Infant Baby Health Monitoring & High Security System Using GSM Technology Providing Key Lock & Passcode

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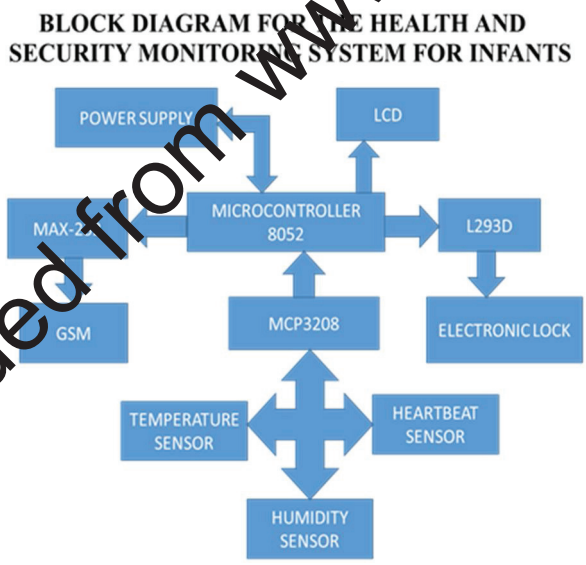
Abstract: In these days of united healthcare, for convenient monitoring of biological signals, the wireless communication technique is necessary. We have investigated several wireless technologies of biological sensor networking for united healthcare. There are some standard techniques such as Bluetooth, wirelesses LAN, ZIGBEE, GSM TECHNOLOGY, etc. We have tested these techniques for biological sensor networking and summarize the advantages and the disadvantages. As a result we decided the GSM TECHNOLOGY to be used as sensor network of patients in the hospital. We developed this patient monitoring system which has several biological parameters. Especially, this system has ability of patient's location awareness in the hospital. The main concept of this project is to provide basic information of the conditions of the just born baby placed in the incubator to the parents by sending SMS through GSM module to the GSM mobile and providing high security such that only authorized medical staff can attend the baby, this information of the baby security is also sent through SMS to the parent. The access to the incubator is authorized through a keypad lock which is entered through a pass code.



Working Description

We have used the microcontroller 8052 in the model as its relatively cheaper and can be used for the tremendous amount of multitasking and the complications which are used in the model. As shown in the block diagram above the microcontroller acts as a source of connection to the sensors, the GSM device and electronic lock which is run by a dc motor. When a certain sensor's preinstalled threshold limits are crossed a message is flashed at the LCD asking for the passcode to open the electronic lock which locks the incubator and when the right password is entered the incubator is opened by the dc motor which has been set by a delay time of 15 seconds after which the lock is automatically closed.

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Power Supply

Power supply is a reference to a source of electrical power. A device or system that supplies electrical or other types of energy to an output load or group of loads is called a power supply unit or PSU. This power supply section is required to convert AC signal to DC signal and also to reduce the amplitude of the signal.

Micro Controller 8052/8051

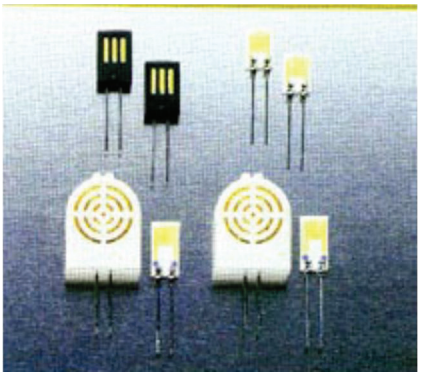
A microcontroller (also MCU or μC) is a functional computer system-on-a-chip. It contains a processor core, memory, and programmable input/output peripherals.

It emphasizes high integration, in contrast to a microprocessor which only contains a CPU (the kind used in a PC). In addition to the usual arithmetic and logic elements of a general purpose microprocessor, the microcontroller integrates additional elements such as read-write memory for data storage, read-only memory for program storage, Flash memory for permanent data storage, peripherals, and input/output interfaces. They consume relatively little power (mill watts), and will generally have the ability to retain functionality while waiting for an event such as a button press or interrupt. Power consumption while sleeping (CPU and peripherals off) may be just nano watts, making them ideal for low power and long lasting battery applications. By reducing the size, cost, and power consumption compared to a design using a separate microprocessor, memory, and input/output devices, microcontrollers make it economical to electronically control many more processes. The **AT89S52** is a low-power, high-performance CMOS 8-bit microcontroller with 8Kbytes of in-system programmable Flash memory.

Humidity Sensors

Humidity sensors are gaining more significance in diverse areas of measurement and Control technology. Manufacturers are not only improving the accuracy and long-term drift of their sensors, they are improving their durability for use in different environments, and simultaneously reducing the component size and the price.

