

Bitbox 2.2 User Manual



Welcome to bitbox. Bitbox is a very useful tool for capturing and playing back samples. This manual will walk you through all of the features of bitbox. If you want to start playing right away, please consult the **Quick Start Guide** found in the box. The Quick Start Guide and this manual are also available on the [1010music.com Support page](https://1010music.com/support).

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Welcome

Bitbox is a digital sampler designed for Eurorack. It allows you to record your own WAV files or bring them over from your computer, trigger them via CV and MIDI, and manipulate them using slices and modulators. It provides the ability to perform tasks on your Eurorack that previously required a computer. The module's touch screen makes working with WAV files easy and intuitive.

In this manual, we will start with an overview of the front panel and the main screen. Next, we will cover how to install the module in your rack and do initial setup of the firmware options. Once the module is set up, we will describe how to create a preset and configure cells. This will include a discussion of the different cell modes, and how to record a new WAV file. Next, we will go into more depth about preset management tasks. That will be followed by a discussion of how to use modulators, tracks and clock signals to synchronize playback across cells and with external devices. After that, we will cover how to backup your presets and WAV files, and upgrade or swap your firmware.

If you would rather get a quick overview of how to use the module, see the Bitbox Quick Start Guide that came with the module and that is also available online at <https://1010music.com/bitbox-documentation>.

This document applies to version 2.2 of the bitbox firmware.

Overview

The bitbox module allows you to record and playback samples in creative ways. When working with bitbox, you create presets that store the selection of samples and parameters that you want to use together. You can create any number of presets, limited only by the space available on your microSD card (up to 32 GB cards). When creating a preset, you start by selecting the samples you want to use and assigning them to individual cells. Then you apply parameters, including loop options, slicing and modulation to each cell. You can route the output of each cell to one of four outputs, either as 4 mono outputs or 2 pairs of stereo outputs. Bitbox can take in MIDI, Clock and CV inputs to allow you to synchronize or trigger playback with other modules or external devices.

Bitbox allows you to manage your Preset and WAV files directly from the module. You can save your changes over the original file or save as a different file. You can rename and delete files as well.

Bitbox shows you a visual representation of your WAV files, and helps you slice the samples into sections that can be triggered independently. Touch screen gestures allow you to zoom into the display of the wave file to get more precise control when you need it, and also allow you to zoom out to see the whole picture.

This manual documents the functionality available in version 2.2 of bitbox. If you have an earlier version of the bitbox firmware, you can upgrade for free. See [Install New Firmware below](#) for the steps to upgrade. To determine which version of the firmware you are running, press the **Home** button until you see the **Menu** screen shown on the right. The number in the lower right corner is the current version. The screen shot shows version 2.2.4.

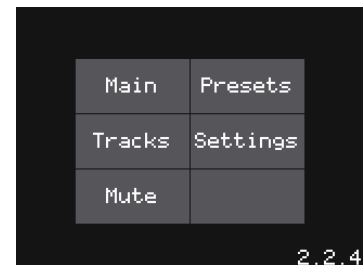


Figure 1: Menu Screen

Front Panel Overview

The front panel of bitbox contains a touch screen, control knobs, HOME and INFO buttons, a MIDI input jack, and CV input and output jacks as shown in Figure 2: Front Panel Overview. This manual will refer to the controls, inputs and outputs of the module using the labels shown in this figure.

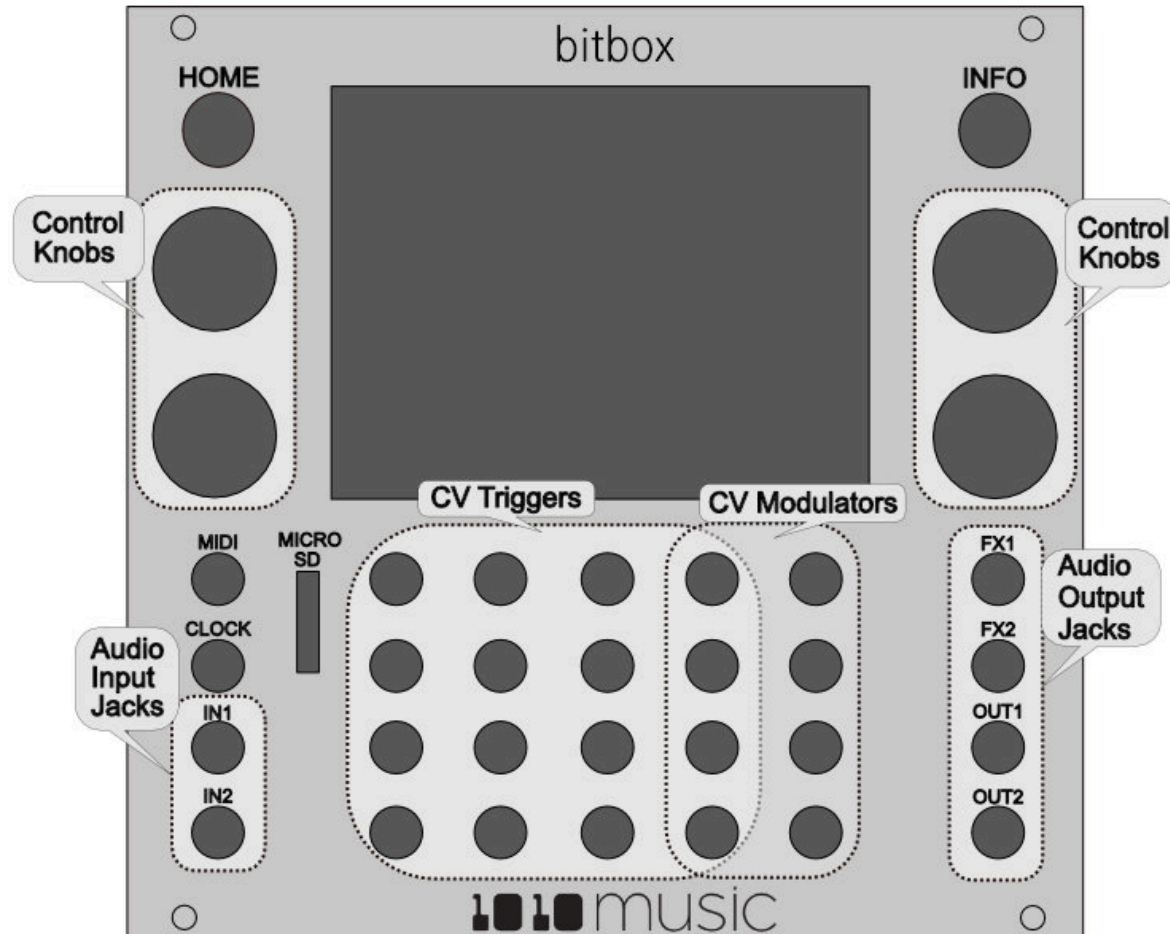


Figure 2: Front Panel Overview

The **Touchscreen** displays the firmware run on the module and allows you to use touch gestures to interact with the firmware. The **INFO** and **HOME** buttons are used to navigate the screens. Press **INFO** to view the information screen for the current selection. In some cases, you can press **INFO** more than once to get to deeper information. The **HOME** button takes you back a screen. If you get lost, you can press **HOME** until you get back to the **Main** screen.

The **Control Knobs** are used to cycle through options on the screen. When there are several parameters on the screen, use the **Control Knob** closest to a parameter to set its value.

Below the screen there are a series of mini jacks that are used for MIDI and Control Voltage input and output. The MIDI input jack allows you to trigger cells, and modulate signals. You can also use the MIDI clock to synchronize playback. The CLOCK input is used to synch with a CV clock signal. The two audio inputs (**IN1** and **IN2**) are used to record WAV files.

Bitbox allows the user to configure how the audio outputs of the cells are routed to FX1, FX2, OUT1, and OUT2, either as mono or stereo signals.

Main Screen Overview

The bitbox touchscreen allows you to do activities on your modular rack that previously required a computer. The User Interface allows you to see the waveforms and take actions on them. It also allows you to see the names of WAV files you are working with and to control numerous parameters with the use of only 4 knobs. You can touch cells to trigger and select them, and touch on-screen buttons to take an action.

The Main Screen of the bitbox firmware provides ready access to the WAV files in the selected preset. The grid on the Main Screen contains 16 gray cells that can each be assigned one WAV file. Each preset may contain a different configuration of WAV files and parameters. The cells display the name of the selected WAV file. A blue bar across the bottom of the cell represents the playback state of the cell. The four cells along the right side of the screen, labeled EXT1 through EXT4, are mapped to external inputs. The column to the left of the EXT cells can also be used as additional external outputs EXT5 through EXT8, in addition to simultaneously being used to trigger samples mapped to those cells. You can touch a cell on the screen to select it. The selected cell is highlighted pink. Press the **INFO** button to drill down and see more information about that cell. In some cases you can then press **INFO** again to access more information about the cell. Press **HOME** to return to the previous screen. You can also use the **Control Knobs** to scroll through the cells. The top two knobs scroll horizontally, and the bottom two knobs scroll vertically. The Control Knobs allow you to select a cell without triggering it.



Figure 3: Main Screen

A counter in the top left corner of the screen tracks the number of measures and beats (e.g. **194:3** in the example) that have played since the clock started. Reset the measure counter by powering down the module, stopping the CV clock input for a few seconds, or sending a MIDI Start signal.

Setup Bitbox

In this section we will discuss how to install the bitbox module in a Eurorack, insert the microSD card, and configure some general settings.

Choose an Orientation

Bitbox can be configured so that the user interface will be right side up with either the touchscreen at the top of the module, or at the bottom. We originally designed the module to run with the touchscreen on the top of the module, and the text on the faceplate right side up. If you are running the module in a tabletop skiff and want to be able to access the touchscreen without reaching over the cables, install the module with the touchscreen at the bottom. That means the text on the front panel will be upside down. (Check our website to see if we are selling upside down faceplates.) Think about how you want to use the module and decide on the orientation that will work for your setup. We will talk about how to flip the User Interface when we configure the general module settings.

