

muRata

INNOVATOR IN ELECTRONICS

RFID at work:
Reducing medical
inefficiencies and costs



What the industry is saying



“RAIN RFID connects healthcare items to the internet, enabling caregivers, administrators and patients to identify, locate, authenticate, and engage with each item. Batteries not required. Healthcare and life sciences enterprises are challenged to deliver the best possible patient care while reducing costs and improving outcomes. RAIN RFID is an enabling technology that saves lives, prevents errors, saves costs, and increases efficiencies. Many parts of the healthcare industry have already experienced these benefits as shown by the market growth rate of 35% each year through 2020.” (Source: [IDTechEx](#))

“In the recent years, there has been an increase in the proliferation and distribution of counterfeit drugs that pose an increased risk for health hazards. The RFID technology assists in screening and detection of such drugs and help in refraining from the distribution in the market. Furthermore, this technology in pharmaceutical companies helps in inventory management and minimizing the labeling errors. These advantages help reduce the wastes and thereby decreases the unwanted costs incurred.” (Source: [Grand View Research](#))

“RFID has been found to improve cost-saving measures and increase efficiency in a range of enterprises. In recent years, its usage and benefits have been explored in the healthcare sector. RFID has the ability to capture data automatically without human intervention. Compared to barcode scanning, RFID does not require line-of-sight for readers to capture information from tags.” (Source: [HIMSS](#))

“The global RFID market in the healthcare industry is witnessing a period of dynamic growth, with the caregivers focused more on enhancing operational efficiency by improving asset availability, inventory management, and personnel tracking. Caregivers are looking to improve user experience within the hospital premise and are looking to leverage technologies such as RFID...” (Source: [Research and Markets](#))

“In addition to healthcare, RFID technology is being used throughout the supply chain in industries such as retail, aviation, security, manufacturing, transportation and industry records. An increasing number of industries recognize the precision and efficiency RFID provides and want to utilize its inherent value from a logistics perspective.” (Source: [Forbes](#))





The impact of counterfeiting

In 2017, the [World Health Organization](#) (WHO) reported that “an estimated 1 in 10 medical products circulating in low- and middle-income countries is either substandard or falsified.” Moreover, “Many of these products, like antibiotics, are vital for people’s survival and wellbeing. Substandard or falsified medicines not only have a tragic impact on individual patients and their families, but also are a threat to antimicrobial resistance, adding to the worrying trend of medicines losing their power to treat.”

– Dr. Mariângela Simão, Assistant Director-General for Access to Medicines, Vaccines and Pharmaceuticals at WHO.

The WHO has provided the following snapshot to help frame how important it is to control the counterfeiting crisis that global healthcare is facing:

Key facts

- Substandard and falsified medical products may cause harm to patients and fail to treat the diseases for which they were intended.
- They lead to loss of confidence in medicines, healthcare providers and health systems.
- They affect every region of the world.
- Substandard and falsified medical products from all main therapeutic categories have been reported to WHO including medicines, vaccines and in vitro diagnostics.
- Anti-malarials and antibiotics are amongst the most commonly reported substandard and falsified medical products.
- Both generic and innovator medicines can be falsified, ranging from very expensive products for cancer to very inexpensive products for treatment of pain.
- They can be found in illegal street markets, via unregulated websites through to pharmacies, clinics and hospitals.
- An estimated 1 in 10 medical products in low- and middle-income countries is substandard or falsified.
- Substandard and falsified medical products contribute to antimicrobial resistance and drug-resistant infections.



Opportunities abound



How can a technology that has been around for decades still be flush with opportunity? Consider Radio Frequency Identification (RFID). It represents one of the swiftest growing technology sectors and is projected to grow more than \$26 billion by 2025. While the retail market for inventory control was an early RFID adopter, others have embraced its value and are implementing it in innovative ways.

