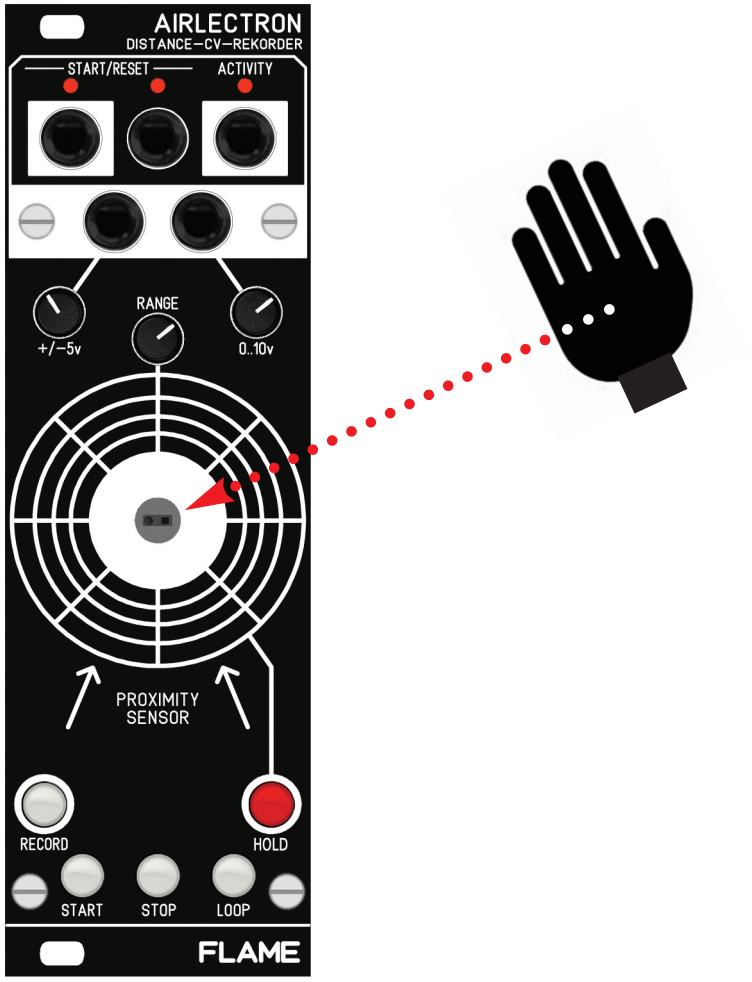
FLAME

AIRLECTRON



MANUAL

Version 1.04

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1. Short description

The AIRLECTRON is a small, compact CV module with a distance sensor and recording function. The module can record the CV generated by hand movement over the sensor up to a length of more than two minutes. The sequence remains stored in the battery-backed RAM even after switching off.

There is a HOLD function to hold the CV at the current position above the sensor. Additionally, a GATE is set when the sensor is triggered. A START/RESET input is used to reset/start recording/playback.

The voltage generated is available at two CV outputs, bipolar from approx. +/-5v and unipolar from approx. 0 to +10v. Both outputs have a passive attenuator so that the voltage range can be set lower. The RANGE control is used to set the distance range (up to approx. 40 cm) of the distance sensor. The sensor is independent of external light and provides a logarithmic voltage curve with 12-bit resolution.