Note:

- When the User Interface is flipped, the alignment of the knobs will be slightly higher than the on screen elements that they control. However, the general orientation mapping will be correct.

Rack Installation

Let's make sure you have a compatible Eurorack. Bitbox requires a +12V connection and uses the standard 16-pin ribbon cable to connect to the rack. You should always power down the Eurorack when connecting new modules. Remove bitbox from the packing material and attach the ribbon cable to the back of the module. The cable is the same on both ends so it does not matter which end is inserted into the module. However, the connector must be in the correct orientation. The connector on the module is keyed so the ribbon cable won't fit in the wrong orientation. The correct orientation places the edge of the ribbon cable with the red line on the left side of the module as shown in Figure 4 to the right. Next, connect the other end of the ribbon cable to the power supply for your Eurorack. When connecting to the Eurorack power supply, extra care is needed because not all power supplies are keyed to ensure correct orientation. The ribbon cable should be connected to the power supply so that the edge of the ribbon cable with the red line is aligned with the -12V pins on the power supply bus. When you power up, watch closely to make sure that the module powers up. If the touch screen doesn't respond right away, turn off the rack and confirm the cable orientation. 1010music modules do contain some buffering to prevent burning out the module but that only buffers for so long. Don't power up yet.

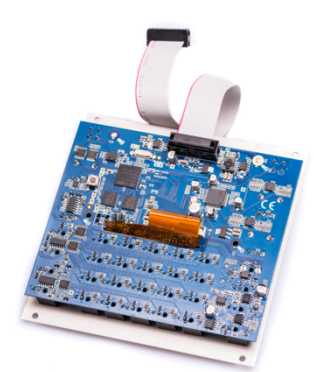


Figure 4: Ribbon Cable Orientation on Module

Next make sure the microSD card that came with the module is inserted into the Memory Card Slot. Most modules come with the microSD card already inserted. The card should be inserted with the straight edge closest to the touchscreen. Bitbox can use microSD cards that hold up to 32 GB of data. Larger cards are not supported. Now you can power up the rack. The module should start up in less than 10 seconds and you will see the Main screen as shown in Figure 3: Main Screen above.

Note:

- A microSD card must be inserted into bitbox before you can get started. All presets are stored on the microSD card. Preset changes are only saved when you choose to save them.

Connect an Output

In order to hear the sounds that are playing on your bitbox, you will need to connect the outputs to some speakers. Start by inserting two mini TS cables to the OUT1 and OUT2 jacks and then connecting the other ends to your mixer or speakers.

Connect an Input

Bitbox accepts several different forms of input. For now we will set up some basic inputs to get you started. If you are going to use a MIDI device to drive your bitbox, connect it to the MIDI input on the bitbox.

Note:

- Not all mini TRS MIDI jacks work the same way. You can use mini TRS cables to connect the bitbox MIDI input to the MIDI output of another 1010music product, or other compatible products. For other products you may need to use a MIDI adapter. For information about MIDI adapters and compatibility see our blog post at <https://1010music.com/stereo-minijacks-midi-connections-compatibility-guide>.

You can also use Control Voltage (CV) signals with bitbox. If you prefer this method, connect some CV signals from other modules or devices to one or two CV Trigger jacks in the array of jacks below the touch screen. Connect one input in the right column of CV Trigger jacks, and another input in one of the first four columns. Configure your external device to send a varying CV signal in the -5V to +5V range.

Global Module Settings

Before we dive into using the module, we will configure three general module settings: **Brightness**, **RecToPlay**, and **Flip UI**.

To access these settings, press the **HOME** button until you see the Menu screen shown in Figure 1 on page 5. Touch **Settings** to display the Settings screen. Use the Control Knob closest to the parameter to adjust its value.

The **Brightness** setting will adjust the brightness of the display, with 100% being the brightest and 0% being totally dark.

When **RecToPlay** is **ON**, bitbox will automatically play a newly recorded sample when recording completes. This only works when a time duration is selected for the recording Length parameter. When it is off, the sample will not be automatically played.

The **Flip UI** setting will turn the user interface upside down so you can use the module with the touchscreen on the bottom. As soon as you change the value for **Flip UI**, the user interface will be inverted. This means you will need to change which Control Knob you use to change it back.

Use the **GlobalMIDI** setting to change the MIDI channel that is used to trigger playback of cells. The default value is **Ch 10**. You can choose a channel between 1 and 16, or choose **None** to ignore MIDI inputs. Note that individual cells have a parameter that allows you to specify a different MIDI channel for that cell. When the MIDI parameter for a cell is set to **Default**, the cell will respond to the channel that is selected in this **GlobalMIDI** setting.

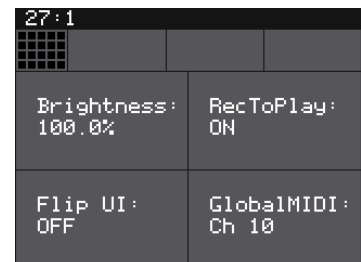


Figure 5: Settings Page 1

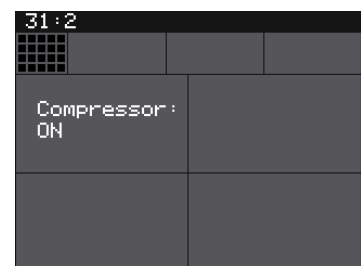


Figure 6: Settings Page 2

Press **INFO** to access the second page of Settings. Here you can turn the **Compressor On** or **Off**. When set to **On**, bitbox will apply a compressor to the signals sent to Out1 and Out2. Press **INFO** again to cycle through the two Settings screens.

Press the **HOME** button to go back to the Main screen.

Working in Flipped Mode

When the value for **Flip UI** is set to **ON**, the user interface on the touch screen will be inverted. Use this setting when the module is installed in a rack with the touchscreen on the bottom. When flipped, the firmware adjusts how the buttons, Control Knobs and CV Trigger jacks are mapped to the user interface. One noteworthy change is that the **HOME** and **INFO** buttons now reverse functions. This is done so that HOME is always on the left and INFO is always on the right. The alignment of the Control Knobs in this mode is slightly high compared to the parameters on the touch screen. However, the top left control knob will control the top left parameter, and the lower right control knob will control the lower right parameter. The CV Trigger inputs are also now mapped to the inverted display. The Input Jacks and Output Jacks maintain their original assignments. The figure below shows the faceplate labels for an inverted module.

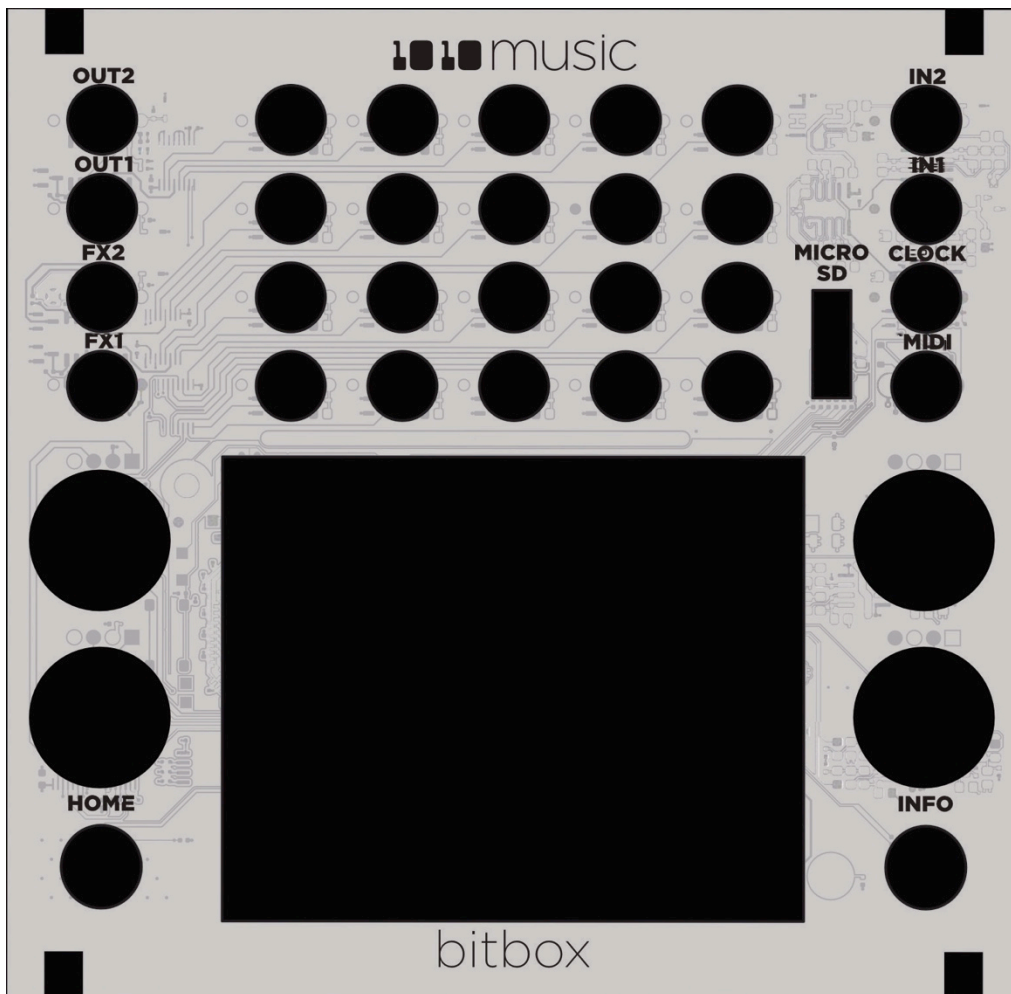


Figure 7: Inverted Faceplate Labels

Test Your Setup

Before we start creating our own presets, let's make sure the module is setup properly by playing back some content from a preset that comes with the module and triggering playback through external inputs.

