FALKEN Secure Networks

RFID for Hospitals and Health Clinics

Healthcare Visibility Solutions to Improve Quality of Care, Reduce Capital and Operational Expenses and Increase Safety

Patient with RFID wristband being read by a mobile RFID reader

While the main goal of all healthcare organizations is to provide excellent patient care, they are also under pressure to contain costs. Most hospitals are attempting to meet challenging objectives such as reducing Wait Times and significantly increasing the number of procedures to reduce the backlog. Few companies experience the need for asset tracking in the same way that hospitals and healthcare facilities do.

Mobile medical equipment inventory management poses many challenges: clinical staff is constantly searching for medical devices such as infusion pumps and wheelchairs, wait times for ordered equipment are long, clean utility rooms do not have the appropriate par levels for equipment, hundreds of thousands of dollars worth of assets are lost and stolen on an annual basis and assets have low utilization rates. Healthcare organizations today face numerous challenges due to lack of visibility – low utilization rates, over rental and over purchasing of medical equipment, non compliance with regulatory mandates, inefficient use of staff time, loss and theft of equipment and more.

With a visibility solution hospitals can automate all the inventory management and receive real-time inventory counts at the click of a button, full control of rental equipment inventory is achieved, par level management is automated and material management and distribution services can receive automated alerts. In addition, trends in equipment availability and utilization can be easily identified and analyzed.

Because of this situation, the healthcare industry needs a high-degree of visibility, often requiring real-time, active RFID asset tracking. This highly accurate tracking provides the exact location of healthcare assets, preventing equipment hording and misplacement, and allowing assets to be quickly located and strategically placed for the best possible response time.

Asset invisibility leads to:

- Hospitals over-procure 20-30% of their mobile assets
- Nursing staff spends 10-30% of their time searching for equipment
- Servicing an item takes 8 hours because 75% of the time is spent searching for it
- Assets are not serviced and maintained when required
- Hospitals are having a difficult time complying with the regulations on equipment maintenance
- Critical staff cannot be located quickly
- Equipment is lost and stolen

Considering that the average cost of a mobile biomedical device is $3,000 along with the additional hourly employee wage, it is obvious that the ability to instantly locate a mobile asset would have a major positive financial impact.

Technology is now available from FSN to effectively manage mobile assets cost-effectively in real time. A real time locator system (RTLS) utilizes RFID and leverages your 802.11 WLAN so no proprietary infrastructure is required. The application provides a visual representation of your environment with assets displayed and identified on a map. Users can easily navigate from one location to another or use the advanced search and filter capabilities to locate an asset or a specific type of asset. The most powerful feature is the ability to provide notifications based on events and rules you create based on your business workflow and thereby automate much of the process. In addition, the application allows users to record and store historical data and provides easy access to this data through powerful reporting and analysis features.

The RFID technology is mature and non-proprietary and the ROI of implementing this solution is substantial and relatively quick. One study report highlighted that for a standard 500 bed hospital with 3000 tracked assets, the first year savings in equipment and productivity on average is over $1,000,000.
For about two years, the University of California, San Diego (UCSD) Medical Center has employed an RFID-enabled real-time location system (RTLS) to track a variety of assets at its Thornton, Calif., campus. The teaching hospital estimates it has saved approximately $70,000 annually on IV pumps alone, because it can easily locate the pumps with a click of a button, thereby eliminating the need to rent pumps on a daily basis in order to meet demand. Now, UCSD is expanding the RTLS to its other campus in Hillcrest.

Item Level Tagging of Drugs

Drug id and anti-counterfeiting

Over the next ten years, the largest use of RFID in healthcare will be labels on drugs at item level and the infrastructure and services to support this throughout the supply chain and in healthcare facilities. The primary purpose of this will be anti-counterfeiting by establishing the full history of that package at all times - called pedigree. This will be underpinned by scientific analysis of the drugs inside the package. The unique electronic identification and its processing is called mass serialization and it will employ tranches of numbers issued by EPCglobal to the so-

called Electronic Product Code EPC. The specification for the air interface will be ISO 18000. The US is driving this and its Food and Drug Administration will legislate if progress is inadequate in its view.

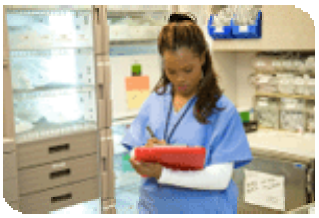
The frequency employed is as yet uncertain because Ultra High Frequency UHF tags have been delivered to Wal-Mart on millions of Type 2 drugs in the last year (primarily for anti-theft and for stock control) but Pfizer and GlaxoSmithKline are fitting millions of HF tags on similar packages under FDA guidelines for anti-counterfeiting.

RFID is now used in smart packaging that not only identifies the drug container but also records when patients take medication and how much they take and provides prompts to help them comply with instructions.

