

ALYSEUM - SELECTOR & HOLD - User's manual 2.0 (Firmware 1.1)

1. Introduction



The **SELECTOR** module is a highly versatile module in terms of connectivity, control, extension and use.

Its front panel, combined with a multitude of control signals, sets it apart from other sequencer switchers.

The heart of the module is a high Voltage and high quality bi-directional addressed Selector $8 \leftrightarrow 1$, also called Sequential switcher $8 \leftrightarrow 1$ or Multiplexer $8 \rightarrow 1$ or Demultiplexer $1 \rightarrow 8$.

Up to 8 **SELECTOR** modules can be chained to create a bigger Selector up to $64 \leftrightarrow 1$.

In every cases, only one Switcher is active at a time!

The **HOLD** module is an optional **SELECTOR** module's companion which adds the features to it:

- 8 digital addressed outputs, selectable between Trigger or Gate.
- 1 CV input to 8 analog addressed outputs, selectable between S&H or T&H.

The 8 digital and 8 analogue outputs are synchronized with the **SELECTOR** I/O.

Modes, features and chaining of the **SELECTOR** module are fully preserved when the **HOLD** module is added!

These modules can be controlled in 8 different modes of wich 5 exclusive:

1. Standalone by buttons.
2. Slave of the **MATRIX II** module linked to its preset and bank management.
3. CV Input with its bipolar offset setting.
4. MIDI NOTE or MIDI CC input.
5. Sequential switcher with a MIDI CLK input.
6. Sequential Switcher with a CLK/Trigger input.
7. Sequential Switcher with a CLK/Trigger + RST inputs.
8. CV & CLK/Trigger Inputs, like S&H

Two unique features increase the power of the different modes and their usabilities:

- An "Arpeggiator-like" function is available for the Modes 5, 6 and 7 and including 4 patterns.
- A "Steps Window" function is available for the Modes 3 until 8 and allows you to freely choose a range of steps in number and location on the fly.

2. Hardware

2.1. Package Content - SELECTOR

- One SELECTOR module.
- One plastic bag containing:
 - o Two M3 screws + nylon washers.
 - o One 10/16 pins power ribbon cable.
 - o Two short MIDI cables : one Jack/Jack and one DIN5 female/Jack (type B)
- Warranty & user manual access card.

2.2. Package Content - HOLD

- One SELECTOR module.
- One plastic bag containing two M3 screws + nylon washers.
- Warranty & user manual access card.

2.3. Specifications

- Front panel width: 8HP for SELECTOR and 6HP for HOLD.
- Modules maximum depth: 26 mm.
- High voltage and high quality chip type: DG408.
- Power requirements for SELECTOR (Full LED On) : +12V= 55 mA / -12V= 2mA.
- Power requirements for SELECTOR + HOLD (Full LED On): +12V= 60 mA / -12V= 6mA.
- Power supply is protected against reverse ribbon cable insertion.

2.4. Installation - SELECTOR

Choose the installation location of your unit carefully:

- Avoid placing it in direct sunlight or close to a source of heat.
- Avoid locations subject to vibrations, excessive dust, heat, cold, moisture or rain.
- Make sure to discharge any built-up static electricity from yourself and your devices before touching or connecting one device to another.

Installation for chaining

For order to use the chaining feature, install the module #1 on the left first and then the module #2 on the right and so on. Thus you visually respected the LED chaining!

When install both SELECTOR & HOLD in chain, place always per pairs HOLD-SELECTOR + HOLD-SELECTOR +

Procedure:

1. Only connect the module to a Eurorack bus board powered by a specified A-100 power supply.
2. Switch OFF and disconnect the Eurorack case from the main power supply by unplugging it from the wall socket!

3. Make absolutely certain that the ribbon cable has the right orientation by connecting the indicated red stripe on the negative 12 Volt side of your Eurorack case bus board.
4. Carefully place the module on an appropriately spaced spot on your Eurorack and fasten it firmly in place with the supplied screws and nylon washers. Replace any covers or blanking plates that you removed to install the module and screw them in firmly.
5. Reconnect the Eurorack case power cable back into the main power supply and switch the case power on.
6. If it doesn't seem to be working as expected (Initialisation LED sequence), immediately disconnect the system from the main power supply again. In this case, double-check the connections, making completely sure that the ribbon cable is the right way round where it connects to the module and the bus.

