International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 1, Issue 1, September 2014

An Interactive Real Time System for Continuous monitoring of Heart Patients

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Abstract: The main design of this project is to trace the guts attack of patients who are suffering from any attacks throughout driving and to send them a medical need to make sure that the persons are safe from accident. An eye fixed blinking device which is accustomed sense the blinking of the attention. A spO2 device is used to envision the heartbeat rate of the patient. Each square measure is connected to small controller. If eye blinking gets stopped then the signal is distributed to the controller to form Associate alarm through the buffer. If spO2 device senses a variation in pulse or low element content in Blood, it should lead to cardiopathy; then the controller stops the motor of the vehicle. Then Tarang F4 transmitter is employed to send the vehicle & the mobile range of the patient to a nearest medical station at intervals twenty five kilometres for treatment. The heartbeat rate is monitored via digital display .The Tarang F4 receiver receives the signal and passes through controller, the amount gets displayed within the digital display screen and an alarm is made through a buzzer as before long the signal is received. 5 topics are mentioned during this project : Detecting the patient beats per minute and also the Eye blinking standing; transmittal via Tarang F4 just in case of abnormalities in patient; The patient status is displayed and indicated by Buzzer; The Hospital Unit receives the patient's mobile and also the automotive number; The communication between the vehicle and also the Hospital through Tarang F4.

Keywords: sPO_2 sensor, Tarang Transmitter, Tarang Receiver, Eye blink sensor

I. INTRODUCTION

A cardiac patient monitoring system is used in which at the first level the Tarang F4 is used for the communication which has more coverage area than the zigbee, for the communication between the vehicle and Hospital. Hence here we design a system which can be used by the vehicle and the Hospital which can communicate each other. We design an automated communication between the patient to Hospital. We also design the automatic vehicle ignition OFF. As the patient suffers any attack or he/she is sleeping,the buzzer indicates an alarm and the patient's BPM, eye blinking ratio is dislayed in LCD as "EYE CLOSED" or NOT.The IR sensors monitors the both function. Meanwhile the patient's status is transmitted to the hospital. The mobile number and vehicle number is displayed on the hospital LCD and is indicated by an alarm and RED LED. The Hospital members then tracks the patient [1].In [2] proposed a system the ever-growing age median among travellers, a health monitoring application is becoming more of a necessity in large capacity aircraft environments, providing safety to passengers with actual or chronic risks, and reducing risk and cost for long-range aircraft operations. Considering the technological advancements in embedded sensor devices a portable medical monitoring enclosure has been developed to provide with the flexibility of low cost and high accuracy measurement equipment in avionic environments. several types of health monitoring sensor modules can be integrated in a compact portable enclosure - such as Electrocardiogram, pulse rate, blood pressure, oximetry, temperature. Health monitoring application is mainly proposed to provide alerts for medical health monitoring staff for the patients when needed. It can be taken by patient and keep the patient movement intact because it is miniature and portable. However The GSM Signal fails at remote areas and ZigBee Coverage area is small. In [3], The authors have developed a database system for this purpose that consists of a portable monitoring terminal,a database for continuous recording of patient and device status, and a web-based data access system with which the clinicians can access the real-time registering of patient data and past history data as well. The system has been tested with data generation emulators installed on remote sites for simulation study and in 2 cases of actual animal experiment conducted at remote facilities. The system showed acceptable functionality and reliability. The results are expected to be a good base for practical use of the system. A machine intelligence based automatic data analysis module is to be included for better practicality. The database system for the continuous patient monitors records. However this method is suitable for only the artificial heart patient. [4] proposed a system in which the physiological data of the heart failure patient at home is monitored. Transducers for measurement

of electrocardiogram (ECG), heart rate variability (HRV), acoustical data are embedded into patient clothing for unobtrusive monitoring for early, sensitive detection of changes in physiologic status. The electrocardiogram (ECG), heart rate variability (HRV), acoustical data are embedded for unobtrusive monitoring for early, sensitive detection of changes in physiologic status. However This paper is not suitable for the mobile patient's and it does not deals with the alert system.

