

Biometric Access Control Implementation Using 32 Bit ARM Processor



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ABSTRACT:

Firstly discussing about Biometrics we are concentrating on Fingerprint scanning. For this we are using FIM 3030N high voltage module as a scanner. This module has in-built ROM, DSP and RAM. In this we can store up to 100 user's fingerprints. This module can operate in 2 modes they are Master mode and User mode. We will be using Master mode to register the fingerprints which will be stored in the ROM present on the scanner.

When this module is interfaced to the LPC2148, we will be using it in user mode. In this mode we will be verifying the scanned images with the stored images. When coming to our application, to prove that the persons are authorized to enter that area they need to scan their images.

I.Literature survey:

Door entrance alert system:

This project describes a security system that can monitor an industry and home. This is a simple and useful security system and easy to install. We can place this module either at a door near home or at offices, factories or any other place where we need monitoring every minute for the purpose of security.

In this project there is a sensor to monitor the door and when ever some one opens the door then a siren is activated to alert others. This can be fixed and can be activated when ever needed. This project has a drawback that the there is no authentication to access.

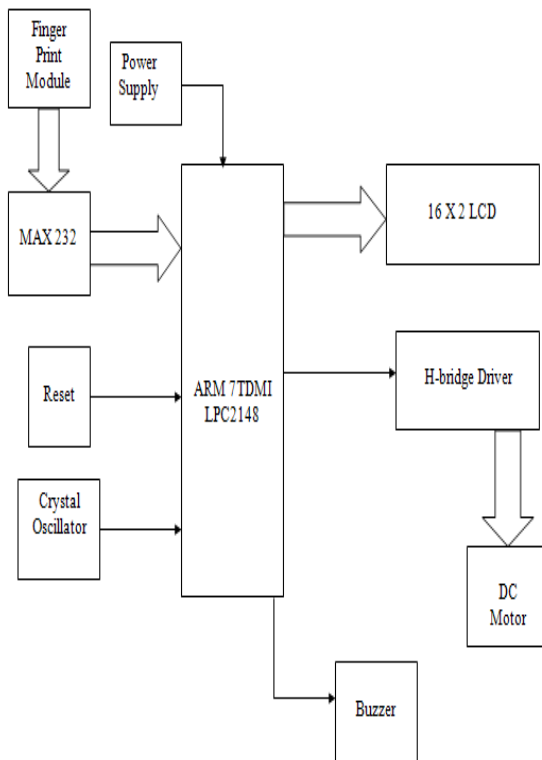
II.PROPOSED SYSTEM:

The scanner is interfaced to LPC2148 microcontroller. By using this controller we will be controlling the scanning process. After the scanning has been completed if the person is authorized, then immediately the locker will be opened by switch the relay automatically, after the work has been completed the user need to press the switch to close the door. If an unauthorized person tries to scan his image then an indication will be given by a buzzer which is interfaced to the controller. This project uses two power supplies, one is regulated 5V for modules and other one is 3.3V for LPC2148. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac out put of secondary of 230/12V step down transformer.

III.INTRODUCTION:

According ancient Greek scripts BIOMETRICS means study of life. Biometrics studies commonly include fingerprint, face, iris, voice, signature, and hand geometry recognition and verification. Many other modalities are in various stages of development and assessment. Among these available biometric traits Finger Print proves to be one of the best traits providing good mismatch ratio and also reliable. The present scenario to operate a bank locker is with locks which are having keys. By this we can't say that we are going to provide good security to our lockers. To provide perfect security and to make our work more easily we are taking the help of two different technologies viz. EMBEDDED SYSTEMS and BIOMETRICS.

BLOCK DIAGRAM



IV.HARD WARE MODULES: FINGERPRINT SCANNERS:

The basic information about fingerprint is that it is unique for each person. Even a twin brother will not have the same fingerprint. Thus each fingerprint is used to store a unique identifiable piece of information. The uniqueness in each fingerprint is due to the peculiar genetic code of DNA in each person. This code causes the formation of a different pattern of our fingerprint. A fingerprint consists of ridges and valleys. They together provide friction for the skin. The main identification of the skin is based upon the minutiae, which actually is the location and direction of the ridge endings and splits along a ridge path.



LCD:

LCD stands for Liquid Crystal Display. LCD is finding wide spread use replacing LEDs (seven segment LEDs or other multi segment LEDs) because of the following reasons:

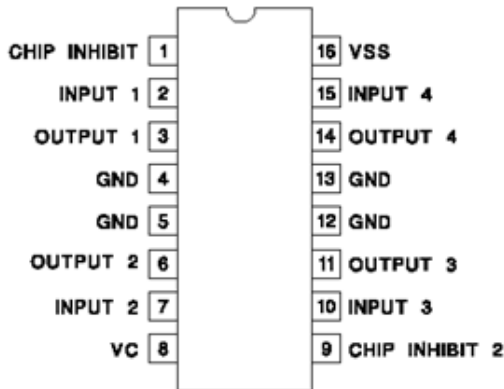
- 1.The declining prices of LCDs.
- 2.The ability to display numbers, characters and graphics. This is in contrast to LEDs, which are limited to numbers and a few characters.
- 3.Incorporation of a refreshing controller into the LCD, thereby relieving the CPU of the task of refreshing the LCD. In contrast, the LED must be refreshed by the CPU to keep displaying the data.
- 4.Ease of programming for characters and graphics.

