GSM Based Door Locking and Unlocking System

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ABSTRACT: The concept of the door opening and clocking system used to GPRS to open and close the door. This system will be providing the security using GSM in case of any unauthorized access. The main aim of this project is to provide security at homes, offices etc. The system automatically locks the door as soon as it receives predefined message from the user. "The user will have to first register, his/her information will be stored in database". Whenever the message will be received for the registered number, the controller will accordingly give instruction to DC motor. DC motor will then perform action on door either locking or unlocking. In case of unauthorized access, the IR sensor will sense the action and send the alert message to the registered user using GSM. These systems used for any Industrial applications, Robotic applications. And also used for any rooms

KEYWORDS: Global System for Mobile Communication(GSM), Microcontroller, DC Motor, IR Sensor.

I. INTRODUCTION

Each day, our lives become more dependent on 'embedded systems', digital information technology that is embedded in our environment. More than 98% of processors applied today are in embedded systems, and are no longer visible to the customer as 'computers' in the ordinary sense. An Embedded System is a special-purpose system in which the computer is completely encapsulated by or dedicated to the device or system it controls. Unlike a general-purpose computer, such as a personal computer, an embedded system performs one or a few pre-defined tasks, usually with very specific requirements. Since the system is dedicated to specific tasks, design engineers can optimize it, reducing the size and cost of the product. Embedded systems are often mass-produced, benefiting from economies of scale. The increasing use of PC hardware is one of the most important developments in high-end embedded systems in recent years. Hardware costs of high-end systems have dropped dramatically as a result of this trend, making feasible some projects which previously would not have been done because of the high cost of non-PC-based embedded hardware. But software choices for the embedded PC platform are not nearly as attractive as the hardware.

Typically, an embedded system is housed on a single microprocessor board with the programs stored in ROM. Virtually all appliances that have a digital interface -- watches, microwaves, VCRs, cars -- utilize embedded systems. Some embedded systems include an operating system, but many are so specialized that the entire logic can be implemented as a single program. Physically, Embedded Systems range from portable devices such as digital watches and MP3 players, to large stationary installations like traffic lights, factory controllers, or the systems controlling nuclear power plants .In terms of complexity embedded systems can range from very simple with a single microcontroller chip, to very complex with multiple units, peripherals and networks mounted inside a large chassis or enclosure.

In this concept by using GSM Technology door can be locked are unlocked. This system will be providing the security by using GSM in case of any unauthorized access. The main aim of this project is to provide security at homes, offices etc.

The system automatically locks the door as soon as it receives predefined message from the user. "The user will have to first register into GSM modem, his information will be stored in database".
Whenever the message will be received for the registered number, the controller will give instruction to DC motor. DC motor will then perform action on door either locking or unlocking. In case of unauthorized access.

II. SIGNIFICANCE OF THE SYSTEM

The AT89S52 is a low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory. The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry-standard 80C51 instruction set and pin out. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with in-system programmable Flash on a monolithic chip, the Atmel AT89S52 is a powerful microcontroller which provides a highly-flexible and cost-effective solution to many embedded control applications.By using this system we can control the door i.e. opening and closing .This system is used in home automation also.

III. LITERATURE SURVEY

The 8-bit AT mega 328P microcontroller based on Arduino UNO is used in this proposal is to control the different components like Wi-Fi module and relay circuit networks. The advantage to having a separate controller is to focus only on the desired task.

A. INTERFACES:

An Interface is the way we interact with the Home automation controller. There are many types of interfaces like Touch Panels, Keypads, Remotes, Mobile Devices and Internet.In this proposal, we used a Mobile device (Android smart phone). Nowadays it is a very common device for every user. We need to install an appliance controller application in it. In addition, within the mobile interface it can be able to control all the respected appliances of the home. Wouldn't it be nice to be upstairs, pull out your mobile phone, and turn off all the lights in your house with the press of a button right before you go to bed?

B. CONTROL METHODS:

We now have a controller, interfaces to interact with the controller, and sensors that tell the controller what things are occurring in the house.Controllers can communicate and control the many different parts of a Home Automation System in a variety of ways. Some of these are IP (Internet Protocol sp), Wi-Fi, Bluetooth, Zig-bee, IR, Serial Data, and Relays (for motorization).

