Updating Firmware

Download the latest firmware from the internet.

Go to the Electro-smith Web Programmer for the Daisy and follow the instructions to connect to the Daisy to your computer. (You can leave it mounted on the module throughout this process).

Select the file you downloaded, and click the ‘Program’ button on the page

Checking Firmware Version

On boot up the module indicates the firmware with the following colors indicating numbers (This will get updated as more versions become available):

- Off = 0
- Blue = 1
- Green = 2
- Cyan = 3
- Purple = 4

The Trig LED will indicate the Major Firmware Version.

The Choke LED will indicate the Minor Firmware Version.

The Voices LED will indicate the Revision Firmware Version.

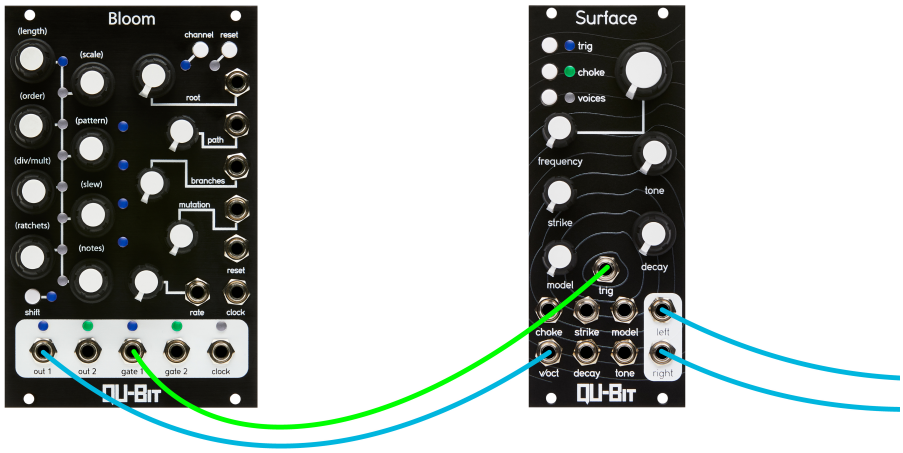
For example, v1.0.2 would be indicated by:

- Trig being Blue
- Choke being Off
- Voices being Green

After Three seconds the normal user interface will take over.

Example Patches

Getting Started



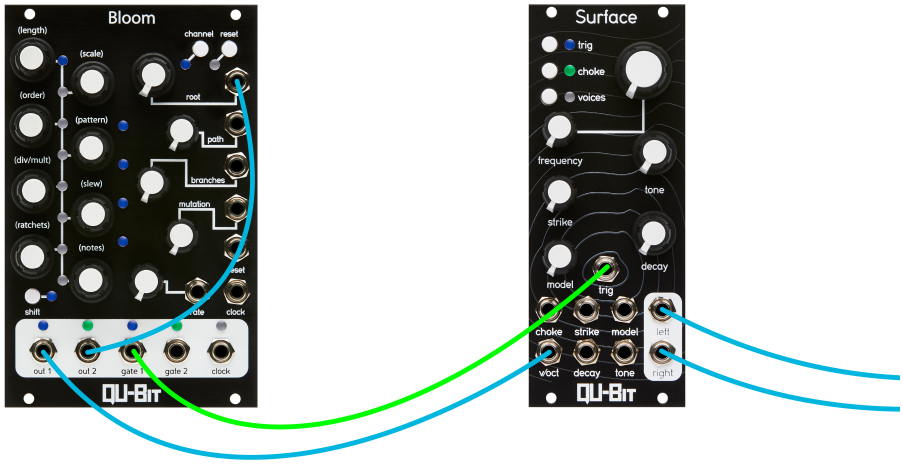
A basic patch to get your Surface singing!

Modules: Surface, Step Sequencer (Qu-Bit Bloom)

Patch Bloom's OUT 1 to V/OCT on Surface. Then, patch the CLOCK out or GATE 1 from Bloom to Surface's TRIG CV input. Make sure to send LEFT and RIGHT audio outputs to a stereo mixer to hear Surface's unique spatialization modes.

Your Surface should now be playing your sequence and is ready for modulation, model changes, and more!

Strummed Guitar



Using Surface to emulate a chord strummed on an acoustic guitar.

Modules: Surface, Step Sequencer (Qu-Bit Bloom)

Surface Settings:

- Model: Plucked String
- Strike: 100%
- Tone: Subjective
- Decay: 60%
- Voices: 8

Bloom Settings:

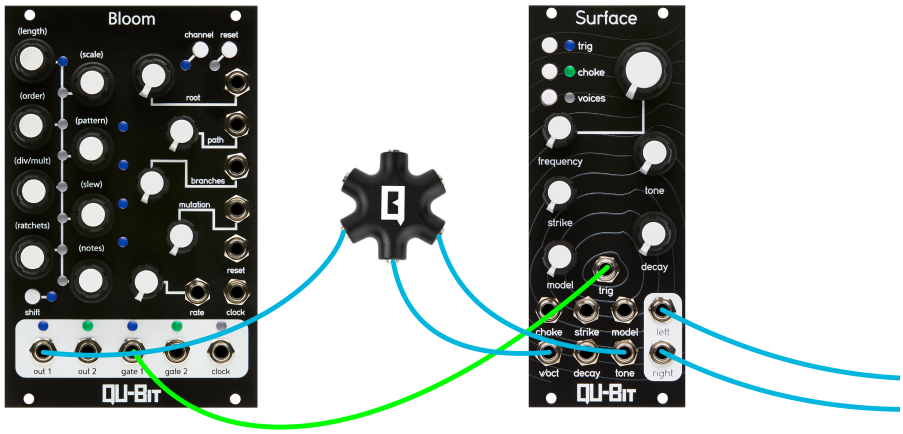
- Channel 1 (Blue):
- Steps: 32
- Div/Mult: x8
- Branches: 0
- Path: 0
- Rate: ~40%

Sequence your “chord” using the first 3 to 6 notes of your Channel one sequence. Leave the rest of the sequence empty. The Surface should now be strumming a single chord!

To add variety, use Branches and paths to add additional plucking, strumming, and guitar-like flair. Patching CV into TONE, DECAY, and CHOKE can help emulate palm mutes and varying picking styles.

To play a fixed chord progression, patch OUT 2 to the ROOT CV. On Channel 2 (Green), sequence your root notes for as many steps as you like. Set Div/Mult to /4 to cycle one Green step for every 32 Blue steps. Feel free to adjust step amounts and settings to your preference!

Keyboard Tracking



Mimic natural acoustic timbres as they move between lower to higher registers

Modules: Surface, Step Sequencer (Qu-Bit Bloom), Buffered Multiplier*

Surface Settings:

- Tone: 0

Patch your sequence out to a buffered multiplier. Send out your multiplied step signal to the V/OCT as well as the TONE CV input on the Surface. Your sequence will now keyboard track across the tone knob, affecting its amount depending on the note played. You can also send your split signal to STRIKE and DECAY for additional keyboard tracking goodness.

*Our Patch image uses a Qu-Splitter to demonstrate multiplying the step sequencer signal, which is not a buffered multiplier. We recommend using a buffered multiplier for a more accurate signal.