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SIMATIC RFID

Промышленная идентификация

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Industrial Identification needs various systems for different challenges

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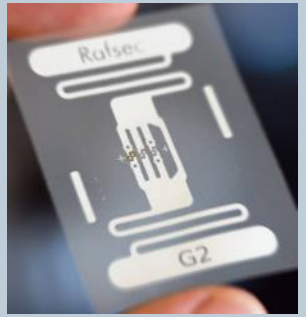
Optical Identification (OID), 1D- / 2D-Code / OCR / Object recognition

- Automatic reading of printed, lasered or needled code
- Optical Character Recognition (OCR: Text-Genius)
- Robust at high temperatures
- Cost-effective and widespread
- Direct marking (identification) on products and components

Radio Frequency Identification (RFID)

- Robust in dusty/dirty environments
- No visual contact necessary
- Automatic and simultaneous gathering of multiple goods (bulk capability)
- Reading and writing of large amounts of data



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The **world's leading provider** of identification systems – with more than 30 years of proven technology and industry expertise

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Radio Frequency Identification (RFID)

Short range (HF)

Long range (UHF)

Siemens offers a comprehensive, single-source range of RFID systems to visualize your entire production chain and monitor your material flows at all times

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SIEMENS – your reliable partner for path-breaking Industrial Identification

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SIMATIC Ident top highlights

Competent partner +

More than 30 years of experience in development, producing and implementation of Industrial Identification

High investment reliability +

Making use of open standards and international certifications

Long-term availability of products - perfectly matched and thoroughly tested components

Supreme profitability +

Through a comprehensive and scalable portfolio

Highest reliability +

Components with high protection class for harsh industrial environments

Reduced engineering costs +

Through simple and seamless integration into Automation and IT systems

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SIMATIC Ident – masters various challenges in production and logistics

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Target industries / applications

Production and material flow management

- Order-related production control
- Decentralized availability of order data
- Correct sequencing of materials in production process

Asset management

- Information about inventory and status in real-time
- Optimal utilization of tools and containers
- Error-free identification without any manual intervention

Track & trace and supply chain management

- Real-time synchronization of real flow of goods and digital world
- Complete transparency along the whole value added chain

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SIMATIC Ident –
typical references / use cases in Automotive

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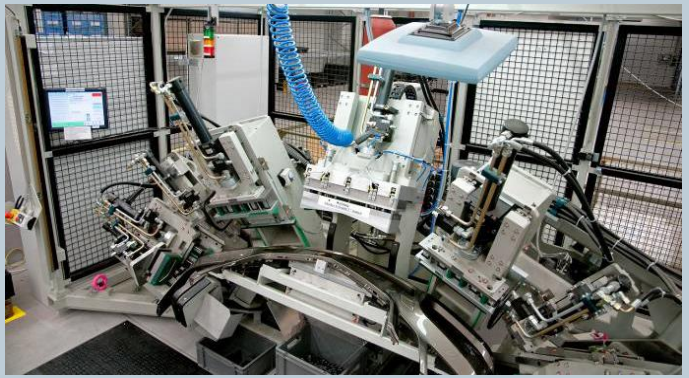
Powertrain

Supplier



Final Assembly

Logistics

Sub Assembly lines

Body Shop, Paint Shop

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SIMATIC Ident – worldwide references for more than 30 years

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Audi	Gleason Pfauter Group	Mauser	Toyota
BAT	GM/Opel/Vauxhall	Mercedes Benz	TRW Automotive
BMW	Hanwha	PCI	Unilever
Boehringer	Heller	Philips	Valeo
Bosch	Hirata	Plastic Omnium	Visteon
Comau	Honda	Porsche	Volkswagen
Daimler	Iglo	PSA (Peugeot/Citroen)	Volvo
Dell	INA	Rehau	Wacker Chemie
Dürr	ISE	Renault	Zentis
EDAG	Johnson Controls	Reishauer	Zeiss
Eisenmann	Kia Motors	Samsung	ZF Friedrichshafen
Ex-Cell-O	Komatsu	Sauer Danfoss	Cherry Jaguar Landrover
Faurecia	KUKA	Seat	Great Wall
FAG	Lancia	Siemens	
Felsomat	Lander	Skoda	… and many more customers worldwide
Fiat	Lear	Solar World	
Ford	Liebherr	Tata Motors	
Gira	LuK	Tesla	References on the internet

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Our portfolio for the Industrial Identification – RFID systems for a wide range of applications!

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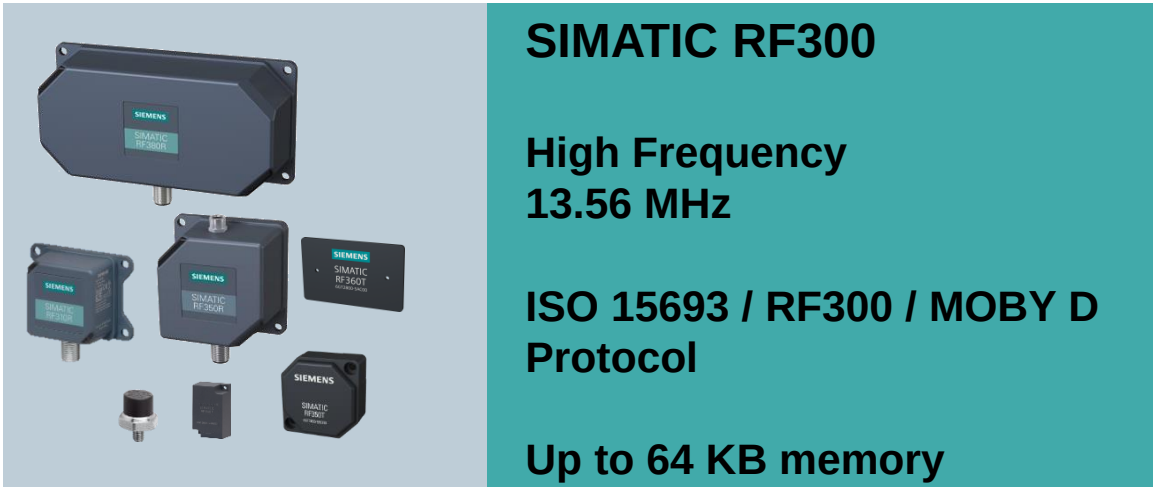

SIMATIC RF300

High Frequency
13.56 MHz

ISO 15693 / RF300 / MOBY D Protocol

Up to 64 KB memory

SIMATIC RF600

Ultra High Frequency
868/915 MHz

Up to 8m

SIMATIC RF200 (MOBY D)

High Frequency
13.56 MHz

ISO 15693 Standard

Mobile reader

Software for SIMATIC S7 and PC

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Criteria for RFID-System: storage capacity vs. range

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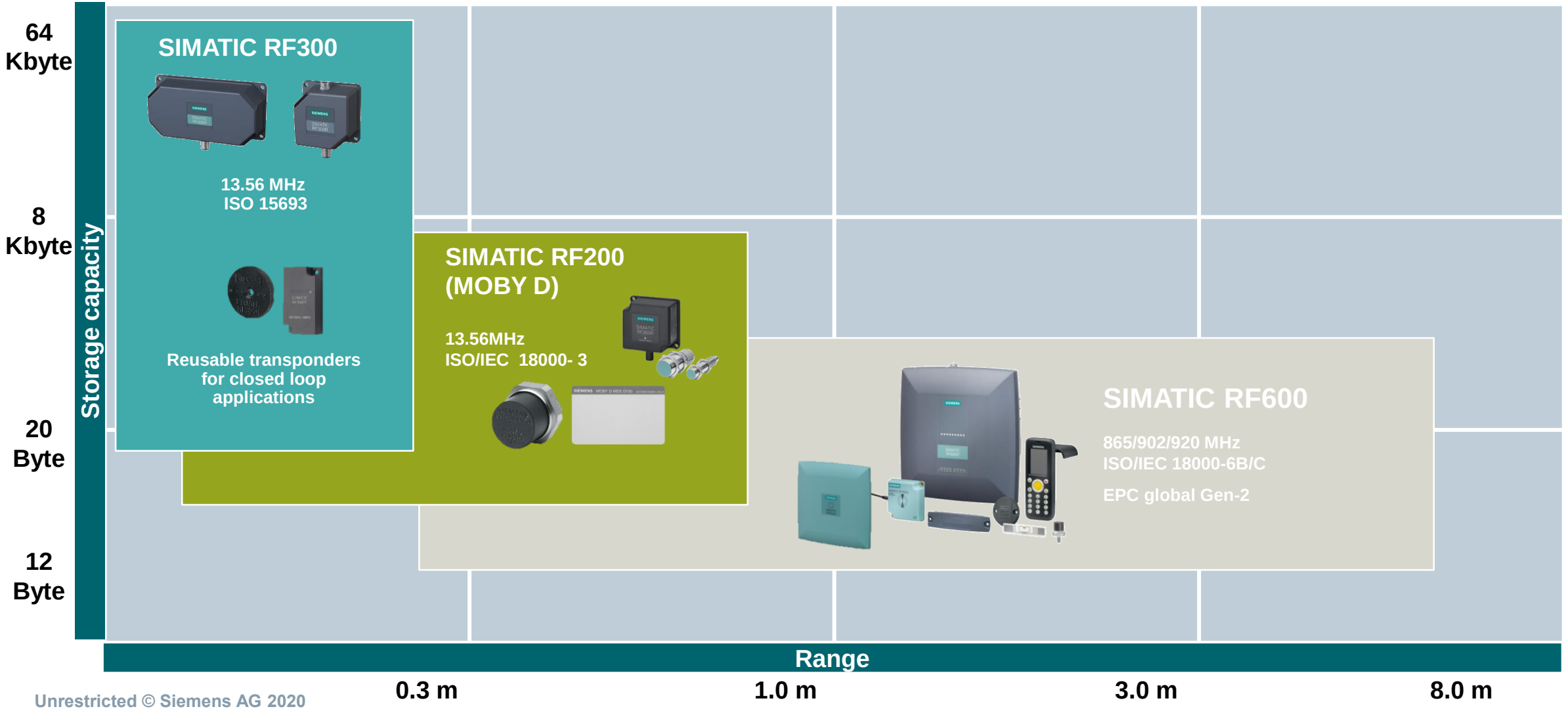

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RFID: wireless, contact-free identification – for the use in harsh industrial environments

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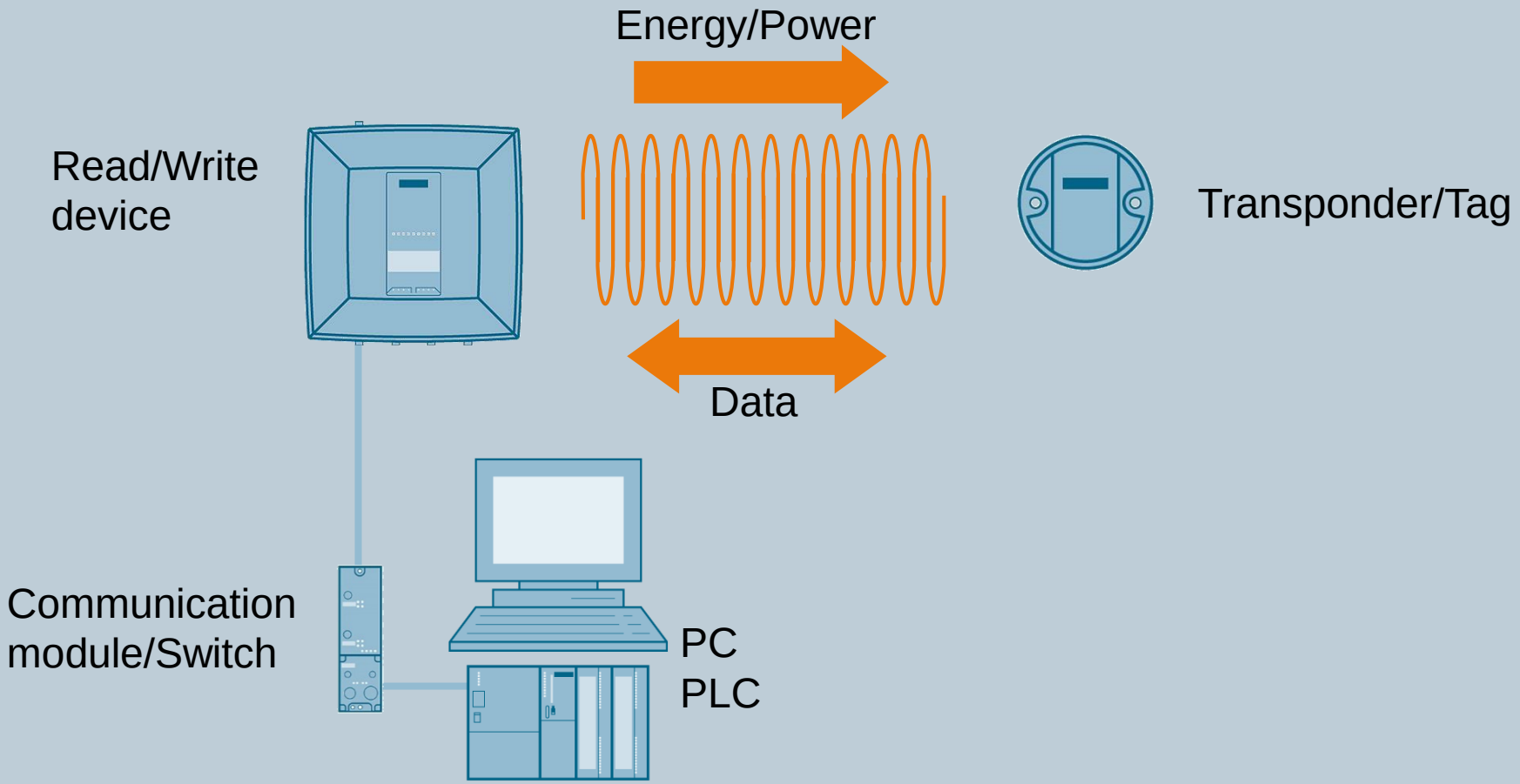
Operating principle



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SIMATIC RF300

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Compact and powerful HF ID system for industrial production control

“Fast data transmission rates for the reduction of cycle times”

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SIMATIC RF300 – Compact and fast “short range” Identification System for Industrial Production Control

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High-speed mobile transponder with large data memory

- User memory up to 64 KB FRAM
- Compact and rugged designs
- High degree of protection, up to IP68/IPX9K
- Unlimited read/write cycles with *FRAM*
- Can be mounted directly on metal
- High temperature version for up to +220 °C incl. ATEX approval
- Reasonably priced transponder

High-performance read/write devices (readers)

- Supported standards: ISO 18000-4, ISO 15693 and ISO 14443 A
- High-speed data transmission up to 8000 bytes/s (ISO mode 1500 bytes/s)
- Read/write distance up to 210 mm
- Comprehensive status and diagnostic functions for preventive maintenance
- Compact designs with integrated or external antenna

