

# ESP32 Shutter Tester Operating Guide V1.2

## 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 **Button4** whilst the splash screen is displayed, will take you to the Laser Alignment & shutter mode Utility.



This utility will allow checking and aligning of the three laser and receiver pairs by giving an indication on the LCD whether or not the receiver can see the laser beam. Output is also sent to the computer screen.

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'.



(older photos showing two laser model)

**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.

**Pressing Button2** will toggle the code to work for the other type of sensor. Note all sensors must be the same type, one cannot mix & match original & 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.

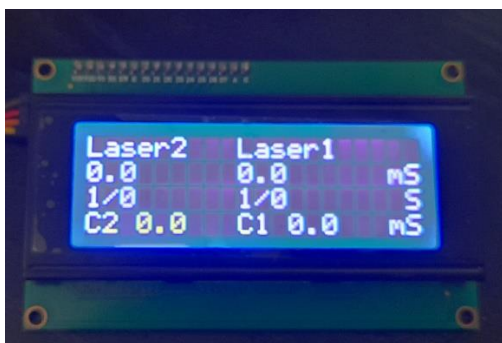
**Pressing Button3** will toggle between Horizontal and Vertical Lasers & sensors.

To exit the utility, press **Button4**

**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.

## 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) to 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.

If 'F' appears in the top centre, it is indicating that the first curtain fully opened before the second started to close, thus Flash sync speed. Note:- This is measured between the two lasers, not the full width of the film gate.

Pressing Button1 will show the average of (up to) the last ten readings.

Pressing Button2 will clear all of the accumulated readings, when changing shutter speeds, for example.

Note:- Due to limitations of 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.

## TFT screen

The TFT screen shows far more data than that of the LCD. It has a similar layout & display to that of the computer screen. Colour is used (green/yellow/Red) to indicate degree of error from the camera.



6	PARAMATER	LASER2	LASERM	LASER1
	Shutt Speed uS	61734	57053	131595
	Shutt Speed mS	61.7	57.1	131.6
	Shutt Speed S	0.062	0.057	0.132
	Shutt Speed 1/	1/16	1/18	1/8
	Dev from Centre	0.11	-0-	0.11
	Dev from Centre	--	-0-	+1
	Shutt Nearest	1/16	1/16	1/8
	Dev frm Nearst	-0.02	-0.13	0.07
	Dev frm Nearst	--	--	--
	Crtain Trvl uS	83209		153070
	Crtain Trvl mS	83.2		153.1
	Curtain Bounce	0		0
	SENSOR/CAMERA IS REVERSED		FLASH SYNC	
mS	61.7	57.1	131.6	
FRC	1/16	1/18	1/8	
DEV	0.11	-0-	1.21	
DEV	--	-0-	+1	
CTN	83.2		153.1	

## Computer Screen Display

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

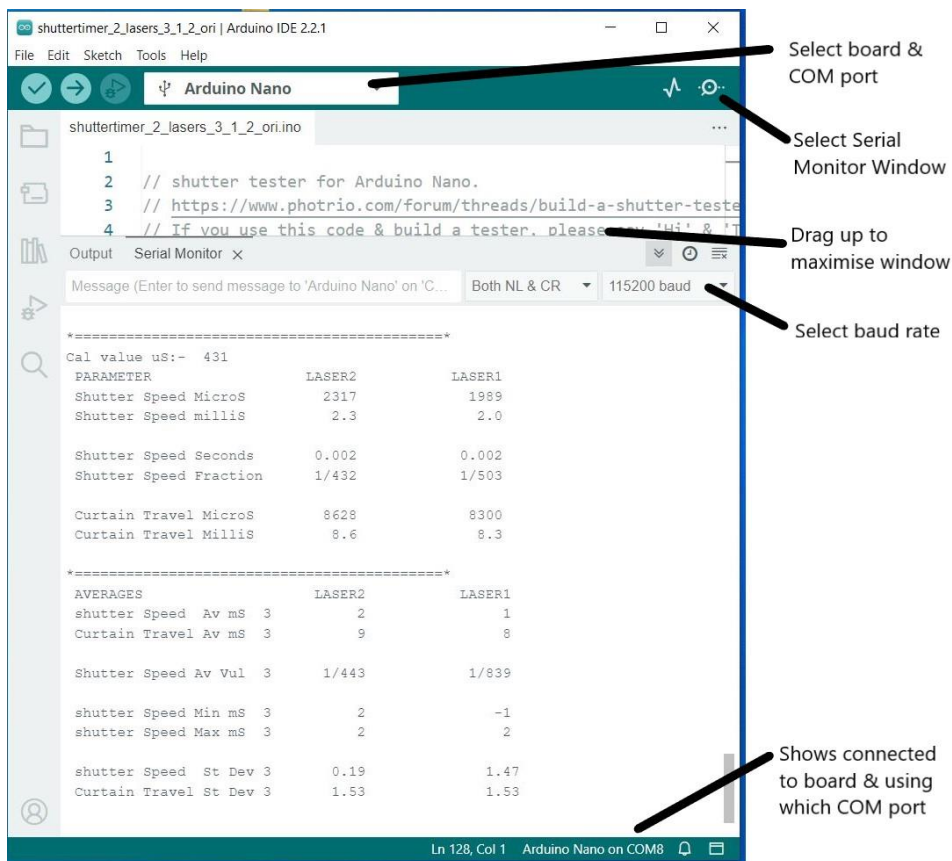
For this, a computer program called 'Arduino IDE' will be required. See separate document of how to install this program.

In the top drop-down box, select your board and com-port. Note:- a new install of Arduino IDE will not recognise an ESP32 board. Just select Nano.

Select 'Serial Monitor by clicking the icon as shown.

The Serial Monitor window will be small, so drag the bar up, to make it larger

Select the correct baud rate of 460800 for Esp32.



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 Button2 will clear the historic data and new averages will be calculated using new test data.