

## Smart Health Care Diagnosys System

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### ABSTRACT:

The project aims in designing a system which is capable of tracking the location of cardiac patients and also monitoring of heart rate alerts in case of emergency through SMS to predefined numbers. Now a day's technology is running with time, it completely occupied the life style of human beings. It is being used everywhere in our daily life to fulfill our requirements. We can not only increase the comfort of life but also increase the health monitoring techniques by making use of advanced technology.

In this project we are making use of technology to sense serious health problems so that efficient medical services can be provided to the patient in appropriate time. This project aims in sending alert messages in emergency times, i.e. when a person is alone in home or travelling and his heartbeat or body temperature rises or lowers then alerting messages will be sent to the mobile phone, the message consist of location of that person also. Also, we can get the heart rate of the person by simply sending a pre-defined format SMS.

Here we get the alerting message from the Wi-Fi. The functioning of this device is based on the truth that the blood level circulation during expansion and contraction of heart which can be sensed by Heart beat sensor. Depending upon the rate of circulation of blood per second the heart beat rate per minute is calculated. This device consists of a microcontroller which takes the input from the heart beat sensor and calculates the heart rate of the patient.

### Introduction to Embedded Systems:

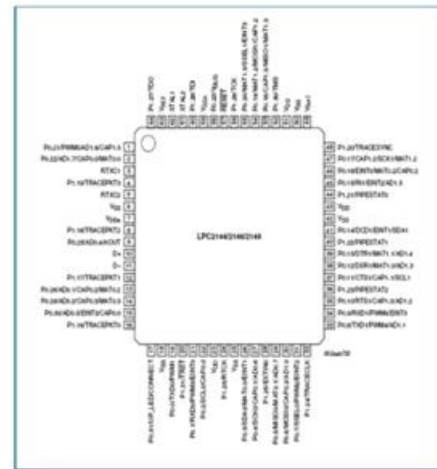
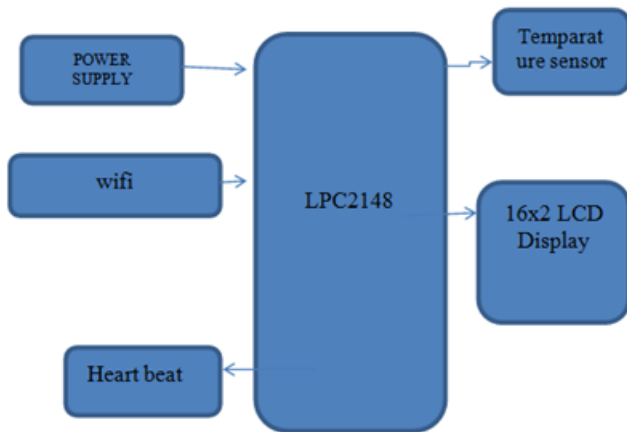
Embedded systems are electronic devices that incorporate microprocessors with in Their implementations. The main purposes of the microprocessors are to simplify the system design and provide flexibility. Having a microprocessor in the device means that removing the bugs, making modifications, or adding new features are only matters of rewriting the software that controls the device.

Or in other words embedded computer systems are electronic systems that include a microcomputer to perform a specific dedicated application. The computer is hidden inside these products. Embedded systems are ubiquitous. Every week millions of tiny computer chips come pouring out of factories finding their way into our everyday products.

Embedded systems are self-contained programs that are embedded within a piece of hardware. Whereas a regular computer has many different applications and software that can be applied to various tasks, embedded systems are usually set to a specific task that cannot be altered without physically manipulating the circuitry.

Another way to think of an embedded system is as a computer system that is created with optimal efficiency, thereby allowing it to complete specific functions as quickly as possible.

**BLOCK DIAGRAM:**



**ARM Microcontroller: LPC2148:**

The LPC2141/42/44/46/48 microcontrollers are based on a 16-bit/32-bit ARM7TDMI-S CPU with real-time emulation and embedded trace support, that combine microcontroller with embedded high speed flash memory ranging from 32 kB to 512 kB. A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at the maximum clock rate. For critical code size applications, the alternative 16-bit Thumb mode reduces code by more than 30 % with minimal performance penalty. Due to their tiny size and low power consumption, LPC2141/42/44/46/48 are ideal for applications where miniaturization is a key requirement, such as access control and point-of-sale. Serial communications interfaces ranging from a USB 2.0 Full-speed device, multiple UARTs, SPI, SSP to I2C-bus and on-chip SRAM of 8kB up to 40kB, make these devices very well suited for communication gateways and protocol converters, soft modems, voice recognition and low end imaging, providing both large buffer size and high processing power. Various 32-bit timers, single or dual 10-bit ADC(s), 10-bit DAC, PWM channels and 45 fast GPIO lines with up to nine edge or level sensitive external interrupt pins make these microcontrollers suitable for industrial control and medical systems. The application program may also erase and/or program the flash while the application is running, allowing a great degree of flexibility for data storage field firmware upgrades, etc.

**ARM7TDMI-S processor has two instruction sets:**

The standard 32-bit ARM set.

- A 16-bit Thumb set.

