Laser Sensor Timer

(/member/ernie666/)

by ernie666 (/member/ernie666/)

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ENFORCER Wireless
OEM/ODM
Mfg of reliable RF transmitter & receivers since 1971. FCC approved.

(http://cdn.instructables.com/FBU/9KTH/GLL509HP/FBU9KTHGLL509HP.MEDIUM.jpg)

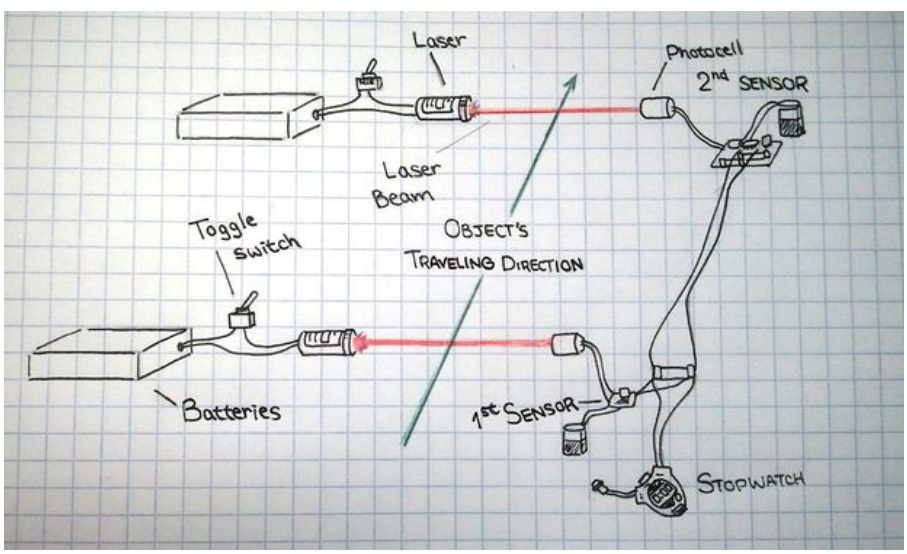
In this instructable I'll show you how to make a very accurate laser sensor timer. The timer latches the time automatically, making it easier to record. The latch has to be reseted before the sensors are ready to use again.

This was originally used for my science project, where I had to test the time it takes for my parachutes to land. They fell at about the same speed so I had to come up with something to time them accurately, and I came up with this. It worked out very well and I like to share it with all of you.

Components

Switches, control units, E-stop
PCB switches, signal lamps

STEP 1: BASIC IDEA



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The lasers are going to act as the transmitters and the light sensing sensors are the receivers. When the laser beam is broken, the receivers loose connection with the transmitters and they send out a signal that starts/stops the timer. The first set of sensors start the timer and the second set stops the timer. The second sensor latches the timer

STEP 2: MATERIALS!

(http://cdn.instructables.com/FVR/BFH8/GLE1RMV0/FVRBFH8GLE1RMV0.MEDIUM.jpg)

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(http://cdn.instructables.com/FHN/8GCJ/GLL4YG83
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Materials:

digital stop-watch
toggle switch **x 2**
lasers **x 2**
9v batteries & clips **x 2**
AA batteries **x 4**
AA battery holders **x 2**
push-button switch
prototyping board
heat shrink (optional)

2N4401 **x 2**
555 timer
100k Ω **x 2**
10k Ω **x 2**
220 µF
0.01 µF
reed relays **x 3**
photocells **x 2**

STEP 3: HACK IT

(http://cdn.instructables.com/FB6/WCCA/GLLI7G8N

/FB6WCCAGLLI7G8N.MEDIUM.jpg)

(http://cdn.instructables.com/FRV/G51Z/GLLI7GDI/FRVG51ZGLLI7GDI.MEDIUM.jpg)

Open your stop watch and locate the buttons; once you find them find their contacts. Solder one wire to each contact. You will only need to solder the wires to the start/stop contacts but I did it to all of them :)

STEP 4: LASERS (TRANSMITTERS)

(http://cdn.instructables.com/F3M/94U8/GLL4Y9G1/F3M94U8GLL4Y9G1.MEDIUM.jpg)

Take your laser and solder the toggle switch to the negative terminal. Solder

the other connection of the switch to your battery holder's black wire, then connect the red wire from laser to the red wire from the battery holder.

