

The Ultimate Industrial RFID Application Guide

Best Practices And More For
Industrial RFID Tracking Systems



XERAFY

Create the right RFID tracking system for your applications: We share the application expertise developed over the years working with industry leaders to implement their solutions.

Tool Tracking



- Tool Control FOD
- Tool Inventory Management
- Tooling and Equipment
- MRO Parts Management
- MRO Inventory Management

Oil and Gas



- Drill Pipe Tracking and Lifecycle
- Downhole Tools Drill Bits
- Oilfield Casing Tubing (OCTG)
- Rigging and Lifting Equipment
- Pipeline and Valve Inspections
- LPG Cylinders

Healthcare



- Sterile Processing
- Loaner Systems
- Point-Of-Care Equipment
- Pharmacy Inventory
- Storeroom Supplies
- Scrubs & Linens

Manufacturing



- Paint Shop Automotive
- Hi-Temp Processes
- Injection Molding
- Industrial Molds Dies

Inventory



- Automated Warehouse
- Returnable Packaging Carriers
- Materials Management
- Work-In-Process

Logistics



- Order Fulfillment
- Returnable Transport Packaging
- Yard Management Systems
- Last-Mile Logistics

Supply Chains



- Consignment Inventory
- Source Tagging
- Cold Chain Monitoring

Data Centers



- Asset Management
- Inventory and Audit
- Infrastructure Management

IT Assets



- IT Equipment
- Inventory Scanners
- Laboratory Equipment

Utilities



- Waste Management
- Weapon Tracking
- Tower Monitoring
- Infrastructure Monitoring

Tool tracking plays its role in mission-critical operations where effective tool inventory management and accountability are key to actively preventing FOD incidents and promoting time savings, such as aviation, rail, defense, nuclear, manufacturing, and construction.



Where to begin an RFID tool tracking system project?

A tool tracking system automates all tool inventory management procedures by using wireless tags and RFID readers, with the option to deploy smart tool storage such as an RFID toolbox and customized tool crib software, to identify, track and control tools in real-time throughout their workflow and lifecycle.

How to build the best Tool Tracking system?

- **Agile Readers** - Fixed readers in both fixed and mobile tool storage units. Handheld readers enable mobile inspections and tool search functions.
- **Accuracy** - Optimize the system for reliability at long and short ranges.
- **Customized Software** - Adapt to your workflows to minimize change management.
- **RFID Tags** - Options for mounting on or embedding in, in a variety of sizes, available for optimized performance on metal, plastic, and wood surfaces.
- **Scalable Tagging** - Methods for retrofitting at point-of-use. Epoxy and heat-shrink tubing are ideal starting points, and a protective carrier can be added.

Explore Use Cases

- [Tool Control FOD](#)
- [Tool Inventory Management](#)
- [Tooling and Equipment](#)
- [MRO Parts Management](#)
- [MRO Inventory Management](#)

[Ask Our Engineers](#)



[More Case Studies](#)

Tracking hand tools?

Start with smaller on-metal tags



[XS Dash](#)



[PICO On](#)



[PICO Mini 100/150/300](#)

Power tools and mobile equipment?

Larger on-metal tags with rugged case and attachment



[PICO Plus](#)



[NANO Plus](#)



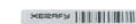
[MICRO Power](#)

Plastic or wood surfaces?

Slimmest hard tag with multi-surface performance



[Slim TRAK](#)



[Metal Skin® Titanium](#)

The Oil and Gas industry has successfully integrated RFID technology into drilling, completion, and production applications, to drive safety, reduce non-productive downtime, enhance operational efficiencies, and extend asset lifecycles.



RFID tags: Prioritize embedded tags that are already qualified by the industry.

- **Global Standards** - Passive UHF RAIN RFID provides ATEX-certified on-metal tagging solutions at a cheaper implementation cost.
- **Qualified** - Designed and tested to meet real-world requirements in exploration, development, and completion.
- **Embedded** - Use welding, rivets, screws, or embed in the metal of a drill string, oilfield tool, lifting equipment to make it especially rugged.
- **Customized** - Encode unique serial numbers for item-level tracking, laser etch on the tag for information redundancy.

RFID Readers: Agile, in strategic locations, and without hindering workflows.

- **Read distance** - Long-range, hard-to-reach, bulk identification.
- **Accuracy** - Focus ranges to prevent stray reads when tripping pipes or identifying adjacent pipes on the same rack.
- **Placement** - Readers have a variety of shapes and sizes, can be placed strategically with data capture automation and coverage in mind.

Software: Automated tracking and interoperability for all.