Easy integration into TIA, PC and other PLCs

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SIMATIC RF300-reader supports RF300-mode, ISO 15693- and ISO 14443 A-functionality

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Max. Range with ISO-tags [mm]

210
120
60
30
15

RF310R

RF340R

RF380R

RF350R
With remote antennas

RF350M
"Handheld"

500 800 2500 List price Germany [EUR]

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SIMATIC RF300
High Performance and ISO Functionality

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RF310R

RF340R

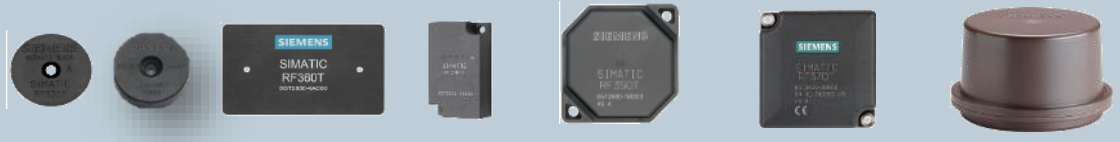
RF350R

RF380R

RF350M [1)]

- Reader price level lowered despite added value

RF300 transponder



RF3XXT

- High read/write speed
- Large memory
- MOBY I applications

- RF300/ISO/MOBY E mode can be parameterized by application

MOBY D/E transponder

MDS DXXX / MDS E6xx

- Easy migration of MOBY E systems
- RF200 and MOBY D applications
- Customized tag process for special designs

1) only for RF300 and ISO 15693 transponders

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SIMATIC RF300
Overview of transponder key data

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	RF300 transponder	MOBY D transponder (ISO 15693)	MOBY E transponder (ISO 14443)
Frequency	13.56 MHz		
Memory capacity (User memory)	20 byte (EEPROM) 8-64 KB (FRAM)	112 - 992 bytes (EEPROM) 8,000 bytes (FRAM)	752 bytes (EEPROM)
Data transfer rate reader tag read / write	Up to 8,000 byte/s / 8,000 byte/s	Up to 3,000 byte/s / 1,500 byte/s	up to 2,800 byte/s / 1,600 byte/s
Range	up to 150 mm	up to 240 mm	up to 100 mm
Integration	S7-300, PROFIBUS, PROFINET, TCP/IP, PC and third-party controllers by means of communication modules or directly (RS422)		
Approvals	ETSI, FCC, UL, ATEX		

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SIMATIC RF300
Overview / Product description

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The SIMATIC RF300 RFID system is used for non-contact identification in a closed production circuit

The SIMATIC RF300 is particularly suitable for use in industrial production in the areas of production control, assembly lines and conveyors where very short cycle times are required

Perfectly matched components

- Readers
- Antennas
- Transponders
- Communication modules

Communication options

Easy integration in

- SIMATIC
- PROFIBUS
- PROFINET
- TCP/IP
- EtherNet/IP

by means of respective interface modules

Reader	Antennas	Transponders	Communication module

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SIMATIC RF300
Benefits

Feature/function	Benefits
• High data transmission speed between reader and tag	• High productivity • Low production cycle times
• Extensive diagnostics function and optical display elements	• Shortened commissioning times • Avoidance of plant failures • Reduction of down times
• Standardized configuration and programming (SIMATIC Manager, function blocks)	• System integration with minimum effort • Cost saving for software creation
• Rugged, compact components to a high degree of protection	• Low space requirements • Can be used in a harsh environment • Investment protection for many years
• Using the ISO mode	• Usability of cost-effective tags from the comprehensive product range of MOBY D

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New Generation of SIMATIC RF300 Readers
Set-up mode (offline)

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	BLUE	Reader in set-up mode and ready to detect a transponder: lit blue
	WHITE	Transponder in sensing range lit white
	OFF	Transponder outside the sensing range: LED Off

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New Generation of SIMATIC RF300 Readers
Ongoing control mode (online)

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	GREEN	Normal operation: lit green Antenna off or not yet initialized Flashing green
	YELLOW	Transponder presence: lit yellow
	RED	Error: Flashing red

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SIMATIC RF300 Reader
Readers in every performance class

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SIMATIC integrated			
RF310R	**RF340R**	**RF350R**	**RF380R**
Compact reader in the lower performance range with integrated antenna	Compact reader in the medium performance range with integrated antenna	Universal reader for connecting external antennas	Powerful reader with RS 422 and RS 232 interfaces and integrated antenna.

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SIMATIC RF300 external antennas
The solution for challenging installation conditions

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Antennas						
ANT 1	**ANT 3**	**ANT 3S**	**ANT 8** [1)]	**ANT 12**	**ANT 18**	**ANT 30**
Universal flat antenna, also designed for dynamic applications	Antenna with flat, compact design, which can be precisely positioned, even in cramped conditions	Like the ANT3 antenna, specially designed for very small transponder sizes (MDS D117, D127, D421, D521)	Very small, compact antenna for tool identification Ø M8 The extremely small design of the antenna allows extremely accurate positioning.	Universal round antenna in M12 design for assembly lines with extremely small workpiece holders	Universal round antenna in M18 design for assembly lines with small workpiece holders	Universal round antenna in M30 design for assembly lines with small workpiece holders

1) Only for handheld RF350M

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SIMATIC RF300 hand-held terminal RF350M

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Technical specifications	
Suitability for use	• RF300 and ISO 15693 transponder [1)] • Read, write, initialize • Read out transponder configuration data
Platform	• 256 MB RAM, operating system Windows Embedded CE 6.0
Environment	• Industry-compatible, degree of protection IP54
User interface	• Backlit QVGA color touch screen (240x320 pixels) • User-friendly, pre-installed RFID application
Communication	• WLAN (IEEE 802.11 a/b/g/n) • Data exchange with PC via USB over docking station • LAN connection to docking station
Order number	**RF350M order number:** 6GT2803-1BA00 **Docking station:** 6GT2803-0BM00

[1)]Exception: The MDS D421, MDS D422, MDS D127 and MDS D117 transponders can only be operated in the version with external antenna.

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SIMATIC RF300 hand-held terminal RF350M

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Technical specifications	
Suitability for use	• Suitable for use with the external antennas ANT 3, ANT 3S, ANT 8, ANT 12, ANT 18, ANT 30 • Read, write, initialize • Read out transponder configuration data
Platform	• 256 MB RAM, operating system Windows Embedded CE 6.0
Environment	• Industry-compatible, degree of protection IP54
User interface	• Backlit QVGA color touch screen (240x320 pixels) • User-friendly, pre-installed RFID application
Communication	• WLAN (IEEE 802.11 a/b/g/n) • Data exchange with PC via USB over docking station • LAN connection to docking station
Order number	**RF350M Order Number:** 6GT2803-1BA10 (Antenna must be ordered separately see section "Antennas") **Docking station:** 6GT2803-0BM00

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SIMATIC RF300 Transponder

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RF300						
RF320T	**RF330T**	**RF340T**	**RF350T**	**RF360T**	**RF370T**	**RF380T**
• Low-priced • Small size • For mounting with spacer onto metal	• Can be directly and flush-mounted on metal • 32 KB memory • For direct identification of metallic workpieces or containers	• Especially suitable for small workpiece holders • Can be mounted directly on metal	• For longer ranges • Can be mounted directly on metal	• Low-priced • Credit card format	• Square format • Up to 64 KB memory • Can be mounted directly on metal	• Heat-resistant up to 220 °C • Designed for skid identification in paint shops • Can be mounted directly on metal • ATEX certified

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Transponders according to ISO 15693

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ISO 15693 transponders								
D100 D200 D400	**D160 D460 D560**	**D124 D324 D424 D524**	**D425 D525**	**D428 D528**	**D139 D339**	**D126 D426 D526**	**D117**	**D127**
• Low-priced • ISO card format • Can be used on metal with spacers • For logistics applications	• Small size • For extreme ambient conditions • Can be used on metal with spacers	• Rugged, industry-standard • User memory from 112 bytes to 2000 bytes FRAM	• Rugged, can be screwed in • 2000 bytes FRAM • Ideal for attaching to motors, gearboxes, and workpiece holders	• Up to +220 °C • High degree of protection • ATEX approval • High resistance to chemicals • Use in paint shops	• For harsh ambient conditions • Production and distribution logistics	• Tool coding according to DIN 69873 • Can be used where small data carriers and exact positioning are required	• Can be screwed onto metal • For direct identification of metallic workpiece holders or workpieces	• For mounting in and on metal • For direct identification of metallic workpiece holders, workpieces or containers

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SIMATIC RF300 and SIMATIC RF200 – Scalable system with cost-efficient and high-performance transponders

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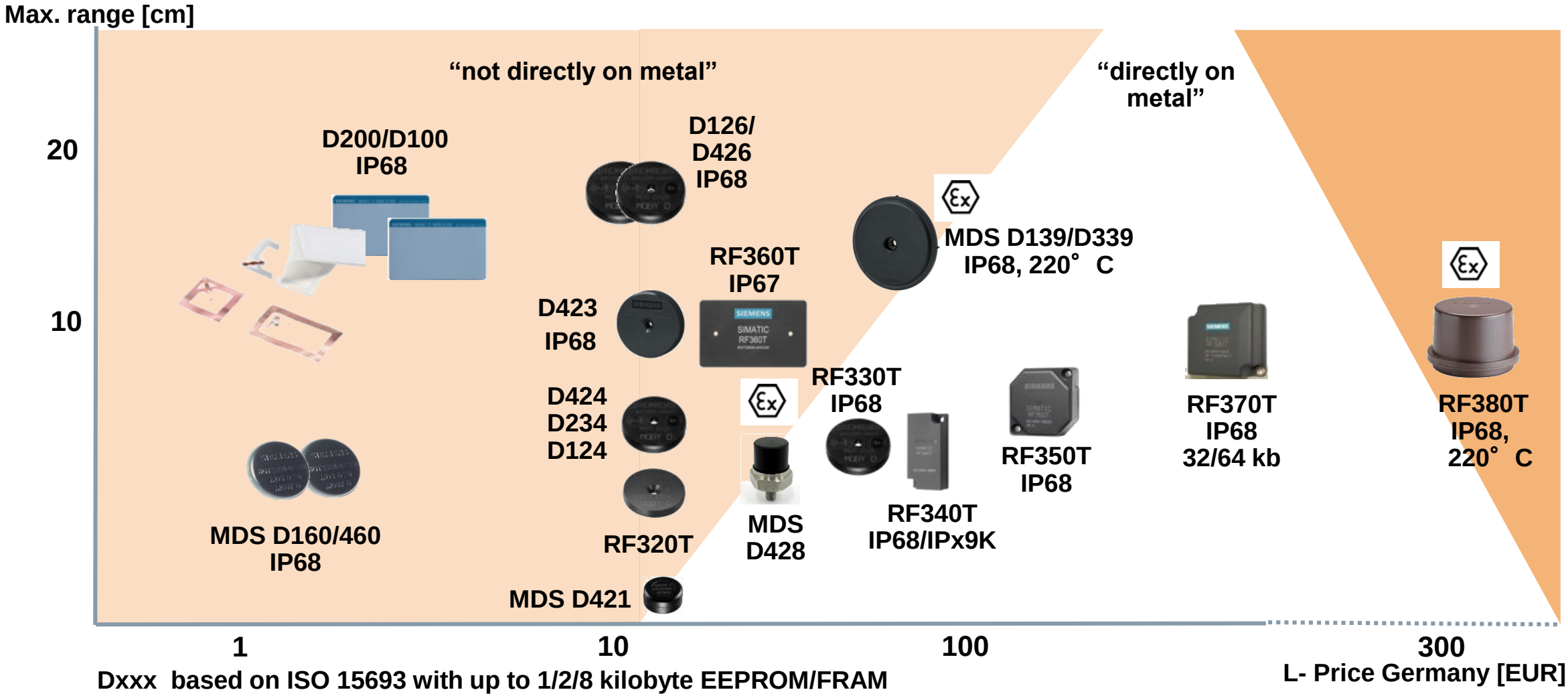

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SIMATIC RF300
Use Case: Powertrain – Engine manufacture

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Task

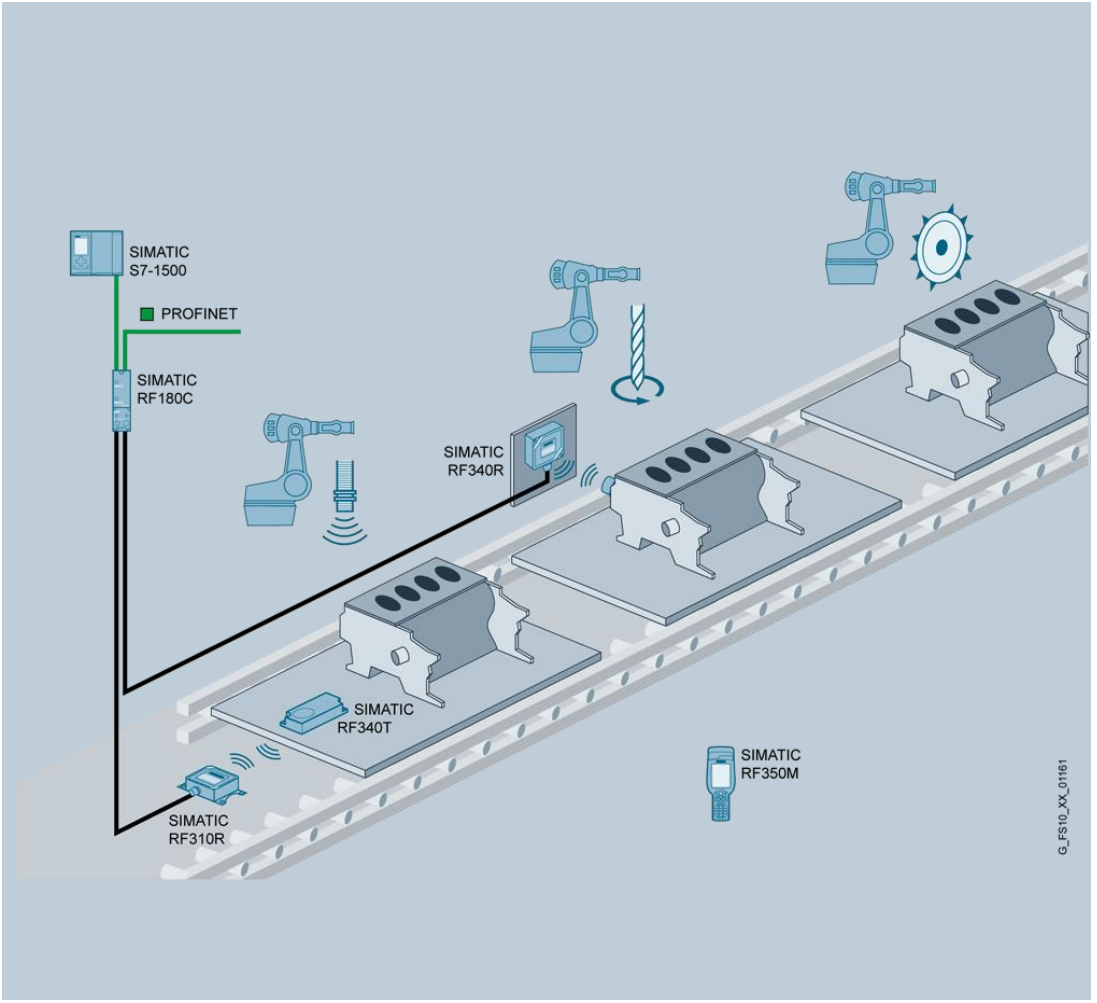
Flexible production with different production steps

