

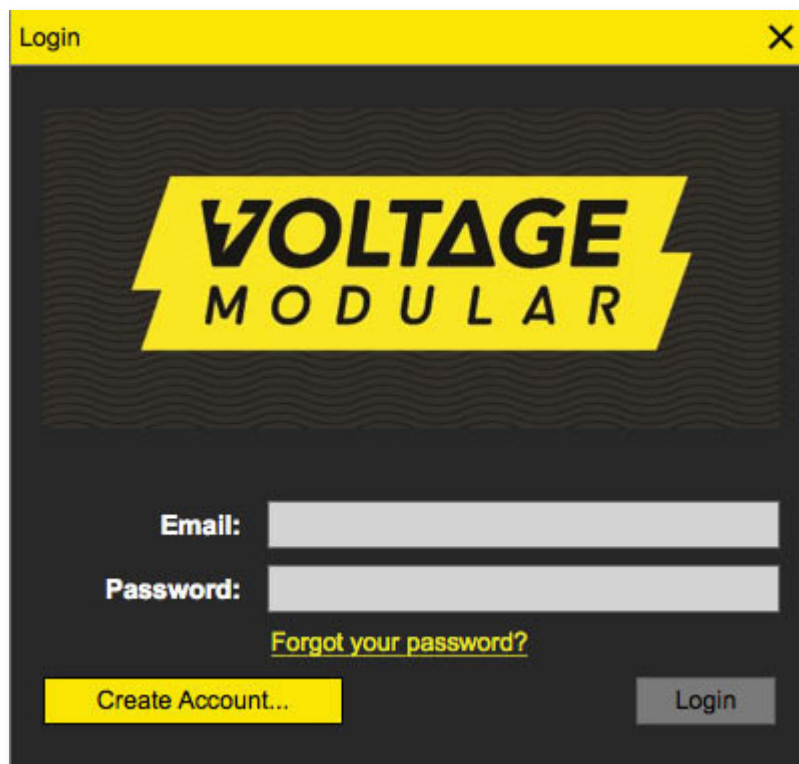
Thanks for choosing Voltage Modular! We're sure you'll have a blast creating amazing sounds with what we feel is the finest virtual modular synthesis system available.

If you have some experience with hardware modular synthesizers, you'll likely jump right in and get cookin', but if you're new or need information about specific functions, this is where you'll find it. This guide won't cover the functions of specific modules, but it will explain all of Voltage Modular's basic underlying functionality: preset loading and saving, adding and moving modules, the Voltage Module store, and more - essentially everything except how individual modules work.

Compatibility

Mac OS: Voltage can run as a standalone application or an AU, VST2, VST3, or Pro Tools AAX virtual instrument. It can also run as an effects plug-in in the aforementioned formats.

Windows: Voltage can run as a standalone application or as a VST2, VST3, or Pro Tools AAX virtual instrument. It can also run as an effects plug-in in the aforementioned formats.



User Account Log In

To use Voltage Modular, you'll need a user account. If you haven't yet created one, click the *Create Account* button which automatically opens the Cherry Audio website where you'll be walked through the easy-peasy

process. Once a user account is set up, simply enter your email and password in the appropriate fields to start using Voltage Modular.

Voltage Modular Install and Copyright Protection

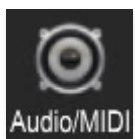
Voltage Modular's copyright protection uses an advanced encryption scheme that customizes the primary app and modules for use on *your* computer only. You'll need an active internet connection during initial installation of the primary app, modules, and sound presets, but once installed, you're free to go off the grid, eat organic spelt in a field, and power your music computer with a generator hooked to your stationary recumbent bike. (Voltage Modular is licensed for use on up to four computers. Users can log into their accounts to control which computers are licensed.)

Configuring Standalone Version MIDI and Audio I/O

Voltage can be used as a standalone application with or without a hardware keyboard or pad control. With its Musical Typing Keyboard, multiple note and trigger sequencers, you can make a heck of a lot of music without even plugging in a keyboard. To use a hardware keyboard or pad controller, click the gear icon to open *Settings*.



Click the *Audio* tab:



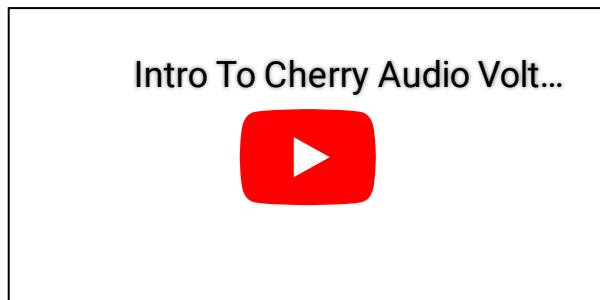
... then check the box for the appropriate USB controller in the *Active MIDI Inputs* area.



Audio inputs and outputs can also be set in this tab. Voltage will typically default to built-in system audio outputs, but clicking the pop-up window will display all other available audio hardware. The audio input can also be set here, but it's not necessary unless you intend to use Voltage's audio in jacks to process external audio (more on this in the [I/O Panel](#) section).

Getting Up and Running

If you're new to modular synthesis and just want to start making sounds, have a look at the following video. It gives a quick overview of loading presets, adding, moving, and patching modules, and more.



Technical Assistance

Cherry Audio's unique online store and automatic updating should make operation a smooth experience, but if you run into any issues or have questions, you can discuss issues online at the Cherry Audio forums at:

<https://forums.cherryaudio.com/viewforum.php?f=8>

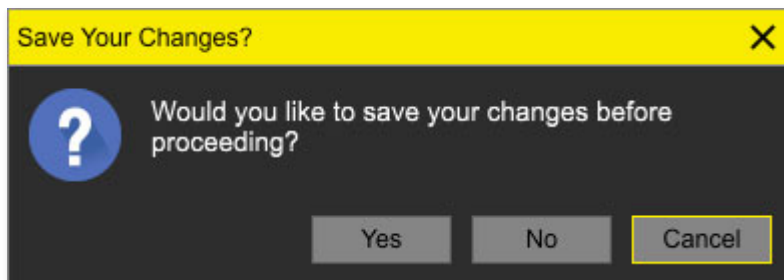
... or you can communicate directly with our ~~surly and uncooperative~~ outgoing and friendly tech support staff at:

<https://cherryaudio.kayako.com/>

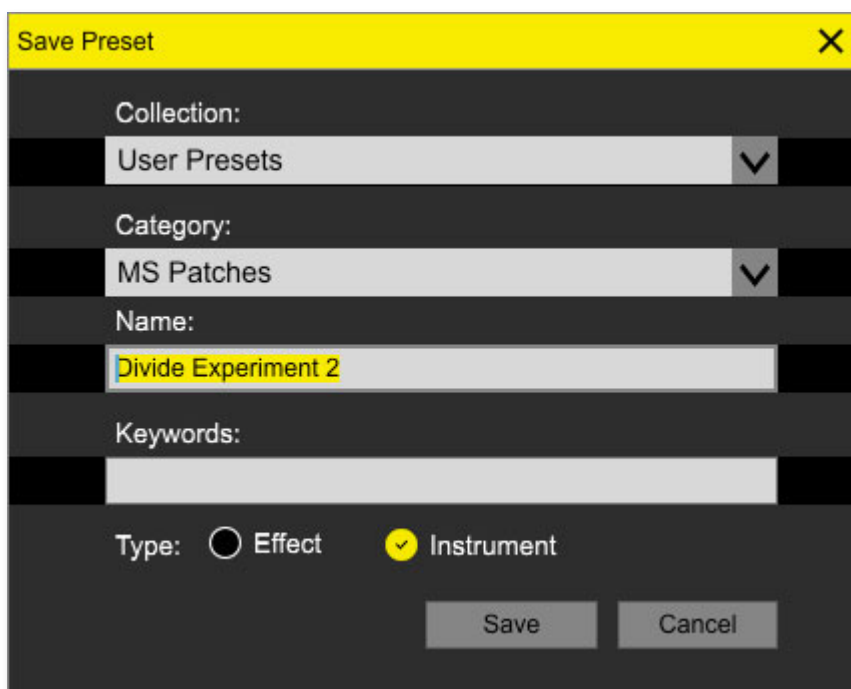
The strip at the top of the Voltage Modular interface is where you'll load, save, and create sound presets. It also contains basic utility functions such as undo, redo, zoom level, and more. Let's go over them:



New- Opens a new blank patch preset. If an unsaved patch is currently open or you've modified an existing saved patch, a dialog will ask if you'd like to save the patch in its current state. This greatly reduces the possibility of losing a patch that you may have spent a lot of time creating.



Save- Use this to save patches. There are a couple of levels of hierarchy:

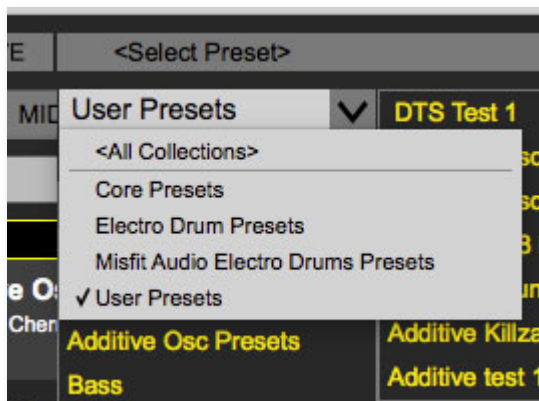


- *Collection*- This is the top level of organization, and contains entire “sets” of presets. The *Core* presets are the main collection of factory presets included with Voltage. New preset collections are included with

additionally purchased module sets (such as *Misfit Audio Electro Drums*), and we also include a *User Presets Collection*. However, you're free to create your own collections. To create a new collections, click in the *Collection* text field (where it says *User Presets* above) and type a name. User-created sounds can be freely saved to any collection; we like to keep 'em separated for organizational purposes.

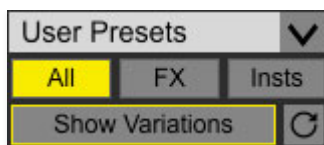
- *Categories*- Within each *Collection* are a number of sound categories. As with collections, you're free to create as many categories as you like. To create a category, click in the *Category* text field of the *Save* dialog window (where it says *MS Patches* above) and type a new category name.
- *Patch*- A patch is an individual sound. To save a patch, simply type the name in the *Name* field and click *Save*.
- *Keywords*- You can add descriptive words such as "huge," "noisy," "poly," etc. to patches to make them appear when terms are typed in the *Search* field. Use commas to separate multiple keywords entries.
- *Type: Effect/Instrument*- Select one when saving patches. This tells Voltage Modular whether the patch is intended for use as a virtual instrument, or as an insert effect.

Browsing Patches- Patches can be browsed by clicking the *<Select Preset>* field. To select a preset collection, click in the area that says *<All Collections>* or on the downward-facing arrow next to it.



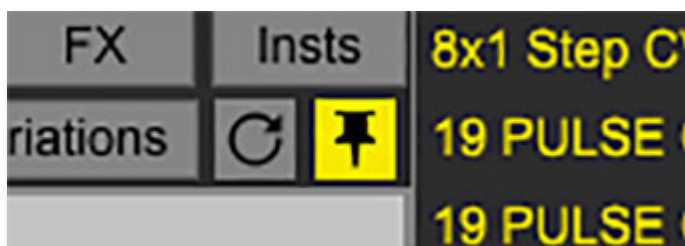
Clicking on the left-side categories narrows down which patches are displayed.

- *<All Presets>* will show presets from all collections and categories.
- *<Recent>* displays recently used presets. (surprising, right?)



Preset Filter Buttons- Toggling these buttons filters which patches show in the patch list.

- *All-* displays all patches
- *FX-* displays on patches saved as effects
- *Insts-* displays only patches saved as instruments
- *Show Variations-* hides or shows patch variations. More about variations in the Using Variations section.
- *Refresh-* This is the circular arrow button and it doesn't toggle a display filter. Clicking this checks the Cherry Audio server for new or updated presets. This occurs automatically every time Voltage is launched, but it's useful for developers.



Pin - Clicking the push-pin icon locks the patch selection list open, allowing fast and easy browsing and auditioning of patches. Click the icon again to disable pin mode. when in pin mode, the up and down arrow keys can be used to select patches.



Preset Step Back/Forward Arrows- These step to the previous or next preset.



Undo/Redo- Use these to undo or redo your last action. Patch a cable to the wrong place? Undo button. It remembers many steps, so if you really loused something up, keep on clickin'...



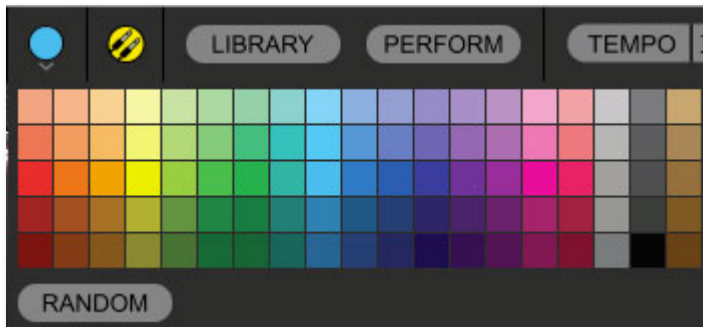
Zoom- Clicking this allows resizing of the I/O Panel, Performance Controls, and main module cabinets to accommodate various screen and window sizes. These settings won't change Voltage Modular's overall window size; this can be done by clicking and dragging an edge or corner.



Settings- This is where user preferences for cables, audio interfaces, user account, and more are configured. See the **Settings** section for full information.



Cable Transparency- Clicking the checkerboard icon displays the cable transparency slider. Slide this to the left for more transparent cables, or to the right for more opaque cables.



Cable Color Select- Click this to select the global cable color, i.e. the color of any newly patched cable. Clicking *Random* randomly chooses a color for each new cable.



Show/Hide Cables- Clicking this hides or shows all cables. It has no effect on sounds, and its status does not save with patches. Cables can also be shown or hidden using the key shortcuts [CONTROL-D] (PC) or [⌘-D] (Mac).

Special Cool Cable Color Select Feature!- The color of any existing cable can be changed by right-clicking in jack area. Right-clicking on a jack that doesn't have a cable plugged in will change the global cable color (i.e. the same as changing the color with the toolbar button).



Library- The “library” refers to the column on the left of the screen (or right depending upon the preference setting) containing the *Modules*, *Cabinets*, *MIDI*, and *Store* tabs. The *Library* button simply hides or displays the column. This is useful for maximizing the available display space for modules in a patch. Click [here](#) for more information on the *Library* column (or check the card catalog in the 786's at your local library).

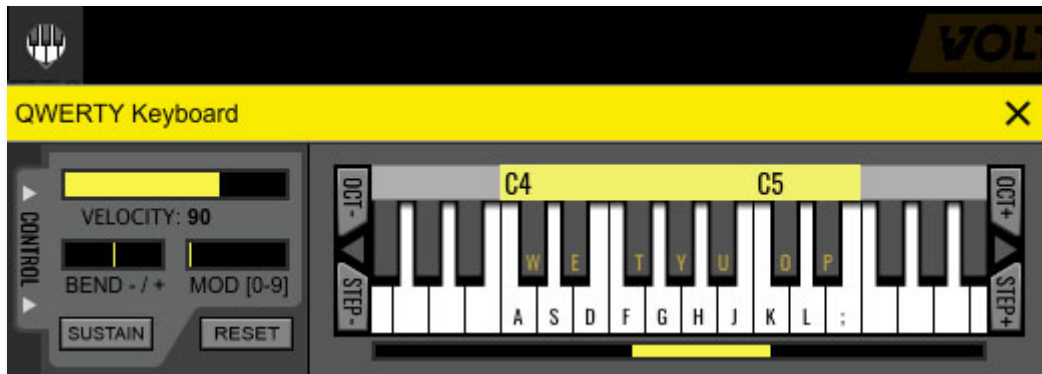


Perform- The Perform control panel contains nine knobs and four buttons; each control can be assigned to control one or more module controls. Like the *Library* button above, the *Perform* button simply hides or shows the panel to maximize the viewable cabinet workspace. [Click here](#) for the full lowdown on the *Perform* control panel - it's pretty useful and pretty awesome!



Tempo- Displays Voltage Modular's current internal tempo setting, which in turn controls the rate of the IO Panel Sync Out jack. The tempo display only appears in the standalone version of Voltage Modular as VST, AU, and AAX plug-in versions receive sync data from their host DAW app.

To change the tempo setting, double-click the number and type in the desired BPM value.



QWERTY Musical Typing Keyboard- Opens an onscreen keyboard allowing a standard QWERTY computer keyboard to be used for playing music notes. For more information, check out the QWERTY Musical Typing Keyboard section.



