MANIKK ADSR

Advanced Envelope Generator - Eurorack Module

Users Guide

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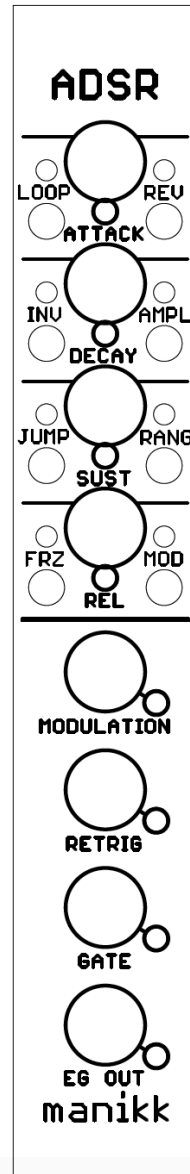# Table of Contents

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REL

MODULATION

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GATE

EG OUT

manikk

Welcome

Congratulations to your purchase of this module.

The manikk ADSR is an advanced envelope generator, capable of producing normal ADSR-envelopes but also a number of experimental envelopes. In loop-mode, it can also be used as LFO.

It is a linear envelope generator with modulation capability.

The module can also be used as a gate delay by using the "Jump"-parameter.

As usual, you need to install it properly inside a case made for Eurorack synthesizer module systems.

The module can be expanded with a manikk Otto Active Expander. The expander gives eight additional digital outputs for different states of the module.

All parameters can also be controlled by MIDI-CC with an optional midi-break-out board.

Happy tweaking!

Overview

Manikk ADSR is a linear envelope generator.

You can use it to create normal linear ADSR-style envelopes, but you can also use the parameters and modulation capabilities to create other type of envelopes.

In loop-mode the module can be used as LFO. By using the jump-parameter, the module can be used as a gate delay.

Main features:

- Linear behavior

- Loop – after a completed envelope it starts over again and again…

- Invert – the envelope is inverted and moves from max to zero and back to max again.

- Jump – no gliding between the phases, it just waits and jumps to the target level.

- Freeze – freeze the time and hold the current envelope output level.

- Reverse – run backwards: R-S-D-A.

- Amplitude – lower or modulate the amplitude.

- Time-range – extend or modulate the A, D, R-times.

- Modulation – the modulation jack can modulate most of the parameters.

- Retrig input jack – retrig an ongoing envelope.

- Gate/trig input jack – start the envelope.

- EG output jack – the resulting output curve $(0 – 8,2V)$.

Almost all of the parameters can be modulated by the modulation input jack.

Some basic behaviors can be configured by a number of config-parameters.

User interface and navigation

Feature-buttons

All buttons except for MOD controls different features directly.

When you make a short press on those buttons, you turn that feature on or off.

A red led indicates if the feature is on.

MOD-button

The MOD-button is special.

MOD-mode

If you make a short press, the module will go into MOD-mode. In MOD-mode the MOD and the MODULATION jack leds are lit. The 7 feature leds now indicates if that feature is affected by the modulation jack or not.

To return to run-mode from MOD-mode, you just make a short press again on the MOD-button. The MOD led will turn off.

Config-mode

If you long-press (hold the MOD-button for a longer time), the module will go to config-mode. Config-mode is indicated by a blinking MOD-led. An additional led will also blink that indicates which config-parameter you are editing.

If you make a short press on the MOD-button when you are in config-mode, you will cycle to the next config-parameter.

If you want to change the config-parameter, you use the Loop-button to cycle the values for that config-parameter.

To leave config-mode and return to run-mode, you need to make a long-press again on the MOD-button. The blinking leds will turn off and the MOD-led will also turn off.

See the chapter "Config-parameters" for more information about each parameter and their values.

LED's

The module can be in three different modes described here:

Normal run mode
The leds indicates the status of the 7 features. Use the buttons to turn on or off.

MOD-led is turned off.

Modulation led shows if the modulation input signal peaks. The modulation range is -5V to +5V.

Retrig and Gate leds indicates if these jacks have logic high input signals.

EG out led indicates if there is an envelope ongoing.

The leds under the A,D,S,R potentiometers indicates which phase the envelope currently is in.

MOD mode
The MOD-led is lit.

The 7 feature leds shows if that feature is controlled by the modulation input jack. Use the buttons to turn modulation on or off for the features. Long press on the 4 left buttons toggles the A, D, S, R features on/off. In total the modulation input jack can control 11 parameters.

