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ANDROID CONTROLLED SCROLLING LED MESSAGE DISPLAY

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ABSTRACT

The project aims at designing a LED based scrolling message display controlled from an Android mobile phone. The proposed system makes use of Bluetooth technology to communicate from Android phone to LED display board.

Android is a software stack for mobile devices that includesan operating system middleware and key applications.
Android boasts a healthy array of connectivity options including Wi-Fi, Bluetooth, and wireless data over a cellular connection (for example,GPRS, EDGE (Enhanced Data ratesfor GSM Evolution), and 3G.

INTRODUCTION

An embedded system is a computer system designed to perform one or a few dedicated functions often with real-time computing constraints. It is embedded as part of a complete device often including hardware and mechanical parts.

By contrast, a general-purpose computer, such as a personal computer (PC), is designed to be flexible and to meet a wide range of enduser needs. Embedded systems control many devices in common use today.

Embedded systems are controlled by one or more main processing cores that are typically either microcontrollers ordigital signal processors (DSP).

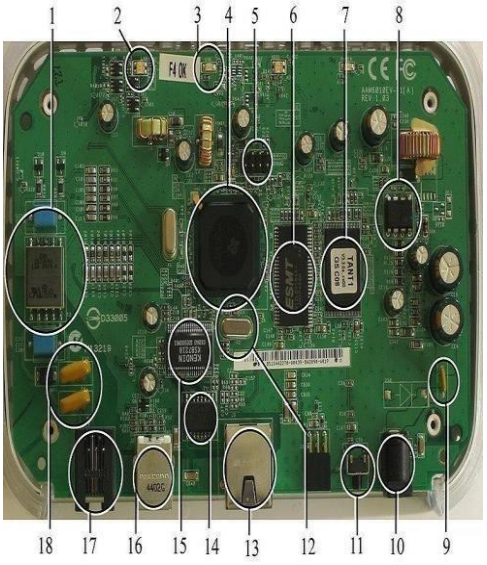

Fig :A modern example of embedded system

HARDWARE DISCRIPTION

In this chapter the block diagram of the project and design aspect of independent modules are considered. Block diagram is shown in fig.

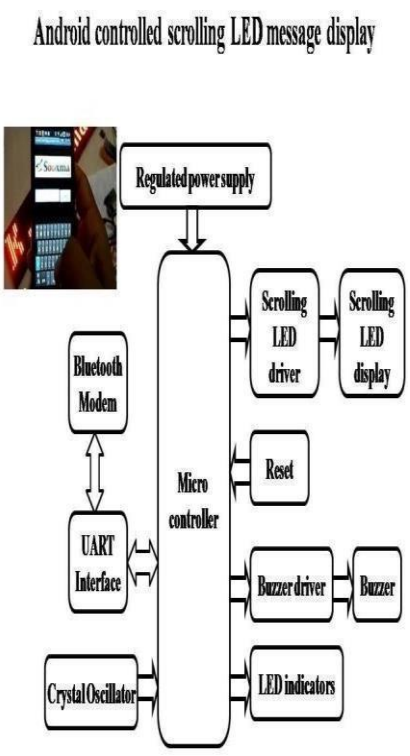

Fig: Android controlled scrolling LED message display

Labeled parts include microprocessor (4), RAM (6), flash memory (7).Embedded systems programming is not like normal PC programming. In many ways,

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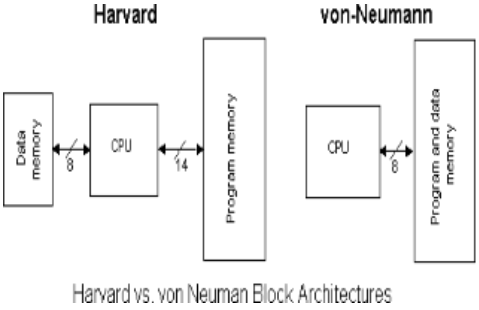
programming for an embedded system is like programming PC 15 years ago. The hardware for the system is usually chosen



Harvard vs. von Neuman Block Architectures

Fig: Harvard vs von Neuman block architectures

The main blocks of this project are:

1. Micro controller (16F73)
2. Reset button
3. Crystal oscillator
4. Regulated power supply (RPS)
5. LED Notice board
6. LED
7. Buzzer
8. Android phone

RAM

Data memory used by a program during its execution. In RAM are stored all inter-results or temporary data during run-time.

