WIRELESS MONITORING FOR MACHINE PART COUNTER

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ABSTRACT

Our project is wireless monitoring for machine part counter. In previous system one parson used to required for continues observation and counting the product. Therefore human error was occurred as well as more time required for doing this process. To solve this problem we have implement wireless monitoring for machine part counter. Using this system we can easily count the product and directly display on mobile with the help of android APP. Using this system we can analyzed the production in small time as well as improve the transparency in production counting. The main aim of this system is monitoring and controlling through RF module. Therefore, we use Bluetooth, microcontroller and RF module.

Keyword:- *Bluetooth Module, PIC Microcontroller, RF Module (Radio Frequency),*

1. Introduction:

Wireless communications play very important role in many of electronics. The wireless communication system includes not only the areas described by home electronics but also manufacturing, industrial Local Area Networks, military purposes, or in any other areas where wired transmission of information is either impossible or impractical. Wireless communication can be implemented by methods including but not limited to radio frequency, infrared light, sound wave and visible lights. Basically, any form of media that is capable of transferring energy from the source to destination can be used for wireless communication. In our project, we resort to implement wireless monitoring for machine part counter [2]. The main aim of this system is monitoring and controlling through RF module. Therefore, we use Bluetooth, microcontroller and RF module. The parameters are Product counting and Graphical representation is displayed. Then send the same data to a remote location. Controller will make transmission between RF and Bluetooth. This process reduces paper, data entry time delays, cycle count processing, typing error, etc. This project operates on 24V DC supply. In this project we will use RF module (CC 2500) for transreceiver because it supports for various modulation format and it has a configurable data rate up to 500 k baud rate [3]. It provides extensive hardware support for packet handling, data buffering burst transmission [1]. RF module operates on 2.4GHz According to Industrial science medical(ISM) band which is free for industrial application. We use RF module for a transmitting the information under the 100 meter area. PIC is a high performance RISC CPU and it support transreceiver operation very easily. Bluetooth module (HC_05) is an easy to use serial port protocol module, design for transparent wireless serial connection setup. Bluetooth is being chosen with its suitable capability. Bluetooth with globally available frequencies of 2400Hz is able to provide connectivity up to 100 meters at speed of up to 3Mbps depending on the Bluetooth device class. In addition, a Bluetooth master device is able to connect up to 7 devices in a "Piconet"[4].

2. PROBLEM STATEMENT:

Firstly, monitoring for any system is done by human that is human is required for monitoring and counting the product. If human does some error in counting due to any factor. It will have an extremely bad effect on industries. So, we are developing a project which will automatically count the product and overall details can be analyzed directly on PC, TAB etc. Using this system we reduced complexity, wastage of time and human efforts and improve reliability and accuracy.

3. LITERATURE SURVEY:

The literature related to the research topic has been reviewed for last twenty years in order to find out work carried out by various researchers. There are many systems for remote monitoring and control designed as commercial products or experimental research platforms. It is noticed that most of the research carried out belong to the following categories:

a. Internet based Monitoring using Servers, GPRS modems, etc. with different approaches.
b. GSM-SMS protocols using GSM module individually or in combination with Internet Technologies.
c. Monitoring using Wireless Sensor Networks.
d. Wireless Monitoring using Bluetooth, Wi-Fi, Zigbee and RF.

Remote Monitoring using Wireless Sensor Networks (WSN), Bluetooth, Wi-Fi, Zigbee technologies:
Many Wireless Technologies like RF, Wi-Fi, Bluetooth and Zigbee have been developed and remote monitoring systems using these technologies are popular due to flexibility, low operating charges, etc. Today Wireless Sensor Network are used into an increasing number of commercial solutions, aimed at implementing distributed monitoring and control system in a great number of different application areas**.** The system can be controlled by three different units (web based remote control, remote control by hand-held device and keypad control mounted on AC). The hardware system of AC is controlled by PIC16F877a microcontroller.

