

Philips Coded Remote Control 4-Line¹Shikha Mishra, ²Himanshu Sirohia¹B.Tech Scholar, ²Assistant Professor^{1,2}Electronics & Communication Engineering Dept.^{1,2}Jayoti Vidyapeeth Women's University, Jaipur.**Email:** - mishrasikha880@gmail.com, himanshusirohia@gmail.com**Abstract**

This Project INFRARED Based Multi Device Switching Using TV Remote is used to switch on/off the Electrical Gadgets by using a TV Remote control. The system is used to switch on/off up to six electrical devices. All the above processes are controlled by the 8 bit Microcontroller. The Microcontroller receives the Infrared Signal from the receiver and it decodes and switch on/off the appropriate Device. The Range of the system is upto 3 meters. The project can switch on/off electrical devices of maximum load current of 5Amperes. High power loads can also be connected by changing the Relay. The Microcontroller is used to receive the Infrared signal from the Transmitter, the received signal is processed by the Microcontroller and according to the signal the corresponding device is switched ON/OFF. The IR remote is generally used in home theatres and is based on the principle of using infrared light as the medium of communication. A TV remote basically consists of a set of buttons and a circuit board. Each button is embedded with a black conductive disk which acts as a contact between the buttons and the printed circuit board. The circuit board or the chip consists of a circuitry to sense the connections or detect the button being pressed and produces the signal in Morse code form which is amplified by the transistors and then given to IR LED. The IR LED is connected to end of the circuit board and emits infrared light which is sensed by the sensor placed at the receiver of the TV.

Keywords: Embedded System, Device, IR LED, TV, ON/OFF, Switch.**1. Introduction****The TV remote as the transmitter**

How TV remote works: today's modern remote controls works by modulating the output from an infra-red LED .A series of pulses usually 10-20 pulses of varying width are sent to a gate that turns on or off. The modulator which is usually 38khz. The reason for modulation is to separate. The remote IR range from the IR light emitted by other bodies in the vicinity .Usually it requires a line of sight communication .when a button is pressed, the corresponding circuitry gets connected to bias the IR LED which contains the input .this output is form of light pulses is pulse width modulated at 38khz frequency , which is obtained at the receiver by demodulation .,

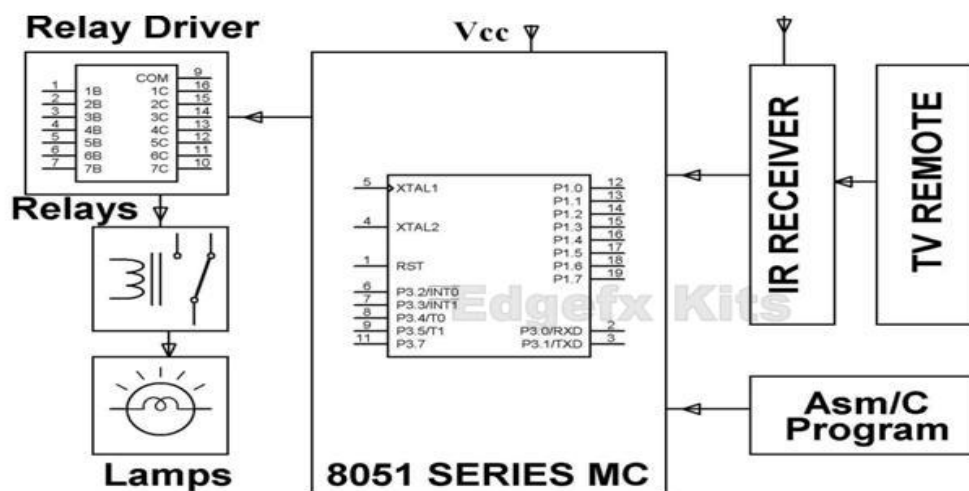
In the receiver there is a tone decoder, which responds well to whatever signals the remote sends at the carrier frequency of 38 khz. The microprocessor decodes the series of pulses and determines whether it is valid and if it, will respond to that function.

In the late 1980's RC-5 protocol was developed by Philips as a semi-proprietary IR (Infrared) remote control communication protocol for consumer electronics. However it was also used by most European manufacture as well as many us manufacture of specially audio and video equipment. Then other man protocol used by consumer electronics manufactures is a NEC protocol. This protocol is largely used by Japanese Manufacture.

Receiver

The receiver at the TV end generally consists of a TSOP receiver, which receive the IR signal at 38 KHZ. Basically the sensor senses the IR pulses and converts the IR pulses into electrical signal. The electrical is decoded to binary data using a decoder and this binary data is fed to the micro processor and micro controller to carry out the required processing of command being sent to processing to corresponding button.

