

Rfid secure access essay



**ASSIGN
BUSTER**

This is a very useful application of RFID (Radio-frequency identification) and is very commonly used in institutes, offices, homes and so on. An RFID system consists of a reader device and a transponder.

A transponder or tag has a unique serial number which is identified by the reader. Here RFID has been interfaced with AT89C51 to provide secured access. The relevant messages are also displayed on a 16×2 LCD. RFID automated access for door controls to buildings, departments, rooms, secured closets (wiring, PBX, etc.) and cabinets is very cost effective and secure to use.

Many people do not realize how easy it is to implement card access systems such as card access door or doors using RFID readers and RFID Cards or Keyfobs for Secured Access Control Management. You can even use smart readers for computer rooms and securing individual computers. In fact access based entrance and exits using access smart technology is rapidly becoming the way of the future for many businesses, government buildings, hospitals, museums and other establishments requiring secured but easy to control access solutions. Access based systems use either 125 kHz RFID or 13.

6 MHz RFID readers, cards and keyfobs. Features: Low power requirement. Excellent characters appearance. Reliability. Lower cost. In our project we are implementing the RFID based secured access system by using microcontroller.

The system communicates with an administrator PC via a serial communications link and HyperTerminal. RFID technology is based on the

concept of magnetic coupling, which is the principle that current flowing in one circuit can induce current flow in another circuit through a magnetic field generated in the space between the circuits. BLOCK DIAGRAM: HARDWARE

REQUIREMENTS: AT89C51 RFID MODULE MAX 232 16×2 LCD SOFTWARE

REQUIREMENTS: PROGRAMMING IN EMBEDDED C KEIL C COMPILER ISP

PROGRAMMER PROTEUS SCHEMATIC DIAGRAM CIRCUIT DESCRIPTION

DESIGNING: The main intension of this project is to design a RFID based Secured access system using 8051 microcontroller (AT89C51) . In order to fulfill this application there are few steps that has been performed i. e.

1) Designing the power supply for the entire circuitry. 2) Selection of microcontroller that suits our application.) Selection of LCD 4) Selection of MAX 232 5) Selection of RFID MODULE Complete studies of all the above points are useful to develop this project. POWER SUPPLY SECTION: In-order to work with any components basic requirement is power supply. In this section there is a requirement one voltage level i. e.

5V DC power supply. Now the aim is to design the power supply section which converts 230V AC in to 5V DC. Since 230V AC is too high to reduce it to directly 5V DC, therefore we need a stepdown transformer that reduces the line voltage to certain voltage that will help us to convert it in to a 5V DC. Considering the efficiency factor of the bridge rectifier, we came to a conclusion to choose a transformer, whose secondary voltage is 3 to 4 V higher than the required voltage i. e.

5V. For this application 0-9V transformers is used, since it is easily available in the market. The output of the transformer is 9V AC; it feed to rectifier that

converts AC to pulsating DC. As we all know that there are 3 kind of rectifiers that is 1) half wave 2) Full wave and 3) Bridge rectifier Here we short listed to use Bridge rectifier, because half wave rectifier has we less in efficiency.

Even though the efficiency of full wave and bridge rectifier are the same, since there is no requirement for any negative voltage for our application, we gone with bridge rectifier. Since the output voltage of the rectifier is pulsating DC, in order to convert it into pure DC we use a high value (1000UF/1500UF) of capacitor in parallel that acts as a filter. The most easy way to regulate this voltage is by using a 7805 voltage regulator, whose output voltage is constant 5V DC irrespective of any fluctuation in line voltage. SELECTION OF MICROCONTROLLER: As we know that there so many types of micro controller families that are available in the market. Those are 1) 8051 Family 2) AVR microcontroller Family 3) PIC microcontroller Family 4) ARM Family Basic 8051 family is enough for our application; hence we are not concentrating on higher end controller families.

In order to fulfill our application basic that is AT89C51 controller is enough. But still we selected AT89S52 controller because of inbuilt ISP (in system programmer) option. There are minimum six requirements for proper operation of microcontroller. Those are: 1) power supply section 2) pull-ups for ports (it is must for PORT0) 3) Reset circuit 4) Crystal circuit 5) ISP circuit (for program dumping) 6) EA/VPP pin is connected to Vcc.