Use the Touchscreen to Trigger a Cell

The bitbox module loads a preset on startup. You can trigger playback of a cell by touching a cell in the grid that has a WAV file name displayed. You will see a blue bar graph appear below the cell during playback. You will hear the WAV file played back through the audio output selected for that cell. If you don't hear anything, try listening on both OUT1 and OUT2, as these are the default outputs for bitbox.

Trigger a Cell via Control Voltage Signal

You can use an external signal to trigger the playback of a Cell. Plug a trigger source into one of the **CV Trigger** jacks. The **CV Trigger** jacks are mapped to the cells on the touchscreen. The cell that corresponds to the used **CV Trigger** jack will now be triggered when the **CV Trigger** input receives a high signal of around 5V. Depending on the Launch Mode selected for the cell, you may need to send another CV Trigger to stop playback of the cell.

Trigger a Cell via MIDI Input

You can use a MIDI input to trigger playback of a cell. Plug a MIDI controller source into the **MIDI** input jack, and configure the MIDI device to use the **GlobalMIDI** channel selected in Settings. (See Global Module Settings above to learn how to set the **GlobalMIDI** channel.) Now you can use the MIDI device to trigger cells. **MIDI** inputs for notes 36 to 51 map to the clips in the grid as shown in the diagram on the right. The Scene Triggers for EXT1 through EXT4 are assigned notes 55 to 52 for use as Scene Triggers and Recording triggers. However, these MIDI mappings for notes 52 to 55 do not work with modulation.

48	49	50	51	55
44	45	46	47	54
40	41	42	43	53
36	37	38	39	52

Figure 8: MIDI Cell Mapping

Note:

- The **MIDI** input uses a Tip Ring Sleeve (TRS) connection compatible with the Arturia BeatStep Pro. Be sure to use a TRS cable and not a TS cable. Read the blog post [Mini TRS Jacks for MIDI Connections Compatibility Guide](https://1010music.com/stereo-minijacks-midi-connections-compatibility-guide) on our website at <https://1010music.com/stereo-minijacks-midi-connections-compatibility-guide> for more details about MIDI TRS cable compatibility and when you need to use a MIDI Adapter.
- Bitbox by default responds to **MIDI** inputs on MIDI Channel 10, which is the default channel for the drum part on the BeatStep Pro. You can change this in the Global Module Settings as described above.
- Bitbox can also use MIDI input to modulate parameters. See Use Modulation to Control Playback below.
- Bitbox can also use MIDI inputs on other channels to trigger playback of slices within a Slicer cell. See Use MIDI to Trigger Slice Playback below for more information.
- The **MIDI** parameter for a cell can be used to configure a cell to be triggered by a MIDI channel other than the **GlobalMIDI** channel.

Create and Configure a New Preset

In order to demonstrate the features of bitbox, we will walk through the process of creating a new preset and configuring several different cells.

Create and Name the Preset

First, you will create a new preset that will be used to store the configuration parameters you select. Follow these steps to create and name your preset:

1. Press the **HOME** button until you see the Menu screen shown in Figure 1 on page 5. Touch the **Presets** option to display the Preset Management screen. The Preset Management screen shows a list of the presets stored on the microSD card with a menu across the top. The currently selected preset is highlighted in blue.
2. Touch **New** in the top menu. A new preset is added to the list with the name **New Preset xx**, where **xx** is the next available number.
3. Touch the **Edit** button in the top row of the **Touch Screen** to display the **Preset Edit Menu**.
4. Touch the **Rename** menu button to display the on screen keyboard.
5. Touch the back arrow **<** to backspace through the preset name to clear it. Then use the onscreen keyboard to type in a new name. Use the carat button **^** to toggle between upper and lower case letters. Touch the **123** button to display the numeric keyboard if needed. When the name is complete, touch **return** to save the name and return to the **Presets** screen with the new preset selected.
6. Touch the **Load** button to start working with your new preset from the Main screen.

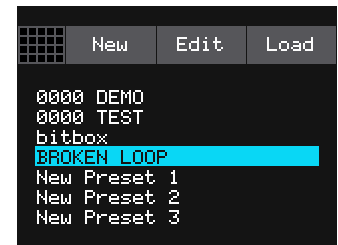


Figure 9: Preset Management Screen

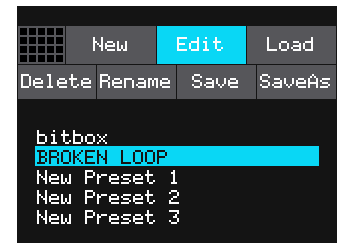


Figure 10: Preset Edit Menu

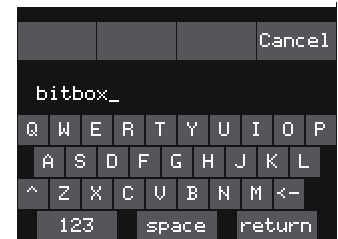





Figure 11: Keyboard Screen

Select WAV Files and Assign Cell Modes

Now you will choose some WAV files to assign to cells and assign a mode to each cell. The main screen has a 4x4 grid of 16 light gray cells. A WAV file can be assigned to each of these cells, and each cell is assigned a cell mode. The available cell modes are sample, clip and slicer:

Icon	Cell Mode	Description	Reverse Playback	Quantize	Set Loop points	Play Slices
	Sample	Use a sample cell when you want to be able to control start and end points for playback and looping. This mode supports reverse playback, along with forward and bidirectional looping. For example, you might use Sample mode with a melodic sample. Sample mode supports 4-note polyphony.	Yes	No	Yes	No
	Clip	Use Clip mode when you want to use synchronized loops and quantized playback. Clip mode works well with drum loops between one and eight measures long. (This works mostly like the original bitbox.) Clip mode supports 2-note polyphony.	No	Yes	No	No

Icon	Cell Mode	Description	Reverse Playback	Quantize	Set Loop points	Play Slices
	Slicer	Use Slicer mode when you have a WAV file with multiple sections that you want to trigger independently. (This is similar to Atomic Mode in 1.x versions of bitbox.) Slicer mode supports 2-note polyphony.	No	No	No	Yes

Each cell can have a different Cell Mode. You can use the same WAV file in different cells in different cell modes. To load a WAV file into a cell:

1. Select a cell by touching it or using the Control Knobs to cycle through the cells. (The top Control Knobs move the selection horizontally. The bottom Control Knobs move the selection vertically.) The selected cell is highlighted pink.
2. Press the **INFO** button. If the cell was empty, the Load and Record screen will be displayed. If the cell already had a WAV file assigned, the Waveform screen will be displayed.

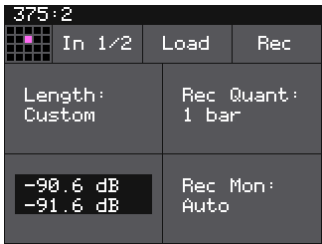


Figure 12: Load and Record Screen

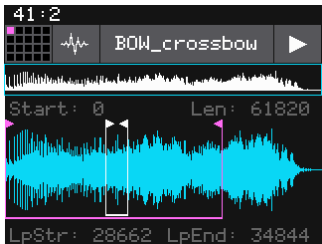


Figure 13: Waveform Screen

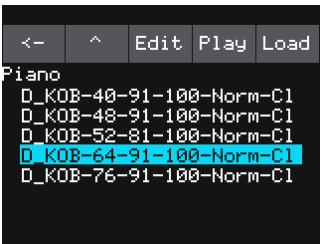


Figure 14: WAV File Selection Screen

3. If you are on the Load and Record screen, touch **Load** in the top menu bar. If you are on the Waveform screen, touch the name of the Waveform at the top of the screen (**AcidDrumLoop** in the example). You will now be on the WAV file selection screen.
4. From the WAV file selection screen, use the **Control Knobs** to scroll through the list of files. The selected file name has a blue highlight. Touch **Play** to preview the highlighted file. The Play button will turn blue to show that auto-preview is enabled. Bitbox will play each WAV file once when you pause on it while scrolling. If you have an input trigger configured for this cell, bitbox will play the selected WAV file whenever a trigger is received for this cell. Touch the **Play** button again to disable auto-preview mode. Touch **Load** to assign the selected WAV file to this cell. When looking at the list of files, list items that start with a slash **** are directories. Load a directory to see its contents. The file path is displayed above the list of files (e.g. **Piano** in the example above.) Touch the caret **^** to navigate back up the directory tree. Touch the back arrow **<** to go back to the previous screen.

Once you have loaded a WAV file, you will be on the Waveform screen. There are a number of important features on the Waveform screen. The grid icon in the top left of the screen, immediately below the clock counter, provides a graphical representation of which cell in the grid you are configuring. You can touch it to return to the Main screen. The icon just to the right of that is a button that allows you to select the cell mode. The text in the top bar displays the first characters of the name of the loaded WAV file, and can be used to choose a different file. Trigger playback by touching the arrow button on the right.

There are two views of the waveform displayed on the screen. The top view always display the full waveform with a blue square indicating the subsection of the waveform that is displayed in the bottom, bigger waveform. You can use pinch and

stretch touchscreen gestures to zoom in and out of the waveform, or swipe to scroll along the length of the waveform. You can quickly jump to a different section of a long waveform by touching that section of the wave in the top view.

The next step is to configure general cell attributes including choosing a cell mode.

1. Touch the icon immediately to the left of the WAV file name at the top of the screen to display the Cell Mode menu. Touch one of the options, **Sample**, **Clip** or **Slicer**, to set the cell mode. The icon changes to represent the selected cell mode.
2. From the waveform screen, press the **INFO** button to display Cell Parameters Screen 1. You can continue to press **INFO** to cycle through the Cell Parameter Screens and the Waveform Screen.
3. On Cell Parameters Screen 1, there are four menu items below the measure and beat count. The left most item is the grid icon. The second menu item is the output selection button (**Out1/2** in the example figure). Touch this menu item to display the list of Output Options:

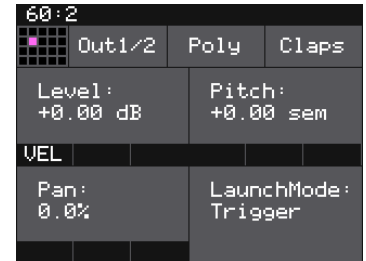


Figure 15: Cell Parameters Screen 1

Output Option	Description
Out1/2	The output of this cell is sent to Out1 and Out2 in stereo.
Out1	The output of this cell is sent to Out1 in mono.
Out2	The output of this cell is sent to Out2 in mono.
FX1/2	The output of this cell is sent to FX1 and FX2 in stereo.
FX1	The output of this cell is sent to FX1 in mono.
FX2	The output of this cell is sent to FX2 in mono.

