

RATCHET MANUAL

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General Overview

Modes of operation

Each of the following modes of operation are engaged by pressing the corresponding button.

Tempo Mode

This mode is engaged any time the tap button is pressed.

When in this mode, the display will indicate the current tempo.

Once in this mode subsequent presses of the Tap button will be measured to set a new internal clock tempo.

Turning the encoder in this mode will adjust the internal clock speed by 1 BPM at a time.

Drum Mode

The encoder adjusts which drum is selected (1-12 corresponds to the outputs from left to right).

The 16 buttons above the display will control which steps are active in the current sequence.

Pressing a button will toggle its state, enabling or disabling that particular step of the sequence.

To navigate through the pattern when it is longer than 16 steps, tap the drum button. The extra bright illuminated LEDs will indicate which set of 16 steps you are currently editing. The less-bright illumination of the LEDs will indicate which set of 16 steps is currently being played.

To adjust the gate length of a particular step, hold specific drum button (1-16 on the desired page) and rotate the encoder.

While holding the encoder down the currently selected step will blink, and the display will display the gate length number.

Gate length will be displayed as a number 1-6, where 1 is a trigger, and 6 is tied to the next active step.

Activate Accents by holding specific drum button (1-16 on the desired page) then push the encoder to toggle “A” accent on or off. The normal gate or trigger output is around +6V and with the accent selected the trigger or gate is around +9V.

Pattern Mode

While in this mode turning the encoder will select a pattern (1-32)

A ‘Pattern’ saves all the information on all 64 steps on all Drums which includes Steps, Ratchets, Gate Length, Ties, Accents., etc.

Rotating the encoder will select the pattern to be loaded.

Pressing the encoder while holding the pattern button will queue the selected pattern to load at the end of the current pattern. Once a pattern is queued the Pattern LED will blink until the sequence reaches the end of the current pattern.

Loading a pattern while another (or the same) pattern is queued will load the selected pattern immediately and cancel whatever pattern was queued.

Pressing Save will store the current state of the drums to the selected pattern.

To copy a pattern to another pattern, first load the pattern you want to copy, and then navigate to the destination pattern, and press save.

Steps Mode

Turning the encoder will adjust the overall length (global length) of the sequence from 1-64 steps.

Pressing the encoder will change the length to the next multiple of 16.

Each drum can also have its own length.

If a button LED is solid, the “global length” setting will affect that drum.

If a button LED is pulsing, the “individual length” setting will affect that drum.

To set the “individual length” setting per drum: Hold down the desired drum (1-12) and turn the encoder to set the desired length. Remember that to engage the “individual length”

setting, you will need to tap the LED button and cycle it to the pulsing display.

Ratchet Mode

Similar to “Drum Mode”, the steps for each drum can be enabled/disabled here.

Turning the encoder will select a drum

1-12

Holding a specific step button will cause that button to blink, indicating you are editing the ratchets for that step.

While holding the button turning the encoder will set the number of ratchets for that step.

Ratchets can be set between 1-16 for any step of the sequence.

Random Mode

When entering this mode the leftmost 12 LED Buttons will illuminate.

The display will show the current random value 0-100

If a button LED is blinking, the corresponding channel is ignoring any amount of random, and will always playback the programmed sequence.

If a button LED is solid, the “global random” setting will affect that drum.

If a button LED is pulsing, the “individual random” setting will affect that drum.

To set the “individual random” setting per drum: Hold down the desired drum (1-12) and turn the encoder to set the desired random amount. Remember that to engage the “individual random” setting, you will need to tap the LED button and cycle it to the pulsing display.

The random value sets the probability that the next step of the sequence will be changed on its own.

When random is set above 50, it will begin to randomize the number of ratchets on

each step as well.

The higher the random setting, the crazier things can get.

CV will be added to the number set by the encoder, regardless of whether the module is in this mode or not.

Swing Mode

The display will show the current swing value 0-25

Odd numbered beats will always occur on the beat, even numbered beats will have an amount of swing applied. The amount of swing is a delay on every other note.

The higher the swing parameter, the longer the delay between when the clock happens, and the gate for the drums outputs.

Ratchets will emit with straight rhythms regardless of swing. However, they will begin when the swung note is fired off.

Start/Stop

Pressing this button or sending a trigger to this jack, will toggle whether the sequencer is running or not.

Pressing this button while holding the Tap button will cause the sequence to restart at the beginning of the pattern instead of resuming from the last position.

When the sequencer is stopped the Start/Stop LED will be illuminated.

When the sequencer is running the Start/Stop LED will blink in time with the clock.

Save

Pressing this will save the current sequence to the last selected pattern, regardless of whether the module is in pattern mode. The SAVE button will blink to indicate a successfully saved pattern.

A short tap on the save button will store the current pattern into memory. A hold on the save button will write the pattern to the SD card. This may cause a pause in the active pattern playing. Holds are not recommended during crucial performances.

Reset

A trigger on this jack will reset the sequence to the first pattern step on the next clock tick.

Pattern CV

CV will add/subtract from the currently selected pattern

Whenever a change in voltage is detected that crosses a pattern threshold, the new pattern will be loaded.

Pattern CV receives voltages 0-5V. Roughly every 156 mV received, the pattern will change one pattern ($5V / 32$)

Clock In

Clock input to the module.

Internal clock is normalled to this jack.

Clock Out

0-10V output of the clock signal.

Random CV

CV adds/subtracts from the random value set in random mode.

-5V to +5V CV Input

Adjusting Playback Order

You can change the direction that the sequence runs by holding the STEPS button while in STEPS mode.

This will cause the display to show an “F”, “B”, or “P” that corresponds to a playback mode specified below.

Turning the encoder will adjust the letter.

F. Forward - The sequence advances 1 step forward every clock pulse. B. Back-ward - The sequence moves backwards 1 step every clock pulse. P. Ping Pong - The sequence alternates between forward and reverse each time it reaches one end of the sequence.

Copy/Paste

An entire viewable 'Page' can be copied, and pasted from either Drum or Ratchet Modes (where the steps for an individual drum can be edited).

The 'page' is what is happening (steps, gate length, ties, accents, ratchets) on the the 16 visible steps per drum. So whatever beat you have created on the all the visible steps (1-16) can be copied and pasted to any other 'page' on any drum and in any pattern.

To copy the page being viewed hold the button for the mode you're in (Drum or Ratchet), and tap Save.

Copying will cause all four page LEDs to blink three times.

To paste the page you have copied, navigate to a different drum, or page of the same drum, and hold the button for the mode you're in (Drum or Ratchet), and click the Val encoder.

Pasting will cause all four page LEDs to blink once.

SD Card

Patterns are stored in a compressed binary format on an SD card.

The SD card must be formatted FAT-32

Persistent Storage

The following things will be saved between power cycles.

This saving occurs whenever a mode is changed, and will not happen more often than once every second. (The 1-second time out is to preserve the life of the memory when

rapidly navigating through menus.)

- - Tempo
 - Per-Drum Random
- Locks
 - Last Selected Pattern
 - Random Amount
 - Start/Stop
 - Swing Amount

Factory Reset

Hold the Start/Stop button for 5 seconds, until the firmware version displays, and then click the Value encoder.

This will reset all of the persistent storage data to its default, including the current working pattern.

Patterns on the SD card will not be changed.

Firmware Updating

To update the firmware, place the Ratchet_vX_Y_Z_update.bin file on the SD Card, and hold the encoder while turning the module on.

To check the current version of the firmware, hold the start/stop button for 5 seconds. The version number will be displayed.

Power Consumption

+12 - 115mA

-12 - nominal

+5 - 0