ADDAC System

Instruments for Sonic Expression

Est.2009

INTRODUCING

ADDAC120s FOUR STRINGS SERIES

USER'S GUIDE . REV01

June.2026

ADDAC System

From Portugal with Love!

Welcome to:
ADDAC120s FOUR STRINGS SERIES USER'S GUIDE

Revision.01 June.2026

WELCOME

We're excited to introduce this new set of modules, designed as an open canvas that inspires users to explore and engage with physical strings from various perspectives, promoting creative experimentation.

The concept originated from the desire to incorporate physical strings into Eurorack, similar to a lap steel guitar or dulcimer that can be seamlessly integrated into any Eurorack frame. This design won't have a fretboard, allowing for the installation and use of other modules beneath the strings, albeit with some limitations.

We started by delveloping the headstock and bridge, raising the strings enough so that there is enough clearing underneath to host other modules, then we developed the humbucker module to be able to capture the strings sounds just like any electric guitar. The limitations of standard humbuckers lead us to develop our own pickup using a quadraphonic configuration where there's one pickup for every string allowing independent string volume control.
We then moved into exploring mechanical automation developing a plectrum module that can pluck each string independently. While developing this we also made a Mute module that can dampen the strings natural vibration similar to how a Fender mute or a palm mute works on a guitar but allowing mechanical automation.
We then moved on into exploring string exciters developing the rotary exciter which generates a rotating magnetical field that will excite strings that are in the same frequency of the motor rotation speed.
Lastly the Ebow slider create a harness and sliding mechanism to use an Ebow to excite any string.

In the process we also designed a couple other usefull attachments:
A headstock arch attaches to the headstock raising the 2 middle strings allowing the use of a bow to reach all strings individually.
Small plastic resonators atach to the strings creating new harmonics that closely resembles complex bell type tones.

We also created a new 122HP frame to accommodate all these modules, allowing the entire system to operate independently. The inclusion of a dedicated power supply within this frame helps prevent contamination from any residual noise that may be generated by the motors.

The system can also be implemented in a DIY build project creating your own alternative to a frame.

MODULES BRIEF INTRODUCTION

ADDAC120 HEADSTOCK & BRIDGE

This is the base of our String modules, a Headstock & Bridge modules, allowing string gauges up to 0.055.
Users can also make these holes larger to fit heavier strings.
Both panels are 2mm stainless steel for strength.
The headstock features 4 locking tuners for easier string installation.

ADDAC121 HUMBUCKER

This is our simple Humbucker pickup module.
It features Tone and Volume controls as well as a LOW/HIGH gain switch for saturation.
An integrated pre-amplifier brings the volume up to synth level.
The height of the pickup can be adjusted using the mounting screws.
The pickup can also be removed and used by hand.

ADDAC122 QUADRAPHONIC PICKUP

This is our Quadraphonic pickup, four independent pickups each with their own pre-amplifier, independent Volume control and output jack.
A Mono Mix output (post volumes) is also available.
All outputs are synth level.
The height of the pickup can be adjusted using the mounting screws.

ADDAC124 PLECTRUMS

This is our Plectrum module, featuring a servo per string allowing to pluck each string independently either from their dedicated push-buttons, incoming triggers or via MIDI.

ADDAC125 STRINGS MUTE

This module is inspired by Fender's Mute system found in some Jaguar and Bass VI guitars where a piece of foam can be engaged to press against the string dampening their natural vibration.
For this module we use a servo motor that raises and lowers a piece of foam that when pressed against the strings lightly dampens their natural vibration.
While not as effective as a standard palm mute it allows a different tone to be automated.

MODULES BRIEF INTRODUCTION

ADDAC126 ROTARY EXCITER

This module features a 7000 RPM brushless motor that rotates a surface with 4 magnets with opposed magnetic poles inducing a rotating magnetic field that will force the strings to vibrate whenever the rotational speed matches the frequency or harmonics of any of the strings tuning.

ADDAC127 EBOW SLIDER

This module creates a harness and a sliding mechanism for a standard ebow. It allows the user to slide the ebow back and fourth below the strings. The ebow used features the "PianoBow" modification (https://ebow.com/diy-mods) where we sand off the Ebow's feet so that it can get closer and avoid touching the strings when sliding it back and fourth. The height of the ebow can be raised or lowered using the four thumb screws.

STRING SYSTEMS

Here's 3 selected systems sold as packs.
Standalone systems ship pre-assembled.

