

Enhancing Safety within Schools:

Active RFID automates security precautions and speeds security responses.

By

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Access control, early notification and location of threats, automatic lock-down, and student and staff visibility are key elements in minimizing harm

With the apparent growing trend of violence in our schools, the three primary things to be seriously considered in order to eliminate or significantly reduce casualties are Greater Security Precautions, Speedier Alerts and Rapid Response. An Active RFID security system can offer automated precautions, with minimal impact on the student and staff population, by using it as a hands-free access control system in a school. Active RFID can also enable automated security responses such as notification and location of a threat using personnel-worn Active RFID tags, automatic lock-down of areas, and student and staff accountability (presence detection, locating, and evacuation monitoring).



Active RFID is a technology that permits both long-range and proximity detection of active tags, and therefore the holder of the tag. The host can be people or objects. Long range detection of tags enables tracking and location of tagged hosts in real time, and a system that provides this functionality is often referred to as a Real Time Location System (RTLS). Adding proximity sensing to such a system allows instant detection of tags at locations equipped to do so, typically at the perimeter of the area covered by the RTLS system so as to provide notification of tagged hosts traversing the perimeter, for security applications for example. Proximity tag detection can also be used on its own, without fully covering the area with readers for RTLS functionality, to secure a perimeter or provide access control functionality for example. Due to the tag detection range, it does not need to be presented at a reader like conventional access control systems using proximity cards, and can be in one's pocket or bag ("hands free" access control).

Active tags are self-powered, and contain intelligence that can be used (in conjunction with built-in sensors) to provide automatic or human-initiated notifications of environmental or physical events such as detection of motion or a fall, or a mere button push. Tags can also be bi-directional so that they can receive commands or data, besides transmitting messages inbound to the system.



Securing School Perimeters

Greater security within schools could potentially be achieved by securing the perimeter of the school building using active RFID as an access control system. As no action is required by a tagged person at the doors for the system to identify the tag (and hence the person), it would seem to be the most appropriate technology for a school environment, if indeed it was practical to tag all students, teachers and ancillary staff. However, such a solution also has its challenges. There are those who may not wish to be tagged for one reason or another. Case in point is a student's refusal to carry an Active RFID badge in Texas due to religious beliefs. There are also other possible issues in implementing such a solution. A person meaning harm can tailgate children or staff as they enter the premises, or someone forgets to wear a badge, or a badge is stolen. As with any other solution, there are

always some drawbacks, but one can create processes and procedures to mitigate them. As long as an institution has the willingness to endure the overheads associated with creating a system that is as water-tight as possible and is committed to enhancing the safety of its environment, such challenges can be overcome. The benefit of even a single human life saved would be worth the investment and effort.

The more practical strategy could be to equip teachers and ancillary staff with tags, and lock down the school during classroom time, allowing movement of students through locked entrances only with the presence of a tagged adult at the entrance. Locked doors may not be an obstacle for one who is adamant in gaining entrance, but it would certainly be somewhat of a deterrent. If the doors are equipped to create local and remote alarms when forceful entry is attempted or gained, this would also enhance the dissuasion aspect as well as provide early notification of a possible emergency situation for response activities to begin much earlier than they currently do.

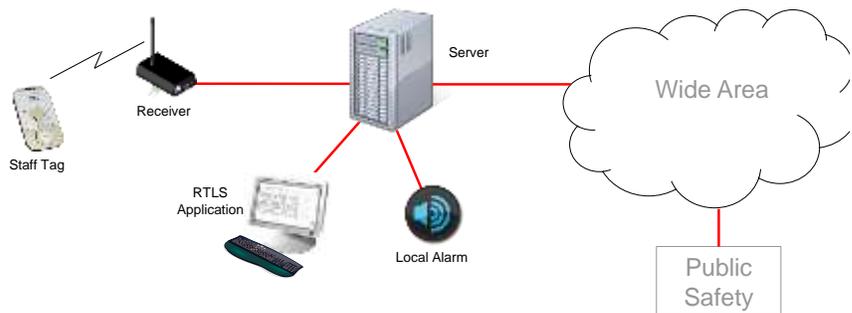
Demographic Information during an Event

There is something to be said about equipping school children with tags as well, as the RTLS capabilities of the technology can also assist response teams by providing demographic information that can permit more informed response activities. Time is always of the essence in such circumstances, and knowledge of where clusters of people are gathered, or where key personnel may be located, could make the difference with respect to lowering the number of people directly impacted in an incident. This is true not only for incidents that have become prominent in the recent past, but also in the case of natural or manmade emergencies. The tags carried by the children do not need to play a part in the access control functionality of the system, and can be permanently attached to an item frequently carried by the children, such as their shoes. In this case one is not looking to achieve 100% detection of all children, but to identify where clusters of children may be within the school building during emergency response activities.



