Why SATO RFID

With a comprehensive offering of printers, labels/tags, applications, and global support, SATO is your ideal choice for solving business challenges using RFID.

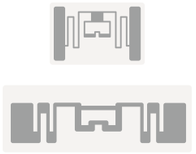
Printers

- SATO designs and manufactures our own RFID printers.
- SATO's IoT-ready printers not only print and encode, but also have a built-in OS (operating system) so that solution software for cloud-connected printing and various peripherals can be installed on the printer itself.



Consumables

- SATO has our own facility capable of handling the entire RFID label/tag manufacturing process, from designing and producing RFID antennas to inspecting and shipping finished products.
- As a label manufacturer with years of experience, we can offer customers RFID labels that meet their needs.



Scanners & Readers/Writers

SATO offers customers the best combination of our own printers and software with scanners and readers/writers from partner companies.



Software

SATO provides the right software to solve the customer's challenge. We develop original and packaged software for printers, PCs, scanners and more.

SATO AEP Application Enabled Printing

SOS SATO Online Services

SATO App Storage

Servicing

The SATO solution does not end with installation. We develop long-term relationships with our customers to address issues in the field and continually improve operations.



Global Network

SATO has a global presence in 26 countries and does business in over 90 countries, delivering optimized solutions for customers around the world.



- RFID products contain sensitive semiconductor chips that may cause their read performance to vary substantially depending on the environment where they are used.
- Field testing for RFID solutions is required in the customer's actual operating environment prior to implementation.
- As RFID solutions are built based on field testing, any subsequent changes to tagging positions and other conditions may affect their intended performance.

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SATO Powered On Site

RFID by SATO SOLUTIONS



Integrate Your Digital Supply Chain with RFID

SATO provides high-quality RFID and collaborates with partners to optimize solutions for digitalizing your supply chain.