4. Touch the desired Output Option to select it.
5. The next menu item (**Poly** in the example figure) controls the polyphony of the cell. Touch the menu option to select Polyphonic or Monophonic playback for this cell. Sample cells support 4-note. Clip mode and Slicer mode support 2-note polyphony.
6. The last menu item displays the first few characters of the WAV file name. Touch this menu item to start playback of the cell. The playback functionality will depend on the other parameter settings. The WAV file is playing when this menu item is highlighted light blue.
7. On Cell Parameters Screen 1 you can configure some general cell options that are the same for all cell modes. Touch the Control Knob closest to each of the parameter to set its value:

Parameter	Description	Range of Values	Mod Target?
Level	Adjusts the loudness level of the cell	-96.0 to +12.0 db	Yes

Parameter	Description	Range of Values	Mod Target?
Pitch	Adjusts the pitch of the cell up or down	-24.0 to +24.0 semitones	Yes
Pan	When a stereo output option is used (OUT1/2 or FX1/2), this controls the positioning of the sound between the two outputs.	-100% to +100% Negative values pan the sound more to Out1 or FX1. Positive values pan the sound more to Out2 or FX2. If a mono Output Option is selected, Pan does not do anything.	Yes
LaunchMode	This controls how a note trigger affects the playback of a cell.	<p>Trigger: Activate the cell by touching the cell, through a CV Trigger, or through MIDI note on. Bitbox will start playback of the clip and play through to the end.</p> <p>Gate: Begin the cell playback in the same manner as Trigger mode. But in Gate mode, playback will stop when you release the touch, the CV Trigger gate goes low, or the MIDI note is released.</p> <p>Toggle: Begin the clip playback in the same manner as Trigger mode. When another trigger event happens, the playback will stop.</p>	No

The ADSR parameters page allows you to shape the envelope of the sample sound using the following parameters:

Parameter	Description	Range of Values	Mod Target?
Attack	The time it takes for the sound to reach its loudest level	0.0 to 100.0% The attack percentage is a logarithmic scale between 0 and 9 seconds.	No
Decay	How long it takes for the sound to go from the initial peak to the sustain level	0.0 to 100.0% The decay percentage is a logarithmic scale between 0 and 38 seconds.	No
Sustain	The volume level that the sound maintains when you hold a note	0.0 to 100.0%	No

Parameter	Description	Range of Values	Mod Target?
Release	The release specifies how long the note will continue to play and fade out when the note is released. In Gate mode, the release begins when the touch ends, the gate signal goes low, or the MIDI note off event occurs. In Toggle mode, the release begins when the toggle off occurs. In Trigger mode with Sample cells the release begins when reaching the Loop End point in loop mode, or the Start + Len point when not looping. In Trigger mode for Clips and Slicers, the release has no effect.	0 to 100% The release percentage is a logarithmic scale between 0 and 38 seconds.	No

Several of the cell parameters have three black boxes below them. These cells are potential modulation targets, and these boxes are used to control the modulation parameters. We will discuss modulation later.

The remaining configuration options for a cell vary based on which cell mode is selected. We will walk through the configuration of each of the cell modes next.

Set up a Sample Cell

Use a sample cell when you only want to play or loop through a single note or drum hit within a WAV file. This cell mode supports reverse playback, along with forward and bidirectional looping. For example, you might use Sample mode with a melodic sample.

Follow the steps in the previous section to create a sample cell. An example of a good WAV file to use for a sample cell is \drums\kick 1.wav. Press the **INFO** button to cycle through the Cell Parameters screens and the Waveform screen. Use the Control Knob closest to the parameter name to change the value of a parameter. The table below describes the parameters available that are specific to a Sample cell.

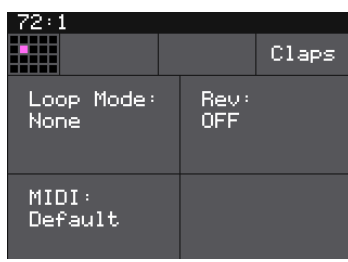


Figure 17: Sample Cell Parameters Screen 2

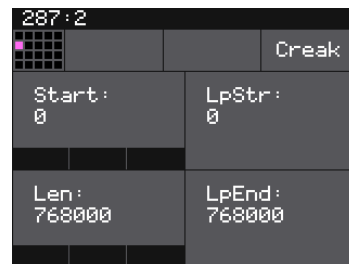


Figure 16: Sample Cell Parameters Screen 4

Parameter	Description	Range of Values	Mod Target?
Loop Mode	<p>Controls whether the WAV file plays in a loop, and the direction of the loop.</p> <p>When looping is enabled, if you have the Launch Mode set to Trigger, looping will happen for the duration of the Release phase of the note.</p> <p>If you have the Launch Mode set to Gate, looping plays through the gate pulse and the release time.</p> <p>If you have the Launch Mode set to Toggle, looping starts to play when the initial pulse is received and continues until the terminating toggle pulse is received.</p> <p>If Loop Mode is Bidirect, and Rev is ON, play back will start from the end of the sample, and then loop as described, but starting with the Loop End to Loop Start pass.</p>	<p>None: Plays once from the value assigned to the Start parameter through the value assigned to the Length parameter.</p> <p>Forward: Plays from the value assigned to the Start parameter through the value assigned to the Loop End Parameter, then jumps back to the value of the Loop Start parameter. Play continues to loop between Loop Start and Loop End for the duration of the note.</p> <p>Bidirect: Works similarly to forward, but loop playback proceeds from Loop Start to Loop End then backwards to Loop Start. It then repeats the looping back and forth.</p>	No
Rev	When Reverse is ON, the WAV file will play in reverse.	ON, OFF	No
MIDI	<p>Playback for all cells will always occur when the corresponding MIDI notes are played on the MIDI Channel selected for the GlobalMIDI setting. This MIDI parameter sets an additional MIDI channel that this cell will respond to. If set to Default, this cell only responds to the GlobalMIDI channel.</p> <p>When a value other than Default is assigned to this parameter, the MIDI signal on the designated channel will trigger playback of the WAV file at the corresponding pitch. Note 64 (typically middle C) will play the note as recorded. Each note above or below note 64 will transpose the pitch the corresponding number of semitones.</p>	Default, Ch1 through Ch16.	No
Start	Point where playback will begin when playing forward or ends when playing in reverse. Expressed in samples.	0 to number of samples in the file	Yes
LpStr	Point where the looping will begin when playing forwards, or looping will end when playing in reverse. Expressed in samples. Must be before or equal to LpEnd.	0 to number of samples in the file	Yes

Parameter	Description	Range of Values	Mod Target?
Len	When Loop Mode is None, how long the sample will play past the value of the Start parameter. Expressed in samples.	0 to number of samples in the file	Yes
LpEnd	Point where the looping will end when playing forwards, or looping will begin when playing in reverse. Expressed in samples. Must be after or equal to LpStr.	0 to number of samples in the file	Yes

You can also set the values for Start, LpStr, Len, and LpEnd from the Waveform screen. When viewing the waveform, the pink frame on the large waveform represents the Start and Len parameters. You can move these end points by turning the top two Control Knobs. If Loop Mode is set to Forward or Bidirect, you will also see a white frame within the pink frame that defines the Loop Start and Loop End points. Use the bottom two Control Knobs to adjust these end points. The corresponding values for the end points are displayed above and below the large waveform. The sensitivity of the Control Knobs depends on the Zoom level. Zoom out to make big adjustments then zoom in to make fine adjustments.

Work with a Clip Cell

Use Clip mode for WAV files where you want to use synchronized loops and quantized playback for the entire WAV file. Clip mode works well with drum loops between one and eight measures long. This is the cell mode that is the most similar to the original bitbox functionality before cell modes were introduced in 2.0. This is the only cell mode that supports quantization. An example of a file that works well with Clip mode is \Loops\1 Massive.wav.

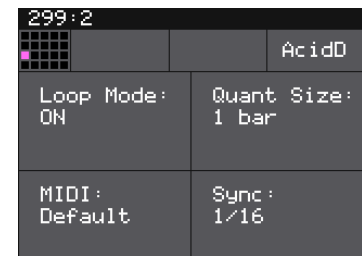


Figure 18: Clip Cell Parameters Screen 2

The following parameters are specific to Clip mode:

Parameter	Description	Range of Values	Mod Target?
Loop Mode	Controls whether the WAV file plays in a loop. The whole WAV file will be played in the loop for Clip cells. Only forward looping is supported with Clip cells.	On, Off	No
Quant Size	Use Quant Size to quantize when the playback starts and stops. Quantization will cause playback to snap to a musical grid with intervals specified by the Quant Size parameter. When quantization is used, the note trigger will cause playback to start and end on the next quant size boundary.	None - always start and stop immediately 1/16 - sixteenth note 1/8 - eighth note 1/4 - quarter note 1/2 - half note 1 bar - a whole note assuming 4/4 time 2 bars 4 bars 8 bars	No