- **Integrate** - Operate with existing systems, for full information access.
- **Operational Visibility** - suitable interfaces show Information needed.
- **Data** - Informed decisions on process efficiency and risk reduction can be made through insights and increased awareness.

Explore Use Cases

- [Drill Pipe Tracking and Lifecycle](#)
- [Downhole Tools Drill Bits](#)
- [Oilfield Casing Tubing \(OCTG\)](#)
- [Rigging and Lifting Equipment](#)
- [Pipeline and Valve Inspections](#)
- [LPG Cylinders](#)

Ask Our Engineers



[More Case Studies](#)

Drill pipes and downhole tools? Embed in metal



[XPLORER Downhole](#)



[XS Wedge](#)



[XPLORER Screw](#)

Rigging, lifting, valves, pumps, cylinder? Extra-rugged tags



[XPLORER Surface](#)



[ROSWELL Autoclavable](#)



[Xylinder OUTDOOR](#)



[NFC RTI OUTDOOR](#)

Tracking tools and equipment? Rugged metal tags



[NANO Plus](#)



[ROSWELL](#)



[Container OUTDOOR](#)

RFID for Healthcare helps hospitals, medical device manufacturers, and distributors in tracking and digitizing critical inventory.



What factors to prioritize when deploying RFID systems in Healthcare?

- **Patient Safety** - #1 priority for everyone from the institutions to the regulatory agencies, with a stringent evaluation of risks and benefits that applies to any new system.
- **UDI Traceability** - The worldwide agenda for traceability gives momentum to device manufacturers looking to leverage technology enablement.
- **Automation** - Tracking and monitoring automation helps hospitals incorporate safety and UDI traceability into their operations.
- **Sterilization** - Reprocessing procedures are based on manufacturers' IFUs and a facility's own best practices for cleaning, chemical treatments, and sterilization parameters by autoclave, EtO, E-Beam, or radiation.
- **Devices** - Tracking technology provides insight into managing field inventory, trunk stock, and consignment programs.
- **Equipment** - Surgical equipment, beds, and stretches are easier and less contentious to track than patients and staff. There are tagging retrofit options available for any asset, workflow, and lifecycle.

Explore Use Cases

- [Sterile Processing](#)
- [Loaner Systems](#)
- [Point-Of-Care Equipment](#)
- [Pharmacy Inventory](#)
- [Storeroom Supplies](#)
- [Scrubs & Linens](#)

[Ask Our Engineers](#)



[More Case Studies](#)

Medical or surgical devices?

Autoclavable tags for trays, containers, cassettes



[ROSWELL Autoclavable](#)



[MICRO Medical](#)

Medical supply chain?

Labels for high-value items, controlled substances



[Metal Skin® Mercury](#)



[Metal Skin® Platinum](#)



[Metal Skin® Titanium](#)



[TEX TRAK](#)

Tracking sterile inventory?

Irradiation-proof labeling solution for converters



[XSKIN Gamma 73x20](#)

RFID for Manufacturing enhances asset availability and data collection in even the most difficult industrial processes, including cataphoresis, cleaning, degreasing, galvanizing, sandblasting, composites, injection molding, die casting, machining, and 3D printing.



What to check for when selecting industry-grade system components for Industrial Processes?

- **Hi-Temp** - Survivability in extreme temperatures is critical. Rugged RFID tags surviving up to 250C are readily available. Above that level, the smart option is using tags that are easy to remove or replace.
- **Complexity** - Industrial processes come with complex parameters: Paint shops for instance involve a varying mix of temperatures, immersions, jets, chemicals, pressure, shocks, and vibrations.
- **Disposable** - Find the perfect balance between durable and disposable, e.g.: High-spec reusable tags on Paint Shop skids and conveyors, or disposable labels staying with each component throughout its manufacturing workflow.
- **Qualification** - Qualifying new systems for industrial processes takes time. Using pre-qualified components and involving experienced partners will accelerate the testing phase.
- **Customization** - Manufacturing relies on proprietary methods and equipment, making customization capabilities a requirement: Software, readers, tags form factors, mounting options, and materials.
- **Interoperable** - RFID tracking systems are designed to give real-time data with the accuracy and dependability required for automation, just-in-time, and custom manufacturing.

Explore Use Cases

- [Paint Shop Automotive](#)
- [Hi-Temp Processes](#)
- [Injection Molding](#)
- [Industrial Molds Dies](#)

[Ask Our Engineers](#)



[More Case Studies](#)

Tracking in the Paint Shop?

Designed for dip tanks, cataphoresis, hi-temp drying



[MICRO Paint Shop](#)

Tracking Tooling equipment?