RAIN ALLIANCE

IMPINJ SILVER PARTNER

PJM

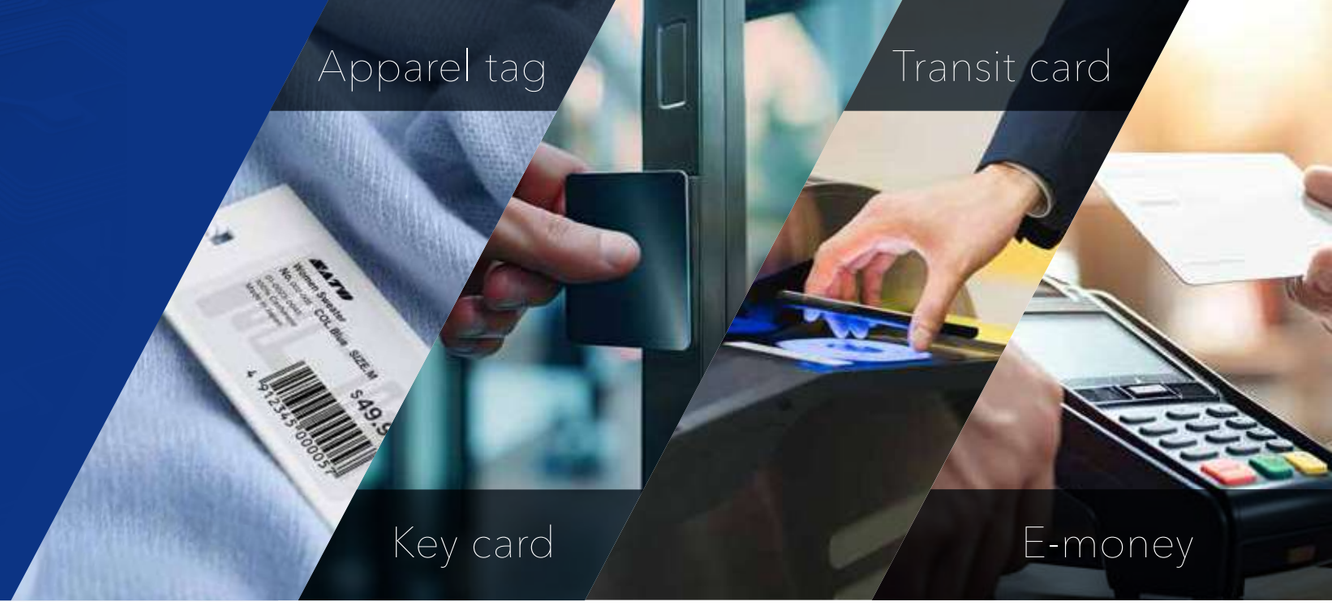
Visit our website

What is RFID

Short for Radio Frequency Identification, RFID is an auto-ID technology that is anticipated to enable advanced information services and bring us closer to a ubiquitous society.

Besides barcodes and two-dimensional (2D) barcodes that are conventionally used to carry data, newer technologies such as RFID and voice recognition are now being introduced at a greater speed for improving business operations and security.

As RFID develops and its product lineup continues to expand, the technology is set to become an increasingly important tool for many applications in various industries such as manufacturing, logistics, retail, service, transportation and healthcare.



Advantages of using RFID

Read and write data without making contact

RFID tags need not be held right next to reader devices like barcodes, meaning that they can be read even from tall shelves.



No line of sight required

RFID tagged items in boxes can be scanned accurately without being unpacked as the tags can be read/written even when they cannot be physically seen. Reliable performance even when used in dirty outdoor environments.



Bulk reading

Large volumes of RFID tags can be read simultaneously and do not have to be scanned individually like barcodes.

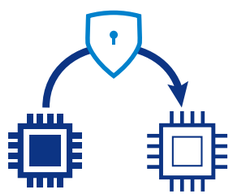


Data rewrite capability

Information in RFID tags can be overwritten repeatedly for different usages so there is no need to keep changing tags, for example, when reusing returnable containers.

High levels of security

As RFID chips cannot be easily copied, they provide counterfeit protection when used for personal identification cards and tickets.



Comparison with other auto-ID technologies

	RFID	2D barcode (QR code)	Barcode
Data capacity	Several kilobytes	Several kilobytes	Several tens of bytes
Rewritability	Supported	Not supported	Not supported
Line of sight	Not required	Required	Required
Multiple reads capability	Supported	Possible, subject to conditions	Possible, subject to conditions
Replication	Difficult	Easy	Easy
Resilience against dirt	Strong	Weak	Weak

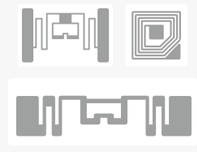
SATO's RFID lineup

As a leading global provider of auto-ID technologies, SATO offers RFID solutions combining RFID labels/tags we produce with RFID printers we develop for printing the labels/tags themselves and writing data to the RFID chips embedded within. SATO is the only company in Japan that manufactures and sells both RFID printers and consumables.

RFID-ready printers and print engines



RFID labels/tags



Peripherals



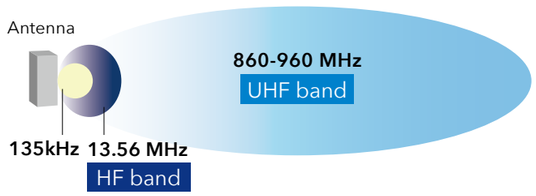
- Support for system setup
- Consultation on implementation
- Know-how from experience

SATO offers total RFID support for customers, starting from sourcing readers/writers most suited to your usage, to developing and providing the software you need.

Main frequencies used in RFID systems

RFID systems operate in various frequency ranges. Primarily used are the low frequency (LF), high frequency (HF), micro-wave, and ultra-high frequency (UHF) bands, and RFID labels/tags read differently at each of these frequencies. SATO offers a wide range of mainly UHF and HF (including NFC and PJM RFID) products, tailoring our RFID solutions to meet customers' needs and applications.

