SMART TINY E-CARD FOR EMPLOYEE MANAGEMENT SYSTEM USING WIRELESS PROTOCOL

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Abstract

Zigbee Communication is being applied for wireless embedded networking in industrial and commercial areas because of its high redundancy and low power consumption. Tracking the location of an employee within a confined area like industries and commercial buildings often needs systems such as multiple CCTV cameras or GPS equipments. These systems although operates actively, the cost involved is much higher while implementation. In those days, to track the location of an employee within a confined area like industries and commercial buildings they used the punching cards. Our project aims at developing a sophisticated system to track an employee within an industrial campus area by means of a cheaper system like I2C serial memory card reader equipment and ZigBee wireless communication capabilities.

Keywords: PIC microcontroller, Zigbee module, UART , I2C serial cable

Introduction

In this project when you will inter in any industry or commercial place then you have to scan your smart tiny E-Card on card scanner, Then by the help of PIC microcontroller the attendance with time and your personal id will be given to the control room by transmitter section to the receiver section. And same type in all places like canteen, library and class room you have to scan your E-Card. Zigbee is used as a

transmission and reception medium in this project.

2. Existing system architecture:

This part gives a brief theoretical preview upon the database information systems and goes through the essence of the problem that should be resolved.

Background

Most of the systems are based on the Database technology as a collection of logically related data, and DBMS as a software system allowing the users to define, create, maintain and control access to the database.

The process of constructing such kind of systems is not so simple. It involves a mutual development of application program and database. The application program is actually the bridge between the users and the database, where the data is stored. Thus, the well-developed application program and database are very important for the reliability, flexibility and functionality of the system. The so defined systems differentiate to each other and their development comprises a great variety of tasks to be resolved and implemented.

2.1 *Motivation:*

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This system should consist of an application program, on one hand, and a database (repository of data) on the other. The program should perform the basic operations Upon the database as retrieving, inserting, updating and deleting data. Any additional functionality is a goal of a further module development.

3. Proposed System architecture:

The time has come for enterprises to begin considering whether smart cards can be used to improve security in their environments. Smart cards offer a secure form factor on which employees can carry digital credentials for accessing buildings, computers, parking facilities and network resources. Indeed, the ability for employee to carry both physical and logical access credentials can be provided on a single card.

Adding to the significance of smart card, that same card can be used for employee identification of other applications, , digital signatures, secure storage of employee medical information, including encryption and electronic wallet for cafeterias and vending machines. A single-card solution can provide return on investment in the forms of vastly improved security, reduced need for security and customer satisfaction.

This report includes a development presentation of an information system for managing the staff data within a small company or organization. The system is called Employee Management System. It consists of function GUI (application program) and database. The choice of the programmable tools is individual and particular. It has two section transmitting and receiving section. Transmitting section consisting two nodes(node 1 and node2)

It consisting of PIC microcontroller (16f877A), LCD display, Zigbee Module, UART, Power supply.

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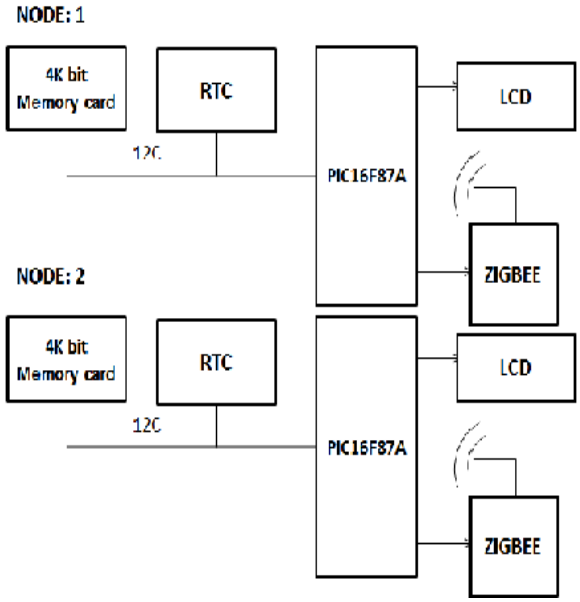
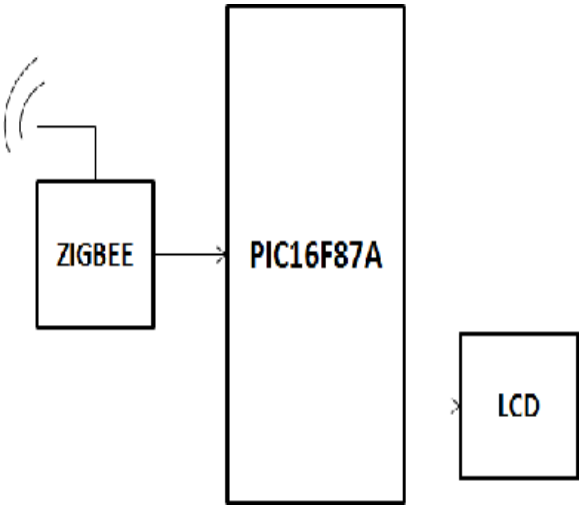
BLOCK DIAGRAM