Stampable plate, scan at height and long range



[XPLATE](#)

Other Industrial Processes?

Rugged for metal, hi-temp, fluids, acids, alkalins, shocks, vibrations



[MICRO Industrial](#)



[MICRO Heat](#)



[ROSWELL Autoclavable](#)

Embed RFID?

In Metal, ABS, PE, PC...



[PICO In](#)



[XSKIN Theta](#)

RFID provides an effective solution to manage the inventory flow and information across the warehouse, production, and shipment, for better inventory management and purchasing decisions.



Inventory Management at Item-Level with RFID Tags

- **Durability, sizes, and read ranges** - Cost-effective inventory tracking.
- **Surfaces** - Performance optimized for metal, plastic, and wood.
- **Attachment** - Adhesives, hang ties, zip ties, magnets, and screws for flexible and durable mounting.
- **Serialization** - Encoded by the manufacturer or on-site.
- **Custom printed** - With text and/or barcode to make deployment easier.

Warehouse Automation with RFID Readers

- **Dock doors, gates, portals, and overhead** - Provide coverage without interfering with workflows.
- **Forklifts, vehicles, and mobile readers** - For flexible on-the-spot checks.
- **Acceptance, dispatch, check-in-check-out** - Turn-key solutions available for specialized processes.
- **Data accuracy** - Read zones, positioning and calibration to enable high-speed data capture over long and/or short distances while preventing stray reads.
- **Interoperability** with WMS and ERP systems.

Explore Use Cases

- [Automated Warehouse](#)
- [Returnable Packaging and Carriers](#)
- [Materials Management](#)
- [Work-In-Process](#)

[Ask Our Engineers](#)



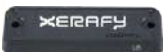
[More Case Studies](#)

Durable but cost-effective and durable tagging?

Start with a universal hard tag



[Versa TRAK](#)



[RTI OUTDOOR](#)



[Circular TRAK](#)

High-value items?

On-metal labels that can be printed and encoded on site



[Metal Skin® Mercury](#)



[Metal Skin® Platinum](#)



[TEX TRAK](#)

Small or curved surfaces?

Check out our tiniest flexible label and slimmest hard tag



[Metal Skin® Titanium](#)



[Slim TRAK](#)

RFID is a pivotal technology in logistics, offering a comprehensive and automated approach to tracking and managing orders, inventory, and shipments.



Unlike traditional barcode systems, RFID enables real-time visibility, accurate identification, and data capture without the need for direct line-of-sight contact. From inventory control and order fulfillment to transportation management and warehouse optimization, businesses leverage RFID to enhance efficiency, reduce errors, and gain actionable insights through seamless integration into existing operational frameworks.

- **99.9% Shipment Accuracy:** RFID-enabled systems help reduce picking errors with up to 30% faster order fulfillment
- **40% Faster Turnaround:** RFID tracking help minimize waiting times in the yard and automates check-in/check-out time.
- **+25% Asset Utilization:** RFID-enabled monitoring of RTPs' movement and usage patterns, allowing efficient allocation and preventing underutilization.

Explore Use Cases

- Order Fulfillment
- Returnable Transport Packaging
- Yard Management Systems
- Last-Mile Logistics

Ask Our Engineers



More Case Studies

Long-range tracking?

Market-leading read ranges



Container OUTDOOR



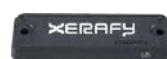
XPLATE

All-weather durability?

Hard tags for indoor and outdoor



Cargo OUTDOOR



RTI OUTDOOR

Custom identification?

Printed, encoded, serialized



Pod TRAK



Metal Skin® Mercury



Metal Skin® Platinum

RFID helps run complex supply chains and take care of critical inventory by enabling end-to-end, real-time visibility across all modes, suppliers, and distributors.



Complex supply chains have a high degree of interconnectedness and interdependence. RFID technology assists in transforming this complexity into synchronized efficiency.

Supply chains face significant challenges such as ensuring proper visibility, guaranteeing quality and safety, and coordinating efficient operations.

RFID offers field-proven solutions to enable end-to-end visibility, speedier operations, and data-driven insights. In addressing these challenges, the technology helps deliver greater efficiency, resilience, and sustainability.

Explore Use Cases

- Consignment Inventory
- Source Tagging
- Cold Chain Monitoring

Ask Our Engineers



More Case Studies

Item-level identification?

Flexible labels, printed and encoded



Metal Skin® Mercury



Metal Skin® Platinum



Metal Skin® Titanium

Global RFID frequency?