Differences in read range and field



Comparison of RFID frequencies

RFID systems behave differently depending on the frequency used.

Frequency	Read range	Data read rate	Read field	Simultaneous identification	Tag standardization	Performance near liquids	Performance near metals
Under 135 kHz (LF)	3 – 30 cm	Limited	Limited	Limited	Not good	Good	Good
13.56 MHz (HF)	5 – 50 cm	Limited	Good	Good *1	Good	Good	Limited
860-960 MHz (UHF)	3 – 8 m	Good	Good	Good	Good	Limited	Limited *2

*1 Dependent on HF standard
*2 Use metal-compatible tags for metal surfaces

Characteristics of UHF (860–960 MHz) RFID

UHF UHF RFID has a long read range and wide directivity, making it suitable for far-field operations. The tags have anti-collision capabilities, ensuring excellent reading efficiency.

Bulk reading

Simultaneous scanning of multiple tags to speed up stocktaking of apparel items, for example, at retail stores and their backrooms.



Long read range

Typically used at reading distances between 3m and 5m, ideal for supply chain applications such as the management of receiving and shipping processes in large warehouses and distribution centers.



*Stocktaking time can be reduced to as much as 10% in some use cases.
(Dependent on operating environment/ conditions, system configuration, etc.)

Characteristics of NFC/FeliCa Lite (13.56 MHz)

HF (NFC) NFC/FeliCa Lite is a type of HF RFID chip that is designed for close-proximity communication. Besides being commonly used in personal identification cards, it is also popular among many low-cost consumer services due to its high compatibility with smartphones and tablets.

Tap for identity verification

Proximity technology is the ideal choice for employee/student IDs, membership cards, and other forms of personal identification. It can also be used in the office together with electronic locks and computer login tools for greater security.



Linking to online content

NFC tags can be embedded into smart posters for online-to-offline (O2O) marketing, while NFC wristbands can be used to increase information touchpoints for tourism services and events.



Characteristics of PJM (13.56 MHz) RFID

HF (PJM) PJM stands for Phase Jitter Modulation and is a type of HF band RFID technology. It is used in the management of blood products because of its excellent readability near liquids, and in the management of medical devices because of its ability to withstand sterilization processes.

Reliable reading at close range

Used in a wide variety of applications including production tracking. Data can be collected accurately in the vicinity of production lines without stoppages or productivity losses.



Capable of reading around liquids

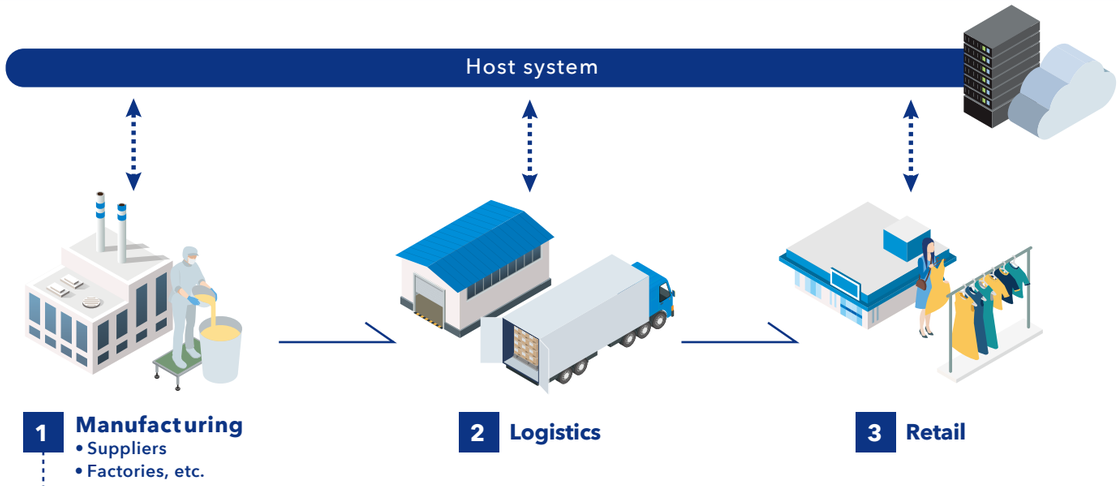
Well-suited for use in intravenous medication labels and patient wristbands as the read performance remains stable in the presence of liquids.



