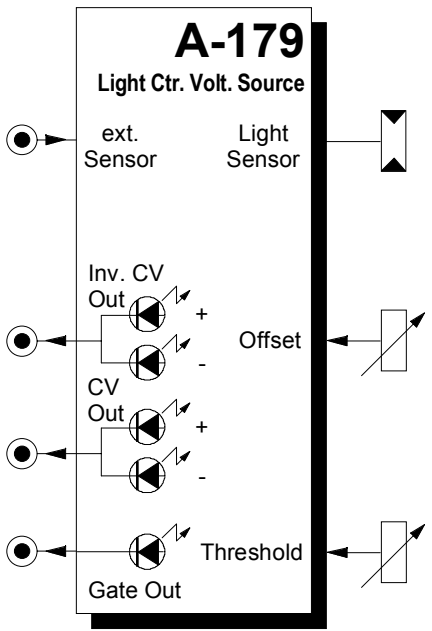


1. Introduction

Module **A-179** (**Light-Controlled Voltage Source**) produces a **variable control voltage** which depends upon the **illumination intensity** of a light sensor (photo resistor). One can use ”active” illumination (e.g. flashlight, mini laser) or ”passive” illumination (darkening by making a shadow, e.g. with your hand).

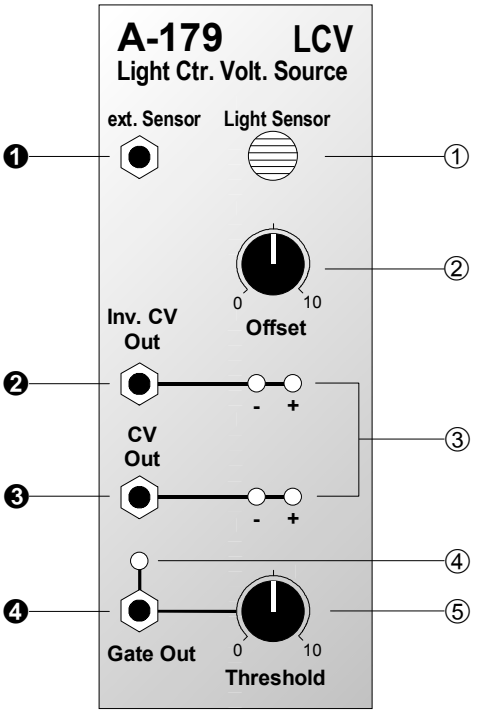
The resulting control voltage is available in **normal and inverted** form. You can use these control voltages in any modulation or control process, and thus have access to an extra system of real-time synthesis control.

You use the Offset control to set the **null point** (zero) of the control voltage output. Two LEDs give a visual indication of the voltages produced.

The module also produces a gate signal at the **gate output**: the signal goes "high" as soon as a voltage is sensed which is above the threshold set with the **Threshold control**. An LED gives a visual indication of the presence of a gate signal.

Instead of the internal sensor an **external remote light sensor** may be used.

2. LCV - Overview



Controls:

① **Light Sensor**: Light sensitive element (photo resistor)

② **Offset** : Control for setting the null (zero) point

③ **LEDs** : LEDs to give a visual indication of the voltages present at outputs ❷ and ❸

④ **LED** : LED to give a visual indication of the presence of a gate signal at output ❹

⑤ **Threshold** : Control for setting the gate threshold

In- / Outputs:

❶ **ext. Sensor** : Input for external sensor (normalled jack socket)

❷ **CV Out** : CV output (normal)

❸ **Inv. CV Out** : CV output (inverted)

❹ **Gate Out** : Gate output

3. Controls

① Light Sensor

Different illumination intensities hitting the built-in **light sensor** ① (photo resistor) result in varying control voltages at CV outputs ❷ and ❸ .

One can use ”active” illumination (e.g. flashlight, laser pointer, spotlight) or ”passive” illumination (covering/ shading the sensor from ambient light with hand or body).

The connection between illumination and control voltage is as follows:

Illumination intensity	Voltage at CV output ❸	Voltage at CV output ❷
low (dark)	low	high
high (bright)	high	low

Instead of the built-in sensor an external photo resistor may be connected to the normalled jack socket ❶. In this case the internal sensor is turned off and the external sensor is used to control the output voltages. Any photo resistor (e.g. LDR07) may be used as the external sensor. If a shielded cable is used the cable length is largely irrelevant - we tried up to 20m without problems.

