

Secured Technology in Health Centers and Updating the Condition

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Abstract:

In this proposed system we have designed a system which has controller which in turn interfaced with PC. When the patient has entered into the health care center he/she has to show the RFID card in the RFID reader which is interfaced with the microcontroller. The controller will read the RFID tag and sends the data to the PC via UART protocol. In the PC the data is already stored to that particular RFID number. And also the doctor can update the database for the particular RFID card.

Introduction (Heading 1), Community-based healthcare is increasingly important for the well-being of inhabitants of emerging economies. The community model is needed partly because roads are less developed, limiting patients' ability to commute from distant villages to central medical facilities. Also, developing countries have a large rural population base. Some estimates are that rural agriculture employs 75% of the population in developing countries.

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I.EASE OF USE:

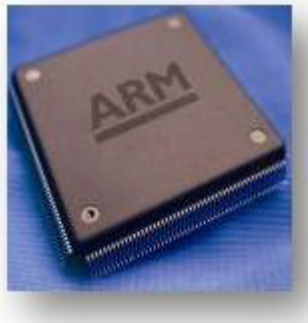
An embedded system is a system which is going to do a predefined specified task is the embedded system and is even defined as combination of both software and hardware. A general-purpose definition of embedded systems is that they are devices used to control, monitor or assist the operation of equipment, machinery or plant. "Embedded" reflects the fact that they are an integral part of the system. At the other extreme a general-purpose computer may be used to control the operation of a large complex processing plant, and its presence will be obvious. All embedded systems are including computers or microprocessors. Some of these computers are however very simple systems as compared with a personal computer.

The very simplest embedded systems are capable of performing only a single function or set of functions to meet a single predetermined purpose. In more complex systems an application program that enables the embedded system to be used for a particular purpose in a specific application determines the functioning of the embedded system. The ability to have programs means that the same embedded system can be used for a variety of different purposes. In some cases a microprocessor may be designed in such a way that application software for a particular purpose can be added to the basic software in a second process, after which it is not possible to make further changes. The applications software on such processors is sometimes referred to as firmware.



ARM PROCESSOR OVERVIEW:

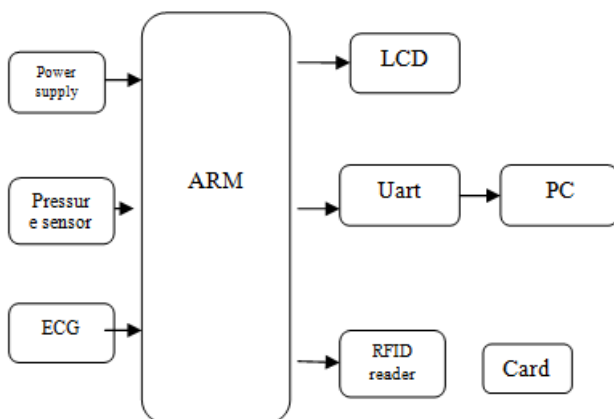
ARM stands for Advanced RISC Machines. It is a 32 bit processor core, used for high end application. It is widely used in Advanced Robotic Applications.



History and Development:

- ARM was developed at Acron Computers ltd of Cambridge, England between 1983 and 1985.
- RISC concept was introduced in 1980 at Stanford and Berkley.
- ARM ltd was found in 1990.
- ARM cores are licensed to partners so as to develop and fabricate new microcontrollers around same processor cores.

Block diagram:



Key features:

- 1.16-bit/32-bit ARM7TDMI-S microcontroller in a tiny LQFP64 package.
2. 8 kB to 40 kB of on-chip static RAM and 32 kB to 512 kB of on-chip flash memory.128-bit wide interface/accelerator enables high-speed 60 MHz operation.

3.In-System Programming/In-Application Programming (ISP/IAP) via on-chip boot loader software. Single flash sector or full chip erase in 400 ms and programming of 256 bytes in 1 ms.