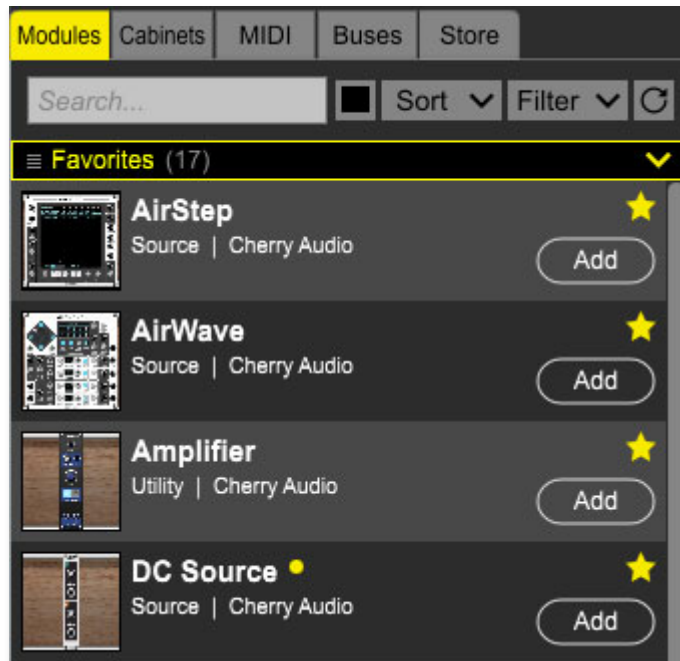
Voltage logo- Though it appears to be in-app advertising, clicking this displays “about” information, and shows the version number and current registered user ID.



Help - Clicking this launches your web browser and opens the very help document you’re currently reading. Circular logic at its finest.

The library refers to the column on the left of the screen (or right depending upon preference settings) containing the *Modules*, *Cabinets*, *MIDI*, *Buses*, and *Store* tabs. The library tab can be hidden or displayed by clicking the *Library* button in the top toolbar. Let's go over each tab:

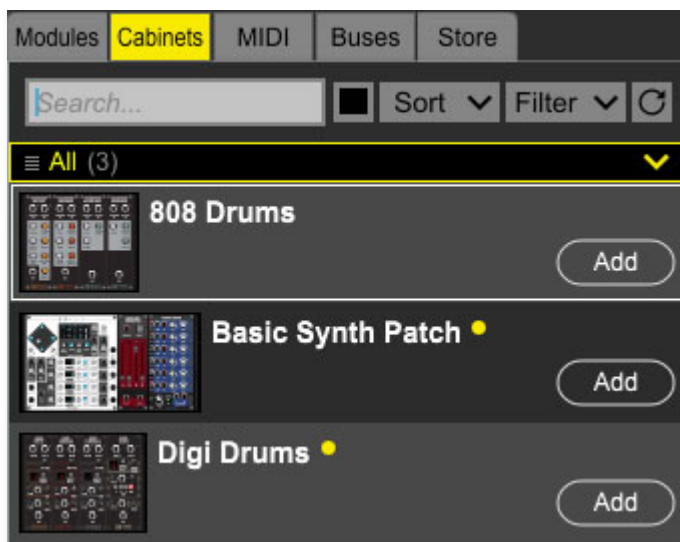
Modules Tab



The library *Modules* tab displays all modules currently owned by the logged-in user (that's you, bub). This is where you'll go to add new modules to a patch, either by clicking *Add*, or by dragging-and-dropping to a cabinet.

For more information about the *Modules* library tab, see [Working With Modules](#).

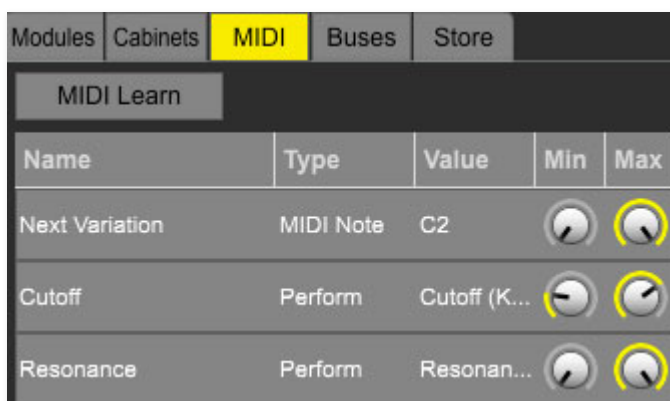
Cabinets Tab



A “cabinet” refers to a single horizontal row of modules. In contrast to presets, which save and load *all* modules and cabinets as a single entity, saving and loading cabinets allows mixing and matching of rows of modules, aka cabinets. This allows subsections of larger presets to be moved freely between patches. Cabinets also offer a time-saving way to load and save templates for sound creation. When the *Cabinets* tab is selected, all saved cabinets are displayed in the library column.

For more information about the *Cabinets* library tab, see [Working With Cabinets](#).

MIDI Tab



This tab displays information about how hardware slider/knob, button, and pad MIDI controllers are assigned to on-screen controls. It's also where you can see and configure DAW automation and Performance Controls Panel assignments.

For more information about the *MIDI* library tab, see [MIDI Continuous Controller Assignment](#).

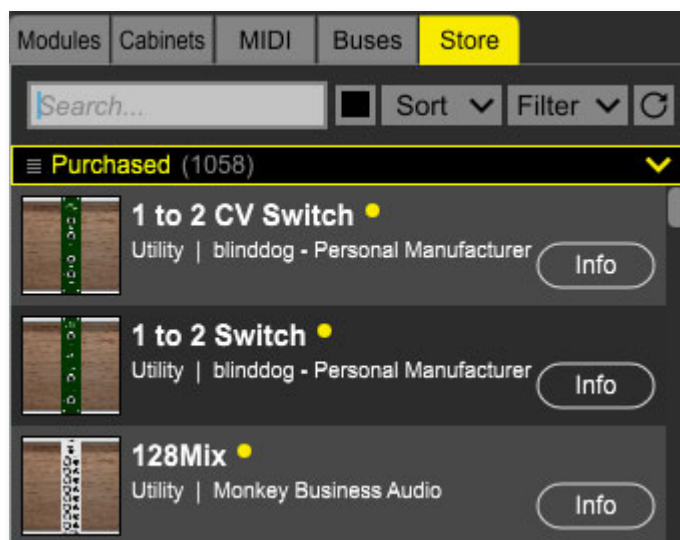
Buses Tab

Modules	Cabinets	MIDI	Buses	Store
#	Bus	Type	Jacks	
1	Keyboard CV	Mono	3	
2	Keyboard Gate	Mono	2	
3	Mod Wheel	Mono	2	
4	Pitch Bend	Mono	2	
1	MIDI Input	MIDI	2	

Displays info and allows modification of “hidden” input and output cable buses created within patches.

For more information, see the *Buses* section. If you need more information about school buses, city buses, or those cool double-decker buses, you’re on your own.

Store Tab



The *Store* library tab lets you purchase modules and sounds from directly within Voltage Modular. Purchased modules and sounds are automatically downloaded and installed for use in Voltage Modular. For information about using the *Store* library tab, see [The Voltage Modular Store](#).



The input/output, aka I/O Panel, is Voltage's "mission control." Here you'll route audio signals, virtual control voltages, and MIDI to and from your computer, audio hardware, and DAW software. It's also where the powerful patch *Variations* section and inbuilt WAV *Recording* section live.

The standard round "mini" jacks send or receive virtual control voltages or "CV" just like a hardware modular synthesizer. These conform to the 1V/octave standard used in most analog synthesizers and can only transmit a single signal at any time. The *Poly Sources* section contains "poly jacks," capable of transmitting up to 16 simultaneous signals; the five-pin jack in the *MIDI* section can transmit up to 16 channels of note and controller data, just like its hardware counterpart.

CV Sources

Oct- Transposes the pitch of the outgoing pitch control voltage in octaves. The LEDs to the right display the transposition interval.

Pitch- This is the pitch control voltage output. This usually is patched to an oscillator keyboard CV input, allowing oscillator pitch to track the keyboard in chromatic half-steps.

Gate- Outputs a constant 5V gate signal for as long as a key is pressed. This typically is patched to an envelope generator or voltage-controlled amplifier to control amplitude.

Trig- A trigger signal is much like a gate signal, but instead of staying high while a key is held, it briefly outputs 5V then returns to 0V (roughly 0.02 milliseconds). It's often used to turn something on or off, or trigger a "one-shot" drum sound.

Single/Multi- Defines how the *Gate* and *Trigger* voltages behave when a key is struck while another key is held. In *Single* mode, a new gate and trigger voltage will not be sent until all previously held keys are released. In *Multi* mode, new gate and trigger voltages are sent any time a new key is played. (Because the gate voltage is already "high," it will very briefly dip to zero volts when a new key is struck in order to let the module know to retrigger.)

Vel- Outputs a velocity control voltage between 0V and 5V, proportionate to how hard the key (or pad) is struck when using a velocity-sensitive controller.

Aftertouch- Outputs a control voltage between 0V and 5V, proportionate to ongoing key pressure when using a controller that transmits aftertouch.

Sus- Outputs a 5V control voltage when a MIDI sustain pedal message greater than 64 is received.

Bend- Outputs a control voltage between -5V and 5V, proportionate to pitch wheel movements. No voltage is transmitted at nominal position.

Mod Wheel- Outputs a control voltage between 0V and 5V, proportionate to mod wheel position.

Poly Sources

These are a special type of jack, capable of transmitting up to sixteen separate "lanes" of CV's, for use with special poly modules from Cherry Audio, PSP, and others. Poly modules and cables make creating and playing poly patches a cinch!

They make use of a special "poly" cable, identifiable by its slight larger D-shaped connector and striped cables. **Poly cables can only be patched to an appropriate poly jack.** In addition to poly oscillators, filters, amps, mixers, etc., Voltage Modular includes a number of utility modules for splitting and converting poly cable signals to standard "mono" CV's for tremendous flexibility (type "poly" in the *Library* search field to see them).

Poly Pitch- This transmits pitch control voltages.

Poly Gate- Outputs 5V gate signals for as long as keys are pressed.

Poly Vel- Outputs control voltages between 0V and 5V, proportionate to how hard the key (or pad) is struck when a velocity-sensitive controller is used.

Number of Voices- Globally sets the maximum number of poly voices, up to 16 voices. Reducing the number of voices may be helpful if you're using a computer with limited CPU.

MIDI

Voltage Modular's MIDI *From Host* jack transmits polyphonic pitch, note on-off, and MIDI CC data from external keyboard controllers and other devices.

When used with various MIDI-compatible modules, this allows for polyphonic patches, arpeggios and more. Voltage MIDI cables are a little fatter than "standard" patch cables and can only be routed to modules with MIDI jacks, including the Poly Oscillator, Arpeggiator, MIDI File Player, and a number of MIDI modules. The LED beside the jack indicates when MIDI data is being received from a controller.

Transport

Sorry, this isn't some nifty Star Trek doodad, but it's still pretty cool. The transport section carries 5V trigger CVs that simplify using and syncing Voltage in DAW projects or in the standalone version of Voltage.

Play- Transmits a 5V trigger when play mode is initiated in DAW host software.

Stop- Transmits a 5V trigger when stop mode is initiated in DAW host software.

Sync Out- Transmits a constant 96-pulse-per-quarter-note (PPQN) signal used to synchronize sequencers and other modules to DAW host tempo. These are intended for use with Voltage's *Sync Divider* module, which essentially "slow down" the super-fast sync signal to musically relevant note clock values.

The standalone version of Voltage will output 96 PPQN sync at the tempo specified in the *Tempo* field of the top tool bar. The *Tempo* field does not appear in the plug-in instrument versions, because the sync signal is derived from DAW project settings.

There are a couple of important things to understand about sync signals:

- **Sync signals are dumb:** Sync signals have no idea where the "one" is, or whether your DAW is playing or stopped. If a sync signal is routed to the *Sync Divider* module and its clock is sent to a sequencer, the sequencer will play at the same tempo as the host DAW project, but "shifted" in time by some random (and usually undesirable) amount which will likely make you insane. Please don't hop on a forum and tell the world that Voltage won't play in time. Instead, keep reading...
- **Use the *Reset* jack for perfect timing:** You'll notice that the Sync Divider, all sequencer modules, and most other timing/trigger-related modules have *Reset* input jacks. Routing the *Transport* section *Play* CV out to these resets these modules to "one" the instant the DAW play button is pressed, forcing everybody to play in time together. (Make sure the DAW play marker is starting on an even beat when you hit play, or else

everything in Voltage will play in perfect time, but out of time with the DAW project.)

Play Gate- Outputs a constant 5V signal any time the DAW host is in play mode. This isn't necessary to play sequenced patches in sync, but it can be handy for more esoteric applications, such as opening voltage-controlled amplifiers during playback.

Audio Sources

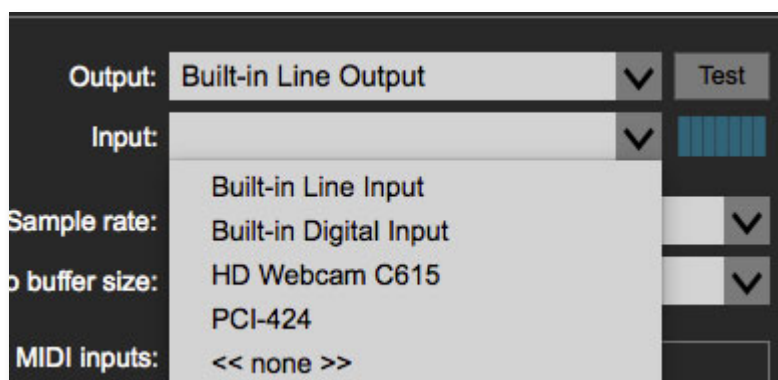
These allow audio to be routed in from either a host DAW when using the Voltage plug-in version (via the plug-in's sidechain inputs) or via the computer's onboard audio inputs when using the Voltage standalone edition. The *Audio In* sources can be configured in *Settings* (gear icon in the top toolbar) when using the standalone version.



... then clicking the *Audio/MIDI* tab



and selecting the *Input* pop-up window. Input level can be set using the horizontal meter next to the pop-up, or with the input meters by the jacks in the I/O Panel.



The *Audio Sources* are useful when using Voltage as an insert effect in a DAW (check out the *Insert & Bus Effects* category in the presets). They can also be used as carrier and modulator sources with the super cool *Vocoder* module.

Main Outs To Host

This is Voltage's master output section.

Volume Knob- Voltage Modular's master volume. Note that like the *CV Octave* and *Single/Multi* settings, its setting is stored with patches.

Limiter- Clicking this engages a transparent-sounding audio level limiter across the final output bus. Its intention is to prevent blowing your head off with loud or obnoxious patches. Safety first at Cherry Audio!

Main Outs To Host 1L(M)/1R jacks- The main out jacks that the final module of a patch is plugged into- the final module **must** be plugged into these or the neighboring *Aux Outs* in order to hear sound ("Hello, tech support? It doesn't make any noise...").

- **Are They Inputs or Outputs?** The concept can be a little confusing: these jacks are routed to your computer's audio hardware. Technically, they're inputs, because you're plugging an output of a module into them, but since they're internally attached to your computer's audio hardware, we call them "outputs." (Incidentally, we had some "spirited discourses" on this topic and how to name them appropriately. Just plug the final module in here and everything will be fine, we promise.)

Aux Outs To Host

These work like the *Main Outs To Host* jacks explained in the preceding paragraph, but they're routed to your DAW or audio hardware additional outputs. Depending on the audio interface used, they can potentially be custom routed within a DAW's virtual mixer or set up to output to additional DAW audio buses or audio interface physical outputs. A useful application would be to route a patch containing multiple drum modules through different DAW plug-in effects. (Kick to a compressor, snare to a reverb, etc.)

Variations



The *Variations* panel allows saving of all knob, slider, switch, or other control settings for individual patches. Variations only store control positions - they do not store patch cable routings. The concept of Variations is to treat a given patch as its own instrument, with variations representing different control settings on that instrument, much like a standard hard-wired synth with presets.

Save button- Click the *Save* button, enter a name in the dialog box, and click OK. You can save as many variations as you like.

Forward/Back arrow buttons- Used to select the previous or next variation. Variations may also be selected by clicking the downward arrow at the right of the display and selecting the desired variation.

Variations CV Jacks

These allow the use of CV's to select variations in a couple different ways.

Prev Var- Decrements the variation selection back when a voltage > than 2.5V is received.

Next Var- Increments the variation selection forward when a voltage > than 2.5V is received.

Rand Var- Randomly selects a new variation when a voltage > than 2.5V is received.

