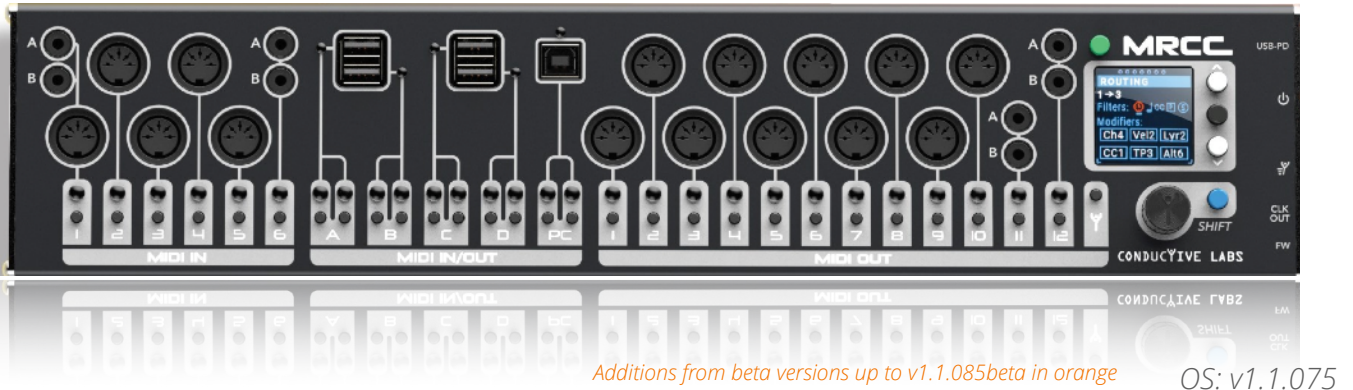


Conductive Labs MRCC Cheatsheet



Overview

Revision: 1

The MRCC is a programmable MIDI router, much like the iConnectivity mioXL, the Cooper Synapse, the DMC MX8 or the MOTU Timepiece XL or similar devices: it gives you a number of ports, between which you can route MIDI messages. Each input can be connected to one or more outputs, and you can merge, filter and transform the MIDI messages along the way.

As opposed to most other routers, the MRCC can be used as a desktop unit (but rack-ears are available, too), provides USB-Ports and a PC-Port in addition to standard DIN or TRS-MIDI, and contains a couple of extras, like arpeggiators and such.

MIDI Inputs and Outputs

The MRCC provides 6 “standard” MIDI INs (1-5 have DIN Ports, IN 1 has also TRS, and IN 6 is TRS only), 12 MIDI OUTs (1-10 are DIN ports, and ports 11 and 12 each feature both TRS-A and TRS-B outputs which can be used simultaneously, so you can connect 2 devices to port 11 and 2 devices to port 12).

There are also 4 USB *host* ports A-D (each with 4 virtual MIDI inputs and one output, internally the 4 host ports appear to work as a hub), and the PC port (a USB *device* port with 12 virtual MIDI inputs and 12 outputs).

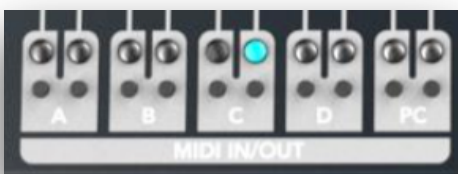
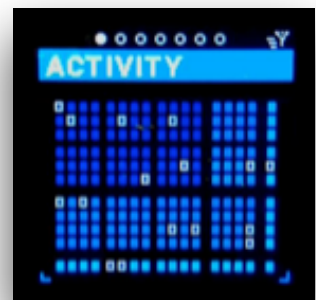
Take a look at the online [USB Host Compatibility Tracker](#) to see which devices are known to work with the MRCC.

Connecting Inputs to Outputs

Each of the “standard” MIDI INs and MIDI OUTs has a button and a LED. **To connect an input to an output simply** press the button of that input, release it and then press the buttons of one or more outputs (one after the other, not simultaneously). For each output connected, you see its LED light up. **To remove an output from the input**, simply press the output’s button again, and the LED goes off. In the [Activity Page](#) each active connection is represented as a white square.