Optimize Your Supply Chain with RFID

RFID technology addresses labor shortages by enabling efficient inventory management and tracking with minimal staffing. Its automatic reading capabilities allow data to be captured and shared at every stage from production to sales, improving data consistency and visibility throughout the supply chain and facilitating data-driven decision making, for example, to respond rapidly to demand fluctuations and minimize waste.
Through the host system, the movement and location of goods are instantly and accurately tracked, even when moved to another location, allowing for real-time inventory management.





1 At manufacturing sites

Receiving management

Improve receiving efficiency by reading incoming materials all at once.

Watch video

Shipping management

Use RFID tags and their unique identification codes to manage full production history and prevent shipping errors (missing, incorrect, duplicate item or shipment).



Production picking

Cross-check parts and materials against work order data at picking to manage their inventory accurately and determine when new orders need to be placed without causing delays to production.

Process control

Track progress at each production stage accurately to help prevent assembly errors.

Asset management

For returnable items and tools

Attach RFID to equipment and fixtures to streamline quantity and location management. RFID also makes it possible to easily locate tools and other items, thereby reducing the burden of searching for things.



For molds

RFID can be attached to the mold to track the number of uses over the mold's lifetime. This helps prevent mold damage due to overuse and contamination by foreign objects from broken molds.



RFID Applications

2 At logistics sites

Vehicle management

Tag vehicles to track their entry and exit. Also control access to only admit drivers with valid IDs for reinforced security.



Receiving and shipping management

Automatically read data of incoming/outgoing parcels all at once, and centrally manage warehouse processes starting from receiving to inventorying and shipping.



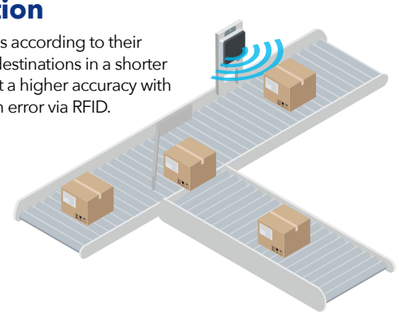
Location management

Track information of tagged parcels together with their pallet or shelf identification. Manage parcels that are stacked or placed at tall shelves easily as RFID tags can be read even from a distance.



Sortation

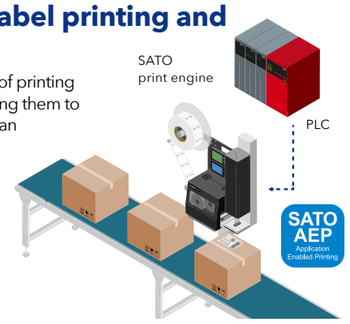
Sort parcels according to their intended destinations in a shorter time and at a higher accuracy with less human error via RFID.



Automated label printing and application

Automate the process of printing RFID labels and attaching them to packages without human intervention.

Watch video



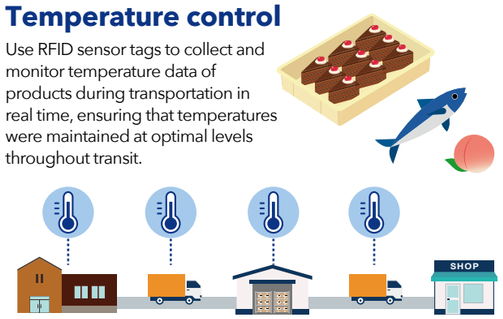
Automatic data collection

Streamline receiving, shipping, and inventory management with RFID gates. Counting items is as simple as letting them pass through the gate.