Config mode
The MOD led is blinking.

Additional leds will also blink to indicate which config-parameter you are editing.

See the chapter "Config-parameters" for more information.

Parameters on the front-panel

LOOP

Puts the envelope generator in looping mode. As long as the gate is high, it will create a looping ADSR curve. In loop-mode the module acts like a LFO.

There is a config-parameter that where you can select the sustain-mode. The sustain-mode controls how the sustain state should behave. Normal sustain or the same fixed time as the A, D or R phases. For more information see the config-parameters chapter.

Modulating this parameter turns the feature on or off.

INV

Inverts the envelope.

Normally the envelope starts from zero and reaches its maximum at the end of the Attack phase, then reaches the sustain level within the Decay time. When the gate is released the output goes from sustain level back to zero.

When it is inverted, it starts at the maximum level and goes to zero and then back to max again.

Modulating this parameter turns the feature on or off.

JUMP

When jump is turned on, the curve will not glide to the next level. It will instead jump and therefore make square-wave-like outputs. This can also be used as gate delay.

Modulating this parameter turns the feature on or off.

FRZ

When you activate the freeze, the current level of the output curve will freeze and hold at that current level. It will stay at that level as long as the freeze is turned on. When freeze is turned off again, the curve will continue from that level. You can think of this as if you "stop the time".

Modulating this parameter turns the feature on or off.

REV

Reverse the order of the phases and run "backwards".

Normally the order of the phases is ADSR. When reversed, the order is RSDA.

In reverse mode, it starts with Release and goes to Sustain, stays at the sustain until the gate goes low, then it finishes with a Decay and finally Attack back to zero.

Modulating this parameter turns the feature on or off.

AMPL

When you turn AMPL on, the amplitude of the output will be half the normal output level.

Modulating this parameter increases or decreases the value for this parameter.

RANG

This feature slows down the envelope. All the time-settings (A, D, R) will be multiplied by a slowdown-factor.

Modulating this parameter increases or decreases the value for this parameter.

MOD

MOD-mode
Short press on the MOD-button goes from run-mode to MOD-mode.

In MOD-mode you use the other 7 buttons to select which parameters you want to be controlled by the modulation input jack.

Long press on the 4 left buttons toggles the A, D, S, R-modulations on or off.

Short-press again on the MOD-button exits MOD-mode and returns to run-mode.

Config-mode
Long press on the MOD-button goes from run-mode to config-mode.

In config-mode you use the MOD-button to cycle to the next config parameter and you use the LOOP-button to cycle the values for the currently selected config-parameter.

The value for the currently selected config-parameter is indicated by the four A, D, S, R-leds. You can think of this as values 1, 2, 3 or 4.

The MOD-led is blinking and additional leds are also blinking to indicate which parameter you are editing.

Long press again on the MOD-button will exit config-mode and go back to run-mode.

See the chapter "Config-parameters" for more information.

Config parameters

See the chapter "User interface and navigation" how to enter config-mode.

Use short press on MOD-button to step to the next config-parameter.

Use short press on LOOP-button to change the value for the currently selected parameter.

The config parameters are cycled in the following order:

Alternative modulation style

MOD and MODULATION leds are blinking.

Press the 7 feature buttons to turn on or off the alternative modulation style for that feature. Long press on the 4 left buttons toggles the A, D, S, R features on /off.

On/off-parameters
The on/off-style features (like loop, inv etc) have these two modulation styles:

Off: Negative modulation turns OFF the feature, regardless of the manual state it has. Positive modulation turns ON the feature, regardless of the manual state is has.

On: Positive modulation "flips" the current manual state of the feature. If it is on and the modulation is zero, the feature will remain on. But if it is on and you give it a positive modulation, the feature will "flip" to its other state, that is off.

Value-parameters
The features where you can select a value within a range (A, D, S, R, Ampl, Range) have these two modulation styles:

Off: Positive modulation will add to the current selected value. Negative modulation will subtract from the current selected value.

On: The modulation is inverted. Positive modulation will subtract from the current selected value. Negative modulation will add to the current selected value.

Retrig-type

How the retrig should behave:

1) Retrig always restarts from zero with full Attack-time (or Release-time when reversed).

2) Retrig restarts from the current level (usually not zero) with full Attack-time (or Release-time when reversed).

3) Retrig restarts from the current level and with a calculated shortened time that depends on the current level. This mode emulates an analog-like feeling.