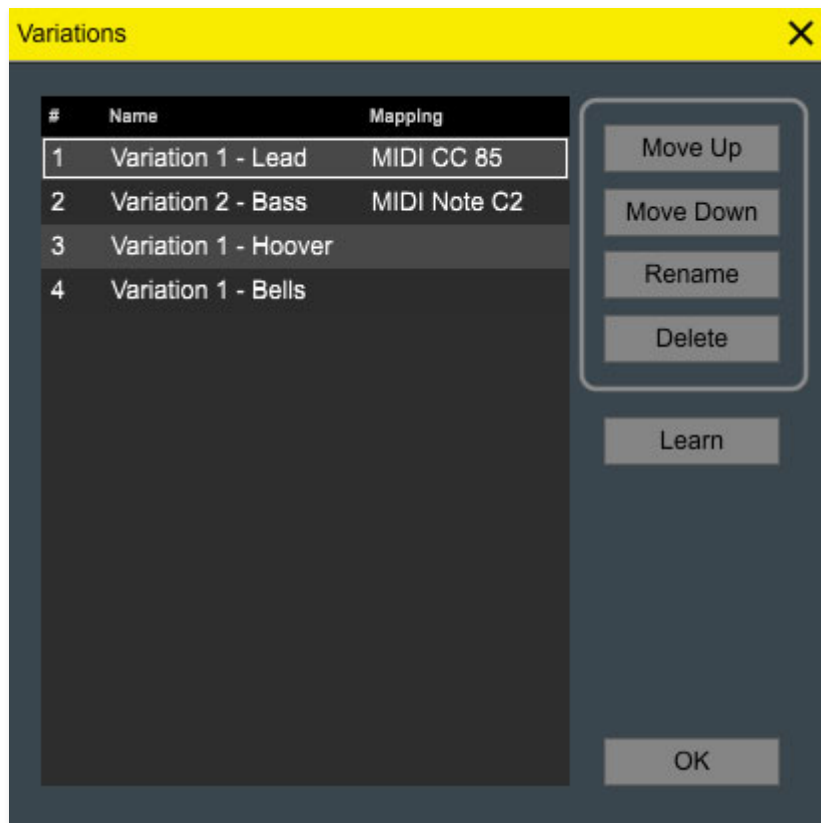
CV Sel- Allows selection of any current variation with a voltage input between 0 and 5V. The total number of variations is divided evenly over the 0-5V span. For example, if there were two variations, variation 1 would be selected from 0-2.49V, and variation 2 would be selected if the voltage was 2.5-5V. This is particularly useful if you're using a sequencer to select variations.

Variations Management

The Variation Management window allows renaming, deleting, and changing the order of Variations. It also lets you assign any MIDI controller to select a specific variation, which opens a lot of creative possibilities. To open the Variations Management window, click on a variation name in the display and select *Manage...*



The Variations window contains a list of all variation names for the current patch. Let's go over its functions:



Move Up/Move Down- These buttons change the order of the Variations list. This can be important if the variations are intended to play chronologically in a performance situation. To edit the order, click on a variation name, then click the *Move Up* or *Move Down* button until the variation is in the desired location.

Rename- Click this to open an edit field and rename the currently selected variation. Variations may also be renamed by double-clicking their name in the list.

Delete- Clears the selected variation. You'll get an, "Are you sure?" prompt, but deletion can't be undone, so be careful.

Learn- Allows assignment of any MIDI controller to select a variation. Select the variation you'd like to assign, click the *Learn* button to arm learn mode and move the external control you'd like to select the current variation. Any type of controller can be assigned, including continuous controls such as knobs and sliders, but momentary buttons, drum pads, or keyboard keys make the most sense.

All of the above functions can also be performed by right-clicking a variation in the list. MIDI controller assignments can also be unlearned by right-clicking.

When you're done editing variations, click the *OK* button.

Recording



The *Recording* section is a fast and easy to use WAV recorder. It can be used in the plug-in or standalone versions, but it's especially useful when using the standalone version. Recordings will be 48 kHz/32-bit WAV files.

Folder- Opens a file browser where the default destination of recorded files can be set. Voltage remembers this location, so you won't need to set it every time.

Rec- Click to start recording. The button will glow red during recording. Click again to stop recording... easy-peasy. A separate new file is created each time recording is initiated.

Recordings are sourced from the *Main Outs To Host* jacks only- the *Aux Outs* jacks do not feed into the recorder. Appropriate levels should be set using the meters in the *Main Outs To Host* section prior to recording. The *Main Outs* section *Limiter* is not in the recording path.

Rec Gate- Engages recording when a constant CV > 2.5V is applied. Recording continues as long as the gate CV is high, and stops when the CV is removed (specifically, if the gate CV is < 2.5V). A new recording file is created when the CV goes high; in other words, engaging and disengaging recording with the *Rec Gate* input creates new files each time the CV goes high and low.

The *Rec Gate* input is not intended for use with trigger signals; a trigger signal would just create a very short recording.

Cable Normalization

Strictly speaking, this is module-specific feature, but because it involves the I/O Panel, we'll discuss it here.

Voltage modules can be coded to communicate directly with I/O Panel connections without the use of patch cords via “invisible” patch cords. The idea is to speed up setup by automatically configuring often-used cables and routings.

For example, the Cherry Audio DCO-60 and Synth Voice voice modules use normalized connections to connect I/O Panel *Pitch* and *Gate* CV outputs to the appropriate oscillator and envelope generator inputs. This eliminates the need for cabling, and makes setting up these "full voice" modules exceptionally easy. Dependent upon how a particular module is programmed, any I/O Panel input or output jack of any type can be normalized to any input or output of that module.

Cable normalization does not strictly apply to I/O Panel connections; connections within a module may be normalized as well. With its numerous normalized modulation input jacks, our Synth Voice module showcases this design approach particularly well.

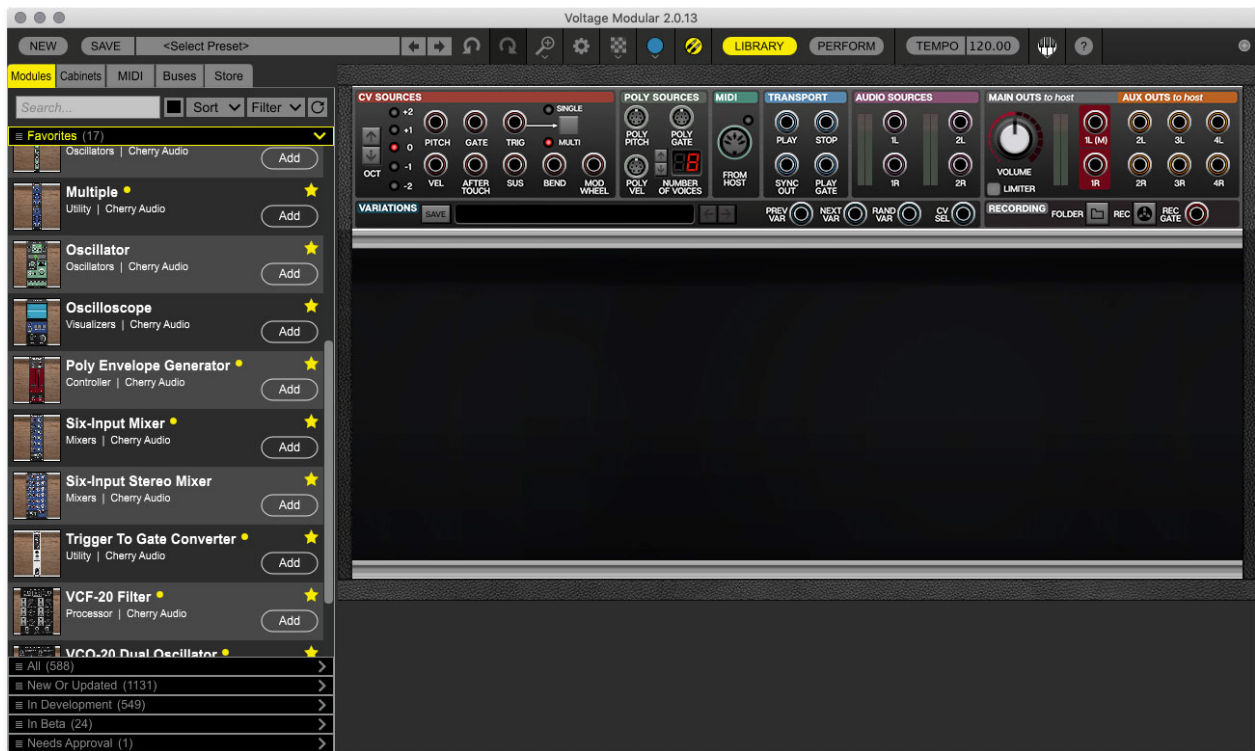
One thing to be aware with normalized connections is that input jacks behave a little differently than outputs. If an output jack is normalized to a connection, and a cable is plugged into that output, the normalized connection is not affected; it simply treats any extra cables as if it were a mulded output. Conversely, if a cable is plugged into a normalized input, the "invisible" normalled connection is broken and removed from the signal path.

Phew, now that we have all that menu and settings stuff out of the way, let's get to the part everyone's been waiting for: creating wicked modular synth sounds with a mess o' cables! Here we'll walk through the creation of a basic two-oscillator subtractive synthesizer patch:

Cabinets operate in Voltage Modular much as they do in the hardware world, except that you'll never need to worry about power routing or requirements, and that the size and number of cabinets is only limited by computer screen real estate.



Upon launch, Voltage Modular will display an empty screen. To create an empty cabinet, right-click anywhere in the empty gray area and choose *Add Cabinet*, or add a module by dragging it to the gray area or clicking the module's *Add* button.



Here we've added an empty cabinet. Note that the cabinet's edge and "back panel" appearance change dependent upon the *Cabinet Theme* selected in *Settings Gear icon>Interface>Cabinet Theme*. In this screenshot we've chosen the roadworthy-yet-understated *Vinyl* theme.



Here we've dragged in an Oscillator module. You could choose the *All* category and scroll to locate the Oscillator module, but it's much faster to type the first few letters of the desired module in the *Search* text field. Here we've typed "osc" which filters the display to only show modules with "osc" in their name. Just like finding stuff on Netflix, only noisier.

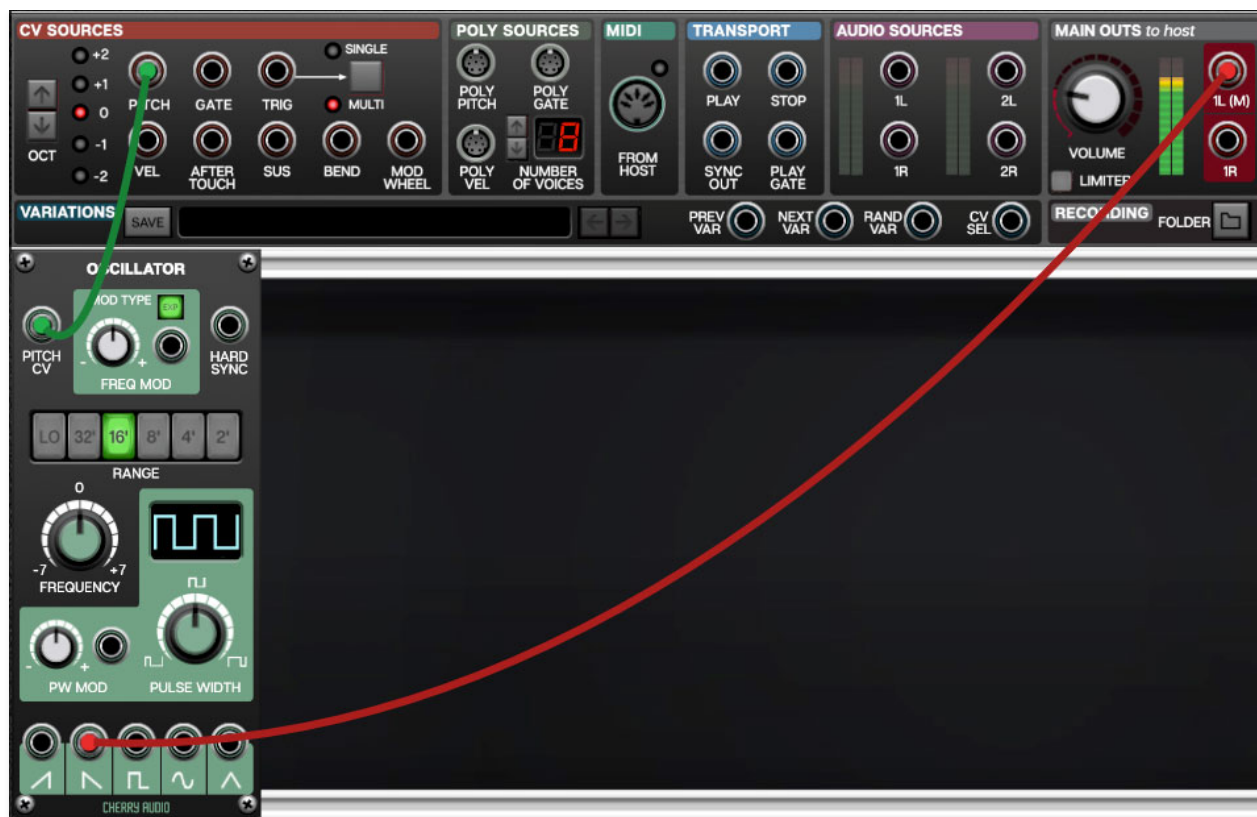
To patch a cable, click on a jack, drag it to the desired destination jack, and release the mouse button.



Inputs vs. Outputs

An important concept to understand is that all jacks are exclusively an input or an output (unlike a hardware modular synth, where some jacks can be used as inputs *or* outputs). When a jack is clicked to patch a cable in Voltage Modular, jacks not available as destinations are grayed out. For example, if you're patching a cable from an output jack, all other output jacks are temporarily grayed out. The same applies if you're patching a cable from an input jack; all other input jacks are grayed out. Now back to our previously scheduled programming...

In the screenshot above, the *Pitch CV* output is being patched, causing all of the oscillator output jacks to become grayed out, while all of the oscillator inputs are potential destinations.

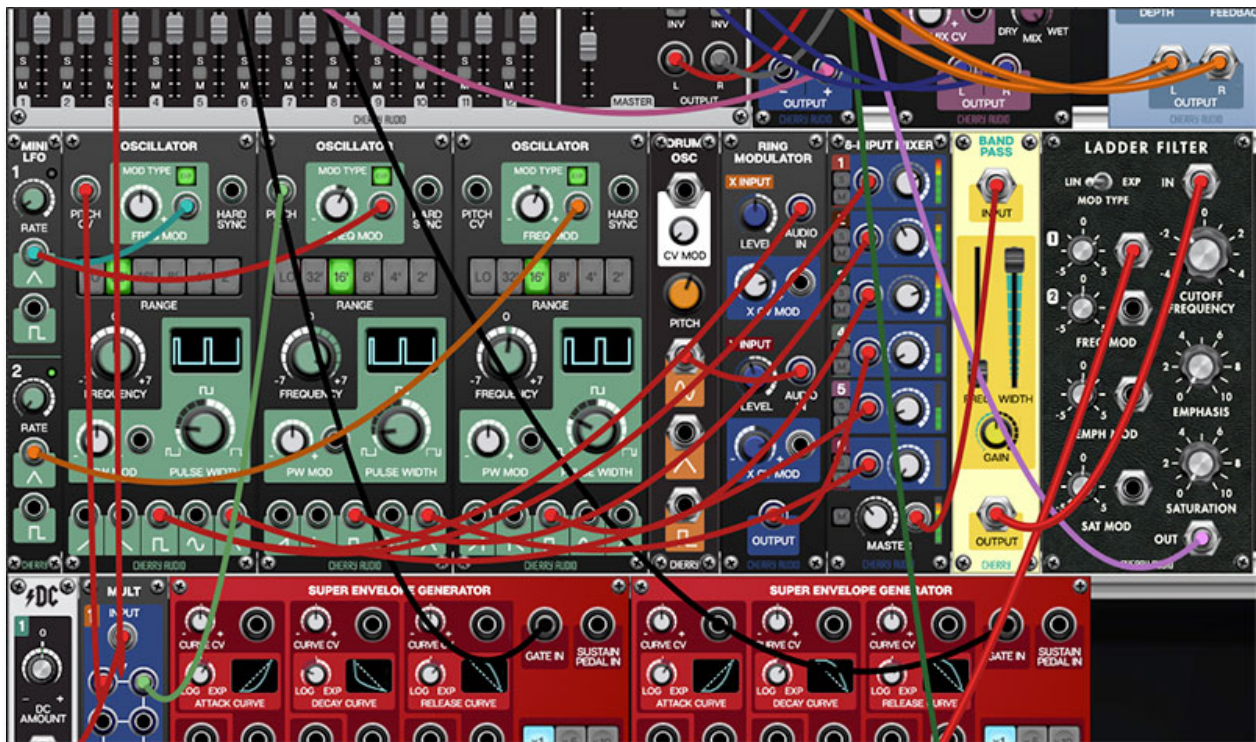


Here we've added two cables for a basic subtractive synth patch. The green cable routes the keyboard pitch control voltage out (we'll refer to control voltages as "CV's" from here on out) to the oscillator's keyboard CV in to allow keyboard control of pitch. The red cable routes the oscillator's sawtooth wave output to the main audio outputs. You'll notice the sound plays continuously, but we're about to fix that.



Here we've fleshed out our basic patch with the addition of a Filter, and Amplifier, and two Envelope Generators (one to control the filter cutoff, and another to control amplitude).

Now that we've covered how to set up a basic patch, we'll go over some (slightly) more advanced things you should know about cabinets, modules, and cables.



Basic Cable Operations

Patching A Cable- Simply click on a jack, drag the cable to the desired destination jack and release the mouse button, **but there's one very important thing to be aware of:**

Unlike a hardware modular synth, where some jacks can be used as inputs *or* outputs, **all Voltage Modular jacks are exclusively an input or an output.** To help clarify this, when a jack is clicked and held to patch a cable, jacks *not* available as destinations are grayed out. For example, if you're patching a cable from an output jack, all other *output* jacks are temporarily grayed out. The same applies if you're patching a cable from an input jack- all other *input* jacks are grayed out.

