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Android Password Based Remote Door Opener System

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Abstract— Our project aims at remote password based door opener system through an android application. The system tends to make a secure door opening mechanism such that the door only unlocks when a security personnel opens it by entering the right password through an android application. The authorized personnel need to be present within Bluetooth range of the door but need not open the door manually. He just needs to enter the right password through his android application in order to unlock the door. This is a useful concept in places where the security needs to open gates quite usually or need to operate a door from a vehicle without needing to get down from it.The command sending functionality is achieved through an android application. The application provides an interactive user friendly GUI for this purpose.

The android application can be operatedfrom any device running on android OS and uses Bluetooth as a medium for sending commands.As soon as commands are sent through the android device a Bluetooth receiver is used to receive those commands. These commands are then sent to the 8051 microcontroller. The microcontroller processes these commands and then tallies the password to check its correctness. If the right password is encountered it sends command to open the door.

1. INTRODUCTION

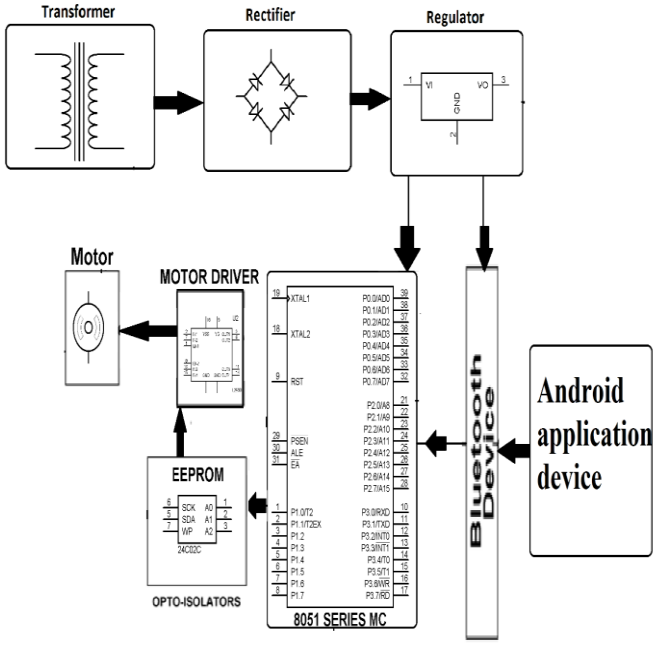
This project is made using embedded system .An Embedded System is a combination of computer hardware and software, and perhaps additional mechanical or other parts,designed to perform a specific function. An embedded system is a microcontroller-based, software driven, reliable, real-time control system, autonomous, or human or network interactive, operating on diverse physical variables and in diverse environments and sold into a competitive and cost conscious market.An embedded system is not a computer system that is used primarily for processing, not a software system on PC or UNIX, not a traditional business or scientific application. High-end embedded & lower end embedded systems. High-end embedded system - Generally 32, 64 Bit Controllers used with OS. Examples Personal Digital Assistant and Mobile phones etc .Lower end embedded systems - Generally 8,16 Bit Controllers used with an minimal operating systems and hardware layout designed for the specific purpose. Examples Small controllers and devices in our everyday life like Washing Machine, Microwave Ovens, where they are embedded in

2. CHARACTERISTICS OF EMBEDDED SYSTEM

- An embedded system is any computer system hidden inside a product other than a computer.
- They will encounter a number of difficulties when writing embedded system software in addition to those we encounter when we write applications.

  - Throughput – Our system may need to handle a lot of data in a short period of time.
  - Response–Our system may need to react to events quickly.
  - Testability–Setting up equipment to test embedded software can be difficult.
  - Debugability–Without a screen or a keyboard, finding out what the software is doing wrong (other than not working) is a troublesome problem.
  - Reliability – embedded systems must be able to handle any situation without human intervention.
  - Memory space – Memory is limited on embedded systems, and you must make the software and the data fit into whatever memory exists.
  - Program installation – you will need special tools to get your software into embedded systems.

Project Block Diagram



3. DESIGN OF THE SYSTEM

Design of the system will include:

- TRANSFORMER (230 – 12 V AC)

  Transformers convert AC electricity from one voltage to another with a little loss of power. Step-up transformers increase voltage, step-down transformers reduce voltage. Most power supplies use a step-down transformer to reduce the dangerously high voltage to a safer low voltage.

- VOLTAGE REGULATOR (LM 7805)

  The LM78XX/LM78XXA series of three-terminal positive regulators are available in the TO-220/D-PAK package and with several fixed output voltages, making them useful in a Wide range of applications. Each type employs internal current limiting, thermal shutdown and safe operating area protection, making it essentially indestructible.

- RECTIFIER

  A rectifier is an electrical device that converts alternating current (AC), which periodically reverses direction, to direct current (DC), current that flows in only one direction, a process known as rectification. The output from the transformer is fed to the rectifier. It converts A.C. into pulsating D.C.

- FILTER

  Capacitive filter is used in this project. It removes the ripples from the output of rectifier and smoothens the D.C. Output received from this filter is constant until the mains voltage and load is maintained constant. However, if either of the two is varied, D.C. voltage received at this point changes. Therefore a regulator is applied at the output stage.

- MICROCONTROLLER (AT89S52/AT89C51)

  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 non volatile memory technology and is compatible with the industry standard 80C51 instruction set and pin out.

- LED'S

  A light-emitting diode (LED) is a semiconductor light source. LEDs are used as indicator lamps in many devices, and are increasingly used for lighting. When a light-emitting diode is forward biased (switched on), electrons are able to recombine with holes within the device, releasing energy in the form of photons.

