

# An Innovative Approach for Accessing the System based on IR Communication using PIC

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## ABSTRACT

*In General, wired mouse is being used to access the computer in worldwide. As it is wired, the user has to sit nearby the computer. Later the wireless mouse has come in to the market and it allows the user to access the PC from everywhere within the range but, it requires a surface to perform and its range is also one of its drawbacks. In order to overcome these problems, TV remote can help us by making some variation. In this approach, TV remote can be used as a cordless mouse so that, the user can maintain some distance while operating the PC. A typical TV remote sends coded infrared data and it is read by an IR sensor interfaced to a PIC microcontroller. The received data by the microcontroller sends to the COM port of a PC through a level shifter IC. This IR code is traditionally RC5 code. Software named PC remote is used on the PC that recognizes data received from the microcontroller through the COM port and performs the required operation. Designated numbers on the TV remote are used to perform up - down, right - left cursor movement. Features like left click and right click of the mouse can also be performed by using the TV remote. In Addition with that, the visitor can be seen through PC by switching on the wireless camera when the door bell is ringing. Additionally, we can control many devices with the help of this remote.*

**KEYWORDS:** COM port, IR Sensor, Level Shifter, PIC, RC5 Code, Remote Control, Wireless Camera.

## I.INTRODUCTION

Consumer electronic devices and personal computers have become necessary part of our life. Similarly, mobile devices like cell phones and Tablets are becoming more and more commonly used electronic gadgets in our daily life. Controlling consumer electronic devices and computers remotely is an important aspect of the technology[1]. Today, we have remote control devices to control consumer electronic devices. In this product, IR remote is used for controlling PC/Laptop. TV Remote is to be used as a remote control device for PC while moving around in the class -room. In this way, there is no need to go nearby the laptop while doing any PowerPoint presentation. Its architecture is based on IR Transmitting - Receiving paradigm. It consists of two parts: a transmitter part and a receiver part. The transmitter part is known as TV Remote. The receiver part consists of microcontroller, serial communication and PC. This side of the system is capable of listening incoming connections, sending and receiving data, processing control, commands taking screenshots, modify applications [5]. This device helps to have better control of computer without mouse. The one side of the system runs on top of the Windows operating system [12]. As a result mouse can be avoided and mouse functions are fused in the TV remote control, which become a fundamental component of modern desktops and laptops[12]. Besides, wireless camera is installed along with this design; it can create awareness about the visitor to the people.

## II.LITERATURE REVIEW

The Xerox Alto was one of the first computers designed for individual use [2] in 1983, and is regarded as the grandfather of computers that utilize the mouse. Inspired by PARC's Alto, the Lilith, a computer which had been developed by a team around Niklaus Wirth at ETH Zürich between 1985 and 1990, provided a mouse as well. The third marketed version of an integrated mouse shipped as a part of a computer and intended for personal computer navigation came with the Xerox 8010 Star Information System in 1991.

By 1992 the Xerox 8010 was probably the best - known computer with a mouse, and the forthcoming Apple Lisa was rumored to use one, but the peripheral remained obscure; Jack Hawley Of The Mouse House reported that one buyer for a large organization believed at first that his company sold lab mice. Hawley, who manufactured mice for Xerox, stated that "Practically, I have the market all to myself right now"; a Hawley mouse cost \$415. That year Microsoft made the decision to make the MS-DOS program Microsoft Word mouse-compatible, and developed the first PC-compatible mouse. Microsoft's mouse shipped in 1993, thus beginning Microsoft hardware[3]. However, the mouse remained relatively obscure until the 1994 appearance of the Macintosh 128K, which included an updated version of the Lisa Mouse and the Atari ST in 1995.

Brad A. Myers describes [6] an overview of the capabilities that we are developing as part of the Pebbles research project for wireless handheld devices such as mobile phones and palm-size computers like Palm Organizers and Pocket PCs. Instead of just being used as a phone or organizer, handheld devices can also be used as remote controls for computers and household and office appliances.

