

An Radio Frequency Identification Based Door Access System

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Abstract: Advent of technology has made changes in every aspect of life. In an business, customer want an error free, user friendly environment to access the information. One of the solution to this is use of RFID. This paper provides a survey on radio frequency identification (RFID) technology for door access system. RFID tags are very advantageous because they can read the data and get information than barcodes. The paper describes the current technology, including the frequency ranges used and standards. This paper presents current research that focuses on use of RFID for door accessing system as security plays a major role. RFID are increasingly used with latest technologies like biometric technologies for security

Keywords: Radio Frequency Identification, RFID, RFID tags

I INTRODUCTION

According to Roy Want in [3], "Radio Frequency Identification Technology (RFID) has moved from obscurity into main stream applications that help speed the handling of manufactured goods and materials". Many products have barcodes, which plays prominent role in supply chain industries and department stores. It gives reduced labor levels, enhanced visibility, and improved inventory management. Walmart has been one of the leaders in the large scale adoption of RFID technology [3, 4]. RFID tags have a memory capacity of 16 - 64 Kbytes which is far more than the barcodes (1 - 100 bytes) [5] and can store additional data such as manufacturer name and product specifications. New advancements in science and technology have enabled usage in commercial applications. The similarity and differences between RFID and Barcodes[1]

Simiarity

- Provision tool to mechanize processes and to advance operations management.
- Reduces labor, eliminates human errors.

Differences

- Tags can be embedded and hidden with no need for line-of-sight.
- They can be read through wood, plastic, cardboard, any material except metal.

RFID advantages can be briefly explained as follows:[2]

- Reader can read and write data to RFID tags with out direct contact and no line of sight problem.

- Data from the multiple RFID tags are accessed by the reader by radio waves.
- No maintenance costs; RFID can work under different environments and can be used effectively for over 10 years.
- Fast read and write with the time taken for read/write being a few milliseconds.
- Modern RFID tags are made with very good memory capacities ranging from 16 - 64 Kbytes which is many times more than a typical barcode.
- RFID tags can work with GPRS and has been used for tracking.
- RFID tags can also integrate with other technologies. For example, it is used with wireless sensor networks for better connectivity.

II RFID PRINCIPLES

Many types of RFID exist, RFID devices are divided into two classes: active and passive. Active tags require a power source—they're either connected to a powered infrastructure or use energy stored in an integrated battery. In the latter case, a tag's lifetime is limited by the stored energy, balanced against the number of read operations the device must undergo. One example of an active tag is the transponder attached to an aircraft that identifies its national origin [5] [8] .

Passive RFID is of interest because the tags don't require batteries or maintenance. The tags also have an indefinite operational life and are small enough to fit into a practical adhesive label. A passive tag consists of three parts: an antenna, a semi- conductor chip attached to the antenna, and some form of encapsulation. The tag reader is responsible for powering and communicating with a tag. The tag antenna captures energy and transfers the tag's ID (the tag's chip coordinates this process). The encapsulation maintains the tag's integrity and protects the antenna and chip from environmental conditions or reagents [6].

Types of RFID Tracking

- Dealership Vehicle Management –Automatically track the movement of vehicles car throughout dealershRFIDips, including post sale return visits.
- Traffic & Queue Management – Automatically control the flow of vehicles to maximize efficiency and prevent operational gridlock.
- Driver Identification – Gain visibility into who is driving which vehicles and at what time.

- Weighbridge Automation – Automatically identify trucks at weighbridges, tying their vehicle identification data and weight measurements to increase process efficiency and transactional accuracy.
- Collision Avoidance – Designed to help prevent collisions between heavy and light vehicles, an alert is generated when a truck comes within a defined range of another vehicle. Certified for use in underground mines, these automatic proximity alerts help to minimize costly and dangerous accidents.
- Associated Assets – Trucks and their associated assets (trailers, containers, returnable items and inventory) are linked to determine the identity responsible for each movement.
- Animal Tracking - RFID tags can be used to track missed animals and their movements and behaviour.
- Health Care Industry- RFID tag is used to store the patient’s medical history. RFID tag is scanned each time to know the developments and changes of the patient’s health condition and medication.

III RFID SYSTEM COMPONENTS

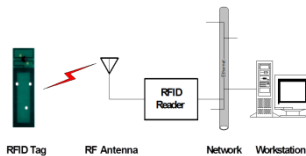


Fig 1 RFID system components

The major components of an RFID based system is shown in figure-1. The RFID based system has an RFID tag, an antenna to access the information An RFID reader to read the data, the communication network to pass the read data to the workstation. RFID tags work by absorbing the radio frequency energy from a scanner and using that energy to respond with data. The simplest passive tag consists of an antenna and chip containing encoded data, and its only power source is the electromagnetic energy it absorbs from the scanning pulse. These tags are cheap and easy to manufacture, but their effective range for scanning is extremely limited.If a greater scan range is required, manufacturers can include a power source in the RFID tag. These active tags have a range that is only limited by the strength of their internal power source. A simple low-voltage battery can produce a pulse readable from anywhere inside a building, while a more powerful source is capable of creating RFID pulses detectable at a range of hundreds of yards or more. Active tags can also be set to send out regular pulses instead of waiting for a scanning carrier wave, and are used in tracking everything from stolen merchandise to endangered animals.

The simplest RFID tags contain only an encoded identification number unique to the tag, but more expensive and complex tags may feature rewritable memory, or a chip that can be rewritten a single time by the end user to store information.

IV USE OF RFID FOR DOOR ACCESS SYSTEM

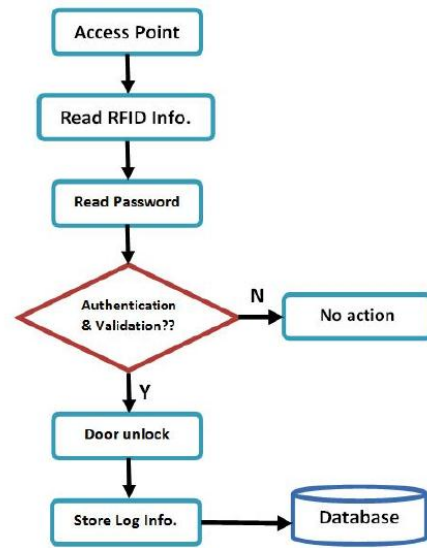


Fig 2 Flow diagram of the system

In the figure 2 gives the flow diagram of the system. Through an access point, the information in the RFID card is read. Authentication is provided through an password. If authenticated, the door is locked and information about the access is stored in the database. If the authentication fails, there wii be no action taken.

IV CONCLUSION

RFID tags are being used in clothing for billing and security purposes. RFID tags are embedded inside animals for tracking purposes. RFID tags embedded in uniforms can be used to know the number of hours an employee spends to complete a particular task. RFID manufacturers and users are looking for proper standardization and regulation of RFID. In this paper we have discussed about the use of RFID for door accessing system which helps from any unauthorized person to enter the room.

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