

# Modern Multipurpose Security Management System

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**Abstract** — Recent statistics show that premature babies are stolen to a great extent and also death increases due to improper and unnoticed security issues. To avoid these issues a method has to be implemented that monitors the position of the baby and inform by message or alarm when it is removed out of the allotted range. The proposed system is that the tag attached to the baby, if it is cut or removed then the system will be informed to the user by alarm, and also message is send to the nearest police station . In order to remove the baby proper password must be used to disable the alert system.

## INTRODUCTION

Identification of persons is always important in places like Airports, railway stations, theatres, etc. Identification can be made automatic using Auto-identification. There are various methods for auto-identification; some of them are bar-code systems, optical character recognition, biometrics, smart cards and RFIDs, of which RFID technology is a revolution. Various applications of RFID include: Transportation and logistics, manufacturing and processing, security, animal tagging, waste management, time and attendance, postal tracking, airline baggage reconciliation, road toll management, etc. To keep unauthorized personnel out of their building, companies have implemented access control systems. Employees are given an access badge with radio frequency identification (RFID) chip in it. This technique uses electromagnetic fields to exchange data from a tag (like a smartcard) to an object (a reader) for the purpose of authentication, identification or tracking.

The application and standardization of RFID are widely increasing but its adoption is still relatively new and hence many features of the technology are not well understood. Developments in RFID technology continue to yield larger memory capacities, wider reading ranges, and faster processing. Though the RFID technology is advantageous compared to bar code, it's highly unlikely that the technology will ultimately replace bar code, even with the inevitable reduction in raw materials coupled with economies of scale, since the integrated circuit in an RF tag will never be as cost effective as a bar code label. If some standards commonality is achieved, whereby RFID equipment from different manufacturers can be used interchangeably, the market will very likely grow exponentially

Extending the benefits of wireless communications to communication of data, to and from portable low cost data carriers, we can appreciate the nature and potential of radio frequency identification (RFID). RFID is an area of automatic identification that is now being seen as a radical means of enhancing data handling processes, complimentary in many ways to other data capture technologies such bar coding. The range that can be achieved in an RFID system is essentially determined by:

1. The power available at the reader/interrogator to communicate with the tag(s)
2. The power available within the tag to respond
3. The environmental conditions and structures, the former being more significant at higher frequencies including signal to noise ratio.

RFID tag is contactless card, referred to as a Proximity Integrated Circuit Card (PICC). Tags may either be actively or passively powered. Active tags contain an on-board power source, such as a battery, while passive tags must be inductively powered via an RF signal from the reader. The distance a reader may interrogate tags from is limited by the tag's power. Consequently, active tags may be read from a greater distance than passive tags. Active tags may also record

sensor readings or perform calculations in the absence of a reader. Passive tags can only operate in the presence of a reader and are inactive otherwise. An active tag's memory size varies according to application requirements and some systems operate with up to 1MB of memory. Passive RFID tags operate without a separate external power source and obtain operating power generated from the reader. Tags contain microchips that store the unique identification (ID) of each object. The ID is a serial number stored in the RFID memory. The chip is made up of integrated circuit and embedded in a silicon chip. RFID memory chip can be permanent or changeable depending on the read/write characteristics. RFID tags can be different sizes and shapes depending on the application and the environment at which it will be used. A variety of materials are integrated on these tags. For example, in the case of the credit cards, small plastic pieces are stuck on various objects, and the labels. Labels are also embedded in a variety of objects such as documents, cloths, manufacturing materials etc. The range of the RFID tags depends on their frequency.

## **EXISTING SECURITY SYSTEMS**

The following security systems are available in hospitals in order to avoid baby theft they are

### **Security warden**

In hospitals for baby ward the special warden is appointed to avoid baby theft. Even though security warden present in the hospital baby theft is a serious issue

### **Tag system**

In both government and private hospitals the tag system is used to identify the baby and mother. This tag may be either paper or card and it can be tear. Hence it is not an efficient system for baby theft.