Solution

The engine blocks mounted on workpiece holders are transported to the workstations on a conveyor belt. The transponder SIMATIC RF340T or 350T is attached to the bottom of the pallet. The SIMATIC RF310R or RFR340R reader is integrated into the conveyor belt so that it can communicate easily with the transponders. If pallets are not used, then alternatively a screw transponder (e.g. MDS D428) can be attached directly to the engine. In this case, the reader is attached to the side of the conveyor belt. Each transponder stores the complete data of the production order. These are acquired by the individual workstations and changed or supplemented according to the station, and transferred back to the transponder. This means that the status of engine production can be determined at any time, even in the event of an interruption to the higher-level database

Benefits

- Low cycle time for the individual work steps thanks to enormous data rates – enables a significantly higher number of products
- No additional data management is required to control the PC
- Production order data can also be read by the SIMATIC RF350M HF handheld reader for maintenance purposes



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SIMATIC RF300
Use Case: Paint spraying lines in the automotive industry

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Task

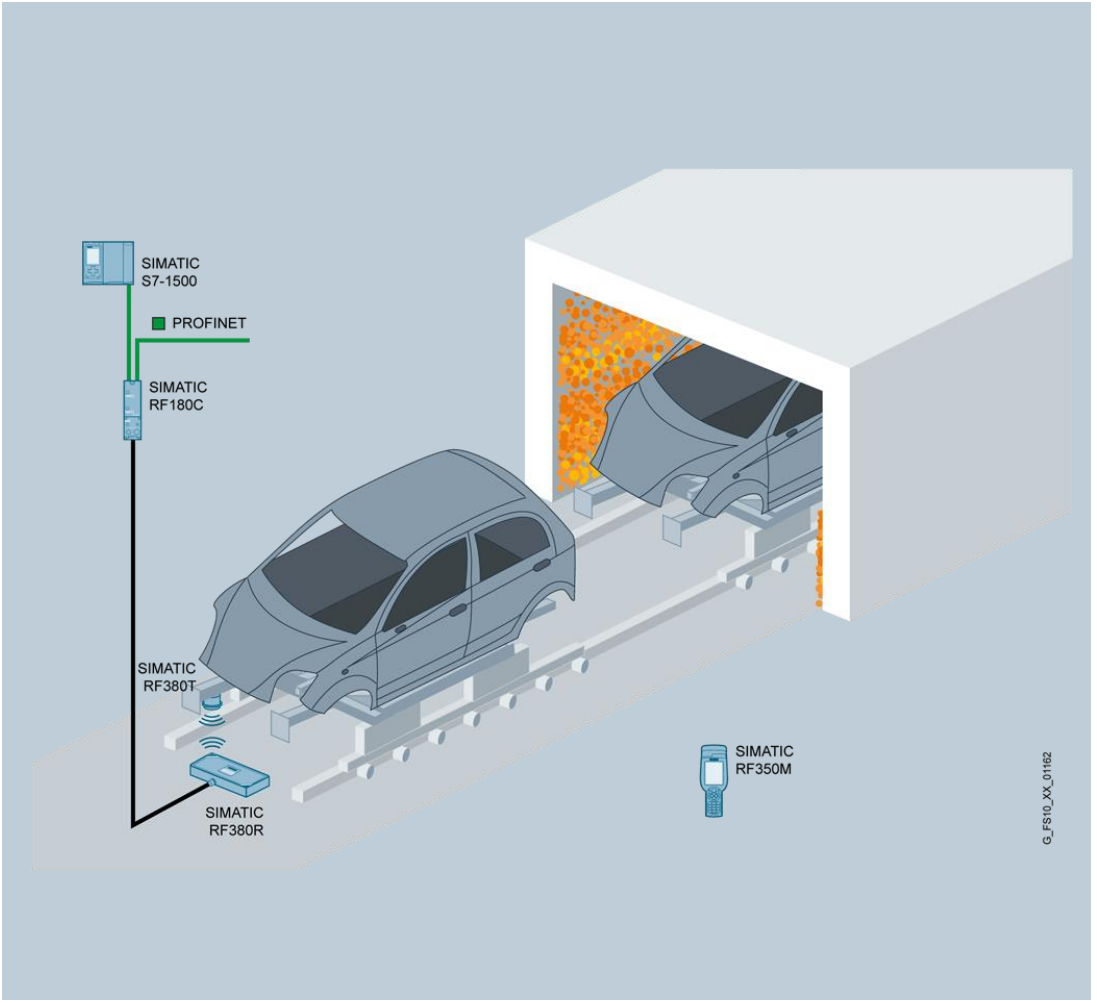
Identification of the skids or car bodies in the paint shop

Solution

The clear identification of a car body is essential in body shops for their order-related color scheme. Aggressive chemicals and drying processes at temperatures up to +220°C place very high requirements on the transponder with regard to degree of protection and resistance to chemicals and high temperatures. In addition, all the components used must be completely free from varnish-moistening
substances (silicone etc.). The SIMATIC RF380T transponder meets all requirements. Usually it is mounted on a crossbeam on the skid and can be read and described at a distance of up to 150 mm by the SIMATIC RF380R reader attached below. The skid and car body can therefore be clearly identified at any time. This concept has proved itself worldwide for decades in numerous paint shops. Thanks to the mobile hand-held device RF350M, in service cases the transponders can be operated from any location.

Benefits

- Reliable and quick identification
- Reliable identification in quick, dynamic operation and processing of data (data transmission rate up to 8000 bytes/s)
- Memory sizes up to 32 Kbyte for total data storage directly on the skid/object



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SIMATIC RF300
Use Case: Overhead monorail conveyor in production

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Task

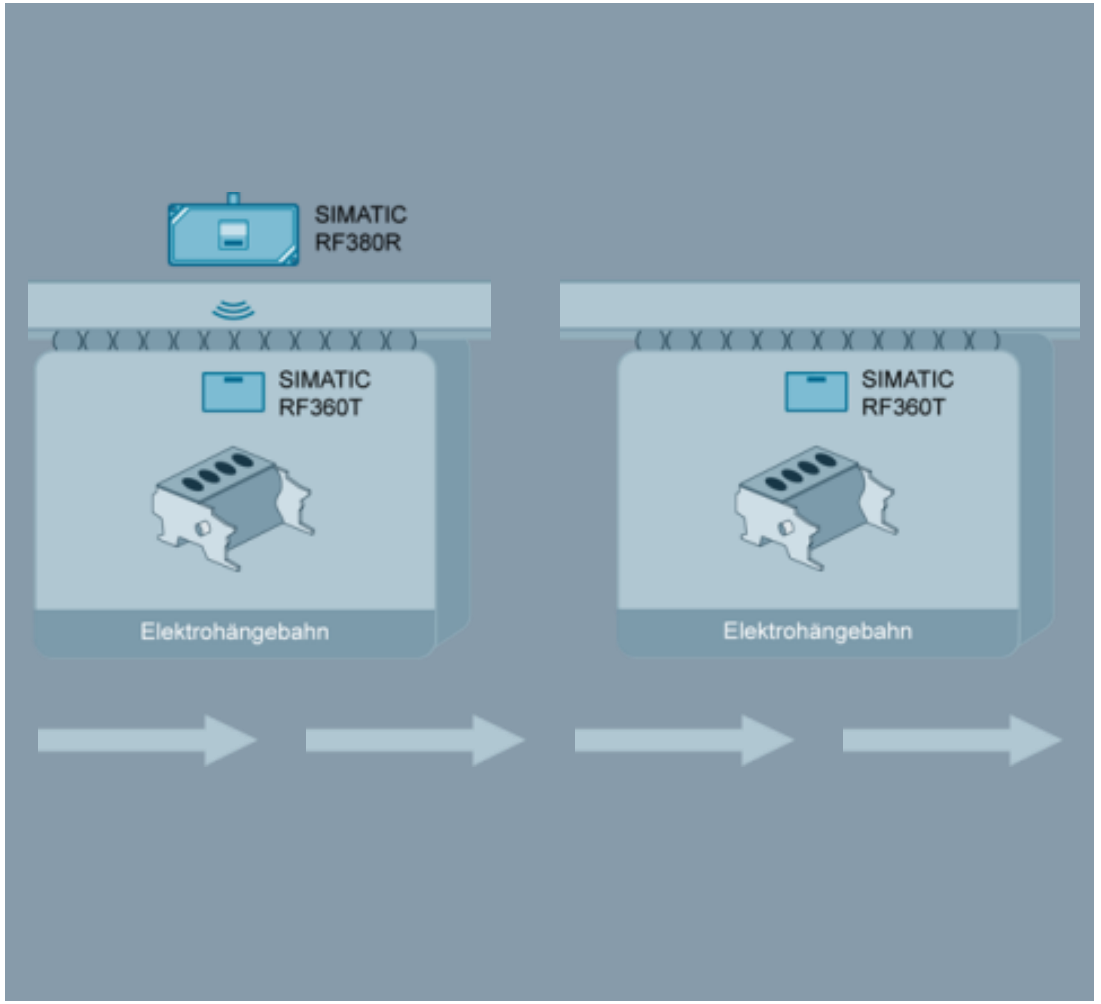
Storing all the important production and quality data required during production. The data are read and written dynamically.

Solution

Each holder is identified by a mobile RF360T tag, which contains up to 8 KB of production and quality data (engine type, part number, etc.). The data can be read or modified at any time by a reader, such as the RF340R. The SIMATIC RF300 thus offers fast, reliable, automatic identification.

Benefits

- Seamless integration in TRANSLINE (including service/diagnostic monitors for RF300)
- Very fast RFID data transmission
- Dynamic reading and writing (without stopping the conveyor system)



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SIMATIC RF200(MOBY D) – cost efficient „short range” Identification System

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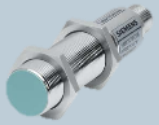
Reader

SIMATIC RF220R

SIMATIC RF250R

SIMATIC RF280R

NEW
SIMATIC RF285R

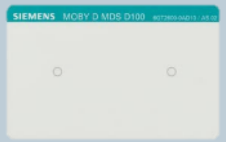

SIMATIC RF210R

SIMATIC RF240R

SIMATIC RF260R

SIMATIC RF290R

Transponder


D100
D200
D400

D421
D521

D160
D460
D560

D127

D117

D124
D324
D424
D524

D139
D339

D423

D126
D426
D526

D422
D522

D428
D528

D425
D525

Mobile hand terminals

SIMATIC RF210M

SIMATIC RF350M

SIMATIC RF350M external antenna

Communication modules

RF180C/
RF182C/
RFID 181EIP

ASM 456/
RF160C

RF170C

RF120C

ASM 475

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SIMATIC RF200
Overview features

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	In combination with ISO 15693 transponders
Frequencies	13.56 MHz
Memory capacity	112 – 992 bytes (EEPROM) 2,000 / 8,192 bytes (FRAM)
Transfer rate Reader to Tag Read / write	up to 1.5 Kbytes / 1.5 Kbytes
Range	up to 650 mm
Integration	SIMATIC S7, PROFIBUS, PROFINET, TCP/IP, IO-Link, PC and third-party controllers via communications modules or directly (RS422/RS232), scan mode for RS232-variants
Approvals	CE (ETSI), FCC, UL

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SIMATIC RF200
Typical application areas

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- Production lines in the automotive industry for engines and gears (Powertrain) suspended electric conveyors
- Small assembly lines in the supplier industry
- Container identification in intralogistics (e.g. mini-load containers)
- Assembly lines for PCs, small-power motors, contactors and switches
- Assembly lines for household electrical appliances, consumer electronics and electronic communication equipment
- Conveyor systems for the assembly of ABS systems, airbags, brake systems, doors and cockpits

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Siemens offers complete technical scalability across the entire range in HF systems

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RF200 ✓	RF200 ✓	RF300 ✓	RF300 ✓	RF300 ✓
Intralogistics	**Small assembly line**	**Production control**	**Assembly line**	**Conveyor line**
Material handling, elec. nameplate	Small parts and components manufacturing	Small parts and components manufacturing	Body-in-white, paint shop, assembly	Material flow control, suspended conveyors
➔ **Low-cost components**	➔ **Compact Components**	➔ **Large date storage capacity**	➔ **Short cycle times**	➔ **Greater distances**

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RF200
Readers in every performance class

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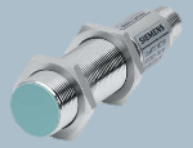
SIMATIC RF200									
RF210M	RF210R	RF220R	RF240R	RF250R	RF260R	RF280R	RF285R (NEW)	RF290R	RF350M
									
Handheld with the proven RF210R reader integratet. Build for manual- and rework places for commissioning, and track-and trace Aufgaben	Extremely compact reader with integrated antenna for very limited installation conditions in small assembly lines; **also available with IO-Link interface**	Compact reader with integrated antenna for universal use in small assembly lines; **also available with IO-Link interface**	Reader with integrated antenna and very good distance-/dimension ratio for universal use in assembly lines; **also available with IO-Link interface**	Compact reader with external antenna particularly suitable for use in tool identification; **also available with IO-Link interface**	Reader with a large field and integrated antenna for universal use in the most diverse conveyor systems; **also available with IO-Link interface**	Reader with a extra large field and integrated antenna. Especially for dynamic read/write operations	Compact Mid Range Reader with RS232 interface for use with an external Antenna	High performance long range Reader with RS422 and RS232 interface for use with an external Antenna, or an antenna-multiplexer RF260X	High performance mobile handterminal for usage in production-control, distribution and service applications

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RF200
Compact antennas for every application

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RF250R/ RF310M antennas				
ANT 3/3S	**ANT 8**	**ANT 12**	**ANT 18**	**ANT 30**
• Very flat antenna preferably for tool-identifikation	• Very small and solid antenna, preferable for toolidentification Ø M8	• Small universal applicable antenna for use under cramped conditions Ø M12	• Compact antenna for assembly lines with small workpiece carrier Ø M18	• universal applicable antenna with wide range for assembly lines Ø M30

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RF200
Antennas for every application