PORT0 is open collector that's why we are using pull-up resistor which makes PORT0 as an I/O port. Reset circuit is used to reset the microcontroller. Crystal circuit is used for the microcontroller for timing pluses. In this project

we are not using external memory that's why EA/VPP pin in the microcontroller is connected to Vcc that indicates internal memory is used for this application. SELECTION OF LCD: A liquid crystal display (LCD) is an electronically-modulated optical device shaped into a thin, flat panel made up of any number of color or monochrome pixels filled with liquid crystals and arrayed in front of a light source (backlight) or reflector. SELECTION OF MAX 232: The MAX232 is an integrated circuit that converts signals from an RS-232 serial port to signals suitable for use in TTL compatible digital logic circuits.

The drivers provide RS-232 voltage level outputs (approx. ± 7.5 V) from a single + 5 V supply via on-chip charge pumps and external capacitors. This makes it useful for implementing RS-232 in devices that otherwise do not need any voltages outside the 0 V to + 5 V range, as power supply design does not need to be made more complicated just for driving the RS-232 in this case. SELECTION OF RFID MODULE: Radio-frequency identification (RFID) is a technology that uses communication through the use of radio waves to exchange data between a reader and an electronic tag attached to an object, for the purpose of identification and tracking.

CIRCUIT OPERATION: The RFID tag is used as an identity for a particular user. If the identity (serial number of the tag) of the user is matched with the one already stored in this system, he gets immediate access through it. This RFID based secured access system also has many additional features. For example, a new user can register himself with the system. A registered user can also withdraw his entry from the system.

These features can be accessed by pressing a tactile switch connected to the microcontroller. In beginning, the user is prompted to scan his tag or ID. The serial code of the tag is identified by the reader module and is sent to AT89C51 for checking. If the ID is matched by the microcontroller, the user gets the access.

On the contrary, if the tag is not identified, a message (' Wrong ID') is displayed on LCD screen. A new user needs to press the switch to register after which his identity is verified twice with RFID tag. The new record is stored by the microcontroller to grant future access. The system also shows ' Error' if the tags do not match during verification. An existing user can delete his record by pressing the same switch. Again the verification is carried out and the user is deleted if the IDs match.

If a different tag is scanned through the reader, LCD displays ' you have shown different ID'. When an RFID tag comes in this range, the reader detects it and sends a unique code of the tag serially. This serial code, consisting of 12 bytes, is received by the microcontroller. This code is treated as an ID for the user and is stored as an array in the microcontroller. If the ID is matched with this code, the user is granted access through the system.

For more details on working and connections of the circuit, refer RFID interfacing through serial interrupt. INTRODUCTION RFID MODULE: RFID technology is based on the concept of magnetic coupling, which is the principle that current flowing in one circuit can induce current flow in another circuit through a magnetic field generated in the space between the circuits.

In passive RFID, there are two major components: the reader and the mobile tag. The reader has two main functions: the first is to transmit a carrier signal, and the second is to receive a response from any tags in proximity of the reader. A tag needs to receive the carrier signal, modify it in some way corresponding to the data on the card, and retransmit the modified response back to the reader.

In modern passive RFID devices, the tag consists of a small integrated circuit (that performs the modulation) and an antenna. The benefit of passive RFID is that it requires no internal power source; the circuit on the tag is actually powered by the carrier signal. Thus, the carrier signal transmitted from the reader must be considerably large so that the response can be read even from the card. As shown in the above block diagram RFID systems are classified according to the properties of the data carrier called a transponder or tag. The two major classes of RFID transponders are active and passive. Active transponders contain a battery or are connected to an external power source.

Active transponders are capable of longer communication distance and can perform data collection tasks even when no reader is present.

MICROCONTROLLERS: Microcontrollers as the name suggests are small controllers. They are like single chip computers that are often embedded into other systems to function as processing/controlling unit. For example the remote control you are using probably has microcontrollers inside that do decoding and other controlling functions.

They are also used in automobiles, washing machines, microwave ovens, toys ... etc, where automation is needed. Embedded system means the processor is embedded into the required application.