II. PROPOSED SYSTEM

A. Hospital Unit

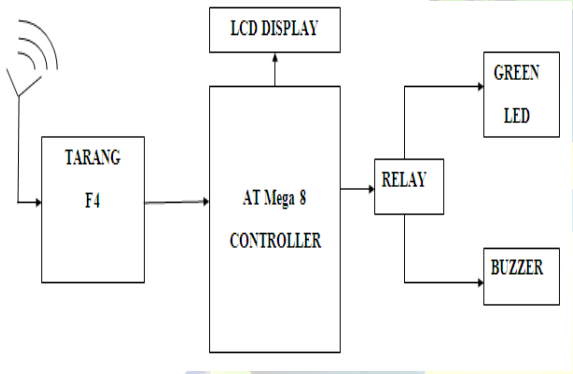

Fig. 1 Block diagram of Hospital unit

Fig.1. Shows The Block Diagram Of the Circuit (i.e) The Hospital Unit. The Hospital Unit Consists of Microcontroller, Tarang F4, Relay, Green LED, LCD and the Buzzer. As soon as the signal received by the Tarang F4 it sends the data to the controller. The controller output is normally LOW, Therefore the Relay ON the Green LED. If the Controller output is High the Relay toggles to the Buzzer. The Controller displays the patient's Vehicle and the Mobile number . The car unit have AT Mega 8535 Microcontroller and the Hospital Unit have AT Mega 8 Microcontroller.

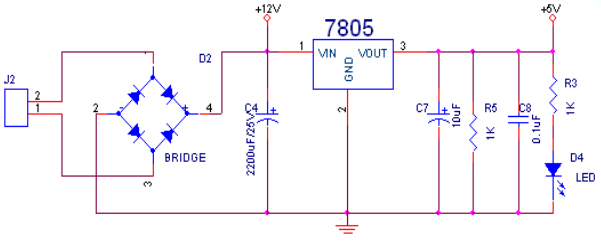

Fig. 2 Circuit diagram of Hospital unit

Fig.2. Describes The Circuit Diagram Of The Receiver Unit.

B. Memory Organization

The ATmega8535 provides the following features: 8K bytes of In-System Programmable Flash with Read-While-Write capabilities, 512 bytes EEPROM, 512 bytes SRAM. This section describes the different memories in the ATmega8535. The AVR architecture has two main memory spaces, the Data Memory and the Program Memory space. In addition, the ATmega8535 features an EEPROM Memory for data storage. All three memory spaces are linear and regular. The ATmega8535 contains 8K bytes On-chip In-System Reprogrammable Flash memory for program storage. Since all AVR instructions are 16 or 32 bits wide, the Flash is organized as 4K x 16. For software security, the Flash Program memory space is divided into two sections, Boot Program section and Application Program section.

C. ATMEGA 8 Architecture

The ATmega8 provides the following features: 8 Kbytes of In-System Programmable Flash with Read-While-Write capabilities, 512 bytes of EEPROM, 1 Kbyte of SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible Timer/Counters with compare modes, internal and external interrupts, a serial programmable USART, a byte oriented Two wire Serial Interface, a 6-channel ADC (eight channels in TQFP and QFN/MLF packages) with10-bit accuracy, a programmable Watchdog Timer with Internal Oscillator, an SPI serial port, and five software selectable power saving modes. The Idle mode stops the CPU while allowing the SRAM, Timer/Counters, SPI port, and interrupt system to continue functioning. The Power downmode saves the register contents but freezes the Oscillator, disabling all other chip functions until the next Interrupt or Hardware Reset. In Power-save mode, the asynchronous timer continues to run, allowing the user to maintain a timer base while the rest of the device is sleeping. The ADC Noise Reduction mode stops the CPU and all I/O modules except asynchronous timer and ADC, to minimize switching noise during ADC conversions. In Standby mode, the crystal/resonator Oscillator is running while the rest of the device is sleeping. This allows very fast start-up combined with low-power consumption.

