

Rfid Based Network Administration with Personal Identification

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ABSTRACT

The concept of RFID based power consumption finds application in software companies. The computers present in the software agency are accessed at the same time. There are cases where some user may forget to shut down the computer which may result in wastage of more energy and money. This RFID technology can be employed to design an automatic energy-saving system to be used in computer labs. The computers can be made to shut down or suspend automatically when not in use. Hence we can save unnecessary waste of energy and reduce carbon dioxide emissions and slow global warming.

KEY WORDS: RFID based power consumption, radio frequency identification technology.

1. INTRODUCTION

All the device details can be represented as a unique code known as an Electronic Product Code (EPC) using an RFID tag. An RFID tag contains a microchip connected to antenna. This compact package is provided in such a way that it can be fixed to any item that has to be tracked. The antenna fixed in the RFID tag receives the signals coming from RFID reader. It then adds extra information to the signal and transmits it back. Tags can be of two types:

- Active Tag
- Passive Tag

Active tags are provided with a battery which provides partial or a complete power for the antenna and the internal circuitry of the tag. Certain active tags can also be fitted with replaceable batteries so that it can be used for years. And its advantages are,

- It can be used at a distance of about one hundred feet or even more.
- Other sensors that work on electricity also can be used.

A passive tag is not fitted with a battery; RFID reader should supply the power for the tag. When a passive RFID tag encounters radio waves from an RFID reader, a magnetic field. And its advantages are,

- No battery usage; Lifetime for the passive is about twenty years or more.
- Low manufacturing cost.

Complement to Barcode: RFID tags can never act as a substitute, for other type of barcodes, because they are very expensive. RFID tag has the advantage of using many data sources on a single item. Barcodes can be generated and distributed through e-mail or mobile phones.

Many terabytes of memory is needed to store the data associated with the tracking of the objects. RFID data should be filtered and categorized to create useful information. Products can be tracked by the pallet with the help of RFID tags and at package level they can be tracked using Universal Product Code (UPC) or EAN from any unique barcodes.

Working of an Rfid System: An RFID reader is provided with an antenna which radiates radio waves; An RFID tag receives the data and sends it back. RFID readers generally used to debrief an RFID tag. Read range of an RFID tag represents the maximum distance at which a tag may be read. It depends on many factors such as the identifying frequency and the gain of the antenna. It also depends on the type of polarization present in the reader and the transponder antenna. The read range also depends on how the antennas are oriented with respect to each other. The position where the tag is placed on the object under test will also have an effect its read range.

RFID Range depends on:

- Transmitted power
- Sensitivity and efficiency of the receiver
- Antenna
- Frequency

The Department of Defense (DOD) and Wal-Mart are the two drivers in RFID today. Both have issued rules for all of their suppliers who use this RFID technology during the shipping of their products to their distribution centers.

Rfid System Components

- The antenna-copper wire winding, which is coiled and designed mainly to radiate RFID signal
- The reader -supplies power to the antenna, filters and supplies power them for long distance transmission.
- The interface - interfaces the RFID reader to any active device.

- The transponder – acts as transmitter and receiver.

Project Description: The term RFID generally describes a system that transfers the identity of any item or object or a person or any product wirelessly, with the help of radio waves. It does not need line of sight for its Transmission. An RFID reader which is connected to the server through microcontroller helps the user to access their respective system. The microcontroller used is ATMEL AT89S52. Whenever a user enters the lab; he/she has to show their respective RFID card to the RFID reader. The power status of the computer system located to that particular staff will be changed from sleep mode to normal mode automatically through the server. Again, the power status of the computer system can be changed from normal mode to sleep mode, when the staff shows the RFID card to the server for the second time. Also, the in-time and out-time of the user is registered on the server based on the time at which the RFID card is been swapped by a particular user. Hence there is efficient control of staff's attendance in the lab, by simultaneously saving power.

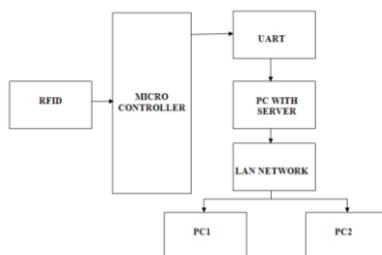


Figure.1. Main Block Diagram

AT89S52 Microcontroller: A microcontroller (can also be called as microcontroller unit, MCU or μC) contains a processor fixed in an integrated circuit. A basic processor is provided along with other additional features like serial I/O, analog I/O, crystal oscillator, timers, watchdog timer etc. Program memory can also be provided on the chip, in the form of OTP ROM or NOR flash. A typical amount of RAM can also be included in the chip. The AT89S52 is CMOS 8-bit microcontroller provided with a programmable Flash memory of 8K bytes which is inbuilt in the system. Atmel has a non-volatile memory technology with higher density. Hence it is used for manufacturing the microcontroller. It adapts itself with the pin out specification and the industrial standard instruction set of 80C51. This microcontroller has an in-system reprogrammable program memory. Otherwise a basic non-volatile memory can be used. It contains a versatile 8-bit CPU combined with flash memory which can be programmed in-system. Hence Atmel AT89S52 acts as a powerful microcontroller. It offers a high flexibility and offers a cheaper solution for most of the embedded control applications.

