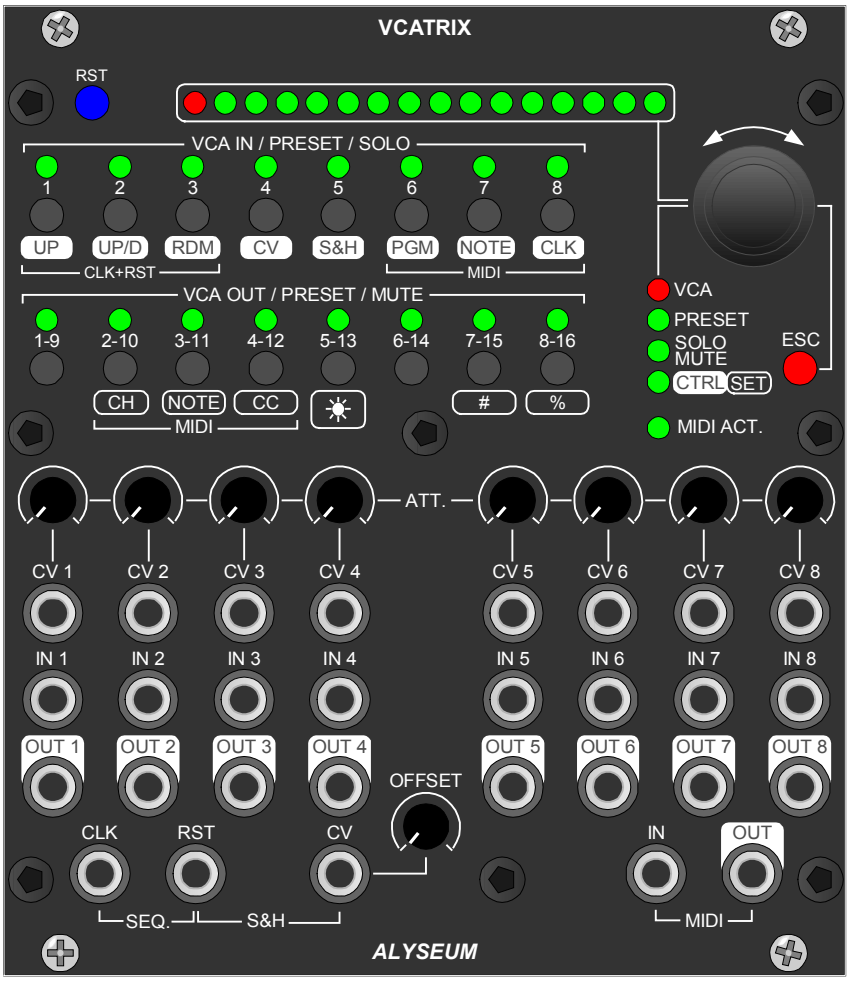
ALYSEUM - VCATRIX - User's manual 1.7 (Firmware 1.0)

1 Introduction



The **VCATRIX** is an 8×8 matrix in which each input is connected to all eight outputs through eight VCAs.

Its 64 linear VCAs provide completely free, flexible, and 100% analog signal routing, equally suited to audio signals and CV.

In addition, each output features a dedicated attenuator placed after the matrix, with control available either from its CV input or the front-panel attenuation knob. This allows precise adjustment of the output level for each channel, or dynamic modulation using an LFO, EG, or other CV sources.

True to its design philosophy, ***ALYSEUM*** offers extensive control options for the 16 presets, which can be recalled or selected via clock (CLK), CV and MIDI.

A free, open-source HTML editor lets you display and adjust all 64 VCAs, as well as save and load an unlimited number of presets on your computer, as you wish.

A Sea of VCAs, Ready to Patch!

Important - *Wichtig - Importanti - belangrijk - Ważne – Σημαντικό*

The VCATRIX inputs and outputs are fully DC-coupled, allowing both audio signals and control voltages (CV) to be processed.