Installation with the MATRIX II:

- SELECTOR modules must be powered by the same power supply, or generally powered ON/OFF simultaneously with the MATRIX II.
- The MIDI Out of the MATRIX II module must be connected to the MIDI Input of the SELECTOR module.
- Please refer to the user manual of the MATRIX II for more informations.

NB: We use a very high speed optocoupler with only 4µS delay. The goal is to be able to cascade a large number of modules without adding a delay on the MIDI. the use of a THRU BOX to avoid any delay is totally useless.

2.5. Installation - HOLD

Power and data is connected to the SELECTOR module by a single 8-contact polarized ribbon cable.

Always place the HOLD module to the left of the SELECTOR in your Eurocase.

Plug the 8-pins header connector as shown in the photo below.



IMPORTANT

Only SELECTOR modules with a serial number equal or greater than 031-xxx are fitted with this connector.

If you already own a module with a serial number lower than 031-xxx, please order the HOLD module containing the hardware upgrade kit for your SELECTOR module.

This kit is sold at cost and can only be obtained with the purchase of the HOLD module.

This KIT included: A new main electronic board including an Allen Key for disassembly and reassembly the SELECTOR module.

How to replace the card:

1. Remove the 5 black screw of the front panel with the Allen Key delivered.
2. Remove the front panel and unplug the LEDs and buttons card.
3. Remove and keep the spacers (5X), nozzles (3X) and screws (5X),
5. Reassemble the LEDs & buttons board with the new board.
4. Refit the front panel with the 5 black Allen screws.

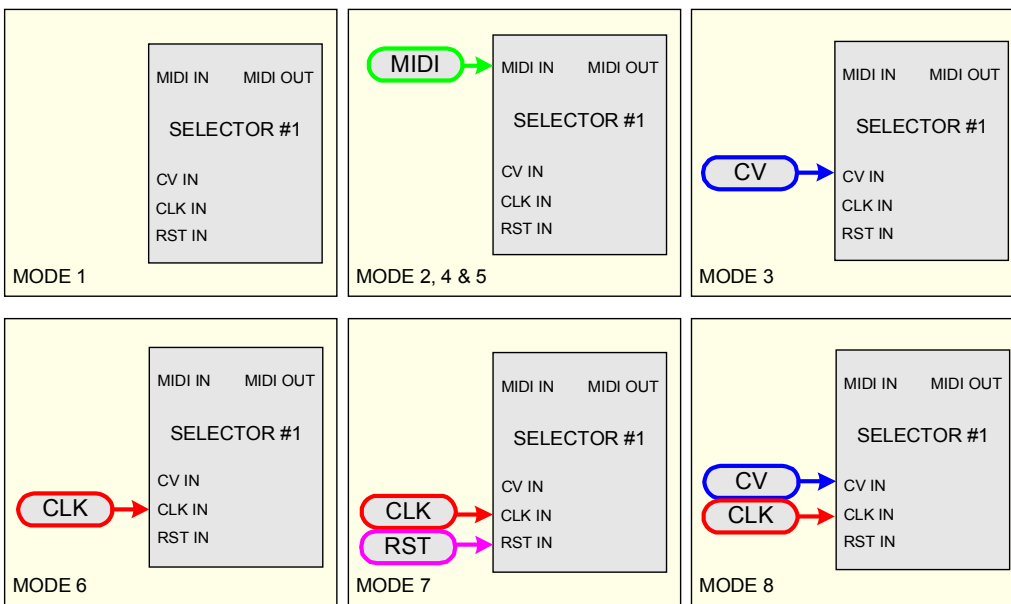
That's it.

2.6. Cabling - SELECTOR

External control

Please, respect the connections according to the Mode used.

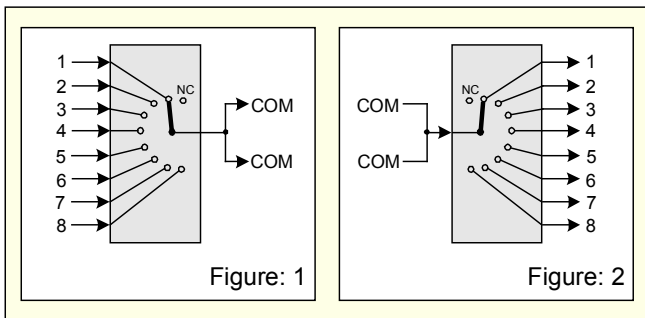
In case of chaining, connect CV, CLK and RST signals only on the module #1 (The Master).