Conventional sensors determine relative air humidity using capacitive measurement technology. For this principle, the sensor element is built out of a film capacitor on different substrates (glass, ceramic, etc.). The dielectric is a polymer which absorbs or releases water proportional to the relative environmental humidity, and thus changes the capacitance of the capacitor, which is measured by an onboard electronic circuit.



Heart beat sensor

Heart beat sensor is designed to give digital output of heat beat when a finger is placed on it. When the heart beat detector is working, the beat LED flashes in unison with each heartbeat. This digital output can

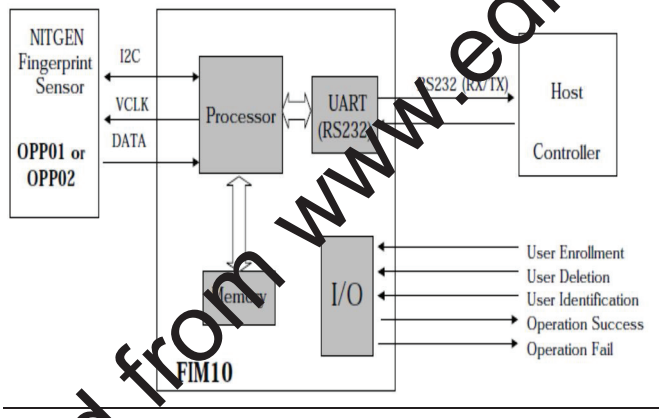
be connected to microcontroller directly to measure the Beats per Minute (BPM) rate. It works on the principle of light modulation by blood flow through finger at each pulse.

Features

- Microcontroller based SMD design
- Heat beat indication by LED
- Instant output digital signal for directly connecting to microcontroller
- Compact Size

FIM10

The FIM10 (Fingerprint Identification Module) is a stand-alone fingerprint recognition device with built-in CPU. FIM10 is a NITGEN Version 1.0, and it is release at the date of February 11, 2004. FIM10 is a standalone Fingerprint Recognition Device with many excellent features. It provides the high recognition performance, the low power dissipation and the RS-232 serial interface with the simple protocol for easy integration into a wide range of applications. It is a durable and compactable device and made into a fingerprint recognition module with NITGEN optics-based fingerprint sensor.



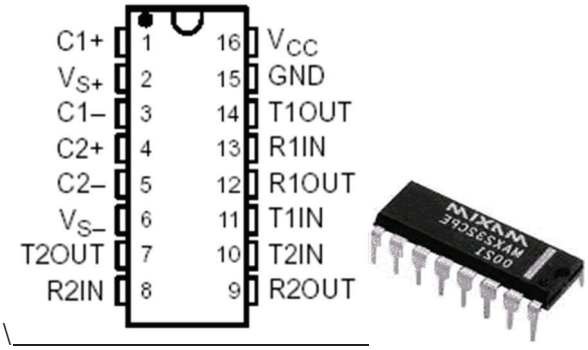
Temperature Sensors (LM35)

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. Low cost is assured by trimming and calibration at the wafer level. 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 µA from its supply, it has very low self-heating, less than 0.1°C in still air. The LM35 is rated to operate over a -55° to +150°C temperature range, while the LM35C is rated for a -40° to +110°C range (-10° with improved accuracy).

MAX 232

A standard serial interface for PC, RS232C, requires negative logic, i.e., logic 1 is -3V to -12V and logic 0 is +3V to +12V. To convert TTL logic, say, TxD and RxD pins of the microcontroller thus need a converter chip. A MAX232 chip has long been using in many microcontrollers boards. It is a dual RS232 receiver / transmitter that meets all RS232 specifications while using only +5V power supply. It has two onboard

charge pump voltage converters which generate +10V to -10V power supplies from a single 5V supply. It has four level translators, two of which are RS232 transmitters that convert TTL/CMOS input levels into +9V RS232 outputs. The other two level translators are RS232 receivers that convert RS232 input to 5V. Typical MAX232 circuit is shown below.



GSM (Global System for Mobile communications)

GSM (Global System for Mobile communications) is a cellular network, which means that mobile phones connect to it by searching for cells in the immediate vicinity. GSM networks operate in four different frequency ranges. Most GSM networks operate in the 900 MHz or 1800 MHz bands. Some countries in the Americas use the 850 MHz and 1900 MHz bands because the 900 and 1800 MHz frequency bands were already allocated. Time division multiplexing is used to allow eight full-rate or sixteen half-rate speech channels per radio frequency channel. There are eight radio timeslots (giving eight burst periods) grouped into what is called a TDMA frame. Half rate channels use alternate frames in the same timeslot. The channel data rate is 270.833 kbit/s, and the frame duration is 4.615 ms.