By design, VCAs inherently produce a small DC offset. For this reason, they are not recommended for directly processing 1 V/oct control signals, but are perfectly suitable for audio processing.

2 Hardware

2.1 Package Content

- One VCATRIX module with Eurorack compliant front panel.
- One plastic bag containing four M3 screws and nylon washers + one power ribbon cable 10/16 pins + two MIDI cable adapter – TRS jack 3.5 to DIN5 female (Type B) + one heathsink
- Warranty & user manual access card.

2.2 Specifications

- Front panel width of 121 mm (22HP) and maximum depth 37 mm with the heatsink.
- VCA type AS3364.
- All inputs and outputs are unity-gain buffered.
- Power requirements (50%LED On): 150 mA/+12 V and 90 mA/-12 V.
- Power supply is fully protected against reverse ribbon cable insertion.

2.3 Installation

IMPORTANT : A square heat sink is included. After removing the protective film from the adhesive, attach it to the back of the module in the screen-printed square area, taking care not to touch the small processor board.

Carefully choose a stable location for your Eurorack, avoiding vibration, dust, heat sources, humidity or rain.

VCATRIX can only be used in a Eurorack synthesizer with an A-100 power supply.

During the entire installation procedure, always switch off your Eurorack.

Make sure that the red band on the flat power cable is correctly positioned at -12 Volts.

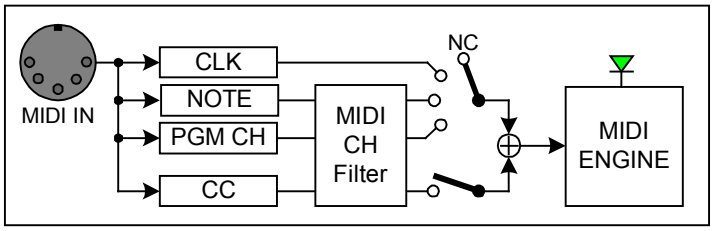
2.4 Output Attenuator Adjustment

Each of the eight outputs has its own attenuator, which can be controlled in two ways:

- Use the ATT knob to adjust the overall output gain. This allows you to balance the summing of multiple sources, which can quickly lead to output saturation.
- Alternatively, insert a jack into the corresponding CV input for external control (0 to 5V and maximum 100Hz) of the related output attenuator.

NB : As this function is 100% analog, it cannot be stored.

