IMPLEMENTATION OF HEALTH MONITORING SYSTEM USING RF ID

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ABSTRACT

In the last decade, Radio Frequency Identification (RFID) has become popular in so many fields from military to industry applications. RFID Tag stores individual information of its attached object and an RFID reader communicates with the tag in radio frequencies to identify the object. This object to be monitored may also be a human. In our work, RFID technology is applied in health care systems. The system supports wireless communication between the RFID tags and readers. Each patient available in the system is inherently sensors and wears a bracelet integrated with a unique tag, and the readers each including a wireless RFID reader card. In this study, an RFID-based patient-monitoring system has been considered. This system, which can be created by integrating a probable patient information system and proposed RFID application, is seen as a proper solution in cases when doctors want to have fast and automatic access to patient information and in particular when patients are not able to establish healthy communication. From this point on, after the information of patients who come to the hospital is recorded in the system, a bracelet is worn by the patients which includes an RFID tag, and the relevant doctor who is assigned to the patients can read the tag in the bracelets with authorized access to an RFID card reader-supported PDA device,

and, as a result of this definition, PDA device can reach the server and withdraw relevant health information from database and submit them to the doctor.

INTRODUCTION

Radio Frequency Identification (RFID) is a communication technology which allows for defining some unique characteristics of an object or a living being, usually its identification information, by relating it to a numeric serial number within a tag, and ensures that this number is conveyed by using radio waves. RFID provides a communication infra -structure at the radio frequencies between a special tag and reader device that can detect the tag, and allows for establishing communication between devices within the system without any physical contact, or even without seeing each other. In recent years, RFID technologies are used in a number of fields including military, logistics, education, production, security, and health. Due to its low cost, RFID technology is becoming widespread throughout the global world. There are different applications of using RFID technologies in health industry. When the significance of human health is considered, it is necessary that information is transferred in a correct and fast manner to rapidly perform the first aid to the patient. By using RFID technologies as integrated with patient information systems, it will easily be possible to identify patients with the RFI tags that they carry and to rapidly process the previously recorded

information about that patient. Based on this reasonable motivation, an RFID-supported patient monitoring system is designed.

OBJECTIVE

The patient parameters Temperature, pressure, Heart beat rate, ECG keeping track of using wireless communication. In case of an emergency situation arising, the microcontroller immediately sends an information alert through RF Transmitter

EXISTING SYSTEM

A patient has to be monitored by a person then and there. No automatic systems exist for this requirement at this point in time. The existing system doesn't have any monitoring system. Doctor knows the patient's condition only if he is near.

PROPOSED SYSTEM

At the monitoring station RF Receiver gets the parameters of the patients. In case of an emergency situation, the problem is conveyed immediately to a concerned person in monitoring room, informing about the situation of the patient.

BLOCK DIAGRAM
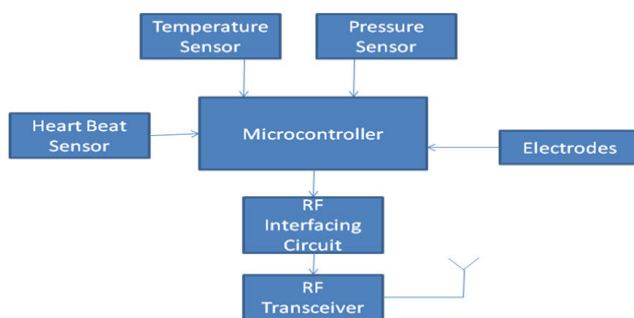
PATITENT MODULE

PC MODULE

BLOCK DESCRIPTION

Sensors – The Sensors are placed in contact to body for completely monitoring the parameters like temperature, pressure and heart beat rate of a soldier in war field. PIC Microcontroller is used. The sensors will transmit the sensed information to microcontroller. The micro controller in turn checks the information and transmits through RF Transmitter. RF Transmitter and Receiver are used for conveying the parametric changes sensed from various sensors to the respective person on monitoring side.

SENSORS

ECG ELECTRODES

`   These are probably the two most important questions healthcare professionals ask about monitoring electrodes.

The integrated abrader strip may be used to gently prepare the skin, reducing its impedance and providing optimal ECG trace quality.

ECG ELECTRODES

3M has long been a leader in pre-wired disposable electrodes for neonates and infants. The benefits of pre-wired solutions are bringing to patients of all ages. These lightweight, low-profile lead wires provide increased patient comfort, and may reduce

the risk and cost of HAIs. In addition, 3M offers a solution that makes one set of lead wires compatible with all your facility's equipment (hardwired, telemetry, and defibrillator) In fact, adapters are only needed about 10% of the time, much less than other systems.

ECG ELECTRODES

Spacing and lead sequence can be standardized across multiple monitoring systems. Consisting of universal connectors, universal cables and adapters (when necessary), this system can be used with shielded and unshielded, disposable and reusable, radiolucent and pre-wired lead wire sets, including 3M™ Red Dot™ Adult Pre-wired Electrodes. One set of lead wires can be used for each patient throughout their hospital stay. To help us make smart recommendations regarding your monitoring needs, fill out the form on page 21 of this brochure, and review it with your 3M representative.