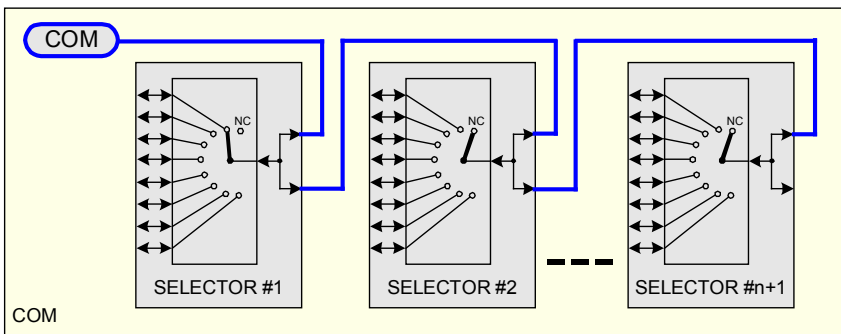
I/O & COM

You have 2 possibilities:

1. Use the COMs as Output, if you want to take signals from 1 of the 8 Inputs - see figure 1.
2. Use the COMs as Input, if you want to route signal to 1 of the 8 outputs - see figure 2.

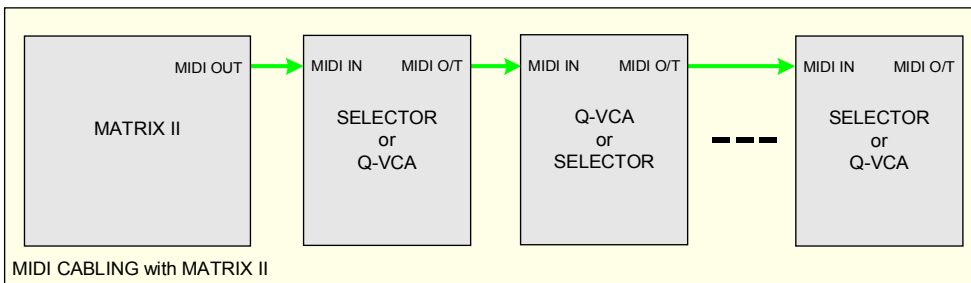


COM - in case of chaining use



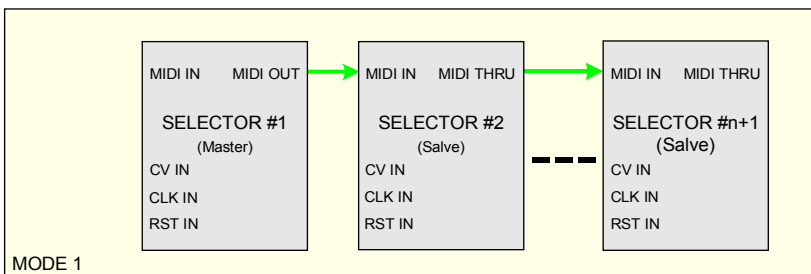
MIDI - with the MATRIX II

To guarantee the management of the Banks and Presets of the SELECTOR, it is important to wire the MIDI as shown below. The principle is simple, MATRIX II is the master, SELECTOR is slaves.



MIDI - in case of chaining

This wiring is necessary for proper operation



NB: SELECTOR use a very fast optocoupler (more than 100 times faster than the speed of MIDI) so you can cascade dozens of modules via THRU and without generating any delays. So, you don't need to use a MIDI THRU BOX!

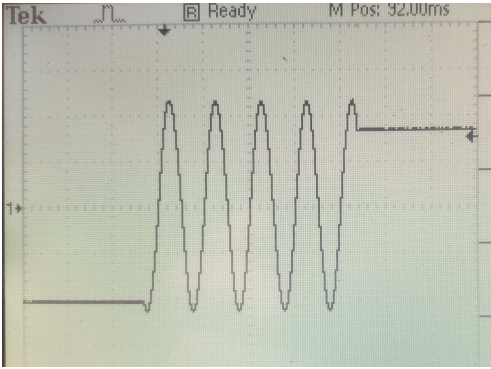
2.7. Good to know

HOLD module - S&H vs T&H?