In the screenshot above, the *Pitch CV* output is being patched, causing all of the oscillator output jacks to become grayed out, while all of the oscillator inputs are potential destinations.

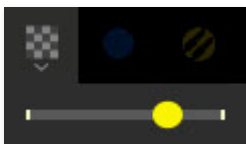
Disconnecting A Cable- Cables can be disconnected by grabbing one end of a jack and dragging it to any area that isn't a jack, or by right-clicking on a jack and selecting *Disconnect Cables*.



Selecting Cable Colors- There are a couple of ways to select cable colors. The most obvious way is to click the colored dot in the top menu bar to reveal the color picker palette and select a global color. By "global," this means all newly patched cables will be the chosen color (or a random color, if *Random* is selected). Existing cables are not affected.

To change the color of an existing patched cable, right-click on one of the jacks it's connected to, then click a new color. This changes *only* that cable, and won't affect the global cable color in the top menu bar.

- **Super Handy "Pre-Patching" Cable Color Selection-** Right-clicking a jack that doesn't have a cable plugged in opens the color palette and changes the global color; the same as clicking the color selector in the top menu bar. This is convenient for specifying a cable color right before patching a new cable.



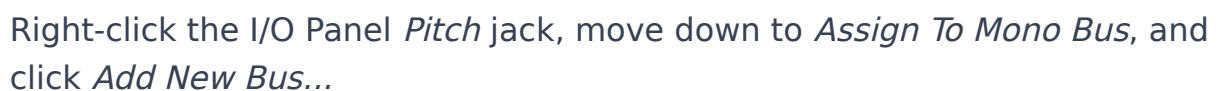
Adjust Cable Transparency- Clicking the checkerboard icon in the top toolbar displays the cable transparency horizontal slider. Slide this to the left for more transparent cables, or to the right for more opaque cables.

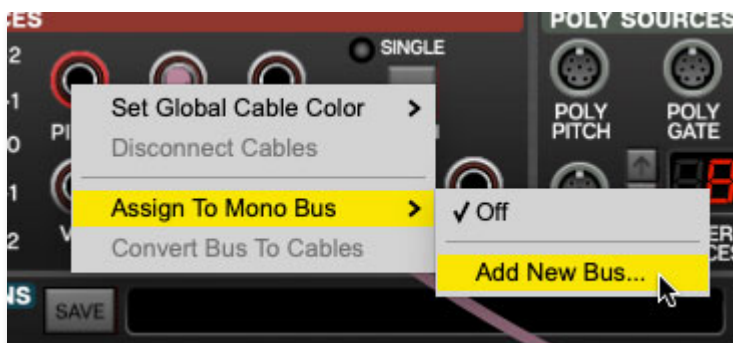


Show/Hide Cables- Clicking this hides or shows all cables. It has no effect on sounds, and its status does not save with patches. Cables visibility can also be toggled with the key shortcuts [CTRL-D] (PC) or [⌘-D] (Mac).

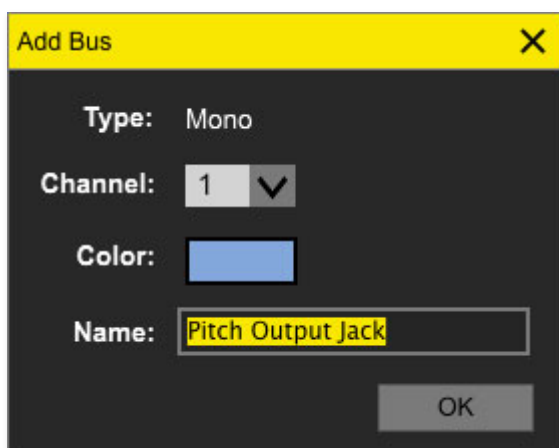
Cable Buses

In the following example we'll use a mono cable bus to simplify routing a pitch CV from the I/O Panel to multiple oscillators. Begin by setting up the basic two-oscillator patch shown below. Notice that we haven't connected the IO Panel CV Sources *Pitch* output.





The following window opens. The name field defaults to the jack name, or a custom name can be added. The bus color can also be customized by clicking on the color swatch. Click the *OK* button.



The jack will now be "filled in" with a number and color; this is the bus number.



Now we'll assign (fancy word for "connect") our pitch cable bus to the oscillator pitch CV inputs. Right-click on the first oscillator's *Pitch CV* inputs, select *Assign To Mono Bus*, and choose *(1) Pitch Output Jack*.



The jack will have the same bus number and "filled" appearance as the I/O Panel *Pitch* jack.



Right-click the second oscillator's Pitch CV jack and click *(1) Pitch Output Jack*. The I/O Panel Pitch CV output is now routed to both oscillators' Pitch CV inputs. In this way, the cable bus can be routed to as many destinations as desired. **Be aware that a single jack can only be connected to one cable bus at a time.** Jacks can be disconnected from a bus by right-clicking and selecting *Off*.





Cable buses can also be configured as a single destination with unlimited inputs. In fact, cable buses may be configured to combine multiple sources and destinations, allowing the creation of elaborate modulation matrixes such as those in classic and pin- and switch-matrix analog synthesizers such as the EMS VCS3 and ARP 2500.

Convert Bus To Cables- Exactly as its name implies, this converts all connections for a bus to mono, poly, or MIDI cables, dependent upon the bus type. The cables will inherit the color originally assigned to the bus.



Show Bus Connections- Hovering over any jack with a cable bus temporarily enlarges the colored circles for all other jacks currently assigned to the bus. This makes it easy to see jacks on the selected cable bus.

Combining Standard Cables and Cable Buses- Cable buses have no effect on standard jack connections. In other words, in addition to cable buses, you're free to connect as many standard cables as desired to jacks.

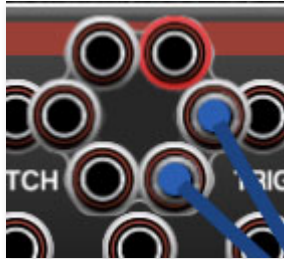
Modules	Cabinets	MIDI	Buses	Store
#	Bus	Type	Jacks	
1	 Pitch Output Jack	Mono	3	
2	 Gate Output Jack	Mono	3	
3	 Scope Input	Mono	3	
1	 Poly Pitch Output Jack	Poly	2	

Buses Library Tab-The *Library* tab includes a tab dedicated to cable buses. It mostly serves as a convenient way to view all cable buses in the current patch. It displays the bus number, bus name, connection type, total number of connections for each bus. (If they let me have my way, it would be called the "bus schedule.") Individual bus parameters can be edited, and buses can be deleted or converted to cables by right-clicking in the list.

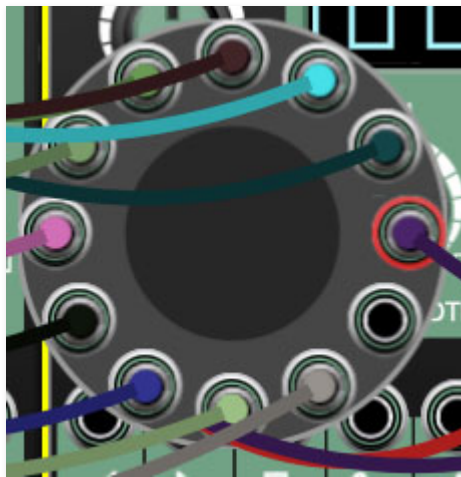
Advanced Cable Shortcuts and Tricks

Following are some not-so-obvious shortcuts that seriously speed up patching operations.

The Unlimited Mult Hiding Beneath Every Jack



If you look closely at the I/O Panel *Gate* CV out, you can see we've routed two cables from this jack to control both envelope generators. Single-clicking on any Voltage Modular input or output jack reveals a six-way multiple jack (aka, a "mult"), which is super convenient for routing (or mixing) multiple sources. The mult stays visible until a cable is routed, at which point it disappears.



Built-in jack mults initially display six jacks, but if more than six connections are added, the "ring" grows and additional jacks appear. Here's the nifty part: there's no limit to the number of mult jacks that can be added to a connection. (We can't wait for some wiseacre to attempt to connect 1500 cables to one jack.) You'll likely take this for granted after working with Voltage for a bit, but if you happen to use a hardware modular synth, you'll desperately long for unlimited built-in multiples!

As an aside, a few standard Mult modules (Multiple and Micro Mult) are included with Voltage, because sometimes seeing all connections is advantageous; the mult modules also let you use Voltage's labeling feature (right-click+"Add Label").

Move or Unplug Multiple Cables Plugged Into A Single Jack



Multiple cables plugged into a single jack can be moved at the same time by holding the [SHIFT] key and clicking and dragging to a new destination. This is also a very handy way to unplug multiple cables from a jack if the mouse button is released in an "empty" area (i.e., not on a jack).

Rapidly Routing A Cable To Multiple Destinations

This one's not so obvious, but it's really handy. To patch cables from a single jack to multiple destinations, press and hold the [CTRL] key in Windows or the [⌘] key on Mac, click the source jack, then click as many destination jacks as desired and release the modifier key when you're done. This works with input or output jacks, and is particularly useful for patching pitch and gate CV's from the I/O panel to multiple oscillators or envelope generators.

Poly Cables

Poly cables are a special cable for use with poly modules from Cherry Audio and other developers. Recognizable by their D-shaped connector and striped cables, a poly jack and cable can transmit up to sixteen separate channels, or "lanes," of CV or audio, which drastically simplifies polyphonic patch creation. Poly CV, gate, and velocity signals are available in the I/O Panel *Poly Sources* section.

Poly cables and modules are discussed thoroughly in the [Working With Poly Modules](#) section.

Virtual MIDI Cables



Voltage Modular's virtual MIDI cables behave much like standard cables, but instead of carrying a single audio or control voltage signal, they carry 16 channels of note and control data just like a good ol' MIDI cable. Though virtual MIDI cables have been somewhat superseded by our Poly jacks, they're handy for certain applications, particularly when MIDI controller data is being transmitted or received from hardware instruments.

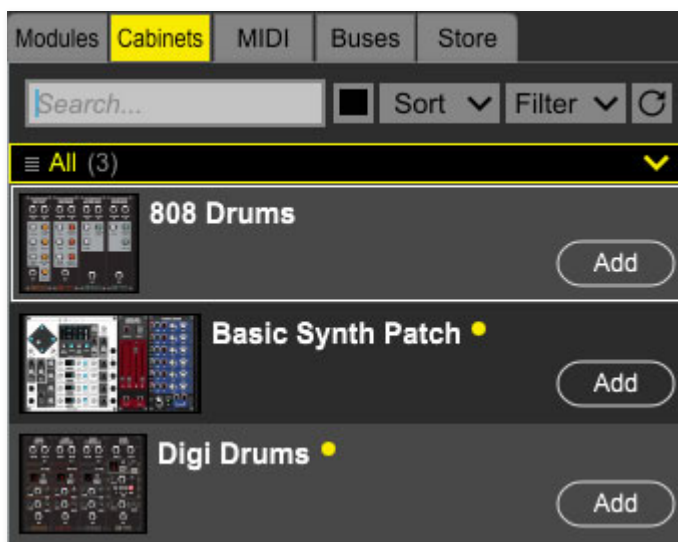
You'll notice that virtual MIDI cables are a bit fatter than standard cables; this is done to make them easy to recognize on-screen (and to fit all that extra data). Virtual MIDI jacks also contain the previously discussed built-in unlimited mult, and if that's not enough, there's a MIDI Multiple module as well. If you're using Voltage Modular Core edition, you'll find numerous MIDI

input, output, drum trigger modules and more for transmitting and receiving MIDI data with external instruments and other useful functions.



A "cabinet" refers to a horizontal row of modules. Cabinets have no width limitations; you're free to add as many modules as you like. If the number of viewable modules exceeds the width of the Voltage Modular window, a scroll bar appears at the bottom of the window. Optimally, you'll want to see as much of a patch on-screen as possible, so it makes sense to organize modules into additional cabinets, stacked vertically. (It also makes sense to "borrow" your rich brother's 120" flat-panel TV and use that as a computer display, but you didn't hear that from us.)

The Cabinets Library Tab

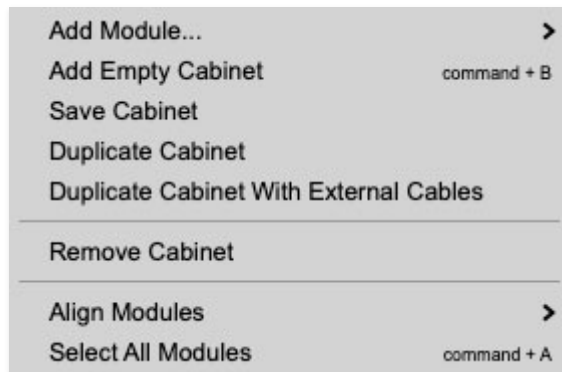


This is a useful Voltage feature that many users aren't aware of. Any cabinet (i.e. a single row of horizontal modules) can be saved *independently of a Voltage preset*. Not only is this nice for creating patch templates, it's really

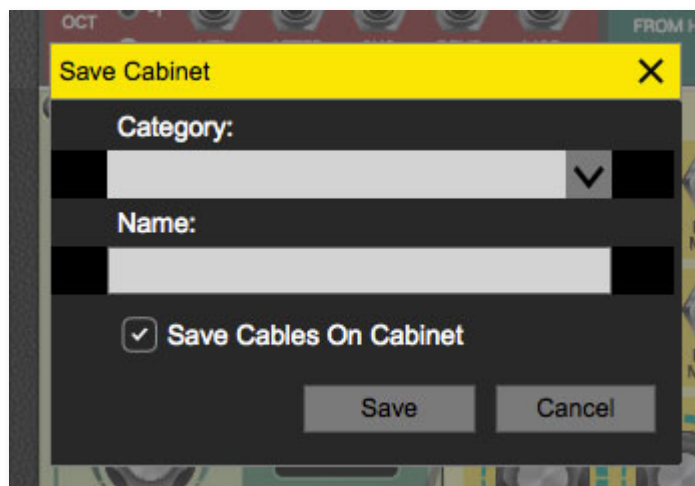
useful for moving parts of patches to a different patch (you may need to do some fancy shuffling of modules into a single cabinet row first).

All stored saved cabinets are visible in the Library tab regardless of the currently selected patch.

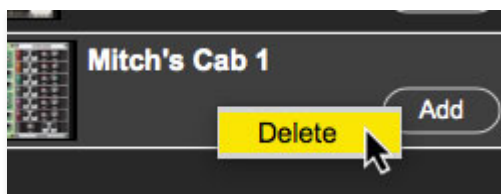
Loading Cabinets- Cabinets can be added to the current preset by clicking the *Add* button, dragging to the module area, or by double-clicking. Newly added cabinets always appear beneath existing cabinets, but once a cabinet is added, modules can be freely dragged between cabinets.



Saving Cabinets- To save a cab, right-click either on the left-edge of a cabinet, in open area of the cab (i.e., an open space without a module), or on one of the “aluminum” rails and select *Save Cabinet*.



Choose an existing category by clicking the downward arrow, or type in the text field to create a custom category, then type a name in the *Name* field. The *Save With Cables* box is on by default and will save all cable routings. Disabling it will save the module layout only, without cables.



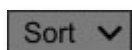
Deleting Cabinets- To permanently delete a cabinet from the library, right-click it in the library tab and click *Delete*. Be careful with this (though you can hit the *Undo* button).

Like the *Modules* tab, cabinets can be saved in user-named categories, but unlike modules, which are “pre-assigned” to one of Voltage Modular’s five module categories, there are no limitations on the naming convention or number of cabinet categories.

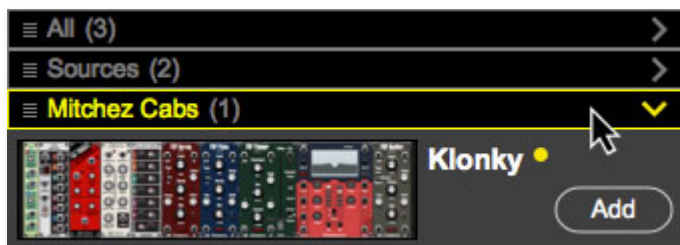
Search- This super-handly field lets you search for modules by typing a few letters of the module name. For example, typing “LFO” would display the LFO and MiniLFO modules. The search field can be initialized by clicking the *X* icon.



Graphic/List View Select- This little guy is easy to miss, but clicking it toggles between graphic+name or name-only display in the cabinet list.



Sort- This drop-down menu allows sorting of the module list by name, category (more on this below), date acquired (as in, “show me my new stuff!”), or the company that made the module.



Filter- Allows filtering of which modules are displayed using descriptive headings.

- *None-* Shows all currently owned modules with no separate headings.

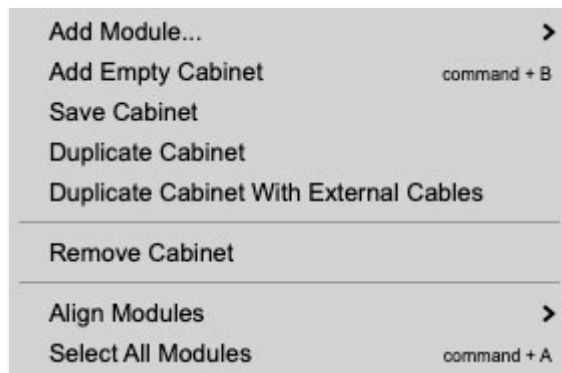
- *Categories*- Divides up modules by "stock" and user-created categories.
- *Name*- Sorts categories alphabetically.