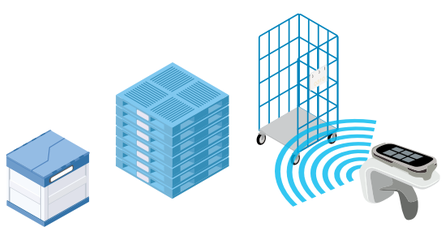
Temperature control

Use RFID sensor tags to collect and monitor temperature data of products during transportation in real time, ensuring that temperatures were maintained at optimal levels throughout transit.



Returnable items management

Manage the location of returnable transport items and their returns and maintenance. Prevent loss of items and improve efficiency of use.



3 At retail sites

Attendance tracking

Have staff tap their ID cards on RFID reader/writer to accurately track and record their in and out times.



Incoming inspection

Verify incoming goods without unpacking, regardless of whether they are transported in single or mixed loads. This shortens the receiving process.



Real-time visibility

Track how items are moved through a store by installing reader antennas on the ceiling, walls and display racks. When shoppers pick up an item or try it on at the fitting room, data can be collected to help stores better understand consumer behaviors and preferences.



Quick checkout

Scan all items in one go to ensure a smooth checkout process that does not keep customers waiting.



Loss prevention

Tag and manage inventory with RFID, and save the hassle of attaching EAS security tags. RFID tags work great for loss and theft prevention as they can be read while hidden.



Stocktaking

Batch reading significantly reduces work time. This enables staff to conduct more frequent inventory checks and improve inventory accuracy.



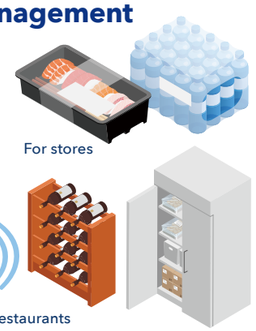
Fast & accurate store-to-store transfers/returns

Information is automatically captured through batch reading for efficient receiving.



Food inventory management

Inventory of high-moisture perishable foods, bottled beverages, and retort pouch foods can be managed with RFID. Detailed discount settings based on expiration dates can also be efficiently performed.



Freshness management of conveyor belt sushi

RFID streamlines freshness and inventory management, allowing real-time preparation checks and efficient checkout.



RFID Printers & Print Engines

RFID printers enable the efficient creation and management of RFID labels and tags. Our printers are easy to use, durable, and offer comprehensive features to meet the needs of various businesses.

Best-in-class thermal industrial printer



CL4NX Plus
UHF RFID
HF RFID (NFC & PJM)

CL6NX Plus
UHF RFID

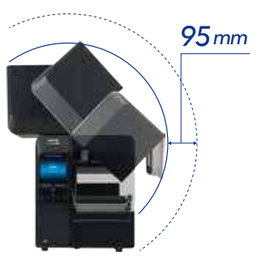
One complete solution for all your printing needs

Watch video

High print speed & precision



Durable & functional design



- Intuitive operation
- Easy setup & maintenance



4-inch smart desktop printer

CT4-LX
UHF RFID
HF RFID (NFC)

Smart printing made simple



Watch video

Intuitive user experience with 4.3-inch colour touch screen & user-friendly menu



Compact & easy to install





Space-saving recessed ports

Label waste prevention function enables printing from the first label onward



POINT

Distinctive features for RFID printing/encoding

The SATO printer shows error messages on screen when it detects multiple RFID inlays or when other errors happen during RFID encoding. If the printer fails to read encoded data in an RFID tag, it also prints an error message on the defective tag to prevent it from being used.