Enhancing Speed of Alerts

If teachers and ancillary staff members are equipped with badges that have the ability to send a panic alarm, or that can automatically detect a “man down” condition, the system can automatically declare a “Code Red”, instantly notifying local security as well as public safety authorities of an emergency in progress, and providing critical information such as the exact location from where the alarm was sent. Most RTLS systems have the ability to dispatch selected notifications directly to other systems, or via email or voice networks. Gaining additional few seconds or minutes of notification time could potentially enable a much more rapid response by public safety agencies and possibly lower the impact of the incident.



If a tag has the capability for receiving notifications, all tag owners could receive the distress signal when a panic or duress alarm is instigated, resulting in swifter emergency procedures being initiated and perhaps reducing the impact of an incident.

A distress signal from the badge can be used simultaneously to turn on sirens and other audio-visual emergency warnings that would allow pre-determined emergency procedures to be evoked much earlier so as to secure the occupants within the school.



Automatic Area-based Lock-down

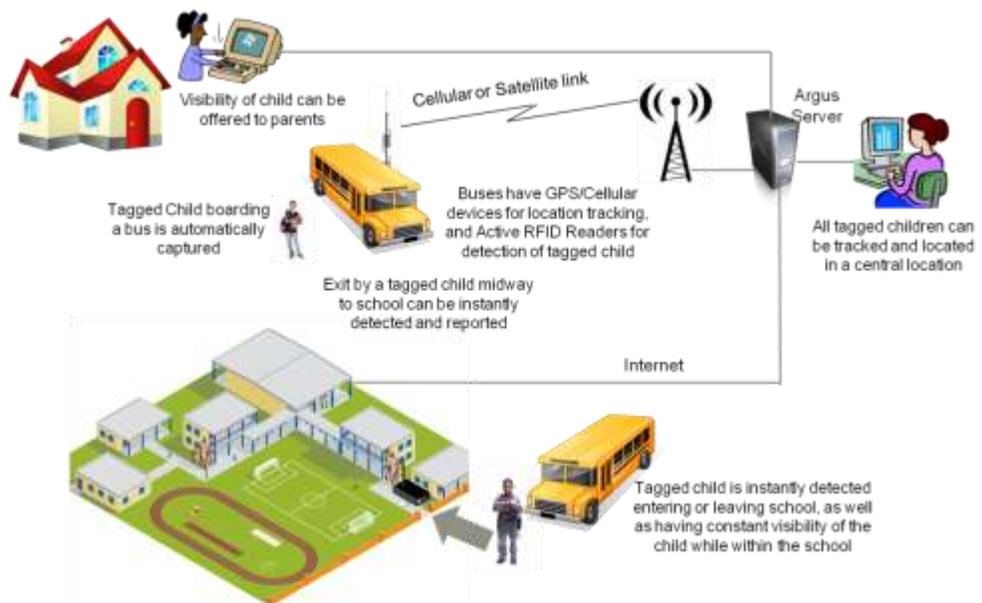
In addition, zones can be created within the school such that all zones, except the one where the incident is in progress, go into a lock down mode. Not securing the incident site provides an opportunity for potential victims to escape from the incident site, and allows the perpetrator to leave so as to limit harm, while the other zones are secured so as to minimize impact.

Secondary Incident Notification

If the badge carried by teachers and staff has two buttons, the second button can be used for secondary notifications such as a sudden medical emergency within a classroom. System coverage can also be extended outside the school building, to the sports field for example, so that secondary notifications can be initiated from those locations. The system can confine broadcast of such alarms only to the local area for summoning assistance within the school perimeter only, and not declaring a “Code Red” for public safety to be involved at that time.