As USB ports provide both inputs and outputs, each of them (A-D and PC) has 2 buttons and 2 LEDs, the left ones for the inputs, the right ones

for the output of that port. Since the USB ports support multiple virtual devices, you need to **first** select the input (using the left buttons on A-D or PC, **then** the virtual device (by pressing one of the lit LEDs 1-4 or 1-12 for PC port in the MIDI OUT section), and **finally** the output port(s) (again using the buttons in the MIDI OUT section).



Note: the REMOTE (Y) button is used for selecting routings to or from a Remote7 or a second MRCC.

Routings

Whenever you connect an input to an output, you create a so-called “**routing**” between that input and the output in the MRCC.

In the *Routing Page* you can configure each individual routing in more detail: set up **filters** for different kinds of MIDI messages (Clock – Notes/Aftertouch/Pitch Bend – CC – Program Change – Start/Stop/Continue), and add up to six *Modifiers* to transform MIDI data.

When one input is routed to several outputs, a separate routing is created for each of the outputs. The MRCC can process up to 50 routings simultaneously.

Added in 1.1.077beta: Number of simultaneous routes (per patch) has been increased to 255, the practical limit might be lower, because the amount MIDI data sent when to many ports are merged will exceed the maximum data rate of the MIDI port (32kbps), overwhelm older MIDI devices, or max out the CPU of the MRCC (unlikely, because the CPU is quite fast). The Activity screen shows the number of routes in the top left corner, the counter turns red once the maximum number of routes is reached.

Merging

MIDI data is merged automatically when data from more than one input ports is routed to the an output port. Merged data will never interrupt SysEx messages.

Note: Ports are evaluated sequentially **from left to right**, so in theory there is an order of precedence, however the processor of the MRCC is fast enough that this is unlikely to become a problem in most setups. Avoid routing data to ports no device is connected to, because the data is still processed and wastes CPU time. Also the data rate for DIN-MIDI ports is rather limited, and some devices have problems processing too many messages, which may lead to timing problems, to devices dropping messages, and to other issues. Especially avoid merging clock data from several inputs. Use input filters, output filters and routing filters to get this under control. Also the Channel Map modifier can filter out the channels it does not map, so you can use that to limit data for a port.

Presets

All routings, modifier variations, extras (clock settings and arpeggiators) and label assignments are stored in presets. There is one factory preset (read-only) and 127 user presets (User 1-3 and then banks A-E with 20 presets each, followed by bank F with 25 more presets). Preset names cannot be changed.

The MRCC remembers the preset you last saved or loaded, and loads that preset again when you turn the unit on. The name of the current preset is shown in the blue title bar of the Activity Screen.

Note: On page 10, the manual mentions 30 “Extras Presets” and 5 “Sys Settings Presets”, but it appears these cannot be used on this page.

