Wireless Signal Transmitter Using Bluetooth and PIC Microcontroller

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ABSTRACT: This paper represents the wireless signal transmitted using Bluetooth, Android module and it can be controlled by PIC16F877A. Where analog input signal converted an improved digital signal using corresponding ADC converter(Analog to Digital Converter) in PIC microcontroller.These improved digital signal sent to the Android smartphone through external Bluetooth device which connected to the PIC16F877A microcontroller. The main purpose of this project is the alternate use of CRO for voltage and current variation measurements.

KEYWORDS: Android smartphone, ADC converter, CRO(Cathode Ray Oscilloscope), PIC16F877A microcontroller.

I. INTRODUCTION

An oscilloscope, previously called an oscillograph, and informally known as scope or o-scope, CRO(for Cathode Ray Oscilloscope), or DSO (for the more modern digital storage oscilloscope), is a type of electronic test instrument that allows observation of varying signal voltages, usually as a two-dimension plot of one or more signals as a function of time. Other signals (such as sound or vibration) can be converted to voltage and display.PIC16F877A is a class of 8-bit microcontrollers of RISC architecture. It has an 8kb flash memory for storing a written program. IT has data memory that needs to be saved when there is no supply. It is usually used for storing important data that must not be lost if power supply suddenly stops.

II. PROPOSED SYSTEM

Inthis project, we use Bluetooth HC-05 module is an easy to use Bluetooth SPP(Serial Port Protocol) module, designed for transparent wireless serial connection setup, power supply as 5V, LCD display, and Android smartphone.
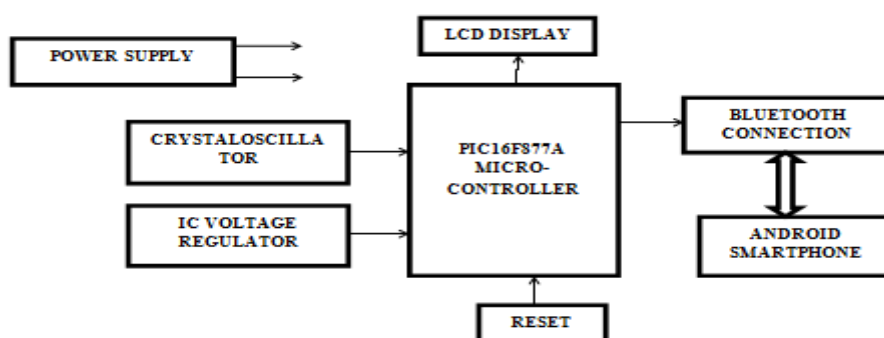

Fig: block diagram

2.1.1.power supply

The power supply circuits built using filters, rectifiers, and the voltage regulators. Starting with an ac voltage, a steady dc voltage is obtained by rectifying the ac voltage, then filtering to a dc level, and finally, regulating to obtain a desired fixed dc voltage.The regulation is usually obtained from an IC voltage regulator unit, which takes a dc voltage and provides a somewhat lower dc voltage, which remains the same even if the input dc voltage varies, or the output load connected to the dc voltage changes.

IC voltage regulator :