Home Automation is a unique system that can control and establish communication between nearly all aspects of your house. HomeAutomation is at ermused to describe the working together of all household amenities and appliances. For example, a centrally- microco ntrollerpanelcanhavethecapabilityto control everything from heating, air conditioning, security system, lighting and overall electrical appliances. [Home automation can include controlling aspects of our home remotely through a computer or any mobile equipment, programming electronics devices to respond automatically to some conditions or scenarios or centralizing the control of a variety of appliances in our home into a single control center. For example, Control of lights in and around our house from one central location so there is no need to get out of to that place or go to downstairs if we forgot to turn OFF or ON any appliances, just we can control remotely. It is essential that the different controllable appliances be interconnected and communicates with each other. The main purpose of Home automation is to control or monitor signals from different appliances, or basic services. A smart phone or web browser can be used to control or monitor the home automation system.

IV. METHODOLOGY

The hardware used in this system design is explained as block diagram and its description also given. The important components and modules used in hardware design are explained.
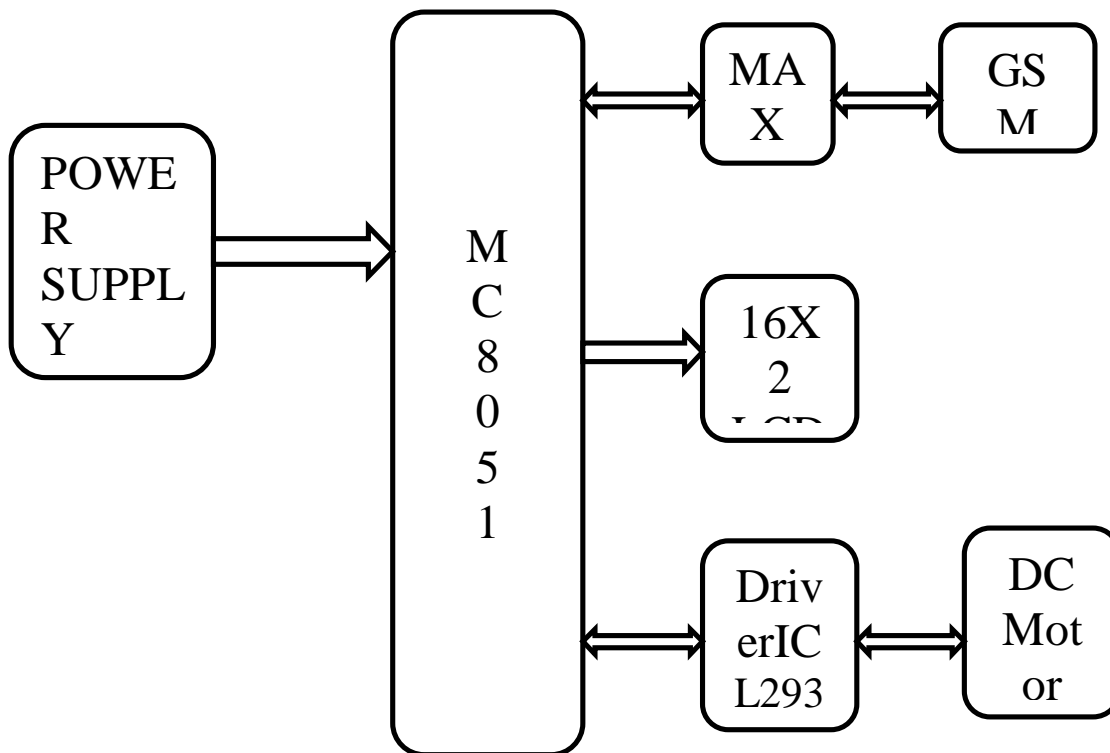
Blocking diagram of GSM based door locking and unlocking system

GSM: GSM was first introduced in 1991. As of the end of 1997, GSM service was available in more than 100 countries and has become the *de facto* standard in Europe and Asia. Global System for Mobile communications is the most popular standard for mobile phone in the world. Its promoter, the GSM Association, estimates that 82% of the global mobile market uses the standard. GSM is used by over 3 Billion people across more than 212 countries and territories. Its ubiquity makes international roaming very common between mobile, enabling subscribers to use their phones in many parts of the world. GSM differs from its predecessors in that both signaling and speech channels are digital, and thus is considered a second generation (2G) mobile phone system. This has also meant that data communication was easy to build into the system.