1.5 MIDI Activity LED

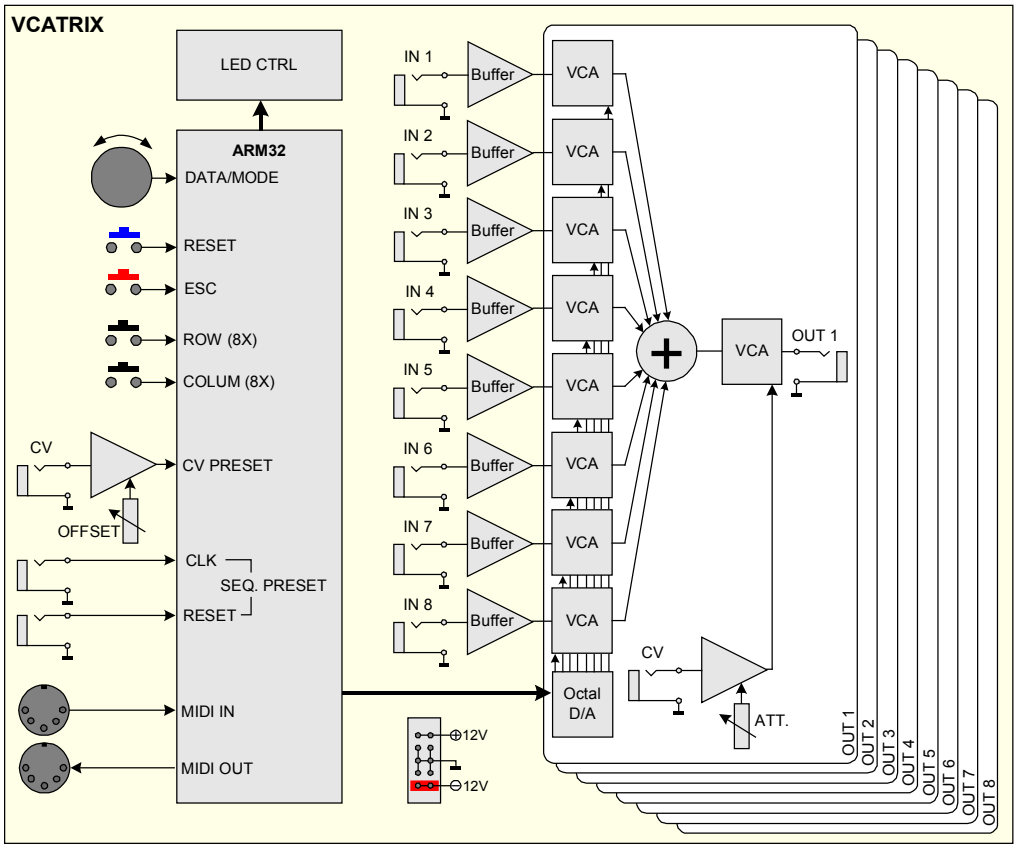


The green MIDI ACT LED flashes only when receiving Program Change (PGM CH), or Note, or Clock (CLK), and/or Control Change (CC) messages.

It responds only to the selected MIDI channel.

This LED does not flash for outgoing messages.

2.4 Bloc diagram



3 Uses

3.1 Initialization Sequence.

1. Sequentially, the 37 LEDs flash one by one.
2. One LED in the top row (1 through 8) flashes for 2 seconds to indicate the firmware version.
3. The last used preset, configuration and setting are loaded
4. The VCATRIX is ready!

3.2 Select a MODE.

By default :

❶ No mode or RUN (Default - All LED Mode Off)

Turn the encoder to select one of the 4 modes :

❶ VCA adjustment - See Chapter 3.3

❷ PRESET management - See Chapter 3.4

❸ SOLO/MUTE - See Chapter 3.5

❹ CONTROL & SETTING - See chapter 3.6

NB 1 : You can exit any mode at any time by pressing the red ESC button.

NB 2 : When selecting ❶ ❷ and ❹ modes, all external events are disabled.

3.3 Mode ⓿ - RUN.

RUN is the default operating mode (no LEDs lit). In this mode, you can:

- Select a preset at any time; the corresponding preset LED lights up.
- Enable the external CONTROL source selected in the mode ❹.

3.4 Mode ❶ - VCA selection & adjustment.

How to proceed:

1. 2 possibilities : Select one input and one or more outputs - OR - Selected one or more inputs and one output
2. The LEDs of the selected inputs and outputs are lit.
3. Adjust the level of all selected VCAs by turning the encoder while monitoring the result on the 16-LED bargraph, then press the encoder to confirm.
4. Repeat this operation for the other VCAs and other VCA values.

NB 1 : From point 3 onward, the red VCA LED flashes to remind you to save the settings, in two ways::

- In VCA mode**,** the red LED flashes every 15/16 time.
- In all other modes, the red LED flashes every 1/16 time.

NB 2 : You can reset the current selection at any time by pressing the blue RST pushbutton.

3.5 Mode ❷ - PRESET.

A preset LED is off when empty, on when it contains a stored preset, and flashes when that preset is active.

Load a preset

Press one of the push button preset to load, her LED blink.

Save a preset

Keep press the button to save more as 1 seconds, the LED blink twice time before stay ON.

Delete a preset

Keep press both buttons ESC + PRESET during 2 seconds, the LED blink twice time to confirm the deleting.