Other RFID Applications for Healthcare

The second largest application of RFID in healthcare by value will be Real Time Locating Systems(RTLS) for staff, patients, visitors and assets. Here the systems and support cost more than the tags, partly because many of the tags are reused. The tags cost from one dollar to 200 dollars depending on sophistication. Some record threatening behaviour, many have an alarm button to fetch help to the exact location.

Temperature Monitoring:



Lab, pharmacy and nursing staff are required to perform manual temperature monitoring and logging several times a day on hundreds of refrigerators and freezers (i.e. storage of blood, organs, drugs, vaccines, tissue samples or food) to ensure safe temperature ranges. Healthcare regulatory bodies require maintaining daily records of the temperature logs. FSN offers the simplest and most cost efficient solution for temperature monitoring that requires no hard wires and no additional network infrastructure. FSN's temperature sensing Wi-Fi tags are battery powered and can be easily placed in each hospital refrigerator or freezer sending the temperature reads over the Wi-Fi network every few minutes. FSN's software provided by Omnitrol networks will send out alerts on exceeded temperature ranges, displays graphical reports of temperature trends and includes an event dashboard.

Solution for sterilization trays and containers

FSN provides a complete range of **RFID TAGs** for sterilization trays and containers available on the market.

Various **RFID readers** are available which allow tracking of containers or trays through every critical stage of sterilization and/or decontamination process. Traceability of the sterilization container, its tray and all of its instruments becomes then possible and gives the exact location of your equipment at any time.

Solution for surgical instruments

Thanks to its unique and patented **MetaluCID®** technology, making it possible to communicate through metal, FSN is capable to track and trace surgical instruments (or any other metal equipment) with an RFID TAG protected by a hermetically sealed metal case.

Traceability of surgical instruments becomes easy and offers at any time the possibility to know its exact location and complete history.

Thanks to the TAG's EEPROM memory, important data is stored in the instrument and can be modified or updated according to the evolution of the instrument's journey :

- Part number
- GS1, HIBC or proprietary code
- Last maintenance or repair date
- Last sterilization date

Each instrument becomes a unique part, thanks to its codification and the reliability and longevity of this RFID Tag.

The FSN RFID technology offers many advantages in the surgical instruments' field :

- Flexibility and fast reading
- Reliable and durable identification of instruments
- Instrument identification possible even through packaging (ex. satellite instrument)
- Identification of medical assets even if the TAG is wet or dirty (blood, liquid,...)
- Facilitated follow up of instrument maintenance or repair

For users the advantages mean :

- Before sterilization, trays packing is highly facilitated :
- Each instrument is automatically identified
- Fast in the event of crossings of boxes
- Productivity improvement
- This solution also offers large advantages in training new technicians

At the operating room :

- Each instrument can be individually "linked" to the patient
- Trays packing after surgery highly facilitated

- Broken or damaged instruments can be identified as such

Traceability at instrument level is therefore ensured in a reliable and durable manner and this throughout the service life of instrument.

LA/SA issues
RFID cuts through communication problems associated with “Look Alike, Sound Alike” medications

Celebrex

- Non-steroidal anti-inflammatory drug
- Used to reduce pain and inflammation
- Relief of osteoarthritis, rheumatoid arthritis, management of acute pain in adults, treatment of menstrual pain

Cerebryx

- Anticonvulsant Used to treat people with epilepsy
- Reduction in frequency of epileptic seizures

Equipment Maintenance:

Clinical and bio-med engineers maintain thousands of medical devices periodically. In many cases, a high percentage of the equipment is not maintained on time since assets cannot be found, leading to non compliance and quality of care issues. With the FSN solution, any tagged equipment throughout the hospital campus can be located according to preventive maintenance pickup schedules, and automated maintenance alerts can also include equipment location and status. The solution can also be integrated to any existing clinical engineering system.

Hand Pump

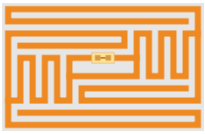
FALKEN Secure Networks also understands the reality of tight hospital budgets and the need to indentify a solid ROI. Many facilities start by finding value in the time and labor costs saved by not having to exhaustively search for equipment. Improved asset tracking also helps eliminate postponed procedures and appointments due to missing equipment, as well as money that may be spent buying or renting additional equipment. And again, there’s the immeasurable benefit of providing patients the best and quickest care possible.

Because FSN's RFID solution is very flexible and expandable, implementing it for multiple purposes – such as for tracking laptops or other IT assets – makes achieving your ROI even quicker. Our solutions span all hospital departments and serve the needs of clinical staff, IT,

materials management, clinical and biomedical engineers, laboratory personnel and others. Our solution can also evolve as your facilities do. If your situation ever changes because of remodeling, unit movement, etc., FSN's solution can be modified to fit those needs.