Parameter	Description	Range of Values	Mod Target?
MIDI	<p>Playback for all cells will always occur when MIDI notes are played on the Channel configured as the GlobalMIDI channel (Channel 10 by default). This parameter sets an additional MIDI channel that this cell will respond to. If set to Default, this cell only responds to the GlobalMIDI channel.</p> <p>When a value other than Default is assigned to this parameter, the MIDI signal on the designated channel will trigger playback of the WAV file at the corresponding pitch. Note 64 (typically middle C) will play the note as recorded. Each note above or below note 64 will transpose the pitch the corresponding number of semitones.</p>	Default, Ch1 through Ch16.	No
Sync	<p>Sync is only enabled when quantizing is enabled (the Quant Size parameter is not None.) The Sync feature prevents timing drift that can occur when the length and BPM of a clip does not align exactly with the tempo of playback. When Sync is used, bitbox will detect the location of the 'beats' within the WAV file along with the BPM of the WAV file.</p> <p>Even slight differences between WAV file BPM and clock tempo can cause significant drift over time. Select a value for Sync that will control the size of the musical unit to which the clip will be synchronized. Choose small settings for rhythmic or percussion clips. Choose large settings for sustained tones or drones.</p>	<p>None – playback will occur at the original rate. Looping will happen as soon as the sample ends.</p> <p>1/16 - quantize to the next sixteenth note time</p> <p>1/8 - eighth note</p> <p>1/4 - quarter note</p> <p>1/2 - half note</p> <p>1 bar - a whole note assuming 4/4 time</p> <p>Slice (See Use Slices to Synchronize Playback of Clip Cells below for more information)</p>	No

Let's talk some more about Quant Size and Sync. When a Quant Size other than None is selected, the playback of the wave file will be delayed until the next selected unit of music as specified in Quant Size. This will ensure that your playback "snaps to the grid" of the beats established by your clock. Sometimes, the WAV file you are playing is longer than one beat. For example, the WAV file might contain a 2 bar drum riff. For a Clip cell, Bitbox will make some assumptions about where the beats in your file occur. In Clip mode, bitbox will play the whole 2 bar riff when the note is triggered. But the beats in the WAV file might not be playing at the same tempo as the clock speed. If you leave Sync set to None, the WAV file will play in its entirety and will get out of sync with your clock. If your WAV file tempo is faster than your clock tempo, it will sound like the beats are running ahead of the rest of the music. If your WAV file tempo is slower than your clock tempo, it will sound like your drums are lagging. If you want to fix that, then choose the value for Sync that identifies how tightly you want to snap to the clock while the WAV file is playing in response to a single sustained note trigger. While the note is playing, the sync will cause the playback of the WAV file to jump to the next selected sync increment in the file when the corresponding clock time has passed. So if the WAV was a little faster than your clock, the playback position will jump backwards to move the playback of

the WAV to the selected clock increment. If the WAV is slower than your clock, the playback position will jump ahead to the selected clock increment. This will work well if the difference between the BPM of your WAV file and the BPM of your clock is small. It will sound like a stutter if the difference is large.

Work with Slicer Cells

Slicer mode is useful when a single WAV file has multiple sections that you want to trigger independently. This is similar to Atomic Mode in early versions of bitbox. For example, if you have a drum riff you may want to trigger different sections of the drum riff independently. Or if you have a recording of a vocal track, you may get an interesting effect if you skip around to playback different words or phrases over time.

In order to use Slicer mode effectively, you will need to identify slices within the WAV file. Bitbox can automatically detect the slice points within the wave file, and you can manually add or remove slice points. An example of a file that works well with Slicer mode is \SFX\Metal\METL_shake and squeal.wav.

The following parameters are specific to Slicer Cells.



Figure 19: Slicer Cell Parameters Screen 2

Parameter	Description	Range of Values	Mod Target?
Loop Mode	Controls whether the slice playback is looped. This does not work with Launch Mode of Trigger. Use Launch Mode of Gate or Toggle if you want to loop slices.	On, Off	No
Slice	Indicates which slice will be played when a note is triggered. You can use modulation to vary this value over time.	1 through the number of slices in the cell.	Yes
MIDI	<p>Playback for all cells will always occur when MIDI notes are played on the Channel configured as the GlobalMIDI channel (Channel 10 by default). This parameter sets an additional MIDI channel that this cell will respond to. If set to Default, this cell only responds to the GlobalMIDI channel.</p> <p>When a value other than Default is assigned to this parameter, the MIDI signal on the designated channel will trigger playback of the WAV file at the corresponding pitch. Note 64 (typically middle C) will play the note as recorded. Each note above or below note 64 will transpose the pitch the corresponding number of semitones.</p>	Default, Ch1 through Ch16.	No

Parameter	Description	Range of Values	Mod Target?
Slice Seq	<p>When Slice Seq is set to a value other than None, each trigger received on the modulation source assigned to this parameter will advance the selection of the next slice to play.</p> <p>The value of this parameter controls the order in which slice selection is advanced.</p> <p>This parameter works with modulation sources of trig, and ext1 thru ext8. Don't use VEL as a modulation source for this parameter.</p> <p>You must setup a modulation source for this parameter for slice sequencing to work.</p> <p>Playback is still controlled via the usual Cell Triggers.</p> <p>It is possible for the slice selection position to move multiple times or no times between cell triggers.</p>	<p>None: This parameter will not be used to control the order of playback of slices.</p> <p>Forward: A trigger on the modulation source will cause the playback to move to the next slice.</p> <p>Backwards: A trigger on the modulation source will cause the playback to move to the previous slice</p> <p>Random: A trigger on the modulation source will cause the playback to move to a randomly selected slice</p> <p>Stagger: A trigger on the modulation source will cause the playback to move through the slices in a somewhat random way. It will move forward a few slices, then back a couple of slices, and repeat.</p>	Yes

In addition to setting parameters for a Slicer cell, you also need to create the slices. There are three ways to do this: Manually, Auto Scan, and Scan to Grid. When you configure slices manually, you set each loop point yourself by defining and removing splits. The manual process may also be used to refine the results of an Auto Scan or a Slice to Grid. When you use Auto Scan, bitbox uses an internal algorithm to decide where to place the splits. You can control the sensitivity of the algorithm. When you use Slice to Grid, You define a fixed number of slices, and bitbox will create splits that evenly divide the WAV file into the specified number of slices.

To manually create or remove slices:

1. From the Waveform screen for the Slicer cell, touch the menu item with the three dots "...". This will display the Waveform Slicing menu.
2. Use touch gestures to move the waveform so the fixed cursor position (the vertical white line) is at the position where you want to add another slice point. Touch **Split** to create a slice point. The slice point is shown as a pink horizontal line with a small pink square near the bottom.
3. Use touch gestures to move the waveform so the fixed cursor position (the vertical white line) is on or near a slice point that you want to remove. Touch **Join** to remove the slice point.

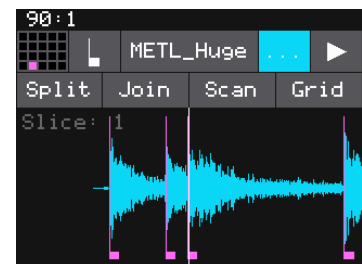


Figure 20: Waveform Slicing Menu

You can have as many or as few slices as you want.

To use Auto Scan to create slices:

1. From the Waveform screen for the Slicer cell, touch the menu item with the three dots "...". This will display the Waveform Slicing menu.

2. Touch **Scan** and then use a control knob to select a **Threshold** percentage for the sensitivity of the scan. The lower the threshold, the higher the number of slices that will be created. Touch **OK** when you are ready to scan. (You can touch anyplace outside of the Threshold field to cancel the scan.) Bitbox will detect and create slice points in the file automatically. The slice points are shown as pink horizontal lines with a small pink square near the bottom.

To use Slice to Grid:

1. From the Waveform screen for the Slicer cell, touch the menu item with the three dots "...". This will display the Waveform Slicing menu.
2. Touch **Grid** and then use a control knob to select the number of **Slices** to create. Touch **OK** when you are ready to scan. (You can touch anyplace outside of the Slices field to cancel the scan.) Bitbox will automatically divide up the WAV file evenly into the number of slices you specified. The slice points are shown as pink horizontal lines with a small pink square near the bottom.

You can adjust the results of the Scan to Grid or Auto Scan by manually adding or removing slices to get the slices that match your creative vision.

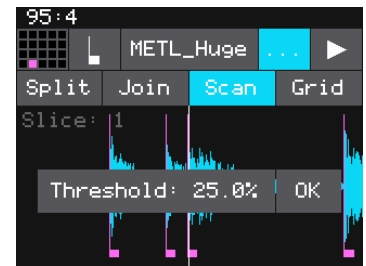


Figure 21: Scan Threshold

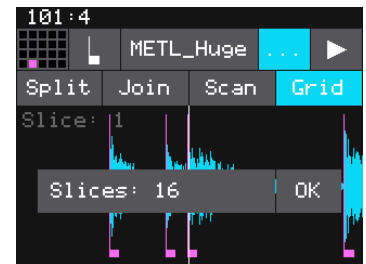


Figure 22: Grid Slices

Use Slices to Synchronize Playback of Clip Cells

You can use slices in a Clip cell to synchronize playback of the beats in the clip. When the value of the **Sync** parameter for a Clip cell is set to **Slice**, bitbox will use the location of the slices in the WAV file as the location of the "beats" for Sync purposes in order to prevent timing drift.

But how do you get slices in a Clip cell? First configure the cell as a Slicer cell, create the slices, and then change the cell type to Clip. The slices will still be visible on the Waveform screen and can be used for synchronization.