Versatile print engines, designed for demanding environments



Watch video

S84NX UHF RFID

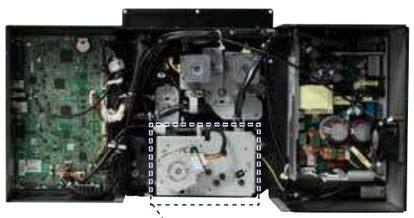
Maximize productivity for 24/7 mission-critical applications

3.5-inch color LCD & dual-color LED indicators



Built-in video tutorials





Versatile specifications to meet diverse needs



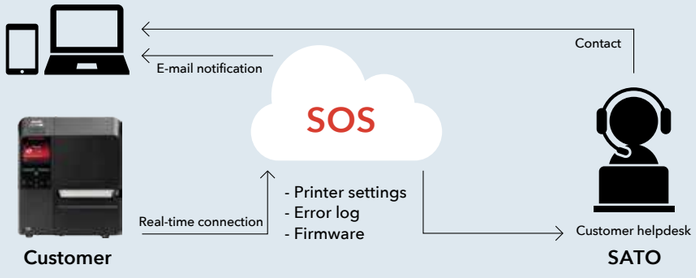
Improved dust & splash protection



SOS SATO Online Services — IoT solution to keep your operations running & visible

By monitoring your printers 24/7 via cloud, SOS (SATO Online Services) enables proactive preventative maintenance and helps you reduce printer downtime by as much as 86%.

*Based on survey conducted by SATO in Japan





SOS Smart App



Perform proactive preventative maintenance



Manage printers at multiple locations

Watch video

RFID × SATO AEP

SATO AEP (Application Enabled Printing) for higher labeling productivity

SATO AEP is a powerful onboard intelligence which enables customization of printer operations to meet the user's needs and to reduce business costs.



Features

PC-less
Eliminates need for separate printers & PCs, with no third-party software for OS & middleware, no licenses required & easier update rollout.

Peripheral device connection
Printer can process info internally and link to devices such as scanners, weighing scales, thermometers, and PLC.

Onboard intelligence
Decisions are made by printer and not by staff who may be inexperienced or unqualified.

Cloud enablement
Connects the printer directly to IT and cloud systems.

Customer benefits

Perfect fit
Ideal for areas where space is minimal, or where the environment is unsuitable for a PC.

Reduces total cost of ownership
Reduces business downtime and decreases system maintenance with less recurring costs.

Improves the labeling process
Easy and intuitive labeling process that improves efficiency and productivity, while minimizing the risk for human errors.

Direct connectivity to IT and cloud systems
Reduces system complexity meaning less things can go wrong and makes troubleshooting easier.

Watch videos : SATO AEP solutions

Receive PLC commands to print labels directly without a PC

Print RFID labels and keep print logs automatically

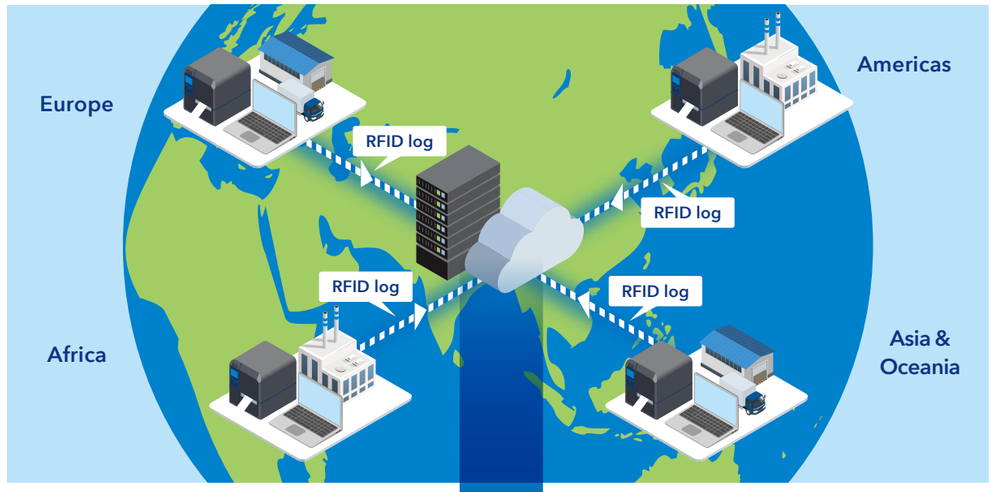
Print labels automatically from CSV data without a PC