Duplicating a preset

First, select the source preset. Then press and hold the destination preset push button. After 1 second, its LED will light up to confirm that the copy has been saved, and you can release the push button.

3.6 Mode ❸ - SOLO & MUTE.

The SOLO & MUTE are similar than an audio mixer.

SOLO

The solo is always pre-VCA. Press one of the 8 buttons on the top row to select a SOLO from the inputs; the corresponding LED lights on.

MUTE

Mutes are always post-VCA. Press one or more of the 8 buttons of the bottom row to select one or more MUTE, the corresponding LEDs turn On.

To return to RUN mode, there are two options:

1. Press the blue **RST** push button: all SOLO and MUTE functions are disengaged.
2. Press the red **ESC** push button: all SOLO and MUTE functions remain engaged.

NB : SOLO and MUTE states are never saved in a preset.

3.7 Mode ❹ - CONTROL & SETTING.

Turn the encoder to select the CTRL/SET mode according to the tables below, and:

- Press the encoder to save the setting and exit.
- Press the red ESC push button to exit without saving.

External CONTROL :

Press one of the eight upper-row push buttons according to the table below. The corresponding LED will light up.

#	External CTRL	Comments
1	CLK + RST inputs **UP**	On each rising edge of the CLK input, the preset is incremented by +1. Arrived at 16 we return to 01. On each rising edge of the RST input, causes a return to preset 1
2	CLK + RST inputs **UP/DWN**	On each rising edge of the CLK input, the preset is incremented by +1. Arrived at 16, preset is decremented by –1. On each rising edge of the RST input, causes a return to preset 01
3	CLK inputs - **RDM**	At each rising edge of the CLK, a preset is randomly selected from 16
4	CV input - **CV**	There is the ability to change preset by an external CV signal (0 to 5 Volts). Use the bipolar OFFSET adjust for a compatibility with your source if down until -5V.
5	CV & RST Inputs **S&H**	With each RST pulse, the voltage present at the CV input, along with the resulting preset, is latched and held until the next RST pulse is received.
6	MIDI **PGM CH**	PGM CH messages 1 to 16 correspond to preset 1 to 16, respectively.
7	MIDI **NOTE**	By default preser 01 corresponds to key C3 (MIDI NOTE 48). Consecutive chromatic notes correspond to the rest of the Preset locations. **NB :** You can freely change this assignment and MIDI CH, see table below
8	MIDI **CLK**	The VCATRIX operates in slave mode and synchronizes to an external MIDI sequence using the messages: F8 (Clock or Tick), FA (Start), FB (Continue), and FC (Stop). By default, the VCATRIX advances to the next preset every 24 MIDI clock ticks per quarter note (24 PPQN). This value can be changed freely by sending a SYS EX message to the VCATRIX: F0 00 20 09 0A 66 03 00 tk F7 — tk= 06H for 6 ticks, 0CH for 12 ticks, 18H for 24 ticks or any others value until 7FH

NB 1 : In the sequential modes ❶, ❷, ❸ and ❽, the RST input jack and the blue RST button allow the sequence to be restarted at any time at Preset #1. The red ESC pushbutton has no effect.

NB 2 : For the others modes ❹, ❺, ❻ and ❼, Holding the blue RST pushbutton freezes the last value. The red ESC pushbutton has no effect.

Internal SETTING.

Activate one of the 5 settings by pressing a push-button on the bottom row according to the table below; the corresponding LED blink.

