

Home Appliance Control Using TV Remote

This circuit is designed to switch on/off any home or industrial appliance by using the TV/DVD remote controller. The circuit can be operated up to a distance of 5-10 metre depending on the remote used. The circuit consists of a step-down transformer X1 (6V-0-6V, 250mA secondary), 5V regulator 7805 (IC1), two 5V, 1 change-over (C/O) relay, a timer NE555 IC (IC2), an IR receiver module (IRX1 TSOP1738) and some discrete components. The circuit works on regulated 5V, which is derived from X1 and regulated by IC1. Home appliance is controlled either by pressing any key on the remote or by manually pressing switch S1 to 'on' state.

The TV/DVD remote controller produces 38kHz frequency. The IR receiver module operates at this frequency. It is used to control relay RL2. The relay triggers IC2, which is wired in a bistable mode to control the home appliance connected at the contacts of relay RL1. Timer IC2 toggles relay RL1 when switch S1 is pressed momentarily.

Threshold and trigger input pins 6 and 2 of IC2 are held at one-half of the power supply voltage (5V) by resistors R2 and R3. When output pin 3 of IC2 is high, capacitor C4 charges through resistor R4, and discharges when the output pin 3 is low.

When switch S1 is pressed, capacitor C4 voltage is applied to pins 2 and 6 of IC2, which causes the output of IC2 to change from low to high, or high to low. When switch S1 is released capacitor C4 charges or discharges to the original level at the output pin 3 of IC2. At normal condition, when IR rays are not incident on TSOP1738, its output at pin 3 remains high. When any TV remote key is pressed, IR rays fall on the TSOP1738 and its output goes low. At the same time relay RL2 energises for a few seconds through pnp transistor T2 (BC558). The working of the circuit is simple.

Initially, when there are no IR rays falling on the IR receiver module, its output remains high. Transistor T2 is in cut-off condition. Relay RL2 does not energise and hence IC2 does not toggle. As a result home appliance connected at the contacts of relay RL1 remains switched off. When you press any remote key for the first time, IR receiver module's output goes low and collector of the transistor T2 goes high. Relay RL2 energises and triggers IC2. Output of IC2 goes high and relay RL1 energises to switch on the appliance. Once relay RL1 is energised it remains in that state.

So the appliance which is connected at the contacts of relay RL1 remains switched on. Now when you press any remote key the second time, relay RL2 energises and re-triggers IC2. Output of IC2 goes low and relay RL1 de-energises to switch off the appliance. Once relay RL1 de-energises it remains in that state. So the home appliance remains off. This cycle repeats when any key of the TV remote is pressed to switch on/off the home appliance. Assemble the circuit on a general-purpose PCB and enclose in a suitable cabinet. Fix TSOP1738 and switch S1 on front side of the cabinet. Place transformer inside the cabinet and mains power cord at the back of the cabinet.