The difference between a S&H capture and a T&H capture is the duration of sampling in relation to the duration of the activation period:

- S&H or Sample & Hold = the first mS. of the entire period of the activation period.
- T&H or Track & Hold = Throughout the entire activation period.

Exemple of a T&H signal below:



HOLD module - Trigger vs Gate?

The difference between Trigger and Gate during activation of a digital output is:

- Trigger= Output remains active for the first mS.
- Gate= The output remains active for the entire activity period.

Finally, Trigger is a very short Gate and Gate is a very long Trigger 😊

SELECTOR + HOLD modules - SYNC switching timing?

To avoid unwanted sound effects as much as possible, it is important that the two switches that change states (one from ON to OFF and the other from OFF to ON) are synchronized to avoid both being closed at the same time or opened together.

Three possible cases:

1. The change between the two switch is limited to the same module. There, the DG408 is by nature: Break-before-make switching action.
2. The change between the two switches which one is in the master module and the other in a slave module.
3. The change between the two switches which are each in a different slave modules.

Software countermeasures are taken to simulate the DG408 in the cases 2 and 3.

3. How to use

3.1. Initialization Sequence

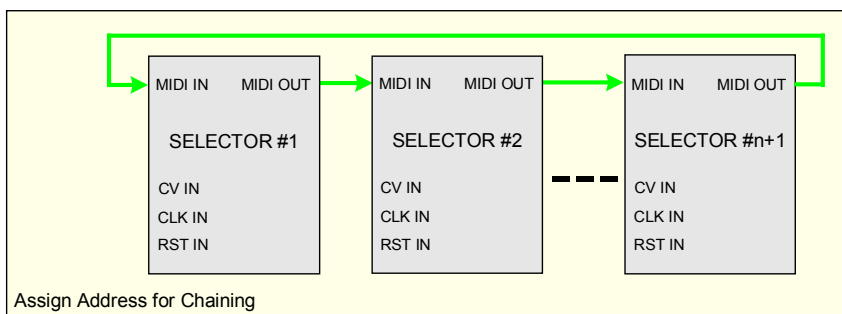
1. Turn the Eurorack case power ON.
2. All LEDs light up one after the other from right to left and finishing by the LED red MODE.
3. Module Address saved in the EEPROM is loaded and the corresponding green LED flashing 1 second.
4. Mode saved in the EEPROM is loaded:
 - o Mode 1: the last position before shutdown is restored.
 - o Mode 2: Slave of the MATRIX II.
 - o Mode 3: Set, regarding the voltage on the CV Input.
 - o Modes 4, 5, 6, 7 & 8: No connection, wait the first event.
5. The SELECTOR module is ready!

If you want to use a single module (no chaining), you can go directly to the chapter 3.3.

3.2. Rules in case of use in chaining.

- Use only the buttons and CV Offset of the module #1 (the Master).
- Connect the external CV, CLK and RST signals only on the module #1 (the Master).
- The next modules (the Slaves) buttons, CV OFFSET and Red LED MODE are inoperant!
- All data are save in EEPROM of the module #1 (the Master).
- Except Module #1, all Slaves modules are automatically in MIDI THRU

Assign address # in Chaining:



The operation is done in a single sequence:

- Turn OFF your system.
- Keep press gently the button RST of the first module (The one you want to give the address #1, and logically installed at the left in your case).
- Turn ON your system and the 8 green LEDs blink 2 times, now release the button RESET.
- Then, the first module will programmed automatically the address #2 of the second module whose the 8 green LEDs blink 2 times to indicate that the module is programmed, and so on until the last of the chain. All modules restart.
- Address module saved in the EEPROM is loaded and the corresponding green LED flashing 1 second.

NB: It is important that all modules in the chain are installed, powered and that MIDI is wired in loop!

NB: Do not forget to remove the last MIDI cable from the loop after programming the addresses.