Creating Cabinets

The easiest way to create cabinet is to drag a module from the library or an existing cabinet onto the gray area next to the library. Cabinets can also be added by right-clicking anywhere in the empty gray area and clicking *Add Cabinet*.

Cabinet Right-Click Menu

The contextual menus that appear when you right-click in a "blank" (i.e., no modules) area of the cabinet.



Add Module...- Allows modules to be added quickly without using the *Library* tab. The submenu displays Favorites, then the five module type categories.

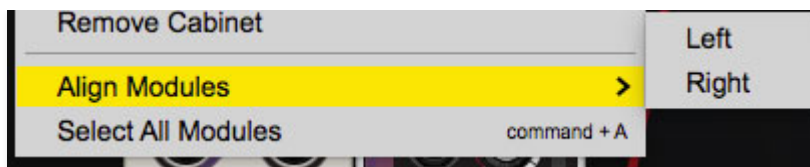
Add Empty Cabinet- Adds a new blank cabinet. The new cabinet will appear beneath if there are any existing cabinets.

Save Cabinet- Saves the cabinet that's being right-clicked to the library *Cabinet* tab.

Duplicate Cabinet- Creates a copy of the cabinet with all modules directly beneath. All cables *within the cabinet only* remain intact.

Duplicate Cabinet With External Cables- Creates a copy of the cabinet with all modules directly beneath. All cables will be intact, *including cables patched to destinations not within the cabinet*. (e.g., I/O panel connections).

Remove Cabinet- Clears the entire cabinet and its cables. Be careful with this one, as it's easy to mess up patches (you can always hit the *Undo* button).



Align Modules- These functions allow rapid tidying up by moving all of a cabinet's modules left or right while simultaneously closing up gaps.

- *Left*- Moves all modules of the current cabinet all the way to the left and closes gaps between modules.
- *Right*- Moves all modules of the current cabinet all the way to the left and closes gaps between modules. *Align Modules/Right* will only move modules to the farthest currently visible right-side border.
- *Auto Align Left*- This is an on/off parameter- when *Auto Align Left* is enabled, modules automatically slide to the left, with no gaps. If modules are moved or deleted, any existing modules to the right will slide left to close the gap. *Auto Align Left* is a per-cabinet setting. The default on/off setting of *Auto Align Left* can be set in *Settings>Interface>Auto Align New Cabinets To The Left*.

Select All Modules- Highlights all modules in the cabinet. You'd typically use this to move or delete all modules in a cabinet simultaneously.

Moving Cabinets

Cabinets can be vertically relocated. You can swap positions of multiple cabinets, or move cabinets above or below the I/O Panel or Performance Controls panel. To move a cabinet, click and drag on the left edge of the cabinet frame. It can be little hard to tell where you're supposed to grab, so we've highlighted the "grab" area in red In the screenshot below. It isn't actually red in Voltage Modular, but it the left and right edges of the currently selected cabinet re shaded a little darker. This works exactly the same for moving the I/O Panel and Performance Controls pane.



Here we'll cover the nuts and bolts of working with modules (but unlike a hardware modular synth, no actual nuts or bolts are involved). Before we discuss the big Library tab on the left (or right, if you changed it in *Settings*), we'll take a short detour to discuss module categories.

Module Categories

All modules are assigned to one of the categories below when programmed. Note that the number of categories has been expanded considerably from Voltage version 1.0.

- **Controllers**- keyboards, sequencers
- **CV Processors**- modules that perform operations that alter CV
- **Drums**- drums and percussion modules
- **Effects**- traditional audio effects such as reverb, delay, chorus, distortion.
- **Envelope Generators**- modules that shape CV over time
- **Filters**- audio filters such as lowpass, bandpass, highpass, etc.
- **Instruments**- modules that contain complete synth instruments
- **I/O**- audio, CV, or MIDI modules that transmit or receive signals to external hardware
- **Logic**- modules that perform mathematical CV operations
- **Metering**- audio level meters, oscilloscopes, etc.
- **Mixers**- modules that mix audio or CV signals
- **Oscillators**- modules that generate audio or control signals
- **Polyphonic Utilities**- modules for combining or breaking out poly audio and control signals
- **Processors**- filters, waveshapers, EQ's, things that alter sound.
- **Sequencers**- modules that create melodic or rhythmic repeating CV patterns
- **Sources**- oscillators, noise generators, anything that makes a sound.
- **Switches**- modules that enable, disable, or redirect signals
- **Utilities**- general category for modules that control signals or simplify patching
- **Visualizers**- modules that display signals graphically

These categories affect how Voltage Modular handles processing internally. Modules may be sorted according to their category (see all the sort criteria below).

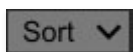
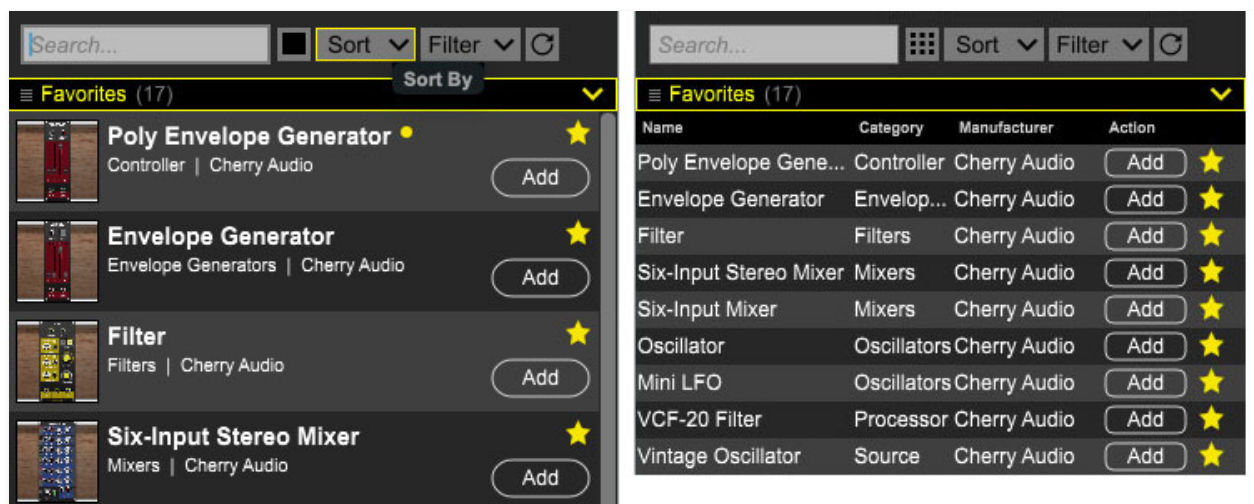
Module Tab Controls and Fields

These are the fields and buttons directly above the module list.

Search... - This field lets you search for modules by typing a few letters of the module name. For example, typing “LFO” would display the LFO and MiniLFO modules. The search field can be initialized by clicking the *X* icon and can be immediately accessed at any time with the keyboard shortcut [CTRL-F] (PC) or [⌘-F] (Mac). If currently hidden, the Library tab automatically opens when the *Find* keyboard shortcut is used.



Graphic/List View Select- This little guy is easy to miss, but clicking it toggles between graphic+name or name-only in the module list as shown in the images below:



Sort- This drop-down menu allows sorting of the module list by name, category (more on this below), date acquired (as in, “show me my new stuff!”), or the company that made the module.

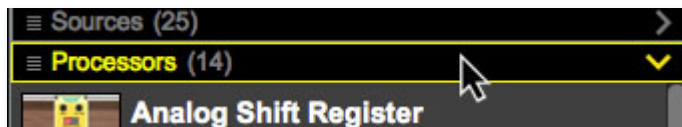
- *Name*- Sorts all modules alphabetically from A-Z or Z-A.

- *Category*- Sorts categories alphabetically
- *Date Acquired*- Signal modules according to date of purchase.
- *Manufacturer*- Sorts alphabetically by the company that made the module.
- *Tags*- Sorts according to user-added tags.



Filter- Allows filtering of which modules are displayed using descriptive headings.

- *None*- Shows all currently owned modules with no separate headings.
- *Category*- Divides up modules by their categories. This is the default filter setting.
- *Manufacturer*- Sorts alphabetically by the company that made the module.
- *Name*- Sorts modules alphabetically.



Module view filters can also be selected by clicking on individual categories.

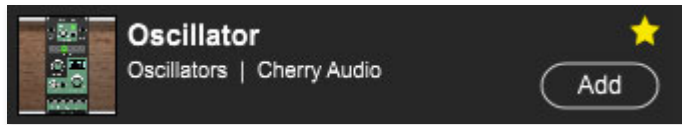


Refresh- Voltage Modular automatically downloads new modules or presets each time it's launched. The *Refresh* button checks for new content while Voltage Modular is running; this is particularly useful for developers who are frequently revising modules.

One of Voltage's most powerful module search and organization features is the *Tag Editor* right-click command described in the following section, so don't miss it!

Modules List

The *Modules* tab in the *Library* displays all modules currently owned by the logged-in user. **This is where you'll go to add new modules to patch, either by clicking *Add*, or by dragging and dropping to a cabinet.**

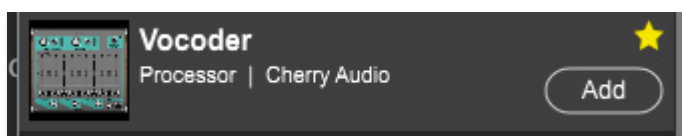


Each module in the library displays the following:

- Thumbnail Image
- Module Name
- Category
- Manufacturer
- Favorite Star- The star above the *Add* button turns yellow when a module is favorited. The *Favorites* tag can be enabled or disabled by clicking on the star and can be used as a sort criteria (see following section for more info).
- *Add* to cabinet button
- User entered search terms (if any have been added by user)

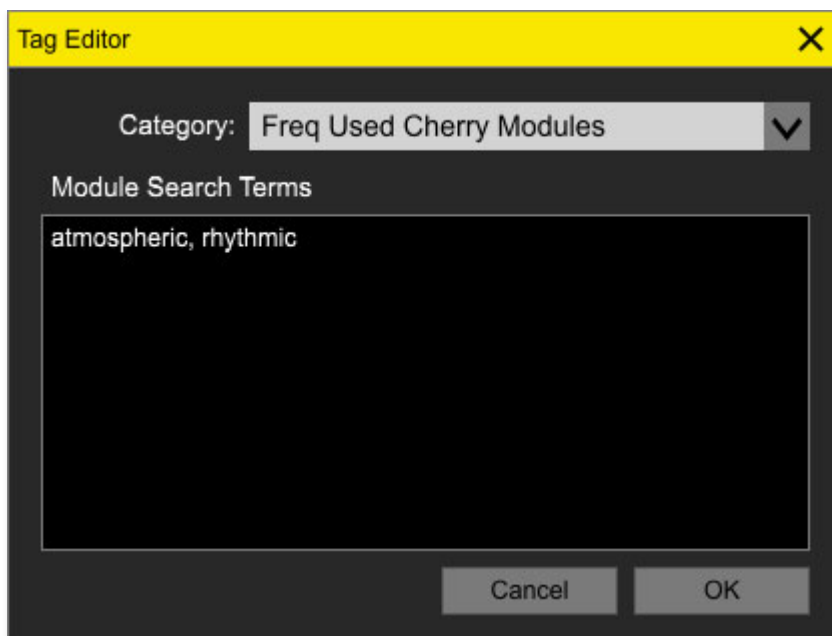
Module Library Right-Click Functions

Add To Cabinet- This adds a module to a cabinet (though it's usually easier to drag and drop the module).

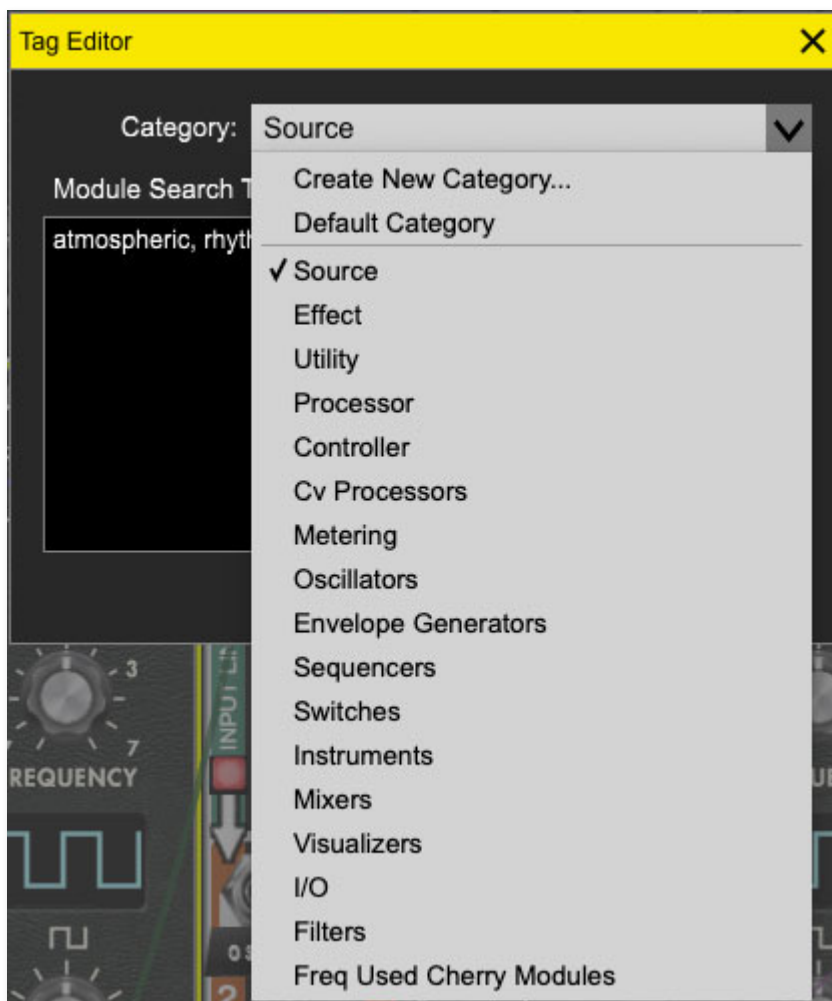


Favorite- Adds a module to the *Favorites* category. This is the same as clicking the the ★ next to a module name.

Info... - Contains general information, links to modules in the online Voltage Modular store, reviews, etc. For some modules, this also contains operational information.



Tag Editor... - The *Tag Editor* is a powerful, user-customizable resource for searching and cataloging modules. Fortunately, it's also real easy to use. Here's what it contains:

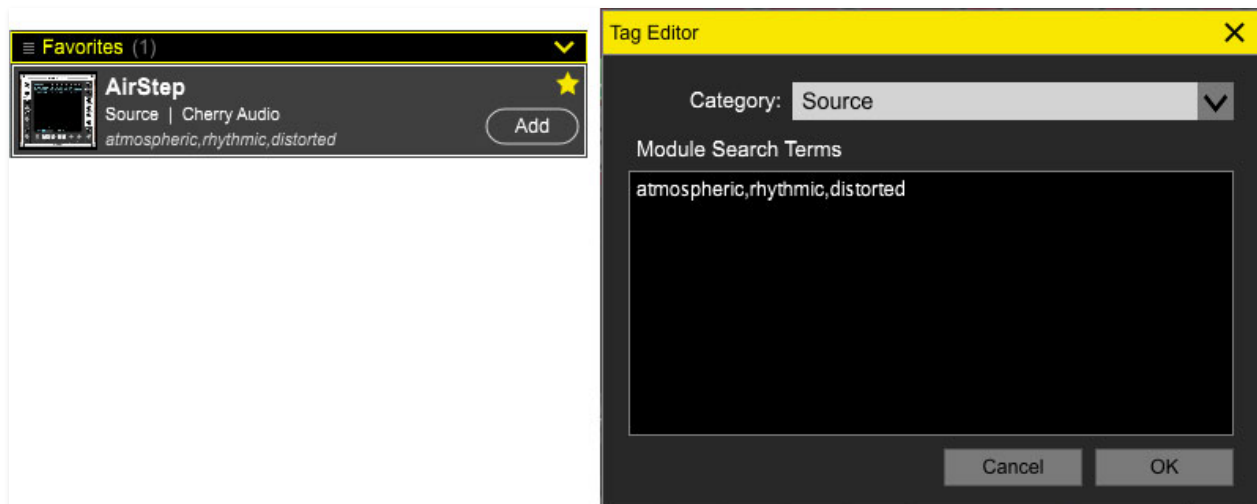


- *Category*- All modules are assigned to a category during the programming process, however module categories can be reassigned in this window. Additionally, users can create their own custom categories and assign them to modules.

To reassign a module to an existing category, click the *Category* menu, select a category, and click *OK*.

To create and assign a module to a new, user-created category, click the *Category* menu, choose *Create New Category...*, type the desired category name at in the text prompt, and click *OK*.