Record a New WAV File

Bitbox comes with a set of WAV files preloaded on the microSD card, and it also allows you to record new WAV files. Here's how:

1. Start by plugging an audio signal source into IN1, IN2, or both to record in stereo.
2. Press **HOME** until you get to the **Main** screen.
3. Touch a cell in the grid to select it. With the cell selected, press the **INFO** button. If the cell is empty, bitbox will display the Load and Record screen. If the cell is already loaded, bitbox will display the Waveform screen. Press the Cell Mode icon to the left of the WAV file name at the top of the screen and then touch **New Recording**. You will now see the Load and Record screen.
4. In the top menu, touch the menu item between the grid icon and the **Load** button (**In 1 / 2** in the example screenshot). This will display the list of input choices. Touch one of the options to choose whether to record just from In 1, just from In 2, or from both inputs in stereo.
5. Before you start recording, set up the parameters that control the recording:

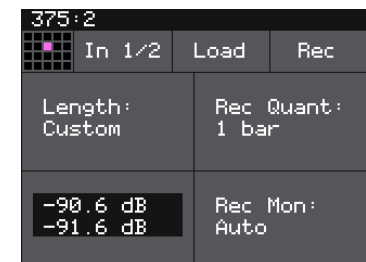


Figure 23: Load and Record screen

Parameter	Description	Range of Values
Length	This parameter allows you to specify a length of time that you want to record, in terms of notes and bars. When Custom is selected, touch the Stop button to stop recording.	Custom, ¼, ½, 1 bar, 2 bars, 4 bars, 8 bars, 16 bars, 32 bars, 64 bars, 128 bars
Rec Quant	This parameter lets you quantize the recording to start and stop at the designated musical time interval.	None - always start and stop immediately 1/16 - quantize to the next sixteenth note time 1/8 - eighth note 1/4 - quarter note 1/2 - half note 1 bar - a whole note assuming 4/4 time 2 bars 4 bars 8 bars
Rec Mon	Controls whether the input signals received through IN1 and IN2 are played out through Out1 and Out2 to enable you to monitor the recording.	Off - Inputs are never played through the outputs. Auto - Inputs play through the outputs while recording or the recording screen is visible. On - Inputs always play through the outputs.

- Send a signal to the selected Input or Inputs. The source will play through the corresponding output jack, **OUT1** or **OUT2**, if the **Rec Mon** setting is **ON** or **Auto**. The lower left corner of the Load and Record screen displays the levels of each of the input signals. For best results leave some room (a few dB) between your loudest level and the max allowed, which is 0dB. If a red bar appears to the right of the level, the signal is clipping and the level should be lowered for best quality.
- Touch the **Rec** button. Bitbox will start recording. If you selected a time value for **Length**, recording will stop after the selected length of time. The Load and Record screen displays a running clock of measures and beats and time duration of the recording. There may be a delay between when you touch **Rec** and when the recording starts as bitbox waits to quantize the recording to the selected **Rec Quant** time interval. See Synchronize Playback with a Clock below for more information about clocks and quantization.
- Touch **Stop** to end recording. There may be a delay between when you touch **Stop** and when the recording ends due to quantization. When the recording has stopped, the main screen is displayed with the new WAV file loaded in the selected cell. The clip name will be **RC** with a numeric suffix. We will discuss changing file names and managing WAV files later.

After you record a clip, that clip is available for use in other cells and presets as well. The WAV file is saved on the microSD card with a file name the same as the name on the screen with a .WAV file extension.

If you have the general module setting **RecToPlay** set to **ON**, bitbox will automatically start to play the new sample when recording ends if the Length parameter was used for recording. See Global Module Settings above to adjust the **RecToPlay** setting.

Note:

- If you record into a loaded cell, the original WAV file remains intact on the microSD card and a new WAV file is created.

Trigger Recording via an External Signal

It can be awkward to initiate recording a sample while also trying to create the sound to be recorded. To help with this, bitbox has the option to use an external CV signal, for example from a foot pedal, to initiate recording. Here's how:

- Press **HOME** to get to the Main screen if needed.
- Touch any of the **EXT** cells on the right hand side and then press **Info** to display the parameters screen.
- Use the control knob to change the value of the **Mod** parameter to **Record**.
- Connect an external CV input to the TS mini jack port corresponding to the EXT cell selected above. The device should provide a gate signal of +5v when triggered.
- Prepare to record a sample as you normally would. Use the external device to send a signal to the EXT port and bitbox will start recording.
- Use the device connected to the EXT port to send another signal to the bitbox to stop recording.



Figure 24: EXT Parameter

Note:

- If you are using MIDI, you can also use the corresponding MIDI note to trigger recording:
 - EXT1: Note 55
 - EXT2: Note 54
 - EXT3: Note 53
 - EXT4: Note 52

Mute Samples

Mute mode allows you to toggle the mute state of various samples from one screen.

- To enter Mute mode, either press **HOME** for three seconds, or repeatedly press **HOME** until you see the menu screen, and then touch **Mute**. You will see the main grid, but the cells will have a background color that indicates their playback state. Active cells will have a green background. Muted cells will be red.
- Tap a cell to toggle mute on or off for that cell.
- Press **HOME** to leave Mute Mode. Muted cells will have a red bar across the top of the cell.

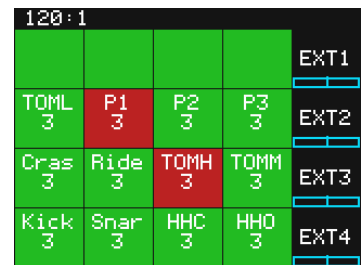


Figure 25: Mute Mode

Note:

- The Mute state is not stored with the preset.

Managing Presets

Bitbox stores a set of cell configurations as a preset. You can save as many presets as you want, as long as there is room for the files on your microSD card. When you turn on bitbox, it automatically loads the first preset in the list alphabetically. The microSD card that comes with bitbox has several presets pre-populated.

When bitbox loads a preset, it loads the set of WAV files and configured parameters for each cell saved in the preset. Review the pre-loaded presets to see some examples of bitbox features in action. The presets that come preloaded with bitbox use only a small fraction of the WAV files that are available on the microSD card. You can use the microSD card to load your own WAV files into bitbox, as well as record new ones. Bitbox also enables you to customize and create your own presets.

Presets are saved on the microSD card when you choose to save them. If you change to a different preset without first saving the current preset, you will lose your work. If you change to a different microSD card, you will have a different set of presets. When you switch to a different preset, all previous settings will be replaced with the settings of the newly selected preset, which may be blank.

We covered how to create a new preset and save changes to a preset in the previous section. We will cover more preset and WAV file management tasks next.

NOTE

- Presets are not saved automatically in the background. This ensures that you don't make unintended changes to a preset.

Save Changes to a Preset

By now you have added a few cells to your preset and spent some time configuring them. If you want to keep the results of your efforts, you will need to save the preset. Bitbox does not automatically save changes as you work. If you change to a different preset or turn off bitbox, you will lose your work. To save the preset:

1. Press **Home** until you see the Menu screen.
2. Touch **Presets** to display the Preset Management screen.
3. Touch **Edit** to display the Edit Preset Menu.
4. Touch **Save** to store your changes to the currently loaded preset.

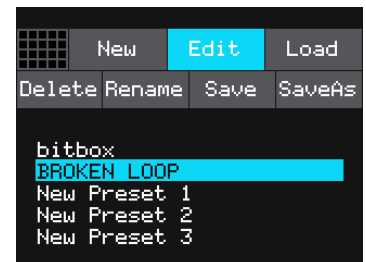


Figure 26: Edit Preset Menu

Load a Preset

To switch to a different preset:

1. Press the **HOME** button repeatedly until you get to the Menu screen.
2. Touch the **Presets** button to view the Preset Management screen.
3. Use the Control Knobs to scroll through the list of presets. The blue highlight indicates the currently selected preset.
4. Touch **Load** to load into bitbox the following information that was previously saved for this preset:

For each WAV cell the WAV file assignment, all parameters, and all modulation settings

For each EXT cell the Scene Trigger setting

For each track the Exclusive Mode setting

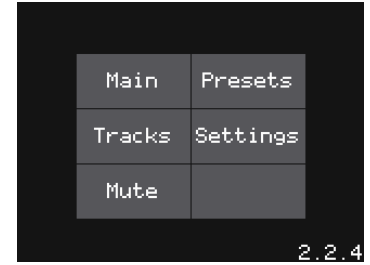


Figure 27: Menu Screen

Delete a Preset

When you delete a preset, you remove the preset from the list of presets on the Preset Management Screen, and you delete the corresponding XML file from the microSD card. To delete a preset:

1. Press the **HOME** button repeatedly until you get to the Menu screen.
2. Touch the **Presets** button to view the Preset Management screen.
3. Use the Control Knobs to scroll through the list of presets. The blue highlight indicates the currently selected preset.
4. Touch **Edit** to display the Edit Preset Menu.
5. Touch **Delete** to delete the highlighted preset.

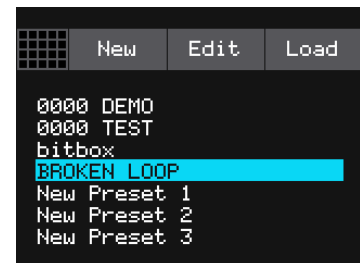


Figure 28: Preset Management Screen

NOTE

- You will not be prompted to confirm the delete action, so please take care when using this feature.

Rename a Preset

To change the name of a preset:

1. Press the **HOME** button repeatedly until you get to the Menu screen.
2. Touch the **Presets** button to view the Preset Management screen.
3. Use the Control Knobs to scroll through the list of presets. The blue highlight indicates the currently selected preset.
4. Touch **Edit** to display the Edit Preset Menu.
5. Touch **Rename** to display the keyboard screen.
6. Touch the back arrow **<** to erase the preset name. Then use the onscreen keyboard to type in a new name. Use the carat button **^** to toggle between upper and lower case letters. Touch the **123** button to display the numeric keyboard if needed. When the name is complete, touch **return** to save the name and return to the **Presets** screen with the preset selected.

Save Current Changes as a New Preset

Sometimes while working on a preset, you decide to save your changes to a different preset in order to save your work while still preserving the original preset state. To save current changes as a new preset:

1. Press **Home** until you see the Menu screen.
2. Touch **Presets** to display the Preset Management screen.
3. Touch **Edit** to display the Edit Preset Menu.
4. Touch **Save As**. Bitbox displays a touch screen keyboard you can use to enter a new name. Touch the **return** button to save the changes and go back to the **Presets** screen.

Work with Preset Files on the MicroSD Card

Preset files can be backed up on your computer or shared with other bitbox users. The presets are saved as XML files on the microSD card. The preset files must be stored at the root of the microSD card. Bitbox will not find preset files that are stored in subdirectories.

You can use a microSD Adapter to insert your microSD card into your computer. You can then use standard file techniques to rename the XML files, delete them, copy them onto your computer or copy them onto other microSD cards. We recommend that you occasionally make backup copies of your presets, especially before upgrading to new firmware.