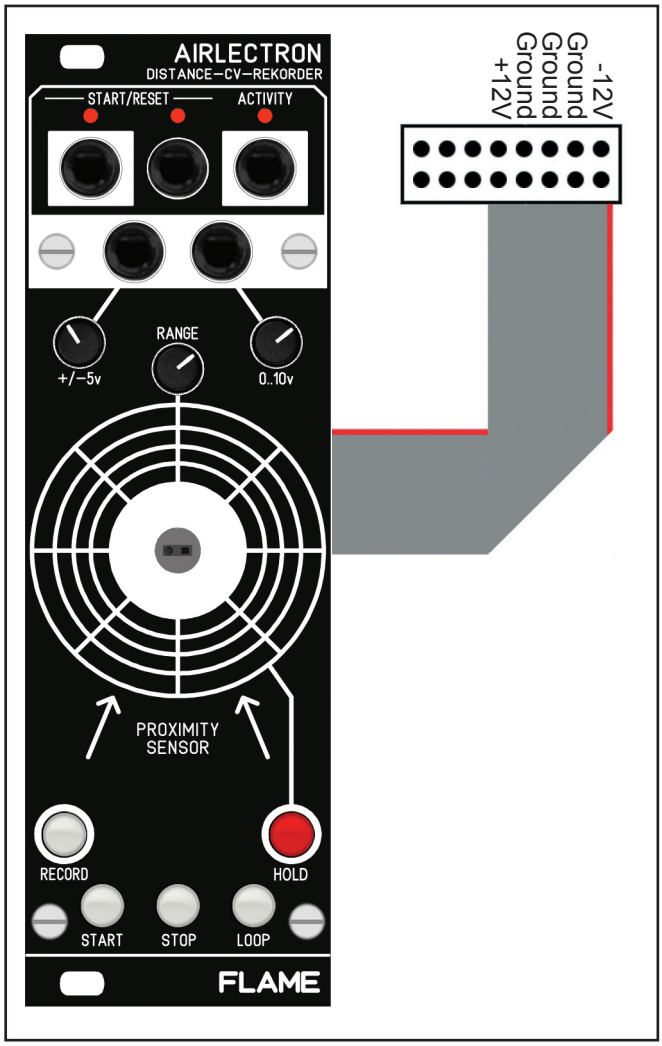
2. Hardware / Connections

2.1 Connection to the modular system (Doepfer bus)

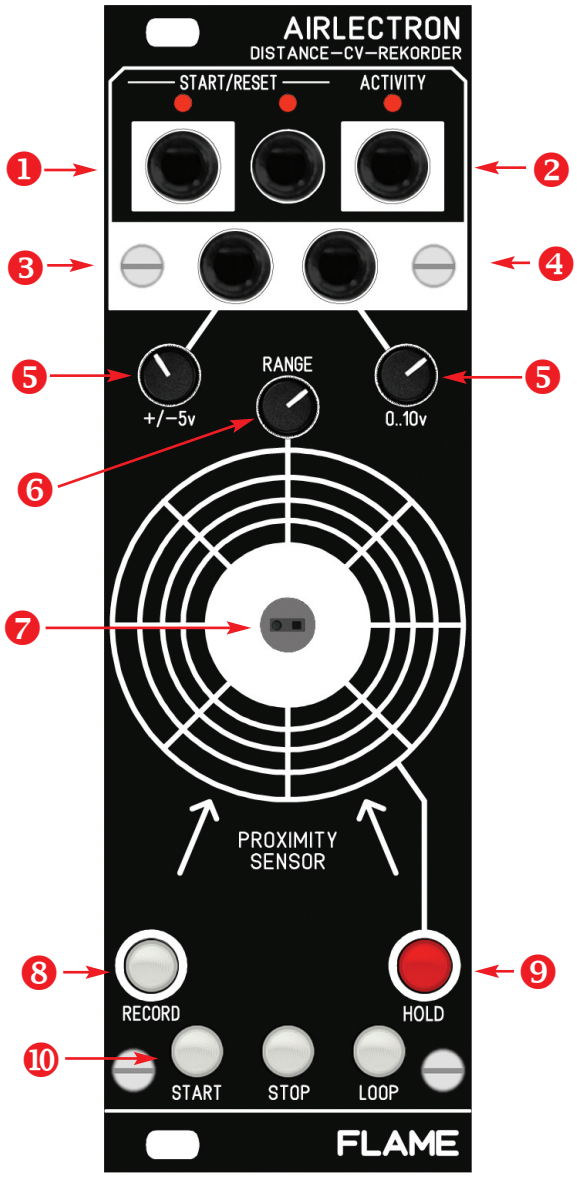
The module is delivered with a connected ribbon cable for the Doepfer bus. The red lead marks -12 volt.

Connecting the module please note the right polarity! If the module is poled accidentally wrong safety diodes avoid the immediate destruction of the module but further damages cannot be excepted.

