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Hand Held Multipara Monitor

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Abstract: ***The hand held multipara monitor is a device which is used to assess the basic parameters of human body. The device helps the people who need domiciliary care and helps to disseminate the recorded or observed values in android application. The monitored body parameters are cross checked with the normal values and can be scrutinized by the care taker. This also succours the patient, care taker and doctors to know the basic body parameters at the time of need. This also gives the consequential difference between the normal and abnormal body variables.***
Keywords**: *Multipara monitor, MAX30100, Arduino nano, LM 35, ECG sensor, Bluetooth module, Android application.***

I. INTRODUCTION

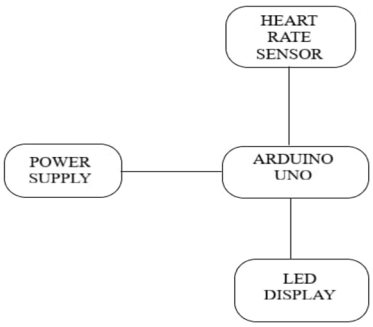
Vital sign recording is one of the most important tools in monitoring the clinical status of a patient in any hospital setting. Multipara monitors take care of any hospital setting. Multipara monitors take care of this job in an Intensive care unit (ICU) and provide continuous real time information about the patient. Patient monitoring is of great help not only for patients but for healthcare professionals as well. The substantial growth in mobile hand held technologies has heralded the opportunity to provide physicians with access to information, resources and people at the right time and place. The impact of mobile hand-held technology on hospital physicians' work practices and patient care, focusing on quantification of the espoused virtues of mobile technologies. Hand held devices are introduced in 1990's and they are steadily increased, generally they are small, portable, lightweight computers with wireless network connectivity. Hand held projects are designed to save time and efforts of the medical practitioner and geriatric patients to save the life from risk. Monitoring vital signs of the patients for the prolonged time period and at the time of need is possible only under the roof called hospital. Shifting a multipara monitor to the patients who are under home care and to monitor geriatric patients under home care is not possible because of its size, operation and prize. When a vast size and function can be modified with same structure, efficiency and affordable rate it can help many geriatric patients and physicians to save the time of dignosing process and also to save the from the risk factors.

II. OBJECTIVE

The objective of the project is to the help the people under domiciliary care as well as the medical practitioner to know the problem and aid them with medication. They can instantly give the values of the body parameter like heart rate, oxygen saturation level etc. We use the two to three sensors which is of compact size and portable and can be charged. This gives accurate value when compared to the available vast machine and by this we have achieved our purpose.

III. EXISTING METHOD

In the existent technique, directly the sensors will be connected to the OLED display, which display the required body variable value. We can select which parameter and find the values . It can only give the output only when we touch the sensor with finger it sense and give the value. Here individual sensors are being used to generate the value. The power supply given here is of 3.3v. The connections and conductivity are within center distance .Here the sensor is being controlled by the arduino UNO microcontroller. The existent technique has arduino, OLED display and heart rate sensor.



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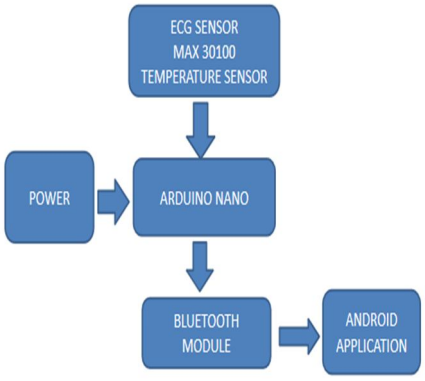
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IV. PROPOSED MODEL

In the proposed model the arduino will be connected with the sensors which will be connected to the mobile through the Bluetooth module, the Bluetooth will directly pass the received values to the Bluetooth module in the Arduino nano microcontroller. The components we use in our project are of low cost and good efficiency, the components are