Compatibility with Legacy Preset Files

Version 2.0 of bitbox introduced a new format for preset files. Newer versions of bitbox can open and use presets created in the older version of the firmware. However, there may be some loss of information in the conversion. Also, once you open an older preset file with a newer version of bitbox, the preset file will be converted to the new format. That preset file will no longer work with older versions of bitbox. Therefore, we recommend that you use your computer to back up your preset files before you use them with a new version of the firmware.

Legacy presets are named SE000001 through SE000012.

Managing WAV Files

Bitbox comes with hundreds of WAV files bundled with the firmware. You can load WAV files into cells in order to add them to a preset. We talked about how to configure cells previously in this document. Here we will discuss what tasks you can perform to manage the WAV files themselves.

Delete a WAV File

When you use bitbox to delete a WAV file, that file is removed from the microSD card. This file will no longer be available for use by presets. This means that any presets that previously used this WAV file will no longer include this WAV file. To delete a WAV file:

1. Touch a loaded cell on the Main screen to display the Waveform Screen.
2. Touch the name of the WAV file at the top of the screen to display the WAV Edit screen.
3. Use the Control Knobs to scroll to the WAV file you want to delete. You may need to load directories to navigate to the file you want to delete.
4. Touch **Edit** to display the WAV Edit menu.
5. Touch **Delete** to delete the selected WAV file.
6. You can scroll through the list of WAV files and continue to delete additional files.
7. You can **Load** a different WAV file from here as well.
8. Touch the back arrow **<-** to exit the screen.

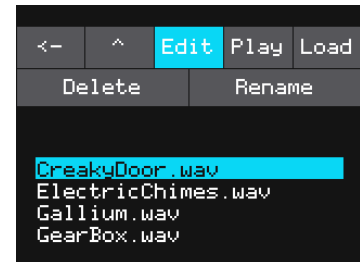


Figure 29: WAV Edit Menu

NOTE

- You will not be prompted to confirm the delete action, so please take care when using this feature.
- If you delete a WAV file, it will no longer be available for use by presets that were previously using it. The name of the WAV file will still appear in the Preset, but the Waveform screen will be blank until you load a new WAV file into the cell.
- To remove a WAV file from a cell without deleting the file, go to the Waveform screen and touch the cell mode icon to the left of the file name, and then touch **New Recording**. You can press **Home** to go back to the main grid without loading a file and the cell will be empty.

Work with WAV Files on the MicroSD Card

You can use the microSD card with your computer to manage the WAV files on the card. You can load new WAV files onto the card or backup your existing WAV files for safe keeping. Bitbox is compatible with all standard WAV files.

You can use a microSD Adapter to insert your microSD card into your computer. Then you may use standard file techniques to rename the WAV files, reorganize them into directories, delete them, copy them onto your computer or copy them onto other microSD cards. We recommend that you occasionally make backup copies of your WAV files, especially before upgrading to new firmware.

NOTE

- If you delete, move or rename a WAV file, it will no longer be available for use by presets that were previously using it. The name of the WAV file will still appear in the Preset, but the Waveform screen will be blank until you load a new WAV file into the cell.
- Bitbox supports samples in the WAV file format. It supports 1 or 2 channel files with 16, 24 or 32 bit resolution at any sample rate. 48kHz is the preferred sample rate.
- WAV file names may use Alpha Numeric Characters (A-Z, 0-9) and some special characters. The following characters are NOT allowed: double quotes, forward slash, back slash, question mark, asterisk, less than and greater than symbols, the colon and the pipe symbol (" / \ ? * < > : |). File names must be less than 256 characters, including the path name. Files that do not conform to these naming constraints will not be recognized by bitbox.

Advanced Features

Use Modulation to Control Playback

Bitbox allows you to modify the values of cell parameters over time by use of internal or external signals. For example, you can use MIDI Velocity to control the Level of a cell, or EXT1 to vary the panning. You can use a Trigger or CV input to control which slice of a Slicer cell will be played on the next note event. The parameter tables in this document indicate which parameters can be used as Modulation Targets. On the parameter screens you can easily identify the Modulation Targets by the three black boxes that appear below them. You can use up to three different signal sources to modulate each parameter. The same signal can be used to modulate multiple parameters.

To configure modulation for a parameter:

1. From the Main screen, touch the cell you want to modulate.
2. Press **INFO** until you see the parameter you want to modulate.
3. Touch one of the three black boxes below the parameter to display the Modulation Parameters screen.
4. Use the Control Knobs to select a value for the Source parameter. This parameter specifies which signal will be used to control this parameter. Available values are:
 - None – no modulation source will be used.
 - TRIG – any input that is used to trigger a cell, such as CV input, touch, or MIDI Note.
 - VEL – MIDI Velocity
 - EXT1 through EXT8 – External CV input as shown in Figure 31: EXT Ports
5. Use the Control Knobs to select the **Amount** of modulation that will be applied. This is used to increase or decrease the amount of impact the modulation will have on this parameter. This parameter does not apply to **Slice Seq** modulation.
6. If you are modulating **Pitch** or **Slice Sel**, you can optionally turn on the **1V/Octave** setting. When this is set to **OFF**, the **Amount** parameter controls how the voltage maps to pitch or slice selection. When this is **ON**, 1V difference in CV maps to one octave difference in pitch playback. In this case, 1/12th of a volt maps to one semitone. Each semitone of voltage level changes the pitch or slice selection by 1.

NOTE

- EXT1 through EXT8 can be used as modulation sources when these cells are triggered via CV. Modulation will not be applied for these modulation sources when MIDI is used to trigger them.

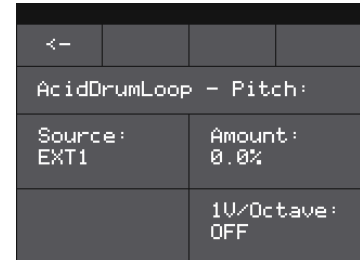


Figure 30: Modulation Parameters Screen

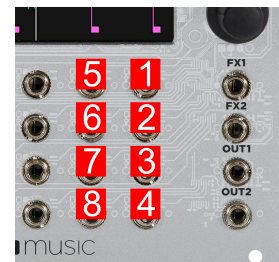


Figure 31: EXT Ports

Use Modulation to Change Slice Selection

You can create some interesting sound patterns using a modulation signal with Slice Seq to control the slice position of a Sample Cell. Here is the basic outline of how to accomplish this:

1. Create a Slicer Cell and create 4 or more slices by either using the Scan feature or manually creating the slices. One example of a WAV file to use with this feature is \SFX\Metal\METL_shake and squeal.wav.
2. Set the following values for the cell parameters:

Parameter	Value	Explanation
LaunchMode	Trigger	This will cause the WAV slice to play from beginning to end when a trigger is received. Other values will work, but let's use this for the example.
Loop Mode	Off	We will turn off looping for this example.
Slice	1	When a MIDI Note on MIDI Channel 10 is received, Slice 1 will serve as the starting point for the sequencer.
MIDI	Default	We want the default behavior where the corresponding MIDI for this cell on MIDI Channel 10 will trigger this cell.
Slice Seq	Random	This will cause the bitbox to select a slice at random.

3. Slice Seq will not work unless we choose a modulation signal to work with it. Touch one of the three black boxes below the Slice Seq parameter to bring up the Modulation Parameters screen.
4. Choose a value for **Source**. For demonstration purposes we suggest you choose **TRIG** and touch the cell or push the Play button to trigger playback.
5. Press **INFO** until you see the Waveform screen. Trigger playback of this cell by pressing the Triangular Play button in the top right corner of the screen. When bitbox receives a CV pulse on EXT1, you will see the waveform move around to change the selected slice position. Press Play at different times and you will hear the randomly selected slice. You can also trigger playback by sending a CV pulse to the CV jack for this cell. Playing the MIDI note that corresponds to this cell on MIDI Channel 10 will also cause a random slice to be selected and triggered. If you are using a CV input as the modulation source (EXT 1 through 8), the position of the slice selector cursor may change several times before the note is triggered again, or it might not change at all. It depends on the frequency of the note trigger compared to the frequency of the CV input.

You can change the value of Slice Seq to change the way the modulation pulse moves the slice selection. You can use other modulation sources to experiment with other ways to advance the slice selection. You can use Toggle or Gate for Launch Mode to get additional effects. Looping can also be used in combination with slicing in these other Launch Modes.

NOTE

- The Sliced Metal preset has a good working example of how to use Slice Seq to modulate slice selection.

Use MIDI to Trigger Slice Playback

Bitbox also allows you to use MIDI to trigger playback of individual slices within a cell. Here is a basic example of how to do this:

1. Create a Slicer Cell and create 4 or more slices by either using the Scan feature or manually creating the slices. One example of a WAV file to use with this feature is \SFX\Metal\METL_shake and squeal.wav.
2. Set the following values for the cell parameters:

Parameter	Value	Explanation
LaunchMode	Trigger	This will cause the WAV slice to play from beginning to end when a trigger is received. Other values will work, but let's use this for the example.
Loop Mode	Off	We will turn off looping for this example.
Slice	3	When a MIDI Note on MIDI Channel 10 is received, Slice 3 will be the starting point for the sequencer. If Seq is disabled, then Slice 3 will always play.
MIDI	Choose a MIDI Channel other than 10.	We want to see the difference between the default MIDI behavior on Channel 10 and using MIDI to trigger slices, so we need to use a separate channel. MIDI notes received on the channel you select here will choose a slice to play.
Slice Seq	None	We will not use the Slice Sequencer in this example.

3. Set up a MIDI input that uses the MIDI Channel you selected for the MIDI parameter. Play MIDI note 36. You will see that slice 1 is played. Play MIDI Note 39 and slice 4 will be played. MIDI Notes 36 and up are now mapped to Slices 1 and up for playback.

The steps above show a simple example of using MIDI alone to trigger different slices within one cell. You can use this with Loop Mode ON with Launch Modes of Gate or Toggle to achieve different effects. You could also use this with Slice Seq if you wanted to have the Slice Seq control what slices play when a cell trigger is received.