Gate-type

The gate has three types:

1) Normal gate.

2) Trig instead of gate. Only the transition from low to high is used to trigger the envelope.

3) "Stuck gate". Best used together with loop-mode to make a LFO. You don´t need any gate or trig signal.

Sustain-mode

In loop-mode the sustain-phase is very short, almost zero seconds. You can extend the time of the sustain in loop-mode with this config-parameter:

1) Use Attack-time also for the sustain.

2) Use Decay-time also for the sustain.

3) Normal sustain (zero time in the loop).

4) Use Release-time also for the sustain.

Amplitude-mode

Here you can attenuate the output level in 4 steps:

1) Full amplitude, 0 – 8.2V

2) Divided by 2

3) Divided by 4

4) Divided by 8

Range-mode

The time-range of the module can be adjusted in 4 steps:

1) Normal range, each time-potentiometer has a max of about 2 seconds.

2) Times multiplied by 2

3) Times multiplied by 4

4) Times multiplied by 8

MIDI-mode

MOD and all four jack-leds are blinking.

If you want to use MIDI, you need an external MIDI-expansion board which has an optocoupler onboard and generates normal TTL level signals (0V/+5V) for the RX input on this module. Have a look at our website if this optional add-on board is available.

Serial parameters: 8 data bits, 1 stop bit, no parity, no flow control.

Here you make the selection of the serial receive (rx) speed:

1 – MIDI off
MIDI is turned off and not used.

2 – 31.250 (MIDI)
Normal MIDI serial speed. Use this with the midi-expansion board and other standard-MIDI-transmitters.

3 – 115.200
Serial speed 115.200 baud. Use this when connected via the USB connector on the microcontroller on the backside, or when connected to a serial device on a computer.

4 – 230.400
Experimental. Serial speed 230.400 baud. See description for 115.200 above.

Learn-mode

When you have selected the correct baud-rate and have hooked up a midi-keyboard that sends MIDI to this module, you can press a key on the MIDI-keyboard. The module will then detect the MIDI channel, store that and then leave config-mode and go back to run-mode.

Factory reset

MOD and ALL leds are blinking.

Press the LOOP-button to make a factory reset.

Connections

Power connector

Located at the bottom on the backside.

Here you connect the normal Eurorack power connector (included).

Two rows with: +12V, GND, GND, GND, -12V.

Make sure you orientate the connector the correct way. The negative -12V is marked on the pcb with the text "red strip".

Normally the flat cables have a red stripe that marks the negative -12V.

Modulation input jack

Modulation input takes a voltage between -5V to +5V. When the signal is near these limits, the peak-led will turn on.

If you have the expander board, there is an output jack (number 5) on the expander that goes high during peaks.

Retrig input jack

Retrig input is activated with a logic high. High=+5V, Low=0V.

The retrig behavior can be selected with the "retrig config parameter".

Gate input jack

Gate input is activated with a logic high. High=+5V, Low=0V.

The gate behavior can be selected with the "gate config parameter".

EG output jack

The EG output is a curve with a range from 0V to 8.2V.

The maximum can be changed and modulated by a number of parameters.

Otto Active Expander pins

There is an optional ACTIVE expander that can be ordered separately (not included).

The expander gives 8 additional digital outputs.

Pins on the back of the ADSR module

These 6 pins are located on the lower right side of the ADSR backside. Between the power connector and the microprocessor board.

Pin (top to bottom)	Function
1	GND (top pin, near the microprocessor board)
2	+5V
3	MOSI
4	CC, NOT USED, No need to connect this.
5	SS
6	SCK (bottom pin, near the power connector)