A. Arduino nano microcontroller
B. ECG sensor
C. Max30100
D. Temperature sensor
E. Android application

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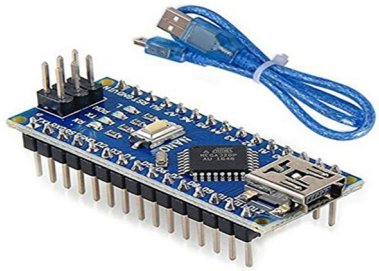
V. SYSTEM DESCRIPTION

A. Arduino Nano

ATMEGA is a single chip microcontroller made by Atmel in the family megaAVR. It has an altered equipment engineering. It is an 8-piece and 28 pins AVR Microcontroller, pursues RISC Architecture and it has program memory of 32KB.

The Arduino Nano is a compact board similar to Uno .The Arduino Nano is a small, complete, and bread-board friendly board based on the ATmega328P(Arduino Nano 3.x).The key difference between arduino UNO and Arduino Nano is that the nano has two extra analog pins, A6 and A7, but the UNO uses an ATmega with 328P with 28 pins. Functions like pinMode() and digitalWrite() are used to control the operations of digital pins while analogRead() is used to control analog pins.

It goes about as an interface. Outer (non-USB) power can come either from AC to DC connector (divider mode) or battery. The connector can be related by halting 2.1mm center positive fitting into the boards ability jack. Leads from the battery can be implanted in the Gnd and vin stick header of the power connector.



Arduino nano

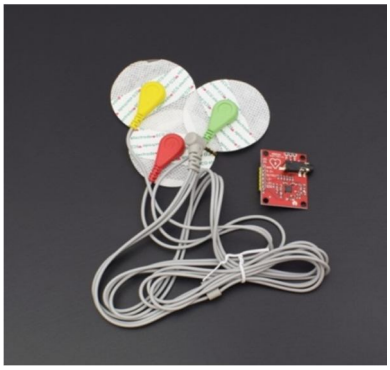
Arduino Nano with a crystal oscillator of frequency 16Mhz.They operate at 5volts. Each pin can provide or receive a maximum of 40mA. This arduino which is used to convert the analogy signals into digital signals which will be display in the mobile using the arduino synced android coding.

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B. ECG Sensor

An ECG is a non-invasive, painless test with quick results. During an ECG, sensors (electrodes) that can detect the electrical activity of your heart are attached to your chest and sometimes your limbs. ECG records the electrical activity generated by heart muscle depolarization's, which propagate in pulsating electrical waves towards the surface ECG electrodes are typically wet sensors, requiring the use of a conductive gel to increase conductivity between skin and electrodes. They play a major role , it records the heart rhythm which will be displayed using the android application.



ECG sensor and ECG electrode (surface electrode)

C. Max 30100

The MAX30100 is an integrated pulse oximetry and heart-rate monitor sensor solution. It combines two LED's photo detector, optimized optics and low-noise analog signal processing to detect pulse oximetry and heart-rate signals.

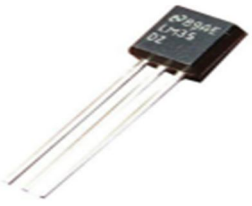


MAX 30100

MAX30100 operates on a supply in the range of 1.7 to 2V. It reduces power consumption and visible light emission when the user's finger is not on the sensor. Ultra-low power operation increases battery life for wearable devices. Application of MAX30100 is, fitness assistant devices, medical monitoring devices and wearable devices.

D. LM35

LM35 is a temperature measuring device having an analog output voltage proportional to the temperature. It provides output voltage in centigrade (celcius). It does not require any external calibration circuitry. Sensitivity of LM35 is 10mV/degree celcius.



