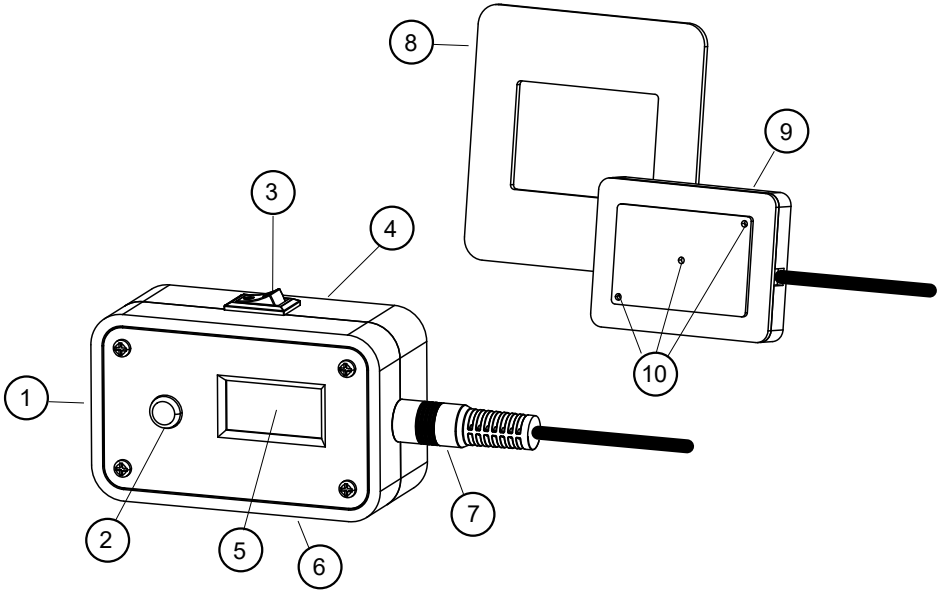
Shutter Lover - User Manual

The Shutter Lover is a device intended to measure the shutter speed of film cameras, and in particular to measure the travel time of the curtains of focal plane shutters.

It is particularly adapted for 35mm film cameras (24x36mm frame). An adapter allows to use it also on medium format cameras.

Presentation



1. Micro-USB port
2. Reset and mode selection button
3. On/Off switch
4. Lighting LEDs
5. Display screen
6. Base for tripod mounting
7. Sensor connector
8. Sensor adapter for medium format camera
9. Sensor
10. Sensor measurement points

Setup

To turn on the unit, plug the sensor into the sensor socket, connect the USB cable to the Shutter Lover on one end and to a power source on the other (computer or AC adapter) and switch On the power switch.

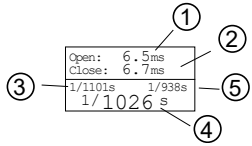
The Shutter Lover should be kept away from moisture and heat sources.
It is designed to operate in a temperature range of 5 to 40°C.

Measurement Operation

- Place the sensor on the back of the camera, in place of the film A relief on the sensor allows to position it precisely in the frame of the 24x36 cameras. A medium format adapter

allows to place it on this camera format as well.
Use a rubber band or other mean to hold the sensor in place.

- Remove the lens from the camera
- Plug in and turn on the Shutter Lover. The display will show "Ready" and its light LEDs will light up. Avoid directing the light from the LEDs towards your eyes.
- Place the Shutter Lover case in front of the camera mount, parallel to it and centered vertically and horizontally. Adjust the distance between the Shutter Lover and the sensor to match the calibration distance (see below). It is recommended to use a tripod for the camera and the Shutter Lover to facilitate control of their relative positioning.
- To ensure that the Shutter Lover is correctly positioned, you can use the Test mode of the camera (see *Test Mode* section).
- Select the shutter speed you want to check on your camera.
- Release the shutter.
- The Shutter Lover screen then displays the summary results of the measurement. The display is split in two parts:



  - The upper part displays the travel time of the first curtain ("Open" (1)) and the second curtain ("Close" (2)) between the two measurement points located on the diagonal of the sensor.
  - The lower part displays the shutter speed on the first diagonal sensor point that detects the opening (3), the central point (4) and the last diagonal sensor point (5).
- If the measurement on one or more of the points of the sensor could not be carried out, (incorrect positioning of the sensor, or malfunction of the shutter), partial results are displayed after a delay of 2 seconds.
- If the Shutter Lover is connected to a computer and the remote application is launched (see paragraph *Remote Application*), you can also get the detailed measurement results and transfer them in your favourite application.
- To start a new measure, briefly press the reset button.