An embedded product uses a microprocessor or microcontroller to do one task only. In an embedded system, there is only one application software that is typically burned into ROM. Example: printer, keyboard, video game player

Microprocessor - A single chip that contains the CPU or most of the computer

Microcontroller - A single chip used to control other devices

MICROPROCESSOR VS MICROCONTROLLER: Microprocessor: CPU is stand-alone, RAM, ROM, I/O, timer are separate Designer can decide on the amount of ROM, RAM and I/O ports. expensive versatility general-purpose

Microcontroller: CPU, RAM, ROM, I/O and timer are all on a single chip fix amount of on-chip ROM, RAM, I/O ports for applications in which cost, power and space are critical

single-purpose MAX 232: The MAX232 IC is used to convert the TTL/CMOS logic levels to RS232 logic levels during serial communication of microcontrollers with PC. The controller operates at TTL logic level (0- V) whereas the serial communication in PC works on RS232 standards (-25 V to + 25V). This makes it difficult to establish a direct link between them to communicate with each other.

The intermediate link is provided through MAX232. It is a dual driver/receiver that includes a capacitive voltage generator to supply RS232 voltage levels from a single 5V supply. Each receiver converts RS232 inputs to 5V TTL/CMOS levels. These receivers (R1 & R2) can accept $\pm 30V$ inputs. The drivers (T1 & T2), also called transmitters, convert the TTL/CMOS input level into RS232 level.

LIQUID CRYSTAL DISPLAY (LCD): A liquid crystal display

(LCD) is a thin, flat panel used for electronically displaying information such as text, images, and moving pictures.

Its uses include monitors for computers, televisions, instrument panels, and other devices ranging from aircraft cockpit displays, to every-day consumer devices such as video players, gaming devices, calculators, and telephones. Among its major features are its lightweight construction, its portability, and its ability to be produced in much larger screen sizes than are practical for the construction of cathode ray tube (CRT) display technology. Its low electrical power consumption enables it to be used in battery-powered electronic equipment. It is an electronically-modulated optical device made up of any number of pixels filled with liquid crystals and arrayed in front of a light source (backlight) or reflector to produce images in color or monochrome.

The earliest discovery leading to the development of LCD technology, the discovery of liquid crystals, dates from 1888

PIN DESCRIPTION: PIN 1 2 3 4 SYMBOL VSS VCC VEE RS I/O —I DESCRIPTION
 Ground +5V power supply Power supply to control contrast RS= 0 to select command register RS= 1 to select data register 5 6 7 8 9 10 11 12 13 14
 R/W EN DB0 DB1 DB2 DB3 DB4 DB5 DB6 DB7 I I/O I/O I/O I/O I/O I/O I/O
 I/O R/W= 0 for write R/W= 1 for read Enable The 8-bit data bus The 8-bit data bus The 8-bit data bus The 8-bit data bus The 8-bit data bus The 8-bit data bus The 8-bit data bus The 8-bit data bus VCC, VSS and VEE: While VCC and VSS provide +5V and ground respectively, VEE is used for controlling LCD contrast. RS (REGISTER SELECT): There are two important registers inside the LCD. When RS is low (0), the data is to be treated as a command

or special instruction (such as clear screen, position cursor, etc.). When RS is high (1), the data that is sent is a text data which should be displayed on the screen. For example, to display the letter " T" on the screen you would set RS high.

RW (READ/WRITE): The RW line is the " Read/Write" control line. When RW is low (0), the information on the data bus is being written to the LCD. When RW is high (1), the program is effectively querying (or reading) the LCD. Only one instruction (" Get LCD status") is a read command. All others are write commands, so RW will almost be low. EN (ENABLE): The EN line is called " Enable".

This control line is used to tell the LCD that you are sending it data. To send data to the LCD, your program should first set this line high (1) and then set the other two control lines and/or put data on the data bus. When the other lines are completely ready, bring EN low (0) again. The 1-0 transition tells the 44780 to take the data currently found on the other control lines and on the data bus and to treat it as a command. D0-D7 (DATA LINES): The 8-bit data pins, D0-D7 are used to send information to the LCD or read the content of the LCD's internal registers. To display letters and numbers, we send ASCII codes for the letters A-Z, a-z and numbers 0-9 to these pins while making RS= 1.