PORTS

are physical connections between the microcontroller and the outside world. PIC16F73 has 22I/O.

CISC, RISC

It has already been said that PIC16F73 has RISC architecture. This term is often found in computer literature, and it needs to be explained here in more detail. Harvard architecture is a newer concept than von-Neumann. It rose out of the need to speed up the work of a microcontroller. In Harvard architecture, data bus and address bus are separate.

Since PIC16F73 is a RISC microcontroller, that means that it has a reduced set of instructions, more precisely 35 instructions. (Ex. Intel's and Motorola's microcontrollers have over hundred instructions).

All of these instructions are executed in one cycle except for jump and branch instructions. According to what its maker says, PIC16F73 usually reaches results of 2:1 in code compression and 4:1 in speed in relation to other 8-bit microcontrollers in its class.

Applications

PIC16F73 perfectly fits many uses, from automotive industries and controlling home appliances to industrial instruments, remote sensors, electrical door locks and safety devices. It is also ideal for smart cards as well as for battery supplied devices because of its low consumption.

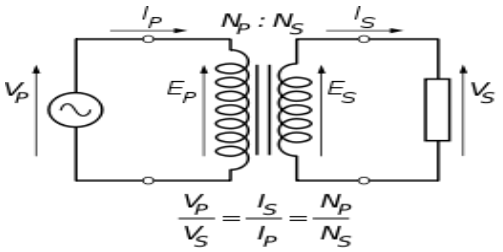


Fig : Step-Down Transformer

The voltage induced in the secondary is determined by the TURNS RATIO.

$$\frac{\text{primary voltage}}{\text{secondary voltage}} = \frac{\text{number of primary turns}}{\text{number of secondary turns}}$$

For example, if the secondary has half the primary turns; the secondary will have half the primary voltage.

All of these instructions are executed in one cycle except for jump and branch instructions. According to what its maker says, PIC16F73 usually reaches results of 2:1 in code compression and 4:1 in speed in relation to other 8-bit microcontrollers in its class.

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Introduction to Capacitors:

The Capacitor or sometimes referred to as a Condenser is a passive device, and one which stores energy in the form of an electrostatic field which produces a potential (static voltage) across its plates. In its basic form a capacitor consists of two parallel conductive plates that are not connected but are electrically separated either by air or by an insulating material called the Dielectric.

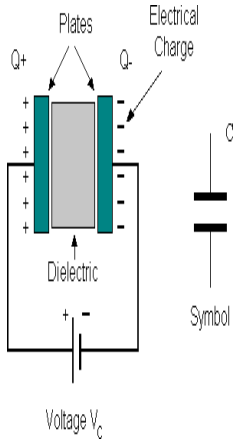
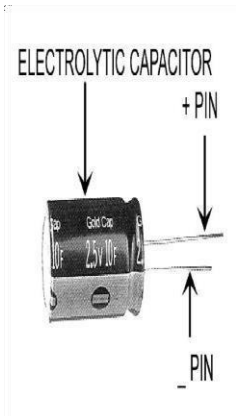


Fig :Construction Of a Capacitor Fig 3.3.8:Electrolytic Capaticor



Units of Capacitance:

Microfarad (μF) 1μF = 1/1,000,000 = 0.000001 = 10^{-6} F

Nanofarad (nF) 1nF = 1/1,000,000,000 = 0.000000001 = 10^{-9} F Pico farad (pF) 1pF

= 1/1,000,000,000,000 = 0.000000000001

= 10^{-12} F **Operation of Capacitor:**

$$P = I^2R = IV = \frac{V^2}{R}$$

Power dissipation:

The power dissipated by a resistor (or the equivalent resistance of a resistor network) is calculated using the following:

PROJECT DESCRIPTION

In this chapter, schematic diagram and interfacing of PIC16F72 microcontroller with each module is considered**.**