STRINGS BASIC SYSTEM (without frame)

STRINGS HUMBUCKER SYSTEM (with either 122HP or 197HP frame)

STRINGS QUADRAPHONIC SYSTEM (with either 122HP or 197HP frame)

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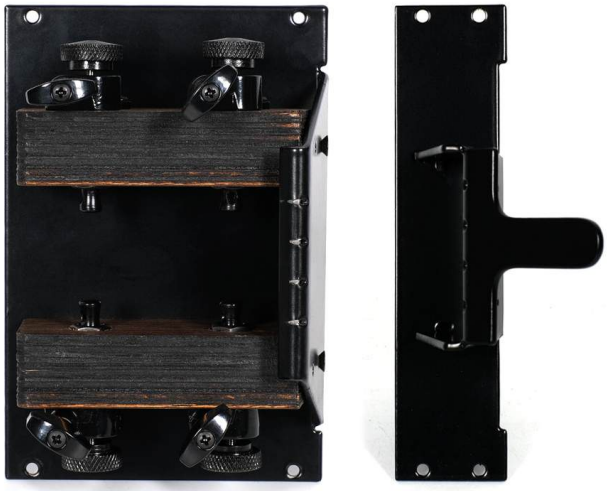
WELCOME

This is the base of our String modules, a Headstock & Bridge modules, allowing string gauges up to .055.
Strings are installed just like any guitar, users are free to choose whichever strings to install and what tuning to use.
The headstock features 4 locking tuners for easier string installation.
Users can also make the string holes larger to fit heavier strings.

Both panels are 2mm stainless steel for strength.