There are also instruction command codes that can be sent to the LCD to clear the display or force the cursor to the home position or blink the cursor. We also use RS= 0 to check the busy flag bit to see if the LCD is ready to receive the information. The busy flag is D7 and can be read when R/W = 1

and RS= 0, as follows: if R/W = 1, RS = 0. When D7= 1 (busy flag = 1), the LCD is busy taking care of internal operations and will not accept any new information. When D7 = 0, the LCD is ready to receive new information. LCD COMMAND CODES: CODE (HEX) 1 2 4 6 5 7 8 A C E F 10 14 COMMAND TO LCD INSTRUCTION REGISTER CLEAR DISPLAY SCREEN RETURN HOME DECREMENT CURSOR(SHIFT CURSOR TO LEFT) INCREMENT CURSOR(SHIFT CURSOR TO RIGHT) SHIFT DISPLAY RIGHT SHIFT DISPLAY LEFT DISPLAY OFF, CURSOR OFF DISPLAY OFF, CURSOR ON DISPLAY ON, CURSOR OFF DISPLAY ON CURSOR BLINKING DISPLAY ON CURSOR BLINKING SHIFT CURSOR POSITION TO LEFT SHIFT CURSOR POSITION TO RIGHT 18 1C 80 C0 8 SHIFT THE ENTIRE DISPLAY TO THE LEFT SHIFT THE ENTIRE DISPLAY TO THE RIGHT FORCE CURSOR TO BEGINNING OF 1ST LINE FORCE CURSOR TO BEGINNING OF 2ND LINE 2 LINES AND 5×7 MATRIX ADVANTAGES: LCD interfacing with 8051 is a real-world application.

In recent years the LCD is finding widespread use replacing LED's (seven segment LED's or other multi segment LED's). This is due to following reasons: The declining prices of LCD's. The ability to display numbers, characters and graphics. This is in contrast to LED's, which are limited to numbers and a few characters. An intelligent LCD displays two lines, 20 characters per line, which is interfaced to the 8051. Incorporation of a refreshing controller into the LCD, thereby relieving the CPU to keep displaying the data.

Ease of programming for characters and graphics. KEIL SOFTWARE: Many companies provide the 8051 assembler, some of them provide shareware version of their product on the Web, Kiel is one of them. We can download <https://assignbuster.com/rfid-secure-access-essay/>

them from their Websites. However, the size of code for these shareware versions is limited and we have to consider which assembler is suitable for our application.

Keil Uvision2: This is an IDE (Integrated Development Environment) that helps you write, compile, and debug embedded programs. It encapsulates the following components: A project manager A make facility Tool configuration Editor A powerful debugger To get start here are some several example programs Building an Application in Uvision2: To build (compile, assemble, and link) an application in uVision2, you must: Select Project- Open Project (For example, C166EXAMPLESHELLOHELLO. UV2) Select Project – Rebuild all target files or Build target. UVision2 compiles, assembles, and links the files in your project. Creating your Own Application in Uvision2: To create a new project in uVision2, 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 from the Device Database Create source files to add to the project. Select Project – Targets, Groups, and 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 only need to configure the memory map of your target hardware. Default memory model settings are optimal for most. device Applications: Select Project – Rebuild all target files or Build target. Debugging an Application in Uvision2: To debug an application

created using uVision2, you must: Select Debug - Start/Stop Debug Session. Use the Step toolbar buttons to single-step through your program.

You may enter G, main in the Output Window to execute to the main C function. Open the Serial Window using the Serial #1 button on the toolbar. Debug your program using standard options like Step, Go, Break, and So on.

PROTEUS: Proteus is the embedded system simulation and developing platform developed by Britain Lab center Company, this software has the following characteristics: Can carry on the intellectual principle Butut; The ones that paid software debugging and one-chip computer and peripheral circuit of the one-chip computer, in coordination with emulation; Meet the standard of the one-chip computer software simulation system. Support common one-chip computer type and PHILIPS Co. ARM7 (series LPC) Processor and common peripheral device, like 8255, ADC0809.

Can with 3 Keil Version, ADSI two integrated development environment combine, until and after the program compiling that language C write with collect, carry on the system simulation that the software and hardware combines. COMPONENT DESCRIPTION AT89C51: AT89C51 is an 8-bit microcontroller and belongs to Atmel's 8051 family. AT89C51 has 4KB of Flash programmable and erasable read only memory (PEROM) and 128 bytes of RAM. It can be erased and program to a maximum of 1000 times. In 40 pin AT89C51, there are four ports designated as P1, P2, P3 and P0.

All these ports are 8-bit bi-directional ports, i. e. , they can be used as both input and output ports. Except P0 which needs external pull-ups, rest of the

ports have internal pull-ups. When 1s are written to these port pins, they are pulled high by the internal pull-ups and can be used as inputs.