III. RESULT AND DISCUSSION

Fig.3. shows the Tarang F4 module. Modules are suitable for adding wireless capability to any product with serial data interface. The modules require minimal power and provide reliable delivery of data between devices. The I/O interfaces

provided with the Module help to directly fit into many industrial applications. The modules operate within the ISM 2.4 GHz frequency with 802.15.4 base band.

Fig. 3 Tarang Module

The Car Unit is mounted near the driver's seat. If the driver is suffered by any attack or he is sleeping the controller warns the patient by a buzzer and the pulse rate, eye blinking time is displayed on the LCD screen. If the patient is normal only the pulse rate, eye blinking time is displayed on the LCD screen. If the patient is sleeping or pulse rate downs due to heart attack is indicated by a buzzer and the patient's record is transmitted to the nearby hospital by the Tarang F4. Then the motor is Turned OFF.

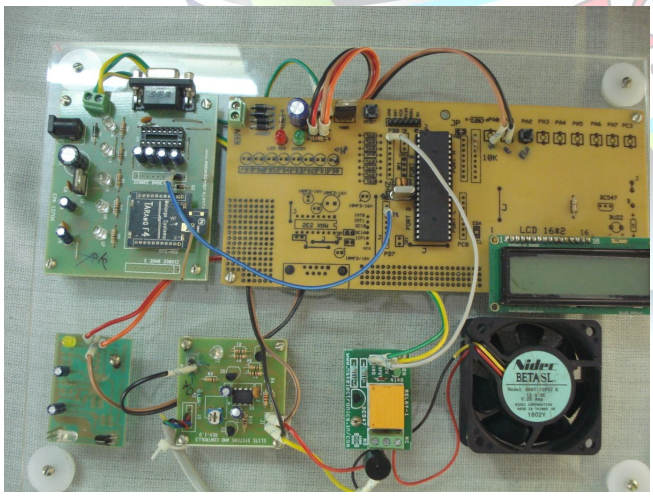

Fig. 4. Car Transmitter unit

Fig.4. shows the Top view of the Transmitter Car Unit which consists of Eye and Pulse detecting sensor, TarangF4, Controller, LCD and Buzzer.

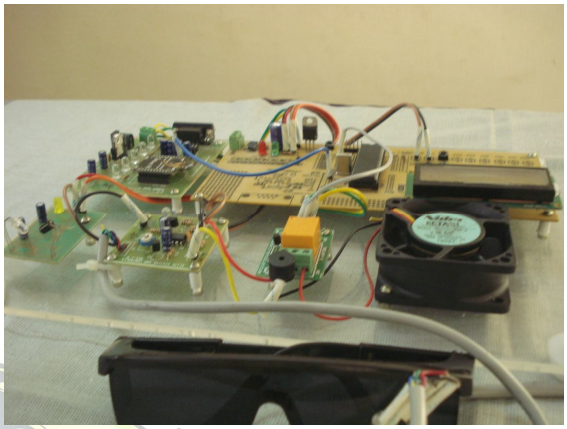

Fig. 5. Car Transmitter unit –Front view

The Fig.5. shows the Front View of Transmitter car unit.

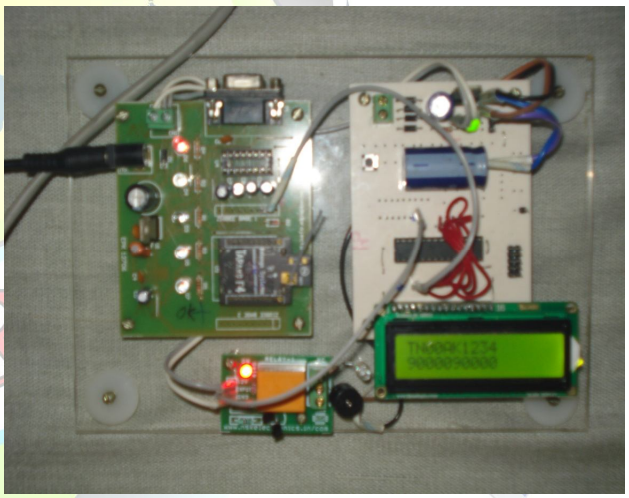

Fig.6. Image Of Hospital Unit

Fig.6.shows the circuit of Hospital Unit. It consists of Tarang, controller(ATMEGA 8), LCD, LED And Buzzer. In Case of any critical situations, the car engine is turned off by using solenoid valve to drain the fuel. The patient's information is sent to the nearby hospital having Tarang module. The patient's car number & mobile number is displayed on the LCD Screen of the Hospital Unit. and is indicated with a Buzzer.