<table>
<tr><th>#</th><th>Internal SETTING</th><th>Comments</th></tr>
<tr><td>2-10</td><td>MIDI Channel</td><td>Turn the encoder to select the MIDI CH reception on the bargraph. Press the encoder to save, the LED blink twice time.
Turn the encoder to select the MIDI channel (1–16), or turn it fully counterclockwise to select ALL MIDI CHANNELS.</td></tr>
<tr><td>3-11</td><td>MIDI Note to Preset</td><td>By default preset 1 correspond to the MIDI Note 48 (Key C3).
<u>There are two ways to set this value:</u>
By Note: To assign the lowest note (the one corresponding to preset 01), simply press and release the desired key on your MIDI keyboard.
By Octave: No MIDI keyboard is required. Turn the encoder to select the octave. The red bargraph LED corresponds to C-2, and the tenth green LED corresponds to C8.
Then, press the encoder to save, or press ESC to exit.</td></tr>
<tr><td>4-12</td><td>MIDI CC</td><td>MIDI CC allows you to use a hardware or software control panel with 64 sliders.
By default, MIDI CC is deactivated and the red LED on the bargraph is lit - you can activate MIDI CC by turning the encoder to light the first green LED on the bargraph and vice versa.
Press the encoder to save, the LED flashes twice.
NB : MIDI CCs are MIDI channel-sensitive and, when enabled, operate in parallel with modes ❶ to ❺.
<table>
<tr><th colspan="9">VCA–MIDI CC mapping table</th></tr>
<tr><td></td><td>IN 1</td><td>IN 2</td><td>IN 3</td><td>IN 4</td><td>IN 5</td><td>IN 6</td><td>IN 7</td><td>IN 8</td></tr>
<tr><td>OUT 1</td><td>00
(00H)</td><td>01
(01H)</td><td>02
(02H)</td><td>03
(03H)</td><td>04
(04H)</td><td>05
(05H)</td><td>06
(06H)</td><td>07
(07H)</td></tr>
<tr><td>OUT 8</td><td></td><td>...</td><td>...</td><td>...</td><td>...</td><td>...</td><td>...</td><td>63
(3FH)</td></tr>
</table></td></tr>
<tr><td>5-13</td><td>LED intensity</td><td>Turn the encoder, the bargraph indicates the light intensity in 1/16 steps, then press the encoder to save, the LED flashes twice.</td></tr>
<tr><td>7-15</td><td># = number of step</td><td>In modes ❶, ❷, ❸ and ❽, the range can be limited from 2 to 16 steps.
To do so, turn the encoder until the desired range is displayed on the bar graph.</td></tr>
<tr><td>8-16</td><td>%</td><td>Reserved</td></tr>
</table>

3.8 Firmware upgrade.

<u>Preliminaries :</u>

You'll need a micro-A USB cable on one end and an A or C cable on the other, depending on the model of computer you have.

The update can be performed with any current OS (WIN 10 and above, OSX, LINUX, ...)

NB : To check the firmware version before and after the update, turn on the module; one of the LEDs in the top row (1 through 8) will flash for 5 seconds.

<u>Procedure :</u>

1. **IMPORTANT :** Switch off Eurorack before any operation!
2. **IMPORTANT :** Unscrew, remove and disconnect the VCATRIX power supply ribbon cable!

3. Insert a micro A-type USB cable into the USB connector on the rear of VCATRIX.
4. Hold down the white push-button on the back of the VCATRIX - AND - connect the other end to your switched-on computer, then release the white push-button.
5. Your computer will soon display a new driver called RPI-RP2, nothing to do with the Star War saga ☺.
6. Unzip the ALYSEUM_Firmware_VCATRIX_Rev.x.zip file you downloaded from our site.
7. The file will simply be dragged into the new driver, and the old one automatically deleted.
8. The VCATRIX will restart and you can remove the USB cable after checking the LED Turn on.
9. Replace the flat power cable and the module in its slot.
10. Switch on your Eurorack and please, check the initialization phase.

3.9 Reset - or - Factory Reset.

IMPORTANT: Please note that a factory reset will erase all 16 presets and all stored settings.