These ports are also bit addressable and so their bits can also be accessed individually. Port P0 and P2 are also used to provide low byte and high byte addresses, respectively, when connected to an external memory. Port 3 has multiplexed pins for special functions like serial communication, hardware interrupts, timer inputs and read/write operation from external memory.

AT89C51 has an inbuilt UART for serial communication.

It can be programmed to operate at different baud rates. Including two timers ; hardware interrupts, it has a total of six interrupts. Pin Configuration:

Features: Compatible with MCS-51™ Products 4K Bytes of In-System

Reprogrammable Flash Memory Endurance: 1, 000 Write/Erase Cycles Fully

Static Operation: 0 Hz to 24 MHz Three-level Program Memory Lock 128 x 8-

bit Internal RAM 32 Programmable I/O Lines Two 16-bit Timer/Counters Six

Interrupt Sources Programmable Serial Channel Low-power Idle and Power-

down Modes PIN DESCRIPTION: VCC Supply voltage. GND Ground.

Port 0 Port 0 is an 8-bit open-drain bi-directional I/O port. As an output port, each pin can sink eight TTL inputs. When 1s are written to port 0 pins, the pins can be used as high impedance inputs. Port 0 may also be configured to be the multiplexed low order address/data bus during accesses to external program and data memory. In this mode P0 has internal pullups.

Port 0 also receives the code bytes during Flash programming, and outputs the code bytes during program verification. External pullups are required during program verification. Port 1 Port 1 is an 8-bit bi-directional I/O port

with internal pullups. The Port 1 output buffers can sink/source four TTL inputs. When 1s are written to Port 1 pins they are pulled high by the internal pullups and can be used as inputs. As inputs, Port 1 pins that are externally being pulled low will source current (IIL) because of the internal pullups.

Port 1 also receives the low-order address bytes during Flash programming and verification. Port 2 Port 2 is an 8-bit bi-directional I/O port with internal pullups. The Port 2 output buffers can sink/source four TTL inputs. When 1s are written to Port 2 pins they are pulled high by the internal pullups and can be used as inputs.

As inputs, Port 2 pins that are externally being pulled low will source current (IIL) because of the internal pullups. Port 2 emits the high-order address byte during fetches from external program memory and during accesses to external data memory that use 16-bit addresses (MOVX @ DPTR). In this application, it uses strong internal pullups when emitting 1s. During access to external data memory that use 8-bit addresses (MOVX @ RI), Port 2 emits the contents of the P2 Special Function Register. Port 2 also receives the high-order address bits and some control signals during Flash programming and verification. Port 3 Port 3 is an 8-bit bi-directional I/O port with internal pullups.

The Port 3 output buffers can sink/source four TTL inputs. When 1s are written to Port 3 pins they are pulled high by the internal pullups and can be used as inputs. As inputs, Port 3 pins that are externally being pulled low will source current (IIL) because of the pullups. Port 3 also serves the functions of various special features of the AT89C51 as listed below: Port Pin P3.

0 P3. 1 P3. 2 P3. 3 P3.

4 P3. 5 P3. 6 P3. 7 Alternate Functions RXD (serial input port) TXD (serial output port) INT0 (external interrupt 0) INT1 (external interrupt 1) T0 (timer 0 external input) T1 (timer 1 external input) WR (external data memory write strobe) RD (external data memory read strobe) Port 3 also receives some control signals for Flash programming and verification.

RST Reset input. A high on this pin for two machine cycles while the oscillator is running resets the device. ALE/PROG Address Latch Enable output pulse for latching the low byte of the address during accesses to external memory. This pin is also the program pulse input (PROG) during Flash programming. In normal operation ALE is emitted at a constant rate of 1/6 the oscillator frequency, and may be used for external timing or clocking purposes.

Note, however, that one ALE pulse is skipped during each access to external Data Memory. If desired, ALE operation can be disabled by setting bit 0 of SFR location 8EH. With the bit set, ALE is active only during a MOVX or MOVC instruction. Otherwise, the pin is weakly pulled high.

Setting the ALE-disable bit has no effect if the microcontroller is in external execution mode. PSEN Program Store Enable is the read strobe to external program memory. When the AT89C51 is executing code from external program memory, PSEN is activated twice each machine cycle, except that two PSEN activations are skipped during each access to external data memory. EA/VPP External Access Enable.