To return a module to its original category, click the *Category* menu, choose *Default Category*, and click *OK*.



- *Module Search Terms*- This window lets you add custom search terms for modules. Typing the search term in the Voltage Library Tab *Search...* fields displays modules with matching search terms. To add a search term, type the word in the *Module Search Terms* field and click *OK*.

To add multiple search terms, use commas between words (spacing doesn't matter). User search terms are displayed in the module tab header beneath the category and manufacturer name.

Working With Modules In Cabinets



Clicking any non-control area (i.e., jack, knob, switch, etc.) of a module selects it - the currently selected module will be outlined in yellow. Single or multiple modules can also be selected by clicking in an empty cabinet region (i.e. no module present) and dragging a square over them. Depending upon cable behavior preferences, cables connected to selected module(s) may display differently from unselected modules. Selected modules are affected by move, delete, and other commands.

To select multiple non-adjacent modules, [CTRL]-click modules in Windows or [⌘]-click on Macs. Multiple modules in different cabinets can be simultaneously selected.

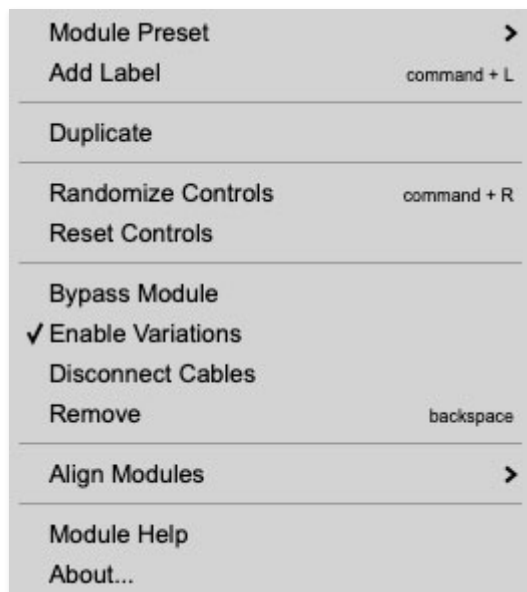
Moving Modules



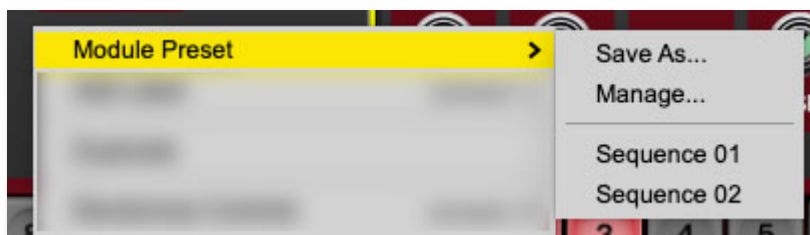
To move a module or a group of currently selected modules, click and drag at the very top of the module. The cursor will change to a hand, and a shaded gray rectangle appears in the top area. Neighboring modules will instantly

scoot out of the way, and all cable connections stay intact, because Voltage Modular is magical, but you knew that.

Module Right-Click Commands



Module Preset- This allows all control settings to be saved for specific modules. It can be useful for recalling complex modules settings (such as sequencers) when using a module in different patches. They are module-specific (i.e. presets for a given module are only visible and recallable for that module), but they are not specific to patches. In other words, the currently opened Voltage patch has no effect on a module's presets.



The *Module Preset* menus are as follows:

- *Save As...*- Click this to save the current module settings.
- *Manage...*- Displays the preset folder for the current module. Each module has its own folder; for PC's these are located at %appdata%\Voltage\Presets\ModulePresets. On Macs, they're located at Users\ <username>\Library\Application Support\Voltage\Presets\ModulePresets.

- **Saved Module Presets-** At the bottom of the list are the saved presets for the module. Select names to open them.



Add Label- Creates an editable text label that can be freely positioned within the boundaries of the module. These can be very helpful when creating elaborate patches, especially for "relabeling" controls to more accurately describe their function in a given patch. Labels may also be creating with the keyboard shortcut [CTRL-L] (PC) or [⌘-L] (Mac).

Newly added labels will appear in edit mode; type in the desired text and click to exit edit mode. Labels can be moved anywhere on a module by grabbing them (cursor turns into a hand). Labels may also be horizontally resized by grabbing clicking and dragging on the left or right edges (cursor turns into an arrow). Be careful with placement, as labels can freely be set upon controls. It won't hurt anything, but it might make it hard to use a control!

- *Edit-* Allows editing of label text. You can also edit the text by double-clicking a label.
- *Color-* Selects the font style and "tape" background color. Note that new labels will appear in the most recently used font/color style.
- *Remove-* Deletes the current label.
- *Remove All-* Deletes all labels in the current module. (Does not delete labels in other modules.)

Duplicate- Creates a copy of the selected module with its current control settings at the nearest available open cabinet space. Modules or groups of selected modules can also be duplicated by [ALT]-dragging (PC) or ⌘-dragging (Mac).

Randomize Controls- Sets all of a module's controls to a random value. This includes knobs, sliders, switches, etc. This is a great way to create aleatory music with sequencer modules, but more importantly, check out how smart I sound using big words like "aleatory."

Reset Controls- Initializes all controls of a module.

Bypass Module- Disables a module. For modules where an audio or control signal originates, this disables all signal output. For modules that process signals (such as filters or audio effects), signals generally pass through the module unaltered. Note that *Bypass Module* may or may not appear depending on the programming of a module, so you or may not see it in the right-click menu for all modules.

Enable Variations- Enables or disables control changes from variations on a per-module basis. Control positions are still stored for variations, but unchecking *Enable Variations* effectively "bypasses" them, leaving current control positions intact. *Enable Variations* is enabled for modules by default. For more information about variations, check out *Variations* in the *I/O Panel* section.

Disconnect Cables- Removes all cable connections for the currently selected module or modules.

Remove- Deletes a module or group of modules. Modules can also be deleted by highlighting them and hitting the [DEL] key (PC) or the backspace key on Mac (the little DEL key in Windows and the big one above the backslash key on Mac).

Align Modules- These functions allow rapid tidying up by moving all of a cabinet's modules left or right while simultaneously closing up gaps.

- *Left*- Moves all modules of the current cabinet all the way to the left and closes gaps between modules.
- *Right*- Moves all modules of the current cabinet all the way to the right and closes gaps between modules. *Align Modules/Right* will only move modules to the farthest currently visible right-side border.
- *Auto Align Left*- This is an on/off parameter- when *Auto Align Left* is enabled, modules automatically slide to the left, with no gaps. If modules are moved or deleted, any existing modules to the right will slide left to close the gap.
 - *Auto Align Left* is a per-cabinet setting. The default on/off setting of *Auto Align Left* can be set in *Settings>Interface>Auto Align New Cabinets To The Left*.

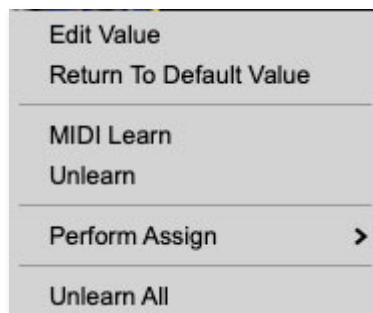
Module Help- Opens a web browser link to the user guide for a module (provided the manufacturer has created one).

About... - Displays a window with module information including its name, build revision, author, copyright information, a brief description, and a link to

its Cherry Audio Store web page. For third-party modules, this box sometimes contains important information about controls, so have a look here if you're confused by an itty-bitty switch that's labeled "X."

Module Control Right-Click Commands

Right-clicking any knob, slider, switch, or button reveals the following right-click menu:



Edit Value- Opens a field where exact values can be entered.

Return To Default Value- Returns any control (i.e. knobs, sliders, buttons, switches, etc.) to their default value. It will be grayed out if the control is already at its default setting.

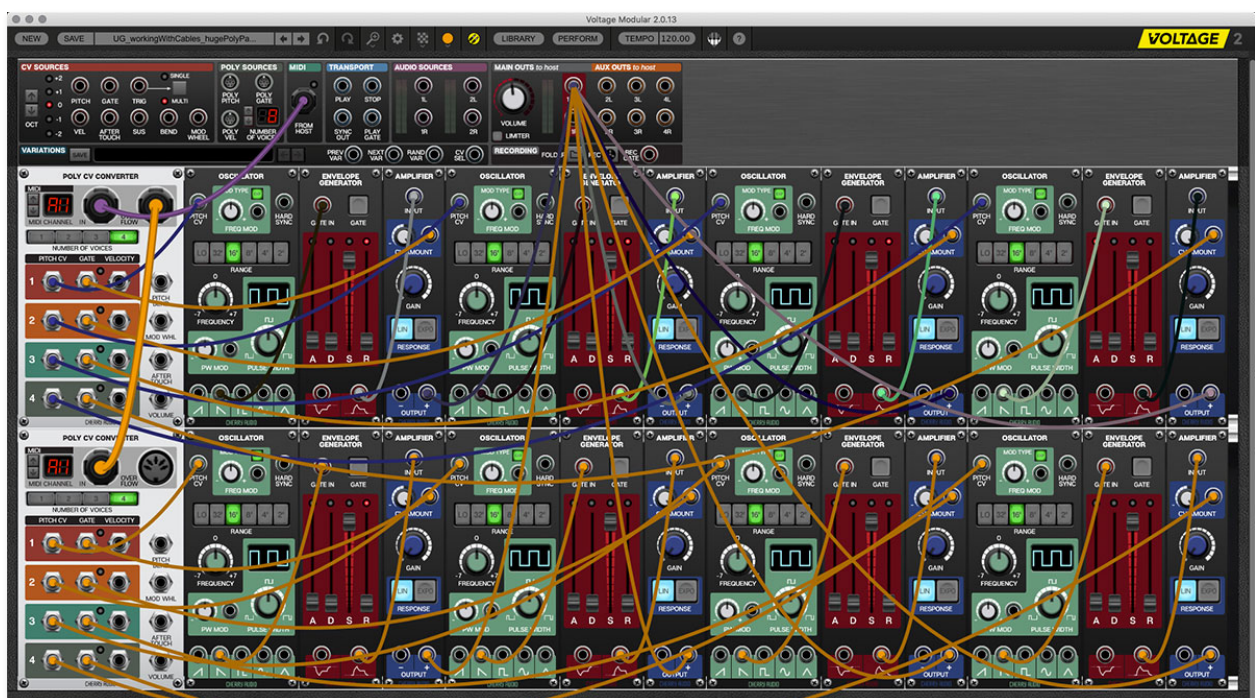
MIDI Learn/Unlearn- These are used for assigning external MIDI hardware controls. Check out the [MIDI Continuous Controller Setup](#) section for more information.

Perform Assign- Allows knobs or buttons to be assigned to the Perform controls panel (that strip of knobs and buttons directly above the cabinets). It may not look too exciting, but it's a super easy and powerful way to simultaneously control multiple parameters in all kinds of ways. Read all about it in the [Perform Controls Panel](#) section.

Unlearn All- Cancels all MIDI CC, DAW, and *Perform* control assignments.



Voltage Modular's Poly modules make use of a special "poly" cable, identifiable by its slight larger D-shaped connector and striped cables. Each poly jack and cable can transmit up to sixteen separate channels, or "lanes," of CV or audio, which drastically simplifies polyphonic patch creation.



At minimum, a basic polyphonic patch would include an oscillator, envelope and amplifier for each voice. To create eight-voice polyphonic version, that would require 24 modules - something like the hot mess above. Once additional envelopes, filters, modulations etc. are added, it's easy to see how this would make for a huge and hard to control patch. Poly cables and jacks **immensely** simplify the creation of polyphonic patches.



The patch above is more or less functionally identical to our previous "mega patch." It accomplishes the exact same thing with just three modules, as opposed to the other patch's 26 modules. Furthermore, patches made using poly modules and cables can have up to 16-voice polyphony.

Other than the use of poly cables and poly modules in place of standard mono cables and modules, patch creation is almost exactly the same as creating a standard mono patch.

Each poly module can be thought of as a "stack" of regular modules. The number of modules in the stack is defined by the *Number Of Voices* setting in the IO Panel. When set to eight, for example, every poly module is actually a stack of eight standard modules, and every poly jack can send or receive eight individual channels, or "lanes" of CV or audio.

Poly Modules and Cables Example



In the patch above, the polyphonic note data received from a MIDI controller is sent from the IO Panel *Poly Pitch* jack to the Poly Oscillator *Pitch CV* jack. This single cable can send up to sixteen simultaneous pitch CV's to the "stack" of individual oscillators living within the Poly Oscillator. The IO Panel *Poly Gate* output jack is patched to the *Gate In* jack of the Poly Envelope Generator, and independently triggers a stack of envelopes controlling the amplitude of each separate oscillator voice in the Poly Amplifier module. In other words, individual note articulation is maintained, because all pitch and amplitude CV's are on their own "lane."

In order to route this to the *Main Outs*, these eight lanes of audio needs to be mixed down to a mono signal, but fortunately the Poly Amplifier includes a *Mono Mix Out* level control and mono out jack.

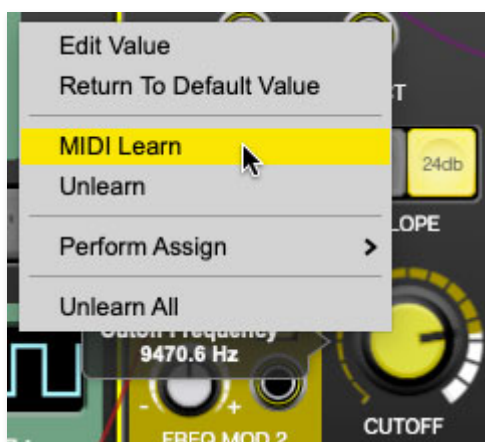
In addition to poly oscillators, filters, amps, mixers, etc., Voltage Modular includes a number of utility modules for splitting and converting poly cables to standard "mono" signals and vice-versa, resulting in a tremendous amount of flexibility.

- In order to save CPU, when the *Poly Pitch* jack in the Poly CV Outs section of the I/O Panel isn't patched to anything, the *Poly Gate* and *Poly Vel* jacks won't output CVs. If these jacks need to be used by themselves, the *Poly Pitch* jack can be patched to the input of a "dummy" module like the Poly Multiple, for example, to activate the *Poly Gate* and *Poly Vel* outputs.

Assigning internal and external hardware controls is easy to do in Voltage Modular, and really adds a whole new dimension of control and musicality to patches. We'll cover the basics of assigning a hardware knob/slider/switch control to a parameter and then delve into the MIDI Tab, where all controller assignments can be viewed and tweaked.

Assigning An External Hardware Control

In this example, we'll assign a hardware slider control to the filter module cutoff frequency. Start by right-clicking the *Cutoff* knob, and select *MIDI Learn*.

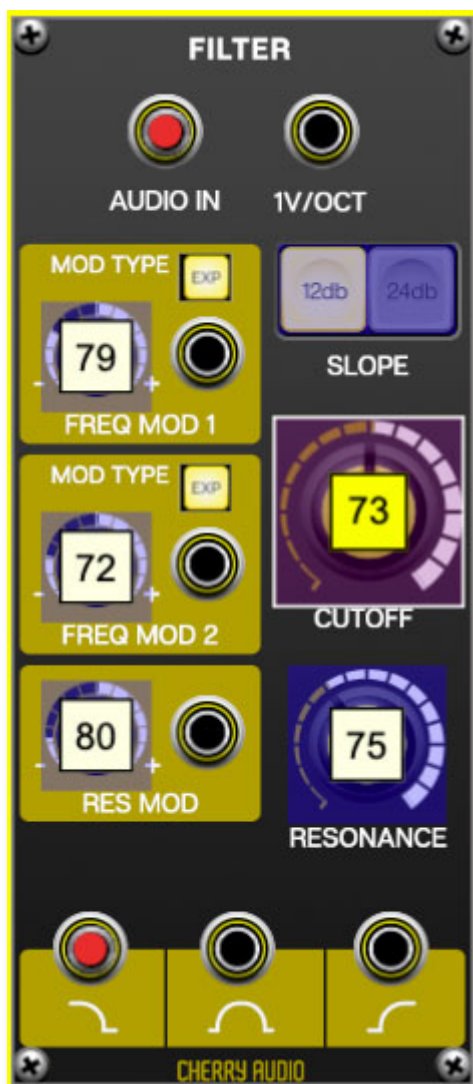


All of Voltage Modular's controls turn purple, indicating that MIDI learn mode is enabled. Now move the hardware control you'd like to assign. You should see the cutoff knob move as the external knob or slider is moved, and assign mode is automatically disabled.



If you change your mind, MIDI learn mode can be aborted by right-clicking and selecting *Stop Learning*.