Voltage regulators comprise a class of widely used ICs. Regulator IC units contain the circuitry for reference source, comparator amplifier, control device, and overload protection all in a single IC. Although the internal construction of the IC is somewhat different from that described for discrete voltage regulator circuit,
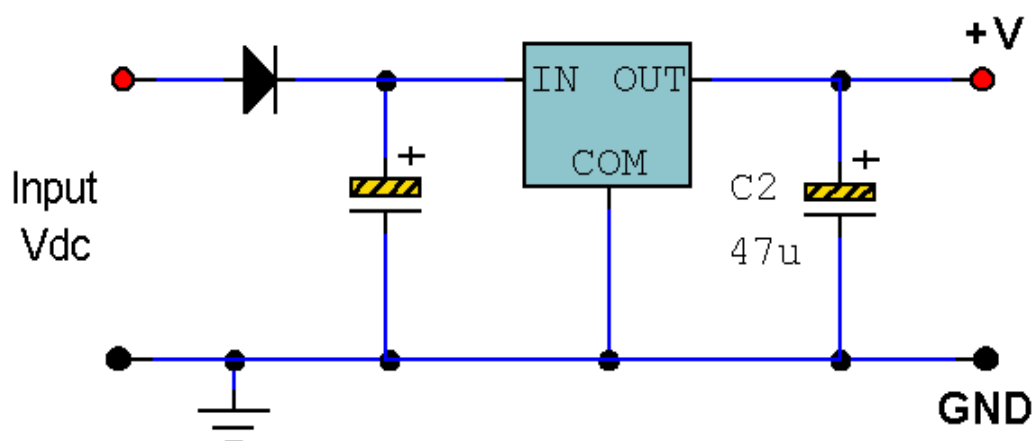

Fig:2.1.1. circuit diagram of IC voltage regulator

the external operation is much the same. IC units provide regulation of either a fixed positive voltage, a fixed negative voltage, or an adjustable set voltage.

FEATURES OF VOLTAGE REGULATOR IC

- Output Current up to 1A
- Output Voltages of 5, 6, 8, 9, 10, 12, 15, 18, 24V
- Thermal Overload Protection Short Circuit Protection

Circuit diagram of a wireless signal transmitter using Bluetooth and PIC microcontroller
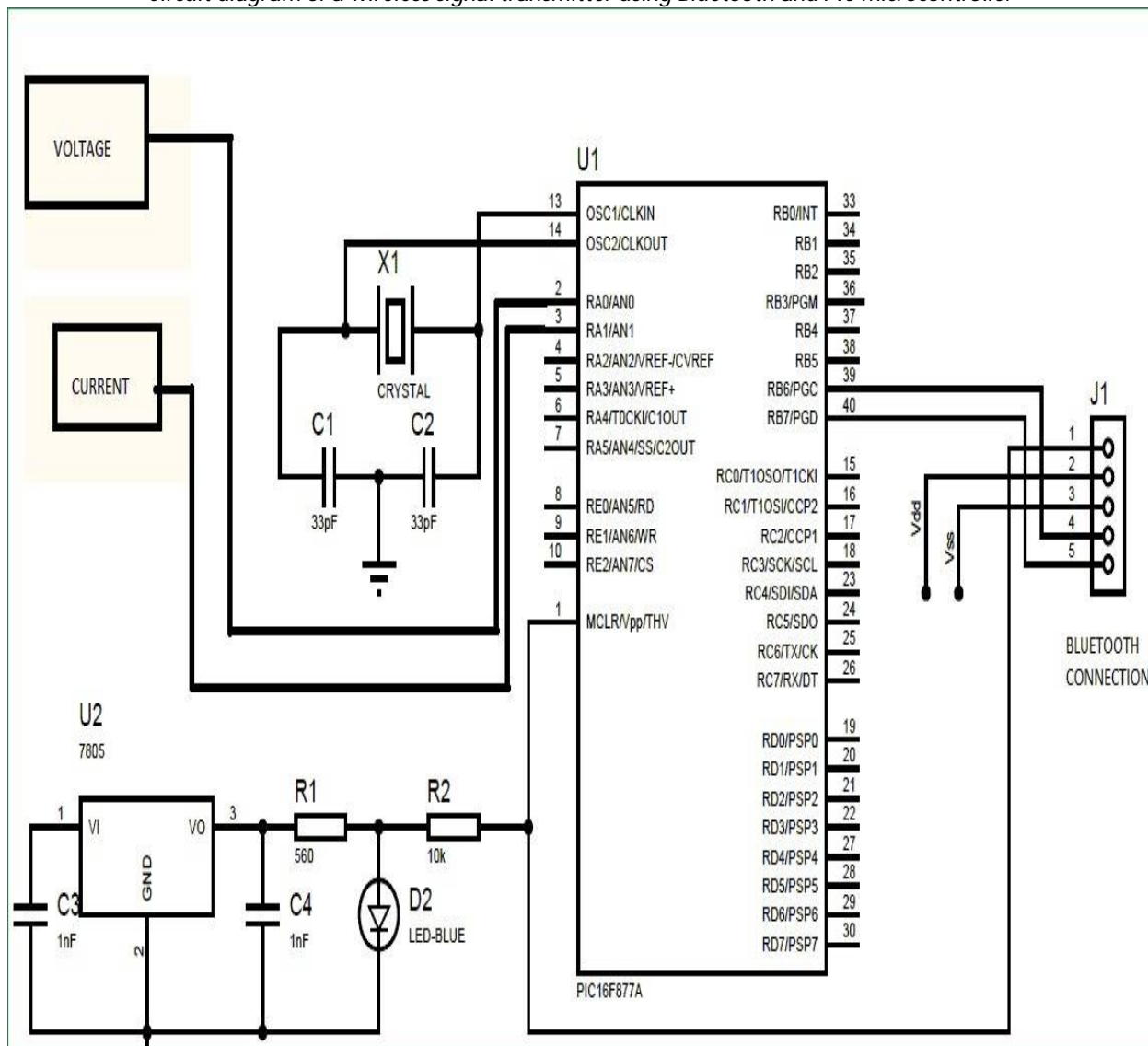