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RF290R antennas			
ANT D1	**ANT D5**	**ANT D6**	**ANT D10**
• HF-antenna for small distance in machineries and conveyor systems	• HF-antenna for midrange application in machineries and conveyor systems	• Powerful HF-antenna for huge distance and universal applications e.g. for material flow and logistics systems	• Large industry-suited HF-antenna for applications in the clothing industry

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Besides simple integration and flexible mounting RF1000R is characterized by a high degree of efficiency

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SIMATIC RF 1000R

Simple Integration +

Connection via USB 2.0 interface or Serial RS232 interface[1)]

Supports standards LF 125 kHZ [2)] and HF 13,56 MHz

Flexible Mounting +

Compatible with existing hardware (HMI devices and panels)

Flexible cable management

Low mounting depth thanks to slim design

Secure (Security) +

Using the access keys of the customer

Cost-effective +

Through utilization of existing employee badges

User-friendly +

Visual diagnostics via 3-color-LED on front

Rugged +

High degree of protection IP65 (front)

Temperature range -25° to +55° C

ATEX II approval[3)]

1) RF1070R and RF1040R
2) RF1040R only
3) RF1060 / 70R, not for OEM RF1070R and not for RF1040R

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With the RF1000R custom solutions for machine or plant access can be implemented easily

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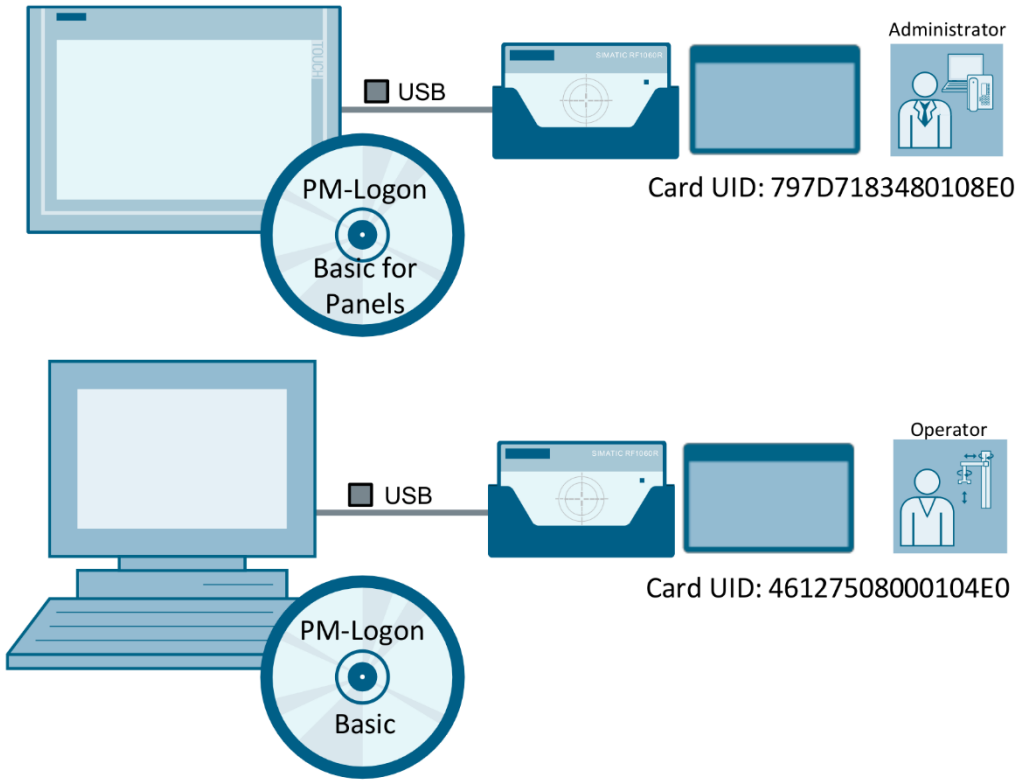
System integration

Example: Local login at HMI-Panel or PC



Task

Identification of operating personnel on machines and plants

Connectivity concept

Connection via USB 2.0/ serial RS232 interface[1)] to windows based PCs and HMIs – Compatible with PM LOGON for user management

Custom application scenario

Various identification scenarios are possible

- One-time reading of the ID-Card
- Permanent reading of the ID-Card
- One-time reading of the ID-Card with additional user-specific password-authentication

1) RF1070R and RF1040R

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SIMATIC 600

The high-performance RFID-System for long range

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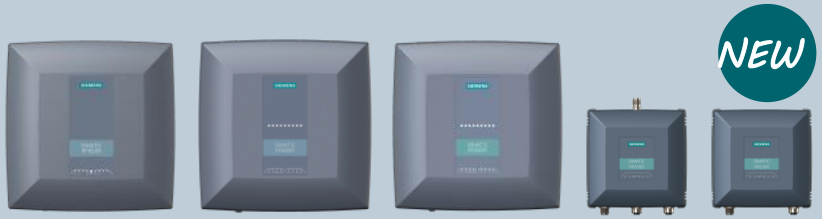
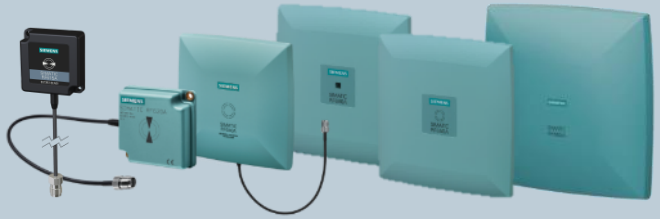
Readers	Antennas	Mobile Reader	Trans-ponders
			
▪ **RF650R** connect up to four external antennas , integrated processing logic, for use in logistics applications ▪ **RF680R** connect up to four external antennas , integrated processing logic, for use in automation sector/industrial environment ▪ **RF685R** with one integrated antenna and one external antenna connector for use in automation sector/industrial environment ▪ **RF610R / RF615R** compact reader with one integrated antenna and one external antenna connector (RF615R only) for use in automation sector/industrial environment	▪ **RF615A** very compact and small design for constricted room ▪ **RF620A** compact design for use in assembly lines ▪ **RF642A** standard antenna for a wide variety of applications ▪ **RF650A** circular antenna for applications in logistics ▪ **RF660A** powerful antenna for wide range applications, high degree of protection ▪ **RF680A** adaptive high-end-antenna for applications in industrial environment	▪ **RF650M** compact and high performance handheld	▪ **RF610T** ▪ **RF620T** ▪ **RF625T** ▪ **RF630T** ▪ **RF640T** ▪ **RF645T** ▪ **RF680T** ▪ **RF682T** ▪ **Labels**

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SIMATIC RF600
Features and overview

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System	SIMATIC RF600
Current firmware	V3.2.1 (June 2019)
Frequencies	865-868 MHz (Europe), 902-928 MHz (USA, Canada), 920.5-924.5 MHz (China), 910-920 MHz and 920-924 MHz (Japan, model dependent)
Range	Up to 8 m (depending on RF-related environmental conditions and on chosen hardware)
Memory capacity	Up to 448 bit EPC-ID, up to 2 kbit user memory
Integration	
Standards	EPCglobal Class 1 Gen 2 V2, ISO 18000-62 and -63
Approvals	ETSI (Europa), FCC (USA/Canada), CMIIT (China), ARIB (Japan, not RF61xR) Russia, Brazil, Mexico, Argentina, South Korea, India and many others*

	RF610R	RF615R	RF650R	RF680R	RF685R
Ethernet (XML)	X	X	X	X	X
Ethernet (OPC UA)	X	X	X	X	X
PROFINET	X	X		X	X
PROFIBUS via ASM456	X	X		X	X
EtherNet/IP	X	X		X	X

NEW

* For details, see: www.siemens.de/rfid-funkzulassungen

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RF600 readers at a glance

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Machines / plants

SIMATIC RF610R
SIMATIC RF615R

NEW

- Integrated circular antenna
- External antenna connector
- PROFINET, PROFIBUS, EtherNet/IP
- XML, OPC UA
- Circular LED display
- IP67

Logistics

SIMATIC RF650R

- 4 antenna connectors
- XML, OPC UA
- IP30

Production / Automation

SIMATIC RF680R

- 4 antenna connectors
- PROFINET, PROFIBUS EtherNet/IP
- XML, OPC UA
- Higher transmit power
- Extended LED-Display
- IP65

SIMATIC RF685R

- Integrated adaptive antenna
- External antenna connector
- PROFINET, PROFIBUS EtherNet/IP
- XML, OPC UA
- Higher transmit power
- Extended LED-Display
- IP65

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SIMATIC RF600
Highlights compact reader RF610R

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- Compact housing and IP67 for use in machine and plant building as well as in conveyor system. +
- The internal, circularly polarized antenna enables the reader to be operated as a cost efficient and compact single read point directly at the point of interest. +
- The new compact reader comes with many advantageous features of the devices RF680R and RF685R: PROFINET, OPC UA, EtherNet/IP, PROFIBUS (via ASM456), web based configuration and diagnosis, and the proven „UHF for Industry“ algorithms. +
- Circular LED visible from all directions for optimal commissioning and fast diagnosis. +

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SIMATIC RF600

Highlights Firmware V3.2.1 for all RF600 readers

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Interfaces Ethernet, PROFINET, OPC UA, EtherNet/IP and PROFIBUS (via ASM456) for all production readers RF61xR and RF68xR. + NEW

Security Events, IT security relevant activities as in IEC 62443, are being logged to reader memory and can optionally be communicated to a syslog server. + NEW

One firmware file for all stationary RF600 readers results in identical user experience, feature set and system integration possibilities with all readers. + NEW

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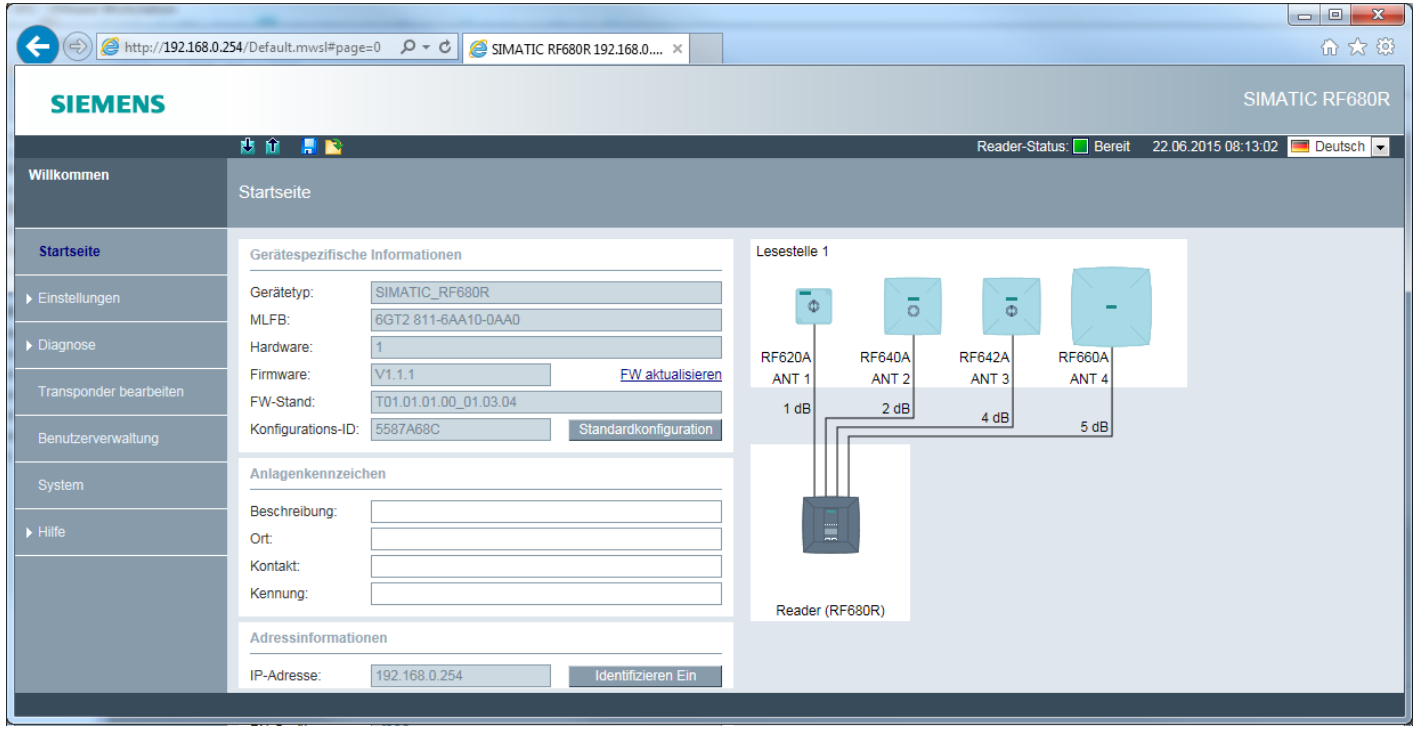
Highlights readers RF61xR, RF650R, RF68xR
Extensive diagnostic functions

- No software installation required
- Easy and quick start in internet browser
- Possibility of local diagnostics and remote maintenance



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Highlights readers RF61xR, RF650R, RF68xR

System independency due to web based software

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- Adjustment of antenna within minutes
- Feedback about the impact of the antenna position and orientation
- LED-Panel indicates the tag signal strength depending on current antenna position and orientation

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SIMATIC RF600 – Onboard Web-Server with high usability reduces commissioning/service time

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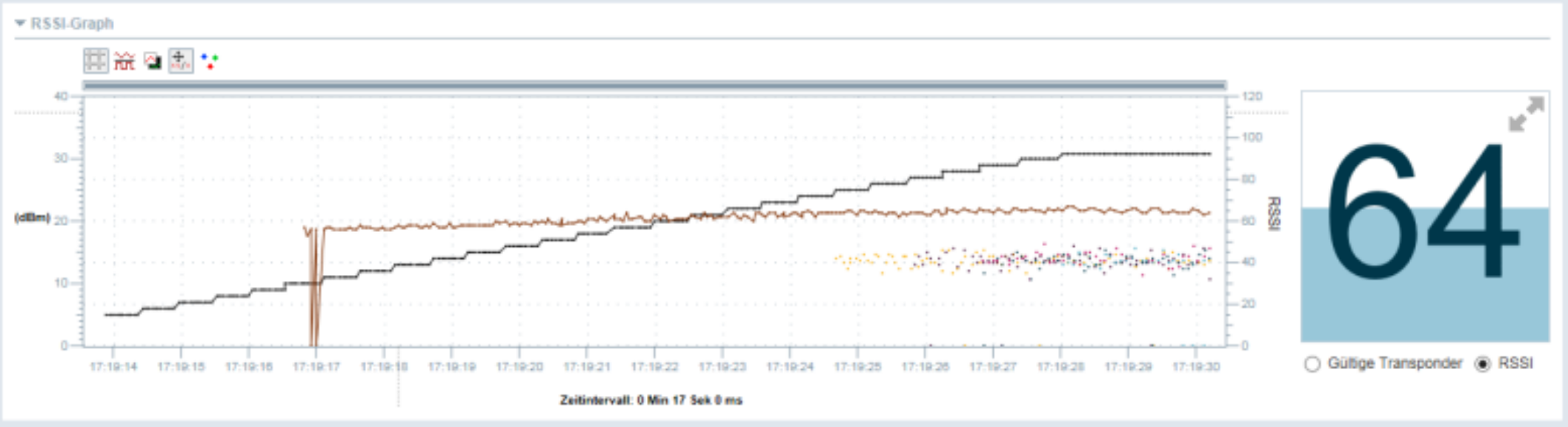
- All relevant information at a glance (signal strength, activation power, frequency of identification)
- Graphic representation allows a detailed analysis of the read point
- The diagnostic logbook records events (read events, write events, errors, ..) for later evaluation