- MOTOR DRIVER(L293D)

  L293D is a dual H-bridge motor driver integrated circuit (IC). Motor drivers act as current amplifiers since they take a low-current control signal and provide a higher-current signal. This higher current signal is used to drive the motors.

- DC MOTOR

  In any electric motor, operation is based on simple electromagnetism. A current-carrying conductor generates a magnetic field; when this is then placed in an external magnetic field, it will experience a force proportional to the current in the conductor, and to the strength of the external magnetic field.

- BLUETOOTH MODULE

  The Android platform includes support for the Bluetooth network stack, which allows a device to wirelessly exchange data with other Bluetooth devices. The application framework provides access to the Bluetooth functionality through the Android Bluetooth APIs.

- 1N4007

  Diodes are used to convert AC into DC these are used as half wave rectifier or full wave rectifier. Three points must he kept in mind while using any type of diode.

1. Maximum forward current capacity
2. Maximum reverse voltage capacity
3. Maximum forward voltage capacity

- RESISTOR

  A resistor is a two-terminal electronic component designed to oppose an electric current by producing a voltage drop between its terminals in proportion to the current, that is, in accordance with Ohm's law:

  $$V = IR$$

- CAPACITOR

  A capacitor or condenser is a passive electronic component consisting of a pair of conductors separated by a dielectric. When a voltage potential difference exists between the conductors, an electric field is present in the dielectric. This field stores energy and produces a mechanical force between the plates.

4. SOFTWARE USED

KEIL MICRO VISION (IDE)

Keil an ARM Company makes C compilers, macro assemblers, real-time kernels, debuggers, simulators, integrated environments, evaluation boards, and emulators for ARM7/ARM9/Cortex-M3, XC16x/C16x/ST10, 251, and 8051 MCU families.Keil development tools for the 8051 Microcontroller Architecture support every level of software developer from the professional applications engineer to the student just learning about embedded software development. When starting a new project, simply select the microcontroller you use from the Device Database and the µVision IDE sets all compiler, assembler, linker, and memory options for you.Keil is a cross compiler. So first we have to understand the concept of compilers and cross compilers. After then we shall learn how to work with keil.

5. CONCEPT OF COMPILER

Compilers are programs used to convert a High Level Language to object code. Desktop compilers produce an output object code for the underlying microprocessor, but not for other microprocessors. I.E the programs written in one of the HLL like 'C' will compile the code to run on the system for a particular processor like x86 (underlying microprocessor in the computer). For example compilers for Dos platform is different from the Compilers for Unix platform So if one wants to define a compiler then compiler is a program that translates source code into object code.

6. CONCEPT OF CROSS COMPILER

A cross compiler is similar to the compilers but we write a program for the target processor (like 8051 and its derivatives) on the host processors (like computer of x86). It means being in one environment you are writing a code for another environment is called cross development. And the compiler used for cross development is called cross compiler. So the definition of cross compiler is a compiler that runs on one computer but produces object code for a different type of computer.

7. KEIL C CROSS COMPILER

Keil is a German based Software development company. It provides several development tools like

- IDE (Integrated Development environment)
- Project Manager
- Simulator
- Debugger
- C Cross Compiler, Cross Assembler, Locator/Linker

The Keil ARM tool kit includes three main tools, assembler, compiler and linker. An assembler is used to assemble the ARM assembly program. A compiler is used to compile the C source code into an object file. A linker is used to create an absolute object module suitable for our in-circuit emulator.

8. BUILDING AN APPLICATION IN µVISION2

To build (compile, assemble, and link) an application in µVision2, you must:
Select Project -(forexample,166\EXAMPLES\HELLO\HELLO.UV2).
Select Project - Rebuild all target files or Build target.µVision2 compiles, assembles, and links the files in your project.

9. CREATING YOUR OWN APPLICATION IN µVISION2

To create a new project in µVision2, you must:

- Select Project - New Project.
- Select a directory and enter the name of the project file.
- Select Project - Select Device and select an 8051, 251, or C16x/ST10 device from the Device Database™.
- Create source files to add to the project.
- Select Project - Targets, Groups, Files. Add/Files, select Source Group1, and add the source files to the project.
- Select Project - Options and set the tool options. Note when you select the target device from the Device Database™ all special options are set automatically. You typically only need to configure the memory map of your target hardware. Default memory model settings are optimal for most applications.
- Select Project - Rebuild all target files or Build target.

10. HARDWARE REQUIREMENTS

- 8051 series Microcontroller
- Crystal
- Transformer
- Diodes
- Push Button
- DC Motor
- Voltage Regulator
- Motor Driver IC
- Bluetooth device
- LED

11. SOFTWARE REQUIREMENTS

Keil µVision IDE

MC Programming Language: Embedded C

12. APPLICATIONS

- Military and aerospace embedded software applications
- Communication Applications
- Industrial automation and process control software
- Mastering the complexity of applications.
- Reduction of product design time.
- Real time processing of ever increasing amounts of data.
- Intelligent, autonomous sensors.

13. CONCLUSION

Thus with the use of such system, it can reduce the time and effort required for opening and closing door. Normally doors like security ones need to be opened and closed frequently but doing so takes time and effort by using this system the load becomes less and the security is maintained.

REFERENCES

[1]http://www.digikey.com/en/articles/techzone/2014/mar/developing-an-android-based-embedded-system
[2] http://www.refreshnotes.com/2016/02/ hardware-units-in-embedded-system.html
[3] https://en.wikibooks.org/wiki/Embedded_Control/Systems_Design/Hardware_peripherals
[4] https://www.scribd.com/doc/61342620/Unit-1-embedded-system
[5] http://www2.keil.com/mdk5/uvision/