### **CCD Camera**

In private hospitals CCD camera placed in the baby ward for the security purpose. It is used to continuously monitoring the entire ward. It is also an inefficient security system because only after baby theft we can identify the person. This system not available in most of the government hospitals.

## **PROPOSED ARCHITECTURE**

By analyzing the functionality of three basic security system available in hospitals namely security warden, tag system and CCD camera. All the above three system leads to an inefficient security system we propose modern multipurpose security management system.

### **Block diagram**

The block representation of the modern multipurpose security management system comprises of two blocks namely

- Control block
- Baby block

*Control block* → Control block is placed either doctor control room or security warden room.

*Baby block* → Baby block is attached with the baby it's look like a bangle or wearable tag

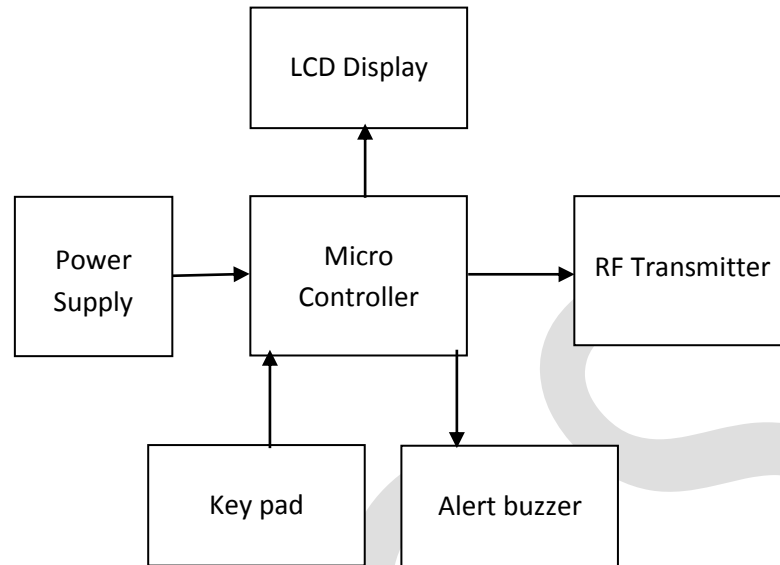


Fig 1 Control Block

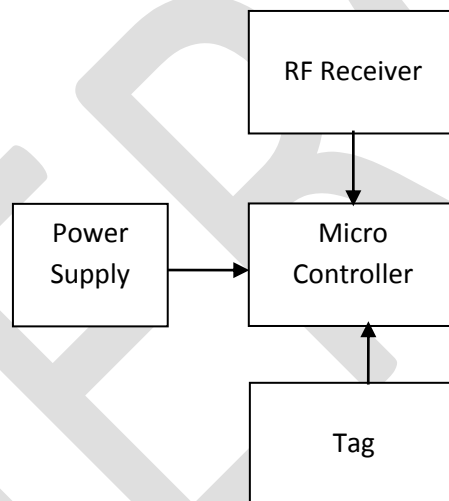


Fig 2 Baby Block

### Working Principle

The proposed architecture is subdivided in to two blocks namely control block and baby block in which control block is placed either in the doctor control room or security warden room and baby block is attached with the baby. There are two situation arises in the baby theft they are

- Baby moving out of frequency range
- Tag is removed

(i) When the proposed system is ON the RF transmitter in the control block send signal continuously to the RF Receiver in the baby block. RF transmitter and receiver having property of covering certain frequency range for example if covering frequency rage is one meter means if baby is moving out of one meter will leads to interruption in the signal transmission and reception and hence baby is out of control and buzzer will on.

(ii) The second situation is trying to remove tag or cut the tag. In both the case the interruption in the signal transmission and reception takes place and hence baby is out of control and buzzer will on. From above two conditions satisfied the proposed system is efficient baby theft security system.

**SIMULATION RESULTS**

In this section, we illustrate the simulation results obtained for proposed system.