System Extension to School Buses

The active RFID system may also be extended to school buses, by placing readers within the buses, assuming children are equipped with active tags. Due to the low transmit power of Active RFID tags, the technology is primarily meant for tracking and location within a local area such as within a building or yard, and so it can also be used to sense the presence of tags within a vehicle, such as a school bus. In this case, the Active RFID system within the bus would need to be interfaced to a wide-area network capable of providing connectivity to the Internet in order to support remote sensing of a tag’s presence within the bus.



Inherent Additional Security

Once an active RFID infrastructure is deployed within a school, there are opportunities for recouping the investment. As an example, tags can be attached to high value assets such as computers and other equipment, so that they can be tracked, located and prevented from exiting the school building.

Active RFID has been utilized for tracking, location and security for many years, especially in the healthcare market for applications such as equipment tracking and location, preventing elopement of patients who have cognitive problems, and even for securing newborn infants to thwart abductions. The employment of the technology for such applications, some of which are considered to be protection against possible sentinel events, is testament to the reliability of active RFID systems.

GuardRFID's Staff Tag



GuardRFID's Staff Tag contains a number of unique features that lend themselves to a variety of applications.

Beacon Transmissions

Tag location is accomplished using the periodic Beacons transmitted by the tags.

Capture Zone Detection

Immediate notification is sent to the system when the tag enters such a capture zone.

2-Way Communications

Staff can be sent customized messages by using the tag as a pager. Built-in Audio/Visual indicators are used to signify different message types.

User Buttons

Two configurable buttons that allow staff to send a message, such as a panic alarm to security or central station.

Fall and Motion Detection

An emergency signal is automatically initiated in the event the wearer of the tag had a sudden

Tag Longevity

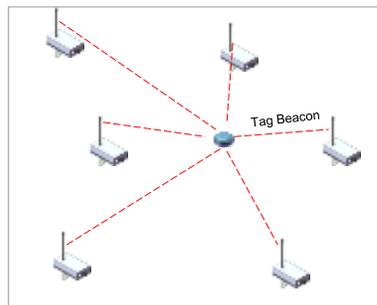
User replaceable batteries significantly prolong the useful life of the tag

GuardRFID's Active RFID Technology

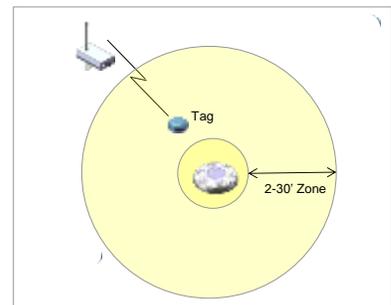
GuardRFID's Active RFID system has a large family of the smallest tags available, with long battery lives. The system consists of tags placed on people and objects, and a network of Readers that receive "here I am" "blink" messages that are constantly transmitted by the tags. This allows for real-time tracking and long-range location of the tags within the area of coverage using special algorithms. The system is unique in that it also includes a second mechanism for detection of tags in close proximity to a location, using low frequency Excitation Fields.



Such low frequency "capture zones" have unique IDs and can be adjusted fairly precisely between 2 to 30 feet, thus permitting zones of different capture distances to be set up depending on specific situations. A tag entering such a zone will instantaneously announce its entry within that specific capture zone, and will also immediately declare its departure from the zone. This permits both Long Range and Proximity location capabilities, allowing for the design of systems that can provide Real Time Location and Tracking as well as Security and Loss Prevention within the same system.



Long Range Location – Multiple Readers receive tag signal, and sophisticated location algorithm reports location (6-15 ft depending on construction and Reader density)



Proximity Location – Tag entering Zone reports zone ID immediately. This can be used for portal or room level location, for example. (2-30 feet, based on Exciter setting)

Several tags are equipped with sensors to detect motion, visible light, a sudden fall and other such events, and to be able to report tag tamper attempts or the movement of the item or person that the tag is placed upon. GuardRFID's Argus AllGuard Server is at the heart of the system,

providing all tag and system management capabilities, and storing status information in a SQL database. The Enterprise-class sever permits centralized monitoring of multiple disparate locations simultaneously. All it takes to create a complete solution is connecting the appropriate software application to Argus via GuardRFID's API.

Conclusion

Active RFID technology can be utilized to control access into school compounds and buildings for greater security, and offers real-time visibility of school children and staff during times of emergency so as to enable more informed response activities. Tags equipped to send alarm signals when a threat is recognized allows for instantaneous notification to all staff within the school and to Public Safety agencies, enhancing the ability for a much rapid emergency response.