Fig.2.circuit diagram

2.1.2.PIC microcontroller:

PIC microcontroller is the first RISC based microcontroller fabricated in CMOS that uses the separate bus for instruction and data allowing simultaneous access of program and data memory. The main advantage of CMOS and RISC combination is low power consumption resulting in a very small chip size with a small pin count. The main advantage of CMOS is that it has immunity to noise than other fabrication techniques.

PDIP
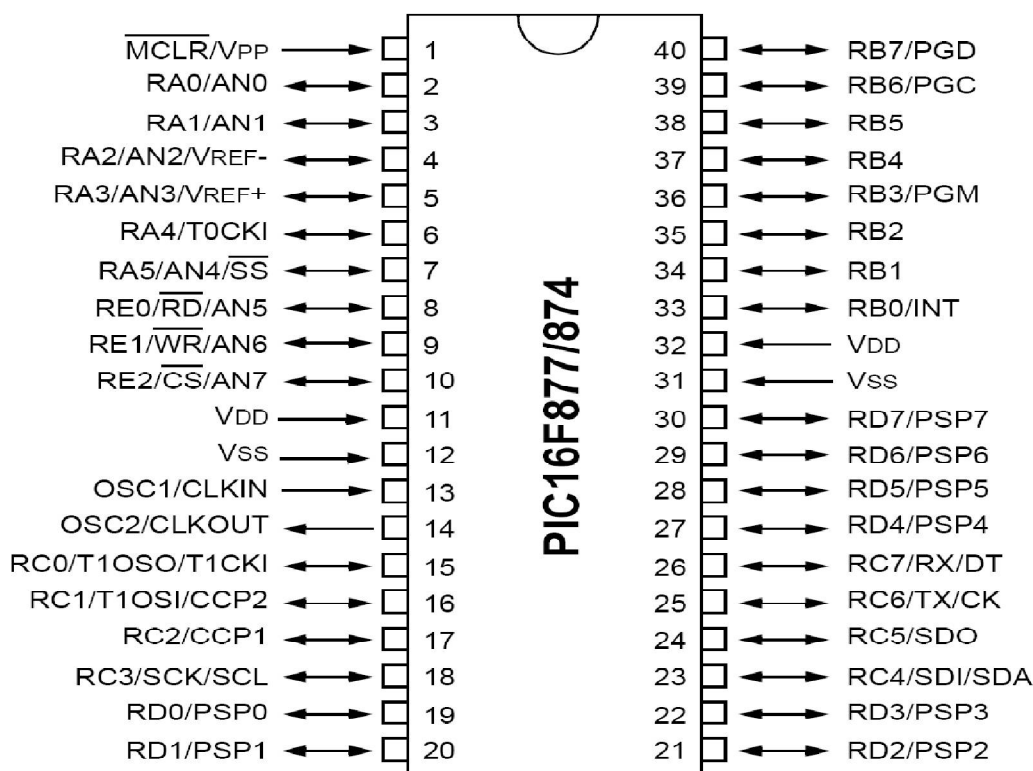
Fig.2.1.2. (a).pin diagram

DEVICE	PROGRAM FLASH	DATA MEMORY	DATA EEPROM
PIC16F877A	8K	368 byte	256 byte

Fig.2.1.2.(b).specification of PIC

2.1.3.Bluetooth module:

Serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR (Enhanced Data Rate) 3Mbps Modulation with complete 2.4GHz radio transceiver and baseband. It uses CSR Bluecore 04-External single chip Bluetooth systemwith CMOS technology and with AFH(Adaptive Frequency Hopping Feature). It has the footprint as small as 12.7mmx27mm. Hope it will simplify your overall design/development cycle.

2.1.4.LCD Display:

LCD (Liquid Crystal Display) screen is an electronic display module and finds a wide range of applications.These modules are preferred over seven segments and other multi-segment LEDs. The reasons being:

❖ LCDs are economical
❖ Easily programmable