SATO AEP
Application Enabled Printing

Tagging products at the point of manufacture

SATO's RFID source tagging solution

- Using SATO AEP, the printer generates a log of the RFID tags that have been actually encoded and printed. This differentiates it from other solutions that provide a log of the data which has been sent to the printer. That kind of data would end up including RFID tags that were not actually printed due to power/network failure or other issues.
- The log file contains a date/time stamp, username, EPC, TID, RFID write result and printer related information like printer name, location, serial number and IP address.
- The RFID log from all printers is sent in real time to one central server or cloud where the data is analyzed and used for traceability purposes. The system can also check for duplicate EPCs and this will prevent suppliers from being fined by the retailer.



Refresh

ID	DateTime	Username	EPC	TID	Result	PrinterName	PrinterLocation	PrinterIP	PrinterMAC
135	11. 01. 2024 14:55:31	Taro Sato	303400C0E4424CC000000097	E2806894200040 10F3B4302B	Success	CL4NX Plus RFID ID 1001	Facility310	192.168.1.3	00:19:98:8
134	11. 01. 2024 14:55:30	Taro Sato	303400C0E4424CC000000096	E2806894200050 10F3B4682B	Success	CL4NX Plus RFID ID 1001	Facility310	192.168.1.3	00:19:98:8
133	11. 01. 2024 14:55:29	Taro Sato	303400C0E4424CC000000095	E2806894200050 10F3B47C2B	Success	CL4NX Plus RFID ID 1001	Facility310	192.168.1.3	00:19:98:8
132	11. 01. 2024 14:55:28	Taro Sato	303400C0E4424CC000000094	E2806894200040 10F3B4902B	Success	CL4NX Plus RFID ID 1001	Facility310	192.168.1.3	00:19:98:8
131	11. 01. 2024 14:55:27	Taro Sato	303400C0E4424C8000000093	E2806894200050 10F3B47C2B	Success	CL4NX Plus RFID ID 1001	Facility310	192.168.1.3	00:19:98:8
130	11. 01. 2024 14:55:26	Taro Sato	303400C0E4424C8000000092	E2806894200040 10F3B4901B	Success	CL4NX Plus RFID ID 1001	Facility310	192.168.1.3	00:19:98:8
129	11. 01. 2024 14:55:25	Taro Sato	303400C0E4424C8000000091	E2806894200040 10F3B4502B	Success	CL4NX Plus RFID ID 1001	Facility310	192.168.1.3	00:19:98:8
128	11. 01. 2024 14:55:23	Taro Sato	303400C0E4424C8000000090	E2806894200040 10F3B4900B	Success	CL4NX Plus RFID ID 1001	Facility310	192.168.1.3	00:19:98:8
119	11. 01. 2024 14:55:22	Taro Sato	303400C0E4424CC000000008F	E2806894200050 10F3B4542B	Success	CL4NX Plus RFID ID 1001	Facility310	192.168.1.3	00:19:98:8
118	11. 01. 2024 14:55:21	Taro Sato	303400C0E4424CC000000008G	E2806894200050 10F3B4681B	Success	CL4NX Plus RFID ID 1001	Facility310	192.168.1.3	00:19:98:8
117	11. 01. 2024 14:55:20	Taro Sato	303400C0E4424C800000008E	E2806894200050 10F3B4582B	Success	CL4NX Plus RFID ID 1001	Facility310	192.168.1.3	00:19:98:8