So please pay attention: Check the connection various times before switching on!



2.2 Module overview



❶ START / RESET Trigger output and input

❷ GATE output “ACTIVITY”

❸ CV output bipolar max. +/-5v

❹ CV output unipolar max. 0..+10v

❺ Attenuators of the CV outputs

❻ Pot for maximum distance range (min. 4cm to max. 7 to 40 cm)

❼ Distance sensor (Proximity sensor)

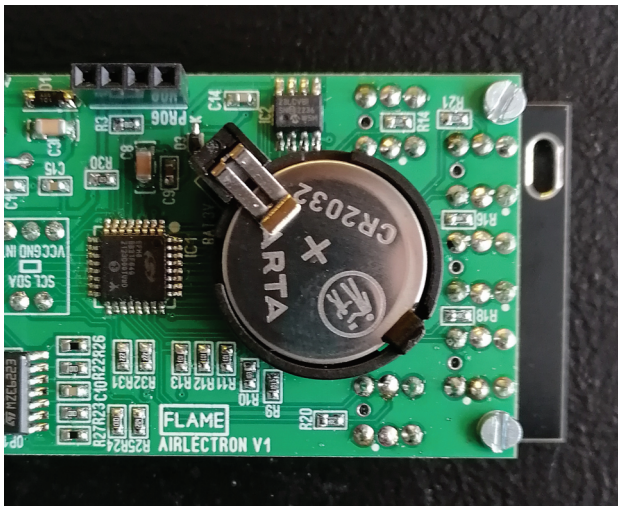
❽ RECORD standby button

❾ HOLD button to freeze the currently generated CV or playback speed

❿ Play button for START, STOP and LOOP on/off

2.3 Module backside (Polarity, Backup Battery)

At the bottom of the module is the socket for the backup battery of the memory. Please note the information below!

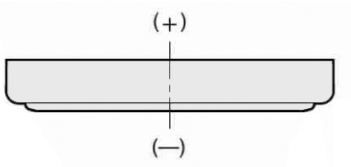


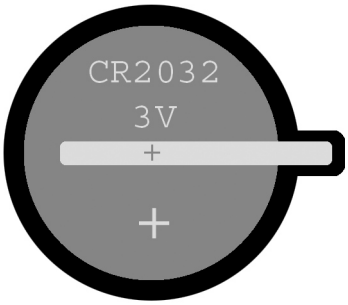
Backup battery
3V Typ CR2032

Insert the backup battery before connecting the unit to your modular rack.

The AIRLECTRON uses a standard 3v lithium backup battery, type CR2032. Insert the provided battery or a comparable battery into the battery compartment as shown below. The battery is needed to keep recordings and settings stored when the Eurorack case is turned off.

Make sure the anode (+) points outwards ! Otherwise you destroy the SRAM !





2.4 Sensor working principle

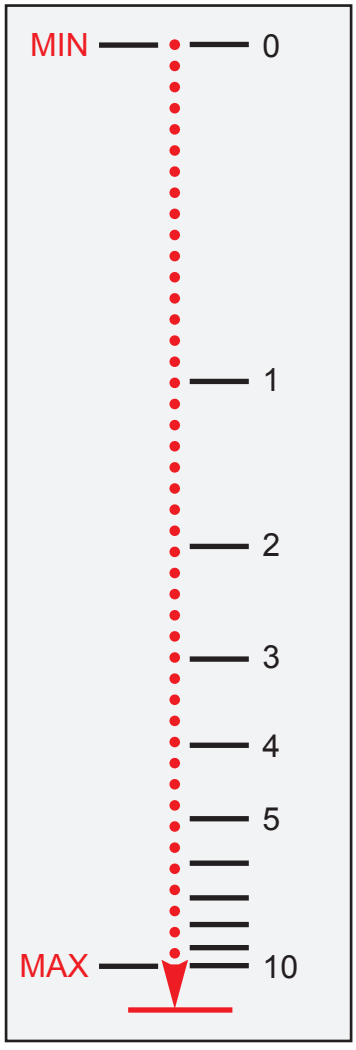
In the middle of the circular graphic there is a modern optical distance sensor with an infrared laser diode and receiver, which measures the distance of a hand (or object) within the maximum set distance range every 10ms. The maximum distance range can be set between approx. 7 and 40cm using the RANGE control. The minimum distance is always approx. 4 cm.