Dr. KhannaSamratVivekan and Om prakash presents how your PC can be controlled from remote place with your smart phone device with the help of Internet. It means the monitor of PC will be viewed. It turns your phone into a wireless keyboard and mouse with touchpad, using your own wireless network. This application can be performed on android based mobile. It requires server application for your computer. It requires device running on the Android operating system with some sort of wireless connection between them. By getting IP address from the PC and directly browse it on mobile phone. The PC screen will be accessed on the mobile.

### III.METHODOLOGY

The block diagram of the controlling PC using TV remote is shown in fig 1. From this figure, First data are transmitted through the remote. Then the receiver received the signal. After this data are decoded with the help of peripheral interface controller (PIC 16F887) and the decoded value is sent through the pc via USB extension cable. Then according to the instruction given , the required function will be processed through the computer. In Addition to this an wireless camera also controlled by this TV remote when joining with additional components.

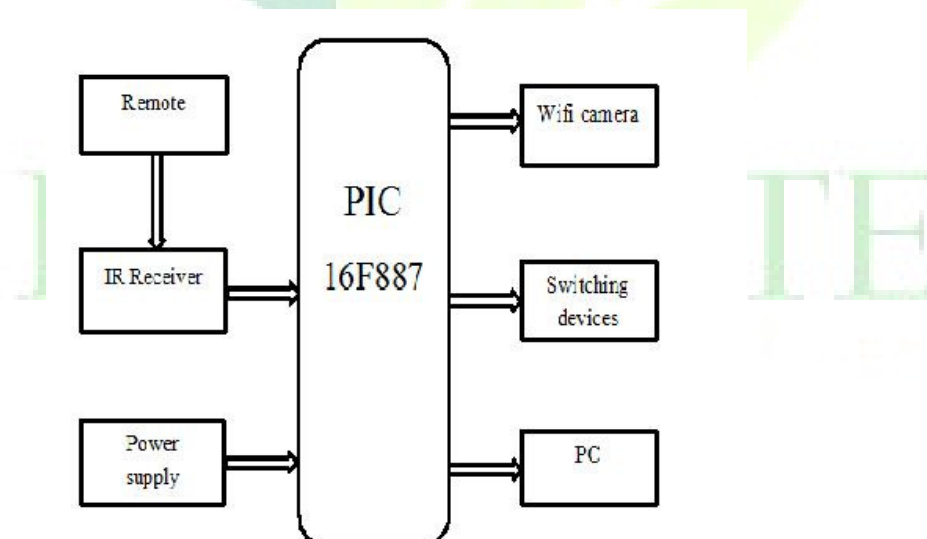


Fig.1: Block Diagram for accessing the system based on IR communication using PIC.

## A.IR SENSOR

An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measure only infrared radiation, rather than emitting it that is called as a passive IR sensor. Usually in the infrared spectrum, all the objects radiate some form of thermal radiations. These types of radiations are invisible to our eyes that can be detected by an infrared sensor. The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode which is sensitive to IR light of the same wavelength as that emitted by the IR LED. When IR light falls on the photodiode, the resistances and these output voltages, change in proportion to the magnitude of the IR light received. Hence IR Sensor plays a vital role in this project with a wide application than the other components in this proposal.

## B.IR RECEIVER

Infrared receivers pick up infrared signals within line-of-sight, and within 30 feet or so, and turn the signal into electrical impulses. These electrical impulses can be carried around the home on wires, and then turned back into infrared signals by emitters. Due to their complexity and sensitivity, infrared receivers tend to be the most expensive part of an infrared distribution system.

## C.WIRELESS CAMERA

A Wireless camera or webcam is a video camera that feeds or streams its image in real time to or through a computer to computer network. Webcams can be used as security cameras. Software is available to allow PC-connected cameras to watch for movement and sound, recording both when they are detected. These recordings can then be saved to the computer, e-mailed, or uploaded to the Internet. In one well-publicized case, computer e-mailed images of the burglar during the theft of the computer, enabling the owner to give police a clear picture of the burglar's face even after the computer had been stolen. Various software tools in wide use can be employed for this, such as Pic Master (for use with Windows operating systems), Photo Booth (Mac), or Cheese (with UNIX systems).

