



# RECORD - User's manual

## 1 Introduction

The **Alyseum** RECORD Eurorack module offers a multitude of audio formats and high-quality audio streaming and recording with no fuss and in a small enough package to fit in every setup.

Having that audio playback inside your case and recording every patch you make has now become so easy!

The RECORD module can encode audio formats, from MP3, Ogg Vorbis, and WAV 16-bit PCM. The proprietary MP3 encoder and Ogg Vorbis encoder have been carefully tuned for highest possible audio fidelity for high-quality audio streaming or recording.

He also, can play back MP3, OGG and WAV PCM formats, making it very suitable for hi-fi audio playback.

**Credits:** Special thanks for comments, suggestions and/or ideas from Cyril (Modular Square), Philippe, Luca, Konstantine and Vangelis.

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## 3 Hardware

### 3.1 Package Content

- One RECORD module with Eurorack compliant front panel
- One free µSD card 16 or 32GB.
- One plastic bag containing:
  - Two M3 screws + M3 nylon washers.
  - 10/16 pins Power ribbon cable.
- Warranty & user manual access card.

### 3.2 Installing the RECORD module.



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.



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.

### 3.3 Features

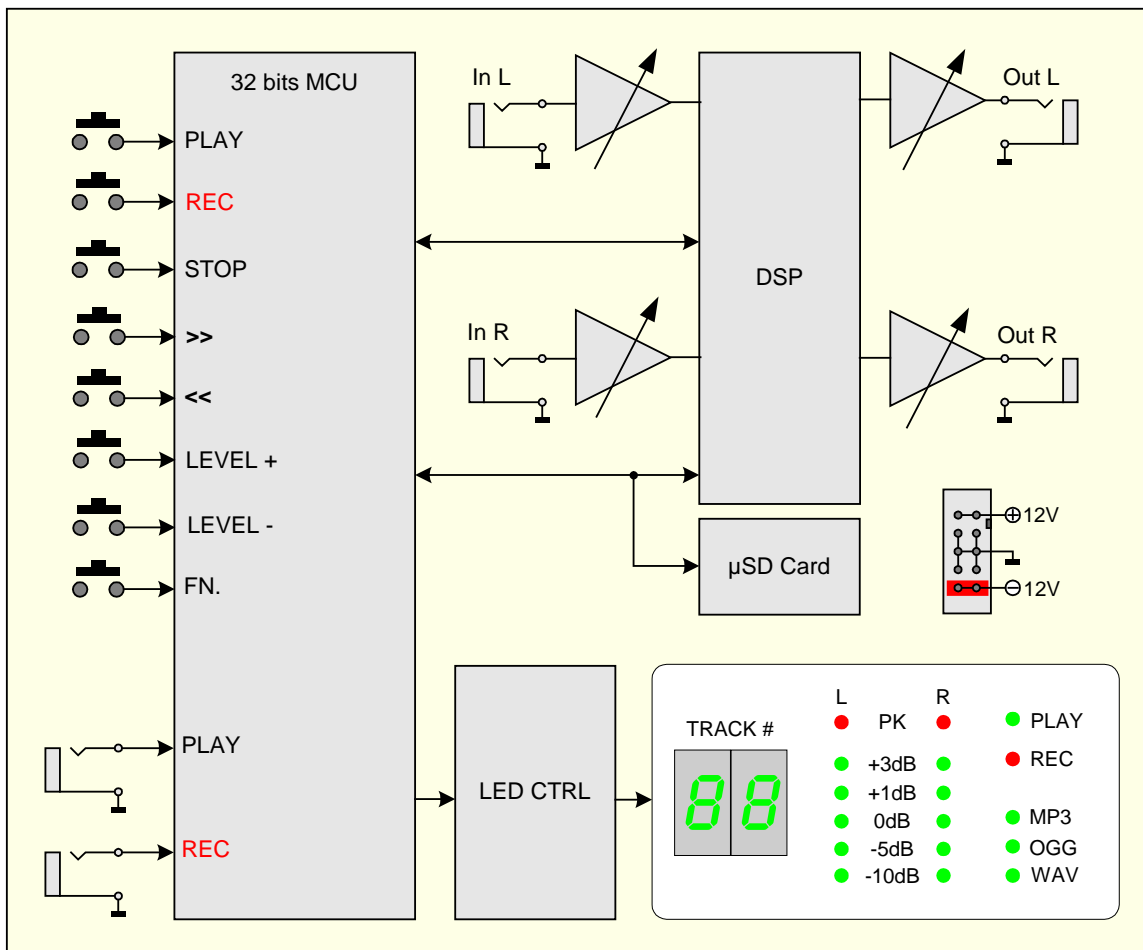
- A Master 32 bits Processor with a µSD card slot, support:
  - FAT12, FAT16 up to 2GB (SD Card standard)
  - FAT32 more than 2GB and up to 32GB (SDHC Card standard)
  - exFAT more than 32GB and up to 2 TB (SDXC Card standard)
- A slave specialized single Chip, contains a high-performance low-power DSP core, memories, as well as a high-quality stereo ADC and a variable sample-rate stereo DAC.
- File management: 99 Banks of 99 Tracks for each format (MP3, OGG & WAV).