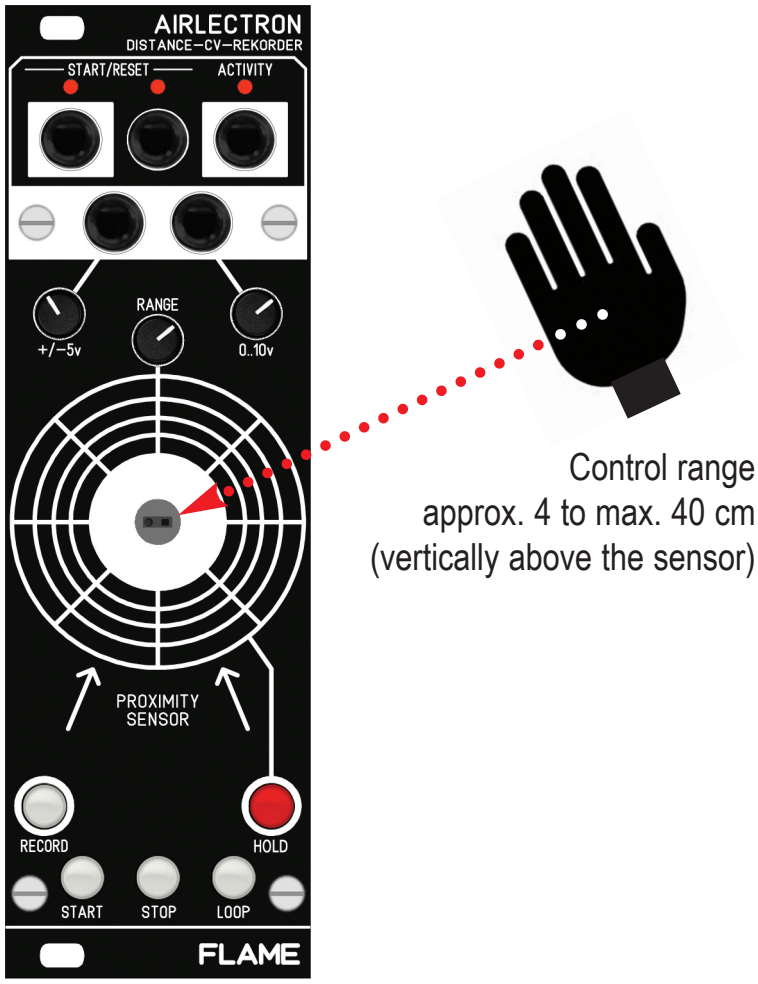
The optical sensor is independent of external light. The maximum voltage generated is +10V at the unipolar output and +5V at the bipolar output when the distance is shortest. It behaves logarithmically over the distance. The closer an object comes to the sensor, the faster the voltage generated increases (see scaling graphic below left).

The sensor should be carefully cleaned of dust from time to time or as necessary using a soft brush.

A NOTICE:
The generated CV has a ripple voltage of approx. 50mV at full level of +10v, which is passively smoothed by a simple low-pass filter. For direct pitch control of an oscillator, it is better to weaken the CV with the attenuator to <= 5v in order to get a smooth tone. The resolution of the sensor is 12bit (4096 values), which is around 2.5mV resolution at full level of +10v output.

logarithmic scaling





3. HANDLING

3.1 Manually mode (play sensor)

Play manually with the sensor when recording is stopped (START button not lit). The current generated voltage can be held permanently using the HOLD button (HOLD button lights up). The output voltage is attenuated with the two potentiometers. If the hand or an object in the sensor area generates a CV value greater than zero, the GATE output “ACTIVITY” is switched on (+11v), the LED then lights up.

3.2 Recording

RECORDING STANDBY
Press the RECORD button to record ready. The LED flashes. (This also works while the track is playing!)