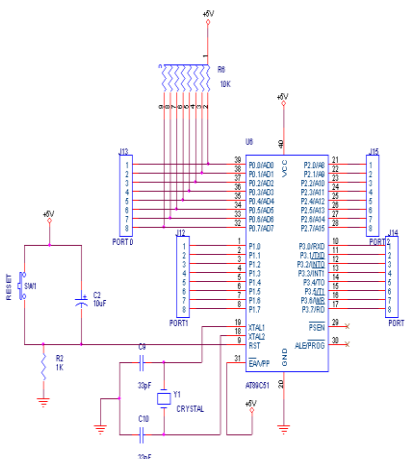


Figure.2. circuit diagram of atmel

Rfid Card Reader: RFID tag is generally applied to or fitted into a object, animal, or person and is used for identifying and tracking of the object with the help of radio waves. Some RFID tags can be read from longer distance. Most RFID tags are provided with two divisions. First part is an integrated circuit used for storing data and can be used for other additional functions. The second part is an antenna used to receive and transmit the signal.

RFID tags offer many applications; for example, can be used to increase the efficiency of inventory tracking and management. RFID involves interrogators (called readers), and tags (called labels).

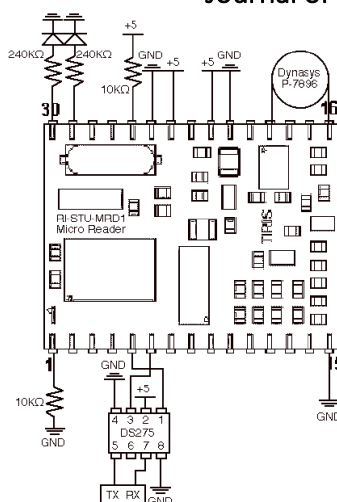


Figure.3. Circuit Diagram Of RFID Reader

UART- Universal Asynchronous Receiver/Transmitter: UART is used for the translation of data from parallel form to serial form and vice versa. UARTs are compatible with most of the communication standards. A UART is commonly a separate integrated circuit or can be a segment of an integrated circuit. It can be applied for serial communications by connecting the serial port of any peripheral device to the computer. Nowadays, UARTs are provided in the microcontrollers itself. In a computer, the UART controller plays the main part in a serial communication system. Data bytes are provided as inputs to the UART and these bytes are then transmitted as bits one by one serially. At the receiving end, another UART is placed to re-assemble all the individual bits into original bytes form. Discrete data can be serially transmitted using a single wire at a cheap rate compared to transmitting it parallel manner using many wired lines. At each end of the link, the conversion of the transmitted information from its serial to parallel form can be done using an UART. Each UART is provided with a shift register to convert data from serial to parallel form and vice versa.

MAX232: The MAX232 is used to change the signals from the serial port of an RS-232 cable into a form which makes the signal adaptive to be used in TTL based digital logic circuits. The MAX232 acts as dual driver or receiver circuit.

Charge pumps and capacitors provided externally to supply the necessary voltage level. Because of this, RS-232 can be is compatible with any devices. It works at an input voltage level of ± 25 V, which gets reduced to standard TTL voltage levels of +5V by the receiver. They have a typical threshold and hysteresis value of 1.3 V and 0.5V respectively.

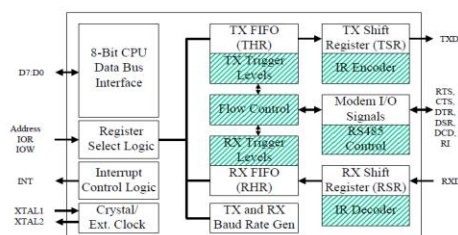


Figure.4. Block Diagram of Max232

LCD- Liquid Crystal Display: LCD has a thin, flat panel. Information such as data, pictures, and moving images can be displayed using these LCDs. Its main applications include computer monitors and televisions. Can also be used in instrument panels, and as displays for aircraft cockpit etc. It is also used in most of the consumer devices like telephones, video players, clocks, gaming devices, watches and calculators.