Erase the address:

- Turn OFF your case.
- Keep press the button MODE.
- Turn ON your case and the 8 green LEDs flash twice time, now release the RESET button.
- The module restart, and your SELECTOR is ready to work alone.

3.3. Mode selection

- Press the red button MODE more as 2 seconds, the red LED turn ON.
- Press several times the button MODE to obtain wished mode, the Mode selected turn ON green LED.

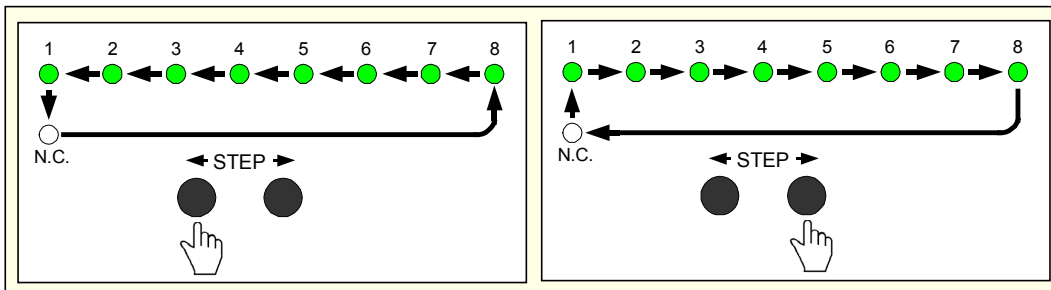
| MODE & LED # | MODE | Arpeggiator-like pattern (3.4) | Step window (3.5) |
|--------------|---|--------------------------------|-------------------|
| 1 | Standalone (out of factory) | No | No |
| 2 | Use with the MATRIX II | | |
| 3 | External CV | | Yes |
| 4 | External MIDI NOTE or MIDI CC command | | |
| 5 | External MIDI CLK command | | |
| 6 | External CLK with programmable steps number | | |
| 7 | External CLK + RST | | |
| 8 | External CV + CLK - Like S&H or STROBE mode | No | |

- Afterwards:
 - o Press more as 2 seconds the button MODE to confirm your choice, the selected green LEDs flash 2 times to confirm the mode is saved in the EEPROM.
 - o OR - Press shortly the button RST to cancel the current programming.
 - o OR - A time out of 15 seconds will cancel the current programming.
- Red LED MODE turn OFF.

Mode 1 - Standalone

Press button STEP ← or STEP → (see figure below), switch is updated.

Keep press button STEP ← or STEP → more as 1 second to engage the auto-repeat, during auto-repeat, switch is not updated.



In resume:

- With a single module, existing 8 steps and a ninth state when all the LEDs are OFF for No Connection (N.C.)
- With 2 modules in chaining, existing 16 steps and a seventeenth state when all the LEDs are OFF for No Connection (N.C.)
-

- With 8 modules in chaining, existing 64 steps and a sixty-fifth state when all the LEDs are OFF for No Connection (N.C.)

NB: Keep pressed the button RESET and the SELECTOR is held at No Connection and the last active LED flashes.

Mode 2 - Controlled by MATRIX II

Same as Mode 1, but with the possibility to save and recall 7 banks of 32 presets via the MATRIX II front panel.

The current Bank & Preset number are saved or loaded and displayed also via the front panel of the MATRIX II, but the values are saved inside the SELECTOR module.

Please, read the user Manual of the MATRIX II to load and save Bank & Preset.

- A LOAD operation, recalls the settings of the SELECTOR + Link to the Bank & Preset number displayed by the MATRIX II.
- A SAVE operation, saves the settings of the SELECTOR + Link to the Bank & Preset number displayed by the MATRIX II.

During SAVE & LOAD operations, green & red LED blink one time.

NB 1: The current Preset # is saved or loaded and displayed via the front panel of the MATRIX II, but the values are saved in the EEPROM of the SELECTOR (Master) module.

NB 2: Keep pressed the button RESET and the SELECTOR is held at No Connection and the last active LED flashes.

MIDI SYS-EX.