The Thumb set's 16-bit instruction length allows it to approach twice the density of standard ARM code while retaining most of the ARM's performance advantage over a traditional 16-bit processor using 16-bit registers. This is possible because Thumb code operates on the same 32-bit register set as ARM code. Thumb code is able to provide up to 65 % of the code size of ARM, and 160 % of the performance of an equivalent ARM processor connected to a 16-bit memory system. The particular flash implementation in the LPC2141/42/44/46/48 allows for full speed execution also in ARM mode. It is recommended to program performance critical and short code sections (such as interrupt service routines and DSP algorithms) in ARM mode. The impact on the overall code size will be minimal but the speed can be increased by 30% over Thumb mode.

**Power supply:**

In this project we have power supplies with +5V & -5V option normally +5V is enough for total circuit. Another (-5V) supply is used in case of OP amp circuit .Transformer primary side has 230/50HZ AC voltage whereas at the secondary winding the voltage is step downed to 12/50hz and this voltage is rectified using two full wave rectifiers .the rectified output is given to a filter circuit to filter the unwanted ac in the signal After that the output is again applied to a



**Pu/se Oximetry Sensor:**

Pulse Oximetry is fast, non-invasive, easy to use and continuous method for measuring the oxygen saturation (SpO2) and Heart Rate. Oxygen Saturation means how much oxygen dissolved in blood, based on detection of Hemoglobin and Deoxy hemoglobin and Heart Rate means number of the heart can contracts in a period of one minute. Two different Light Wavelengths 660nm (red light spectrum) and 940 nm [10] (infrared light spectrum) are used to determine the actual dissimilarity in the absorption spectrum of HbOz and Hb. A photo detector in the sensor receives the non-absorbed light from the LEDs. This signal is inverted using an OpAmp and result signal like Figure 2. This signal represents the light that has been absorbed by the finger is separated in a DC and AC component. The DC part represents the light absorption of the venous blood, tissue and non-pulsatile arterial blood. The AC part represents the pulsatile arterial blood. The pulse oximeter analyzes the light absorption of two wavelengths from the pulsatile-added volume of oxygen rated arterial blood (ACIDC) and absorption ratio using equation

**Wireless Network Technology: Embedded Serial to Wi-Fi Modules**



Wifi stands wireless fidelity Wireless technology has become common in modern society .It can be used in many application because the power consumption is very less expensive . It is very simple ,reduces wiring harness compare with the olden devices .wifi module efficiently transmit data up to 100 meters compare with the blue tooth the range of wifi is very high. This is the one of the standard protocol to transmit the data the IEEE 802.11.b.g/n and in the wireless application it can place special role by using this Wi-Fi we connect the network anywhere, if you know the encryption password you can access easily monitoring everything on the internet.

In the early 2007, embedded serial to Wi-Fi modules have become eagerly obtainable in public consumer markets. Each brand boasts similar features such as low power consumption and onboard wireless encryption or firewall security. The following section will investigate two embedded serial to Wi-Fi modules currently available on the market. Embedded serial to Wi-Fi modules function as device servers bridging serial devices to 802.11b/g wireless LANs. The Wireless-fidelity modules utilize RS232 serial ports in conjunction with UART to interact with serial machines. Some Wi-Fi modules such as the Wireless fidelity employ custom serial protocols .Additionally the modules are prepared with programmable processor chipsets with an OS that coordinates the data transfer between serial and Internet protocols. The Wi-Fi modules attach to wireless access points by utilize a built-in wireless adapter.

The typical embedded serial to Wifi module is designed for somewhat simple installation. The attachments involve a Data bus 9 pass end to end serial cable that links the module to a serial port terminal. For most modules, power is supplied by a 4 -12v dc voltage unfettered , 3.3V regulated, or in some cases 2-3 V low down power battery sources. Initially, users must configure the module by connecting to a PC and utilizing the provided installation software prior to connecting the module to a serial module to controller device.



**What's New in μVision4?**

μVision3 adds many new features to the Editor like Text Templates, Quick Function Navigation, and Syntax Coloring with brace high lighting

Configuration Wizard for dialog based startup and debugger setup.  $\mu$ Vision3 is fully compatible to  $\mu$ Vision4 and can be used in parallel with  $\mu$ Vision4.

### What is $\mu$ Vision4?

$\mu$ Vision3 is an IDE (Integrated Development Environment) that helps you write, compile, and debug embedded programs. It encapsulates the following components:

- A project manager.
- A make facility.
- Tool configuration.
- Editor.
- A powerful debugger.

To help you get started, several example programs (located in the \C51\Examples, \C251\Examples, \C166\Examples, and \ARM\...\Examples) are provided.

- HELLO is a simple program that prints the string "Hello World" using the Serial Interface.
- MEASURE is a data acquisition system for analog and digital systems.
- TRAFFIC is a traffic light controller with the RTX Tiny operating system.
- SIEVE is the SIEVE Benchmark.
- DHRY is the Dhrystone Benchmark.
- WHETS is the Single-Precision Whetstone Benchmark.

Additional example programs not listed here are provided for each device architecture.

### Building an Application in $\mu$ Vision4

To build (compile, assemble, and link) an application in  $\mu$ Vision4, you must:

1. Select Project – (forexample, 166\EXAMPLES\HELLO\HELLO.UV4).
2. Select Project - Rebuild all target files or Build target.

$\mu$ Vision4 compiles, assembles, and links the files in your project.

### Conclusion:

The project "SMART HEALTH CARE DIAGNOSYS SYSTEM" "has been successfully designed and tested Integrating features of all the hardware components used have developed it. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. Secondly, using highly advanced IC's and with the help of growing technology the project has been successfully implemented.

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