The Different Operating Modes

The initial operating mode of the Shutter Lover is the "Measurement" mode.
But the device also has other operating modes, that can be used to facilitate positioning or to display information. A long or short press on the device button allows you to navigate from one mode to another.

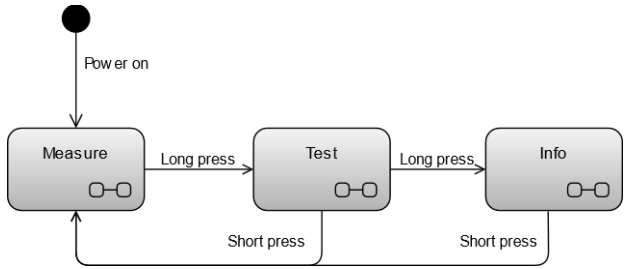


Figure 2: Operating modes and transitions.

Measurement Mode

This mode is used to make measurements. See paragraph "Measurement operation"

Test Mode

This mode ensures that the sensor is correctly positioned on the camera.

In this mode, the screen displays a representation of each of the sensor's measurement points and indicates which of them are illuminated.

Position the sensor on the back of the camera, position the Shutter Lover's housing in front of it, centered, at its calibration distance and fire the shutter at slow shutter speed or pause B. When the sensor is correctly positioned, the 3 measurement points are illuminated. You can then proceed with your measurements.

Information Mode

In this mode, the display shows information about the device: firmware version number and factory calibration values.

Operating principles

Many cameras, including most SLRs in 24x36 format, feature a focal-plane shutter.
This type of shutter consists of two curtains that move in front of the focal plane (the film plane). Both curtains move in the same direction. The first curtain opens, the second closes. If the travel speed of the two curtains is not identical, this leads to exposure variations from one side of the exposed surface to the other, particularly visible at high speeds, where the distance between the edge of the two curtains is low.
In their maintenance manuals, manufacturers recommend setting the curtain travel speed to precise values. The role of the Shutter Lover is to measure this speed for control and maintenance purposes.
The Shutter Lover uses a sensor with 3 measuring points. One is located at the center, the two others in opposite corners of a 32mm x 20mm rectangle (2mm from the edges in 24x36 format). This diagonal positioning makes it possible to measure both horizontally and vertically moving curtains. When facing the camera, the sensor should be positioned instead of the film, with the cable on the right.
The Shutter Lover's casing features 3 LEDs that illuminate each of the sensor's measurement points, preventing parallax errors.
The Shutter Lover takes the time of the illuminated/unilluminated transitions at each measurement point, and so can deduce the shutter speeds and times at each point, and also the curtains travel times between points.

Measurement accuracy and factory calibration

Due to physical phenomena linked to the size of the sensor, measured speeds vary slightly with light intensity, and therefore with LED-to-sensor distance. A factory calibration is carried out to determine the optimum distance between the LEDs on the casing and the sensor.
This optimal distance, specific to your model, is noted in the documentation supplied. As the used components are stable, there is no need to recalibrate the device over time.

Remote application

A remote application enables you to collect, display and archive on a personal computer the detailed results of measurements taken with the Shutter Lover.
This application is Open-Source, as are its interface specifications. So, you can adapt it to your own needs.
For installation and use, please refer to the following web address:
http://github.com/sebastienroy/shutter_lover_remote_app

Limitation of warranty

The Shutter Lover has been designed and manufactured with care, in order to perform measurements with the best reliability. The device comes with a 2-year manufacturer's warranty. However, the manufacturer declines all responsibility for the consequences of its use.

All warranties, express or implied, including, but not limited to, implied warranties of merchantability and fitness for a particular purpose, are disclaimed. In no event shall the manufacturer be liable for any direct, indirect, incidental, special, exemplary or consequential damages (including, but not limited to, loss of use or profits, or business interruption), however caused and on any theory of liability, arising in any way out of the use of this equipment, even if advised of the possibility of such damages.

Manufacture

This product has been designed and manufactured in France.
The plastic material of the casing is bio-sourced and produced in Europe.
Its assembly, including the soldering of its components, is carried out according to an artisanal process. Each unit is calibrated individually

Sébastien ROY
76 avenue François Molé
92160 Antony – France
mailto:photographyelectronics@gmail.com

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