

# Inventory management for medical devices with GSI compliant passive RFID labels



With its 1000 beds and 61 wards, Cambridge University Hospitals NHS Trust (CUH) is one of the largest and best known hospitals in the UK. The Trust provides high-quality healthcare for the local people of Cambridge, together with specialist services for a regional, national and international population. The Trust is recognised as a centre of excellence and innovation with many of the hospital specialists being leaders in their field.

## Overview

By pioneering the use of active and passive RFID technology, and implementing GSI standards to manage mobile medical equipment, CUH has improved efficiency, increased patient safety and reduced capital expenditure.

In 2015 CUH became the first NHS trust in the UK to introduce GSI standards for tracking medical devices. To ensure that they could fully benefit from fast data capture and location data for inventory management, CUH chose a passive RFID Discovery system to support their GSI implementation.

“ Using RFID technology has improved our care and provided a phenomenal return on investment by saving us hundreds of thousands of pounds and thousands of hours of nurses' time. ”

Professor Paul White, Head of Clinical Engineering

## The implementation

When choosing to implement GSI compliant labelling, the Trust had already experienced huge benefits from tracking 7,500 mobile devices with an active RFID Discovery system for a number of years. In order to enable CUH's wards, departments and Clinical Engineering team to track the locations of all of their medical assets, including those of lower value, the remaining assets have now been fitted with passive RFID asset tags which are fully compliant with GSI standards.

The project to roll out GSI compliant new asset labelling utilising passive RFID technology started in May 2015 and was completed in October 2016. To date a total of 37,500 units have been tagged with either or both active and passive RFID tags.

## How does it work?

Passive RFID labels replace the existing asset labels, and are fully compliant with GSI standards, carrying a Global Individual Asset Identifier (GIAI). They are encoded with a unique ID which is linked to a particular asset in the database on registration. Unlike active tags, which are used to track high value and high risk mobile assets, passive RFID tags have no battery and require an external source to trigger a signal transmission such as a passive RFID reader.

CUH's clinical engineering staff use two different types of passive RFID readers, which capture data from the tags and send location information to a central database. A specially designed trolley fitted with a UHF RFID reader and three antennas performs equipment searches as it is pushed around the hospital by a clinical engineering technician.

With a read range of typically up to eleven meters it records the date, time and location when it detects a passive tag. In addition, a small mobile handheld reader with a read range of up to six metres is also used to audit wards or locate specific equipment.

The central RFID Discovery database has been integrated with the Trust's e-Quip asset management system, which records all medical device assets.

Professor Paul White, Head of Clinical Engineering at CUH, explains: "This integration allows our clinical engineering and clinical teams to see the location of any medical device assets fitted with an active RFID tag and – as GSI labelling progressed – the location of those fitted with the new passive asset labels."

## Challenges

One of the challenges prior to implementation of GSI asset labelling was to choose the best suitable RFID inlay type to ensure that label sizes were appropriate for application to all different types of medical devices.

Professor Paul White explains: "We worked closely with the RFID Discovery team to ensure label sizes would be suitable for all different types of medical device. We also successfully carried out a number of due diligence tests to establish the best position for labels to be applied on each type of device."

The correct positioning is crucial to ensure that the asset tag does not interfere with the regular use of the device but at the same time guarantees a successful signal transmission to allow for the device to be captured by a reader.



GSI compliant asset label

“RFiD Discovery is the backbone of our medical equipment library – it gives us data which provides vital information for decision makers at the Trust.”

Professor Paul White, Head of Clinical Engineering

## Key Benefits

- GSI Compliance
- Rapid auditing
- Improved inventory management
- Reduced capital expenditure
- Helps achieve and maintain compliance including CQC and MHRA



Professor Paul White,  
Head of Clinical  
Engineering

# Benefits

## GSI and Scan4Safety

The unique identification of each medical device with their new GSI compliant asset labels puts CUH firmly on the route to scanning for safety. This means equipment can be scanned against a patient's wristband to identify which exact device is used for the patient.

## Improved inventory management

With a vast inventory, CUH had identified it needed a way of accurately and efficiently auditing all medical devices to improve inventory management.

Professor White explains: "It's impossible to accurately audit over 30,000 medical devices without using RFID. When we previously carried out a test audit on six wards, it took us two weeks to complete and a staggering 35% of devices were unaccounted for. Now all our medical devices are fitted with a passive tag, the same process takes just 10-15 minutes and we can account for more than 90% of our inventory. By auditing our equipment more regularly we can make sure our assets are where we think they are."

Using passive RFID has helped CUH understand the flow of equipment and highlighted the issue of devices going missing from the Trust, which had been an unknown factor before.



Medical devices with GSI compliant asset labels

## Improved risk management

Better inventory management also means better risk management. Knowing the current and historic locations of equipment supports all areas of risk management by helping to provide accurate data for clinical and engineering decision makers.

RFID tracking also helps with CUH's regulatory compliance including for CQC and MHRA by minimising the circulation of potentially dangerous, unsuitable or unmaintained equipment.

## Benefits of active RFID extended to all devices

Prior to introducing GSI asset labels, CUH had already experienced an array of benefits as a result of tracking high risk and high value mobile medical devices with active RFID. Implementing GSI standards and passive RFID tracking for devices means that these benefits can now be extended to all types of equipment:

- Reducing capital expenditure for new medical devices by improving utilisation levels for existing equipment, e. g. tagging all ECG monitors, helped improve the use of existing devices resulting in a lifetime capital cost saving of £175,000. The one-off cost of tagging all ECG monitors was just £16,000.
- Enabling the Clinical Engineering team to focus on core tasks of maintenance, repair and delivery of medical devices to the wards by helping them to locate equipment faster
- Ensuring clinical staff spent less time searching for devices allowing more time to support patient care
- Reducing the time it takes to audit the average ward from 1 hour 30 minutes to just 8 minutes. This enables more effective use of engineers' time and allows for more frequent auditing.
- Improving the management of hired devices. For example, a first year saving of £99,441 on rental costs has been achieved by tracking hired low level beds to enable a timely return as well as avoiding unnecessary replacement costs of hired beds that had been lost.
- The target for supplying a device to a ward is 30 minutes but the average achieved is approximately 12 minutes.
- Increased confidence amongst clinical staff means that they no longer hoard equipment for their convenience, an issue which used to exacerbate the problem of device availability.





## What's next?

RFID asset tracking is already being used for many other types of asset across the whole of the Trust such as moving and handling, wheel chairs, tablets and communication aids. Its use will be expanded further to include areas such as IT (computers, laptops, tablets) and estates (TVs, microwaves).

For CUH the next stage in the process of moving towards GSI compliance is to introduce Global Location Numbers (GLNs) to identify each location within the hospital and use of the system for other departments and sections within the Trust as part of the wider GSI implementation.



## Why choose RFiD Discovery?

RFiD Discovery is the recognised brand name for radio frequency identification solutions from Paragon ID, a global leader in identification solutions. Used in a growing number of hospitals across the UK and beyond for over 14 years, RFiD Discovery is the number one choice for active and passive RFID systems.

Paragon ID is largest manufacturer of passive RFID labels in Europe and accredited to ISO 9001.



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