Procedure:

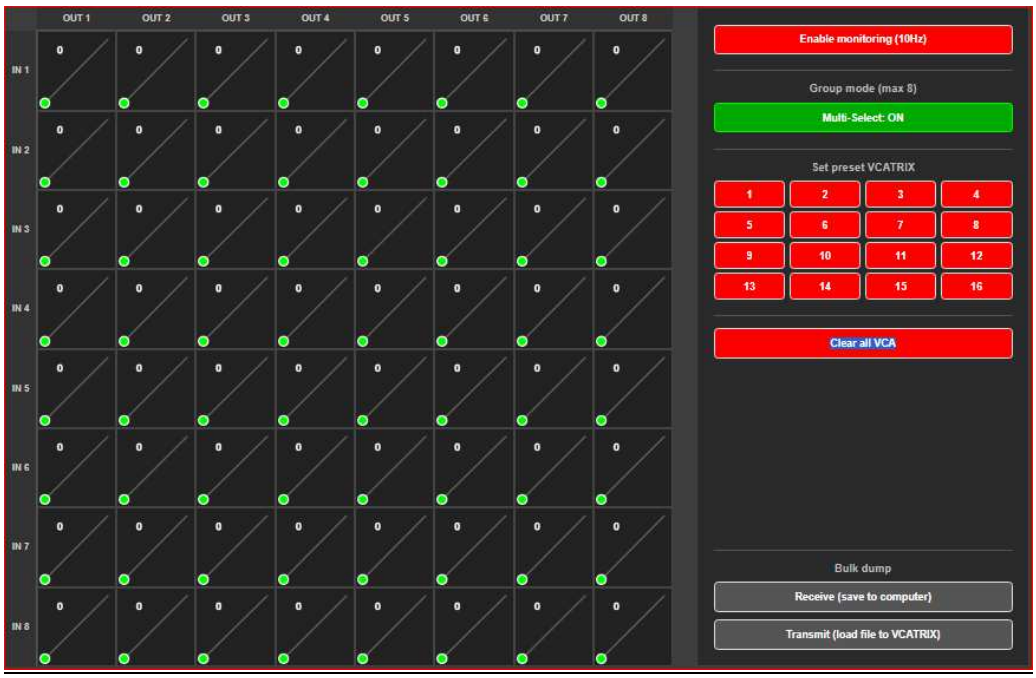
1. Press and hold the blue RST and red ESC push buttons simultaneously.
2. The 16 LEDs across both rows will flash. Choose one of the following:
    1. To confirm a **Reset**, briefly press any push button.
    2. To confirm a **Factory Reset**, press and hold the encoder for 5 seconds.
3. The module will restart.

4 Editor

HTML editor provides a fast, user-friendly remote interface for controlling all 64 VCAs.

It runs in a standard web browser that supports Web MIDI (Brave, Chrome, Opera, etc.) and can be downloaded for free from our website.

- Connect the MIDI In/Out of the VCATRIX to a MIDI interface port on your computer.
- Download and unzip the file; you will obtain a file named ALYSEUM_Editor_VCATRIX_Rev.x.html.
- Launch the application: an initial window allows you to select the MIDI In and Out ports or enable Demo mode.
- Once the MIDI In/Out ports or Demo mode are selected, the main window opens automatically.

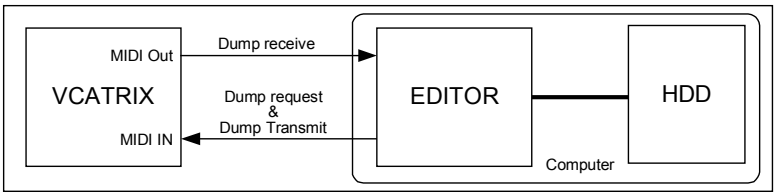


- **IN/OUT (VCA):** The editor can be used as a remote control to adjust the 64 VCAs.
    - By selecting a single VCA.
    - By selecting multiple VCAs (see Group Mode).

NB : Input and output labels (maximum 8 characters) can be edited by clicking on them. These labels are automatically saved in each backup file.

IMPORTANT: To save the new ajustments from the editor to the module, press the encoder to confirm them, then save the settings in PRESET mode.

