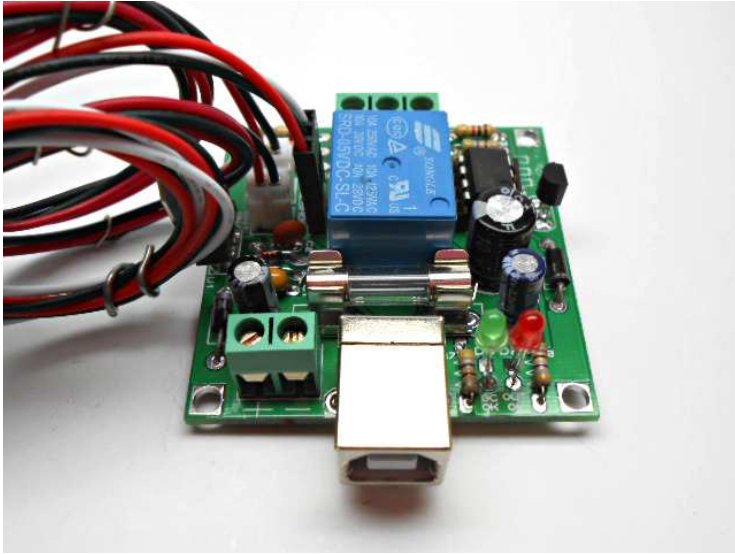


# Dark detector (Laser Alarm)

V2

## Datasheet



### Technical Features

**Layers :** 2

**PCB Thickness :** 1.6mm

**Dimensions :** 50 mm x 50 mm ( 2 inch x 2 inch )

**Operating Voltage :** 5 Vdc via usb cable or 7.2 to 30 Vdc via external power supply or 9v bat.

**Operating current :** 20 ma max

**Rel.date:** 12/12/12

## Functionality

This is a useful dark or light detector switch based on a ldr variable resistor and an op-amp TL081 as a comparator!

When the light or dark drops down on the ldr sensor the resistance of it changes and makes the voltage on the inverting input of the opamp change too.

When the voltage on the inverting input goes higher than the non inverting, the output of the opamp goes high.

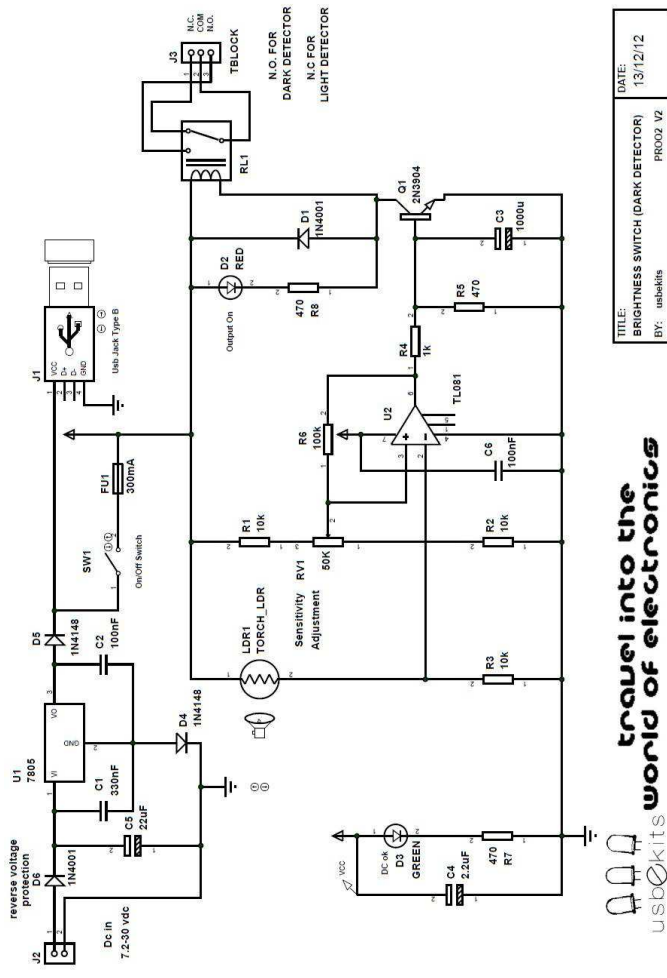
You can set the voltage on the non inverting input via a trimmer to select the brightness threshold you desire.

The opamp drives a relay through a npn transistor and you can then select the output you want (N.O. or N.C.).

You can set the brightness or darkness threshold through a trimmer and you can choose the dark or light operation by swapping the ldr with a resistor!

You can select the dark or light functionality at any time via the relay output too, because you have the opportunity to select both the N.O. and N.C. outputs of the relay via a 3pin terminal block.

### Circuit schematic



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### Part list

Ref.	Type	Value
C1	Ceramic Capacitor	330nF
C2	Ceramic Capacitor	100nF
C3	Electrolytic Capacitor	1000u
C4	Electrolytic Capacitor	2.2u
C5	Electrolytic Capacitor	22u
C6	Smd 0603 Capacitor	100nF
D1,D6	Rectifier diode	1N4001
D2	3mm Diffused Led	Red
D3	3mm Diffused Led	Green
D4,D5	Diode	1N4148
FU1	Fuse Glass 20mm	300ma
J1	Usb jack	Type B
J2	Terminal Block	2 pin Dc input
J3	Terminal Block	3 pin Output
SW1	jst 2pin cable	ON/OFF Switch
U1	Voltage Regulator	7805
Q1	NPN Transistor	2n3904
R1-R3	Resistor 1/4 watt	10k
R4	Resistor 1/4 watt	1k
R5	Resistor 1/4 watt	470
R6	Resistor 1/4 watt	100k
R7,R8	Resistor 1/4 watt	470
U2	Operational Amplifier	TL081
LDR1	Light Dep. Resistors	Variable
RL1	Relay double contacts	5V coil
RV1	jst 3pin cable	Trimmer 50k