GSM Advantages

GSM also pioneered a low-cost, to the network carrier, alternative to voice calls, the Shortt message service (SMS, also called "text messaging"), which is now supported on other mobile standards as well. Another advantage is that the standard includes one worldwide Emergency telephone number, 112. This makes it easier for international travelers to connect to emergency services without knowing the local emergency number.

LCD (Liquid Cristal Display)

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. Each pixel consists of a column of liquid crystal molecules suspended between two transparent electrodes, and two polarizing filters, the axes of polarity of which are perpendicular to each other. Without the liquid crystals between them, light passing through one would be blocked by the other. The liquid crystal twists the polarization of light entering one filter to allow it to pass through the other.

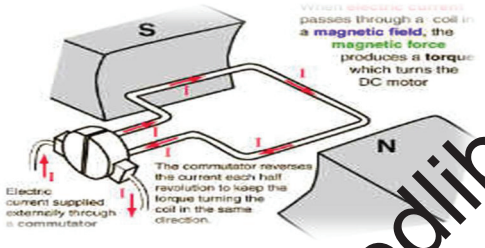
L293, L293D (Quadruple Half H-Drivers)

The L293 and L293D are quadruple high-current half-H drivers. The L293 is designed to provide bidirectional drive currents of up to 1 A at voltages from 4.5 V to 36 V. The L293D is designed to provide bidirectional drive currents of up to 600-mA at voltages from 4.5 V to 36 V. Both devices are designed to drive inductive loads such as relays, solenoids, dc and bipolar stepping motors, as well as other high-current/high-voltage loads in positive-supply applications. All inputs are TTL compatible. Each output is a complete totem-pole drive circuit, with a Darlington transistor sink and a pseudo- Darlington source.

Drivers are enabled in pairs, with drivers 1 and 2 enabled by 1,2EN and drivers 3 and 4 enabled by 3,4EN. When an enable input is high, the associated drivers are enabled, and their outputs are active and in phase with their inputs. When the enable input is low, those drivers are disabled, and their outputs are off and in the high-impedance state. With the proper data inputs, each pair of drivers forms a full-H (or bridge) reversible drive suitable for solenoid or motor applications.

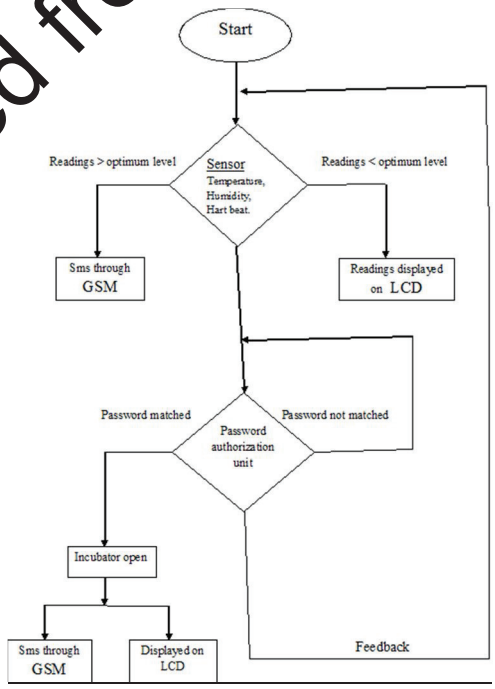
DC Motor

A DC motor is designed to run on DC electric power. Two examples of pure DC designs are Michael Faraday's homopolar motor (which is uncommon), and the ball bearin motor, which is (so far) a novelty. By far the most common DC motor types are the brushed and brushless types, which use internal and external commutation respectively to create an oscillating AC current from the DC source -- so they are not purely DC machines in a strict sense.



Keypad

A keypad is a set of buttons arranged in a block which usually bear digits and other symbols but not a complete set of alphabetical letters. If it mostly contains numbers then it can also be called a numeric keypad. Keypads are found on many alphanumeric keyboards and on other devices such as calculators, combination locks and telephones which require largely numeric input. An input device, sometimes part of a standard computer keyboard, consisting of a separate grid of numerical and function keys arranged for efficient data entry.



References

1. The 8051 Micro controller and Embedded Systems, Muhammad Ali Mazidi, Janice Gillispie Mazidi
2. The 8051 Micro controller Architecture, Programming & Applications, Kenneth J. Ayala
3. Fundamentals of Microprocessors and Microcomputers, B. Ram
4. Microprocessor Architecture, Programming & Applications, Ramesh S. Gaonkar
5. Electronic Components, D. V. Prasad

References on the Web

1. www.national.com
2. www.atmel.com
3. www.microsoftsearch.com
4. www.geocities.com