These commands are generated by the MATRIX II, of course, if you will control the SELECTOR by any software, welcome!

| Commands SYS EX | Header + ID Device + Command # + Data + End |
|----------------------|--|
| Load a Bank & Preset | F0 00 20 09 00 1F 00 XX YY F7 (XX=00 until 06 - YY= 00 until 1F) |
| Save a Bank & Preset | F0 00 20 09 00 1F 01 XX YY F7 (XX=00 until 06 - YY= 00 until 1F) |

Mode 3 – Controlled by an external CV.

There is the ability to control SELECTOR module by an external CV signal (0 to 5 Volts).

Use the bipolar OFFSET adjust for a compatibility with your source down to -5 Volts.

| | Single module | Chaining modules | | | | | | |
|----------|---------------|------------------|-------|-------|-------|-------|-------|-------|
| Module # | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Steps # | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 |
| V/Step | 0.7V | 0.33V | 0.22V | 0.16V | 0.13V | 0.11V | 0.09V | 0.08V |

NB 1: The division factor of the input voltage is calculated to the nearest step when the STEPS WINDOW are activated.

NB 2: Keep pressed the button RESET and the SELECTOR is held at No Connection and the last active LED flashes.

Mode 4 - Controlled by an external MIDI NOTE or MIDI CC.

In Mode 4, two categories of MIDI messages can be used, but only one at a time.

1. MIDI NOTE, where each module represents an 8-notes zone
2. MIDI CC, where The 128 values automatically distributed over 1 or multiple modules if chaining.

NB: Keep pressed the button RESET and the SELECTOR is held at No Connection and the last active LED flashes.

Programming MIDI command

Only programmable if the SELECTOR Module is configured in Mode 4.

Connect an external MIDI Keyboard or controller device on the MIDI input.

- Press the button STEP ← more as 2 seconds, the red LED MODE blink.
- Afterwards:
 - The first MIDI Note On or the first MIDI CC detected by the SELECTOR is saved (MIDI Channel sensitive). The 8 green LED flash 2 times to confirm.
 - OR - Press shortly the button RESET to cancel the current programming.
 - OR - A time out of 15 seconds will cancel the current programming.
- The red LED MODE stop to blinking.

Mode 5 - Controlled by an external MIDI CLK.

There is the ability to control SELECTOR module by a MIDI sequencer or any software.

Some info about MIDI CLK (System Real-Time Messages) https://en.wikipedia.org/wiki/MIDI_beat_clock

| Hex | Condition | Comments |
|-----|------------|----------------------------------|
| F8 | Timing CLK | Sent 6 times per MIDI beat (BPM) |
| FA | Start | From beginning |
| FB | Continue | From Stop position |
| FC | Stop | Stop song's execution |
| FF | Reset | Return to the first Step |

NB: Keep pressed the button RESET and the SELECTOR is held at No Connection and the last active LED flashes.

Mode 6 - Controlled by a single CLK input.

Each CLK pulse increments the SELECTOR of one Step, within the programmed number of steps, and repeats indefinitely the cycle.

NB 1: Press shortly the RESET button, repeat the sequence from the beginning.

NB 2: Keep the RESET button pressed, hold the sequence frozen

Mode 7 – Controlled by the CLK + RST Inputs.

Same as MODE 6, but here we use an external RST.

You can connect directly a sequencer to the SELECTOR module.

Each CLK pulse increment the SELECTOR and a single RST Pulse and the SELECTOR go to the step #1.

NB 1: Press shortly the RESET button, repeat the sequence from the beginning.

NB 2: Keep the RESET button pressed, hold the sequence frozen

Mode 8 – Controlled by the CV & CLK Inputs – like S&H or STROBE mode

At each CLK pulse, the voltage at the CV input is frozen until the next CLK pulse.

NB: Keep pressed the button RESET and the SELECTOR is held at No Connection and the last active LED flashes.

3.4. "Arpeggiator-like" patterns

"Arpeggiator-like" patterns is available and programmable for the Modes 5, 6 & 7.

In chaining, the Master module automatically calculates according to the number of modules in the chain.

The are 4 different styles:

| Arpeggiator-like patterns | Pattern # | Resulting Example play | LED |
|---------------------------|-----------|-----------------------------------|-----|
| Up (loop) | -- | 1-2-3-4-1-2-3-4..... (no pattern) | 1 |
| Down (reversed loop) | 1 | 4-3-2-1-4-3-2-1..... | 2 |
| Up & Down | 2 | 1-2-3-4-4-3-2-1-1-2..... | 3 |
| Pendulum | 3 | 1-2-3-4-3-2-1-2..... | 4 |
| Random | 4 | Any-any-any-any..... | 5 |

Programming Arpeggiator-like pattern.