These 5 pins (1 GND, 2 +5V, 3 MOSI, 5 SS, 6 SCK) should be connected to the active expander pins with the same names. Female to female dupont cables are recommended.
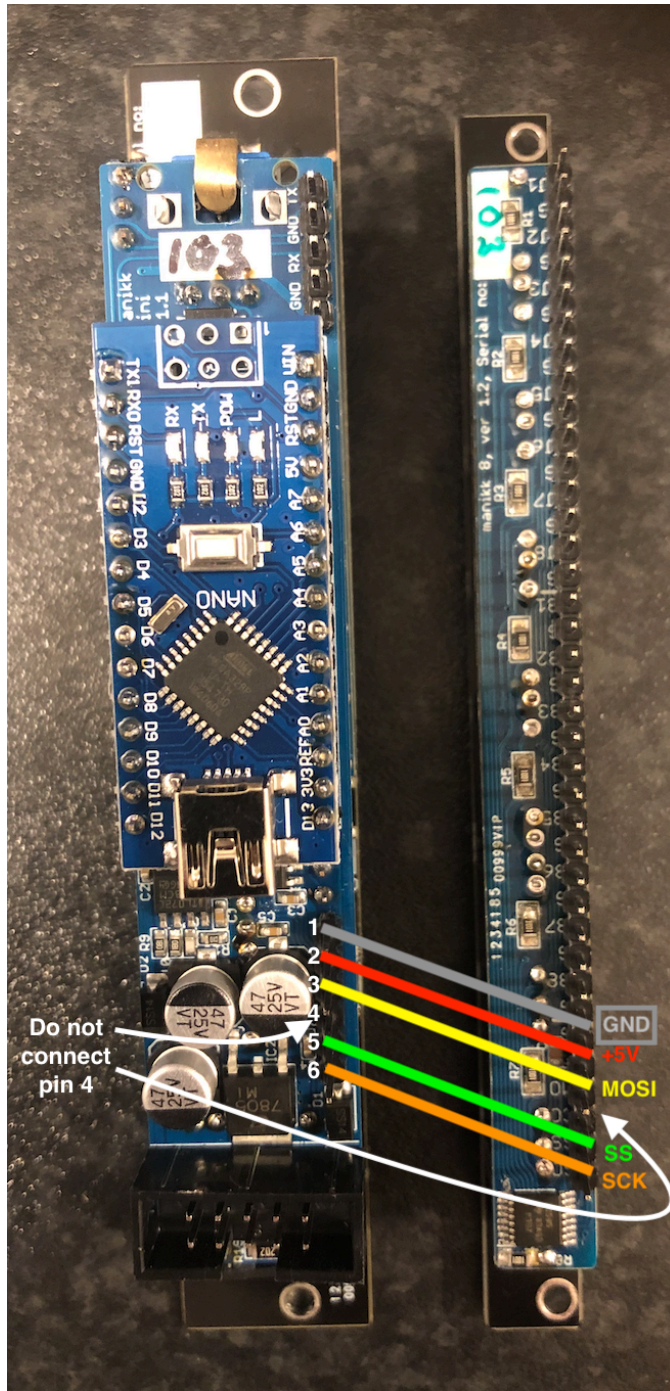
How to connect an active expander to the ADSR module.

Active Expander output jacks

High=+5V, Low=0V

Jack (top to bottom)	Function
1	High in Attack phase
2	High in Decay phase
3	High in Sustain phase
4	High in Release phase
5	High when modulation input peaks -5V or +5V
6	High when in freeze mode
7	High when idle (no ongoing envelope)
8	High during an ongoing envelope

MIDI pins

5 pins located at the top right on the ADSR backside.

This module communicates by serial communication. It can only receive information. There is no led that indicates when the module receives data. See also the midi-config-parameter where you select the serial baud rate.

The serial signal voltage levels on the RX input pin must be 0 or +5V.

Pin (top to bottom)	Function
1	TX (top pin on the backside)
2	GND
3	RX
4	GND

5	+5V (bottom pin, near the top of the microprocessor board)

There are different options to enable MIDI-functionality:

manikk MIDI-dongle
This is a separate little board that you attach directly on the RX-TX header pins on the backside. The little board has pins for normal MIDI connectors In and Out. The ADSR can only receive data, so only MIDI in is working.

The midi dongle also has some TX-pins that can be used to relay the midi-data to multiple ADSR-modules (or other modules) from only one midi-dongle. The dongle is connected to the first ADSR (master), and the other ADSR modules (slaves) are connected with dupont-wires to the midi-dongle on the first master-module.

Have a look at our website if this optional add-on-board is available.

If you use this setup, you must set the RX parameter to: $1 = 31.250$ (MIDI).

USB on the back
This is a "experimental method" and is not the recommended setup.

The USB connector on the back of the Outbreak can be used to transfer the serial signals needed.

First you must install a serial driver on your computer, for the chip used on the microprocessor board. That chip is usually a CH341 chip, and you need to install the correct drivers for that chip. It can be found on many places on the internet.