HEART RATE SENSOR

HRM is a portable heart rate monitoring module. It works on the principle of opto interruption caused by the flow of blood. The sensor houses an IR transmitter and a sensitive IR detector on the other side of the sensor. HRM2115 is available in two different options for user convenience. The "E" version of for using the sensor by clipping to the ear lobe. The"B" version is for using it with the finger. Any of these can be used dependent on user convenience and suitability

TEMPRATURE SENSOR
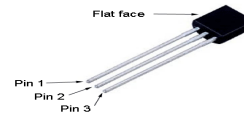
The LM35 series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature. The LM35 thus has an advantage over linear temperature sensors calibrated in ° Kelvin, as the user is not required to subtract a large constant voltage from its output to obtain convenient Centigrade scaling.

RF MODULE

RF modules are designed with low to medium transmit power and for high reliability wireless networks. The modules require minimal power and provide reliable delivery of data between devices. The interfaces provided with the module help to directly fit into many industrial applications. The modules operate within the ISM 2.4-2.4835 GHz frequency band with IEEE 802.15.4 baseband.

LabVIEW

(**Lab**oratory **V**irtual **I**nstrumentation **E**ngineering **W**orkbench) is a platform and development environment for a visual programming language from National Instruments. The graphical language is named "G". Originally released for the Apple Macintosh in 1986, LabVIEW is commonly used for data acquisition, instrument control, and industrial automation on a variety of platforms including Microsoft Windows, various flavors of UNIX, Linux, and Mac OS.

DATAFLOW PROGRAMMING

The programming language used in LabVIEW, also referred to as G, is a dataflow programming language. Execution is determined by the structure of a graphical block diagram (the LV-source code) on which the programmer connects different function-nodes by drawing wires. These wires propagate variables and any node can execute as soon as all its input data become available. Since this might be the case for multiple nodes simultaneously, G is inherently capable of parallel execution. Multi-processing and multi-threading hardware is automatically exploited by the built-in scheduler, which multiplexes multiple OS threads over the nodes ready for execution.

OUTPUTS USING LABVIEW

Comma delimited files can be saved from LabVIEW and read by Excel. They should be saved with the .csv file extension when operating in the Windows environment. A better solution is to use Excel to call the LabVIEW VI using VBA code and pass data back and forth between LabVIEW and Excel. Alternatively, you can make ActiveX calls to Excel from within a LabVIEW VI and perform those same operations. An example of how to do both of these can be found in LabVIEW's help file.
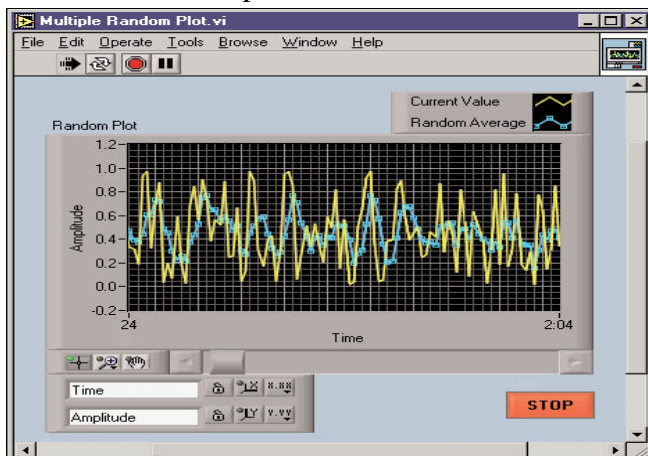
SIMULATION WAVEFORM
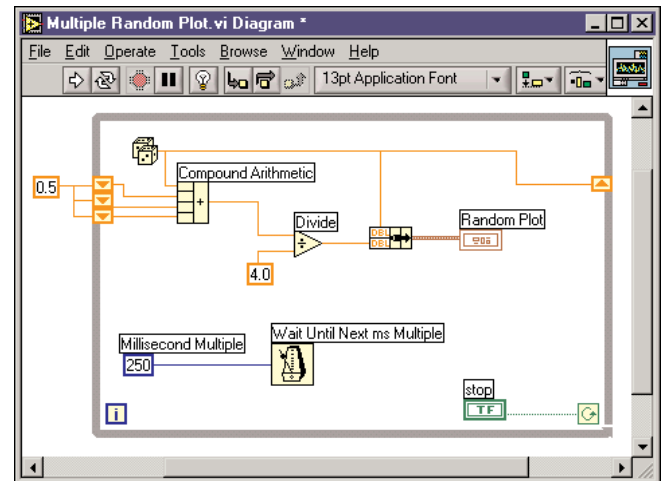
VI DIAGRAM

CONCLUSION

In this paper, the system can used for monitoring the patient's blood pressure, heart beat, temperature and ECG and transmit those parameters to the doctor using RF transmission. The concepts of RF technologies are used and relevant standards are examined. RF communication is used for patients monitoring purposes in hospitals.

FUTURE SCOPE

Health monitoring system using RFID is mainly intended designing with the above mentioned system, keeping this as the basic foundation in Tele-medical fields we can built a more robust system that Integration of inpatient and out-patient services, creating user networks example: Tele-pathology, Case conference and research oriented Continued Medical Education. . We can increase inpatient efficiency – walk into the hospital down load updated patient list, down load list of new consultations, voice mail and video mail, message from physicians / nursing / patients / Patient's family. With further 4-G technology we can build Wireless Long Distance

[WiLD] Clinical Applications deliver expertise to anywhere in the world and medical Transportation. Apart from these tasks the main challenge still to human being is implementation of Tele-surgery in Medical Education.

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