INFRARED(IR) SENSOR/DETECTOR CIRCUIT

Description.

The circuit shows that the output of IC1 555 IC,which is designed for a duty cycle of 0.8mSec,with a frequency of 120Hz and 300 mA peak current, is used to drive the infra red LED,D1.From the connection it is clear that the diodes D1 and D2 are on the same line,just a few centimeters apart, on the breadboard.Thus diode D2 receives the infra-red output from the diode D1.The diode signal, which is given to the inverting terminal of the op-amp IC LM 358 gets amplified and its peak is detected by diode D4 and capacitor C4.The forward voltage produced by diode D4 is compensated by diode D3 with R5 and R6.According to the distance between the infra-red transmitter and receiver, a proportional DC voltage is fed to the inverting input of IC2.According to the output of the comparator the LED is turned ON and OFF and this is detected by the transistor Q1.Thus the relay is driven according to the output of Q1.The comparator output is set according to the value of the pot.

This circuit is mainly used for liquid level detection or proximity detection. It operates detecting the distance from the target by reflection of an infra-red beam.The biggest advantage of this circuit is that there is no physical contact with the liquid whose level is to be measured.The range is set by adjusting the pot.Range can vary, depending on infra-red transmitting and receiving LEDs used and is mostly affected by the color of the reflecting surface. Black surfaces lower greatly the device's sensitivity.
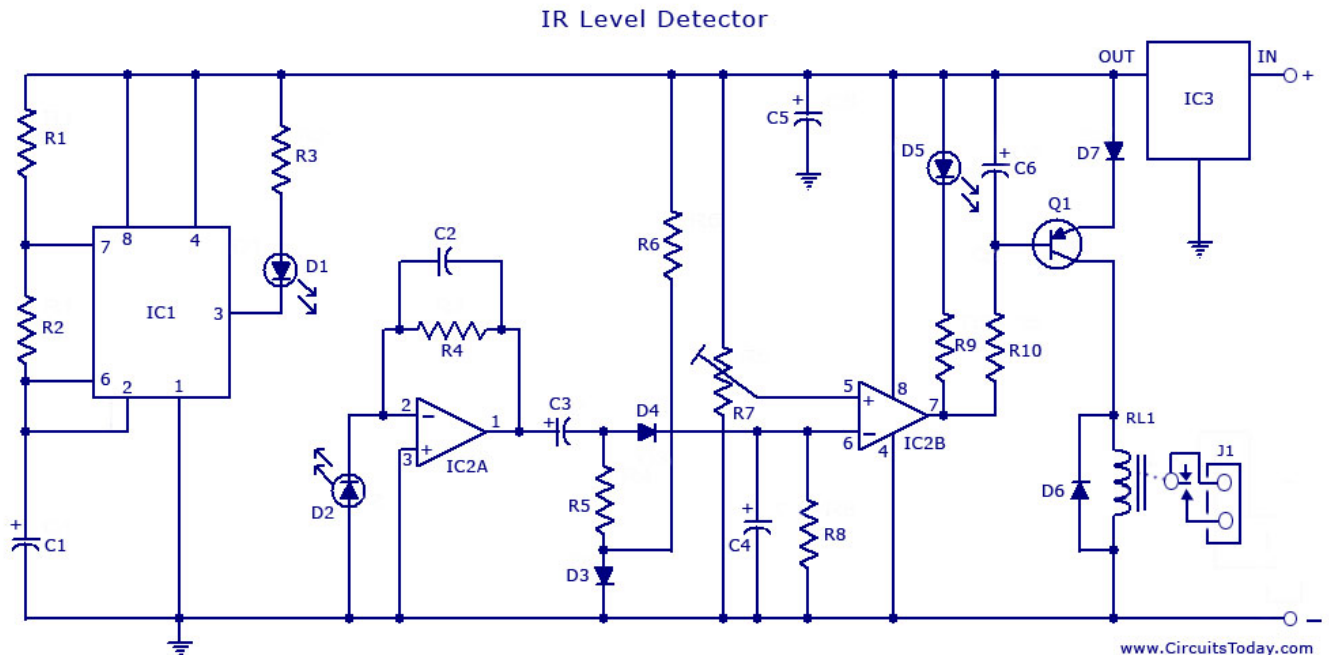
Notes .

Use a good quality regulated power supply .The sensor diodes must not be subjected directly to other light sources.

Parts List .

1. Resistance R1   10K(4W)
2. Resistance R2,R5,R6,R9   1K(4W)
3. Resistance R3   33R(4W)
4. Resistance R4,R8   1M(4W)

5. Trimmer Cermet R7   10K

6. Resistance R10   22K(4W)

7. Capacitance C1,C4   1 uF(63V)

8. Capacitance C2   47pF(63V)

9. Capacitance C3,C5,C6   100uF(25V)

10. Diode D1   IR LED

11. Diode D2   IR Photo-Diode

12. Diode D3,D4   1N4148(75W/150mA)

13. Diode D5   LED

14. Diode D6,D7   1N 4002

15. PNP Transistor Q1   BC 558(45V/800mA)

16. Timer IC IC1   NE 555

17. IC 2   LM358

18. IC 3   7812

19. Relay   SPDT(2A/220V)

20. J1   Two ways output socket

Infrared Sensor Circuit Diagram:

IR Level Detector

Source : http://www.circuitstoday.com/ir-level-detector