Now you have some options how to communicate serially over USB with the module:

1) MIDI to Serial converter

In this case you need to install a "MIDI to Serial converter" on your computer. You will also need to create a "virtual MIDI device" on your computer that will be the MIDI device that you use in your DAW, that forwards the signals to the MIDI to Serial converter that in turn forwards the signals to the module. On a Mac there are built-in virtual MIDI drivers called IAC Drivers that you can use.

In the MIDI to serial converter software, you also need to select the correct serial interface as the serial output. The driver you installed for the CH341 chip.

There are a number of different MIDI to Serial converters that you can find on the internet. One of them is "Hairless MIDI <-> Serial Bridge" and it works for Mac, Windows and Linux. Do not forget to set the correct serial speed parameters. See the RX config parameter for more information.

2) Ableton Live - Max for Live

You can create a Max for Live MIDI Effect where you connect the output from a "midiin" object to the input of a "serial" object.

Settings for the serial object should be "serial a 115200 8 1 0", where "a" is the serial-port on your computer where the USB cable is connected. "a" is the first port, "b" is the second, "c" is the third and so on…

Put this Max MIDI effect at the end of the effects chain for a MIDI-channel, and the MIDI information will be routed out on that serial port that you have chosen.

There seems to be a limitation with this method, that it always will send on midi channel 1. Another limitation seems to be that Ableton don't send MIDI sync out with this method, but midi-sync is not used by this module.

Direct serial on the RX and GND pins

This is a "experimental method" and is not the recommended setup.

Maybe you have another serial solution that sends normal serial 5V? Then you can connect your computer or that device directly to the RX pin and the GND-pin.

See the serial settings in the USB description above.

PLEASE NOTE! No warranty if you break this module when connecting things here.

Other manikk module as "MIDI-master"

Future plans…

Some manikk modules may in the future have TX-pins onboard. This kind of modules can be used to relay MIDI-data to other modules like this one. One master-module can relay to multiple slaves.

Possible future modules: MIDI THRU module, USB Interface, OSC Interface…

Have a look at manikk.com to see if any of these modules exists.

MIDI Implementation

The module can receive and act upon a number of control change messages received on the base channel.

The base-channel is selected with the midi-learn function in the MIDI-mode config parameter (see config-parameters).

All CC's respond to a value 0-127 and will be scaled up or down depending on the parameter range.

Parameter changes by MIDI is not saved to the EEPROM.

Note on/off controls the GATE.

CC	Parameter	Description
7	Amplitude	0-127, scales down the output amplitude.
64	RETRIG	0-63=off, 64-127=on
66	FREEZE	0-63=off, 64-127=on
67	AMPL/2	0-63=off, 64-127=on
69	RANGE*4	0-63=off, 64-127=on
72	Release time	0-127
73	Attack time	0-127
75	Decay time	0-127
76	Sustain level	0-127
77	Range	0-63 squeezes the time, 64=center, 65-127 expands the time
80	Loop	0-63=off, 64-127=on
81	Invert	0-63=off, 64-127=on
82	Jump	0-63=off, 64-127=on
83	Reverse	0-63=off, 64-127=on

85	Cfg-Ampl	0-127, will be divided by 32 and sets 1 of the 4 possible settings for amplitude.
86	Cfg-Rang	0-127, will be divided by 32 and sets 1 of the 4 possible settings for range.
87	Cfg-Gate	0-127, will be divided by 32 and sets 1 of the 3 possible settings for gate-type.
88	Cfg-SusMode	0-127, will be divided by 32 and sets 1 of the 4 possible settings for sustin-mode.
89	Ampl Velocity	0-63=off, 64-127=on. Turns on or off velocity sensitivity. Note on velocity-data controls the EG out amplitude.

Technical details

Current consumption	+12V	-12V
Idle mode	35mA	9mA

More information

You can find more information on the website manikk.com:

- Latest version of this manual

- Max for live patches

- Other products, and more…

Warranty

This device has a one (1) year limited warranty starting from the first purchase date.

The warranty covers malfunctions in the device.

The warranty does not cover bad usage, external damage or other abnormal usage.

The device is designed to work in a Eurorack synthesizer system. Other uses are not covered by the warranty.

If you have to use this warranty you need to do the following:

1) Check that the date is still in the warranty-time of 1 year from the date of purchase.

2) Contact the seller where you purchased the device.

3) Send the malfunctioning device to the address given by the seller. You have to pay for this freight yourself. Very important that you attach your return-address to the device, so we know where to return the repaired device.

4) Manikk will repair or replace the device if the problem is covered by the warranty. We will send the repaired device back to you.