Command	RS	RW	D7	D6	D5	D4	D3	D2	D1	D0	Execution Time
Clear display	0	0	0	0	0	0	0	0	0	1	1.64mS
Cursor home	0	0	0	0	0	0	0	0	1	x	1.64mS
Entry mode set	0	0	0	0	0	0	0	1	LD	S	40uS
Display on/off control	0	0	0	0	0	0	1	D	U	B	40uS
Cursor/Display Shift	0	0	0	0	0	1	D/C	R/L	x	x	40uS
Function set	0	0	0	0	1	DL	N	F	x	x	40uS
Set CGRAM address	0	0	0	1	CGRAM address					40uS	
Set DDRAM address	0	0	1	DDRAM address					40uS		
Read "BUSY" flag (BF)	0	1	BF	DDRAM address					-		
Write to CGRAM or DDRAM	1	0	D7	D6	D5	D4	D3	D2	D1	D0	40uS
Read from CGRAM or DDRAM	1	1	D7	D6	D5	D4	D3	D2	D1	D0	40uS

These components are “specialized” for being used with the microcontrollers, which means that they cannot be activated by standard IC circuits. They are used for writing different messages on a miniature LCD.

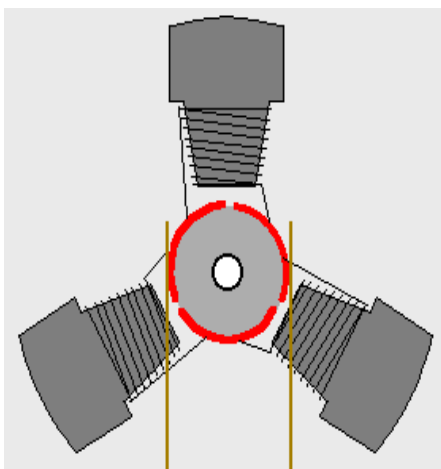
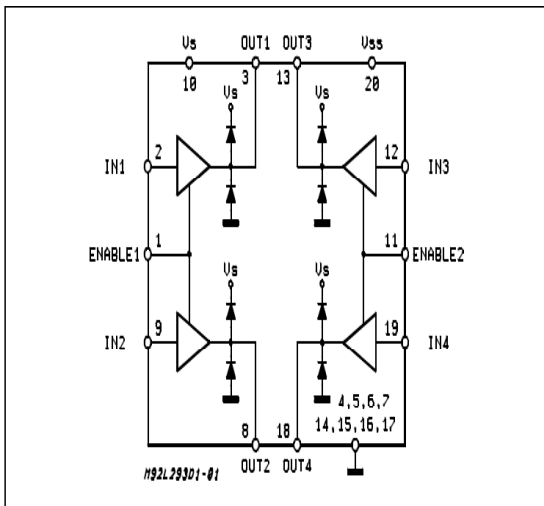
H-BRIDGE:

An H-bridge is an electronic circuit which enables DC electric motors to be run forwards or backwards. These circuits are often used in robotics. H-bridges are available as integrated circuits, or can be built from discrete components.



DC MOTOR:

An electric motor is a machine which converts electrical energy into mechanical energy.



V.SOFTWARE DETAILS:

A.Keil compiler:

Keil compiler is a software used where the machine language code is written and compiled. After compilation, the machine source code is converted into hex code which is to be dumped into the microcontroller for further processing. Keil compiler also supports C language code.

B.Proload:

Proload is a software which accepts only hex files. Once the machine code is converted into hex code, that hex code has to be dumped into the microcontroller placed in the programmer kit and this is done by the Proload. Programmer kit contains a microcontroller on it other than the one which is to be programmed. This microcontroller has a program in it written in such a way that it accepts the hex file from the keil compiler and dumps this hex file into the microcontroller which is to be programmed.

VI.ADVANTAGES:

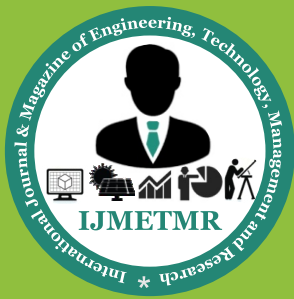
- » Sophisticated security
- » No manual errors
- » No false intrusion
- » Need not remember any password
- » Others cannot steel the user's entry key

VII.APPLICATIONS:

- » Industries are using finger print modems for access control, Stores, attendance recording, and machine operation authentication.
- » Banks and ATM
- » Voter Identification and electoral enrollment
- » Personal Computers
- » Automotives and high end cars

VIII.CONCLUSION:

In this project work, we have studied and implemented a complete working model using a LPC2148. The programming and interfacing of microcontroller has been mastered during the implementation. This work includes the study of FINGERPRINT module.



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