

## Thank you for your support of the Phochron XA through Kickstarter!

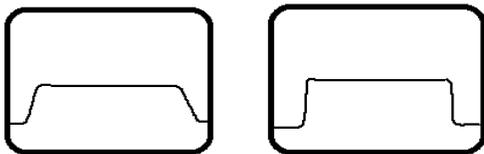
Here's a quick start guide to help you to properly use the shutter tester. I'm sorry it's only available in English, but I will post a copy on the website: [www.phochronxa.com](http://www.phochronxa.com) for you to use google translate on it.

**Battery:** Install the batteries with the + end inserted first. You may have to push them hard to get them down all the way. Use either alkalines or rechargeables. To get the batteries back out, just hit the tester into your open palm and they will pop out. Don't worry, you won't break anything. **Power:** press the center button to turn it on, press and hold the center button for 5 seconds to turn it off.

**Connections:** There are two jacks on the tester, one on the side and one on the front panel. The one on the side is for the light source, the one on the end is for the dual sensor. If you received the "basic" tester, you will not be using the jack on the front panel. If you accidentally plug the external devices into the wrong jacks, nothing will be damaged.

**Light sources:** It is best to use the included light source, whenever possible. Sometimes this light source may not be bright enough. This can happen when testing an antique camera with a small fixed aperture which will not let in much light. Other light sources can be used, but you will find that AC lights such as florescent bulbs flicker enough that they will not give a smooth waveform. I have found that the flashlight feature built into many smart phones is very high intensity and can be used for certain testing situations. Be careful not to overdrive the sensor with one of these bright light sources.

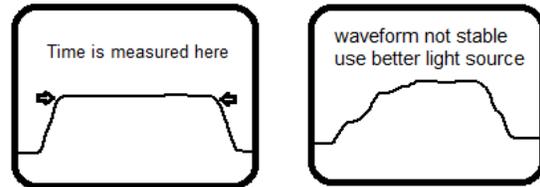
**Light levels:** When setting up the camera for testing, it's best to try to achieve a light level of between 40 and 50 as shown on the bar graphs during the open shutter (B setting) alignment part of the test. A typical waveform when tested at this level will look like one of these two:



If your wave form looks like either of the two below, then you have your light source set incorrectly and the readings will be off. The second waveform shows a signal that is clipped off at the top and is overdriving the sensor.



**Measurement data:** The tester measures the time that the waveform is flat and stable; this is the time that the shutter is fully open. If you have a waveform that is not stable you will get an inaccurate time measurement.



Make sure to hold the light source steady, with some kind of holder to give consistent results.

When measuring a single lens reflex camera with a removable lens, it's always best to remove the lens for testing. If the camera you are testing does not have a removable lens, make sure the aperture is open to its widest setting.

If you are working with a box camera or a large format camera and you cannot get enough light to the sensor, you can always test it with the light source inside the camera and the tester in front of the lens. The light can pass through the shutter in either direction. **NOTE:** do not try to put the light source inside the camera body on a medium format model like the Bronica or a Hasselblad. There is a light door that comes down after the shutter is tripped and you could damage this mechanism.

**Automatic settings:** Cameras that have automatic or program modes, or are aperture priority mode only can be impossible to test. If your camera has a manual mode, set it to manual so you can set the shutter speed to a fixed value. Some simpler cameras (point and shoot variety) have automatic modes and shining the bright light of the tester into their lens may just force it to its fastest shutter, or may stop it down to a minimum f/stop and you will not get any reading. If the metering is not through the lens you may be able to use a second light source to force a particular shutter speed. This is a difficult technique, but can be done.

It is always best to try multiple tests at any speed. You are looking for inconsistent timing, rather than absolute speed numbers. If during the testing of a shutter you keep seeing the words "changing range" then the shutter speed is *very* inconsistent. This is displayed only when the timing varies by a large margin from test to test.

**Interpreting the data:** Don't be surprised if the data you see shows that your prized camera is running very slow. This does not mean that it must be serviced, if it is working well for you, then keep on using it. But knowing how slow it is may mean you can easily compensate for it. **DONT** shoot the messenger... if the meter is saying it is far off, **don't blame the meter!**

Calibration checking: Use the calibration checking to verify whether the meter is measuring properly. In this mode the light source is pulsed for a precise time and allows you to verify that it's responding correctly. It will NOT re-calibrate the tester. There is nothing to calibrate or adjust. As with the testing, keep the light source about 3 inches from the tester so as to not overdrive the sensor. Note that these readings can vary as much as +/- .008 msec. This is considered normal and is a variance of only a few microseconds in the measured signal. Remember that a shutter speed of 1/1000<sup>th</sup> = 1000 microseconds, and a variance of +/- 8 microseconds is less than a 2% variance.