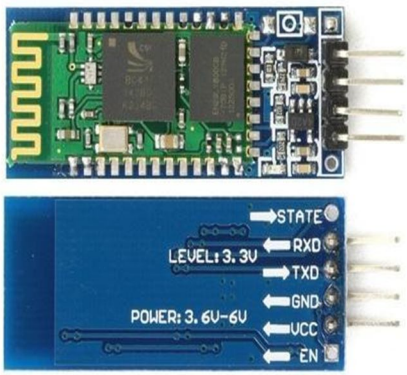
LM 35

As temperature increases output voltage voltage also gets increased. LM35 gives temperature output which is more precise than thermistor output. It operates with supply of 4V to 30V and measures the temperature from the range of -55 deg C to +150 deg C.

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E. Bluetooth Module

The HC-06 is a class 2 slave Bluetooth module designed for transparent wireless serial communication. Once it is paired to a master Bluetooth device such as PC, smart phones and tablet, its operation becomes transparent to the user. All data received through the serial input is immediately transmitted over the air. When the module receives wireless data, it is sent out through the serial interface exactly at it is received. No user code specific to the Bluetooth module is needed at all in the user microcontroller program.



Hc – 06 Bluetooth module

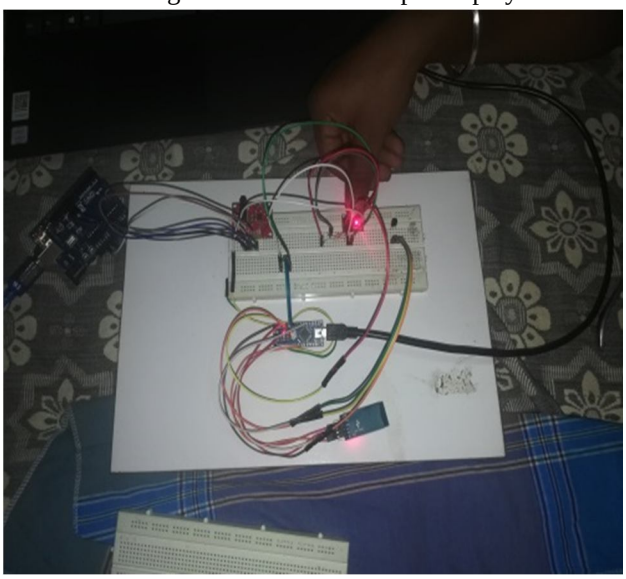
The HC-06 will work with supply voltage of 3.6VDC to 6V DC, however, the logic level of RXD pin is 3.3V and is not 5V tolerant. A Logic Level Converter is recommended to protect the sensor if connect it to a 5V device (e.g Arduino Uno and Mega).

F. Android Applications

An Android app is a software application running on the Android platform. Because the Android platform is built or mobile devices, a typical Android app is designed for a smartphone or a tablet PC running on the Android OS. Android apps are written in the Java programming language and use Java core libraries. In our project the arduino will be laden with a program which will be synced with the android application.

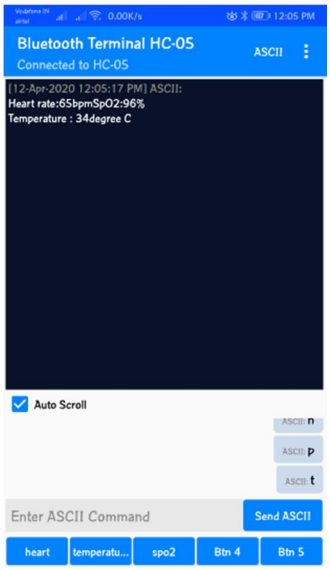
VI. RESULT

The interfaced setup of sensors with the micro controller Arduino nano and with Bluetooth module results as light weight and cost effective medical care equipment. The basic working of hardware and output displayed in mobile application is displayed below.



Working of hardware

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Software output

When sensor is placed over the patients body this is how the hardware works out and relays the observed parameter in the android mobile application.

VII. CONCLUSION

The prototype was developed in an efficient hand held structure which can measure vital signs of the body. The aim of the design is to attain reduction in time during monitoring parameters of the body, must be in cost effective manner and easily portable. By using this device we can record or observe each body variables individually at the time of need.