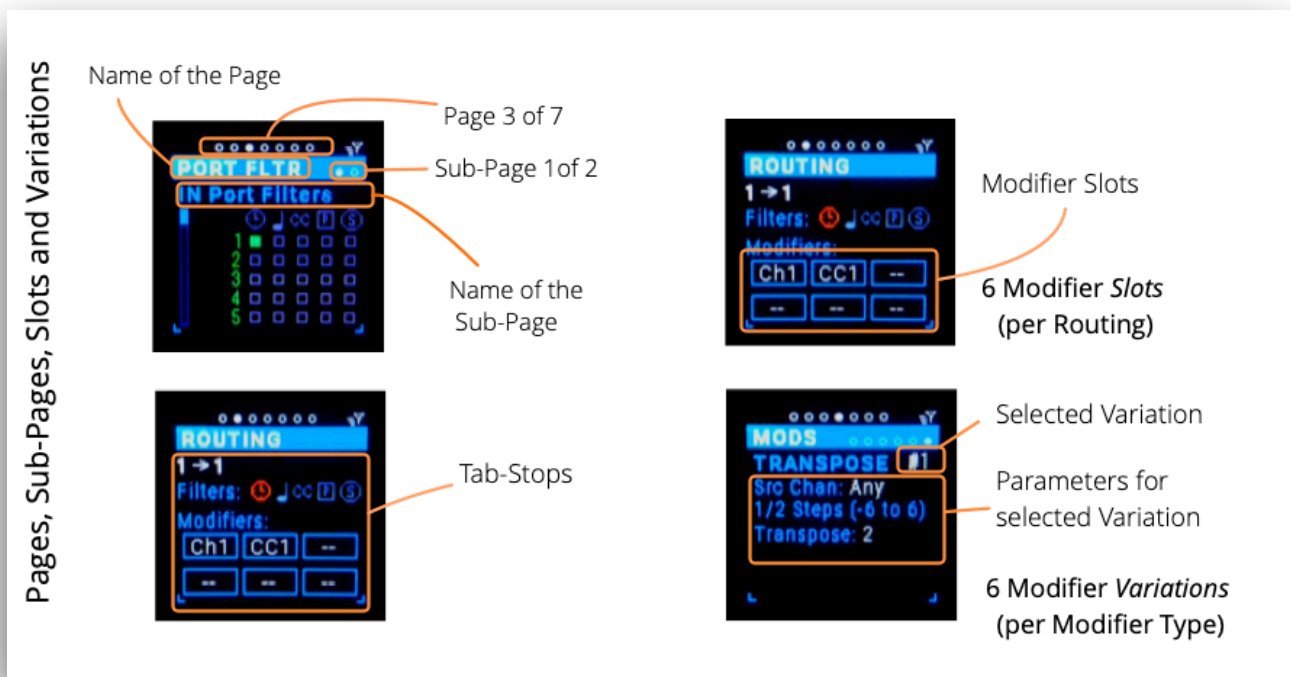
Note: Presets are stored on the SD-card in the directory /CLABS/MRCC/PRESETS in text files, so they can be backed up, copied and adapted. Each preset contains of 3 files, one for the actual settings, and two more for the assignment of labels to the input and output ports. That means you can simply copy your assignments between presets when you insert the SD-card into your computer.

Navigation

The interface of the MRCC is split into 7 main **pages**: Activity Matrix – Routing – Port Filters – Modifiers – Extras – Tools – Settings

The blue bar contains the *name* of the current page, while *position* of the current page is highlighted as a filled dot in the line of dots *above* the blue bar. All but the first 2 pages have 2 or more **sub-pages** (like tabs, displayed as a line of dots *inside* the blue bar), and inside the (sub-)pages there are so-called “tab-stops” (a fancy word for all the elements on that page you select and interact with, mostly parameter values and buttons, but sometimes also icons and scrollbars).

On some of the sub pages for the Modifiers (and also in the arpeggiators) you will find an additional layer: each type of modifier stores up to 6 **variations** (think “presets”) which are accessed via the first tab-stop, which in that case has a value of “#1” ... “#6” for the variations 1-6.



Buttons and Encoders

In addition to the ROUTING BUTTONS below the input and output ports, the MRCC provides 5 buttons and one clickable encoder, located around the display for navigation and such.

Instead of a common and straightforward point-and-click approach, where one would simply turn the encoder to point to an element on screen, and then click the encoder to interact with that element, the MRCC has a more elaborate and slightly less intuitive approach:

- the white UP and DOWN buttons are used to point to the element you want to interact with (the dots for selecting pages or sub pages, and the tab-stops)
- the ENCODER is used to interact with the selected element *if it is not a button* (change the page, sub-page, or change a value of the selected parameter)
- the black ENTER button is used to activate buttons, and can also be used on elements with on/off (or yes/no) settings.
- the green **STANDBY/ESCAPE** button has 2 main functions:
 - **ESCAPE**: click the button to move the focus to the page navigation dots at the top
 - **STANDBY**: hold button for about 2 seconds to put the MRCC into standby mode. There is a setting that allows for keeping devices connecting to the USB host powered in standby.