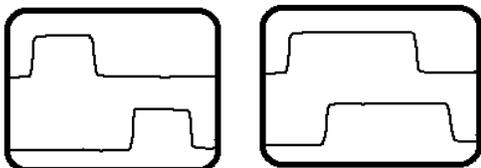
### Notes for those with the deluxe tester

The deluxe tester allows those with 35mm curtain shutter style shutters to do more extensive evaluations of the curtain travel. By taking measurements at each edge of the film opening, the overall time it takes for the curtain to travel from one end of the film plane to the other can be determined.

External module: **Note: This module is only included in the Deluxe tester kit.** The module can only be used to test curtain type shutters only. If your 35mm camera has a leaf shutter built into the lens (Kodak Retina, Argus, etc) then you must use the simple shutter test. The module has a switch on one side and the sensors on the opposite side. Setting of the switch is based on the travel direction of the curtains. If the curtains move left and right, then set it to the horizontal position (looks like . .) If the curtains move up and down, set it to the vertical position (looks like : )

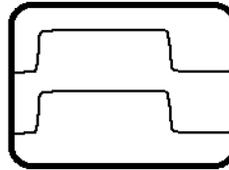
Successful measurement of the curtains requires that the sensor block be carefully mounted to the back of the camera in the area where the film travels. There are rubber bumpers on the face of the dual sensor block that help keep it aligned properly and also keep it from slipping. Use rubber bands to hold the module in place on the camera. It can be helpful to hook the rubber bands on the "hot shoe" on the top of the camera. The sensor module should be shifted left or right so that when viewed from the front with the shutter open, all four sensors are visible.

Always take the lens off the SLR for testing, and keep the light source mounted on a fixed stand in front of the lens mount by about 1/2". Check your light levels with the shutter open (B setting) and move the light source to get both light levels at about 40. It is not critical that they are the same level, try to get them close.



A properly set up dual sensor test should look like one of the two waveforms above.

If it looks like the waveform below, then you probably have the slide switch set wrong.



There should be some visible shift of the two measured waveforms (especially at higher speeds).

Interpreting the data: The actual opening time of the shutter at each end of the film plane is displayed as Sensor 1 and Sensor 2. These two numbers should be nearly the same. It is normal for them to be different. The displayed time of the shutter displayed at the top of the screen is the average of these two measurements. The next set of data displayed are the leading and trailing curtain travel times. The leading curtain is the first to travel and opens the shutter; the trailing curtain follows behind the leading curtain and is the closing curtain. These two numbers should be ideally the same. The actual measured difference is shown as a delta percentage. Typically this number will be from 0.5% to 5%. If this delta percentage is greater than 10%, uneven exposure can result. The camera may need service. The average number listed at the bottom of the screen is the average of the tests run, with the number of tests run in [ ] brackets. Pressing retest will reset this average.

As mentioned earlier, if the shutter speed on your expensive SLR is very slow (or way too fast), **don't panic**. You need to look for consistency in the measurements. If one time the shutter is 1/520<sup>th</sup> and the next time it is 1/350<sup>th</sup>, then you might need service. If you have it set for 1/1000<sup>th</sup> and it reads about 1/800<sup>th</sup> (consistently) and you are happy with the results, no service is needed. But please **don't blame the tester**. It doesn't know a Leica from an Instamatic!

The included light source may not be wide angle enough to fully illuminate both sensors when in the horizontal mode. If this is the case, use a bright flashlight or the flashlight mode of your smart phone instead, keeping it steady while testing.

If you are testing and suddenly the screen goes to blank white, then the batteries are getting low. The tester has an extremely long battery life and the auto shutoff mode (after 5 minutes of no buttons activity) helps to extend battery life. As with any battery operated device, if it's not going to be used for an extended period of time, remove the batteries.

If you need additional help with any of the tester features or operation, feel free to write to me at [info@phochronxa.com](mailto:info@phochronxa.com) or visit the website [www.phochronxa.com](http://www.phochronxa.com) as I will be posting tips, FAQs, and videos in the future. Best of luck testing!