TRANSMITTING SECTION:



RECIVING SECTION:



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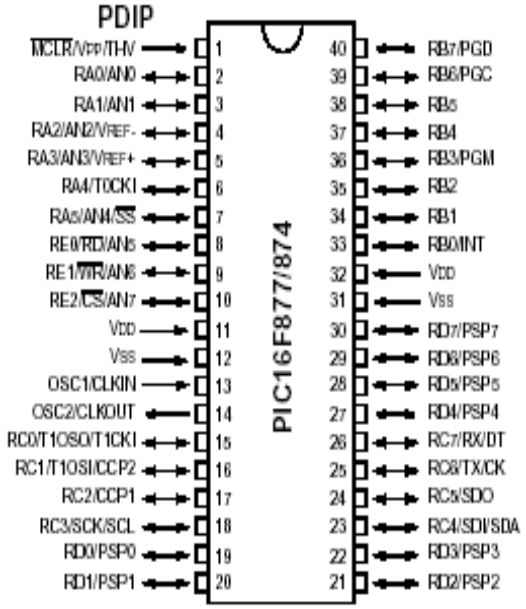
The 16F877A PIC microcontroller is the main component of this project. 16F877A PIC Micro controller is a 10-bit microcontroller with 72 Kbytes of programming memory. The microcontroller interfaced with the accelerometer records the physical activity and prepares the profile of the user which can be analyzed.

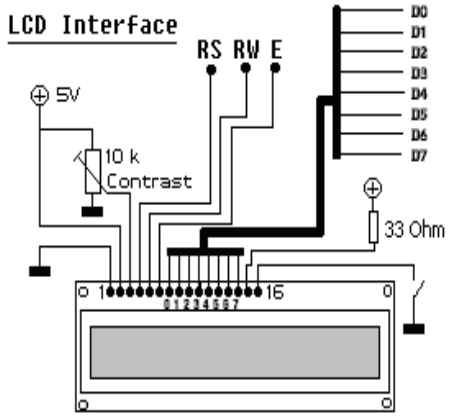


PIN DIAGRAM

It is a High performance of RISC CPU with 35 single word instructions, All single cycle instruction except for program branches with two cycle

The declining prices of LCDs. The ability to display characters, numbers, and graphics. This is in contrast to LEDs, which are limited to numbers and a few character. Incorporation of a refreshing controller into the LCD, by relieving the CPU of the task of refreshing the LCD. In contrast, LED must be refreshed by the CPU (or in some other way) to keep displaying the data.Ease of programming for characters and graph

LCD are available in different flavors which are specified as follows 16x1 , 16x2 , 20x2 in the format AxB where A is the number of columns (chatters) and B is the number of Rows (lines) An LCD might also be Back lit .



Lcd Interface with PIC Microcontroller

Now connect pins RS ,RW ,E ,D0 - D7 to pins on the micro controller Lets suppose I connect Data bus on port A and the RS , RW , E on port B . (you can save pins by using LCD in Nibble Mode (4 data pins) and permanently grounding the RW line (always in write mode) . Now well see how to go from simple switching it on to graphics on the LCD . An Intelligent LCD Need Only a few Commands And data to function Command Set for the LCD.

ZigBee and IEEE 802.15.4 are standards-based protocols that provide the network infrastructure required for wireless sensor network application. 802.15.4 defines the physical and MAC layers, and ZigBee defines the application and network layers. For sensor network application, key design requirements revolve around long battery life, small footprint, low cost, and mesh networking to support communication between large numbers of devices in an interoperable and multi-application environment. Motivation for ZigBee .The ZigBee standard was developed to address

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the following needs: Low cost ,Flexible and extendable ,Secure

Low power consumption Reliable and self-healing, Easy and inexpensive to deploy. Global with use unlicensed. Integrated intelligence for network radio bands set-up and message routing. ZigBee is the only standards-based technology that addresses the unique needs of most remote monitoring and control sensory network applications.