START RECORDING
Recording only begins when the START button is pressed or when there is a positive trigger pulse via the START/RESET input socket. Now the REC and START buttons light up permanently. The voltage generated by the movement of the hand over the sensor is now recorded. The maximum recording time is approximately 2.5 minutes.

STOP RECORDING AND START PLAYBACK
Recording ends when the START button is pressed again or ends with a positive trigger pulse via the START/RESET input socket or when the maximum recording time is reached. The recording then starts automatically and is played in a loop if LOOP is switched on.

STOP RECORDING AND STOP
When the recording is stopped using the STOP button, the sensor is back in manual mode. However, if the recording is ended by pressing the START button or by a positive trigger pulse via the START/RESET input socket, playback begins immediately.

3.3 Playback

Playback starts by pressing the START button or by a positive trigger pulse at the START/RESET input socket (only not if the STOP button is lit because the reset input is switched off).

LOOP
Press the LOOP button to turn the function on/off. The sequence will now be played in a loop.

PLAY LOOP - The sequenz will be played repeatedly when the LOOP LED lights up.
At the end of the loop, a RESET pulse is output at the socket when the sequence is restarted (LED flashes briefly). The START button lights up permanently during playback.

PLAY ONE SHOT - The sequence will only be played once if the LOOP LED is not lit. When playback ends in ONE SHOT mode, the last voltage value is permanently retained. The START button then flashes. To be able to play the sensor again, you must manually press STOP.

RESET SEQUENCE
If the track is currently playing (START button is lit), it can be restarted (reset) by pressing the START button again or by a positive trigger pulse at the START/RESET input socket.

RESET OUTPUT
With every start or restart after the end of the loop, a trigger pulse of approx. 10ms length is output at the START/RESET output socket.

SWITCH OFF THE RESET INPUT
When the sequence is stopped, the external RESET input can be switched off by pressing the STOP button again so that a trigger signal cannot start the sequence. However, the RESET impulse can still start and stop a recording (if record readiness has been switched on manually). This function is signaled by the STOP button lighting up and remains saved even after switching off.

3.4 Speed = additional function of playback

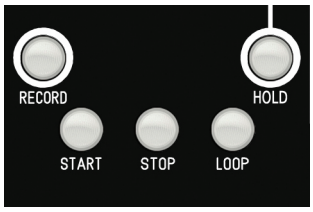
While the sequence is playing, the playback speed can be changed to a limited extent by the sensor. First, after a new recording, the HOLD button is automatically switched on during playback. This is for safety reasons so that the playback speed remains the same after the recording has ended. If you want to change this, turn off the HOLD button during playback. When the sensor is activated, the playback speed changes from slow to much faster. If the sensor is inactive, the original speed takes effect. The HOLD button can be used to permanently hold the playback speed that has just been changed with your hand over the sensor. This setting remains in effect until HOLD (during playback) is turned off or a new sequence is recorded. The Speed-HOLD setting remains permanently saved after switching off.

3.5 List of saved data

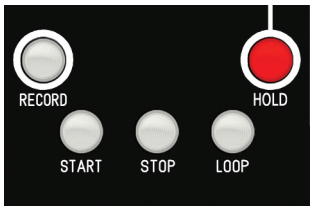
If a backup battery is inserted, the following data is automatically saved permanently after the module is switched off:

- The recorded sequence
- The length of the sequence
- LOOP setting
- Speed HOLD setting of the playback
- Sensor HOLD setting
- Switching off the RESET input at STOP (STOP button lights up)

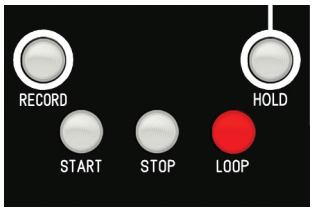
3.6 Quick overview of functions



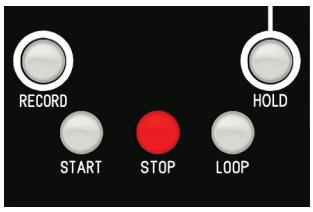
Sequencer stopped, sensor active, sensor HOLD switched off