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Highlights Antenna RF685R

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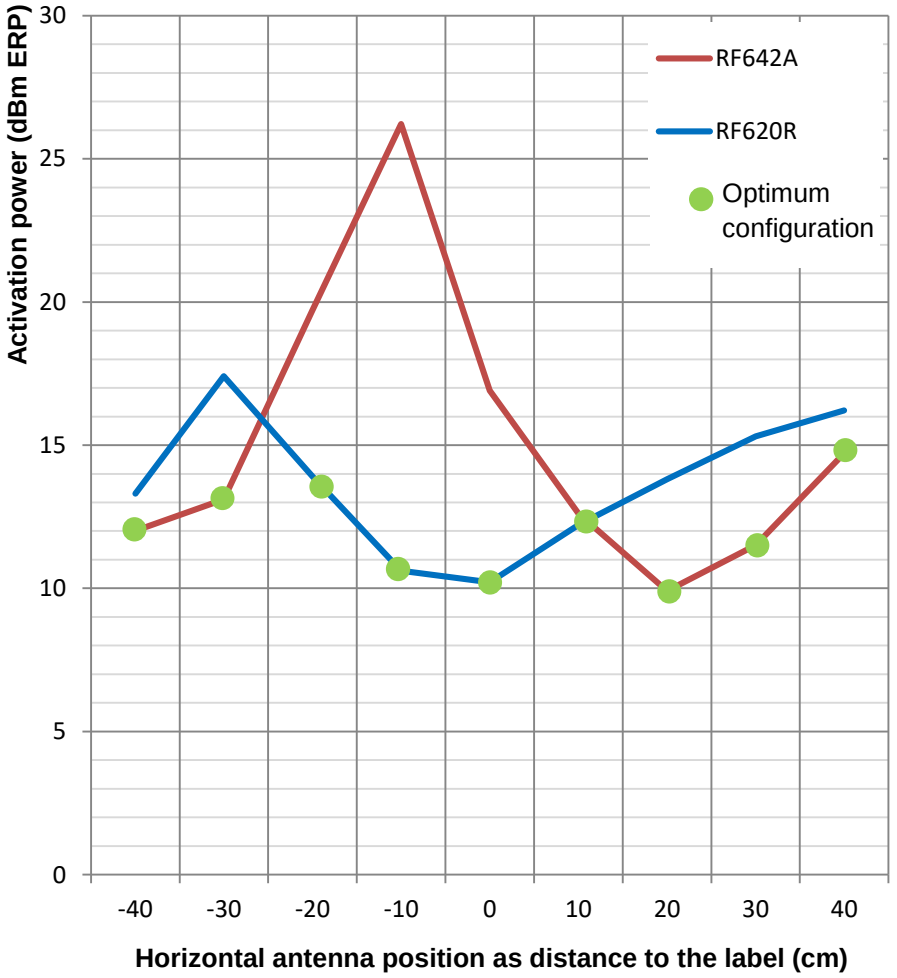
RF620R
Antenna with circular polarization

RF642A
Antenna with linear polarization

NEW

RF685R with adaptive antenna

- **Linear (v/h) und circular polarization possible**
- **Configurable**
- **Automatic polarization switching**



Depending on the position and the direction of the antenna to the transponder, a reliable communication may require a different polarization. This applies particularly in a strongly reflective radio environment.

The integrated antenna of the RF685R is capable of adapting the polarization to achieve reliable communication in the air. Unnecessary high transmit power which can cause cross readings can be avoided.

Translated into project planning this means: challenges of difficult read situations can be solved with a single device.

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Highlights Antenna RF680A

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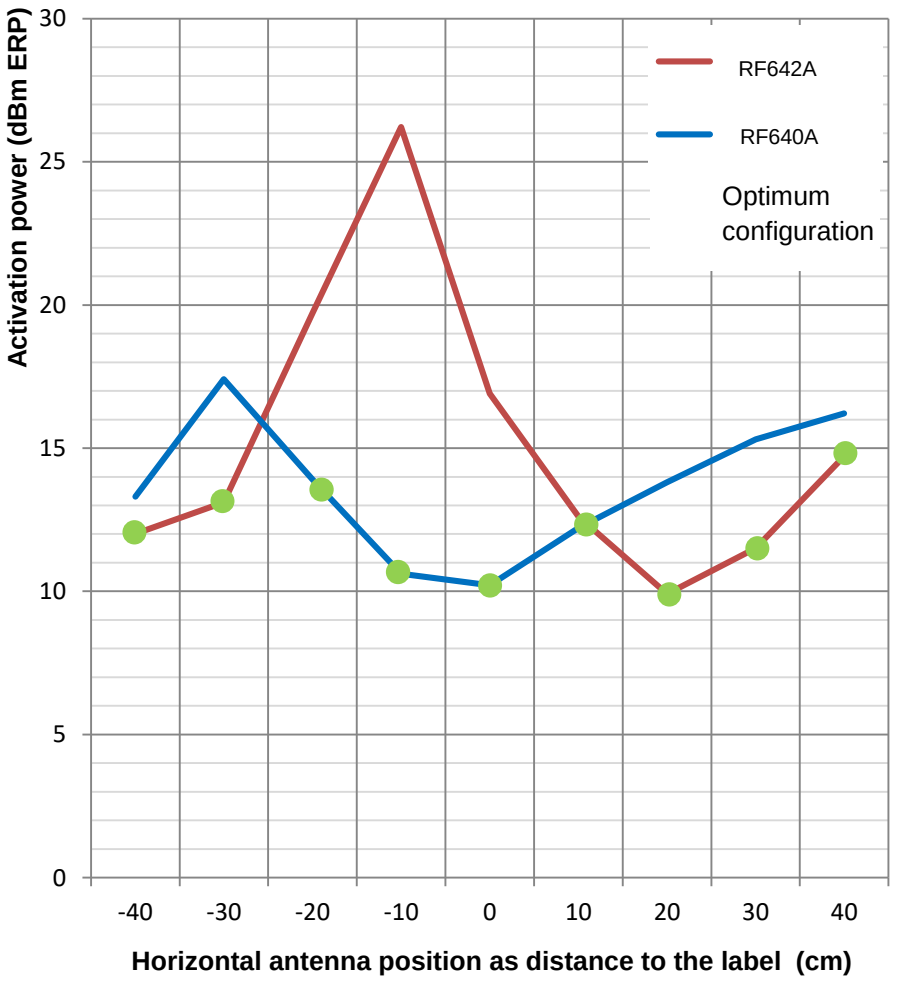
RF640A
Antenna with circular polarization

RF642A
Antenna with linear polarization

NEU

Adaptive antenna RF680A

- **Linear (v/h) und circular polarization possible**
- **Configurable**
- **Automatic polarization switching**



Depending on the position and the direction of the antenna to the transponder, a reliable communication may require a different polarization. This applies particularly in a strongly reflective radio environment.

RF61xR, RF650R and RF68xR readers can switch the polarization of the RF680A antenna. This ensures a reliable communication in the air. Unnecessary high transmit power which can cause cross readings can be avoided.

Translated into project planning this means: one antenna ready for the challenges of any application.

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Highlights
RF650M – Handheld RFID-Reader

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SIMATIC RF650M – compact and high performance handheld reader

- Easy operating and handling
- WLAN integrated
- High protection class (IP54)
- Docking station with USB and Ethernet interface
- High radio power for long read ranges

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Highlights Antennas

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Robust and compact antenna design for a big variety of applications

SIMATIC RF615A	SIMATIC RF620A	SIMATIC RF642A	SIMATIC RF650A	SIMATIC RF660A	SIMATIC RF680A
This small, compact antenna can be aligned precisely in constricted rooms, e.g. in machining centers	Compact UHF antenna for operation in machines / conveyor systems Limited range to avoid cross reads	Standard antenna for reflective environments (linear polarization)	Circular antenna for universal use in industrial applications in production and logistics	High degree of protection – long range: For material flow and logistics applications	Adaptive high-end-antenna for use in harsh industrial environments Polarization switchable (linear/circular) 3-color-LED

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Highlights Labels

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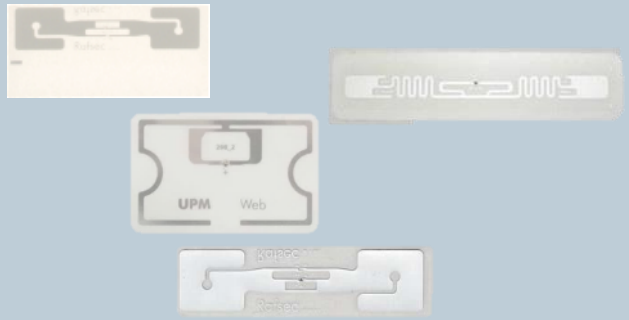
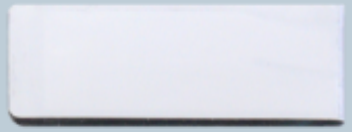
Portfolio includes different label variants from cost-efficient over on metal up to heat-resistant

RF630L	RF642L	RF690L
		
▪ Read range up to 8 m ▪ Surface paper or PET ▪ Wide frequency range ▪ Printable	▪ Small model ▪ Read range up to 4 m ▪ Mounting on metallic and nonmetallic surfaces ▪ Printable	▪ Read range up to 5 m ▪ Mounting on metallic surfaces ▪ Heat-resistant up to 160° (higher temperatures open request) ▪ Printable

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Highlights Transponders

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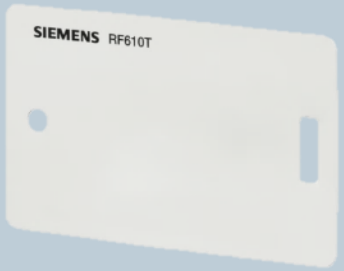
Transponders with EPCglobal-Standard provide suitable solutions for each long range application

RF610T	RF620T	RF625T	RF630T
			
▪ Flexible Card in ISO-Format ▪ For mounting on metal, plastics, wood, glass ▪ Printable	▪ Read range up to 8 m ▪ Rugged design ▪ For mounting on metal and EDS-plastics ▪ Printable	▪ High protection class IP68 ▪ For mounting on metal ▪ Adapted for demanding production processes	▪ High protection class IP68 ▪ M6-screw thread ▪ Can be applied in metal / on metal ▪ Rugged design with resistance to detergents

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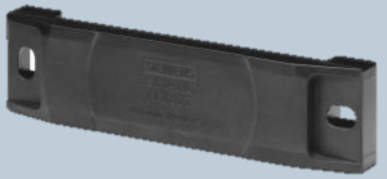
Highlights Transponders

SIEMENS
Ingenuity for life

Transponders with EPCglobal-Standard provide suitable solutions for each long range application

RF640T	RF645T	RF680T	RF682T
			
▪ High protection class IP68 ▪ Robust and compact ▪ For mounting on metal ▪ ATEX approval ▪ II 2G Ex ib IICT6 bis T3Gb ▪ II 2 D Ex ib IIIB T135°C Db	▪ Large memory ▪ High protection class IP68 ▪ For mounting on metal ▪ Chemical resistance for many cleansing agents	▪ Up to +220 °C ▪ For mounting on metal ▪ High protection class IP68/ IPx9K und chemical resistance ▪ ATEX approval ▪ II 2G Ex ib IIB T6 bis T2Gb ▪ II 2D Ex ib IIIB T135 °C Db	▪ Large memory ▪ Up to +220 °C ▪ For mounting on metal ▪ High protection class IP68/ IPx9K und chemical resistance

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Technical specifications transponders – Ranges 1/2

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Transponder 6GT2810	RF610T -2BB80	RF620T -2HC81	RF625T -2EE00	RF630T -2EC00	RF640T -2DC00	RF645T -2HC05	RF680T -2HG80	RF682T -3HG80
RF680R, RF685R								
Internal ant. RF685R	5,0	7,0	2,0	2,0	3,5	6,0	5,0	4,0
With RF615A	1,2	2,5	0,5	0,5	0,8	1,8	1,4	1,0
With RF620A	1,4	2,5	0,5	0,5	1,0	2,0	1,6	1,2
With RF642A	4,5	7,0	1,8	2,0	4,0	6,0	5,0	4,5
With RF650A	3,0	5,0	1,4	1,2	2,5	5,0	4,0	2,5
With RF660A	3,5	6,0	1,4	1,8	3,0	5,0	4,5	4,0
With RF680A	3,0	6,0	1,2	1,2	3,0	4,5	4,5	3,0
RF650R								
With RF615A	0,9	1,8	0,3	0,4	0,6	1,2	1,0	0,7
With RF620A	0,9	1,8	0,4	0,4	0,7	1,4	1,2	0,8
With RF642A	4,5	7,0	1,8	2,0	2,5	6,0	5,0	4,5
With RF650A	2,0	4,0	1,0	0,9	2,0	3,5	3,0	2,0
With RF660A	3,5	6,0	1,4	1,8	2,0	5,0	4,5	4,0
With RF680A	2,0	4,0	0,8	0,9	2,0	3,0	3,0	2,0

Typical ranges are listed (in m) at a room temperature of 25 °C. Ranges depend on the environmental conditions and may be longer or shorter depending on the surroundings. All transponders except RF610T are noted when mounted on metal.

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Technical specifications transponders – Ranges 2/2

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Transponder 6GT2810	RF610T -2BB80	RF620T -2HC81	RF625T -2EE00	RF630T -2EC00	RF640T -2DC00	RF645T -2HC05	RF680T -2HG80	RF682T -3HG80
RF610R, RF615R								
Internal ant. RF61xR	0,8	1,0	0,3	0,3	0,4	1,0	1,0	1,0
RF615R with RF615A	0,3	1,0	0,1	0,1	0,2	0,7	0,6	0,4
…with RF620A	0,4	1,2	0,1	0,2	0,2	0,9	0,7	0,4
…with RF642A	3,0	4,0	1,0	0,5	1,4	3,0	4,0	2,5
…with RF650A	1,2	3,5	0,2	0,4	0,7	1,6	1,8	1,2
…with RF660A	3,0	4,0	0,8	1,0	1,2	3,5	4,0	2,0
…with RF680A	1,4	4,0	0,2	0,5	1,2	1,8	2,0	1,2

Typical ranges are listed (in m) at a room temperature of 25 °C. Ranges depend on the environmental conditions and may be longer or shorter depending on the surroundings. All transponders except RF610T are noted when mounted on metal.