Power Supply:

•The input to the circuit is applied from the regulated power supply. The ac. input i.e., 230V from the mains supply is step down by the transformer to 12V and is fed to a rectifier. The output obtained from the rectifier is a pulsating dc voltage. So in order to get a pure dc voltage, the output voltage from the rectifier is fed to a filter to remove any ac components present even after rectification. Now, this voltage is given to a voltage regulator to obtain a pure constant dc voltage.

•The abbreviation “i.e.” means “that is,” and the abbreviation “e.g.” means “for example.”An excellent style manual for science writers is [7].

TEMPERATURE SENSOR:

Temperature Sensor which converts temperature value into electrical signals. We used IC called LM 35 as a temperature sensor. LM35 series sensors are precision integrated-circuit temperature sensors whose output voltage is linearly proportional to the Celsius temperature. The LM35 requires no external calibration since it is internally calibrated. . The LM35 does not require any external calibration or trimming to provide typical accuracies of $\pm 1/4^{\circ}\text{C}$ at room temperature and $\pm 3/4^{\circ}\text{C}$ over a full -55 to $+150^{\circ}\text{C}$ temperature range. The LM35’s low output impedance, linear output, and precise inherent calibration make interfacing to readout or control circuitry especially easy. It can be used with single power supplies, or with plus and minus supplies. As it draws only $60\ \mu\text{A}$ from its supply, it has very low self-heating, less than 0.1°C in still air.

TEMPERATURE SENSING CIRCUIT:

The methods of temperature measurement may be divided into two main classes according as the exchange of heat between the testing body and the hot system takes place by contact, or by radiation across a space. In the contact methods, thermometers or thermocouples are used and they are immersed in solids or liquids.

A.What is RFID:

RFID is short for Radio Frequency Identification. Generally a RFID system consists of 2 parts. A Reader, and one or more Transponders, also known as Tags. RFID systems evolved from barcode labels as a means to automatically identify and track products and people. You will be generally familiar with RFID systems as seen in:

•Access Control.

RFID Readers placed at entrances that require a person to pass their proximity card (RF tag) to be “read” before the access can be made.

•Contact less Payment Systems.

RFID tags used to carry payment information. RFIDs are particularly suited to electronic Toll collection systems. Tags attached to vehicles, or carried by people transmit payment information to a fixed reader attached to a Toll station. Payments are then routinely deducted from a user's account, or information is changed directly on the RFID tag.

•Product Tracking and Inventory Control.

RFID systems are commonly used to track and record the movement of ordinary items such as library books, clothes, factory pallets, electrical goods and numerous items.

B.How do RFIDs work.

Shown below is a typical RFID system. In every RFID system the transponder Tags contain information. This information can be as little as a single binary bit, or be a large array of bits representing such things as an identity code, personal medical information, or literally any type of information that can be stored in digital binary format

LIQUID CRYSTAL DISPLAY:

LCD stands for Liquid Crystal Display. LCD is finding wide spread use replacing LEDs (seven segment LEDs or other multi segment LEDs) because of the following reasons:

- 1.The declining prices of LCDs.
- 2.The ability to display numbers, characters and graphics. This is in contrast to LEDs, which are limited to numbers and a few characters.
- 3.Incorporation of a refreshing controller into the LCD, thereby relieving the CPU of the task of refreshing the LCD. In contrast, the LED must be refreshed by the CPU to keep displaying the data.
- 4.Ease of programming for characters and graphics.
- 5.These components are “specialized” for being used with the microcontrollers, which means that they cannot be activated by standard IC circuits. They are used for writing different messages on a miniature LCD.



A model described here is for its low price and great possibilities most frequently used in practice. It is based on the HD44780 microcontroller (Hitachi) and can display messages in two lines with 16 characters each. It displays all the alphabets, Greek letters, punctuation marks, mathematical symbols etc. In addition, it is possible to display symbols that user makes up on its own. Automatic shifting message on display (shift left and right), appearance of the pointer, backlight etc. are considered as useful characteristics.