One sector that can benefit tremendously is the medical community. Healthcare facilities are routinely bogged down in the challenges that accompany item level device tracking, which can ultimately impact patient care and safety. The [U.S. Food and Drug Administration](#) (FDA) even issued guidance that Class I medical devices be marked with a Unique Device Identifier (UDI) by September 2020. Europe plans to implement something similar mandate by 2027.

Company visionaries are looking at the bigger picture on how to improve overall efficiencies within their organizations and meet customer demands. In addition, product, brand and facility managers are all regularly searching for item tracking solutions that can curb some of their most pressing issues – from inventory control to brand defense to counterfeit protection.

Their need is clear. It warrants a solution that a device can be incorporated into any tracking system to quickly determine a specific item's location, usage, warranty status, and assign user accountability. These are the key features that help improve loss prevention, eliminate time searching for specific tools, and provide real-time critical data analytics. RFID tags can deliver on all.

“RFID is continuing to demonstrate benefits in the healthcare market, when it comes to tracking solutions that manage assets. By using RFID to track surgical devices, for instance, hospitals could potentially improve patient safety and operating room efficiency as well as meet U.S. FDA requirements for unique identification (UDI) on medical devices. As tags have become more robust, and with smaller form-factors, the use of RFID to track the smallest surgical tools is becoming a reality.” **Claire Swedberg, Senior Editor, RFID Journal**

Up until now, many of the healthcare applications have been rooted in manual processes. Of course, these consume inordinate amounts of time, manpower, and are vulnerable to human error. RFID resolves many of these issues.

Consider these three application scenarios...

Medical equipment tracking



Scenario one:

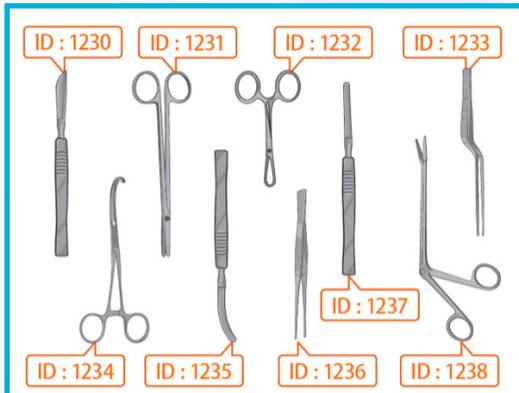
It comes down to this – improving safety and efficiency. Diagnosis devices, scalpels, scopes, and ultrasound equipment require meticulous tracking records to prevent infections and communicable diseases. Not only that, but operators need a system in place to ensure that the right equipment is in the right place at the right time.

Historically, this has been done through the use of barcodes – which is time intensive and subject to human error. With RFID, the process to verify an expiration date and record the equipment's usage is instantaneous, accurate, and efficient. It also allows for a device's time in service to be calculated and tracked.

Another benefit is that equipment can be automatically validated to ensure its authenticity and compatibility when attached to another device.



Surgical tool tracking challenges



- Worldwide trend to make it compulsory to put ID on each surgical tool.



- Cannot accurately manage use time due to the difficulty with using manual records.
- Assembling and checking the set of tools takes time and manpower.



- Laser marking is vulnerable to rust and stain.
- One-by-one reading of ID from QR code is time consuming.

Global regulations are requiring that surgical tools be tagged.

Checking each tool takes inordinate amounts of time and is subject to human error.

While laser markings were used in the past, they were vulnerable to rust, stains and other environmental degradations.



Drug & device authentication



Scenario two:

One of the myriad tasks that healthcare staff tackle on a routine basis is verifying that devices with consumable items are used within a specified time range. RFID tracking greatly reduces the chance of using outdated items and unwarranted parts. Further, the technology can be automated and linked into an inventory control system to help coordinate and manage key items.

This level of automation reduces possible human error and greatly improves efficiency. Plus, data can be readily stored and recalled from each RFID tag. Password protection can be enabled to secure this information and ultimately enhance data integrity. The end result: greater patient safety.