Extra Parts Provided

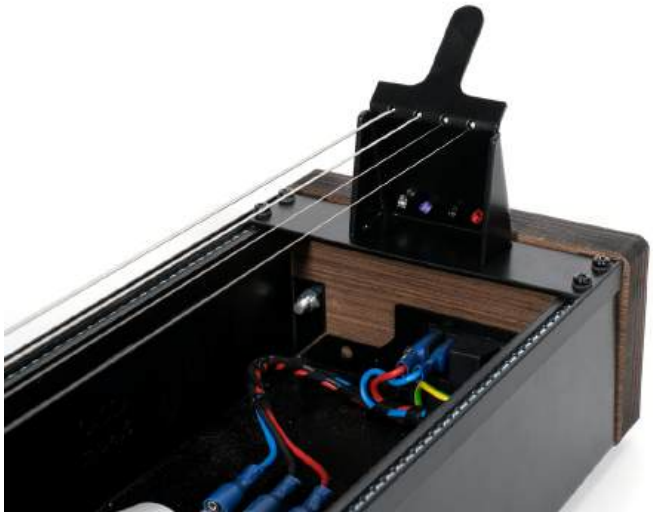
String set .010 to .046

Bow Arch attachment

Small resonators

HEADSTOCK
17HP

BRIDGE
6HP

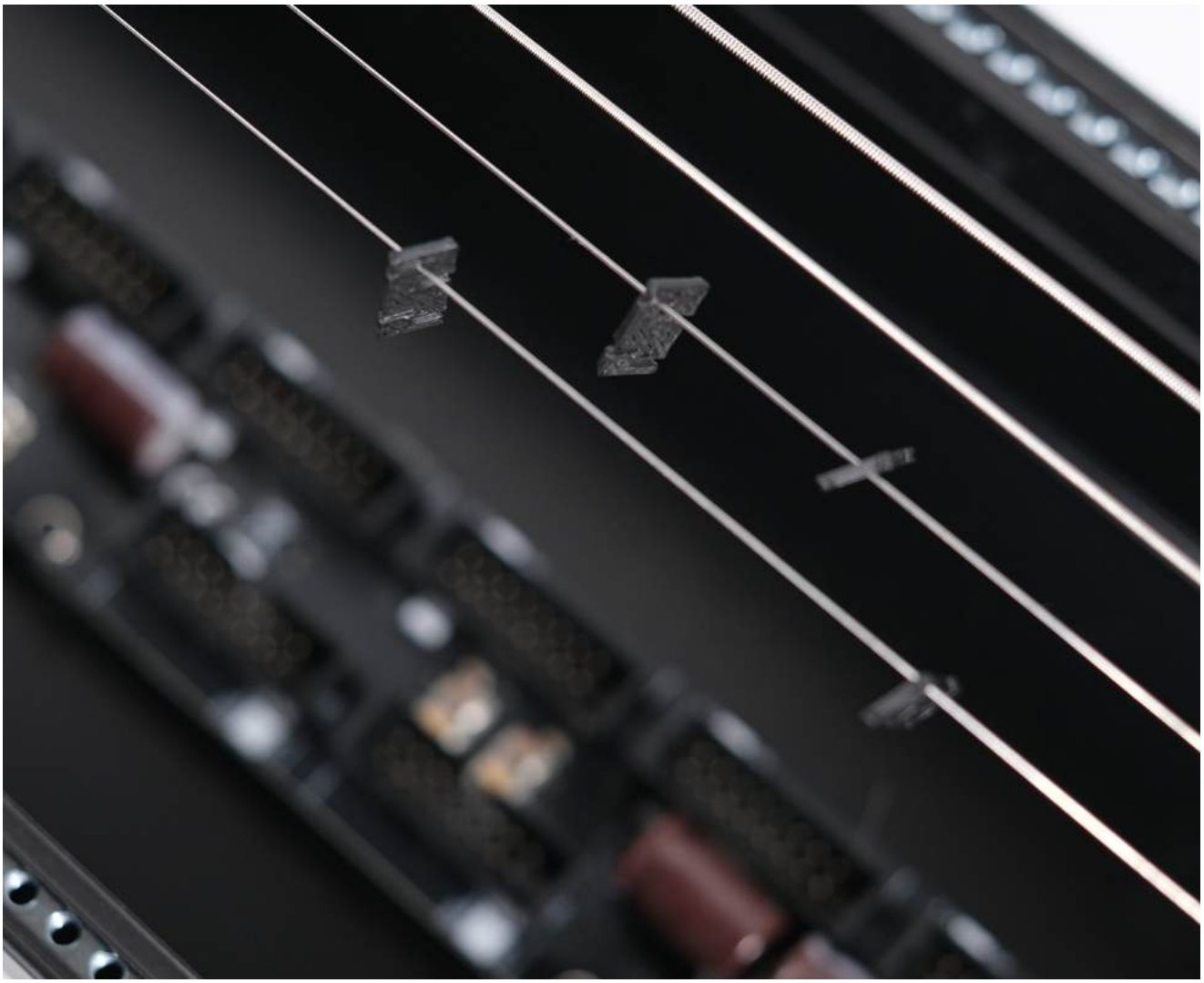


BOW ARCH ATTACHMENT

This attachment raises the two middle strings allowing a bow to reach each string individually.