- Press the button STEP ←, more than 2 seconds, one of the 5 green LEDs of the arpeggio type turn ON.
- Press the buttons STEP ← or STEP →, to select the Arpeggiator-like pattern you want use.
- Afterwards:
 - Press more as 2 seconds the button STEP ← to save your choice
 - OR - Press shortly the button RESET to cancel the current programming.
 - OR - A time out of 15 seconds will cancel the current programming.
- The green LEDs selected turn off.

NB: Modes 5, 6 & 7 each have their pattern saved in EEPROM.

3.5. Configurable "Steps Window"

"Steps Window" is available and programmable for the Modes 3 until 8.

The "Steps Window" function allows you to freely choose a range of steps in number (minimum 2) and location on the fly! (even in chaining).

Programming the steps window

- Press the button STEP →, more than 2 seconds. Two green LEDs turn ON, these indicate the limit left & the limit right of the steps window.
- Press the button STEP ← or STEP →, to move the starting (left) point.
- Press the button MODE to switch to editing ending point of the steps window.
- Press the button STEP ← or STEP →, to move the ending (right) point.
- Afterwards:
 - Press more as 2 seconds the button MODE to save your choice
 - OR - Press shortly the button RESET to cancel the current programming.
 - OR - A time out of 15 seconds will cancel the current programming.
- The two green LEDs selected turn off.

NB 1: As soon as two LEDs are contiguous, you can continue to move starting and ending points together.

NB 2: Modes 3 until 8 each have their Steps Window saved in EEPROM.

3.6. Firmware upgrade

SELECTOR module is pre-programmed with the ability to receive firmware upgrades (for bugfixes, extra features, customizations etc...) via MIDI protocol (SysEx commands).

Please, fill in the page Firmware Upgrade <http://alyseum.com/firmwareupdate> to receive all new firmwares for your product.

In order to flash new firmware, please follow the instructions below (One module at a time):

1. Turn the Eurorack case power OFF.
2. Close all MIDI software on your computer.
3. Connect the computer and the SELECTOR to upgrade with a MIDI cable.
4. Download Sys Ex utility at <http://www.elektron.se/support-and-downloads> (WIN and OSX).
5. Press and hold the BOOT button, while turning the Eurorack case power back ON. The BOOT button is located behind the small hole in SELECTOR front panel, down the CV input and can be pressed using a thin, long object like, for example, a toothpick.
6. The red LED MODE flashes 3 times, release the BOOT button.
7. Open the Elektron C6 Sys Ex utility software, click **Load**, find the new firmware file and click Open.
8. Click **Configure**, select a MIDI Out port corresponding at your MIDI interface, set 400mS for Delay in the textbox, select x1 for Turbo limit field and click OK.
9. Click **Send**.
10. During the firmware update, the red LED MODE blink slowly.
11. During the EEPROM update, the red LED MODE blink fastly.
12. Wait until sending is complete, the red LED Mode flash 3 times, and the module reboots to normal operating mode with new firmware.

NB 1: Please note that for the software to be able to send the MIDI commands successfully, no other software or Active Sensing message should be using the MIDI device simultaneously.

NB 2: All parameters are reset and all Presets are erased during new firmware flashing.

Thanks to Émilie Gillet from Mutable Instrument for his open Bootloader code: <https://github.com/pichenettes/avr-midi-bootloader>.

4. Miscellaneous

4.1. Disclaimer

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4.2. Warranty and repair

ALYSEUM warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for a period of two years following the date of purchase.

This warranty does not apply to any products which have been repaired or altered by other than **ALYSEUM**, or which have been subject to ESD, moisture, abuse, accident, improper installation or use.

ALYSEUM assumes no liability as a consequence of such events under the terms of this Warranty.

Please, consult your dealer for more details or visit our support page on <http://www.alyseum.com/support> before any action.

4.3. Special Thanks

Vyronas Dokimakis (the programmer), Philip Thoma, Cyril Colomb and some users for your positive comments or feedback.