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SIMATIC RF600 – transponder portfolio
from smart label to high temperature label/transponder

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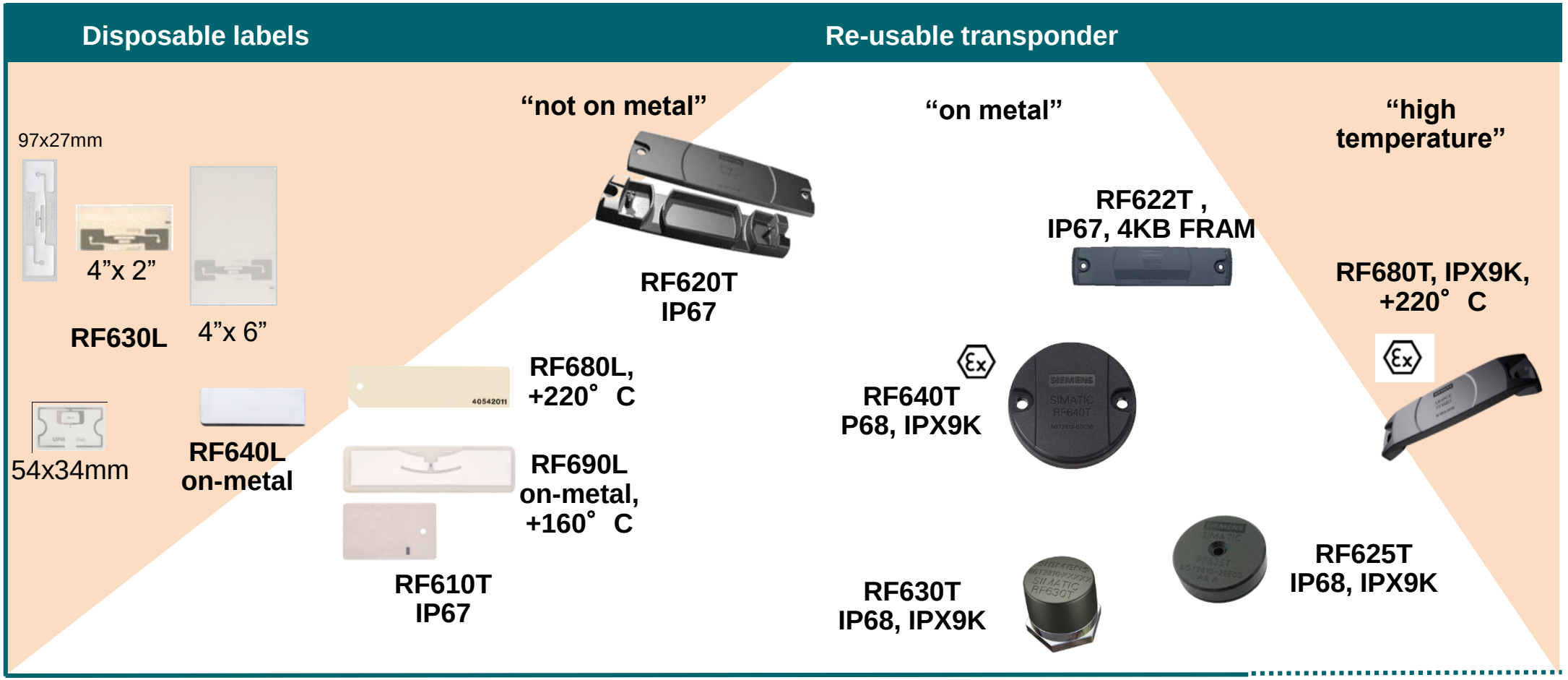

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High system availability thanks to simple device replacement
RF61xR, RF68xR with PROFINET

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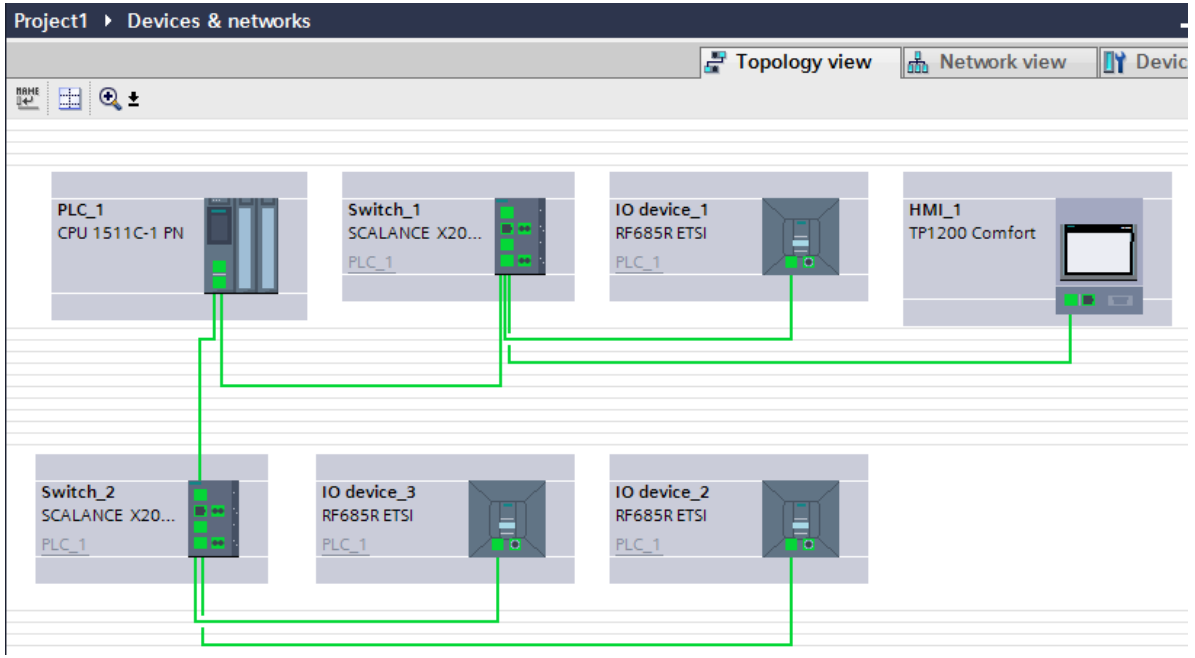
Procedure to replace a reader (Ethernet-/PROFINET-interface):

Hardware

1. Disconnect reader from the power supply
2. Remove the communication cable from the reader
3. Dissemble the old reader
4. Install the new reader
5. Connect cables/antennas



PROFINET Configuration

Automatic transfer of parameters relevant to PROFINET (IP address/PROFINET names) with the aid of the PROFINET topology functionality.

Requirements

- The PROFINET topology has been configured.
- In the CPU, the "Device replacement without removable medium" option is activated in the PROFINET settings.
- The new reader is set to the factory defaults, i.e. no device name and no IP address have been assigned

Thanks to this function, only the defective device (hardware) has to be replaced. The PROFINET configuration is processed automatically . Thereby downtimes and costs can be saved.

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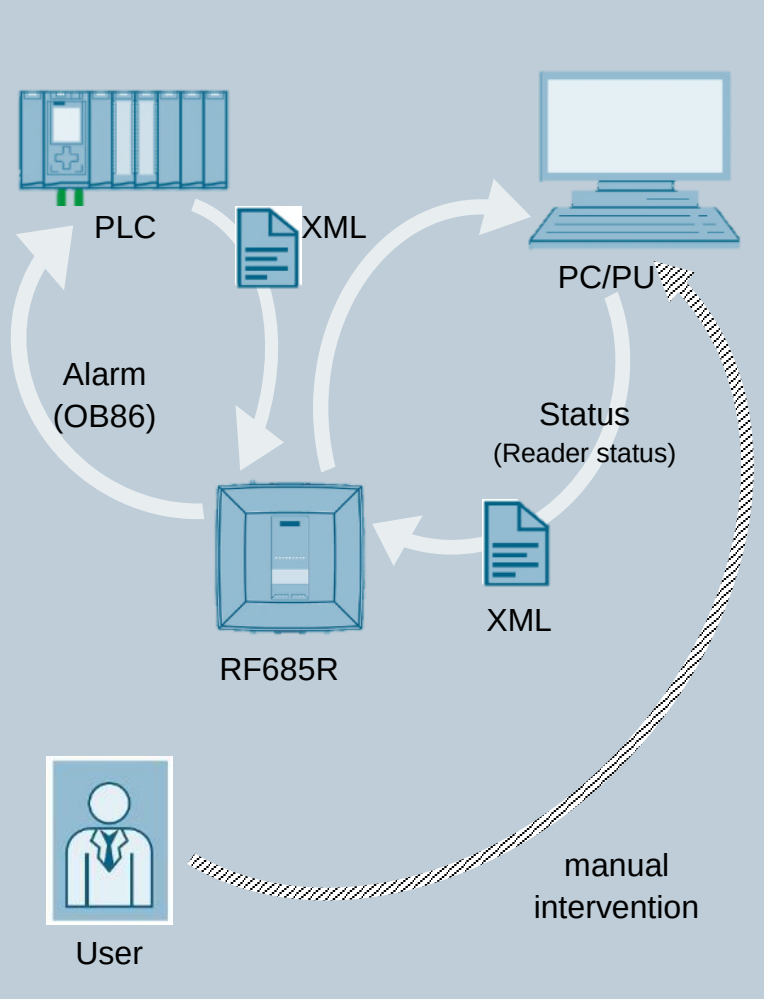
High system availability thanks to simple device replacement

All RF600 readers with Ethernet (XML)



Configuration

Requirement

- XML configuration has been transferred to the PLC with the ConfigUpload command, or into the PC with the ReadConfig command, and has been backed up in non-volatile memory
- This mechanism is triggered either automatically (by PLC/PC) or optionally by an employee/user

Module replacement in the software (TIA Portal)

- A diagnostic telegram is sent automatically to the Profinet master PLC after replacement. In the PLC, the function is called up in OB86
- OB86 has three parameters (#eventclass, #hardware-identifier, #fault-id)
- The combination of #hardware-identifier and #eventclass can be used to determine which device has been replaced
- Optionally, the XML file's configuration ID can be used to determine whether the offline/online configuration is up to date
- The XML file is transferred with the ConfigDownload command

Maximum flexibility because the software can be configured both automatically and manually.

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SIMATIC Ident – seamless HW/SW-integration into TIA reduces RFID-engineering

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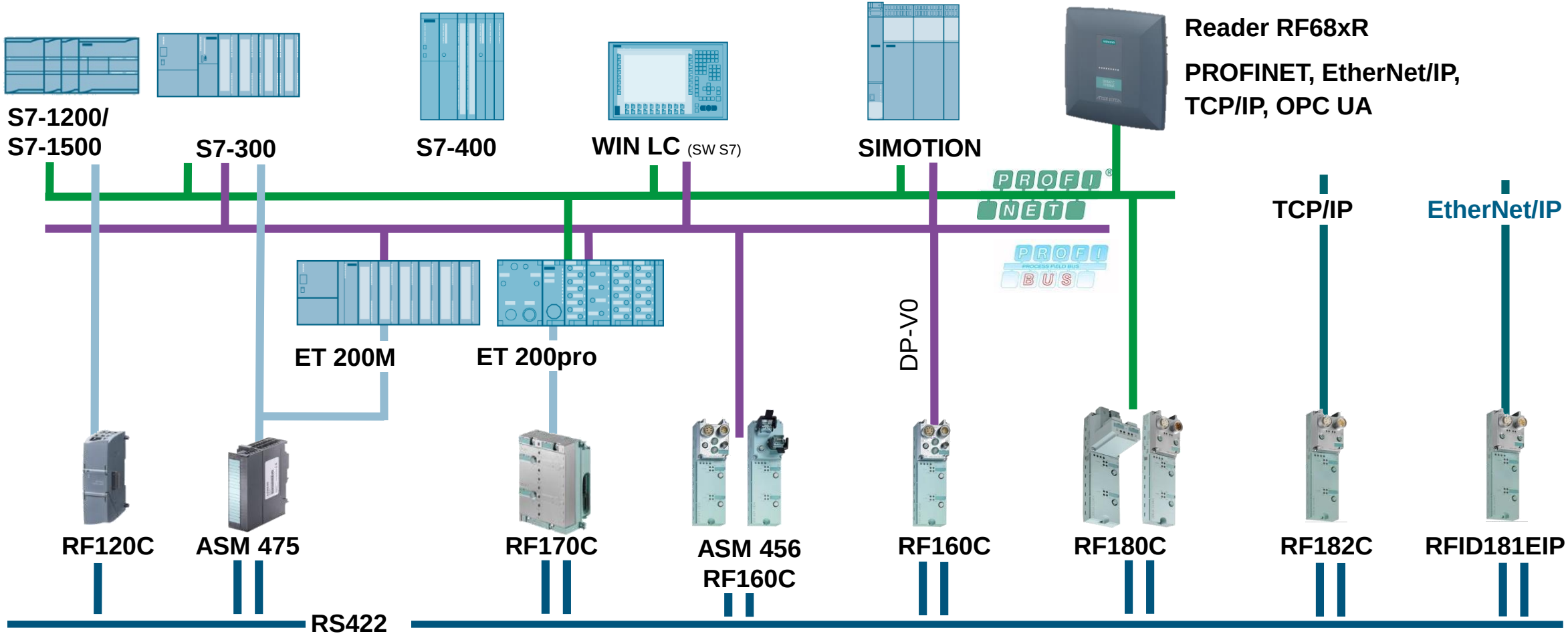

Identification Systems: RF200, RF300, RF600 and MV540, MV440, MV420

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SIMATIC Ident – RFID integration into non-Siemens controllers via ident profile

