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Web Based Real Time ECG

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ABSTRACT: In the real time, it is expected that the ECG data should be available on the mobile phones and internet and even in absence of doctor at the hospital the required treatment should be started immediately. The doctor in his absence at the hospital should be able to check the ECG and allow for fast ECG check and take corrective action immediately. Considering this factor the proposed system allows the ECG trace should be captured by the PC to which it is connected and allows for capturing ECG image and sends it in real time to remote location where the doctor can check the ECG and take immediate action if necessary. Heart rate would be a feature indicated and whether it comes under the group of tachycardia or bradycardia is also indicated.

KEYWORDS: ECG, remote monitoring, real time diagnosis, Lab VIEW

I. INTRODUCTION

The real time ECG capture has become a necessity in the recent lifestyle where everybody is busy in their routines. Following everyday routine we tend to forget about our health and thus sudden emergencies requiring medical attention may be just thus ignored and it may result disturbing our life completely. Thus in this busy lifestyle it is necessary that we take care of our health. In such a case it may be beneficial if we are able to take ECG recording at home or office, and transfer it over the Internet and allow doctor to take the immediate decisions if any cardiac emergency occurs. This allows for remote monitoring of the ECG even in the hospitals and in the absence of doctors in the hospital the patients can still be diagnosed by the hospital personnel. The hospital personnel thus can send the ECG in real time and allow doctor to remotely diagnose the disease and indicate the medication as soon as possible.

II. BLOCK DIAGRAM OF WEB BASED REAL TIME ECG

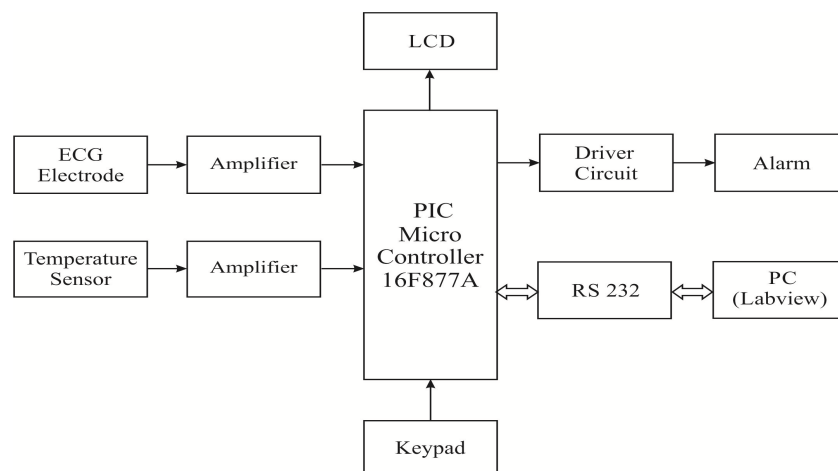


FIG 1: Block Diagram of Web Based ECG

III. BLOCK DIAGRAM OF POWER SUPPLY

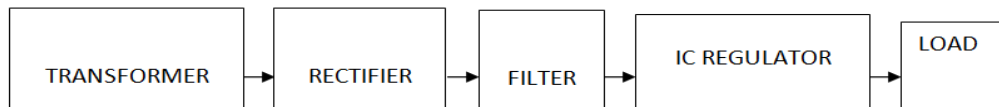


FIG 2: Block Diagram of Power Supply

There are many types of power supply. Most are designed to convert Voltage AC Mains electricity to a suitable low voltage supply for electronic Circuits and other Devices. A power supply can be broken down into a series of blocks, each of which performs a particular function.

- Transformer - steps down high voltage AC mains to low voltage AC.
- Rectifier - converts AC to DC, but the DC output is varying.
- Filter - avoids noise signal
- Regulator - For ICs, microcontroller, LCD ----- 5 volts
For alarm circuit, op-amp, relay circuits ----- 12 volts

IV. PIC MICROCONTROLLER



FIG 3: PIC Microcontroller

PIC (usually pronounced as "pick") is a family of microcontrollers made by Microchip Technology, derived from the PIC1650 originally developed by General Instrument's Microelectronics Division. The name PIC initially referred to Peripheral Interface Controller. The first parts of the family were available in 1976; by 2013 the company had shipped more than twelve billion individual parts, used in a wide variety of embedded systems. 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 by family of PIC, and may be 12, 14, 16, or 24 bits long. The instruction set also varies by model, with more powerful chips adding instructions for digital signal processing functions.

The hardware capabilities of PIC devices range from 6-pin SMD, 8-pin DIP chips up to 144-pin SMD chips, with discrete I/O pins, ADC and DAC modules, and communications ports such as UART, I2C, CAN, and even USB. Low-power and high-speed variations exist for many types.

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, availability of low cost or free development tools, serial programming, and re-programmable Flash-memory capability.

V. RS232 COMMUNICATION



FIG 4: RS232

RS232:

In telecommunications, **RS-232** is a standard for serial binary data interconnection between a *DTE* (Data terminal equipment) and a *DCE* (Data Circuit-terminating Equipment). It is commonly used in computer serial ports.

Details of character format and transmission bit rate are controlled by the serial port hardware, often a single integrated circuit called a UART that converts data from parallel to serial form. A typical serial port includes specialized driver and receiver integrated circuits to convert between internal logic levels and RS-232 compatible signal levels.

VI. OVERALL SETUP

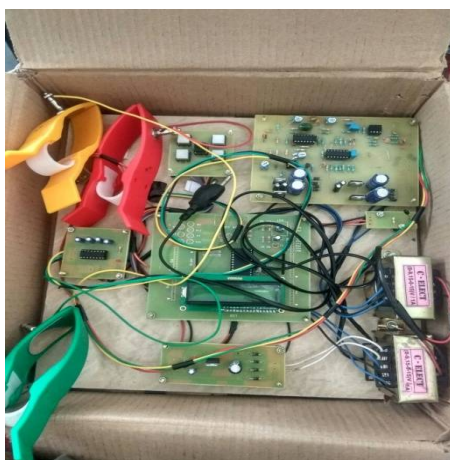


FIG 5(a): hardware Setup

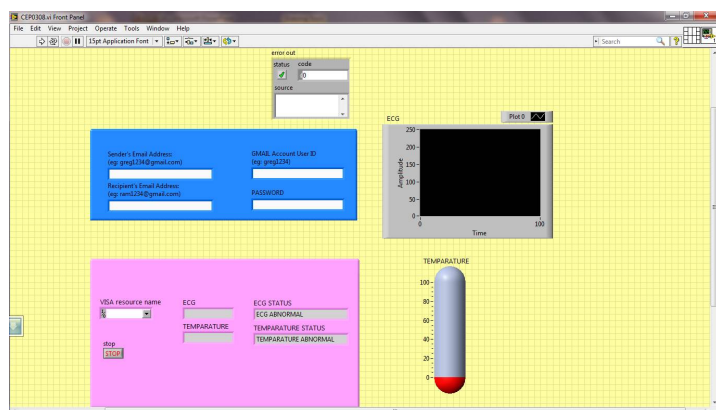


FIG 5(B): Lab view Setup

The above figure is the output of the entire system. The value shown in the LCD display is the ECG pulse. The same ECG pulse is shown in the substation by using Lab VIEW software. This system is achieved by using RS232 communication.

VII. CONCLUSION

The ECG signal thus obtained from the electrodes is processed to obtain digital signal and then that signal is further processed in Lab VIEW. Then at a remote location the doctor can view the reading of ECG signal on his mail. Further development possible in this, is inclusion of further processing to detect other diseases as well and also integrating it with BP or EEG measurements.

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