Watch video

System generates alerts on duplicate tags

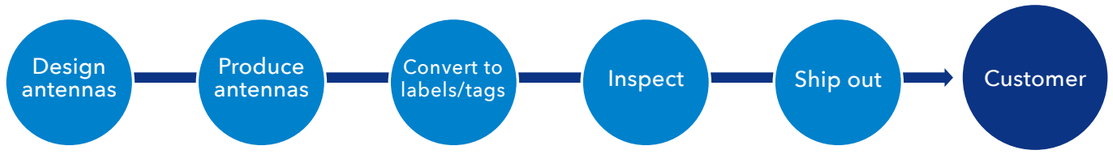


RFID Labels & Tags

SATO-original RFID labels



We have established a comprehensive system that manages the entire RFID label/tag manufacturing process, from antenna design and production to inspection and shipping. Leveraging our extensive experience in label manufacturing, we also propose RFID labels tailored to specific operating environments and conditions.



Standard RFID labels

Retail / Apparel



STD36X56 / DT / 5030U9
P36xW56mm

Drinks



45x100PER / 3S / 9424M73
P45xW100mm



STD / 3S / 4907M73
P10.5xW52.5mm

Food



STD / 3S / 4907M73
P10.5xW52.5mm

Returnable transport items



STD / PP / 9020R6P
P27xW97mm

Transport & Logistics



STD / 3S / 9020R6P
P45xW96mm

Transport & Logistics / Chemicals and semiconductors



45x100PER / 3S / 9424M73
P45xW100mm

Supplier label / Chemicals and semiconductors



101.5x101.5 / PP / 9424U7xm
P101.5xW101.5mm

Iron and steel / Automotive



STD / U8 for Metal
P23xW42mm

Parts label / Automotive



STD / PP / 9424U7xm
P27xW97mm

Medical implants



STD / 3S / 70104QT
P24xW76mm

Hospital / Patient safety



DT UHF Adhesive Wristband
P355.6xW29mm

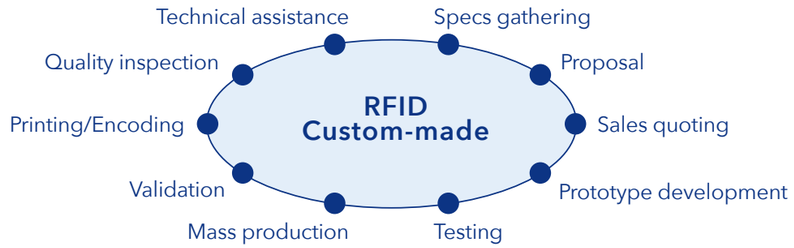
*1 Some RFID labels use film-based materials.
*2 The examples shown here are not extensive. Please contact our sales representatives for our full lineup.

SATO-original RFID labels are 100% compatible with SATO printers

RFID tags for unique needs

Depending on the environment and purpose, customers have different requirements for RFID tags such as durability, heat resistance, and compatibility with metals. Customers may also want to attach RFID tags to various objects. We offer our RFID expertise from tag selection to tagging methods, to meet diverse needs.

Customization support



Please contact us for custom-made orders

Tags for unique needs

SATO-original

Tags for non-metal



Strap type
for handy terminals



Low-cost type
for pallets



Washable type
for clothing



Shock and water-resistant type
for keys



Wearable wrist-type



Stick type
for embedding



For sushi plates



For floor



For wine bottles

Tags for metal



Heat and chemical-resistant type



For curved surfaces



Magnet type
for asset management



Tie-on type for cart trolleys



For small tools



Flexible type



Adhesive type

Beontag

Rugged hard tags for industrial environments

For steel pallets, train wagons, etc.



Ironside Classic
H47.5xW51.5xD10mm

For industrial container tracking



Ironside Slim
H21xW85xD10mm

For use with cable tie, steel wire or other attachment tools



Ironside Flex
H73xW26xD6mm

Durable on-metal tags for indoor and outdoor applications

Where high performance on all surfaces is required



Steelwave Classic
H30xW115xD3.9mm

For tracking IT assets and other office equipment



Steelwave Micro II
H13xW38xD4.5mm

*We do not provide customization support for Beontag products.