3.4.1 Pins Functions:

There are pins along one side of the small printed board used for connection to the microcontroller. There are total of 14 pins marked with numbers (16 in case the background light is built in). Their function is described in the table below:

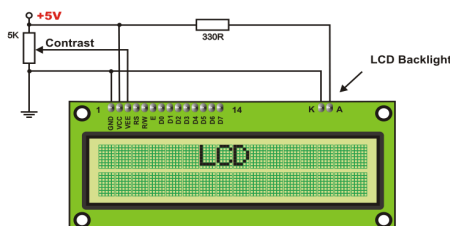
TABLE:2

| Function | Pin Number | Name | Logic State | Description |
|--------------|------------|------|-------------|--|
| Ground | 1 | Vss | - | 0V |
| Power supply | 2 | Vdd | - | +5V |
| Contrast | 3 | Vee | - | 0 – Vdd |
| | 4 | RS | 0 1 | D0 – D7 are interpreted as commands D0 – D7 are interpreted as data Write data (from |

| | | | | |
|----------------------|------|-----|-------------|--------------------------------------|
| Control of operating | 5 | R/W | 0 | controller to LCD) |
| | | | 1 | Read data (from LCD to controller) |
| | 6 | E | 0 | Access to LCD disabled |
| | | | 1 | Normal operating |
| | | | From 1 to 0 | Data/commands are transferred to LCD |
| | 7 | D0 | 0/1 | Bit 0 LSB |
| | 8 | D1 | 0/1 | Bit 1 |
| | 9 | D2 | 0/1 | Bit 2 |
| Data commands | / 10 | D3 | 0/1 | Bit 3 |
| | 11 | D4 | 0/1 | Bit 4 |
| | 12 | D5 | 0/1 | Bit 5 |
| | 13 | D6 | 0/1 | Bit 6 |
| | 14 | D7 | 0/1 | Bit 7 MSB |

3.4.2 LCD screen:

LCD screen consists of two lines with 16 characters each. Each character consists of 5x7 dot matrix. Contrast on display depends on the power supply voltage and whether messages are displayed in one or two lines. For that reason, variable voltage 0-V_{dd} is applied on pin marked as V_{ee}. Trimmer potentiometer is usually used for that purpose. Some versions of displays have built in backlight (blue or green diodes). When used during operating, a resistor for current limitation should be used (like with any LE diode).



3.4.3 LCD Basic Commands:

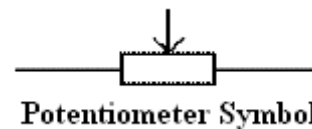
All data transferred to LCD through outputs D0-D7 will be interpreted as commands or as data, which depends on logic state on pin RS: RS = 1 - Bits D0 - D7 are addresses of characters that should be displayed. Built in processor addresses built in "map of characters" and displays corresponding symbols.

Displaying position is determined by DDRAM address. This address is either previously defined or the address of previously transferred character is automatically incremented.

- To perform time delay functions. Relays can be used to act as a mechanical time delay device by controlling the release time by using the effect of residual magnetism by means of a inserting copper disk between the armature and moving blade assembly.

POTENTIOMETER:

- Variable resistors used as potentiometers have all three terminals connected. This arrangement is normally used to vary voltage, for example to set the switching point of a circuit with a sensor, or control the volume (loudness) in an amplifier circuit. If the terminals at the ends of the track are connected across the power supply, then the wiper terminal will provide a voltage which can be varied from zero up to the maximum of the supply.



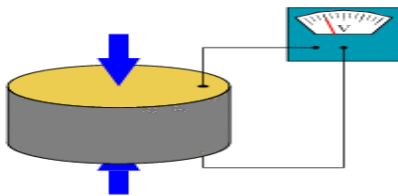
Presets:

- These are miniature versions of the standard variable resistor. They are designed to be mounted directly onto the circuit board and adjusted only when the circuit is built. For example, to set the frequency of an alarm tone or the sensitivity of a light-sensitive circuit, a small screwdriver or similar tool is required to adjust presets.
- Presets are much cheaper than standard variable resistors so they are sometimes used in projects where a standard variable resistor would normally be used.
- Multi turn presets are used where very precise adjustments must be made. The screw must be turned many times (10+) to move the slider from one end of the track to the other, giving very fine control.