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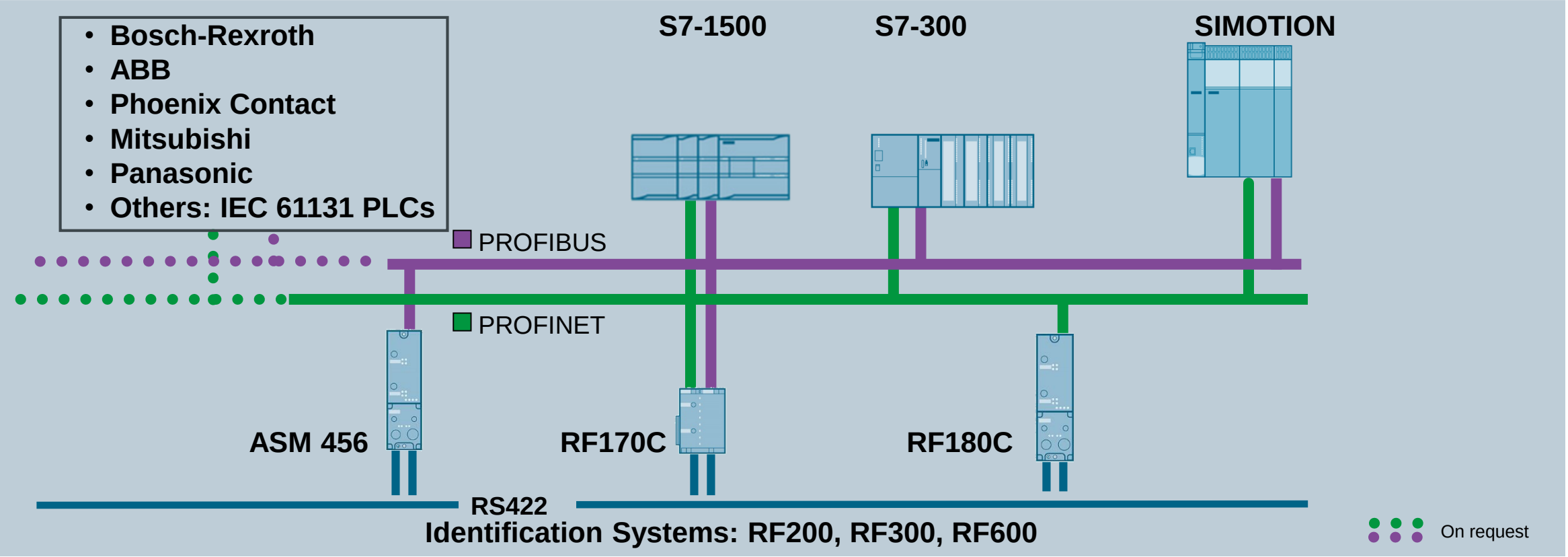
Integration of RFID into non-Siemens controllers based on the PNO standard “Profile for Identification systems, Proxy Ident Function Block” (PIB). Siemens RFID and code reading systems can be integrated into every non-Siemens controller that can be programmed in accordance with IEC 61131



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Automatic Weighing

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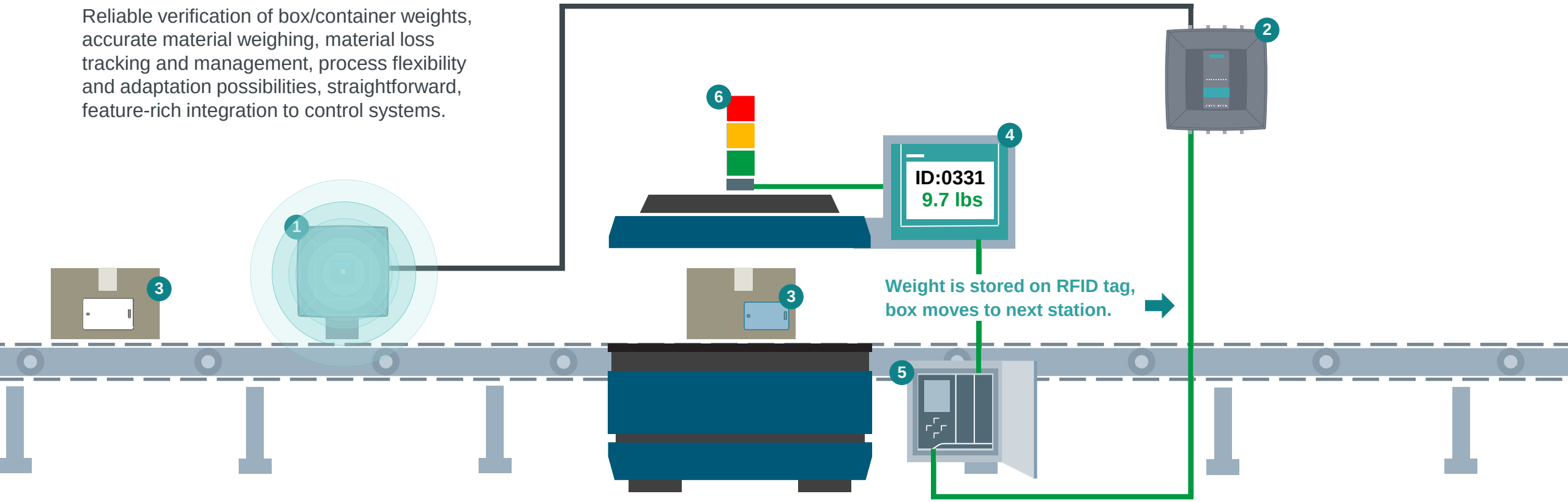
Application Solution

Reliable verification of box/container weights, accurate material weighing, material loss tracking and management, process flexibility and adaptation possibilities, straightforward, feature-rich integration to control systems.



1 UHF Antenna (RF680A)
2 UHF Reader (RF680R)
3 UHF Tag (RF610T)
4 Operator Panel (SIMATIC HMI)
5 PLC Controller (SIMATIC S7)
6 Stack Light

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Ingredient Verification

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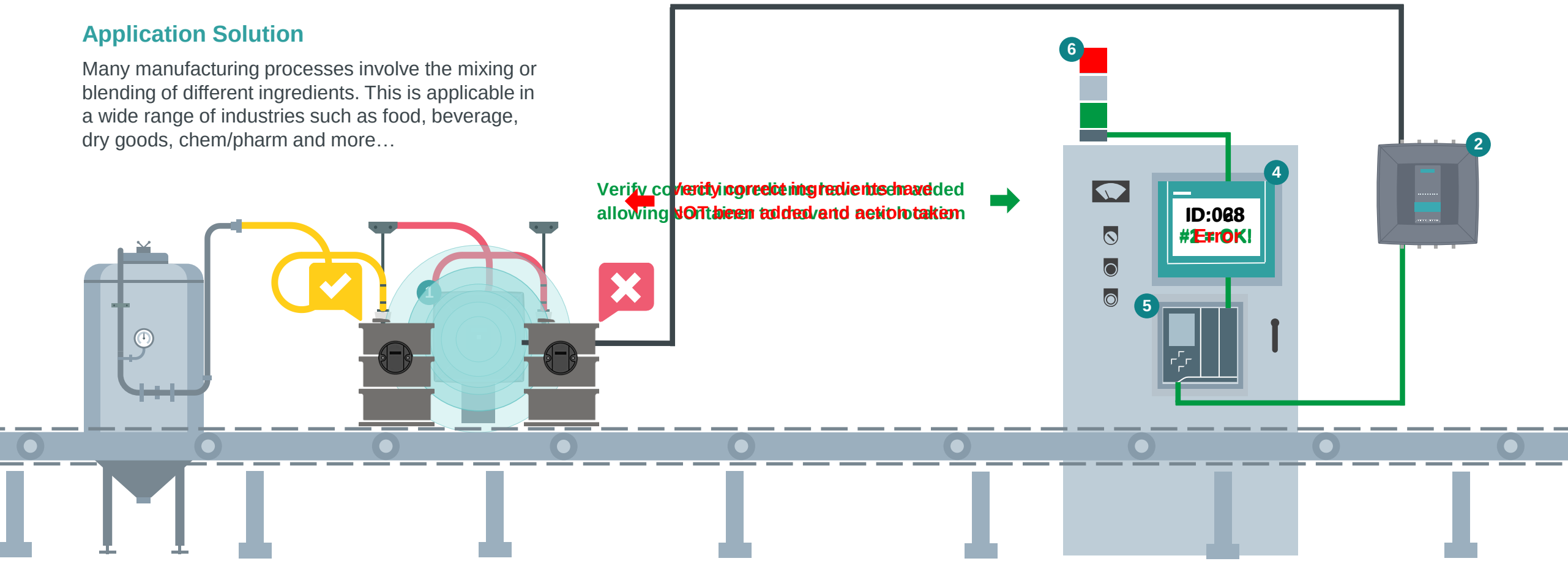
Application Solution

Many manufacturing processes involve the mixing or blending of different ingredients. This is applicable in a wide range of industries such as food, beverage, dry goods, chem/pharm and more…



1 UHF Antenna (RF680A)
2 UHF Reader (RF680R)
3 UHF Tag (RF640T)
4 Operator Panel (SIMATIC HMI)
5 PLC Controller (SIMATIC S7)
6 Stack Light

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Container Sterilization

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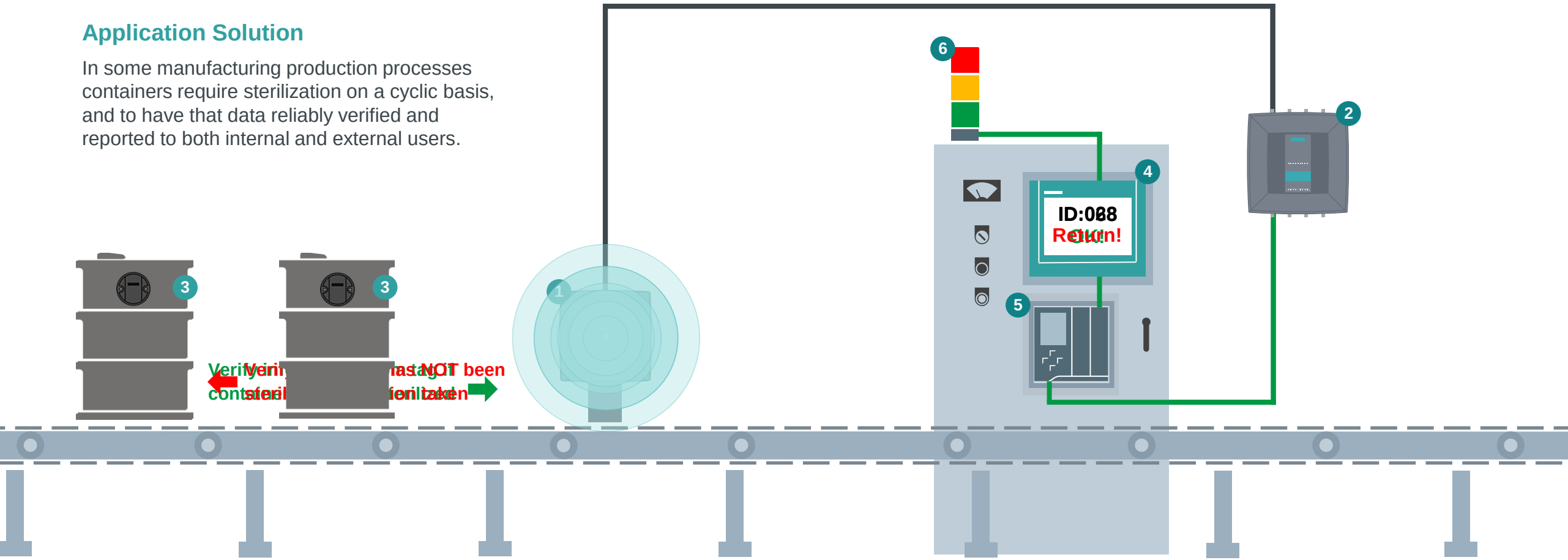
Application Solution

In some manufacturing production processes containers require sterilization on a cyclic basis, and to have that data reliably verified and reported to both internal and external users.



1 UHF Antenna (RF680A)
2 UHF Reader (RF680R)
3 UHF Tag (RF640T)
4 Operator Panel (SIMATIC HMI)
5 PLC Controller (SIMATIC S7)
6 Stack Light

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Pallet Verification

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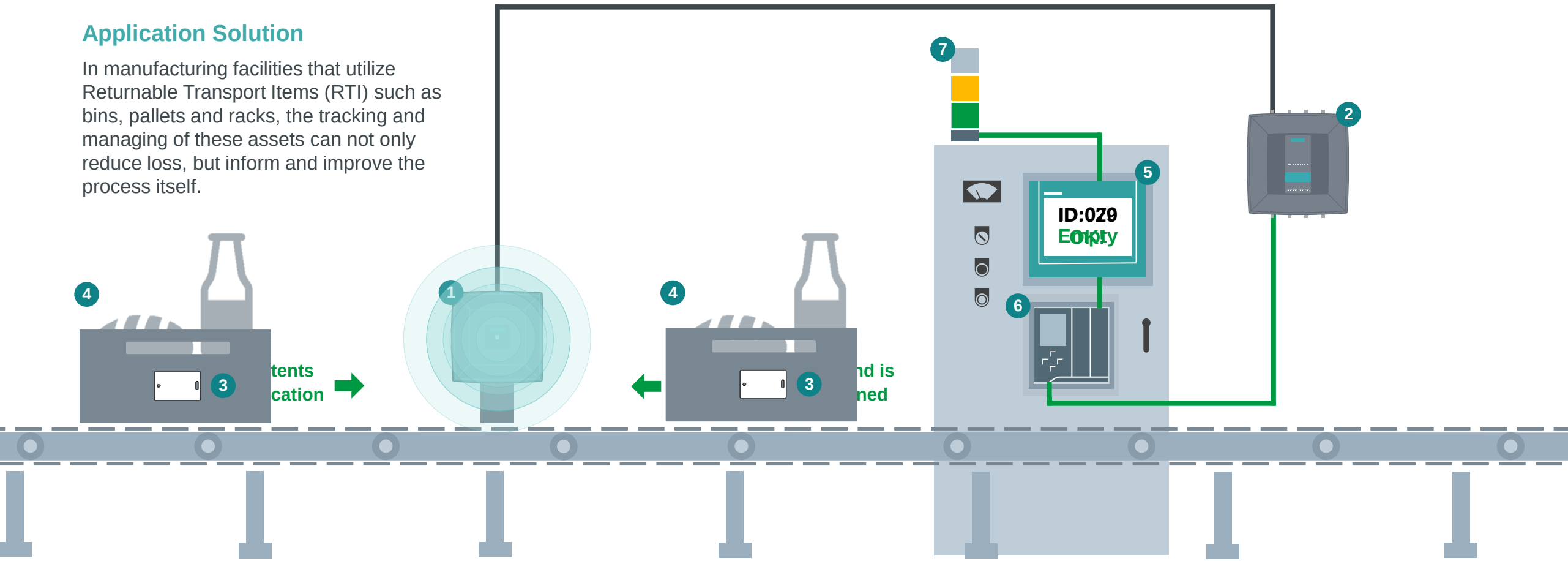
Application Solution

In manufacturing facilities that utilize Returnable Transport Items (RTI) such as bins, pallets and racks, the tracking and managing of these assets can not only reduce loss, but inform and improve the process itself.