- File-based system configurations (auto generated with default properties into virgin memories)
- Upgradeable firmware by the user with a simple  $\mu$ SD Card.

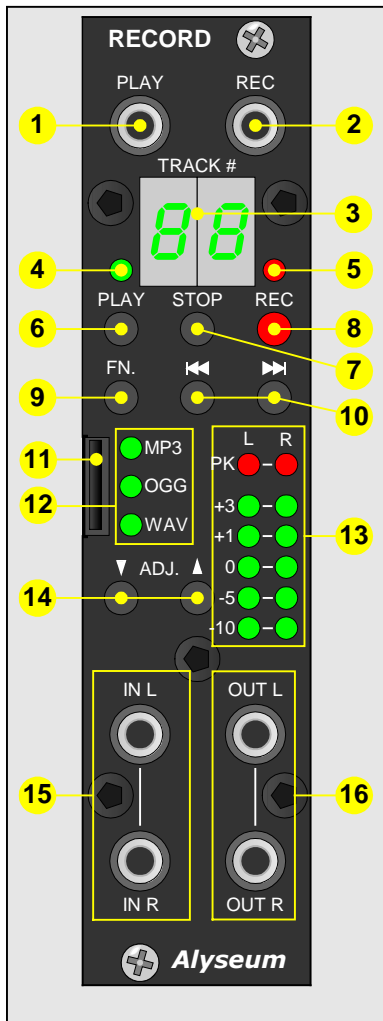
### 3.4 Specifications

- Front panel width: 30 mm (6HP)
- Module maximum depth: 26 mm
- Inputs Outputs jacks: 3.5 mm - ring/tip
  - **AUDIO LEVEL ONLY!**
  - Nominal input level: -10dBV
  - Maximum input level: +6dBV
  - Audio input maximum level: -1.4 to +1.4 Volts, protected until +/-12 Volts
- Power requirements:
  - +12 Volts regulated at 90 mA
  - -12 Volts regulated at 0 mA

### 3.5 Bloc diagram



### 3.6 Front Panel



1. Input PLAY jack plug
2. Input REC jack plug
3. Dual Numeric LED Display (green)
4. PLAY LED (green)
5. REC LED (red)
6. Push Button PLAY
7. Push Button STOP
8. Push Button REC
9. Push Button FN.
10. Push Buttons << or >>
11. μSD Card slot
12. Format LED MP3 / OGG / WAV (green)
13. Stereo VU meter LED (Recording or Playing)
14. Push Buttons ↓ or ↑
15. Input Stereo line jack plug
16. Output Stereo line jack plug

### 3.7 About μSD Card


μSD Cards are delicate media, In order to avoid damaging μSD cards, please take the following precautions when handling them.

