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Controlling the Applications through the Android Mobile

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Abstract:- Now a days embedded technology plays an important role in our daily life. These applications ease everyday existence of a typical man. The main purpose of this project Home Automation using through the wifi(wires less fidelity) . In this paper, we propose configuration and model execution of home mechanization framework that uses Wi-Fi innovation and Android working framework. An attractive business sector for Home Automation Framework is for occupied families and people with physical confinements. Clients can control electrical machines in home or office through advanced mobile phone. Application will likewise give secure notices and alert to Burglary, fire dangers. This undertaking goes for controlling each event at home or office on your fingers. Here in this undertaking we are proposing the wifi module and heaps of electrical apparatuses .so by utilizing android versatile and the backing of the android application we are controlling the heaps furthermore we can control every one of the applications that we expected to the home or other specific spots.

1. Introduction

An embedded system is an application it consist at least one programmable computer that is micro processor either Microcontroller or Digital signal processor a which is performs a specific function ,with out human intervention .In this embedded system we have combination of both software and hardware , in this we have hidden software it is not visible But performs function, when we see embedded devices they are washing machine, micro oven and home automation ,lift etc are embedded applications examples ,here we see the only hard ware components only, the software is hidden in the controller. These embedded reflects many application in our daily life, What is the criteria choosing of embedded application these are working with the less power consumption , save the lot of time and make the human works very smaller this is the reason choosing of embedded systems .We are using controller and processor this can be implementing efficiently and we can easily modified according market requirement. The very simplest embedded systems are have the ability to performing only a single function or set of functions .In our daily life we are mostly using embedded applications these are playing a key role ,the processor and controllers are designed in a such way that application software for a particular purpose.

2. ARM Processor Overview

It is extensively used in Advanced Robotic Applications. ARM stands for Advanced Reduce Instruction Set Computer Machines.

It is a 32 bit processor core, used for high end application

History and Development:

ARM was develope at Acron Computers ltd of Cambridge, in England during 1983 and 1985.

RISC concept was begin in 1980 at Stanford and Berkley.Advance Risc Machine ltd was found in 1990.

ARM cores are licensed to partners so as to develop and fabricate new microcontrollers around same processor cores.The Arm it has 2.8 kB to 40 kB of on-chip static RAM and 32 kB to 512 kB of on-chip streak memory. 128-piece wide interface/quickening agent empowers fast 60 MHz operation. 3.In-System Programming/In-ApplicationProgramming (ISP/IAP)by means of on-chip boot loader programming. Single blaze area or full chip delete in 400 ms and programming of 256 bytes in 1 ms.

Power Supply

- In this project we gives the power supply +5v to -5v. when we give the power supply if it Ac supply it can be step down 12V/50Hz using of transformer , after that the bridge rectifier it can be used to convert Ac voltage into dc voltage ,here we are using two capacitor filters remove unwanted Ac pulses. Here the filters blocks Ac current and allows only dc current . After that the power goes to the voltage regulator Lm7805 , it gives the only five voltage to the controller why because the controller working with 5v dc only, If we use the dc supply no need of transformer.

Description

A transformer is an instrument that changes electrical energy from one path to another path means one circuit to another circuit through the inductively coupled conductors. The varying of current in the primary coil it creates the magnetic flux in the transformer. The varying induces generate electromotive force in the secondary coil. This is effect is called mutual induction.

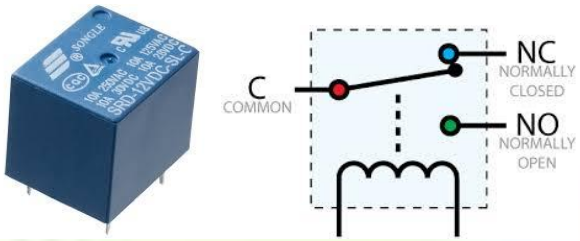
Figure: Transformer Symbol

Transformer is a device that reducing and increasing of the energy like a transducer.

Relay

Relays are simple switches, which operated in both ways electrically and mechanically, we know already relays are using in industrial high end applications effectively. Relays are consisting of an electromagnet and contacts. The switching mechanism carried out by the with the help of electromagnet switch. A relay is used to separate one electrical circuit from another. It allows a small current control circuit to make contacts or break an electrically isolate high voltage path.

The simple relay consists of a coil and a set op contacts. The most common relay coil is a length of magnet wire envelop around a metal . When the voltage is given to the coil, current passes through the wire and generate a magnetic field. This magnetic field drag the contacts together and holds them there until the current flow in the coil after that when release the switch it is stopped. The below diagram shows the parts of a simple relay.



Relay

Usage of Relay in it's place of switches are a lot of safer, relays can be operate in very low down voltage but it can handle high voltages also and much safer .Switches are only manual operated, easily depreciate . The other form a Relays is contactor & Breakers during power supply it control 400v to 220 kilo volts for these application switches cannot be situated used at all. We know the working of a relay as a remote control switch. It can have one or more set of connections so one relay can become a series of remote controlled switches Single Pole Single Throw relay. Current will only stream thought the connection as the time as the relay coil is enable means when we give the voltage supply it make contact.