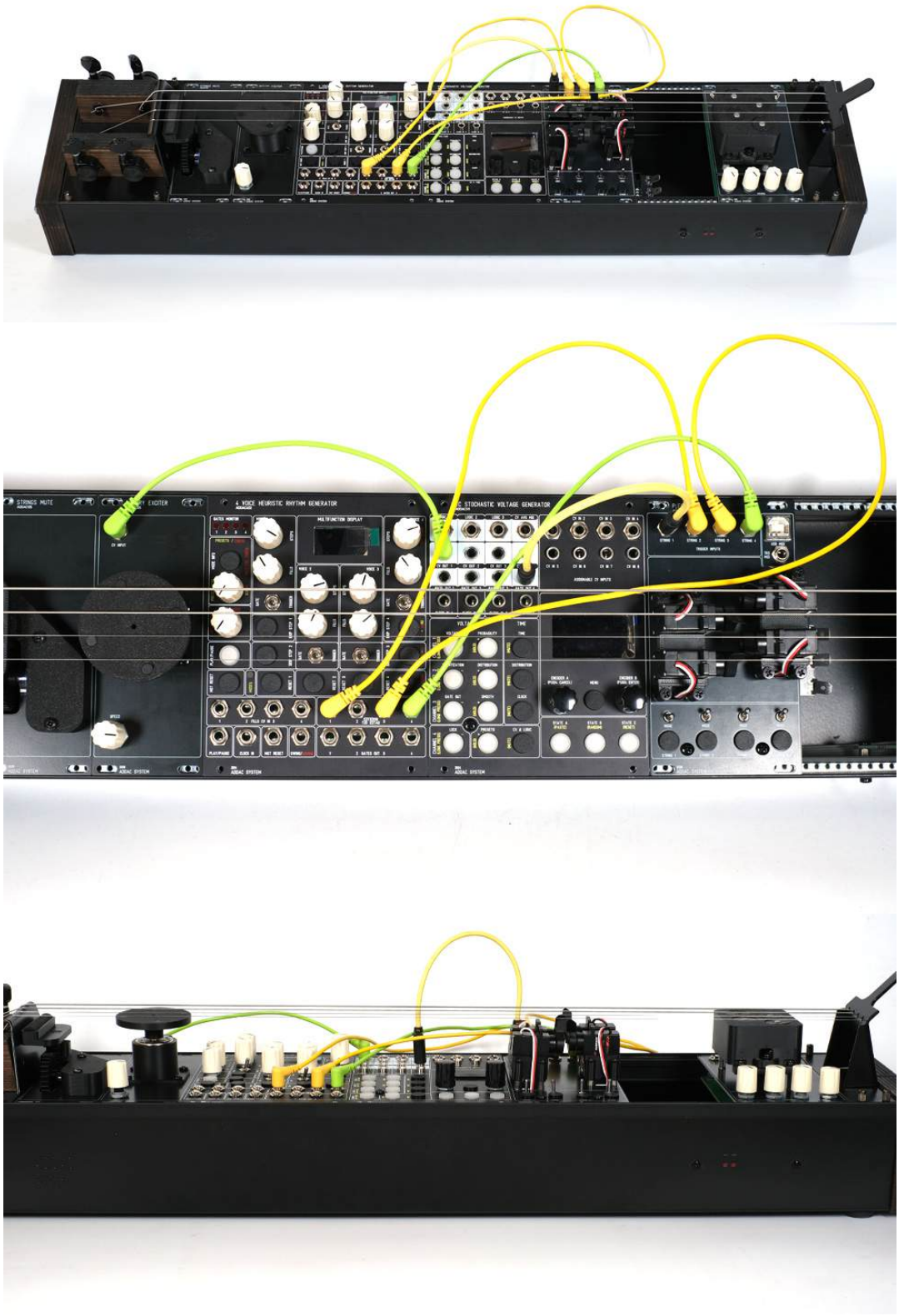
SMALL RESONATORS

Although quite simple these are extremely efective adding harmonics to non-wounded strings. For every resonator attached to the string a new partial is added, placing more pieces adds more partials which makes the tone increasingly complex.
The tuning of each harmonic is defined by the position of the resonator on the string.
The resulting sound can be quite surprising as very much resembles a bell type sound.



UNDER STRINGS CLEARENCE

When designing the system, we set the string height at a level that maintains sufficient clearance for accommodating standard modules beneath it.



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HUMBUCKER

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June.2026

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10HP
30mA on +12V
30mA on -12V

WELCOME

This is our simple Humbucker pickup module.
It features Tone and Volume controls as well as a LOW/HIGH gain switch for saturation.

An integrated pre-amplifier brings the volume up to synth level.

The height of the pickup can be adjusted using the mounting screws.
The pickup can also be removed and used by hand.

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ADDAC122 QUADRAPHONIC PICKUP

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June.2026

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14HP
80mA on +12V
60mA on -12V

WELCOME

This is our Quadraphonic pickup which allows each string to be independently captured. While not common Hexaphonic guitar pickups were developed in the 80's to allow guitar synthesizers to pickup each string independently allowing for more precise detection instead of decoding all strings from a mono output.

One can look at it like four independent pickups each with their own pre-amplifier, independent Volume control and output jack.
A Mono Mix output (post volumes) is also available.
All outputs are synth level.

All coils are hand winded by us, they're stacked humbuckers with Alnico 5 slugs,
Each is winded to 20.000 turns using 44AWG polyurethane wire measuring aprox. 7.4k Ohms.

The height of the pickup can be adjusted using the mounting screws.