- Do not leave μSD Cards in extremely hot or cold places.
- Do not leave μSD Cards in extremely humid places.
- Do not let μSD Cards get wet.
- Do not put things on top of μSD Cards or twist them.
- Do not hit μSD Cards
- Do not remove or insert μSD Cards during recording, playback, data transmission or other access.
- During the transport of your case, remove and place your μSD cards in a safe place.

## 4 Software (2.7)

Always ensure that you have the latest firmware installed before using the module.

### 4.1 Initialization Sequence

1. Turn the Eurorack case power On
2. RECORD module displays during 0,2 second the Revision of the firmware 
3. RECORD module turn On each individual and digit LED, one by one during a short time.

### 4.2 Use µSD Card

**ALYSEUM** preconize manufacturers like Samsung EVO 32GB or Kingstone (best results during our tests).

Some manufacturers use "white product" and print their names on them, these cards are less reliable and have (too) many bad sectors.

Use always µSD Card with a minimum Class 10 (10 MB/s Write) or UHS-I or UHS-II or UHS-III.

You can use a µSD Card from 128MB up to 2TB.

- FAT16 for capacity of 128MB until 2GB (microSD™)
- FAT32 for capacity of 4GB until 32GB (micro SDHC™)
- exFAT for capacity of 64GB until 2TB (micro SDXC™)

File-based system configurations (auto generated with default properties into virgin memories).

#### 4.2.1 Tips about µSD cards with RECORD

- If you use several µSD cards with the same settings, you can duplicate the two files DUMP.\* with your computer on each new µSD card.
- Format µSD Cards after a long period of use is always a good suggestion, especially for FAT file system.


#### 4.2.2 Insert the µSD Card

Insert gently the µSD Card into the slot with the groove and the inscription on the left side.




Never remove the µSD Card or turn off your Eurorack case during PLAY or REC mode.

#### 4.2.3 No present µSD card

No present, not usable or after a removing µSD Card is displayed 

At any time, you can insert a µSD Card and then RECORD display automatically the track# .

#### 4.2.4 Remove the µSD Card

Hold press FN + STOP push buttons, display blinking  (Eject) during 2 seconds and then turn off. Now, un-mounts the file system and µSD card is free to remove.

Catch the groove with your nail and then pull back gently the µSD Card.

To restart the module, insert a  $\mu$ SD Card and press whatever button.

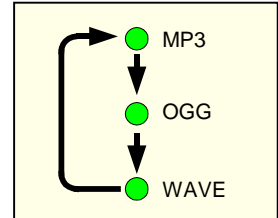
**NOTE:** If your Eurorack case is power Off, you can remove the  $\mu$ SD Card at any time.

#### 4.2.5 Playing and Recording FORMAT selection

To select your choice, keep press gently the FN button and then press several times the REC button to change the format as follows:

Currently 3 formats are available automatically, by default:

1. MP3 - 320 kbit/s - CBR or VBR @ 48 kHz stereo,
2. OGG (OggVorbis) - 300 kbit/s - VBR @ 48 kHz stereo
3. WAV - 1536 kbit/s @ 48 kHz - 16-bit PCM stereo.



### 4.3 Operations via the front panel

#### 4.3.1 PLAYBACK operation

Press the PLAY button, playback starts from the track displayed.

To stop playback, press the STOP button.

To suspend playback temporarily (pause) press again the PLAY button and the green LED play blinking.

To resume playback, press again the PLAY button.

NOTE: The syntax of the FILE NAME is:

- MP3 file : Alyseum\_XX\_ZZ.MP3
- OGG file : Alyseum\_XX\_ZZ.OGG
- WAV file : Alyseum\_XX\_ZZ.WAV

XX is the number of the bank 01 until 99, ZZ is the number of the track 01 until 99.

#### 4.3.2 RECORDING operation

Press the REC button, a new track is created automatically and displayed on the numeric display.