For supply chains spanning the globe



Global TRAK



Versa TRAK

Condition monitoring in pharma and food?

Passive RFID sensors



XENSE Temp

RFID has become an integral part of data center management, offering numerous benefits in tracking and optimizing critical infrastructure operations.



Asset Tracking Automation in Data Centers

- **Automation Technology:** Tracking and identification technologies that can be automated, ie work in bulk, without having to pull servers out of their racks.
- **Interoperability:** With IT Asset Management (ITAM) systems such as Nlyte, ServiceNow, Remedy...
- **Machines And Humans:** A best practice that requires printing and encoding on-site or at point-of-manufacture.
- **Unique Identifier:** Identification, traceability, compliance reporting at item-level.

RFID Tags for Data Centers

Data centers are **metal-dense** environments: RFID tags and labels are available that can be custom-tuned to minimize cross-reads and interferences.

Unique identifier with serialized ID (TID) or custom encoding of User and EPC memories.

Identification information can be **printed and encoded**, to make it readable by both machines and people.

Xerafy has RFID tagging solutions that meet industry standards and are specifically engineered for data centers.

Available for both **retrofit** and **source-tagging**, the award-winning Xerafy RFID Tags and Labels are designed to deliver optimal performance for IT Assets, be they used on or in metal, and on plastics.

Compact form factors are available to fit blade servers, rack locations, and mobile devices. More options are available regarding chip memory, materials, and mounting options.

Explore Use Cases

- [Asset Management](#)
- [Inventory and Audit](#)
- [Infrastructure Management](#)

[Ask Our Engineers](#)



[More Case Studies](#)

Server tracking and monitoring?



[Data TRAK II](#)



[XENSE Temp](#)

Slim form-factor?



[Slim TRAK](#)



[Metal Skin® Titanium](#)

Custom frequencies?



[PICO On](#)



[PICO Plus](#)



[PICO Mini 100/150/300](#)

IT asset management leverages RFID technology for smoother, more efficient operations, paving the way for enhanced productivity and cost savings.



How to leverage RFID in IT asset management?

RFID tags, affixed to devices like laptops, inventory scanners, or laboratory equipment, automatically transmit information to RFID readers, without any direct line of sight. The whereabouts and status of each technology asset can be tracked effortlessly, eliminating the need for manual tracking and reducing the likelihood of errors.

RFID technology significantly cuts down on human intervention, minimizing the chances of human error and saving precious time. Moreover, the ability to track the entire lifecycle of a technology asset from procurement to disposal provides valuable insights for making informed decisions about resource allocation and upgrades.

25% Decrease In Data Entry Errors

RFID technology automates asset tracking, ensuring a high level of accuracy in asset visibility.

40% Reduction In Audit Time

RFID enables swift, automated asset audits, allowing teams to focus on more strategic tasks.

+15% Asset Utilization Rates

Organizations experience an improvement in asset utilization rates, indicating a more efficient use of resources and an optimized return on investment.

Explore Use Cases

- [IT Equipment](#)
- [Inventory Scanners](#)
- [Laboratory Equipment](#)

[Ask Our Engineers](#)



[More Case Studies](#)

Laptops and small devices?



[PICO On](#)



[Slim TRAK](#)



[Global TRAK](#)

Unique identification?



[Metal Skin® Mercury](#)



[Metal Skin® Platinum](#)

Curved surfaces?



[Metal Skin® Titanium](#)



[XSKIN Theta](#)



[Metal Skin® Delta](#)

RFID technology is deployed in the field to manage fleets of equipment and capture the data needed for operational efficiency.



How to achieve optimal performance tracking fleets in the field?

- **Outdoor** - Durable components that are weatherproof, waterproof, UV-proof, shocks and impact-resistant.
- **Long Range** - Tagging solutions that are cost-effective and deliver high-accuracy RFID reads on metal, plastic, and wood, over long distances.
- **Retrofit** - Tags and labels in a variety of sizes and profiles, and paired with durable mounting methods such as embedding, epoxy, heat-shrink tubing, adhesives, zip ties, screws, rivets, and magnets.
- **Fleet** - Support fleet management for assets in the field: Replacement, new items, direct tempering protection.
- **Unique** - Serialized tags encoded with unique numbers will enable item-level tracking and traceability.
- **Customized** - Hard tags customized with text and/or barcode identification, as well as labels printed on-site, facilitate deployment and operations.
- **Software** - Utilities tracking projects typically rely on bespoke solutions, developed locally, however specialist vendors can offer speed, cost, and best practices.