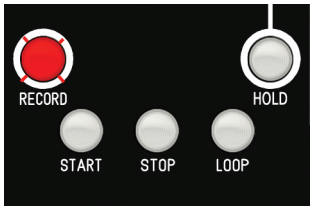
Sequencer stopped, sensor HOLD switched on
(Sensor position is held)



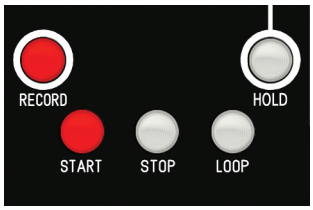
Sequencer stopped, sensor HOLD switched off
LOOP sequence switched on



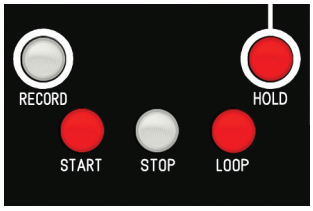
Sequencer stopped, sensor HOLD switched off
LOOP sequence switched off
STOP button lights up: external RESET switched off at STOP
(external RESET cannot start sequence)



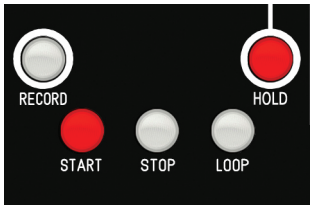
Sequencer in recording standby (RECORD button flashes)
LOOP sequence switched off
Press START button to start recording
(or external RESET starts recording)



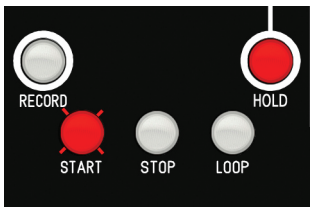
Recording is in progress
Press START button to end recording (sequence starts)
(or external RESET ends recording and starts sequence)



Recording finished, sequence is played in LOOP
HOLD automatically switches on when playing
(no speed change possible)



Recording finished, sequence is currently being played once (OneShot)
HOLD while playing (no speed change possible)



Sequence played once and ended
last voltage value is held
Press the STOP button once to switch to the sensor or
Press START button to replay or
external RESET restarts sequence

4. Anhang

4.1. Technische Details

Connections:

Ribbon cable adapter for Doepfer bus +/-12Volt
Inputs: 1x Trigger, 1/8th inch mono jack
Outputs: 2x Trigger/Gate, 2x CV, 1/8th inch mono jacks

Control elements:

5 push buttons
2 Potentiometer
3 LED's

Resolution: DAC: 12Bit/100Hz, max. Recording time: 2,5min, CV Range: 0..+10V, +/-5V
Current consumption: +60mA / -10mA
Size: Euro rack format 3U / 6HP 40,3x128,5x33 mm, Installation depth: 30mm

4.2 Warrenty

Beginning from the date of purchase a 2-year warranty is guaranteed for this device in case of any manufacturing errors or other functional deficiencies during runtime.The warranty does not apply in case of:

- damage caused by misuse
- mechanical damage arising from careless treatment (dropping, vigorous shaking, mishandling, etc)
- damage caused by liquids penetrating the device
- heat damage caused by overexposure to sunlight or heating
- electric damage caused by improper connecting
  (wrong power supply/ jacks/ MIDI connections/ voltage problems).

If you have any complaints please contact your dealer or send an e-mail to:
service@flame-instruments.de

4.3 Terms of production

conformity: CE, RoHS, UL

4.4 Disposal

The device is produced with RoHS-conformity (subject to the regulations of the European Union) and is free of hazardous substances (like mercury, plumb, cadmium and hexavalent chrome). But electronical scrap is hazardous waste. Please don't add this to consumer waste. For an environment friendly disposal of waste please contact your distributor or specialist dealer.

4.5 Support

Updated and additional informations, updates, downloads and more see:
http://www.flame-instruments.de

4.6 Acknowledgment

For help and assistance big thanks to:
Alex4, Thomas Wagner, Felix Bergleiter, Ebotronix und Anne Metzler.