After a short period need for the initialization of the file on the  $\mu$ SD card, the red LED Rec blink quickly and recording starts.

Press the STOP button to stop recording.

To suspend REC (pause) press again the REC button and the red LED REC blinking slowly. To resume recording, press again the REC button.

**NOTE 1:** If the 99 Banks or if the 99 tracks or if the  $\mu$ SD Card is full, the display blinks **FU** (Full).

Please: replace the  $\mu$ SD Card by a new one or select an other format.

**NOTE 2:** The FILE NAME is fixed up automatically in regular sequence like:

- MP3 file : Alyseum\_XX\_ZZ.MP3
- OGG file : Alyseum\_XX\_ZZ.OGG
- WAV file : Alyseum\_XX\_ZZ.WAV

XX is the number of the bank (from 01 until 99), ZZ is the number of the track (from 01 until 99)

**NOTE 3:** Adjust the Gain of the external audio source to suitable level before recording. If not, the recording quality becomes poor.

**TIP:** At any time, you can start the recording promptly!

Push more than 1 second the REC button and the LED REC blinking quickly, display indicates **SE** (Setting) if you shortly push the REC button again, Recording starting without delay!

### 4.3.3 Fast Forward & Fast Backward (Search for a part of a track)

During playback, keep pressed the << or >> button more than 1 second and release it when the part you want to listen to is found.

**NOTE :** Keep pressed more than 10 seconds the << or >> button, FF or FB accelerate automatically.

### 4.3.4 Selecting previous or next Bank.

Only in STOP Mode, press FN + << or >> button several times until the desired Bank is found (01 until 99). Bank number 00 is useful if you do not use Bank, or for old files.

### 4.3.5 Selecting previous or next Track

Only in STOP Mode, press << or >> button several times until the desired Track is found.

In PLAY mode, press << or >> button several times until the desired track is found. The selected Track will be played from the beginning.

When the << button is pressed once during the playback, the Track being played will be played from the beginning.

### 4.3.6 Erase a Track

Only in STOP mode, press << or >> button several times until the desired track to erase is selected.

Keep press gently FN + PLAY buttons during more than 2 seconds, number of the selected track blinks and finally the track is erased.

The next track # is selected automatically.

## 4.4 Level adjustment

### 4.4.1 Playing - level adjustment

You can adjust the output level step by step, each step represents a value of 0,5dB.

No attenuation (Gain 1) , displays **50**, the maximum attenuation is –24,5dB, displays **01**, and mute, displays **00**.

The last playing level adjustment is automatically saved in Flash.

### 4.4.2 Before recording - level adjustment

Before starting recording, input levels should be adjusted to prevent recorded sounds or signals from being distorted due to excessive input levels and to prevent them from being so low that they are below the noise floor.



Push more than 1 second the REC button and the LED REC flashing quickly, display indicates **SE** (SEtting) and the VU meters are connected to the input.

Press ↑or↓ buttons and adjust the recording level according to the feedback of the VU.

The recording level is adjustable between **01** and **40**.

The last recording level adjustment is automatically saved in the μSD Card.

**NOTE:** At any time, you can start the recording promptly if you shortly push the REC button again.

#### 4.4.3 During Recording - level adjustment

Press REC button, recording starting and the VU meters are connected to the input.

Press ↑or↓ buttons and adjust the recording level according to the feedback of the VU.

The recording level is adjustable between **01** and **40**.

The last recording level adjustment is automatically saved in the μSD Card.

**NOTE :** Never use directly the signal from your modular, always use an attenuator or mixer module to adapt the signal.