EA must be strapped to GND in order to enable the device to fetch code from external program memory locations starting at 0000H up to FFFFH. Note, however, that if lock bit 1 is programmed, EA will be internally latched on reset. EA should be strapped to VCC for internal program executions. This pin also receives the 12-volt programming enable voltage (VPP) during Flash programming, for parts that require 12-volt VPP.

XTAL1 Input to the inverting oscillator amplifier and input to the internal clock operating circuit. XTAL2 Output from the inverting oscillator amplifier. Oscillator Characteristics XTAL1 and XTAL2 are the input and output, respectively, of an inverting amplifier which can be configured for use as an on-chip oscillator, as shown in Figure 1. Either a quartz crystal or ceramic resonator may be used. To drive the device from an external clock source, XTAL2 should be left unconnected while XTAL1 is driven as shown in Figure 2. There are no requirements on the duty cycle of the external clock signal, since the input to the internal clocking circuitry is through a divide-by-two flip-flop, but minimum and maximum voltage high and low time specifications must be observed.

Idle Mode In idle mode, the CPU puts itself to sleep while all the on-chip peripherals remain active. The mode is invoked by software. The content of the on-chip RAM and all the special functions registers remain unchanged during this mode. The idle mode can be terminated by any enabled interrupt or by a hardware reset.

It should be noted that when idle is terminated by a hardware reset, the device normally resumes program execution, from where it left off, up to two

machine cycles before the internal reset algorithm takes control. On-chip hardware inhibits access to internal RAM in this event, but access to the port pins is not inhibited. To eliminate the possibility of an unexpected write to a port pin when Idle is terminated by reset, the instruction following the one that invokes Idle should not be one that writes to a port pin or to external memory. Power-down Mode In the power-down mode, the oscillator is stopped, and the instruction that invokes power-down is the last instruction executed. The on-chip RAM and Special Function Registers retain their values until the power-down mode is terminated. The only exit from power-down is a hardware reset.

Reset redefines the SFRs but does not change the on-chip RAM. The reset should not be activated before VCC is restored to its normal operating level and must be held active long enough to allow the oscillator to restart and stabilize. Program Memory Lock Bits On the chip are three lock bits which can be left unprogrammed (U) or can be programmed (P) to obtain the additional features. When lock bit 1 is programmed, the logic level at the EA pin is sampled and latched during reset. If the device is powered up without a reset, the latch initializes to a random value, and holds that value until reset is activated.

It is necessary that the latched value of EA be in agreement with the current logic level at that pin in order for the device to function properly.

ARCHITECTURE: RFID MODULE: RFID technology is based on the concept of magnetic coupling, which is the principle that current flowing in one circuit can induce current flow in another circuit through a magnetic field generated in the space between the circuits. In passive RFID, there are two major

components: the reader and the mobile tag. The reader has two main functions: the first is to transmit a carrier signal, and the second is to receive a response from any tags in proximity of the reader. A tag needs to receive the carrier signal, modify it in some way corresponding to the data on the card, and retransmit the modified response back to the reader. In modern passive RFID devices, the tag consists of a small integrated circuit (that performs the modulation) and an antenna.

The benefit of passive RFID is that it requires no internal power source; the circuit on the tag is actually powered by the carrier signal. Thus, the carrier signal transmitted from the reader must be considerably large so that the response can be read even from the card. As shown in the above block diagram RFID systems are classified according to the properties of the data carrier called a transponder or tag. The two major classes of RFID transponders are active and passive. Active transponders contain a battery or are connected to an external power source.

Active transponders are capable of longer communication distance and can perform data collection tasks even when no reader is present. Passive transponders are powered by RF field. Passive transponders are smaller, have lower cost and require no periodic maintenance. The simple RFID devices are single bit Electronic Article Surveillance (EAS) tags. It simply detects the presence and absence of an EAS transponder in the reader zone. EAS tags are passive and must not contain integrated circuits.

Fixed RFID and Mobile RFID: Depending on mobility, RFID readers are classified into two different types: fixed RFID and mobile RFID. If the reader

reads tags in a stationary position, it is called fixed RFID. These fixed readers are set up specific interrogation zones and create a “ bubble” of RF energy that can be tightly controlled if the physics is well engineered. This allows a very definitive reading area for when tags go in and out of the interrogation zone. On the other hand, if the reader is mobile when the reader reads tags, it is called mobile RFID.