Use Control Voltage to Trigger a Row of Cells

You can send a control voltage signal to the right column of **CV Modulators** to trigger all of the cells in the corresponding row. This is called a Scene Trigger.

1. Plug a CV signal into the right column of **CV Modulator** jacks. These are the jacks that map to **EXT1** through **EXT4**.
2. Touch the corresponding EXT cell and then press **INFO**. Bitbox displays the External Input Parameters screen.
3. Set the value of the **Mod** parameter to **Scene Trig**.
4. Send a trigger signal to the configured **CV Modulator** jack. Bitbox will trigger all of the cells in the row simultaneously.



Figure 32: External Input Parameters Screen

- To disable the Scene Trigger, set the value of the **Mod** parameter for this **EXT** cell to **Custom**. This frees up this EXT input for use in modulation without triggering the scene.

Synchronize Playback with a Clock

There are three different musical clocks that you can use with bitbox:

Name	Description	Priority
CV Clock	Bitbox gets the CV Clock signal from an input to the Clock jack on the front panel of the module. Bitbox expects a clock pulse signal of with 4 pulses per quarter (PPQs), or a pulse per 16 th note.	1
MIDI Input	When a MIDI signal is connected to the MIDI jack on the front panel of the module, bitbox will follow MIDI Start, Stop and Clock messages.	2
Bitbox Internal Clock	When no other clock input is provided, bitbox will use its own internal clock.	3

Bitbox displays the current clock time in the top left corner of most screens in the format <measure>: <beat>. If more than one clock input is available, the highest priority clock signal (lowest priority number) will be used. Bitbox can delay the timing of the playback of a Clip cell to synchronize it with a specified unit of musical clock time.

To synchronize the playback of Clip cells with the clock, configure a cell in Clip mode and set the value for **Quant** to something other than **None**. Bitbox only synchronizes cells with a cell mode of Clip, and only when Quant is set to something other than **None**, such as **Quant: 1 bar**. Bitbox will then delay the playback of the cell if needed to quantize it to the selected quantization unit.

Note:

- The Clock input must use 4 pulses per quarter (PPQs), or a pulse per 16th note.
- If **MIDI** and **CLOCK** inputs are both used, Bitbox will select the highest priority clock based on the following order of priority: 1.) **CLOCK** Input; 2.) **MIDI** Input; 3.) Internal Clock.

Reset the Clock

You can use the following methods to reset the clock counter back to 0:0:

- Stop the CV clock input for a few seconds
- Send a Clock Start signal over MIDI.
- Power down the module

Use Tracks with Exclusive Mode

A **Track** is a vertical column of clip cells on the **Main** screen. Tracks are used to control the exclusive playback of cells in the track. When exclusive mode is **ON**, only one cell in a track can play back at the same time, and when you start a second cell on a track, the first one will stop. This behavior works the same way as tracks in Ableton Live.

To set the exclusive mode for a track:

1. Press the **HOME** button repeatedly to return to the **Menu** screen.
2. Touch **Tracks** on the menu screen. You will see the **Track Selection** screen.
3. Select the **Track** you want to modify by touching the column on the screen. The pink column indicates the selected **Track**.
4. Press the **INFO** button to see the **Track Info** screen for the selected track as shown on the right.
5. Use the Control Knob to turn **Exclusive Mode ON** or **OFF**.

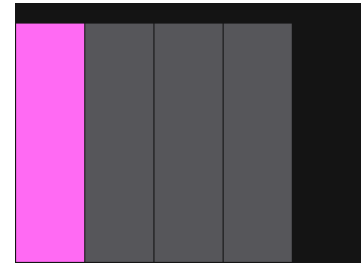


Figure 33: Track Selection Screen



Figure 34: Track Info Screen

Export a Set to Ableton Live

Bitbox creates files compatible with Ableton Live. Follow these steps to export them:

1. Save the changes to your preset by following the instructions above.
2. Remove the microSD card and connect it to your computer.
3. Double click or open the **.als** file with the same name as the preset in order to open your set in Ableton Live.
4. For best results, use the **Save As** option as well as the **Collect and Save** menu item in Ableton to migrate the relevant WAV files onto your machine and into the customary Ableton directory structure.

Update and Swap Firmware, Audio Files and Presets

Owners of Series 1 modules can update the module's firmware to get the latest features and other updates. This process can also be used to convert a module to run any Series 1 firmware. This means that your bitbox can be converted to a synthbox or an fxbox and then back again. You can also install bitbox firmware on your fxbox or synthbox. The firmware can be updated with the factory image, which includes the original presets, or just the firmware itself. You can also choose individual presets to copy over to your microSD Card.

Switch to a New microSD Card While Operating Bitbox

You can switch to a different microSD card while operating bitbox. Simply remove the current card and insert the new one, then load a preset from the new card as usual.

Backup Your Presets and WAV Files

Before you re-use a microSD to update or swap firmware, backup the files that are stored on the microSD card:

1. Remove the microSD card from your module and insert into your computer. You may need to use a microSD adapter.
2. Copy the files from the microSD card onto your computer.

Install New Firmware

Here are the steps required:

1. Download the desired firmware onto your computer. You can choose to download either synthbox, fxbox or bitbox firmware, but only one set of firmware can run at a time. You can find the latest firmware images on the forum at <https://forum.1010music.com>. You must be a registered user of the forum to access the download files. Forum registration is free.
2. Unpack the zip file. Some browsers do this automatically for you.
3. Prepare a microSD card with the FAT32 format. The card that comes with your module is formatted properly, but you may need to reformat a card that came from somewhere else. Make sure you only have the files from one Series 1 module on the microSD card at a time.
4. If you want to replace the Presets with the factory image, copy the full contents of the zip file onto a microSD card. If you do not want to overwrite your presets, copy only the MATRIX.BIN file to the microSD card.
5. Turn off power to the Eurorack.
6. Place the microSD card in your module.
7. While powering up the unit, hold the **HOME** and **INFO** buttons. When you see the message about upgrading the firmware, you can let go.
8. When the upgrade finishes in about 15 seconds, the unit will restart with the new software.

Reset Bitbox Presets to Factory Settings

If you want to reset one or more of the bitbox presets to the original factory settings, you can copy individual preset files onto your microSD card.

1. Download the bitbox firmware onto your computer. You can find the available firmware images on the forum at <https://forum.1010music.com>. You must be a registered user of the forum to access the download files. Forum registration is free.
2. Unpack the zip file. Some browsers do this automatically for you.
3. Find the *.xml file in the unpacked folder that has the same name as the preset you want to restore. Copy the .xml file onto the microSD card to replace the file on the card.
4. Insert the microSD card into the **MICRO SD** slot of your module.
5. Push the **HOME** button to return to the **Menu** screen if needed.
6. Touch the **Presets** menu option to display the **Presets** selection screen.
7. Select any preset to load the updated presets.

Technical Specs

Module Specs

Bitbox is designed with the following specs:

Rack width: 26 HP

Power supply requirements:

- +12V: 350mA
- -12V: 0mA
- 5V: 0mA

Pin Mapping for Mini TRS Jack to MIDI 5 Pin DIN Connectors

The musical instrument industry currently uses several different ways of mapping MIDI 5 Pin DIN signals to mini TRS jack connectors. The diagram to the right shows the numbering of the pins on a MIDI connector and the labels of the connection components of a mini TRS jack. 1010music products are compatible with cables that use the following mapping of MIDI signals between female MIDI connectors and mini TRS jacks:

MIDI Signal	MIDI Connector	Mini TRS
Current Source	Pin 4	Tip
Current Sink	Pin 5	Ring
Shield	Pin 2	Sleeve

Table 1: MIDI Connector to Mini TRS Jack Mapping

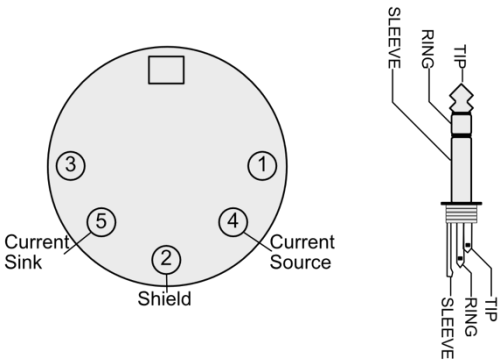


Figure 35: 5 Pin DIN and Mini TRS Jack Connectors

For more information on the use of adapters, read the blog post on our website [Mini TRS Jacks for MIDI Connections Compatibility Guide](https://1010music.com/stereo-minijacks-midi-connections-compatibility-guide) at:

<https://1010music.com/stereo-minijacks-midi-connections-compatibility-guide>

Notes for Those Upgrading from a Previous Firmware Version

- Bitbox 2.2 can open presets that were created in previous versions of bitbox firmware. However, when loading presets created prior to bitbox 2.0, not all settings will come over to the new firmware. Presets that are created or modified in bitbox 2.0 or 2.2 will not work with 1.x versions of bitbox. Therefore, we highly suggest that you backup your v 1.x presets on a separate microSD card or on your computer before you open them in bitbox 2.2.
- Due to changes in how modulation works, modulation configurations that were stored in presets created in 1.x versions of bitbox will be lost when you open the preset in newer versions of bitbox.
- Bitbox no longer automatically saves your changes to the presets as you work, as it did in v 1.x. If you turn off the module without saving you will lose your work.

Stay Up To Date

Demonstration Videos and Latest Docs

You can find video demonstrations of bitbox on our website at <https://1010music.com/bitbox-support>. You can also look there for updated versions of this user manual.

Connect with Other Bitbox Users

There is a very active community of users of 1010music modules at forum.1010music.com. If you have a question about the module that isn't answered in this manual, this is your best source for help. We actively monitor the wish list sub-forums for ideas for future versions of our products. Forum registration is free. We hope to see you out there!

Contact Us

Are you loving bitbox? Have questions? You can contact us through our website at <http://1010music.com/contact-us>.