#### 4.4.4 Resume operations

Buttons Combinations	Release	Action
PLAY	STOP	Playback track # displayed
Hold + 1 sec. PLAY		Playback all successive tracks in the current format
PLAY (pause)	PLAY	PLAY suspended (pause), LED PLAY blinking. To restart playing push PLAY button again
Hold + 1 sec. REC	STOP	Before recording - Connect only the VU meter to the inputs. To start recording push again REC Recording level (step by step <b>01</b> until <b>40</b> )
REC	STOP	Recording a new track and connect the VU meter to the inputs Recording level (step by step <b>01</b> until <b>40</b> )
REC (pause)	REC	Recording suspended (pause), LED REC blinking and connect the VU meter to the inputs. To restart REC push again REC button or push STOP button to STOP. Recording level (step by step <b>01</b> until <b>40</b> )
REC	PLAY	Not available
STOP	--	Return in STOP mode and connect VU meter to the input
FN + RECORD	STOP	Format selection, MP3 or OGG or WAV
<< or >>		
	REC	Not available
	PLAY	Start the execution of the previous or next track
Hold + 1 sec. << or >>		2X Forward or backward (no effect during recording)

Hold + 10 sec. << or >>		8X Forward or backward (no effect during recording)
Hold + 2 sec. FN + PLAY	STOP	Delete Track - # TRACK to delete blinking
↑or↓	PLAY	Playing level (step by step 00 until 50 )
Hold + 0,7 sec. ↑or↓		Fast Playing or Recording level ( 00 until 50 )
FN + << or >>	STOP	Bank number selection ( 01 until 99 )
Hold + 2 sec. FN + STOP	STOP	Un-mounts the file system and μSD card is free to remove. To restart the module, insert a μSD and press whatever button
FN + ↑or↓		Increase or decrease the LED luminosity ( L0 until L9 )
STOP + >>		Toggle PULSE or LOGIC mode – Displayed P <sub>U</sub> or L <sub>0</sub> during 1Sec

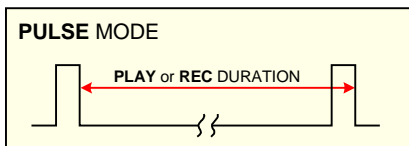
## 4.5 Operation via the external inputs PLAY & REC

**NOTE 1:** Anyway, it is possible to stop Playback or Recording by a simple press of the STOP button.

**NOTE 2:** If PLAY is active, the REC function is disable and vice versa.

### 4.5.1 PULSE Mode

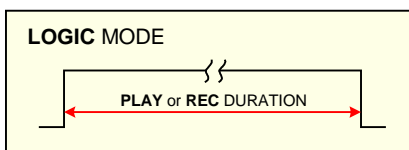
Width of the pulse signal must have a duration greater than 5 mS, amplitude greater than 4V and duration between two pulses must be great as 0,1 second.



**TIP:** In playing, Pulses mode permit to create easily a loop effect.

### 4.5.2 LOGIC Mode

Duration between two logic signal must be great as 0.5 second and amplitude greater than 4V.



### 4.5.3 Select LOGIC or PULSE Mode

Only in STOP mode, press STOP + >> buttons to switch in LOGIC mode, displayed during 1 Second L<sub>0</sub>. Press again STOP + >> buttons to switch in PULSE mode and displayed during 1 second P<sub>U</sub>.

### 4.5.4 Resume operation via the external inputs PLAY & REC

Pulse mode (via Jack)	Release	Action
PLAY	STOP	Playback track # displayed

PLAY (pause)	PLAY	PAUSE, LED PLAY blinking. To restart PLAY pulse again the input gate PLAY or push STOP button to STOP
REC	STOP	Recording a new track
REC (pause)	REC	Recording suspended (pause), LED REC blinking. To restart REC pulse again the input gate REC or push STOP button to STOP

Logic mode (via Jack)	Release	Action
PLAY	STOP	Start playing # track displayed at the rising edge and stop at the falling edge or push STOP button to STOP.
REC		Start recording at rising edge and stop at the falling edge or push STOP button to STOP

## 4.6 Firmware Bootloader

The RECORD module is pre-programmed with the ability to receive firmware upgrades (for bug fixes, extra features, customizations etc...) via the µSD card.