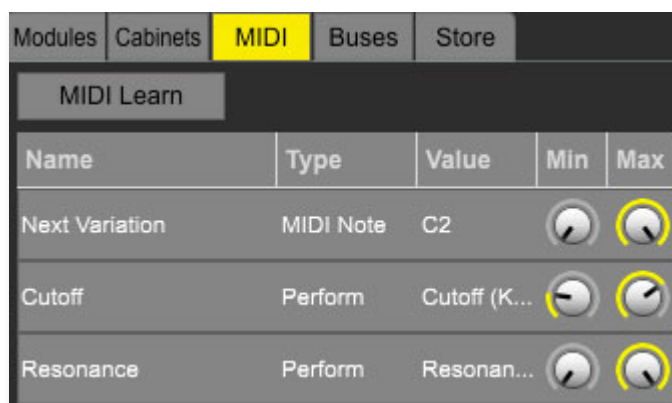
This is the basic procedure for assigning hardware controllers to almost any module control. Hardware controllers may also be assigned to knobs and buttons in the I/O Panel or the *Perform* controls panel.



When in MIDI learn mode, previously assigned controls will display numbers in squares on module controls. These indicate the MIDI continuous controller number of the assigned hardware control (these are also displayed in the *MIDI* library tab).

Once a MIDI CC controller has been assigned, in addition to real-time control of a Voltage Module parameter, you'll also be able to record and play back controller data from a DAW.

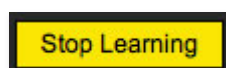
The Library MIDI Tab



This is command central for external MIDI controller, DAW automation, and Voltage Modular's *Perform* control panel assignments. Here you'll be able to see information about all currently assigned controllers and adjust control ranges. Let's go over the *MIDI* tab functions and displays.

MIDI Learn- This is almost exactly the same as enabling MIDI learn mode by right-clicking a control. Click the *MIDI Learn* button to enter learn mode (all controls turn purple). Unlike right-clicking on specific knobs, where Voltage Modular automatically exits controller assignment mode, clicking the *MIDI Learn* knob "stays on" to enable assignment of multiple hardware controls. This is really handy for quickly assigning a bunch of sliders or buttons on a grid-style controller.

To assign multiple controls, click *MIDI Learn*, click an on-screen control, move the desired hardware knob or slider, then continue clicking and assigning on-screen controllers until all desired controls are assigned.



When you're done assigning controllers, click *Stop Learning*. (Just remember that when we stop learning, we stop growing... maybe that doesn't apply here.)

MIDI Tab Columns

Name- Displays the name of the module parameter being controller.

Type- There are three possible types of controller automation in Voltage Modular:

- *MIDI Continuous Controller (CC)*- The standard 128 MIDI controller numbers as defined in the MIDI spec. More specifically, these are the controllers transmitted by hardware knob, slider, or pad controllers. MIDI

CC's can be used to control parameters in real-time or recorded and played back within DAW software.

- *Parameter*- Up to 128 slots used with DAW parameter automation. Compared to MIDI CC controllers, DAW automation typically has finer control resolution, easy on-screen drawing and editing of controller movements, and allows controller movements to be directly written by moving Voltage Modular's on-screen module controls.
- *Perform Controls Panel*- This refers to the panel directly beneath the I/O Panel containing nine knobs and four buttons, which are assignable to any module controls in a patch. Each knob or switch can control an unlimited number of module parameters over different ranges (via the *Min* and *Max* controls), and external hardware controllers can be assigned to the *Perform* knobs and buttons. (See the [Perform Controls Panel](#) section for the full lowdown.)

Value- Displays the specific automation controller. In the case of a MIDI CC, this would be the MIDI CC controller number. For DAW automation, this is the automation slot # (1-128) and associated module control parameter. For the *Perform* controls panel, this displays the knob or button number.

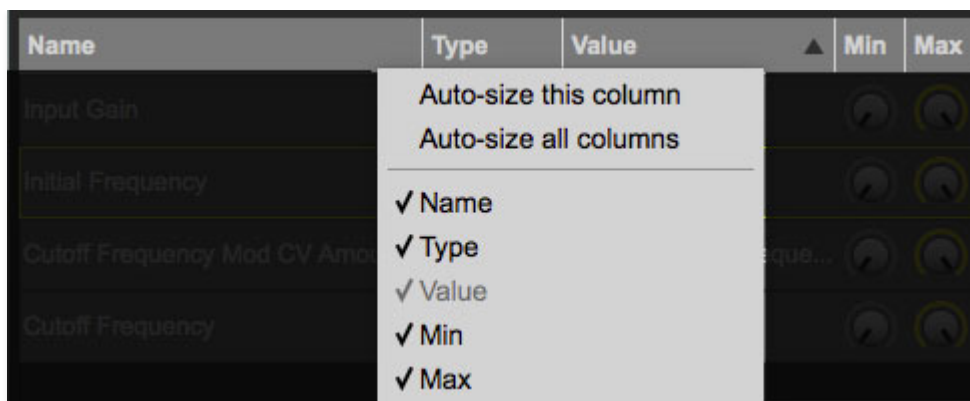
Min- Sets a limit on the lowest value any automation control can set a mapped controller to. This actually recalibrates the range of the automation controller to the remaining parameter range.

Max- Sets a limit on the highest value any automation control can set a mapped controller to. This actually recalibrates the range of the automation controller to the remaining parameter range.

- ***Super Tricky Min-Max Inversion***- Not only can parameter ranges be limited via the the *Min* and *Max* knobs, mapped control destinations can be completely inverted by setting the *Min* knob all the way up and the *Max* knob all the way down (or anywhere in between).

Generally speaking, parameter range limiting with the *Min/Max* controls is really useful, so we encourage you to make use of them!

MIDI Tab Column Configuration Right-Click Menus



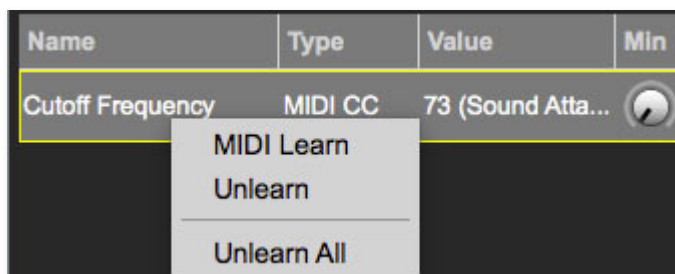
Right-clicking anywhere in the top row displays the column configuration menu.

Auto-size This Column- Automatically resizes so that all text in this column is visible.

Auto-size This Column- Automatically resizes all columns simultaneously so that all text visible.

Column View Filters- Clicking any of these will hide or show the respective columns.

MIDI Tab Parameters Right-Click



Right-clicking on an assigned parameter opens the menu above.

MIDI Learn- This is used to change the controller assigned to a particular parameter. This only works if you're changing to a MIDI CC controller.

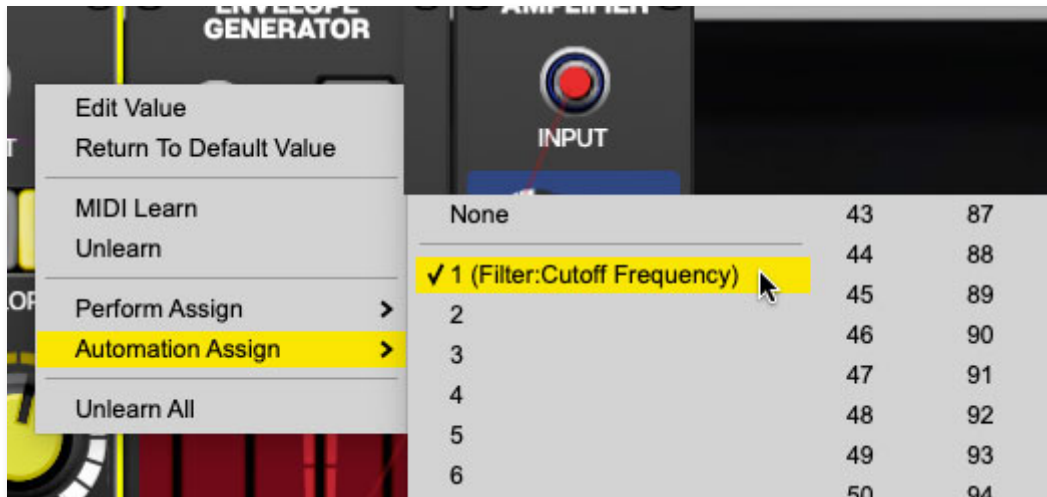
Unlearn- Deletes the selected automation parameter.

Unlearn All- Deletes all controller assignments for the patch. Voltage Modular will display a warning dialog prior to deletion in order to thwart potential Unlearn-related disasters.

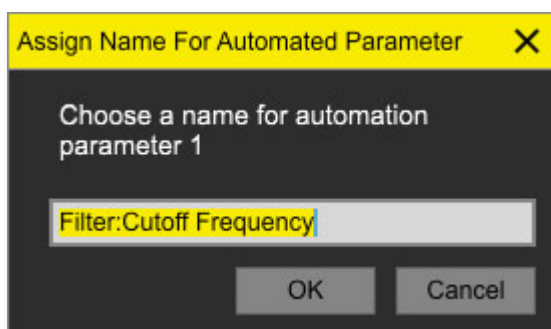
Voltage Modular really comes to life when hardware MIDI knob, slider, or pad controllers are assigned to controls. Learning controller assignments is fast and easy, so let's delve in.

Module controls can be automated using DAW software automation. A maximum of 128 parameters can be automated in Voltage Modular. The DAW Automation Assign menus are only visible when running plug-in versions of Voltage Modular in a DAW environment.

Assigning Parameters To DAW Automation



To assign a parameter, right-click on the module control, select *Automation Assign*, and choose any automation "slot." It's not important which number is used, as long as it doesn't already have a parameter assigned.



The default automation parameter name (shown in your DAW) will be the module name followed by the name of the automated parameter, but custom names can be typed in this field.

Automation parameters can be viewed and edited in the Library *MIDI* tab, and will also appear as an available instrument automation parameter in your DAW software.



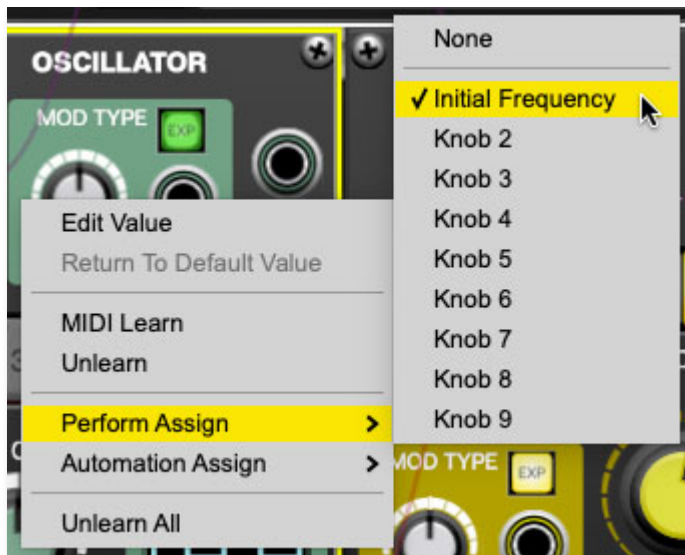
The *Perform* controls panel comprises nine knobs and four buttons that are freely assignable to control almost any controls within a module or the I/O Panel. What makes them special is that each knob or button can be matrixed to simultaneously control an unlimited number of module parameters. In conjunction with the *MIDI* tab's individual *Min* and *Max* controls, a single knob or button can be configured to dramatically alter a patch, with great accuracy. If you're wondering why we choose nine knobs (as opposed to an even number), this was done to match the sliders on many hardware MIDI controllers (which in turn, often feature nine sliders to mirror the nine drawbars of a Hammond-style tonewheel organ - cutting-edge technology, circa-1935!).

Besides being really powerful, the *Perform* controls panel is a cinch to set up and use, so let's delve in:

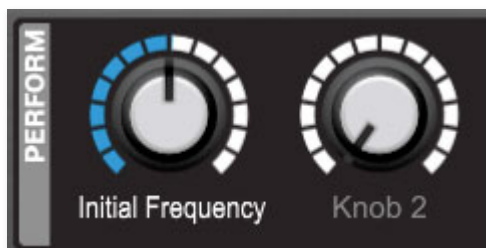
Hide/Show Perform Controls Panel

The *Perform* controls panel can be hidden or displayed by clicking the big yellow *Perform* button at the top of the Voltage Modular window. Like the hide-able *Library* tab, hiding the Perform Controls panel helps make room on the screen when it's not in use.

Assigning Control Knobs To The Perform Controls Panel



To assign a control to a *Perform* controls panel knob, right-click on the module knob, select *Perform Assign*, and choose a knob number. Once the control is assigned, the module knob parameter name appears beneath the selected Perform knob.



To rename the Perform knob, double-click the name, type a name, and click [ENTER] or click the mouse. Renaming is especially useful if the knob is set up to control more than one parameter concurrently.

To control more than one module parameter with a single Perform knob, right-click on additional module controls and simply assign the same perform panel knob. The name beneath the control won't change, but all Perform control assignments will be viewable and editable in the Library *MIDI* tab.

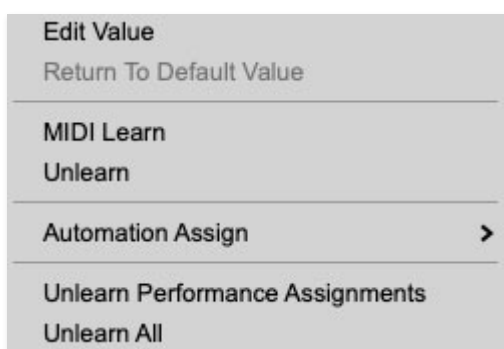
As mentioned, the *Min* and *Max* controls can be used to fine tune the control range for each module parameter. Be sure to take some time and experiment with this - it's very useful when controlling multiple parameters with a single Perform control knob.

Assigning Control Buttons To The Perform Controls Panel



These work much the same as the Perform control knobs, but are) intended for assignment to module button controls. They are momentary in nature (i.e. they send a brief on or off message when clicked). In the screenshot above, two Perform buttons are configured to control the two *Slope* toggle buttons of the Filter module.

Perform Controls Right-Click Menu



Edit Value- Opens a field where exact values can be entered.

Return To Default Value- Returns knobs controls to their default value. It will be grayed out if the control is already at its default setting.

MIDI Learn/Unlearn- MIDI CC controls can be assigned to *Perform* controls, allowing (amongst other things) real-time manipulation of multiple module parameters.

Automation Assign- Assigns DAW automation slots to Perform controls. Please see the [DAW Automation section](#) for more information.

Unlearn All- Cancels all MIDI CC, DAW, and *Perform* control assignments.

Move It All Around



Don't forget that, like the I/O Panel and cabinets, the entire *Perform* controls panel can be moved vertically above or below the I/O Panel and module cabinets by grabbing and dragging at the left side of its cabinet (highlighted in red above, but it doesn't actually turn red).

Here's where you'll configure all the under-the-hood stuff such as cable behavior (oh behave!), user-interface preferences, account settings, and audio and MIDI settings.

General



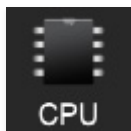
Undo, user log file settings, and more. Wee!

- *Add Undo For Module Control Changes With The Mouse*- Enabling this allows undo of knob/slider/button adjustments to modules. You'll probably want to leave this on if you want the ability to undo all aspects of patch editing and programming.
- *Load Last Preset On Startup (Standalone Only)*- Automatically loads the last preset used when Voltage Modular standalone version is started.



- *Create A Log File For Usage*- This creates a text doc of all of Voltage Modular's internal and routines during use. It is mainly intended for those developing custom modulators using our *Module Designer* app. Clicking *Show Log Folder* opens the folder containing Voltage Modular log file docs. We've included a photo of a log, y'know... just in case.

- *Preset Folder*- Displays the current location of Voltage Modular's sound presets. This can be changed by clicking and typing in the field.
 - *Browse...* - Displays the current location of preset folder in the file manager.
 - *Set Default*- Sets the current displayed *Preset Folder* path as the default location
- *Clear Cache Files*- Deletes all log files, temporary sounds, and the image cache.
- *Delete Module Files*- Deletes all modules. This is here in case a module becomes corrupt; you won't permanently lose anything, because Voltage Modular will "know" your modules have been deleted and automatically re-download all purchased modules. That said, it might take a bit, so don't delete module files five minutes before you're gonna hit the stage.



CPU

These settings define how Voltage Modular utilizes your computer's processor hardware.

- *Use Multiple Threads For Mixing*- On a fast computer with multiple cores, this feature can improve mixing performance considerably, but it will also use more CPU. On a slow computer, this feature can potentially slow down mixing and cause degraded performance. The number of mix threads used can be set in the dialog. This option is off by default, so definitely enable it if you have a honkin' fast multi-processor computer.
- *Use OpenGL Hardware Acceleration*- This allows improved graphics performance if your graphics card supports it. If you're not sure, we recommend doing some research on your graphics card (or just try both ways to see what performs better).



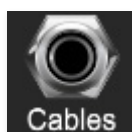
Interface

Here's where you can customize Voltage Modular's user interface settings.