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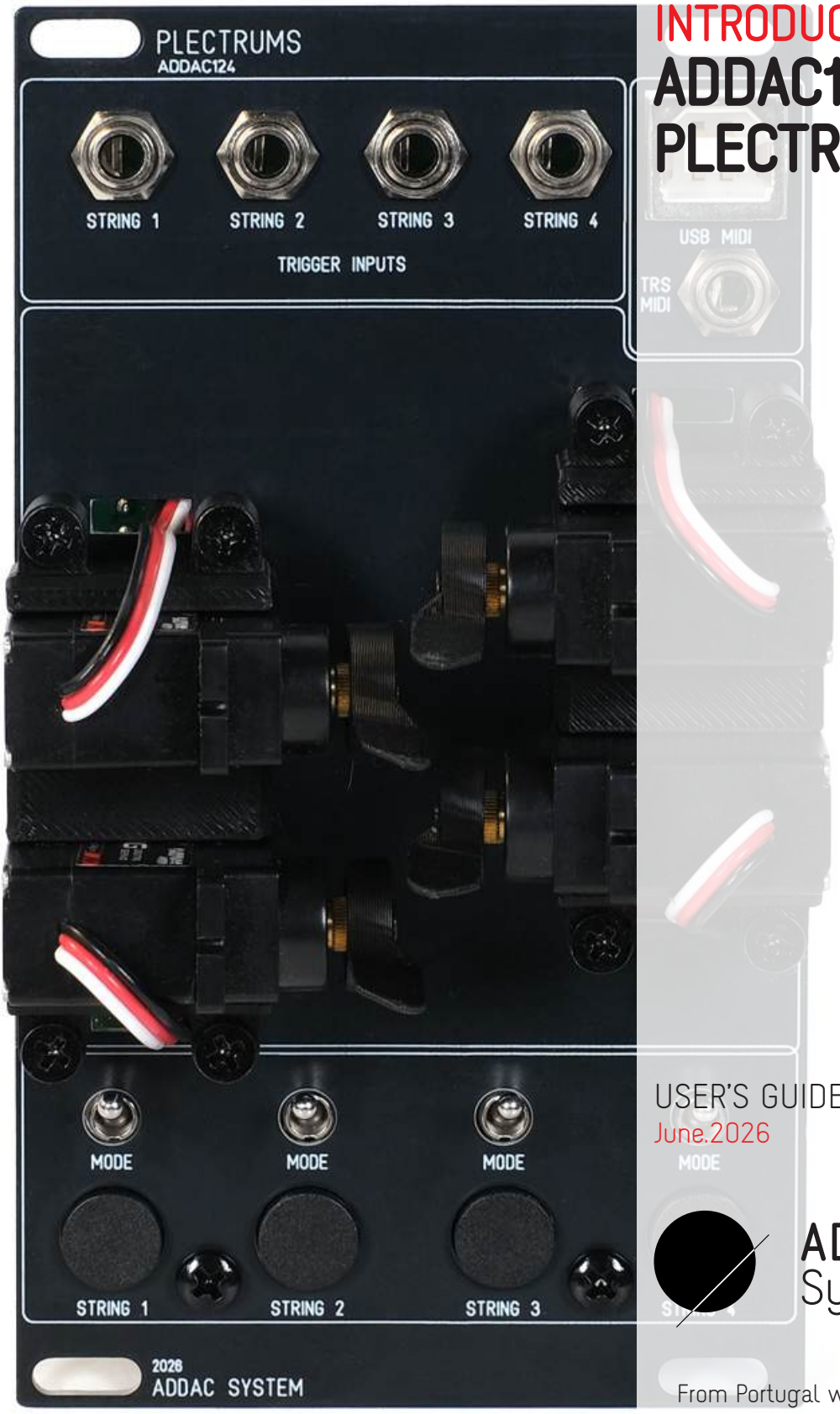

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ADDAC124 PLECTRUMS

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June.2026

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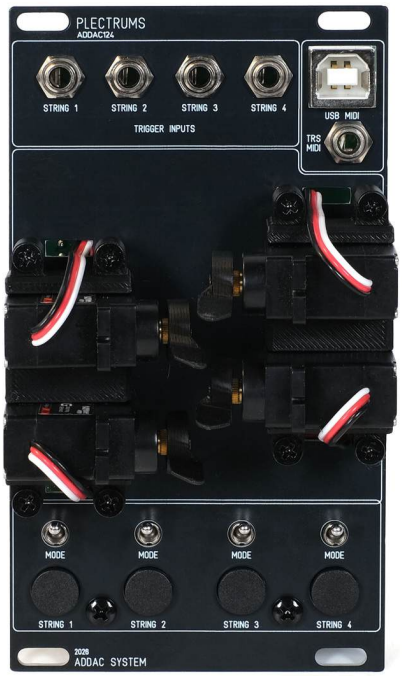
14HP
idle: 120mA on +12V
extreme use: 920mA on +12V
20mA on -12V

WELCOME



This is our Plectrum module, featuring a servo per string allowing to pluck each string independently either from their dedicated push-buttons, incoming triggers or via MIDI.

In Pluck mode the servo will move about 20 degrees efectivelly plucking the string.

In Harmonic Mode the servo only moves about 10 degrees stopping at vertical position to lightly tap the string so that harmonics can be heard. For this to happen the user needs to place the module in specific locations, for ex. at half the string length, at 2/3 the string length or 3/4 of the string length.

For effective use up to 3 modules can be daisy chained, one plucking the strings and 2 others to engage different harmonics.

To change between modes 4 switches features 3 states:
UP: disables triggers and MIDI inputs while still allowing push buttons to trigger the PLECTRUM.
MIDDLE: Pluck mode, all inputs are active.
DOWN: Harmonic mode, all inputs are active.

Plectrum Height Calibration
The user can ajdjust the height of the plectrums with the screws.
For Pluck mode they need to be quite low, for Harmonic mode they need to be raised about 4mm.

Plectrum Calibration
Pressing any push button for longer than 2 seconds will enter calibration state, the plectrum will start going back and fourth automatically then at every tap of the push button it will offset it's action by 2 degrees, once the desired position is reached holding the button down for 2 seconds saves the current position and exits the calibration state.