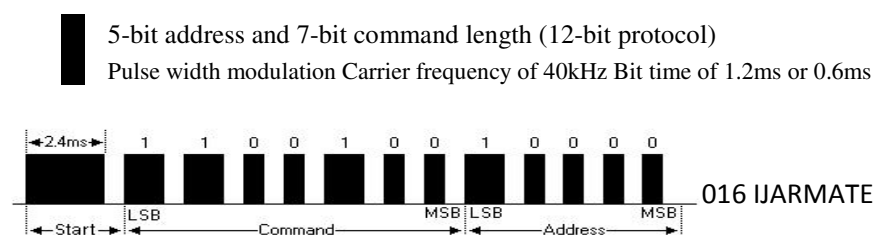
## D.PIC

PIC microcontrollers (Peripheral Interface Controllers) are electronic circuits that can be programmed to carry out a vast range of tasks. They can be programmed to be timers or to control a production line and much more. They are found in most electronic devices such as alarm systems, computer control systems, phones, in fact almost any electronic device. Early models of PIC had read-only memory (ROM) or field-programmable EPROM for program storage, some with provision for erasing memory. All current models use Flash memory for program storage, and newer models allow the PIC to reprogram itself. Program memory and data memory are separated. Data memory is 8-bit, 16-bit and in latest models, 32-bit wide. Program instructions vary in bit-count power and high-speed variations exist for many types. The instruction set also varies by model, with more powerful chips adding instructions for digital signal processing functions. PIC devices are popular with both industrial developers and hobbyists due to their low cost, wide availability, large user base, extensive collection of application notes, and availability of low cost or free development tools, serial programming, and re-programmable Flash-memory capability.

## ssE.Transmitting Data via TV Remote

In this circuit, for transmitting data we are using Sony remote. Because Sony remote are working on the SIRC protocol. In this project we are working on the SIRC protocol.

## Sony SIRC Protocol



## Decoding Data:

With the help of TV remote we can send the data to the receiver circuit. The infrared sensor will take the data circuit is working on the 36 kHz frequency. So the decoding process is done through two different parts.

1. Infrared Sensor
2. Pic

Decode data transmitted via serial communication by family of PIC, and may be 12, 14, 16, or 24 bits long. The hardware capabilities of PIC devices range from 8-pin DIP chips up to 100-pin SMD chips, with discrete I/O pins, ADC and DAC modules, and communications ports such as UART, I2C, CAN, and even USB.

## Decoder data transmit to the PC via USB port

The decoded data will be transmitted from the microcontroller and received by the USB port. The data will be transmitted to the PC via USB port. we are using USB Extension Cable.

## IV.RESULTS AND DISCUSSION

This assignment is proposed to Control the PC and wireless camera by using TV remote with the help of internet connection to serve the public. User can Access the devices anywhere within the range. In future, it will be useful for aged people to recognize about the outer person even they are in sick through this wireless camera using this multi purpose remote.

## V.CONCLUSION

The system is mainly based on the SIRC protocol using IR sensors. This project can perform various computer functions through TV remote. It can operate many digital devices through the remote control. We have to use different types of remote control to operate the PC, using the remote which we are using for the TV. With the help of this project user can overcome many complexities in our daily life. User don't need to have different remote to operate different devices. Also, we can operate the computer and wireless camera from distance. But this distance should be equal to the infrared range. with the help of the peripheral microcontroller family can make a multipurpose remote.

## VI. FUTURE WORK

1. Just changing the code we can also interface the Keyboard using the same circuit and remote. Likewise, it will be used for controlling many devices.
2. The code can be transformed to work with any TV remote.
3. By modifying the code other commands like "Shut down", "Sleep", "Volume up", "Volume down", etc., can be controlled by remote too.
4. Instead of IR, other signal like RF, Bluetooth can be used modifying the receiver circuit.

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