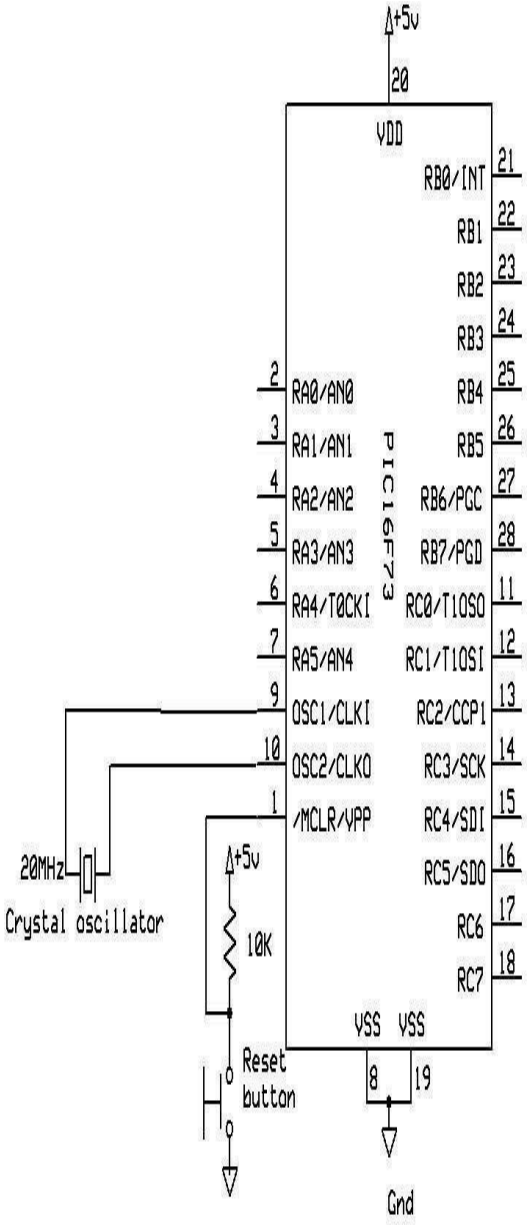


Fig : Interfacing crystal oscillator and reset button with microcontroller:

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SOFTWARE DESCRIPTION

This project is implemented using following software1s7

1 . Express '0B C for designing circuit.

2 . -0 0 compiler " for compilation part.

3 . Embedded 0+ C for simulation part.

&.1 Express PC+

Breadboards are great for prototyping e9uipment as it allows great fle%ibility to modify a design when neededK however the final product of a project ¯ ideally should have a neat '0B ¯ few cables ¯

and survive a shake test. 8 ot only is a proper '0 B neater but it is also more durable as there are no cables which can yank loose. E%press '0B is a software tool to design '0Bs specifically for manufacture by the company .

E%press '0B $no other '0B maker accepts E%press '0B files+. -t is very easy to use¯but it does have several limitations. -t can be likened to more of a toy then a professional 0AD program. -t has a poor part library $which we can work around+ -t cannot import or e%port files in different formats -t cannot be used to make prepare boards for D-Y production E%press '0B has been used to design many

'0Bs $some layered and with surface"mount parts. 'rint out '0B patterns and use the toner transfer method with an Etch (esistant 'en to make boards. @owever¯ E%press '0B does not have a nice print layout. @ere is the procedure to design in E%press '0B and clean up the patterns so they print nicely.

Bmaker accepts E%press '0B files+. -t is very easy to use ¯ but it does have several limitations. -t can be likened to more of a toy then a professional 0AD program. -t has a poor part library $which we can work around+ -t cannot import or e%port files in different formats -t cannot be used to make prepare boards for D-Y production E%press '0 B has been used to design many

ADVANTAGESAND DISADVANTAGES

Advantages:

1. Controlling of LED Notice board operations is through a Android mobile.
2. Wireless communication using Bluetooth technology.

Disadvantages:

1. Dealing with Bluetooth is sensitive.
2. Distance of Communication between Bluetooth and mobile jest 3meters.

Applications:

1. This system can be practically implemented in real time to operate wireless LED display
2. This system can be used in schools, display systems in railway stations, airports etc.

RESULTS

it is designed such that it is used to control the LED notice board using wireless Bluetooth technology. -nstead of using wire communication¯one can use this device from certain distance and can perform all the functions that our voice commands sends to LED 8oticeboard wirelessly using Bluetooth .

CONCLUSION

The project "**Android controlled scrolling LED message display**" is designed such that it is used to control the LED Notice board using wireless Bluetooth technology. Instead of using wire communication, one can use this device from certain distance and can perform all the functions that our voice commands sends to LED Noticeboard wirelessly using Bluetooth module.

FUTURESCOPE

IT i s m a i n l y intended to operate a LED 8otice board using a Bluetooth eliminating the use of generally used input peripherals like !ires¯'01s. This project has a Bu¯ er and LED 8otice board to the micro controller wirelessly using Bluetooth technology. -n future we can provide secrete code for Bluetooth to operate from selected mobile phone. this is have high security in school LED 8otice board.

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