Repeat the steps above 1 more time (we're making 2!)
Add heat shrink if you want

STEP 5: LASER SENSOR SCHEMATIC

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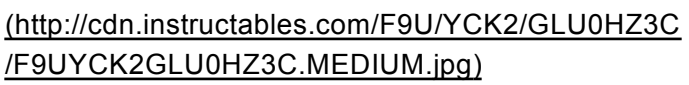
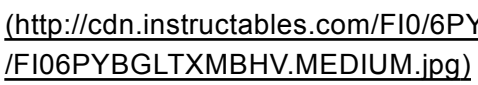
(http://cdn.instructables.com/FFI/6QX6/GLL4YPAS/FFI6QX6GLL4YPAS.MEDIUM.jpg)





(http://cdn.instructables.com/FSD/A7O3/GLL508IL/FSDA7O3GLL508IL.MEDIUM.jpg)

Follow the schematic. After soldering everything in place, cut it out.

First picture= first sensor
Second picture= second sensor

View all 8 Steps

(/id/Laser-Sensor-Timer/all/)

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27 comments

Comment

(/member/JCondor/) JCondor (/member/JCondor) Reply

My son wants to try to build this for school project. What are the specific form factors required for the resistors, capacitors and relays?

a month ago

(/member/ernie666/) ernie666 (author) (/member/ernie666) Reply

all parts are fairly generic not special at all. resistors are 1/4W.

a month ago

(/member/tconner85/) tconner85 (/member/tconner85) Reply

I want to make one of these, but for running laps around a track. If I make two of the first circuit and put one of them on the lap button, and one of the on the Start/Stop button and not make the third circuit, it should work right? My hand would trigger the start stop and every time i run through the lap sensor, it would do my laps if i'm not mistaken.

3 months ago

(/member/ernie666/) ernie666 (author) (/member/ernie666) Reply

that sounds like it would work! :)

3 months ago

(/member/Anallely Tonks Doors/) Anallely Tonks Doors (/member/Anallely Tonks Doors) Reply

Hi, I'm doing this for a project but it doesn't work well, I have connected the entire system but it works reversely, the transmitters send out a signal when I put the laser beam instead doing it when it's broken.

I changed the reed relays position (first I connected normally open all the reed relays) and now the second sensor doesn't do what I want, I mean It doesn't stops the stopwatch. I have tried many combinations to make the second sensor works but I didn't succeed in that task.

Can you tell me what I'm doing wrong? Is it related with the reed relays position? How did you connect them?

I'll be grateful if you could answer me as soon as possible.

4 months ago

(/member/ernie666/) ernie666 (author) (/member/ernie666) Reply

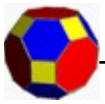
The relays are normally opened. My only guess here is that you might have made a mistake when you connected the photoresistor. If you had swapped the positions of R1's and the photoresistors, then you would get a signal when light is shine upon and not when no light is shine upon, like what you had described. I hope this answers your questions, but if not, message me again.

3 months ago

(/member/mwagner63/) mwagner63 (/member/mwagner63) Reply

Could you use this as a measure for speed? You could place them a foot apart and figure out feet per second

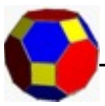
4 years ago



(/member/Yolo1927/) Yolo1927 (/member/Yolo1927) Reply

Actually seconds per foot

6 months ago



(/member/Yolo1927/) Yolo1927 (/member/Yolo1927) Reply

Could I stick the ground for the sensor onto the positive terminal of the battery using an LED without messing up the circuit?

7 months ago

(/member/ernie666/) ernie666 (author) (/member/ernie666) Reply

I'm quite confused, could you explain what you are trying to do a little better. (maybe with pictures?)

7 months ago

More Comments

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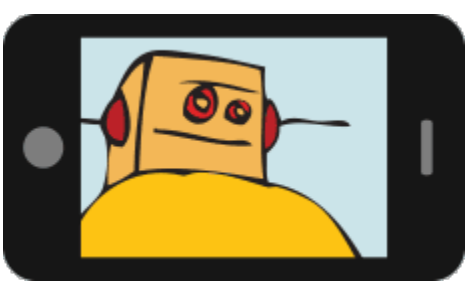

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