12 extra spare plectrums are provided.
(.stl 3D printing files available per request)

The current consumption of this module is somewhat different for standard modules, the idle consumption is about 120mA on the +12V, when a servo moves the current can go momentarily up by 200mA, if all servos move at the same time there will be a momentary peak of about 920mA.

ADDAC124 MIDI IMPLEMENTATION

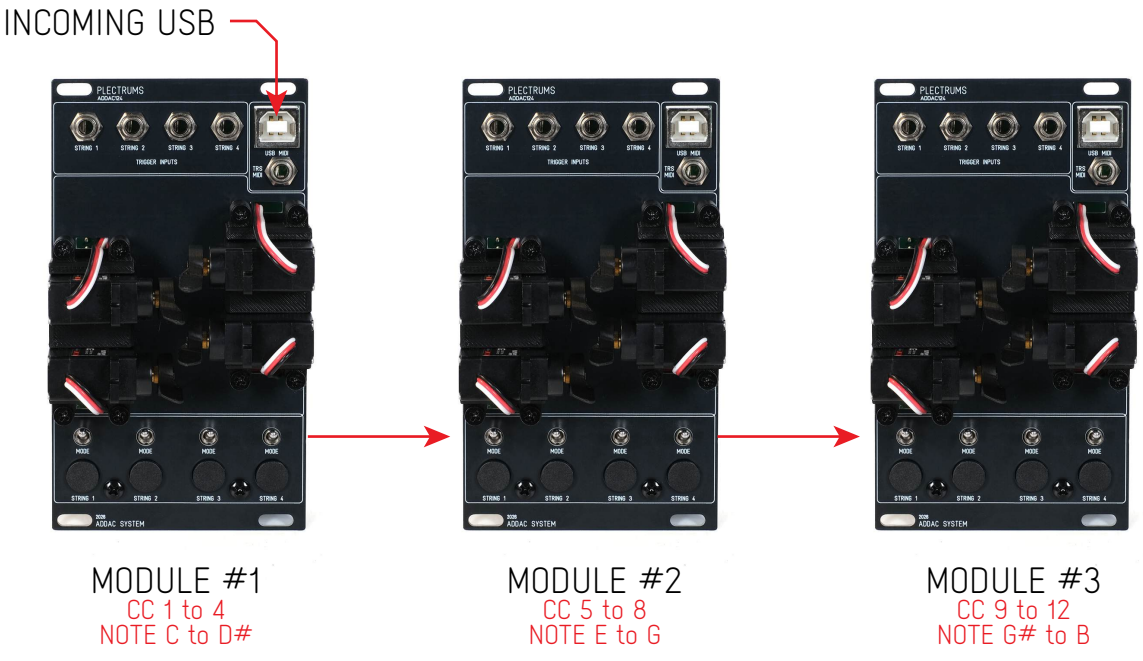
MIDI TO PLECTRUMS

When connected to MIDI device the module can receive either a NOTE or a CC message to trigger the desired plectrum.
Daisy chaining up to 3 modules is possible using a single midi to trigger all modules.
Modules are connected via pinheaders on the back with the provided cable.

All MIDI channels are active.
CC messages are active from CC1 to CC12.
MIDI notes are all active, any same note on any octave triggers the same plectrum.

MIDI IMPLEMENTATION

		MIDI CC	MIDI NOTE (on any octave)
MODULE #1 1st in Chain	SERVO 1	1	C
	SERVO 2	2	C#
	SERVO 3	3	D
	SERVO 4	4	D#
MODULE #2 2nd in Chain	SERVO 1	5	E
	SERVO 2	6	F
	SERVO 3	7	F#
	SERVO 4	8	G
MODULE #3 3rd in Chain	SERVO 1	9	G#
	SERVO 2	10	A
	SERVO 3	11	A#
	SERVO 4	12	B



MODULE #1
CC 1 to 4
NOTE C to D#

MODULE #2
CC 5 to 8
NOTE E to G

MODULE #3
CC 9 to 12
NOTE G# to B

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ADDAC125 STRINGS MUTE

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10HP
100mA on +12V

WELCOME

This module is inspired by Fender's Mute system found in some Jaguar and Bass VI guitars where a piece of foam can be engaged to press against the string dampening their natural vibration. while not as intense as a standard palm mute and achieving a diferent tone.
For this module we use a servo motor that raises and lowers a piece of foam that when pressed against the strings lightly dampens their natural vibration.
While not as effective as a standard palm mute it allows a different tone to be automated.

To be the most effective this module needs to be connected as close to the headstock as possible.