Fluid crystal display

LCD remains for Liquid Crystal Display. LCD is finding across the board use supplanting LEDs (seven portion LEDs or other multi fragment LEDs) on account of the accompanying reasons:

1. The declining costs of LCDs.

2. The capacity to show numbers, characters and design. This is rather than LEDs, which are constrained to numbers and a couple characters.

3. Incorporation of an invigorating controller into the LCD, in this way calming the CPU of the undertaking of reviving the LCD. Interestingly, the LED must be invigorated by the CPU to continue showing the information.

4. Ease of programming for characters and illustrations.

5.These parts are "particular" for being utilized with the microcontrollers, which implies that they can't be enacted by standard IC circuits. They are utilized for composing diverse messages on a smaller than expected LCD.

A model portrayed here is at its minimal effort and incredible potential outcomes most as often as possible utilized as a part of practice. It depends on the HD44780 microcontroller (Hitachi) and can show messages in two lines with 16 characters each. It shows every one of the letter sets, Greek letters, accentuation marks, numerical images and so on. Furthermore, it is conceivable to show images that client makes up all alone. Programmed moving message in plain view (move left and right), appearance of the pointer, backdrop illumination and so on are considered as helpful qualities.

Pins Functions:

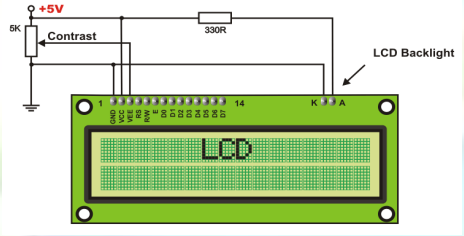
There are pins along one side of the little printed board utilized for association with the microcontroller. There are aggregate of 14 pins checked with numbers (16 on the off chance that the foundation light is implicit). Their capacity is depicted in the table underneath:

TABLE:2

Function	**Pin Number**	**Name**	**Logic State**	**Description**
Ground	1	Vss	-	0V
Power supply	2	Vdd	-	+5V
Contrast	3	Vee	-	0 – Vdd
Control of operating	4	RS	0 1	D0 – D7 are interpreted as commands D0 – D7 are interpreted as data
	5	R/W	0 1	Write data (from controller to LCD) Read data (from LCD to controller)
	6	E	0 1 From 1 to 0	Access to LCD disabled Normal operating Data/commands are transferred to LCD
Data / commands	7	D0	0/1	Bit 0 LSB
	8	D1	0/1	Bit 1
	9	D2	0/1	Bit 2
	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-Vdd is applied on pin marked as Vee. 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:*

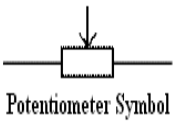
All data transferred to LCD through outputs D0-D7 will be interpreted as commands or as data, which depends on logic state on pin RS:RS = 1 - Bits D0 - D7 are addresses of characters that should be displayed. Built in processor addresses built in "map of characters" and displays corresponding symbols.

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 an 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.



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- 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. a complete set of alphabetical letters. If it mostly contains numbers then it can also be called a numeric keypad.

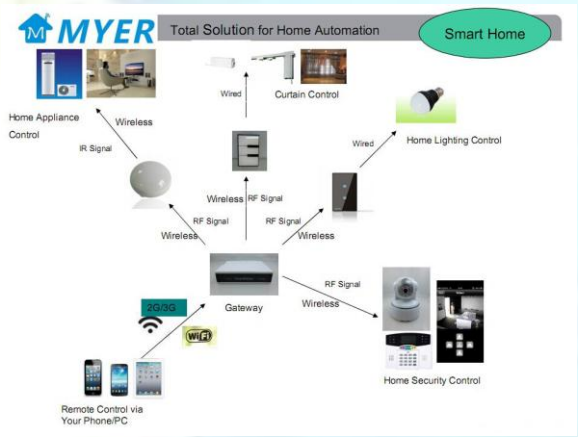
Keypads are found on many alphanumeric keyboards and on other devices such as calculators, push-button telephones, combination locks, and digital door locks, which require mainly numeric input. In keypad we have keys arrays in which keys can be arranged in different combinations and the matrix keypad in which keys are arrange in a particular rows and columns.

4. Wireless Network Technology: Embedded Serial to Wi-Fi Modules

Wifi module

Wifi stands wireless fidelity Wireless technology is common to the all in modern society .This wireless module we use in much application because the power consumption is very less expensive. It is very simple ,reduces wiring harness compare with the olden devices .wifi module range is nearly 80 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 wifi 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.



Controlling of appliances of using Android phone

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 UN fettered, 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

About keil software

KEIL is a software which is used to create the code and that is based on the C programming . Here mainly the purpose of KEIL software is to create a .c file and also for the creation of the hex file , by the use of .c file is the source code which can be used for the main code. And coming to the Hex file it is mainly used for the dumping into the hardware. And run the compiler on each C source file,and also specifying the list of controllers . Here one more thing is that for the selection of the controller also it is mainly using this KEIL software. It can run the library manager or linker. Hex file is main source for the hardware because it is download to the target h/w and debugging. It is used to create a source file to create the .c file. Mainly the compiling is going in the KEIL software they are translate ,burn and Reburn these three main compiling buttons which can be used to compile the program.