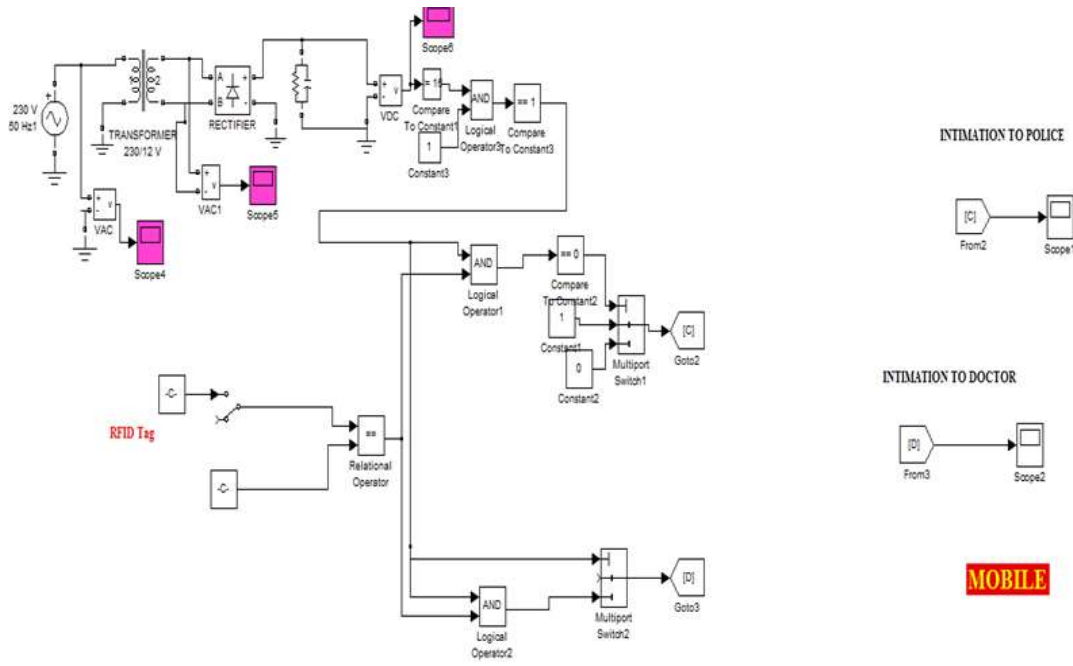


Fig 3 Overall System

The following procedure will followed to create model

- Open MATLAB then click file→model
- Pick and place the required component from library browser save the model and then run.
- Click on the scope block to view the obtained result.

We are creating the model in such a way that if the tag is not removed or cut the signal '1' will send to the authority. Similarly if the tag is removed or cut it will checked by the comparator block and signal '0' will send to the authority and siren will on.



Fig 4 Baby in Safe Condition

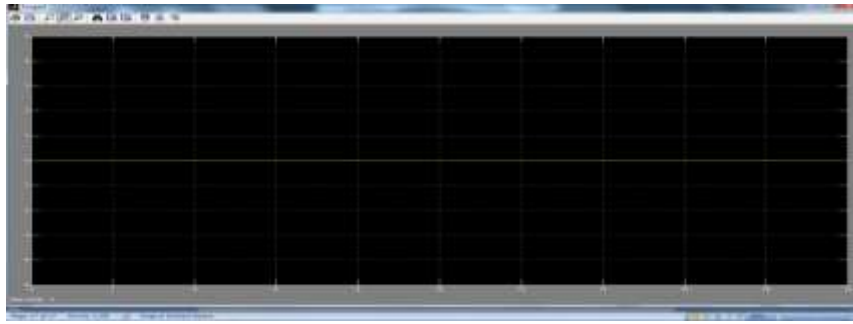


Fig 5 Baby in not Safe Condition

## CONCLUSION

From the survey we observe that the available security systems for baby theft protection are security warden, security tag system and CCD camera. All the above security system will leads to an inefficient security hence we propose modern multi-purpose security management system which is a highly efficient security system for baby theft in hospitals. The proposed system is fully automatic monitoring system. The same system can be used in jewelry shop protection and also in prisons to avoid escaping of prisoner hence we named the proposed system as modern multipurpose security management system.

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