2. CONCLUSION

This solution can save a lot of energy, correspondingly, we also saving the much expense of electricity if this system can extensively popularize each computer classroom and lab. We can Implement Energy Efficiency and Carbon Reduction; It can reduce the considerable Electricity charges and carbon dioxide emissions and slow warming of the Earth. This automatic energy-saving system has been designed using RFID radio frequency identification technology to be used in any computer lab. When the computers were not in use, the computer will shut down or suspend automatically. Hence we can save unnecessary waste of energy and reduce carbon dioxide emissions and slow global warming. RFID reader connected to the server through microcontroller helps the user to access their respective system.

Future Enhancements: In this paper, we successfully designed a computer classroom of the energy-saving system by RFID. This concept of RFID based power consumption can also be extended for software companies. The computers present in the software agency are accessed at the same time. There are cases where some user may forget to shut down the computer which may result in wastage of more energy and money. This technology can be used to design an automatic energy-saving system for the companies also.

REFERENCES

- Carroll A and Heiser G, an Analysis of Power Consumption in a Smartphone, In Proc USENIX Annual Technical Conference, 2010.
- Gopalakrishnan K, Sundar Raj M, Saravanan T, Multilevel inverter topologies for high-power applications, Middle - East Journal of Scientific Research, 20(12), 2014, 1950-1956.
- Jasmin M, Vigneshwaran T, Beulah Hemalatha S, Design of power aware on chip embedded memory based FSM encoding in FPGA, International Journal of Applied Engineering Research, 10 (2), 2015, 4487-4496.
- Kanniga E, Selvamarathnam K, Sundararajan M, Kandigital bike operating system, Middle - East Journal of Scientific Research, 20 (6), 2014, 685-688.
- Kanniga E, Sundararajan M, Modelling and characterization of DCO using pass transistors, Lecture Notes in Electrical Engineering, 86 (1), 2011, 451-457.
- Karthik B, Arulselvi, Noise removal using mixtures of projected gaussian scale mixtures, Middle - East Journal of Scientific Research, 20 (12), 2014, 2335-2340.
- Karthik B, Arulselvi, Selvaraj A, Test data compression architecture for low power vlsi testing, Middle - East Journal of Scientific Research, 20 (12), 2014, 2331-2334.
- Karthik B, Kiran Kumar T.V.U, Authentication verification and remote digital signing based on embedded arm (LPC2378) platform, Middle - East Journal of Scientific Research, 20 (12), 2014, 2341-2345.
- Karthik B, Kiran Kumar T.V.U, EMI developed test methodologies for short duration noises, Indian Journal of Science and Technology, 6(5), 2013, 4615-4619.
- Karthik B, Kiran Kumar T.V.U, Vijayaragavan P, Bharath Kumaran E, Design of a digital PLL using 0.35 μ m CMOS technology, Middle - East Journal of Scientific Research, 18(12), 2013, 1803-1806.
- Namboodiri V and Gao L, Energy-Aware Tag Anticollision Protocols for RFID Systems, IEEE Transactions on Mobile Computing, 9 (1), 2010, 44-59.
- Oztaysi B, Baysan S and Akpınar F, Radio Frequency Identify (RFID) in hospitality. Technovation, 29, 2009, 618 – 624
- Oztekin A, Pajouh F.M, Delen D and Swim L.K, An RFID Network Design Methodology for Asset Tracking in Healthcare, Decision Support Systems, 49, 2010.
- Philomina S, Karthik B, Wi-Fi energy meter implementation using embedded linux in ARM 9, Middle - East Journal of Scientific Research, 20 (12), 2014, 2434-2438.
- Saravanan T, Sundar Raj M, Gopalakrishnan K, Comparative performance evaluation of some fuzzy and classical edge operators, Middle - East Journal of Scientific Research, 20 (12), 2014, 2633-2633.
- Saravanan T, Sundar Raj M, Gopalakrishnan K, SMES technology, SMES and facts system, applications, advantages and technical limitations, Middle - East Journal of Scientific Research, 20(11), 2014, 1353-1358.
- The 8051 Microcontroller and Embedded Systems by Muhammad Ali Mazidi, Gummesson J, Zhang P and Ganesan D, Flit A Bulk Transmission Protocol for RFID-Scale Sensors, In Proc ACM Mobi Sys, 2012.
- Vijayaragavan S.P, Karthik B, Kiran Kumar T.V.U, A DFIG based wind generation system with unbalanced stator and grid condition, Middle - East Journal of Scientific Research, 20 (8), 2014, 913-917.
- Vijayaragavan S.P, Karthik B, Kiran Kumar T.V.U, Effective routing technique based on decision logic for open faults in fpgas interconnects, Middle - East Journal of Scientific Research, 20 (7), 2014, 808-811.
- Vijayaragavan S.P, Karthik B, Kiran Kumar T.V.U, Privacy conscious screening framework for frequently moving objects, Middle - East Journal of Scientific Research, 20 (8), 2014, 1000-1005.