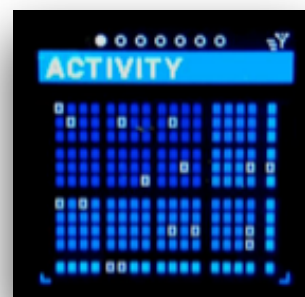
- the blue **SHIFT** button provides access to various secondary functions:
 - **SHIFT** + ENCODER speeds up incrementing/decrementing values
 - **SHIFT** + ROUTING briefly displays the label for that port (helpful when unsure which port is connected to what)
 - **SHIFT** + ENTER in the routing page clears all filters and modifiers for the current routing
- the ENCODER BUTTON is a “**fast navigation button**”:
 - **when a modifier slot is selected in the routings page:** it jumps to the modifier sub-page and variation for that modifier, and from there back to the routings if you press it again
 - **everywhere else** it jumps between the Activity page, Routing page and (optionally) the Midi Monitor sub-pages, and the current (sub-)page.

Note: If you press the encoder button in accident – which in the beginning might happen quite often – simply press it again until you are back where you came from. That (mostly) works.

Activity (Page 1)

On this page you see the active routings, with the rows representing inputs, the columns representing outputs. When an input is routed to an output, you see a *white square* at the intersection of that row and column. If you have several inputs connected to one outputs (i.e. several white squares in one column), messages are merged automatically.

Triangles on the left of any row represent incoming MIDI messages for that port (red for clock messages, green otherwise), outgoing messages of a routing are indicated by flashes of the white square(s) for that routing. Red squares indicate the current routing.



Rows (top to bottom): 6x DIN/TRS inputs (2 rows of 3), 4x USB host inputs, and the USB PC port on the bottom.

Columns (left to right): 12x DIN/TRS outputs, 3x USB host outputs, 1x PC outputs

The 4 virtual inputs for each of the host ports, and the 12 virtual PC ports are combined into one row/column in this view.

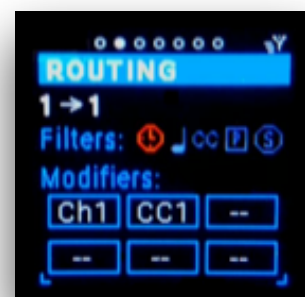
To see details for the USB host ports and the PC port, press DOWN to step through each of the USB ports, and then back to the main view. Hold the “Y” button to show the remoter routings. Hold **SHIFT** and then a ROUTING BUTTON to display the label for that port.

Routings (Page 2)

On this page you can set up filters and modifiers for each of the routings.

The current routing is shown at the top, with the input port to the left of the arrow, and the output on the right. Both numbers are tab-stops, so you can use them to select another routing using the ENCODER.

To the right of port numbers of the current routing you get a **real-time display of MIDI messages** coming into the routing (pre-modifiers and filters): the number of the MIDI channel (if the message contains one), and an abbreviation for the type of MIDI message (see pg. 26 of the manual).



The current routing is also indicated by the routing LEDs, in cases where one input is routed to several outputs, the LED representing the output for the current routing is brighter than the others. You can select another routing to edit by pressing the ROUTING BUTTONS, or even create a new routing without leaving the routing screen.

Note: If you accidentally clear a routing by pressing the output button for the current routing, simply press that button again to restore the routing with all filters and modifiers.

You can set up filters for 5 different kinds of MIDI messages (Clock, Notes/Aftertouch/Pitch Bend, CC Program Change and Start/Stop/Continue) by selecting and toggling the 5 icons (active filters turn red), and you get 6 slots for modifiers.

Note that each of the boxes for modifiers contains **two tab-stops**: the modifier type (two characters), and the variation selected from that type (a number of 1...6). Exception: The *Channel to Port Mapping* (C-P1) and the *NoteMap* (Nmp) modifiers have no variations.

Port Filters (Page 3)

In addition to the filters configured in the routings, you can also configure “global” filters for each INPUT and OUTPUT port. You can filter 5 types of MIDI messages: *MIDI Clock* – *Note Data* (Note On/Note, Aftertouch & Pitch Bend) – *CCs* – *Program Change* – *Realtime* (Start/Stop/Continue).

The first sub-page shows input filters, the second shows output filters.