One hospital, for example, found that its employees were always searching for infusion pumps -- critical for patient care. This apparent shortage led to annual purchases of pumps (and time lost looking for them). The hospital implemented a trial program to use Real-Time Locating System (RTLS) on its infusion pumps and discovered that not only was there no shortage of pumps, there was, instead excess inventory -- 20 percent more pumps than were actually needed. Not only did this allow the hospital to more efficiently use what it did have, it allowed the hospital to eliminate that line item from the next year's budget.

Barcoding vs RFID – Quick Comparison



- Requires line of sight
- Manual
- Scan one item at the time
- Widely used
- Standards-based
- Read Only
- Depends on External Data Store
- Provides license plate information only

- Line of sight not required
- Automatic
- Multiple items at the time
- Emerging
- Standards-based
- Digital, read-write capable
- Can store data or trigger access to external data
- Can store relevant data (Serial #, loc, expiry,dates)

Storing critical information in the tag
Hospital equipment

- Component's DNA
- History, maintenance data, calibration information, Serial Numbers Usage/chain of custody data, time, date stamp
- Schematics, use instructions
- Certification, inspections
- Compliance documents

Specimen Tracking

- Usage/chain of custody data (time, date stamp, clinic, doctor, patient name)
- Test Results (Clinic, test name, lab tech's name, results, etc)
- Digital forms
- Link to patient record
- Billing information

Equipment Tracking and Tracing

- Continuous location and tracking of equipment
- Location and usage history
- Data for improved efficiency and workflow management .
- Assets monitored as they leave the facility
- Theft protection
- Better asset utilization

RFID-enabled Patient Tracking

Privacy issues

There are many privacy issues in the healthcare industry. They are managed under both Federal (PIPEDA-Canada, HIPPA -US) and Provincial legislation such as PHIPA in Ontario and provide regulations and guidelines of good practice in terms of protecting Personal Identification Information(PII). RFID is not a particularly significant component any more than the barcodes they sometimes replace. Although some privacy advocates have concerns about the tagging of patients and they will also be concerned about the tagging of visitors when that occurs, this is in some contrast to the views of the patients themselves. Surveys have shown that patients realize that tagging reduces the chance of errors and can enhance privacy and dignity. For example, the wrist or ankle tag can be read electronically without burrowing under the bedclothes. The tag on disoriented elderly people automatically sets of an alarm if they are approaching somewhere dangerous, obviating the need for staff to be near them at all times - the often oppressive traditional approach. Personal data stored in an RFID-fed server behind a firewall is far more secure than the clipboard at the end of a bed.

An RFID (Radio Frequency Identification) chip stores the wearer's data, which can be accessed by a hand-held computer or laptop

At-risk patients (i.e. psychiatric, dementia, Alzheimer, elderly) may need to alert staff in case of emergency when out of bed. In addition they may be wandering into restricted areas or exiting the building in an unauthorized manner. Hospital staff may also need to trigger an alert should there be a patient problem or if patients are posing risk to them. The FSN solution enables pervasive monitoring throughout the hospital automatically alerting on such safety events in real-time and enabling constant tracking of patients and staff for overall improved safety.

RFID is a remarkably versatile enabling technology and its uses in healthcare will widen rapidly. It is, in a sense, the ultimate Local Area Network connectible, being cheaper and more versatile than any other, even disposable in an increasing number of cases.

RFID is already extensively used in hospitals and it is starting to be used in other healthcare environments, including care homes and self help. In all these locations there is considerable scope for further use of RFID.

FALKEN Secure Networks(FSN)—Your partner for RFID automation

If you choose to pursue RFID implementation in your organization, here is the FALKEN Secure Networks commitment to you:

- FSN will provide solution architects to work with you to define system requirements for your particular installation. Multiple locations can be networked together for a central and real-time view and centralized management.
- FSN will do a RFID site survey to validate radio frequencies, tag types, system design and performance
- FSN will provide all necessary hardware and software to make the system work for you
- FSN will integrate the system with your existing enterprise management software
- FSN will provide documentation for the system, including operating procedures
- FSN will train your people
- FSN will provide warranty and continued system support

For RFID-enabled Document Tracking and Management, FALKEN Secure Networks (FSN) and partners bring together the right technologies to give you control over your files and make your office run more efficiently. Our automated and secure processes save time and labor, and prevent problems before they occur. With FSN ,you get the latest, non-proprietary secure RFID technology with the most powerful and flexible RFID file tracking software available.

Contact Us

FALKEN Secure Networks is a specialized System Integrator, RFID Solution Architect, and Value-Added Reseller with focused expertise in the RFID site survey, cost-effective design, and turn-key project implementation.

Contact FSN at **sales@falkensecurenetworks.com**

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