UART (Universal Asynchronous Receiver Transmitter) right - most bit is transmitted first. If parity is present, then parity bit comes after data bits. but before the stop bit(s). UART stands for the Universal

Asynchronous Receiver/Transmitter. In asynchronous transmitting, teletype-style UARTs send a "start" bit, five to eight data bits, least-significant-bit first, an optional "parity" bit, and then one, one and a half, or two "stop" bits. The start bit is the opposite polarity of the data-line's idle state and provides a delay before the next character can start. (This is known asynchronous start-stop transmission).

In mechanical teletypes, the "stop" bit was often stretched to two bit times to give the mechanism more time to finish printing a character. A stretched "stop" bit also helps resynchronization. The parity bit can either makes the number of "one" bits between any start/stop pair odd or even or it can be omitted. Odd parity is more reliable because of it assures that there will always be at least one data transition, and it permits many UARTs to resynchronize.

In synchronous transmission, the clock data is recovered separately from the data stream and no start/stop bits are used.it improves the efficiency of transmission on suitable channels since more of the bits sent are usable data and not character framing. asynchronous transmission sends nothing over the interconnection when the transmitting device has nothing to send; but a synchronous interface must send "pad" characters to maintain synchronism between the receiver and transmitter. The usual filler is the ASCII "SYN" character. it may be done automatically by the transmitting device. USART chips having both synchronous and asynchronous modes

Power supply circuit is a small +5V power supply, it is useful for experimenting with digital electronics. . This transformers are easily available, but usually the voltage regulation is very poor, which turn them unsable for digital circuit experimenter unless a better regulation can be achieved in some other way.

3.1 Implementation:

The first module of the block diagram is the node-1 of transmission section called as ADMINE BLOCK, which contains ZIGBEE MODULE, 16x2 LCD, UART,PIC MICROCONTROLLER (16F877A) I2CSerial EEPROMs. This module is used to scan the E-Card by card scanner, it will scan the information id of employee and store it in PIC MICROCONTROLLER.

The second module of the block diagram is called CANTEEN BLOCK of transmitter section node-2. It will also scan the personal information of employee by the card scanner and send to receiver section by Zigbee module. The third module block diagram is called receiver or control section, which will receive the personel information of employee transmit by transmitter section of different blocks through zigbee module. And display the id of employee with reporting time on 16x2 LCD.

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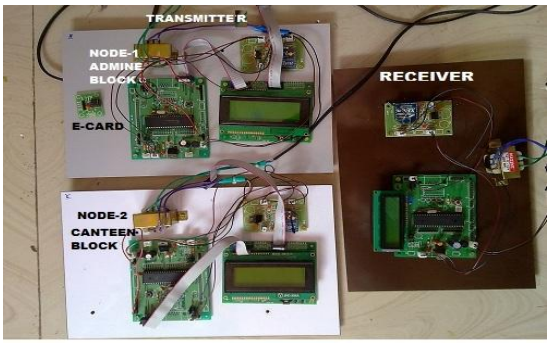

PROJECT KIT

4. Results:

Its capable to monitor the employee in a company. smart card has simple structure with good precision and efficient to transform signals towards receivers. The device is designed to implement anywhere. This model can be used any one and use any number of times. This device can be used by anyone irrespective of age by scaning smart card. This model is used for more security and identification of our team member within a less amount of time.

5. Conclusions and future work:

In this model, I made the project using real time embedded system transmitter and receiver as a Zigbee modem, with UART protocol. As we know that these days nobody has more time to finish any task, and everybody wants to finish any task before the time, so in our project there is no time loss according to same mention reason.

Apparently, the role of such systems is basic and essential within each company that wants to keep a really good control and record concerning its personnel data, functionality and their performance on every levels in the structure. Every organization, in nowadays, has the necessity of managing its staff on a really good level as the staff has definitely the greatest merit of building up a company as such as it is. The well ma nagged staff means giving the appropriate financial award-ness and all kind of benefits as such as they have been deserved. That's why the development of such systems is not just a programming business – a lot of people are ordinarily involved in such projects and one of the basic requirements is the reliability of the system, especially it concerns the storage of data and all of the operations that will be performed upon it.

If a usable, well-documented framework were to be developed, perhaps it would spur the deployment of smart cards in enterprises. Mostly, it would be most beneficial if the framework consisted of a package of instructions, surveys, policy templates, schematics, and lists of cards and equipment that are interoperable.

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