② Offset

Control ② is used to adjust the **null point**, so that the control voltage at the outputs ❷ and ❸ is about 0 V in the neutral state. The neutral state depends upon how the A-179 is being used (e.g. in the ”passive” mode the neutral state corresponds to having the sensor fully illuminated and uncovered).

③ LEDs

The LEDs ③ indicate the state of the voltages at CV outputs ❷ and ❸.

④ LED

LED ④ shows the presence of a gate signal at gate output ❹.

⑤ Threshold

Using control ⑤ you set a **threshold** voltage for the CV output ❸ , above which a **gate signal** will be produced at output ❹.

4. In / Outputs

❶ ext. Sensor

If one connects an **external sensor** ① (e.g. photo resistor LDR07) to the normalled jack socket ❶ the internal sensor is turned off and the illumination of the external sensor controls the output voltages.

❷ Inv. CV Out • ❸ CV Out

CV output ❷ puts out the inverted control voltage, and output ❸ the normal control voltage.

CV output ❸ generates a decreasing voltage, and output ❷ an increasing voltage when the illumination decreases (i.e. by covering the sensor).

❹ Gate Out

Socket ❹ puts out a gate signal whenever the control voltage at output ❸ is greater than the threshold set with control ⑤. This gate signal can be used e.g. as a noise-gate or as a source of manually-triggered gates for other modules (see user examples).

5. User examples

Module A-179 is another **controller** that enables changing sound parameters in **real time** like the Theremin A-178 or Foot Controller A-177.

Varying the illumination can be used for all sorts of control or modulation. Here are some examples:

- VCO pitch control
- VCA gain
- VCF cut-off frequency
- VCF resonance (with the A-121, 122 or 123)
- VC-LFO frequency
- LFO modulation depth
- Panning (A-134)
- Morphing (A-144 + A-135)
- Time parameters of a VC-ADSR or VC-Decay
- Start/Stop
- Clock speed

Light controlled "Theremin"

Fig. 1 shows a ”light controlled Theremin”. In contrast to the Theremin the **pitch** (VCO) and **loudness** (VCA) parameters are not controlled by the distance to the antennas but by the illumination of the light sensors of two A-179s. For details concerning the Theremin please look at the A-178 user’s guide.

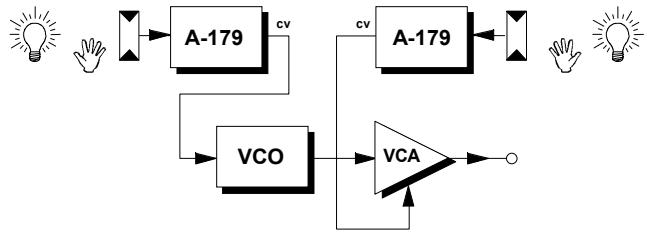


Fig. 1: “light controlled Theremin"

If the light source is located a few meters away from the sensors it's possible to control them with whole body movements (e.g. controlling A-179s by dancing).

Module A-179 allows the creation of "**environment-controlled sounds**” for special performances, i.e. sound generation (pitch, timbre, loudness, panning, clock speed ...) responding to illumination changes caused by the movement of people or objects.

Using the gate function

The gate function in the A-179 gives you the facility to have remote switching of events in **real time**, simply by changing the illumination in one of the ways described on the previous pages:

- Start/Stop (e.g. of a sequencer)
- "One-Shot" (ADSR-triggered sound event)
- Switching filter types or VCO waveforms
- Advancing Sequential Switch A-151 to next step

Another example is an **audio gate**, using the gate signal to switch a VCA on and off, either directly or via an ADSR or slew limiter (Fig. 2). Whenever the signal is below a certain voltage, the VCA simply shuts down.

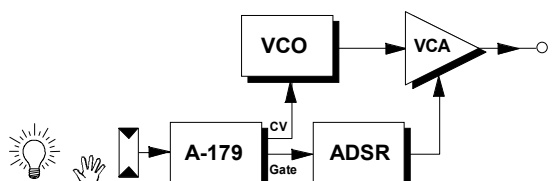


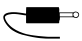
Fig. 2: User example for the audio gate function

6. Patch-Sheet

The following diagrams of the module can help you recall your own **Patches**. They're designed so that a complete 19" rack of modules will fit onto an A4 sheet of paper.

Photocopy this page, and cut out the pictures of this and your other modules. You can then stick them onto another piece of paper, and create a diagram of your own system.

Make multiple copies of your composite diagram, and use them for remembering good patches and set-ups.



- Draw in patchleads with colored pens.
- Draw or write control settings in the little white circles.