It’s important that you fill in the contact form on our website [www.alyseum.com](http://www.alyseum.com) by mentioning that you have got a RECORD module in order to receive the updated firmware by Email.

### 4.6.1 Download the new firmware

First, turn Off your Eurorack case.

Second, with your computer, download and UNZIP the new file "image.hex". Copy the file on a empty µSD card (maximum size of 32GB and of course formatted – no exFAT supported) and insert it on the slot of the RECORD module.

### 4.6.2 Activate the bootloader of the RECORD

Keep pressing PLAY + REC buttons, then turn On your Eurorack case, the Red LED REC blinks during 2 seconds, then the display show **UP** (Upload), now you can releasing the PLAY & REC buttons.

At this point, if the "image.hex" is found in the µSD Card, the bootloader will load the content in the flash of the Microprocessor. During this phase the Red LED REC blinks fast during erasing process and then the Green LED PLAY blinks fast during writing process.

The initialization sequence start and the RECORD module is updated!

### 4.6.3 Points of failure:

If the bootloader does not find the µSD the Green LED PLAY blinks slow forever until the µSD card is inserted. If the µSD Card is detected and the file "image.hex" has some problems, 4 kinds of errors are detected. The display shows the codes: **Sd**, **E1**, **E2**, **E3** or **E4** and the software loop forever until the power is restarted.

- **Sd** for µSD card no present.
- **E1** for Error 1. File "image.hex" non valid or not present in the µSD card
- **E2** for Error 2. Some read error with file "image.hex" (the file could be empty). Format the µSD card with FAT16 or FAT32 and try again (exFAT is not supported during the update firmware).

- **E3** for Error 3. File "image.hex" terminated incorrectly or corrupted (the file could be truncated during the copy). Ensure to remove the  $\mu$ SD card properly when written with PC.
- **E4** for Error 4. File "image.hex" Hex record Checksum mismatch. There are a corruption in the file. Generate a new one from sources.

#### 4.6.4 Firmware revision history

- Rev. 2.7 - Updated to last FAT file system library available R0.13b (July 8, 2018) + Updated to last DSP patch v2.2 (2018-08-06) + Change the compiler options for the fastest execution speed + Bug fix > Bypass a random bad register on a component + new management of the red LED Record.
- Rev. 2.2 - Commercial Bank file management
- Rev. 2.0 - First Bank file management file
- Rev. 1.2 - WAV file bug fixed.
- Rev. 1.0 - Logic bug fixed.
- Rev. 0.9 - Firmware revision is displayed shortly after module startup + Possibility to adjust the recording level without launching the recording + Improved multiplexing of the display for less noise + Bug inside DSP chip has been fixed (sometimes the chip swapped L & R outputs).
- Rev. 0.8 - exFAT is supported with latest FatFS library version + Some fixed minor bugs.
- Rev. 0.7 - First commercial release.

## 5 Miscellaneous

### 5.1 Disclaimer

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The information and specifications described in this manual are subject to change without prior notice.

Throughout this manual, trademarked names might be used. We state herein that we are using the name to the benefit of the trademark owner, with no intention of infringement.

### 5.2 Static Electricity, ESD



Electrostatic discharge (ESD) can cause malfunction and/or damage to electronic devices if discharged into the module.

Despite **ALYSEUM** products having built-in protections against ESD, voltages might build up at levels that could harm your equipment.

Some tips and precautions for ESD sensitive environment:

- Make sure to discharge any built-up static electricity from yourself and your devices before touching or connecting one device to another.
- Ground yourself by touching an earth grounded metal surface before handling your module and other equipments.
- For fixed installations, place the module in a grounded metallic rack.
- Ensure air relative humidity is minimum 60%.
- Install ESD specific prevention items, such as grounding mats.
- Reduce movement speed when handling or (dis)connecting devices.
- Avoid carpet or other synthetic flooring.



### 5.3 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 [alyseum.com/support](http://alyseum.com/support) before any action.