Authentication challenges



- Failure or error in checking the times of use and expiration date.



- It contributes to the reduction of manpower at the medical scenes.



- Verification by barcode on the package cannot guarantee the information of the product without package.

Previous solutions required significant amount of manpower.



The RFID solution



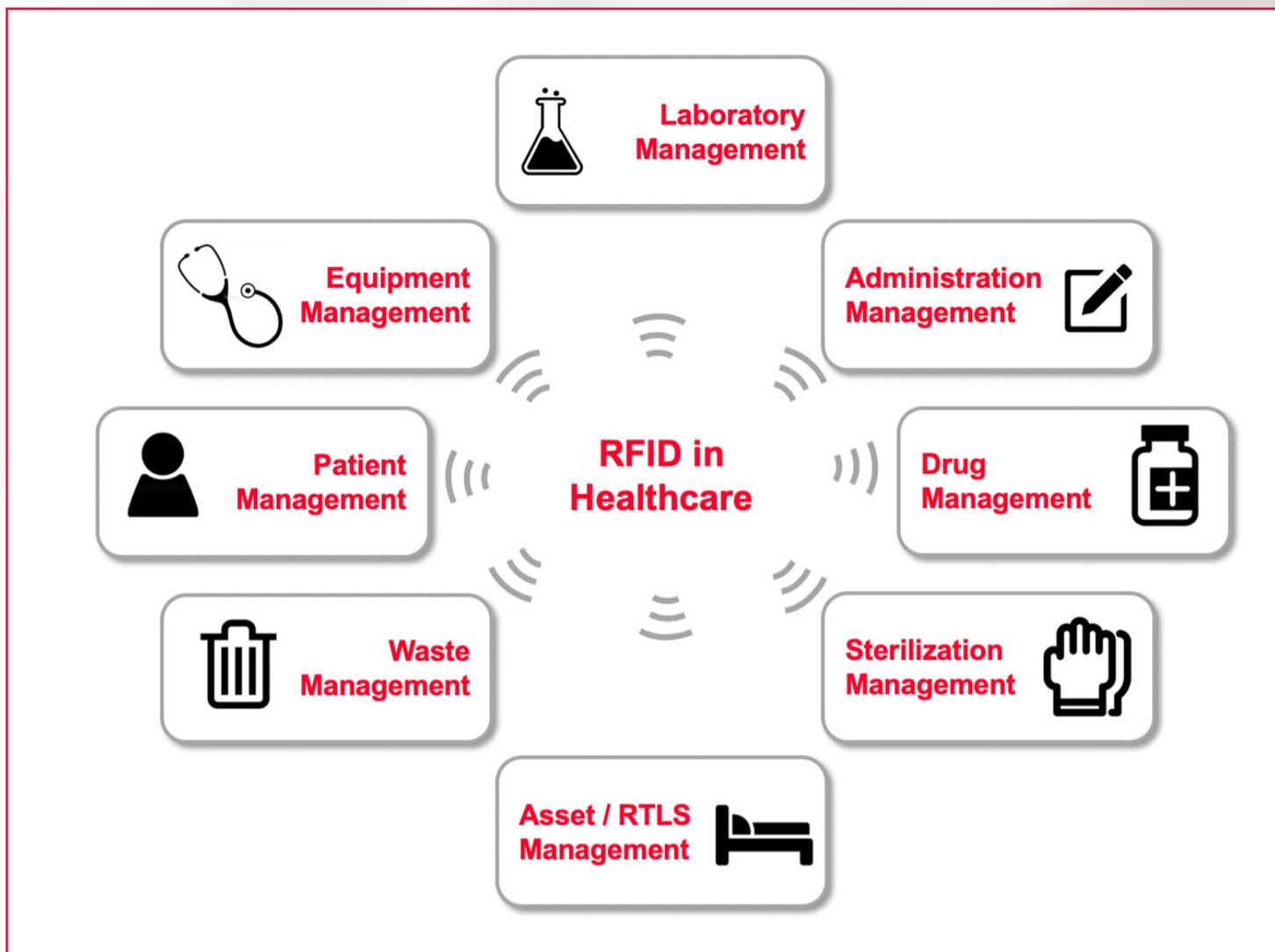
There are many ways to track products and equipment – QR codes, barcodes, magnets, etc.