- **MONITORING:** Displays the 64 VCATRIX values in real time.
- **GROUP MODE:** Allows you to activate up to 8 VCAs.
    - Enable the Multi-Select button and select the desired VCAs.
    - Disable the Multi-Select button.
    - Change the values by selecting a single fader from among those selected.
- **SET PRESET VCATRIX:** Selects one of the 16 internal VCATRIX presets.
- **CLEAR ALL VCA:** Resets all 64 VCAs of the current preset.
- **BULK DUMP:** Allows you to save either a single VCATRIX preset or all 16 presets to your computer - OR - allows you to load either a single or all 16 presets from your computer to the VCATRIX.



4.1 SYS EX Commands

If you will control the VCATRIX by any software, you are welcome!

This chapter is intended for musicians/technicians who have a good knowledge of their software and are used to working with Hex commands, and any support is provided for this chapter.

Editor to VCATRIX		
Command	**Header ID Device Command # Data End**	**Data value *or Comments***
CLEAR all VCA	F0 00 20 09 0A 01 F7	Reset the 64 VCA channels of the current preset
SET preset	F0 00 20 09 0A 02 pt F7	pt = Preset, 00 to 0F Select one of the 16 presets on the VCATRIX
DISPLAY Request	F0 00 20 09 0A 03 F7	If enable, the editor automatically sends the request 10 times per second.
UPDATE upto 8 VCA Value	F0 00 20 09 0A 04 va xx ..... va xx F7	Data 1 to 8, in set of 2 Bytes Va = Address VCA, 00 to 3F Xx = Value VCA, 00 to 7F This command is sent 10 times per second when a value is changed manually. It is equivalent to and replaces the DISPLAY Request command. Groups of 2 bytes whose values do not change may be omitted.
DUMP request	F0 00 20 09 0A 05 pt F7	pt = Single preset, 00 to 0F pt = All preset, 7F Before sending this command, pause the DISPLAY Request command.
DUMP Transmit (LOAD to VCATRIX)	F0 00 20 09 0A 06 00 x1 x2 x3 .....x64 F7 ..... F0 00 20 09 0A 06 0F x1 x2 x3 .....x64 F7	00 to 0F = consecutive preset xn = 64 value VCA, 00 to 7F After sending the 64th command, resume sending the DISPLAY Request command. Include a half-second delay between each command.

VCATRIX to Editor		
Command	**Header ID Device Command # Data End**	**Data value *or Comments***
DISPLAY 64 successive VCA Value	F0 00 20 09 0A 10 x1 x2 x3 ..... x64 F7	xn = Value VCA, 00 to 7F The VCATRIX sends back its 64 values to refresh the editor screen.
DUMP Receive (SAVE TO COMPUTER)	F0 00 20 09 0A 11 00 x1 x2 x3 .....x64 F7 ..... F0 00 20 09 0A 11 0F x1 x2 x3 .....x64 F7	00 to 0F= preset # xn = 64 value VCA, 00 to 7F After receiving preset 1 or 16, wait half a second and resend the DISPLAY Request command if it is enabled.

VCA # mapping (HEX)								
	IN 1	IN 2	IN 3	IN 4	IN 5	IN 6	IN 7	IN 8
OUT 1	00	01	02	03	04	05	06	07
OUT 8	...	...	...	...	...	...	...	3F

5 MISCELLANEOUS

5.1 Disclaimer.

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ALYSEUM warrants to the original purchaser that each of these products is free from defects in materials and workmanship for a period of two years from the date of purchase.

This warranty does not apply to products which have been repaired or modified by anyone other than ***ALYSEUM***, or which have been subjected to electrostatic discharge, moisture, improper installation or use.

ALYSEUM assumes no responsibility for such occurrences under the terms of this warranty.

Before taking any action, please consult your dealer for further details or visit our support page at http://www.alyseum.com/support