❖ Have no limitation of displaying special characters.
❖

*16X2 LCD DISPLAY SPECIFICATIONS***:**

➢ Display Mode: STN, BLUB Display
➢ Formate: 16 Character x 2 Line
➢ Viewing Direction: 6 O'Clock
➢ Input Data: 4-Bits or 8-Bits interface available
➢ Display Font : 5 x 8 Dots

III.EXPERIMENTAL RESULTANDDISCUSSION

When the device switch on,the battery will discharge the analog inputsignal is as improved digital signal by using pic microcontroller. Then the improved digital signal will be displayed by the LCD display which is interfacing with the pic microcontroller.
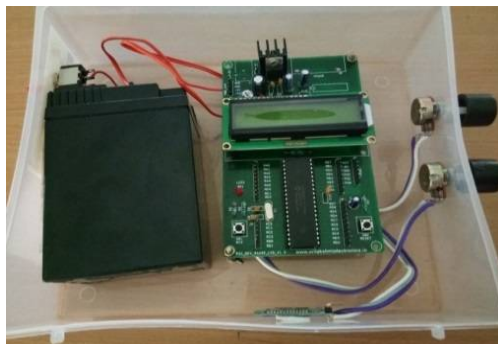
Then the voltage, current variations can be displayed in smartphone via Bluetooth module. Where we use microcontroller as PIC16F877A and Bluetooth module as HS 05.
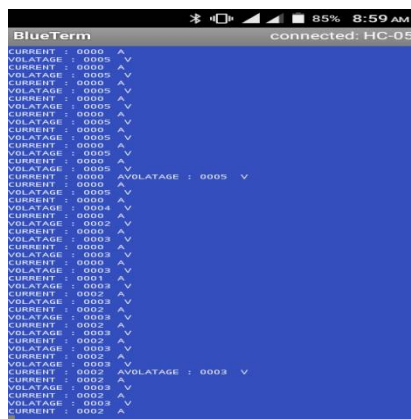

Fig.3.2.simulation result

IV. CONCULSION

This project represents the basic technologies related to low power consumption, portable and embedded Bluetooth. The device includes the capture input signal which can be converted as improved digital signal; it can be transmit into the android smart phone via Bluetooth embedded with PIC microcontroller. This device is highly used in alternated use CRO for voltage and current variation measurement.

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BIOGRAPHY

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