However, RFID delivers advantages that the others cannot. Consider rewrite and password protection features, as well as the ability to be read outside of packaging. To achieve this, Murata added a line of ultra-small RFID tags to its already extensive portfolio. Not only is the solution miniaturized, but it is also made of robust materials so it can be used in harsh conditions.

Benefits of RFID item-level tracking

- Tag is easy to embed and hide
- Permanent item identification for brand protection
- Authentication and product validation
- Enables multiple items to be counted at one time
- Increase product's value and feature set
- Information can be easily added and modified to the tag throughout its life cycle
- Withstands harsh conditions

Where to apply the technology...



Murata's answer



Murata is a global leader in the RFID space – from conceptualization through manufacturing. We provide not just products, but complete turnkey solutions for the entire software, hardware, and middleware continuum. Further, Murata collaborates with customers to provide consultancy services to resolve market-barrier challenges, no matter how proprietary they seem.

If you need to actualize RFID, talk to us. More information on Murata's RFID solutions for the medical market can be found here.

<https://solution.murata.com/en-global/service/rfid-solution/solution/>

Looking ahead



What's shaping tomorrow's RFID healthcare market

There are several factors driving the RFID Healthcare market's growth. Following is a high-level overview of some of the key areas:

Telemedicine – Serving the underserved:

The [World Health Organization](#) explains it as follows: “The delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interest of advancing the health of individuals and their communities.”

While many definitions exist, one thing is consistent – the sector is constantly changing as new technologies and science evolve and adapt to the changing medical needs around the world. This holds particularly true for those who do not have adequate healthcare access.

Telecare – Connectivity counts:

Telecare refers to technology that enables people to stay safe and live independent in their own homes. This is largely achieved through the usage of consumer-oriented health and fitness apps, sensors, and tools that connect consumers with family members or other caregivers. Exercise tracking tools, digital medication reminder systems, and early warning and detection applications also fall into this category. Think of it as support services, such as preemptive care, disease prevention, and rehabilitation support – all of which are achieved through connectivity.

Similar to telemedicine, advancements in connectivity technologies enable healthcare providers to offer more robust, interactive, and remote care. Further, regulatory agencies – such as the U.S. Department of Health and Human Services – have become more socialized and now have a better understanding of the value of digital healthcare. The means the doors are opening for new opportunities.





Increased government adoption:

As mentioned earlier, both the FDA and European regulators have announced mandates for labeling medical devices with UDI. Other initiatives are also underway that will make a significant impact in improving medical device safety and facilitating the reporting of device-related adverse events. Consider this excerpt from a recent [Forbes article](#):

“As the federal government and state systems attempt to control the opioid epidemic, proper track-and-trace solutions in the drug supply chain are at the top of the agenda. Congress recognized the need for a serious shift in 2013 when it implemented the DSCSA under the Drug Quality and Security Act (DQSA). This act requires full implementation of an interoperable track-and-trace system within the U.S. drug supply chain by 2023. As the deadline approaches, more and more manufacturers and providers recognize the value and potential of RFID.”

Opportunities extend well beyond the U.S. and Europe as well. With growing demographics and economies, China and India are particularly promising.

For more information

Are you ready to find out more? For more on the scenarios, watch here:

- ▀ [Medical equipment tracking](#)
- ▀ [Drug and device authentication](#)
- ▀ [Hearing aid market](#)

For more on Murata's RFID solutions for the medical market, [visit here](#).

Contact us for inquiries and consultation, [click here](#).