

RFID Baby tagging systems



Radio Frequency Identification (RFID) Tags are fitted to a baby to accurately report Real-Time location and to avoid unauthorised removal of an infant from a ward. These RFID tags use the very latest in RFID Technology, transmitting a unique ID to the local network of readers to confirm the location of the baby.

A transmitter tag attached to the baby's ankle sends RF signals to discreetly placed receivers as the baby is moved throughout the facility. Any movement beyond a 'secure area' will trigger alarms and notify staff. A Low Frequency (LF) Receiver inside the tag works with an LF Exciter to create an alert if a tag nears an exit.

Radio-frequency identification (RFID).

RFID is the wireless non-contact use of radio-frequency electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects. RFID tags communicate with a networked system to track the object that has the tag. Like other wireless devices, RFID tags broadcast over a portion of the electromagnetic spectrum. The exact frequency is variable and can be chosen to avoid interference with other electronics or among RFID tags. The tags contain electronically stored information. Some tags are powered by and read at short ranges (a few meters) via magnetic fields. Others use a local power source such as a battery, or else have no battery but collect energy from the interrogating EM field, and then act as a passive transponder to emit microwaves or UHF radio waves. Battery powered tags may operate at hundreds of meters. RFID tags communicate with an electronic reader which in turn is connected to a large network that will send information on the location of the tagged object to a central location. RFID tags are an improvement over bar codes because the tags have read and write capabilities. Data stored on RFID tags can be changed, updated and locked. Through RFID tags, Security can quickly be alerted when the baby leaves the designated area.

Types of RFID tags.

Inductively coupled RFID tags are powered by a magnetic field generated by the RFID reader. This magnetic field **inducts** a current in the wire.

Capacitively coupled tags use conductive carbon ink instead of metal coils to transmit data. The ink is printed on paper labels and scanned by readers.

However both of the above are relatively bulky and expensive and hence no longer used.

Newer innovations in the RFID industry include active, semi-active and passive RFID tags. These tags can store up to 2 kilobytes of data and are composed of a microchip, antenna and, in the case of active and semi-passive tags, a battery. An active tag also uses its battery to broadcast radio waves to a reader, whereas a semi-passive tag relies on the reader to supply its power for broadcasting. The tag's components are enclosed within plastic, silicon or sometimes glass. These tags are less expensive to produce, and they can be made small enough to fit on almost any product. **RFID tags that contain their own power source are known as active tags. Those without a power source are known as passive tags.**

RFID - Basics.

- Data stored within an RFID tag's microchip waits to be read.
- The tag's antenna receives electromagnetic energy from an RFID reader's antenna.
- Using power from its internal battery or power harvested from the reader's electromagnetic field, the tag sends radio waves back to the reader.
- The reader picks up the tag's radio waves and interprets the frequencies as meaningful data.

RFID system components.

A RFID tagging system comprises of the tag itself, a read/write device, and a host system application for data collection, processing, and transmission.

Passive Reader Active Tag (PRAT) system has a passive reader which only receives radio signals from active tags (battery operated, transmit only). The reception range of a PRAT system reader can be adjusted from a few feet to over 1500 feet, allowing flexibility in applications such as asset protection and supervision.

An **Active Reader Passive Tag (ARPT)** system has an active reader, which transmits interrogator signals and also receives authentication replies from passive tags. An **Active Reader Active Tag (ARAT)** system uses active tags that respond to an interrogator signal from the active reader. A variation of this system could also use a Battery-Assisted Passive (BAP) tag which acts like a passive tag but has a small battery to power the tag's return reporting signal.

Fixed readers are set up to create a specific interrogation zone which can be tightly controlled. This creates a highly defined reading area for when tags go in and out of the interrogation zone.

Central Monitoring station and software.

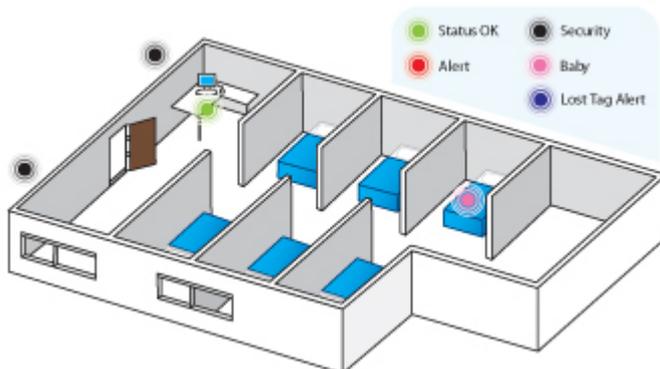
When an unauthorized person attempts to remove a monitored infant from the secured area, software displays status of automatically locked doors, infant location and alert/alarm condition information. This system becomes the eyes and ears of the security department, augmenting existing policy and procedure protocols. It is designed to perform a variety of Perimeter Alarm and Access Control functions by locking a door during the programmed hours and triggering an alarm if an unauthorized entry or exit has occurred.

Securing the Infant.



The objective of the RFID tagging system is to prevent babies or infants from being removed from a ward without authorisation.

Immediately after birth, a tag utilizing a unique code is applied to the ankle of an infant. This code is used to identify the infant as it enters or exits a monitored area. The presence signal provides the system with information about the RFID tag, and will generate an alert if the signal is lost, a different alert for a low battery and an alarm when a strap is tampered with. Each facility may have a designated "safe area" usually the maternity ward. Infants may be moved freely within this area, at all times. All exits from the safe area are monitored using a reader. As soon as a tag comes near an exit, an alarm occurs showing the specific RFID tag and the location. **As long as the infant is wearing a tag, he or she cannot be passed through a monitored exit undetected.** Most system manufacturers also provide special tamper-proof straps that trigger an alarm if anyone attempts to cut or unfasten the strap.



The control system has a "sign out" procedure, whereby authorised staff can sign out specific infants. Sign outs are strictly controlled through the use of passwords. The identity of the person authorising the sign out is recorded in the database of the control system. Similar precautions apply when discharging infants. **Control systems are also designed to perform a variety of Perimeter Alarm and Access Control functions by locking a door during the programmed hours and triggering an alarm if an unauthorized entry or exit has occurred.** When a tag is tampered with or removed without proper authorization, the facility locks down and audible or silent alarms are triggered.

Caveat

RFID baby tagging system is an aide to the security staff and not an end in itself. Relying solely on RFID baby tagging systems might dull the security staff into a sense of complacency and they might miss the criminal activity happening right in front of their eyes. **Human intelligence, alert nursing staff and the security staff together with the baby tagging system will make a secure system.**