Setting up port filters is a bit weird. Filters are presented as a table where you toggle each filter on or off for a given input or output. BUT: you can only edit the topmost row in the display (change the topmost row by using the ENCODER on the scrollbar on the left), AND you can change the green port numbers, so that a row points to another port.

Use the UP and DOWN buttons to select the scrollbar, the port number or a filter, use the encoder to select a row (via the scrollbar), a port number, or toggle a filter on or off for that port.



Modifiers (Page 4)

Modifiers change MIDI data in various ways, currently they are 8 different types of modifiers (described below). Modifiers are not configured per routing, instead you can set up a maximum of 6 so-called **variations** for each modifier type, and then assign these variations to your routings. You can use one variation in several routings, or even use one variation multiple times in the same routing, e.g. for transposing notes for more than one octave.

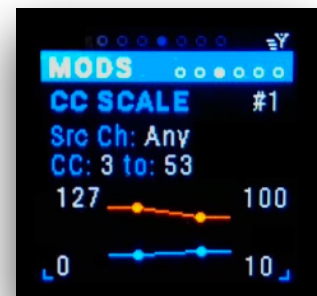
The modifiers page has a sub page for each of the modifier types where you set the parameters for the variations of that modifier, the first tab stop in each sub-page selects the variation (#1...#6) you’re editing.

Note: the *Channel to Port Mapping* modifier has no parameters, and therefore it has no sub-page, and the *Note Map* modifier has no variations.

(1) **Channel Mapping [Ch1...6]:** you can map up to 4 MIDI channels to another MIDI channel, you can also set the first input channel to “all”, which disables the other 3 mappings. You can also set the source for lines 2-4 to “-“ (none) if you want to remap less than 4 channels. When you set exclusive to “Y”, all channels that are not mapped are filtered.

(2) **Velocity Scaling [Vel1...6]:** compress or expand velocity on one or all channels, you can set maximum and minimum velocity for both the incoming data (numbers on the left) and output data (numbers on the right). Everything incoming above maximum is set to outgoing maximum, everything below incoming minimum is set to outgoing minimum, the rest of the data is scaled proportionally.

(3) **CC Scaling and Mapping [CC1...6]:** transform ONE CC (or Note velocity) on one or all channels to another CC, and scale the CC (or velocity) values (works exactly like velocity scaling).



(4) **Channel Layers (Splits and Layers) [Lyr1-6]**: Each variation defines one of the 6 zones that are visualized on the bottom of the page. Each zone has a source and a destination channel, as well as a minimum and maximum note value. When Blend is set to a value greater than 0, you get that number of additional notes *outside* the zone where the velocity gradually reduces, you can create crossfades between sounds that way (if the sounds react o velocity, that is). The chain on the left is selectable, but does nothing for now.



(5) **Alter (Random & Probability) [Alt1...6]**: on the one or on any channel, randomly change note number by a given percentage (tab stop: Random), and/or reduce the probability that each note plays from 100% to less (tab-stop: Probability)

(6) **Transpose [Tp1...6]**: transpose notes on one or all channels (max. ± 12 semitones)

(7) **Note Map [NMP]**: Only allow certain notes to pass, e.g. to brute-force a specific scale. On the little on-screen keyboard, you can select which notes are allowed, below the keyboard you can set what should happen with the incoming notes that are not allowed, they can be mapped to the next upper or lower note, to the closest note, or discarded ("Match Only").

Channel to Port Mapping [C-P1]: (there is no page, no settings and no variations for this modifier type). Oddly specific: Filter out all MIDI channels except the channel number that matches the output port number, AND map that channel to channel 1. Helpful for devices that are fixed on channel 1, or respond to all channels (omni-mode), or default to channel 1 after power-up.

Extras (Page 6)

(1) **MRCC Clock**: set up the internal MIDI (and CV) clock, route it to individual output ports (LEDS of selected ports light up red while on that sub-page), use the on-screen buttons to send start/stop/continue messages.