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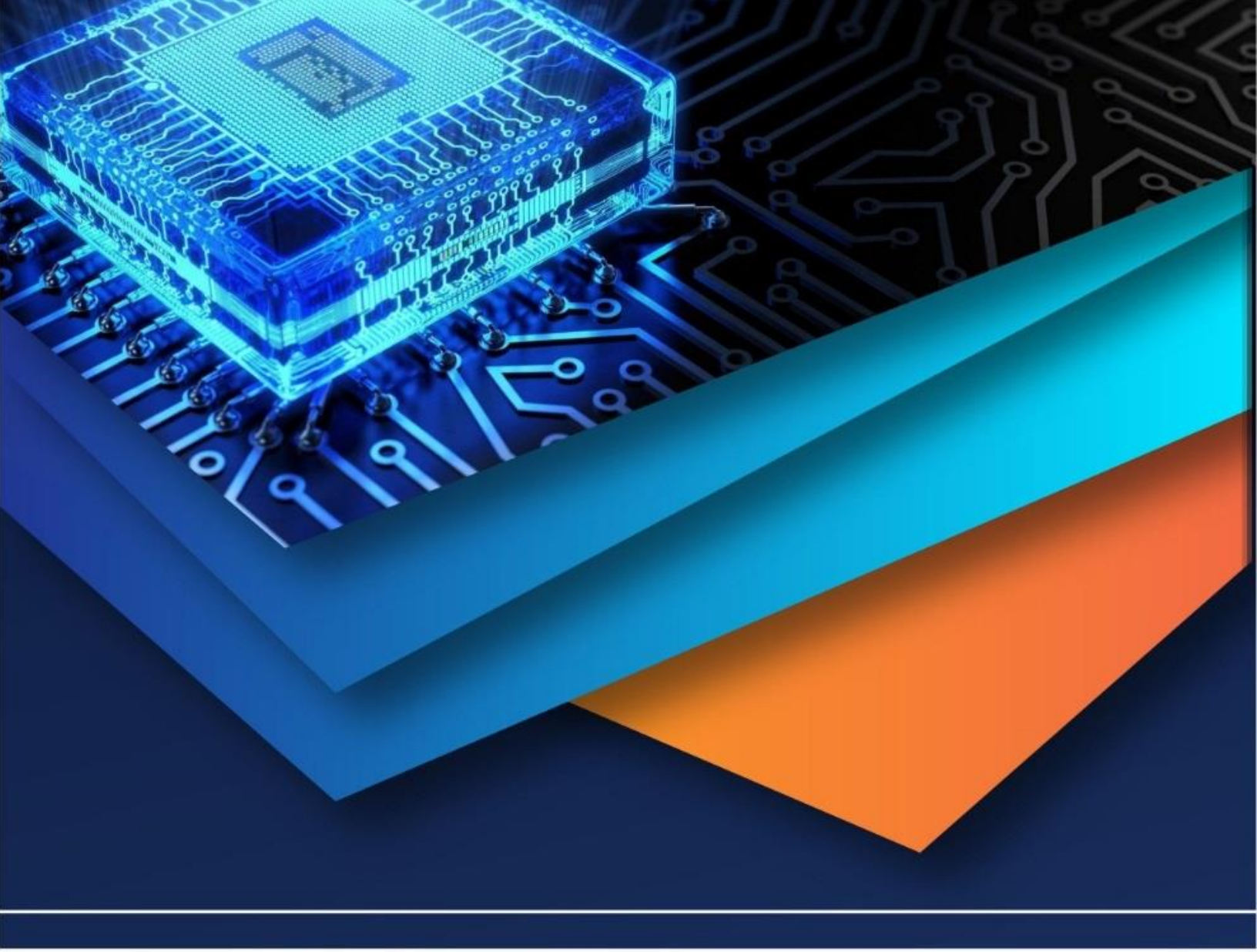
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