GSM (Global System for Mobile communications) is an open, digital cellular technology used for transmitting mobile voice and data services. GSM differs from first generation wireless systems in that it uses digital technology and time division multiple access transmission methods. GSM is a circuit-switched system that divides each 200 kHz channel into eight 25 kHz time-slots. GSM supports data transfer speeds of up to 9.6 kbps, allowing the transmission of basic data services such as SMS (Short Message Service). Another major benefit is its international roaming capability, allowing users to access the same services when traveling abroad as at home. GSM satellite roaming has also extended service access to areas where terrestrial coverage is not available.

There are five different cell sizes in a GSM network they are macro, micro, Pico, femto, and umbrella cells. The coverage area of each cell varies according to the implementation environment. Macro cells can be regarded as

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ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

Vol. 6, Special Issue , August 2019
International Conference on Recent Advances in Science, Engineering, Technology and Management at Sree Vahini Institute of Science and Technology-Tiruvuru, Krishna Dist, A.P

cells where the base station antenna is installed on a mast or a building above average roof top level. Micro cells are celling whose antenna height is under average roof top level; they are typically used in urban areas. Pico cells are small cells whose coverage diameter is a few dozen.

Operation

The GSM module when received the particular command sends the predefined message to the number stored from the SIM card placed in the socket provided in the module. The message received by the user, it will alerts the user by LED (LM-35) indicator. Write the program to the wireless electronic notice board using keil software. Now burn the program to the micro controller with the help of flash magic.

EXPERIMENTAL RESULTS

STEP 1: Place the SIM into GSM modem
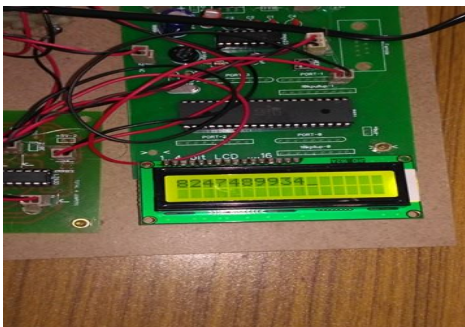
STEP-2: First register the mobile number in to GSM modem. After that give the password to GSM door can be open or close. If I give a password number is *1 is open and *2 is close
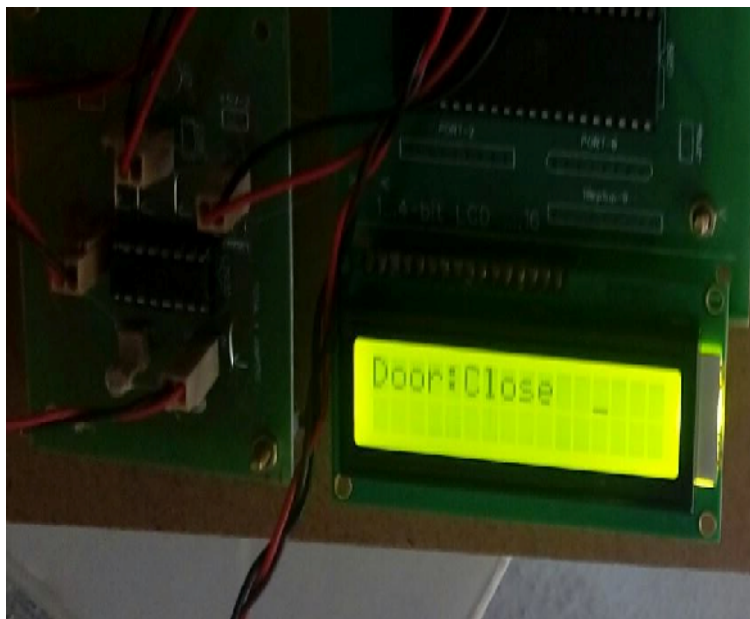
STEP-3: If give a *1 door can be **OPEN**

ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

Vol. 6, Special Issue , August 2019

International Conference on Recent Advances in Science, Engineering, Technology and Management at Sree Vahini Institute of Science and Technology-Tiruvuru, Krishna Dist, A.P

STEP-4: If give a *2 door can be **CLOSE**

VI. CONCLUSION AND FUTURE SCOPE

A new concept and implementation of an effective "GSM BASED DOOR LOCKING AND UNLOCKING SYSTEM" using GSM technology and 8051Microcontroller. Byusing this project we can control the door i.e. open and close and cost is also less. In future this is also used in home automation with diiffrent operations.We can monitor and control more parameters and devices. Voice announcement system can be added to indicate device conditions. We can implement other related modules like fire sensor, wind sensor.

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