Explore Use Cases

- Waste Management
- Weapon Tracking
- Tower Monitoring
- Infrastructure Monitoring

Ask Our Engineers



More Case Studies

Durable identification?

All-weather with rugged mounting



Container OUTDOOR



Cargo OUTDOOR



MICRO Industrial

Cost-effective deployment?

Zip ties, adhesives, rivets



RTI OUTDOOR



Flex OUTDOOR



XPLATE

Custom identification?

Printed, encoded, with adhesive



Metal Skin® Mercury



Metal Skin® Delta



Pod TRAK

Find Your Tag

Find Your RFID Tags To Track Assets, Returnables, and Inventory: UHF, On Metal, Rugged, Small, High Temperatures, Embedded, Memory.

Passive RFID tags that deliver performance, reliability, and consistency at the service of specialized asset identification and tracking systems:

RUGGED

Benchmark-topping tags for critical assets

- MICRO - high temp
- PICO - small
- XS - world smallest
- ROSWELL - ultra rugged

SKIN

Smart labels for complex supply chains

- Metal Skin® - durable labels
- XSKIN - specialty labels

TRAK

Durable tags for returnable assets and inventory

- TRAK - inventory
- POD TRAK - returnable
- TEX TRAK - laundry
- OUTDOOR - long range
- XPLATE - stampable

IOT

Devices for asset tracking and monitoring

- XENSE - passive sensing
- NFC - smart tracking

Get RFID Tags Guide

Industry Certification and Compliance



CE Certification



ATEX Certification



ISO 9001:2015



ISO 14001:2015



Industry Alliance

Xerapy is a member of RAIN RFID.



Xerafy Customizable RFID Tags

Xerafy offers a Custom RFID tag development service drawing on a 14 year-long expertise in RF technology and industrial asset tracking systems. Xerafy lets you build your RFID System on the company's unparalleled reputation for first-class durable, passive, on-metal tags and labels.

Our Custom RFID Tags co-development approach ensures you start in no time with the support you need at every step of the process:

1. **KEY FEATURES** - Identifying the application environment and the level of performance to be achieved allows for effective validation of the custom design's MVP
2. **FEASIBILITY** - A technical and financial assessment provides the data required to finalize the business case and confirm the expected ROI
3. **PROTOTYPING** - Incremental innovation to achieve the performance required
4. **DEPLOYMENT** - Manufacturing, shipping, and full support throughout

Xerafy Service Bureau

Chose from a full range of customization services available to personalize off-the-shelf RFID tags, labels, inlays, and sensors.

- **Readable identifications** - Serial numbers, text, custom colors, logos
- **Optical identifications** - Barcodes, QR Codes
- **Encoding** - Unique ID numbers, serialized or unserialized, written in the memory of the chip

RFID Labels are specifically designed to be personalized in the field, with the leading Industrial RFID printers from SATO, Zebra, TSC, Postek... able to print and encode at the same time, at scale.

Customized physical markings are available with various levels of durability to suit every use case:

- **Painting**
- **Printing, for labels**
- **Laser marking, for hard tags.**

[Talk To An Expert](#)

About Xerafy

Digitize Your Business Smarter, Safer, Cleaner, Better

Xerafy enables digital transformation at Fortune 500 companies with benchmark-topping RFID tagging solutions and engineering services.

Connected Assets

At Xerafy, we believe in the Industrial Internet of Things.

Manufacturers and end-users develop smart connected assets using our RFID technology, allowing for more efficient business operations and new product capabilities.

How we got started

Xerafy was founded by a team of experienced RFID engineers who got together to solve the problems faced by industrial customers.

Customers needed to manage small assets like hands tools, manufacturing molds, industrial equipment, medical devices. They wanted tags small enough to embed or attach to their assets but rugged enough to survive the extreme temperatures, humidity, and rough handling that are the norm in industrial environments.

Traditional barcode solutions available had already demonstrated too many limitations including line-of-sight, distance, automation, and durability.

The Xerafy engineering team came together to develop a breakthrough Radio Frequency Identification (RFID) design. Unlike others, it would take advantage of the metal in its surrounding, instead of being limited by it.

The company decided to name themselves Xerafy to symbolize the smallest EPC UHF RAIN RFID tag to verify and quantify assets.

Awards

Our technology has been distinguished by EY, Frost & Sullivan, GS1, RFID Journal, Alconics, and Red Herring.



The Company

Xerafy is headquartered in Singapore, and maintains sales and technical support offices in the US, UK and China. Xerafy's wholly owned manufacturing plant in China allows the company to guarantee quality as well as provide unique customization capabilities and cost advantages.

[Contact Us](#)