(2) **Program Change**: not implemented

(3) **Arpeggiators**: run up to 6 arpeggiators (selected via #1...#6), processing incoming notes from a specific channel and port, and outputting notes on a specific channel and port. *Div* selects the length of a step, *Gate* is either a percentage of the step length, or RND (random). *Clk* selects the clock source (internal or one of the ports). Press ENTER to Play/Pause, and **SHIFT** + ENTER to latch/unlatch (or use the two on-screen buttons).



Note: Arpeggiators can be controlled via MIDI CCs in realtime (see Appendix B in the manual)

Tools (Page 7)

(1) **Load/Save**: load and save presets. Presets are stored on the SD-Card. If you make changes and don't save them to a preset before turning off the MRCC, those changes are lost. Preset names are red until you save data to that present, once a preset contains data, the name turns green. See "[Presets](#)" for more info.

To load or save a preset, navigate the cursor to the preset name, use the ENCODER to select the preset number, then move the cursor to the **Load** or **Save** button and press ENTER. There is no safety mechanism, so it's pretty simple to lose all your changes by overwriting the wrong preset, or by *loading* a preset when you in fact wanted to save one. Therefore it's good practice to always save a copy of presets, especially when it took you ages to finally get things to work as intended.

(2) **Assign Labels**: assign a label to port by first selecting a port, then selecting the label, and finally pressing the assign button. Each label can only be assigned to one port, if a label is purple, it is already assigned to another port. To remove a label from a port, simply assign the "none" label. There are 20 predefined labels, custom labels can be defined on the next page.

(3) **Edit Labels:** you can add, edit and delete your custom labels here, but not delete the preset labels. To add or edit a on the MRCC label, you need to connect a computer keyboard to one of the USB ports. Highlight the two small arrows next to the label to select a label, use the keyboard to edit the text, then use the save or delete buttons (no need to press **SHIFT** as the manual claims). Custom labels are stored on the SD-card in a text file called "UPLABELS.INI", you can edit that file on your computer to add or change the labels.

(4) **MIDI Monitor:** shows *outgoing* MIDI messages. Press ENTER to toggle scrolling on/off, press **SHIFT** + ENTER to clear the list.

(5) **Play Notes:** Play notes (#52 on channel 1 to ...#64 on channel 16) on all 5-Pin, USB or PC ports. Use the Play button to start and stop notes.

(6) **Gear Search:** repeatedly play a note on one port and on one or all channels. Use the play button to start and stop notes.

Settings (Page 8)

Here you can set brightness of LEDs and display, the time before the screen saver kicks in, MIDI ports and channel to remote-control the MRCC, filter Active Sense messages, behavior of USB host in standby mode and other things.

Added in v1.1.089beta: option for setting an unique USB device name so that you know what is what when you connect multiple MRCCs to one computer.

Settings are global, and therefore are *not* stored in presets!

As settings are rarely changed, they are beyond the scope of this cheatsheet, consult the manual for details.

Note: The screen will sleep when MRCC is "idle" (no MIDI notes). However, Clock, Active-Sensing or TimeCodeQuarterFrame MIDI messages will **not** keep the screen on. Tap **STANDBY/ESCAPE** (or any other button) to turn the screen back on.

Ports and Notes Monitor

On page 3 of the settings you'll find a setting *LED Show*, in addition to various flickerings that may be pleasing to your eyes there are actually two helpful functions hidden here:

Port Monitor: ROUTING LEDs for any output ports flicker when MIDI channel messages are transmitted through that port

Note Monitor:

- the ROUTING LEDs for the USB ports (A-D, PC) indicate the octave (with a different color for each octave)
- the ROUTING LEDs for the MIDI OUTs indicate the semitone of the note within the octave 1-12 they flash in the same color as the octave

Use **SHIFT** + Y (REMOTE) to toggle the LED light show on and off.

Troubleshooting

- **SHIFT** + ENCODER BUTTON – send MIDI Note-off messages all output ports that are routing destinations
- **SHIFT** + ENCODER BUTTON (long press) – send MIDI Note-off messages to all output ports
- Holding **STANDBY/ESCAPE** button while booting (hold until you see the boot menu) to reset all MRCC settings and **erase all presets and labels stored on the SD-card**. This might help when the MRCC refuses to store files to the SD-card. **Use with caution, and make a backup first!**