IV. CONCLUSION

The main aim of this project is to trace the guts attack of patients who are suffering from any attacks throughout driving and to send them a medical need to make sure that the persons are safe from accident. An eye fixed blinking

device which is accustomed sense the blinking of the attention. A spO2 device is used to envision the heartbeat rate of the patient. Each square measure is connected to small controller. If eye blinking gets stopped then the signal is distributed to the controller to form Associate alarm through the buffer. If spO2 device senses a variation in pulse or low element content in Blood, it should lead to cardiopathy; then the controller stops the motor of the vehicle. Then Tarang F4 transmitter is employed to send the vehicle & the mobile range of the patient to a nearest medical station at intervals twenty five kilometres for treatment. The heartbeat rate is monitored via digital display .The Tarang F4 receiver receives the signal and passes through controller, the amount gets displayed within the digital display screen and an alarm is made through a buzzer as before long the signal is received. 5 topics are mentioned during this project : Detecting the patient beats per minute and also the Eye blinking standing; transmittal via Tarang F4 just in case of abnormalities in patient; The patient status is displayed and indicated by Buzzer; The Hospital Unit receives the patient's mobile and also the automotive number; The communication between the vehicle and also the Hospital through Tarang F4.

REFERENCES

[1] Myung-kyung Suh; Evangelista, L.S.; Chen, V.; Wen-Sao Hong; Macbeth, J.; Nahapetian, A.; Figueras, F.; Sarrafzadeh, M (2010), 'WANDA B.: Weight and activity with blood pressure monitoring system for heart failure patients', IEEE International Symposium on a , vol., no., pp.1,6, 14-17 June 2012

[2] Wei Lin, "Real time monitoring of electrocardiogram through IEEE802.15.4 network," Emerging Technologies for a Smarter World (CEWIT), 2011 8th International Conference & Expo on , vol., no., pp.1,6, 2-3 Nov. 2011

[3] Palantei, E.; Baharuddin, M.; Andani, A.; Nien, K.N.; Utami, D.; Febriani, A. E A; Umar, U.; Agus, M., "A 2.5 GHz wireless ECG system for remotely monitoring heart pulses," Antennas and Propagation Society International Symposium (APSURSI), 2012 IEEE , vol., no., pp.1,2, 8-14 July 2012

[4] Hagiu, B.; Pasca, S., "Wireless ECG monitoring and alarm system using ZigBee," Advanced Topics in Electrical Engineering (ATEE), 2011 7th International Symposium on , vol., no., pp.1,4, 12-14 May 2011

[5] Yongwon Jang; Hyung Wook Noh; Lee, I. B.; Ji-Wook Jung; Yoonseon Song; Sooyeul Lee; Seunghwan Kim, "Development of a patch type embedded cardiac function monitoring system using dual microprocessor for arrhythmia detection in heart disease patient, " Engineering in Medicine and Biology Society (EMBC), 2012 Annual International Conference of the IEEE , vol., no., pp.2162,2165, Aug. 28 2012-Sept. 1 2010

[6] Rotariu, C.; Pasarica, A.; Costin, H.; Adochiei, F.; Ciobotariu, R.,"Telemedicine system for remote blood pressure and heart rate monitoring," E-Health and Bioengineering Conference (EHB), 2011 , vol., no., pp.1,4, 24-26 Nov. 2009

[7] De Capua, C.; Meduri, A.; Morello, R., "A Smart ECG Measurement System Based on Web-Service-Oriented Architecture for Telemedicine Applications," Instrumentation and Measurement, IEEE Transactions on , vol.59, no.10, pp.2530,2538, Oct. 2008.