

Arduino Shutter Tester Operating Guide V1

First use after loading firmware

Assuming the build has been completed correctly and the firmware loaded, when the Shutter Tester is connected to the computer via the USB cable, The LCD should light, splash screen will show for 3 seconds and then change to the main display.

If the LCD lights, but no text can be seen, try adjusting the contrast screw on the back. As an initial setting, turn fully clockwise and then just a small amount back.



Laser Alignment Utility

When first applying power, via USB and the splash screen is shown, pressing & holding the 'Display Average' button will take you to the Laser Alignment Utility. Once in the utility, release the button.



This utility will allow checking and aligning of the laser and receiver pairs by giving an indication on the LCD whether or not the receiver can see the laser beam.

When the laser is shining onto the receiver and the receiver can see the laser, the LCD will report 'Seen' When the laser is blocked, by a piece of card or your hand, the LCD will say 'blocked'.



There are two different versions of the sensor, referred to as 'original' and 'new'. Both look identical, so there is no way to tell by looking, which type they are. The only difference between the two is that one has an inverse output to the other. If the Laser Alignment Utility seems to be working backwards, it means you have the other type of sensor. Simply load the other version of the firmware, 'ori' or 'new'.

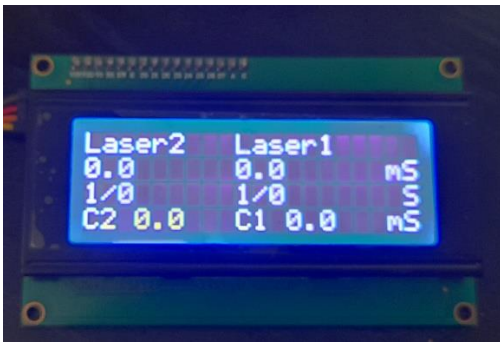
If there is no change to the LCD screen, then check all the wiring. Lasers should be shining Red and the LED on the receiver boards should be on. There is no protection from incorrect wiring or sensor orientation on the boards, so incorrect wiring will most likely result in a damaged board or sensor.

Note:- You will probably find that the Laser barrel is not affixed to the pcb other than by its connecting wires. Adding a bit of hot-glue, or another suitable adhesive, will hold it in place.

Due to limitations with the Arduino Nano memory. The only way to leave the Laser Alignment Utility is to either press the reset button on the Arduino board or power-reset the board.

Normal Use

After the initial splash screen, the LCD will change to the testing window.



Testing screen

There are two columns. Each column will show the calculated exposure measurement from each of the laser and receiver pair.

The measured exposure is shown in milliseconds (0.001 of a second) one decimal place.

The fractional value is then shown below

The last value in each column C2 & C1 show the time each curtain took to travel between the two lasers in milliseconds.

Each time the camera shutter is fired, the display will automatically update.

If 'Bou' appears in the top right corner, it is indicating that shutter bounce has been detected.

Pressing the 'Display Average' button will show the average of (up to) the last ten readings.

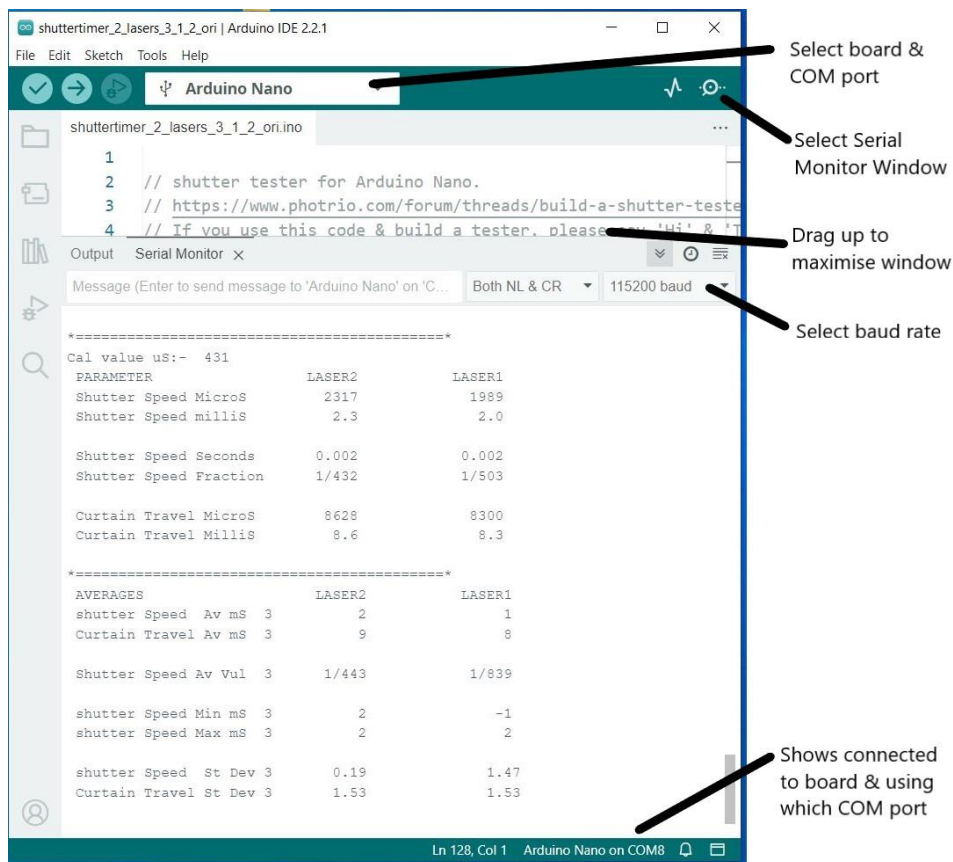
Pressing the 'Reset Average' button will clear all of the accumulated readings, when changing shutter speeds, for example.

Note:- Due to limitations of the Arduino memory, error checking is limited. So strange readings may occur, for example fingers waved across the lasers or a seriously badly behaving camera is being tested.

Computer Screen Display

Far more information can be displayed on the computer screen, than that of the LCD alone.

For this, a computer program called 'Arduino IDE' will be required. See separate document of how to instal this program.



The display follows a similar format to that of the LCD, but with more information.

Shutter bounces will be shown as well as if flash sync has occurred at the given speed.

Averages are updated and displayed. The number of cumulative tests used to calculate the average are shown (in this picture, 3 can be seen).

A maximum of ten individual tests are used to calculate the average. After this, the oldest is lost from the calculation and the latest reading added.

As with the LCD, pressing the 'Reset Average' button will clear the historic data and new averages will be calculated using new test data.