This is a passive module, to use it one needs to connect its servo to an ADDAC124 Plectrums.
This module can either replace one of the plectrums servos, disconnecting it to connect this module or connected in parallel with one of the plectrums servos using the provided splitter cable operating both the plectrum and mute at the same time. The Mute is always controlled by the ADDAC124.
The foam part height can be adjusted.

ADDAC125 MUTE ACTION

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June.2026

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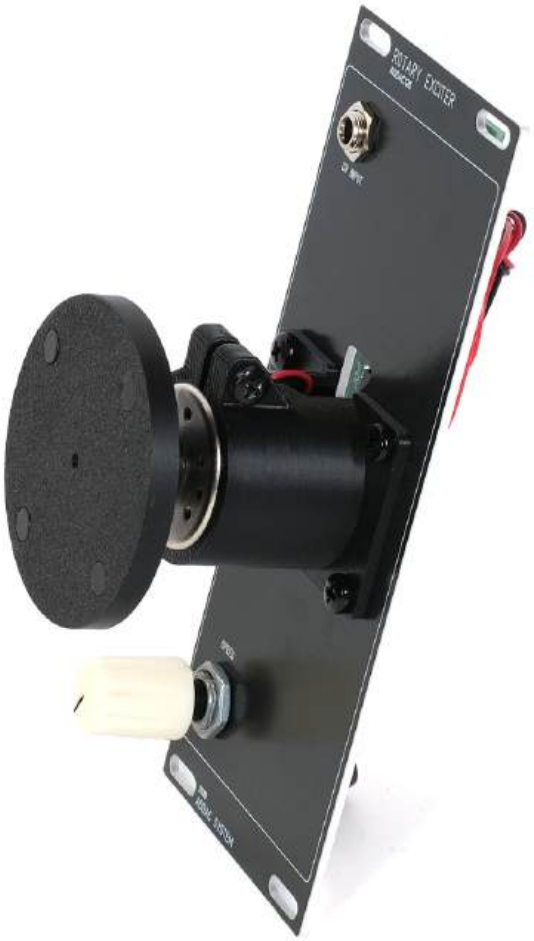
Revision.01 June.2026

10HP
100mA on +12V

WELCOME

This module features a 7000 RPM brushless motor that rotates a surface with 4 magnets with opposed magnetic poles inducing a rotating magnetic field that will force the strings to vibrate whenever the rotational speed matches the frequency or harmonics of any of the strings tuning.

A [SPEED] knob and CV input allows non-linear control of the motor speed.



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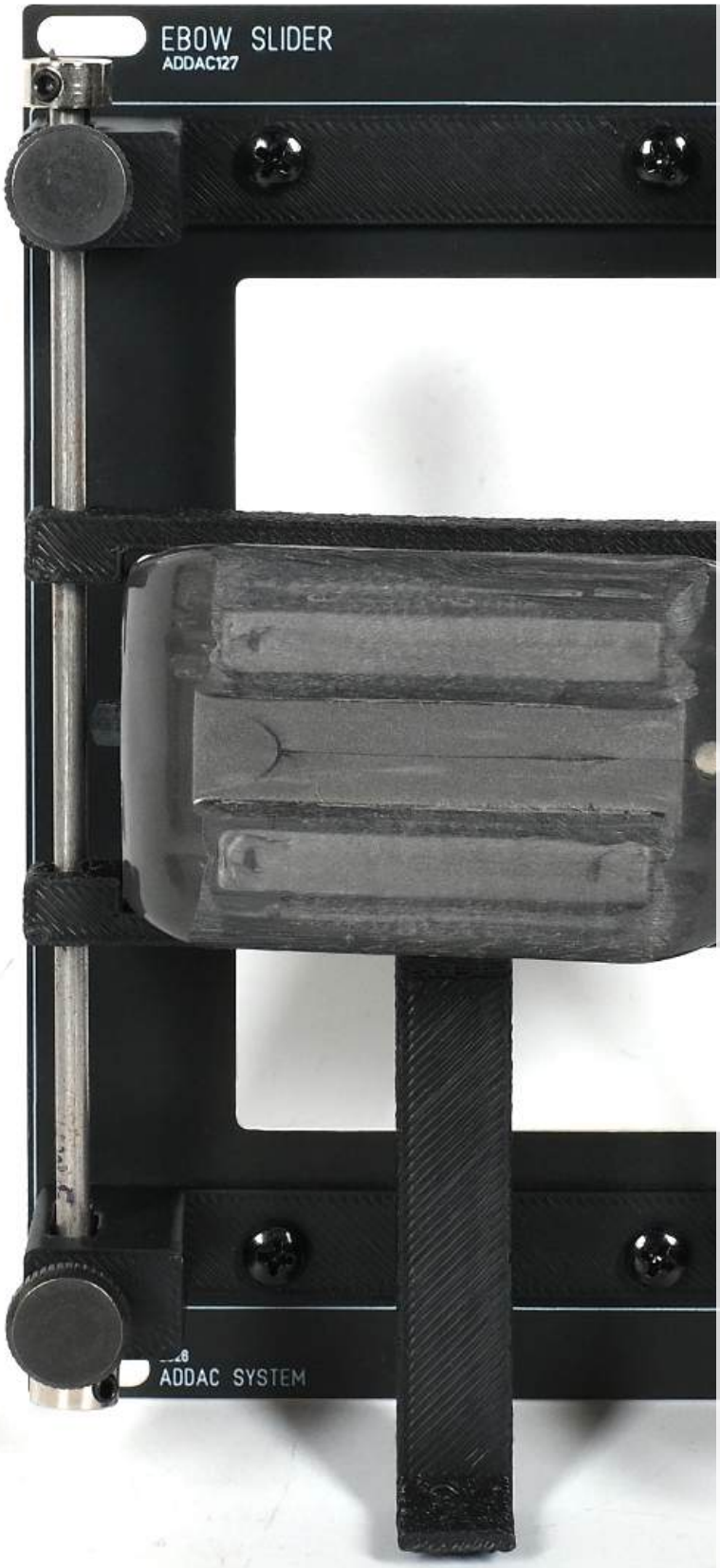