Block Diagram

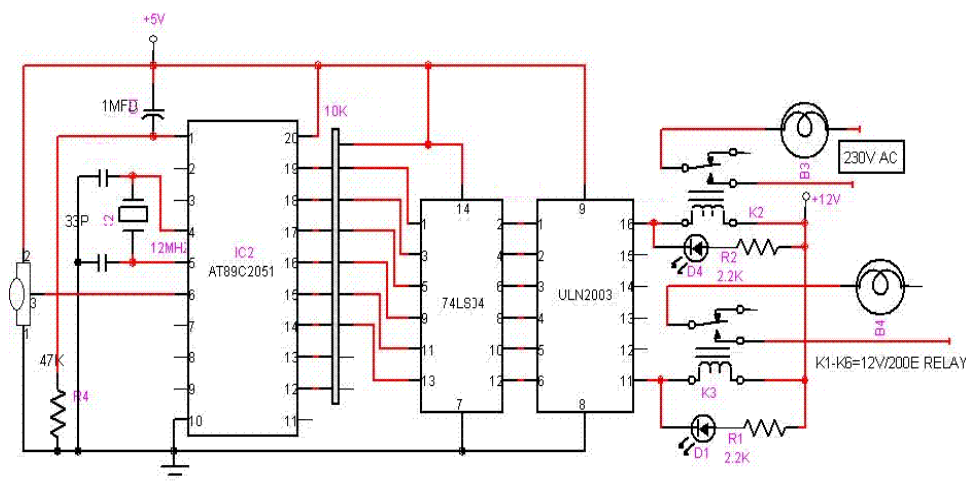


2. Component Used In Remote

1.	IC	AT89C2051	1
2.		74LS04	1
3.		ULN2003	1
4.		LM7805	1
5.	IC Base	20 Pin	1
6.		18 Pin	1
7.		14 Pin	1
8.	Crystal	12 MHz	1
9.	Infrared Sensor TSOP	1738	1
10.	Relay (SPST)	12 Volts-5 Amp	8
11.	LED	5 mm, Red	9
12.	Diodes	IN4007	4

13.	Capacitors	1000Mfd/25 Volts	1
14.		47 Mfd/ 25 Volts	1
15.		2.2 Mfd/ 25 Volts	1
16.		0.1 Mfd Ceramic	1
17.		33 pf Ceramic	2
18.	Resistors	10 K Strip (9 Pin)	1
19.		33 K	1
20.		1k	9

Circuit Diagram



3. Working

The receiver at the TV end generally consists of a TSOP receiver, which receive the IR signal at 38 KHZ. Basically the sensor senses the IR pulses and converts the IR pulses into electrical signal. The electrical is decoded to binary data using a decoder and this binary data is fed to the micro processor and micro controller to carry out the required processing of command being sent to processing to corresponding button. The receivers IC TSOP1738 receive the light pulses from the remote (corresponding to the particular button are the number pressed) and converts into electrical pulses. The receiver output is given to the micro controller, which is programmed to decode the pulses for the required, the number (button). The micro controller is terms sent a logic signal to the input pin (corresponding to the output pin to which the relay required to switch on up particular load connected) of the relay IC ULN2003. The corresponding output pin of the IC develops a logic low signal and the relay connected to the particular output pin gets switched on and it turns switches on the load.

Program used in remote control:

VAR1 equ r7	Temporary Variable
TEMP equ 10H	Temp variable
COUNT equ 11H	Count
ADDR equ 12H	Device address

CMD	equ 13H	Command
FLIP	bit 00H	Flip bit
TOG	bit 01H	Temp bit for flip
IR	equ P3.3	IR Receiver connected to this pin
SW1	equ P1.0	Switch 1 connected here
SW2	equ P1.1	Switch 2 connected here
SW3	equ P1.2	Switch 3 connected here
SW4	equ P1.3	Switch 4 connected here
SWport	equ P1	Port at which switches are connected

4. Types of Remote Control

IR Remote Control

IR remote control is the best known form of wireless remote control. It's cheap and reliable, but limited to line-of-sight communication. Complete IR-receiver modules, like the TSOP1736, are available cheaply and can be interfaced with most controllers without much extra components. TV remote controls using RC5 (Phillips) can be used with such modules. If you want a faster data link, IRDA components could boost it significantly. Bluetooth and Wifi have replaced it on modern laptops, but IRDA components are still available.

RF Remote Control

RF is widely known in model race cars, Wifi, and various other applications. These days complete RF transmitter/receiver modules are available at reasonable low prices. These modules are very easy to use and have ranges of around 100m depending on their environment. RF remote controls for high end model race cars have larger range but are much more expensive and limited in their use.

Speech Recognition Remote Control

In essence speech recognition is a form of remote control. Probably one of the hardest forms of remote control, but also one of the most impressive ones. Although today there are modules that contain a full speech recognition system capable of learning a dozen commands, those systems are still very limited as they can't handle sentences (just commands), need to be trained before they are useful and usually can only be used by one person.

Network Control

A further step would be to do the control over a network, from another device. This could be a wired network, like RS-232, RS-485 or Ethernet, or a wireless one, as WLAN, Bluetooth or ZigBee.

Advantage of remote control:

- **No legal issues**

Obtaining access to or traversing properties with hard lines is extremely difficult.

- **No copper wire to steal**

As the price of copper increases, so does the possibility that your wire will be stolen. Using a wireless remote system means no wire for thieves to steal.

- **Extended range**

Unlike much of the equipment on the market, Remote Control Technology's wireless remote equipment has long-range communication capabilities — up to 5 miles.

- **Eliminate the need for wire and conduit**

Wire and conduit are expensive and high maintenance. Typical wear-and-tear, digging, rodent damage, theft, etc., are all examples of problems that can damage wire. RCT's wireless remote systems put an end to these drawbacks of wired technology.

Application

Industry

Remote control is used for controlling substations, pump storage power stations and HVDC-plants. For these systems often PLC-systems working in the longwave range are used.

Garage and gate

Garage and gate remote control are very common, especially in some countries such as the US, Australia, and the UK, where garage doors, gates and barriers are widely used. Such a remote is very simple by design, usually only one button, and some with more buttons to control several gates from one control. Such remotes can be divided into two categories by the encoder type used: fixed code and rolling code. If you find dip-switches in the remote, it is likely to be fixed code, an older technology which was widely used. However, fixed code has been criticized for its (lack of) security, thus rolling code has been more and more widely used in later installations.

5. References

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