Mobile readers include hand helds, carts and vehicle mounted RFID readers from manufacturers such as Motorola, Intermec, Sirit, etc. There are three types of RFID tags: passive RFID tags, which have no power source and require an external electromagnetic field to initiate a signal transmission, active RFID tags, which contain a battery and can transmit signals once an external source (‘ Interrogator’) has been successfully identified, and battery assisted passive (BAP) RFID tags, which require an external source to wake up but have significant higher forward link capability providing greater range. Most passive RFID devices operate in one of three frequency bands: low frequency (125 kHz), high frequency (13. 56 MHz), and ultra-high frequency (400 to 930 MHz). Within these bands, there are various ways to modulate the signal so the reader can easily decipher the data. RFID can be used in a variety of applications, such as: • • • • • Access management Tracking of goods and RFID in retail Tracking of persons and animals Toll collection and contactless payment Machine readable travel documents • • • Smartdust (for massively distributed sensor networks) Tracking sports memorabilia to verify authenticity Airport baggage tracking logistics

MAX 232: The MAX232 IC is used to convert the TTL/CMOS logic levels to RS232 logic levels during serial communication of microcontrollers with PC.

The controller operates at TTL logic level (05V) whereas the serial communication in PC works on RS232 standards (-25 V to + 25V). This makes it difficult to establish a direct link between them to communicate with each other. The intermediate link is provided through MAX232. It is a dual driver/receiver that includes a capacitive voltage generator to supply RS232 voltage levels from a single 5V supply. Each receiver converts RS232 inputs to 5V TTL/CMOS levels.

These receivers (R1 ; R2) can accept $\pm 30V$ inputs. The drivers (T1 ; T2), also called transmitters, convert the TTL/CMOS input level into RS232 level. The transmitters take input from controller's serial transmission pin and send the output to RS232's receiver. The receivers, on the other hand, take input from transmission pin of RS232 serial port and give serial output to microcontroller's receiver pin. MAX232 needs four external capacitors whose value ranges from $1\mu F$ to $22\mu F$. PIN DIAGRAM: PIN DESCRIPTION: ISP

PROGRAMMER: In-System Programming (abbreviated ISP) is the ability of some programmable logic devices, microcontrollers, and other programmable electronic chips to be programmed while installed in a complete system, rather than requiring the chip to be programmed prior to installing it into the system.

Otherwise, In-system programming means that the program and/or data memory can be modified without disassembling the embedded system to physically replace memory. The primary advantage of this feature is that it allows manufacturers of electronic devices to integrate programming and testing into a single production phase, rather than requiring a separate programming stage prior to assembling the system. This may allow

manufacturers to program the chips in their own system's production line instead of buying preprogrammed chips from a manufacturer or distributor, making it feasible to apply code or design changes in the middle of a production run. ISP (In System Programming) will provide a simple and affordable home made solution to program and debug your microcontroller based project. Normally, the flash memory of an ATMEL microcontroller is programmed using a parallel interface, which consists of sending the data byte by byte (using 8 independent lines for the data, and another bunch of lines for the address, the control word and clock input).

Many members of the Maxim 8051-based microcontroller family support in-system programming via a commonly available RS-232 serial interface. The serial interface consists of pins SCK, MOSI (input) and MISO (output) and the RST pin, which is normally used to reset the device. ISP is performed using only 4 lines, and literally, data is transferred through 2 lines only, as in a I2C interface, where data is shifted in bit by bit though MOSI line, with a clock cycle between each bit and the next (on the SCK line). MISO line is used for reading and for code verification; it is only used to output the code from the FLASH memory of the microcontroller.

The RST pin is also used to enable the 3 pins (MOSI, MISO and SCK) to be used for ISP simply by setting RST to HIGH (5V), otherwise if RST is low (0V), program start running and those three pins, are used normally as P1. 5, P1. 6 and P1. 7. After RST is set high, the Programming Enable instruction needs to be executed first before other operations can be executed.

Before a reprogramming sequence can occur, a Chip Erase operation is required. The Chip Erase operation turns the content of every memory location in the Code array into FFH. Either an external system clock can be supplied at pin XTAL1 or a crystal needs to be connected across pins XTAL1 and XTAL2. The maximum serial clock (SCK) frequency should be less than 1/16 of the crystal frequency. With a 33 MHz oscillator clock, the maximum SCK frequency is 2 MHz.