- *Reset To Default Window Size*- Resets the Voltage Modular workspace to 1280x720 pixels. Use this to reset the window size if Voltage Modular's workspace somehow becomes too large for your display and can't be resized.
- *Minimum Cabinet Width*- This sets the narrowest you'll be able to size Voltage Modular when resizing by dragging the edges of the window.
- *Cabinet Theme*- These are various "skins" for the outside and inside of the Voltage Modular's cabinets. Try this with a hardware modular!
- *Tooltip Delay*- Tooltips are those handy little bits of text that pop up when hovering over a control or jack (go ahead and try it, we'll wait...). The *Tooltip Delay* setting defines how long you must hover before the tooltip pops up.
- *Knob Movement*- Defines how mouse movements relate to turning onscreen knobs. It defaults to *Vertical Drag*, but can be changed to *Horizontal Drag*, or *Rotary Drag* if you're one those folks that cut their teeth on the *Steinberg Model E VST* back in 2000.
- *Library Location*- This determines whether the library containing the *Modules*, *Cabinets*, *MIDI*, and *Store* tabs appears on the left (default) or right side of the workspace. If you need to find a public library, we recommend Google maps.
- *On Control Double-Click*- Defines what happens when the mouse is double-clicked on a control. If *Edit Value* is selected, an exact number can be entered by typing the number and hitting [ENTER] or [RETURN]. If *Sets Default Value* is selected, double-clicking a control resets it to its default value.
- *Zoom Interface 2x*- Doubles the zoom level of display. This intended for high resolution displays ("Retina" displays on Mac).
- *Allow Module Dragging From Any Part Of Module*- By default, modules can only be moved by clicking and dragging in their top area, around the module title. Enabling this allows modules to be grabbed and moved from any non-control. part of the module. The usefulness of this setting largely depends on what type of input device you're using, i.e. mouse with wheel, trackpad, etc. The idea is to minimize unwanted module movement if you accidentally "miss" when moving a module control.
- *Mouse Wheel Adjusts Control Value*- Enabling this lets you adjust knob, slider, and switch values by moving the mouse wheel. This works great

with a standard mouse wheel, but you'll want to disable it if you're using an Apple Magic Mouse (which will move the control AND scroll the window).

- *Show Tooltips On Any Control Change*- Displays parameter tooltips/values next to controls any time a control is changed, i.e. if a control is moved via an assigned MIDI controller or a *Perform* panel knob, etc.
- *Show Control Tooltips Under Mouse*- Displays parameter tooltips/values when the mouse is hovered over a control or as a control is moved with mouse clicked.
- *Hide Store On Library View During Searches*- If this box is unchecked, Voltage Modular will show modules don't own in a special *Store* category. Clicking this option disables display of the Store category and only shows modules you own.
- *MIDI Program Changes Should Change Current Preset*- Allows MIDI program change messages to change Voltage Modular patches.
- *Delay Play Trigger and Gate Until Measure Boundary*- When enabled, the IO Panel Transport *Play* and *Play Gate* signals "wait" until the host DAW playback hits an even bar number. This is **very** helpful for keeping sequencer-based patches in time with host playback. Without this, sequences can start playing between bars, resulting in synchronized playback that's slightly "shifted" forward or back in time from other project audio or MIDI.
- *Auto Align New Cabinets To The Left*- When checked, all modules in newly created cabinets will automatically align to the left, with no gaps. This can be disabled for individual cabinets by right-clicking in an empty (i.e. no modules) cabinet area.



Cables

These preferences define how Voltage Modular's virtual patch cables behave.

- *Animate Cables*- When checked, Voltage Modular cables will bend and dangle like real cables. This makes everything sound better (not really, but it looks cool).

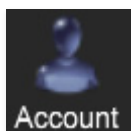
- *Move Cables Away*- When checked, hovering over a cable (or multiple cable spaghetti) will temporarily shift them out of the way to make it easier to see modules beneath.
- *3D Cables*- Checking this shades cables to appear more well, three-dimensional. Best of all, you won't need those silly red and green glasses to see this.
- *Draw Shadow*- Causes cables to cast a shadow upon modules.
- *Cable Thickness*- Adjusts the thickness of all cables.
- *Transparent Cables*- This works in conjunction with the *Cable Transparency* button discussed previously.

All Cables- *Cable Transparency* slider affects all cables.

All But Current Jack - Hovering over a jack will make its cables opaque. If the *Cable Transparency* control is set to its maximum setting, *Transparent Cables* will have no effect.

All But Current Module - Hovering over a module will make all of its cables opaque. If the *Cable Transparency* control is set to its maximum setting, *Transparent Cables* will have no effect.

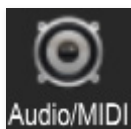
- *Show Signal Animation*- Enabling this superimposes a stream of “marching ants” over cables displaying signal flow and direction. (They're easier to see at wider cable width settings.) The *Speed* slider adjusts the speed of display, but has no effect on signals.
- *Enable Animations For Jacks*- Selecting this shows a nifty little animation when a jack is clicked to use its built-in six-way mult. If you're a super impatient Type A personality (like the guy typing this), unchecking this box disables the animation, causing the six-way mult to pop up immediately.
- *Hide Cables When Dragging Modules*- Causes cables to temporarily disappear when moving modules around.



Account

Settings for your personal login information and account.

- *Email*- This displays the email address of the current login.
- *Update Login Info*- No, this isn't a place for news and tour dates for yacht rock superstar, Kenny Loggins. Clicking this opens the same email and password login screen you'll see when initially launching Voltage Modular.
- *Ask Before Downloading Updated Modules*- We often fix bugs and improve modules. By default, Voltage Modular automatically downloads new versions of modules when available. Checking this box defeats automatic updates and will ask if you'd like to update modules. We'll never make changes to existing modules that can potentially "break" existing patches, but nonetheless, we recommend enabling *Ask Before Downloading Updated Modules* if you're using Voltage Modular for live performances or other "mission critical" situations.
- *Use One-Click Purchasing*- Enabling this skips over all that login/credit card nonsense and speeds up buying modules. Don't leave this on if you have an irresponsible kid who's crazy for modular synthesis (or if YOU are an irresponsible kid who's crazy for modular synthesis).
- *View Account Settings*- This opens your personal account page on the Cherry Audio Store website containing information about modules purchased and more.
- *Software Update*- Click this to see if an updated version of Voltage Modular available.



Audio/MIDI

Settings for audio and MIDI hardware input and output. **This tab is only visible in the standalone version of Voltage Modular.**

- *Output*- Use this drop-down menu to choose a physical audio output source. This defaults to *Built-In Line Output*, i.e. your computer's onboard system audio, but you'll get better fidelity with an external professional audio interface. The biggest audible difference is usually reduced background noise or hum, but external audio hardware also offers greater flexibility in terms of number of inputs and outputs and built-in mic or low-level instruments pres (i.e. electric guitars). These are especially useful if you're using Voltage Modular's external inputs to process sound. The *Test*

button will produce a sine wave when clicked; this will help with troubleshooting, aka, “WHY THE HECK ISN’T THIS MAKING ANY NOISE?!?”

- *Input*- Clicking the drop-down menu lets you select which physical input(s) feed the *Audio In from host jacks* in the I/O Panel. The small horizontal input meter to the right illuminates when the selected input is receiving an audio signal.
- *Sample Rate*- This sets Voltage Modular’s global sample rate. Lower sample rates offer better performance, but if you have a fast computer, high sample rates may offer slightly improved fidelity.
- *Audio Buffer Size*- As with any digital audio app, this defines performance vs. note latency, and will largely depend upon computer CPU speed. A professional external audio interface will almost always exhibit better performance than “built-in” system audio. Lower settings will result in less latency (in the form of faster response to notes played), but will increase the chances of audio gapping or crackling noise.
- *Active MIDI Inputs*- Displays all available MIDI input sources, i.e. keyboards, pad controls, MIDI knob/fader control surfaces, etc. Checking the boxes to enables devices.

Following is a list of Voltage Modular's keyboard shortcuts (or "hot keys," if you prefer). We'll also talk about some not-so-obvious handy mouse functions.

Keyboard Shortcuts

Please note that shortcut key functionality can be affected by "focus" and existing key shortcuts in the the host app when running Voltage Modular as a virtual instrument.

COMMAND	MAC OS	WINDOWS	FUNCTION
Undo	⌘Z	CTRL Z	Cancels last action. Multiple undos are supported.
Redo	[SHIFT] ⌘Z	[SHIFT] [CTRL] Z	Returns controls to their state prior to the last undo.
New Patch	⌘N	CTRL N	Creates a blank new patch
New Patch - No Save Dialog	⌘ [SHIFT] N	CTRL [SHIFT] N	Creates a blank new patch with no "Save changes?" warning dialog
Save Patch	⌘S	CTRL S	Saves the current patch
Save - Overwrite Current Patch	⌘ [SHIFT] S	CTRL [SHIFT] S	Overwrites the current patch with no pop-up warnings.
Previous Preset	⌘←	CTRL ←	Loads the previous preset in the current bank.
Next Preset	⌘→	CTRL →	Loads the next preset in the current bank.
COMMAND	MAC OS	WINDOWS CTRL +	FUNCTION Zooms View closer of I/O

Zoom In	⌘ +	key	Panel, Perform controls, and module cabinets.
Zoom Out	⌘ -	CTRL - key	Zooms view farther of I/O Panel, Perform controls, and module cabinets.
Reset Zoom To 100%	⌘ 0	CTRL 0	Resets zoom value to 100%.
Show/Hide Library Tab	⌘ 1	CTRL 1	Toggles the visibility of the Library tab.
Show/Hide Performance Controls	⌘ 2	CTRL 2	Toggles the visibility of the Perform controls strip.
Add A New Empty Cabinet	⌘ B	CTRL B	Adds a new cabinet beneath the lowest cabinet.
Show/Hide Cables	⌘ D	CTRL D	Displays or hides all current cables. Same as clicking the “two cable” icon in the top toolbar.
Show/Hide QWERTY Keyboard	⌘ K	CTRL K	Displays or hides the QWERTY onscreen musical keyboard. Same as clicking the keyboard icon in the top toolbar.
Delete Module	[BACKSPACE]	[DELETE]	Removes a module or selected group of modules.
Add Module Label	⌘ L	CTRL L	Adds a user-defined “tape” label to any part of a module. (Right-click the label for formatting options)
COMMAND	MAC OS	WINDOWS	FUNCTION

Randomize Module Controls	⌘ R	CTRL R	Randomizes all knob/slider/switch settings for a module.
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Mouse/Track Pad Zoom Control

The table below clarifies zoom functions with various input devices.

MOUSE MOVEMENT	MAC OS	WINDOWS
Zoom In/Out - mouse w/wheel	⌘ mouse wheel	CTRL mouse wheel
Zoom In/Out - track pad	⌘ slide finger	CTRL slide finger
Zoom In/Out - Apple Magic Mouse	⌘ slide finger	-

Rapidly Routing A Cable To Multiple Destinations

We discussed this trick back in the [Working With Cables and Buses](#) section, but we like it so much (and it's kind of a keyboard shortcut thing), we thought we'd mention it again:

To patch cables from a single jack to multiple destinations, press and hold the [CTRL] key in Windows or the [⌘] key on Mac, click the source jack, then click as many destination jacks as desired and release the modifier key when you're done. This works with input or output jacks, and is particularly useful for patching pitch and gate CV's from the I/O panel to multiple oscillators or envelope generators. We refer to this function as "quick patch." (which is also a fine wall spackling product, but don't tell them or they'll sue us and we'll have to get rid of this handy function...)

Quick patch is also really useful when adding additional cables to a jack with one or more cables already plugged in. Here's why: when a jack with existing cables is clicked, its multiple opens, *then* a cable can be plugged into one of the multiple's available jacks. Even if you're patching a single cable, holding down the [CTRL] key (Windows) or the [⌘] key (Mac) lets you skip the opening the multiple and clicking on an open jack - instead the new cable

immediately "plugs in." Now click the destination jack (or jacks) and the patch is complete.

We don't know why you'd want to do such a thing, but just in case, we'll explain the removal procedure for Mac OS and Windows.

Uninstalling In Mac OS

There isn't a dedicated "uninstaller" app for Mac, so you'll need to manually delete the following files from a few folders:

FILE TYPE	LOCATION
Voltage Modular main app	/Applications/Voltage Modular
Application files	/Library/Application Support/Voltage
User files	~/Library/Application Support/Voltage*
Audio Unit	/Library/Audio/Plug-Ins/Components/Voltage Modular.component and Voltage Modular FX.component
VST	/Library/Audio/Plug-Ins/VST/Voltage Modular.vst and Voltage Modular FX.vst
VST3	/Library/Audio/Plug-Ins/VST3/Voltage Modular.vst3 and Voltage Modular FX.vst3
AAX	/Library/Application Support/Avid/Audio/Plug-Ins/Voltage Modular.aaxplugin and Voltage Modular FX.aaxplugin

*This is Apple's extra-confusing other "user" *Library* folder, which is different from the "main" *Library* folder. The easiest way to access it is to click the *Go* menu at the top of the screen while holding down the [OPTION] key.

Uninstalling In Windows

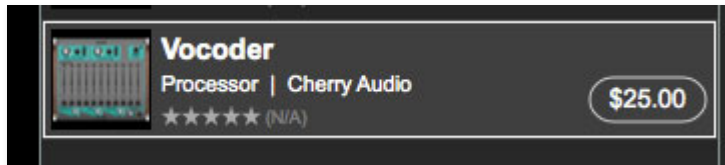
The procedure for uninstalling Voltage Modular is the same as other Windows applications:

- Click on the Windows search bar and type *Add or Remove Programs*.

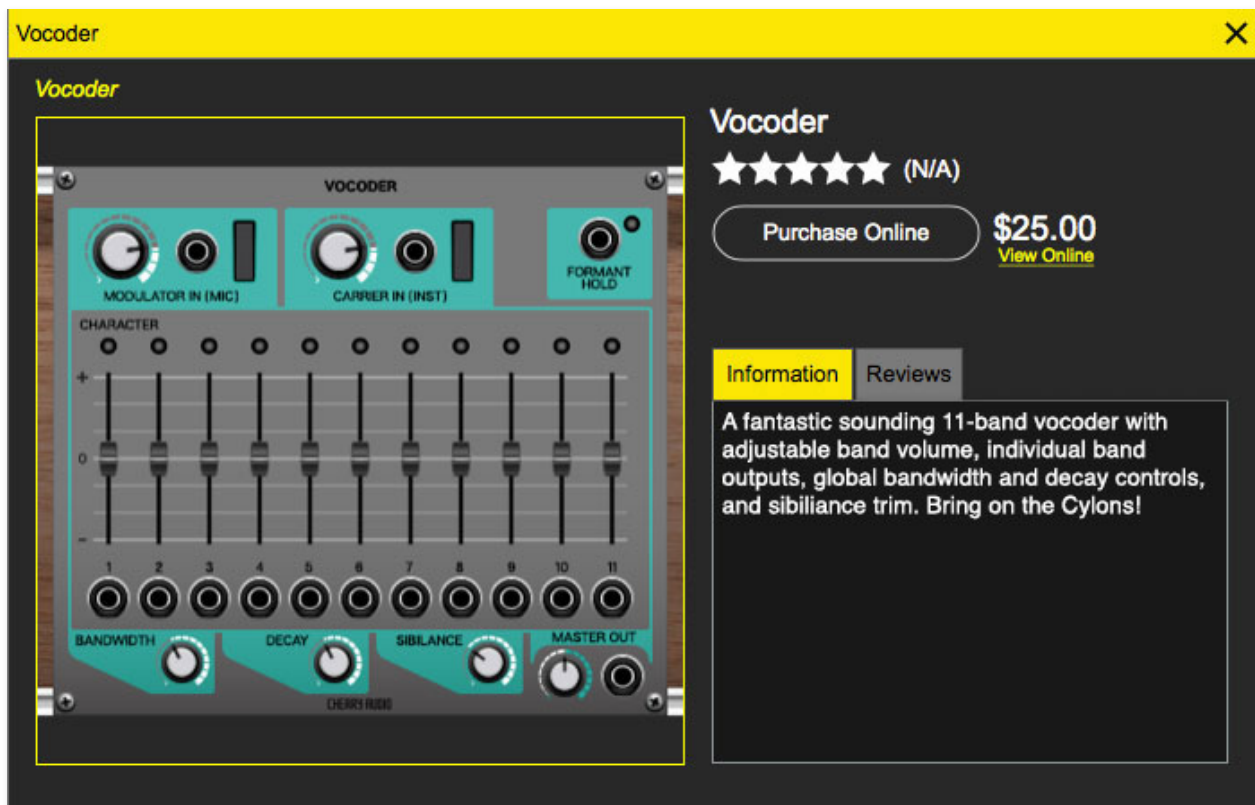
- Search the list of installed applications for *Voltage Modular*.
- Select *Voltage Modular* and click *Uninstall*.

The *Store* library tab lets you purchase modules and sounds from directly within Voltage Modular. Purchased modules and sounds are automatically downloaded and installed for use in Voltage Modular.

Categories in the store only display modules *not* installed on your computer except for the *Purchased* category, which displays previously purchased modules and sounds.



Purchasing Modules and Sounds- To purchase a module, module collections, or sounds package, click on the price button, or double-click anywhere in the listing.



Purchase Online- This takes you to the Cherry Audio website where you'll be able to complete purchases. Upon completion of the transaction, the new module(s) is automatically downloaded to your hard drive and installed for immediate use. Yay!

The *Information* tab displays information about the item you're purchasing; the *Reviews* tab contains user reviews to help you make decisions on purchases.