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16HP
Passive module

WELCOME

This module creates a harness and a sliding mechanism for a standard ebow. It allows the user to slide the ebow back and fourth below the strings. The ebow used features the "PianoBow" modification (https://ebow.com/diy-mods) where we sand off the Ebow's feet so that it can get closer and avoid touching the strings when sliding it back and fourth.

The height of the ebow can be raised or lowered using the four thumb screws.

Provided with the Ebow which can be removed and used elsewhere however without its feet, it won't be as easy to use on guitar as a non-modified Ebow.

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ADDAC120F STRINGS FRAME

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June.2026

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Revision.01 June.2026

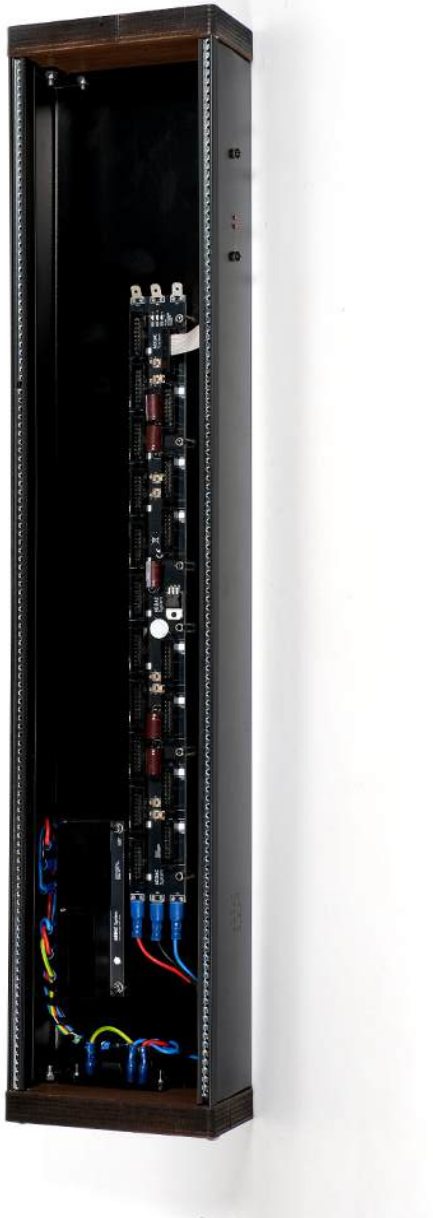
WELCOME

We made this frame specifically for our ADDAC12X String modules.
Width: 122HP

Power Specifications:
- AC Input: 90v to 240v
- Output: ±12V
- Current: 1.5A on the +12V, 1.5A on the -12V
- Busboards with 19 connectors
- Our busboards already provide +5V (Draws from +12V, 500mA max. per busboard)

PSU festures shutdown protection for:
Over Current - when maximum current is exceeded (for when a module ribbon cable is reversed)
Over Heating - if the AC Brick is over heating
Over Voltage - if the voltage changes above or below the expected output

If one of these issues happens then the PSU will enter an intermittent ON/OFF state until the issue is corrected.
These safety protections will prevent damage to your PSU and consequentially to the modules as well.



For feedback, comments or problems please contact us at:
addac@addacsystem.com

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Revision.01 June.2026