Pressure SENSOR:

Honeywell S&C offers electronic speed and position sensors designed for enhanced reliability and an extended life. Honeywell uses multiple technologies to detect a change in magnetic field and create an electronic signal for control system interface. These technologies offer the ability to detect speed, direction, or position of a moving ferrous metal or magnetic target. Sensing is accomplished without contacting the target, and there are no moving parts. This eliminates mechanical wear of the sensor or target.

Honeywell offers a comprehensive line-up of Hall-effect, magnetoresistive, and variable reluctance sensors which provide electrical compatibility to most control system interfaces. We also offer a variety of sensor package types designed to enable mounting flexibility and wire harness interface compatibility. The Honeywell Speed and Position portfolio has been developed to support potential transportation and industrial customer application requirements. A piezoelectric sensor is a device that uses the piezoelectric effect to measure pressure, acceleration, strain or force by converting them to an electrical signal.



A piezoelectric disk generates a voltage when deformed

ABOUT KEIL SOFTWARE:

It is possible to create the source files in a text editor such as Notepad, run the Compiler on each C source file, specifying a list of controls, run the Assembler on each Assembler source file, specifying another list of controls, run either the Library Manager or Linker (again specifying a list of controls) and finally running the Object-HEX Converter to convert the Linker output file to an Intel Hex File. Once that has been completed the Hex File can be downloaded to the target hardware and debugged. Alternatively KEIL can be used to create source files; automatically compile, link and convert using options set with an easy to use user interface and finally simulate or perform debugging on the hardware with access to C variables and memory. Unless you have to use the tools on the command line, the choice is clear. KEIL Greatly simplifies the process of creating and testing an embedded applicatio.

4.1.3 Projects:

The user of KEIL centers on “projects”. A project is a list of all the source files required to build a single application, all the tool options which specify exactly how to build the application, and – if required – how the application should be simulated.

A project contains enough information to take a set of source files and generate exactly the binary code required for the application. Because of the high degree of flexibility required from the tools, there are many options that can be set to configure the tools to operate in a specific manner. It would be tedious to have to set these options up every time the application is being built; therefore they are stored in a project file. Loading the project file into KEIL informs KEIL which source files are required, where they are, and how to configure the tools in the correct way. KEIL can then execute each tool with the correct options. It is also possible to create new projects in KEIL. Source files are added to the project and the tool options are set as required. The project can then be saved to preserve the settings. The project is reloaded and the simulator or debugger started, all the desired windows are opened. KEIL project files have the extension.

4.1.4 Simulator/Debugger:

The simulator/ debugger in KEIL can perform a very detailed simulation of a micro controller along with external signals. It is possible to view the precise execution time of a single assembly instruction, or a single line of C code, all the way up to the entire application, simply by entering the crystal frequency. A window can be opened for each peripheral on the device, showing the state of the peripheral. This enables quick trouble shooting of mis-configured peripherals. Breakpoints may be set on either assembly instructions or lines of C code, and execution may be stepped through one instruction or C line at a time. The contents of all the memory areas may be viewed along with ability to find specific variables. In addition the registers may be viewed allowing a detailed view of what the microcontroller is doing at any point in time. The Keil Software 8051 development tools listed below are the programs you use to compile your C code, assemble your assembler source files, link your program together, create HEX files, and debug your target program. μ Vision2 for Windows™ Integrated Development Environment: combines Project Management, Source Code Editing, and Program Debugging in one powerful environment.

- C51 ANSI Optimizing C Cross Compiler: creates relocatable object modules from your C source code,
- A51 Macro Assembler: creates relocatable object modules from your 8051 assembler source code,
- BL51 Linker/Locator: combines relocatable object modules created by the compiler and assembler into the final absolute object module,

- LIB51 Library Manager: combines object modules into a library, which may be used by the linker,
- OH51 Object-HEX Converter: creates Intel HEX files from absolute object modules.

4.1.5 What's New in μ Vision3?

μ Vision3 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. μ Vision3 is fully compatible to μ Vision2 and can be used in parallel with μ Vision2.

CONCLUSION:

The project 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.

Reference:

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