PROJECT

To build a single application a project is list of all source files required. Here KEIL centers on projects ,all the tools in the KEIL are used to support how to apply the tool depends on the selected program. For every project contains the set source files and instructions, and they exactly the binary code for the application required. The degree flexibility required from specific manner. For loading the project file to the KEIL which the source files are required. Therefore they are stored in a project file. Whenever we are going to write the program we need to do are repeat the same steps, because by using this only all the programs that they are running. Repeat to all the programs

Debugger and simulator

Debugger and simulator can work both the very detailed execution of a micro controller with external signals. It can used to execute for the prescribed time of a assembly instruction ,or by using the single line C code source code .these are all used for the entire application and to perform the task that can be used for the particular task .

Lines of C code and executions it may be stepped through in single instruction or c line at single time .the memory areas are viewed with some ability along to find specific variables. In present the register may be viewed allowing detailed for what microcontroller is doing at any point in single time .Mainly in this KEIL 8051 developing tools and they are listed for the program to compile in the source code. And by arranging the code files in a programmed way. To create Hex file and for the debugging the target program, micro µVision2 is for the OS that can be used to get the keil4 and also keil3 like this we are having

the different version but coming to the 8051 the keil that we are using is the KEIL4 and is called micro vision .here in this we are editing programming project management.

- Here in this C51 KEIL ANSI creates and relocate object module from c source code.
- And coming to the A51 macro version, object modules are taken from the 8051 assembler source code .
- And BL51 locater and linker, they are created by the compiler and final absolute module will be assembled.

What is the new in micro vision?

It is used for the text compiler templates, fast navigation function and coloring of syntax with high lighting compared to micro3 micro2 is compatible.

What is the micro vision 3?

It is an IDE that which can be used help us write. And compile debug the embedded program.

- Project manager
- Making facility
- Configuration of tool
- Editable
- And debugger
- For analog and digital systems measure

Creating the steps of (micro) *µvision*

1. Open the keil icon
2. Go to top tool kit in that go to project
3. Click on the project with right click then we can see the open new project option
4. Select a folder for saving the project in that with name of the project.
5. Later go to select the controller
6. Go for Atmel in that we can see
7. Particular controller
8. The later select new file for writing the code
9. After completion of the program save it
10. Then we can see a new window which is used save the in to the .C file
11. Whatever the name u have given before creating folder with the program or project
12. Same with that name only we need to add the .c file
13. Coming to the target take a click beside it.
14. Coming to source group and double click on that
15. Add the .c file and translate and check the errors
16. In this way we can compile

Debugging

- Go to debug option which is above
- Start /stop option we can see debug session
- Click on the start button in single press or click ,so it will goes to debugging mode and starts
- The output windows execute to the main c function .Debug your program click go through and so on …

Creation of project

The micro vision is standard window application starting with click on the icon and the it can started New project window. Same as above steps.,

Building Projects and Creating a HEX Files

You may translate all source files and line the application When you build an application with syntax errors, µVision2 will display errors.

Creation hex file

After completion of the compiling the program or executing the code without any errors then we need to for the hex file creation.

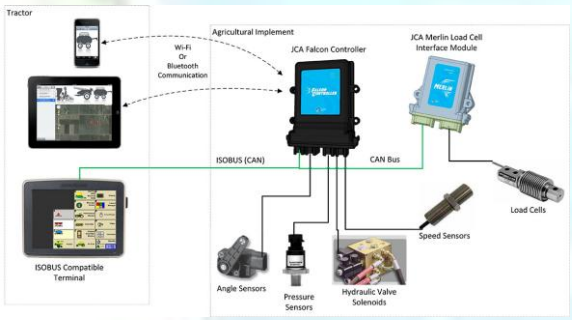
So to create hex file we to go to the target button which is at the left side of the window. When we click on to that button we can see target button again so need to click on that window we will get the new window

In this window go to the frequency setting and later goto the output window at the top. So by using this we can now click on the hex file button which shows

below window and later go to the save options. this is how we can create the hex file. window with the source text or shows CPU instructions in the disassembly window. Here now total can be used for finding the commands or correct program errors. The steps of the can be see in the below slides which are used to to get the idea how the process is going on.they taken in the following steps

Future scope

In this project we are controlling Home appliances using Andriod mobile through the wifi application, the wifi module transmit and receive the data through the Mobile , by using this project we avoid wastage of current in our home appliances and the implementation of this project is very helpful in homes, and offices and industrial also. Here we controlling wire lessly without transmission cables and reducing wiring harness.



Conclusion

The venture "Remote Controlled Home Automation Using Android Application by means of WiFi" been effectively outlined and tried. Coordinating elements of all the equipment parts utilized have created it. Vicinity of each module has been contemplated out and set precisely in this way adding to the best working of the unit. Besides, utilizing profoundly propelled IC's and with the assistance of developing innovation the venture has been effectively actualized.

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