4. SYSTEM OVERVIEW:

4.1 Block Diagram of Transmitter:

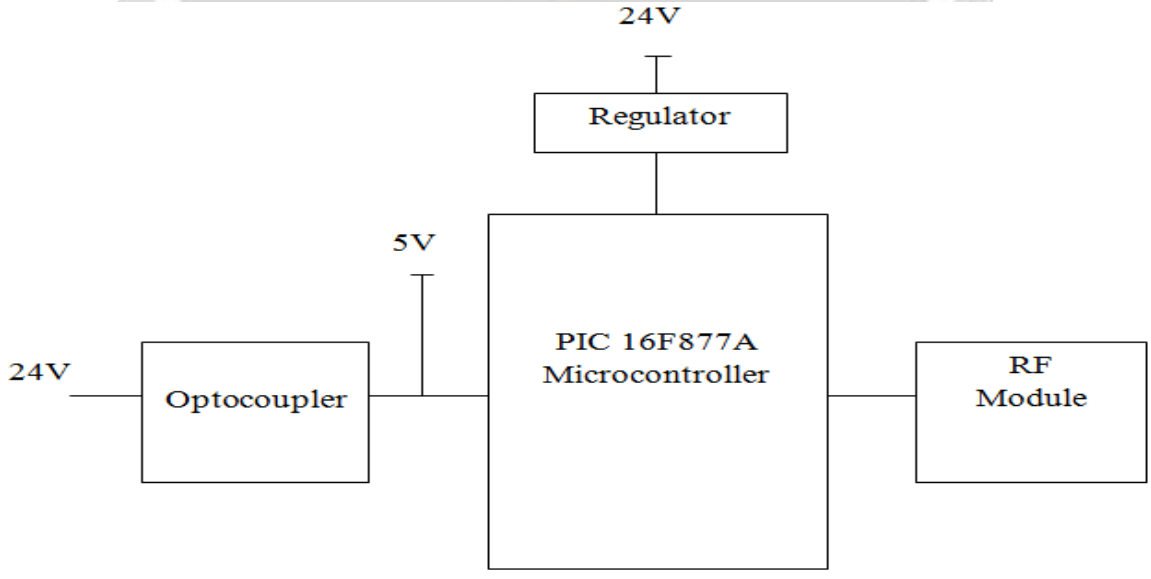

Fig.1 - Block Diagram of Transmitter

4.2 Block Diagram of Receiver:

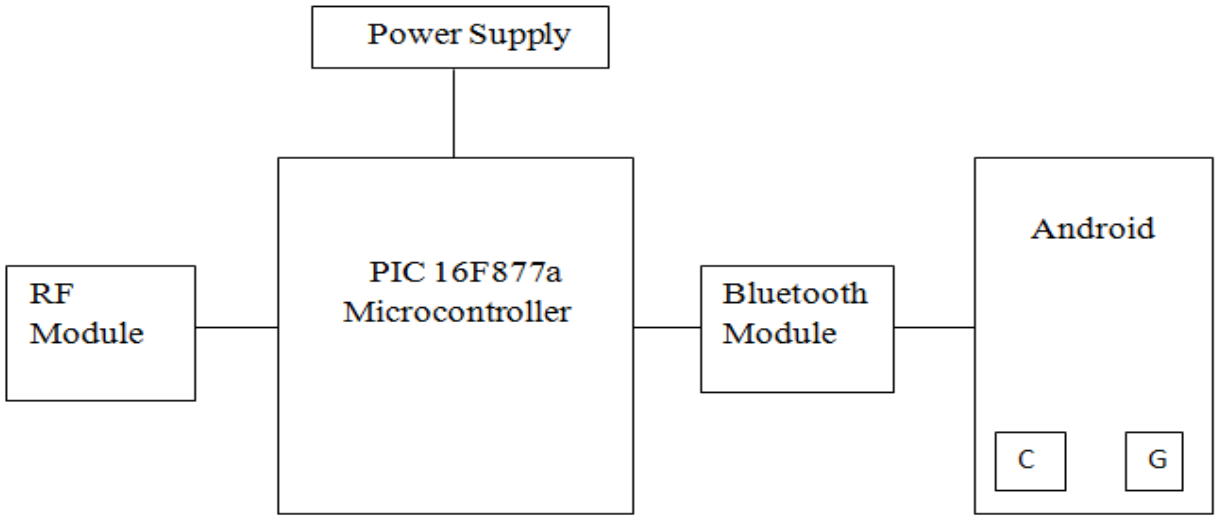

Fig.2 - Block Diagram of Receiver

4.3 Block Diagram Description:

The system is divided into two section transmitter and receiver. In transmitter section we apply the 24v input pulse to the optocoupler. Main purpose of optocupler is the to prevent rapidly change in voltage on one side of the circuit. The useful purpose of isolation is to provide protection from high voltage. Optocoupler covert 24v supply into 5v. The output of optocoupler is 5v apply to the PIC microcontroller IC. PIC microcontroller stored the data and transmit to the RF module. It is very convenient. The main advantage it can right-erase as many time possible because it use FLASH memory technology. Regulator has the several fixed output voltages them useful in wide range application, if adequate heat sink provided. They can deliver over 1Amp output current. This device can be used with external component to obtain adjustable voltage current. RF module (CC2500) is operate on 2.4GHz transceiver. It provide extensive hardware support for packet handling and a real time system. RF module can transmit data in 100 meter range. Output of transmitter section is applied to the input of receiver section. In receiver section RF module receive input data and transmit to the PIC microcontroller. Again PIC microcontrollers similarly work as a transmitter section. Output of microcontroller applied to the Bluetooth module. Bluetooth can receive the information from PIC microcontroller and sending to the device counting app. The main function of Bluetooth module it receives data serially and sends data parallely. This system is MASTER-SLAVE technology.

Table 4.1 - Component Specifications:

SR NO.	PIC MICROCONTROLLAR (16F877)	BLUETOOTH (HC-05)	RF MODULE (CC-2500)
1	Operating Speed Dc-20MHz Clock Input Dc-200ns Instruction Cycle	RF Transmitting Power +4dbm	Frequency Range-2400 to 2483.5MHz
2	Wide Operating Voltage Range-2.0V to 5.5V	Typical -80dbm Sensitivity	High Sensitivity(-10dBm At 2.4Kbaud)
3	10-Bit Multi-Channel Analog to Digital Converter	Data Bit-8,Baud Rate-9600	Data Rate-1.2 to 500 kbaud Rate

5. RESULT AND DISCUSSION:

According to industries requirement we have implement this project using PIC 16F877 microcontroller, RF module, Bluetooth module CC250In privies system one parson is required for continues monitoring & counting the product. Therefore human error was occurred as well as more time required for doing this process. To solve this problem have implement wireless monitoring for machine part counter. Using this system we can easily analyze overall production of the product with the help of android APP. This system divided in to two type transmitter section and receiver section. Transmitter section is connected to parishodhmachine. We apply the 24V input pulse after 5 sec from parishodh machine. Opt coupler receive this signal and converted in to 5V which is required for in circuit. PIC 16F877 stored the counted pulse and send to RF module. Receiver section is which digital form is. PIC stored received signal placed at office cabin receiver side RF module receive the signal from transmitted RF module. in EEPROM memory and send to Bluetooth module. Whenever parson want to see the product counting. First pairing mobile Bluetooth and device Bluetooth. Establish connection between two devices. Then open device counting APP. As our requirement we select count option or select graph option. If we select count option then total product counting display on mobile. If we select graph option then overall production analysis display with help of graph. It is portable and real time system.

Fig.3 - Wireless Monitoring For Machine Part Counter

6. SUMMARY/CONCLUSIONS:

This study gives remedies from the faults occurring in monitoring the machine part counting and it overcomes the drawbacks of previous working system. The mainly through wireless communication that eliminates the use of large cables which are of high cost, low reliability and maintenance. The RF Transmission helps in better way of communication which enhances the improvement steps in this process. Using this system we reduce the human efforts as well as improve the system accuracy. Bluetooth based monitoring system serves as a reliable and efficient system for monitoring the machine part. Wireless monitoring of filed not only allowed user to reduced human power, but also allowed user to see accurate monitoring of system. It is chipper in cost.

7. ACKNOWLEDGMENTS:

We would like to thank to Prof. Gore S. S. for his advice support and encouragement throughout this work and help about the paper quality. We are also grateful to Ms. Deshmukh R. J. for suggestion to published a paper with all experiences incorporated.

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