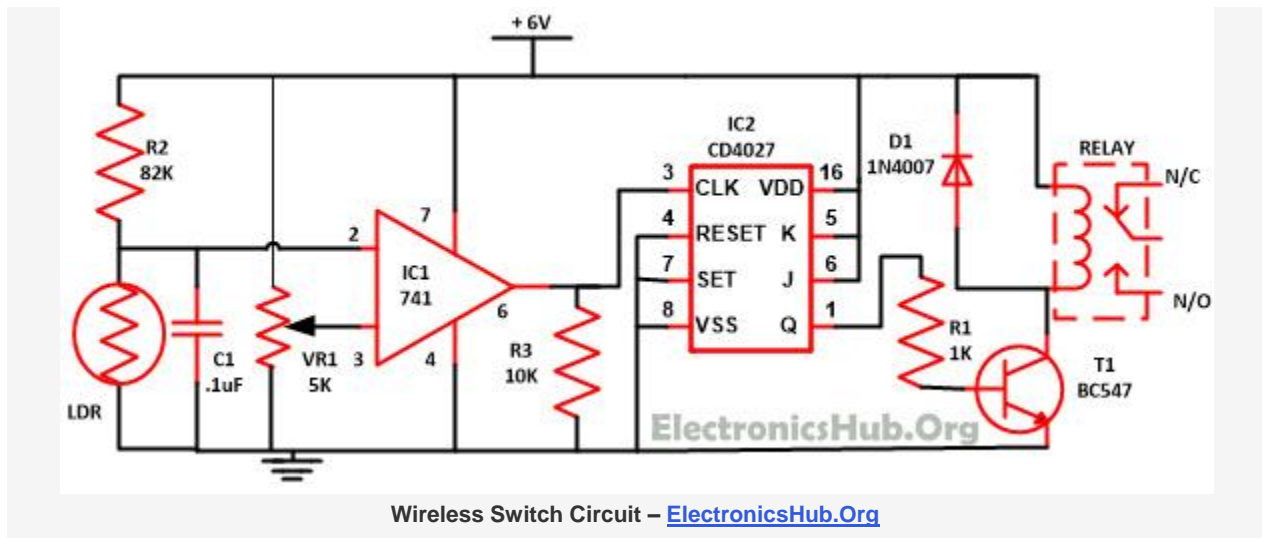


Wireless Switch Circuit using CD4027

Generally appliances that we used in our home are being controlled with the help of devices like switches, sensors. However sometimes it is dangerous to have physical contact with these switches. So to overcome these dangers, here we have explained a circuit that needs no physical contact with the appliance. In these circuits all you need is to pass your hand above LDR. As you first pass your hand over LDR the device connected with it started and remain in that state till you again pass your hand above LDR.

These circuits are mainly depending on two ICs. First one is LM714 which is an operational amplifier. These IC is used to increase the voltage level at the output hundred of a thousand times as compared with the input. Another one is most generally used JK flip flop i.e. CD4027. These IC works in toggle mode and based on the JK flip flop master slave concept. This IC is used to alter the state when the signal is given to the any one of the input terminals and can get more than single output. There are four input pins in JK flip flop named J and K along with set and reset pin and Q and Q⁻ for output.



Description:

The circuit is made up of Operational amplifier LM741 which is employed like a comparator for sensitive voltage, LDR , Preset VR1 is used to give a reference voltage to the pin 3 which is a non-inverting terminal as well as to LDR and R2 is linked with IC1 at inverting pin 2 along with a few additional components.

It is very simple to understand the working of the circuit. LDR device will not start till we do not pass our hand over it and as a result of it IC1 pin 2 move to high state. And as a result of its low state is achieved by the IC1 pin 6 which is an output pin.

Now as soon as someone passes their hand over LDR, IC1 pin 3 is set to high as compared with the IC1 pin 2 as a result of its pin 6 reaches to high state which supply a clock pulse to 13 pins of IC2 (a flip flop IC). The logic level present at the input terminal ie. J and K guarded the state of a flip flop with the help of some internal control. With the positive going cycle of the clock changes occur. Set and Reset pin are not dependant on the clock and it started when high signal is provided to any one of the input pins.

The circuit revealed is triggered on the primary rim of the switch pulse ie output vary when you once more place your hand above LDR. As in the circuit you can find that J and K both attached to high input which implies that at each transition of the clock pulse whether negative or positive pin 13 fluctuate between high and low. This can be demonstrated with the assist of JK flip flop truth table. Hence when it got the pulse from clock from IC1 as of hand above LDR transistor attached to pin 15 begins condition and the output is get with the help of relay attached in the circuit. With the help of the VR1 sensitivity of LDR can be adjusted.

Components used in this Circuit:

- IC
- CD4027 – 1
- LM741 – 1
- Resistor

- R1 (1K) – 1
- R2 (82K) – 1
- R3 (10K) – 1
- VR1 (5K) – 1
- Relay – 1
- D1 (1N4007) – 1
- LDR – 1
- T1 (BC547) – 1
- C (. 1uF) – 1

Source: <http://www.electronicshub.org/wireless-switch-circuit-using-cd4027/>