0. 1UF/35V GND GND 100K VCC 13 25 12 24 11 23 10 22 9 21 8 20 7 19 6 18
5 17 4 16 3 15 2 14 1 CONNECTOR DB25 1 2 3 4 5 6 7 8 9 10 GA I1A O1B I2A
O2B I3A O3B I4A O4B GND 74HC244 GND VCC GB O1A I1B O2A I2B O3A I3B
O4A I4B 20 19 18 17 16 15 14 13 12 11 1 3 5 7 9 2 4 6 8 10GND

In the above figure we can see the ISP programmer connections using 74ls244.

74LS244: The 74LS244 is used to work between PRINT ports to the chips AT89S52. We cannot observe 74LS244 on the PCB which is AT89S52 located. It hid in the joint between PC and 6 transmission lines. The 74LS244 pin configuration, logic diagram, connection and function table is on the below.

DB-25 Male pin description: Pin no 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
18 19 20 21 22 23 24 25 Name GND TXD RXD RTS CTS DSR GND CD ---STF
S. CD S. CTS S. TXD TCK S. RXD RCK LL S.

RTS DTR RL RI DSR XCK TI Direction Pin Description Shield Ground Transmit
Data Receive Data Request to Send Clear to Send Data Set Ready System
Ground Carrier Detect Reserved Reserved Select Transmit Channel
Secondary Carrier Detect Secondary Clear to Send Secondary Transmit Data
Transmission Signal Element Timing Secondary Receive Data Receiver Signal

Element Timing Local Loop Control Secondary Request to Send Data terminal
Ready Remote Loop Control Ring Indicator Data Signal Rate Selector
Transmit Signal Element Timing Test Indicator ATMEL ISP FLASH

PROGRAMMER: This is the software that will take the HEX file generated by whatever compiler you are using, and send it - with respect to the very specific ISP transfer protocol - to the microcontroller. This programmer was designed in view of to be flexible, economical and easy to built, the programmer hardware uses the standard TTL series parts and no special components are used. The programmer is interfaced with the PC parallel port and there is no special requirement for the PC parallel port, so the older computers can also be used with this programmer. SUPPORTED DEVICES: The programmer software presently supports the following devices AT89C51 AT89S8252 AT89S51 AT89C51RC The ISP-3v0.

zip file contains the main program and the I/O port driver for Windows 2000 & XP. Place all files in the same folder, for win-95/98 use the " ISPPgm3v0. exe" File, for win-2000 & XP use the " ISP-XP. bat" file. The main screen view of the program is shown in fig below.

Following are the main features of this software: Read and write the Intel Hex file Read signature, lock and fuse bits Clear and Fill memory buffer Verify with memory buffer Reload current Hex file Display buffer checksum Program selected lock bits & fuses Auto detection of hardware AT89C1051 AT89C55 UD87C51 AT89S53 AT89C52 AT89C4051 AT89S52 AT89C55WD AT89C2051 D87C52 Note: For 20 pin devices a simple interface adapter is required. The memory buffer contains both the code data and the EEPROM data for the devices which have EEPROM memory. The EEPROM memory

address in buffer is started after the code memory, so it is necessary the hex file should contains the EEPROM start address after the end of code memory last address. i. e.

, for 90S2313 the start address for EEPROM memory is 0 x 800. The software does not provide the erase command because this function is performed automatically during device programming. If you are required to erase the controller, first use the clear buffer command then program the controller, this will erase the controller and also set the device> to default setting. ISP

PROGRAMMER PICTURE: CODING Program for RFID based Secured access system using 8051 microcontroller (AT89C51) #include sfr lcd_data_pin= 0xA0; sbit rs= P1^0; sbit rw= P1^1; sbit en= P1^2; sbit new_user= P1^3; unsigned char card_id[12], index= 0, key1= 0, flag0= 0, flag1= 0, flag2= 0, flag3= 0; unsigned char card_mem[6][12];
 //={/*'2','6','0','0','9','3','6','C','B','2','6','B','*','2','6','0','0','9','1','1','D','D','B','7','1','2','6','0','0','9','3','6','F','7','2','A','8','0','F','0','0','2','D','D','7','D','0','2','5'}; unsigned char current_byte = 0; void display(); void memory(); //P2 port void delay(unsigned int count) { int i, j; for(i= 0; i