1 UHF Antenna (RF680A)
2 UHF Reader (RF680R)
3 UHF Tag (RF610T)
4 UHF Tag (MDS D124)
5 Operator Panel (SIMATIC HMI)
6 PLC Controller (SIMATIC S7)
7 Stack Light

**RTI: Returnable Transportation Item

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Production Logistics

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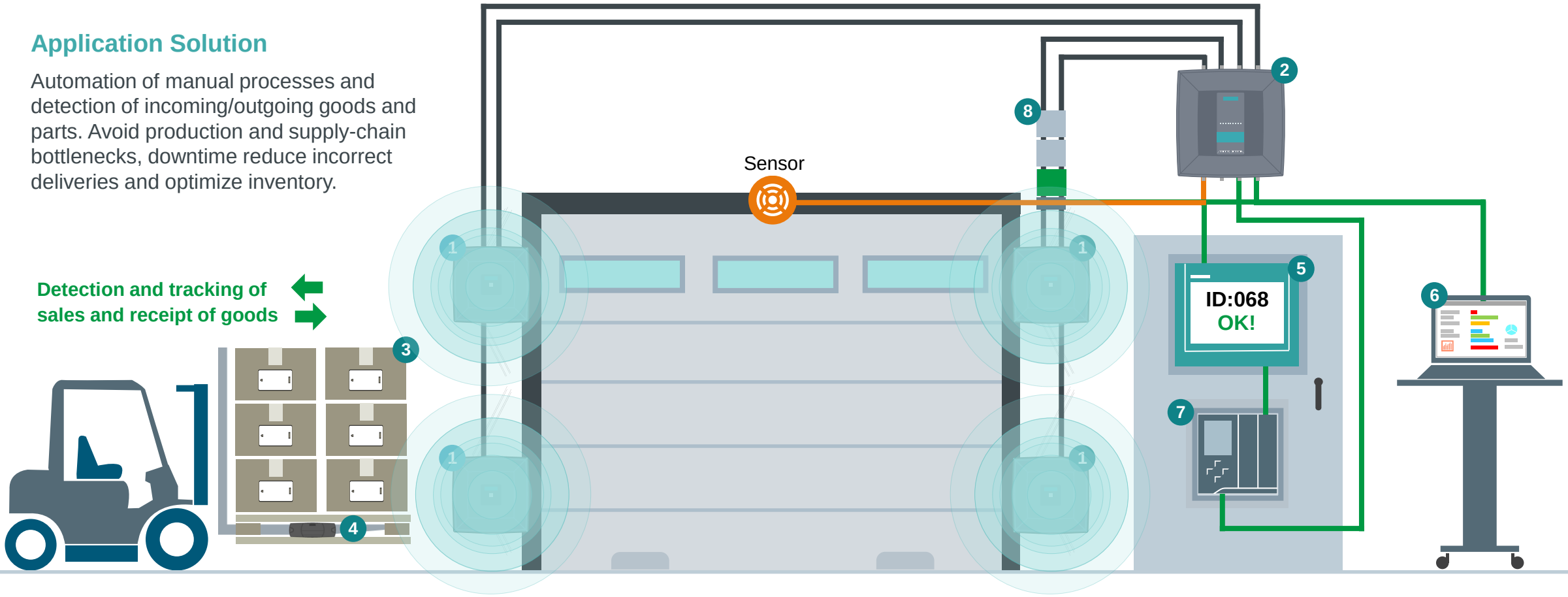
Application Solution

Automation of manual processes and detection of incoming/outgoing goods and parts. Avoid production and supply-chain bottlenecks, downtime reduce incorrect deliveries and optimize inventory.



1 UHF Antenna (RF680A)
2 UHF Reader (RF680R)
3 UHF Tag (RF610T)
4 UHF Tag (RF620T)
5 Operator Panel (SIMATIC HMI)
6 User App (PC)
7 PLC Controller (Optional)
8 Stack Light

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SIMATIC RF600
Use case – Supply chain management

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Task

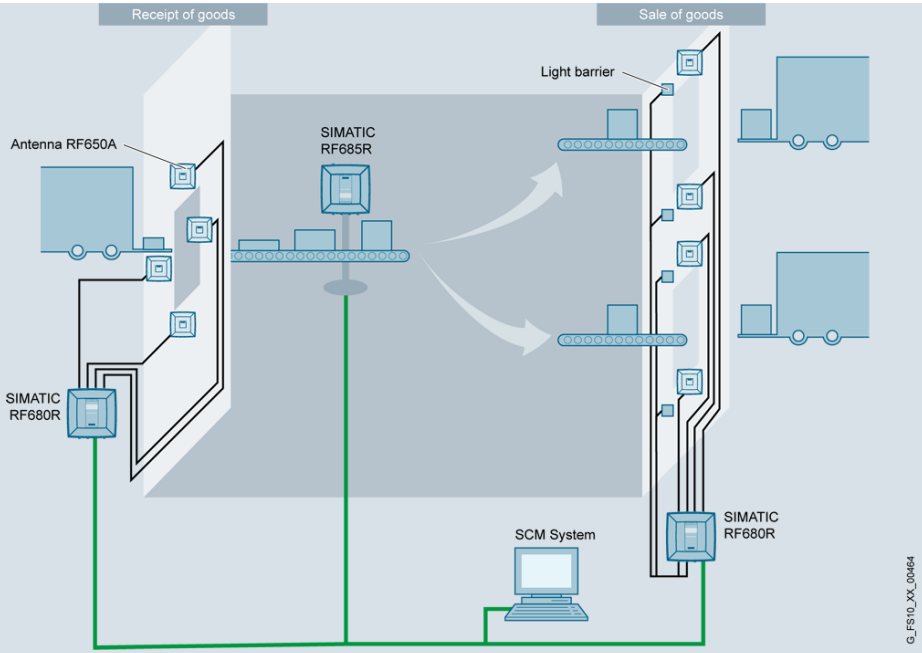
Monitoring receipt, exit and distribution of goods.

Solution

- A reader SIMATIC RF680R with four antennas monitors the goods receipt gate.
- The sender data of the transponders, which are attached to each pallet, are read out and transmitted to the overlaid system.
- The individual packages are taken from the received pallets, picked according to customer orders and provided with new transponders on which the recipient data is stored.
- After checking the parcels at the exit of the goods, opens – according to the reading result – the exit gate or a warning message is issued.

Benefit

- A high degree of automation saves time, avoids mistakes and therefore increases throughput.
- The OPC UA interface integrated into the reader enables standardized communication to superimposed systems – for low integration costs



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SIMATIC RF600
Use case – Conveying system

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Task

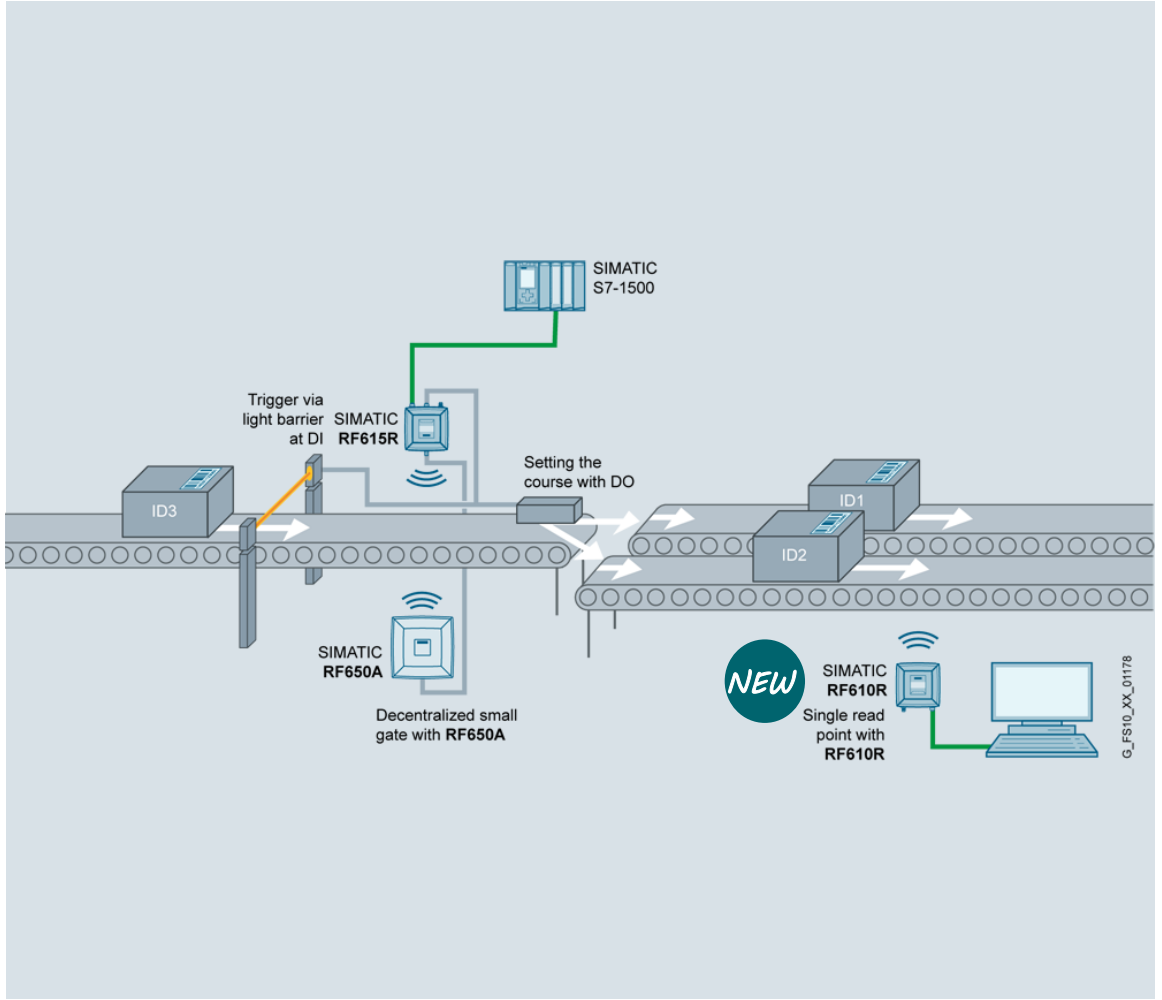
Transport of similar objects (e.g. transport containers, workpiece carriers) via extended, modular and space-saving conveyor systems.

Solution

- The compact reader SIMATIC RF615R is integrated in a conveyor system module and forms a small gate together with the UHF antenna SIMATIC RF650A.
- The trigger for the reading point as well as the key element of the switches are connected to the digital entry or output of the reader.
- A compact reader SIMATIC RF610R is directly connected to a PC on the conveyor system as an isolated application.

Benefit

- Simple integration of compact readers in confined spaces.
- Local response to trigger signals and reading events by digital IOs integrated into the reader.
- Cost-efficient gate set-up through integrated antenna and external antenna connection.



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SIMATIC RF600
Use case – Flow production

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Task

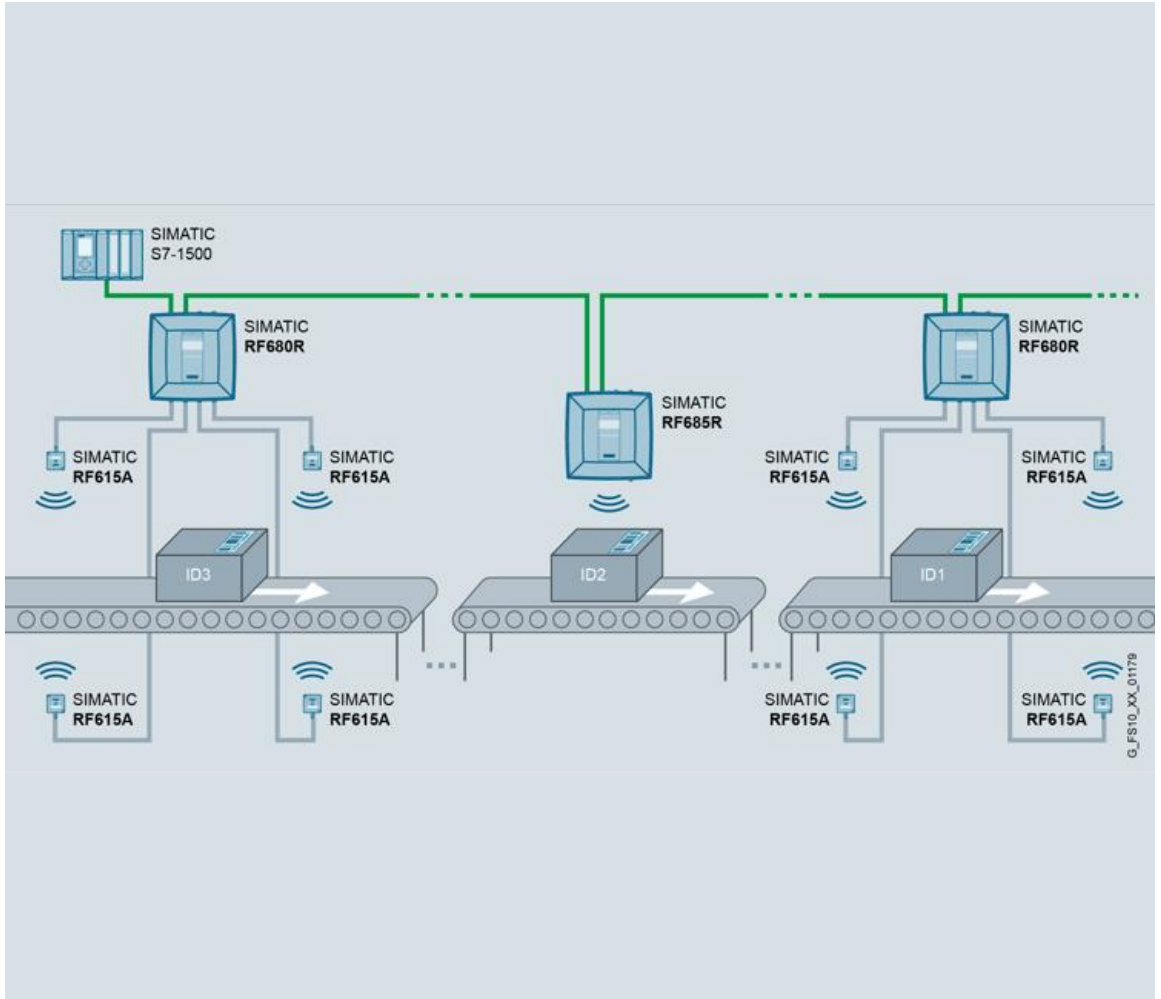
Equipping workplaces with a reading point each to track objects within the line.

Solution

- The Reader SIMATIC RF680R and R685R are mounted along the line and can be connected with two integrated PROFINET ports each.
- The line structure of the PROFINET networking therefore avoids the inconvenient star structure.

Benefit

- The line structure of the PROIFNET network therefore avoids the inconvenient star structure in this case and reduces the number of industrial Ethernet switches that are otherwise necessary.
- Therefore a simple implementation of e.g. production control, quality assurance as well as individual production according to customer specifications is possible.



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SIMATIC RF600
Use case – Track & trace

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Task

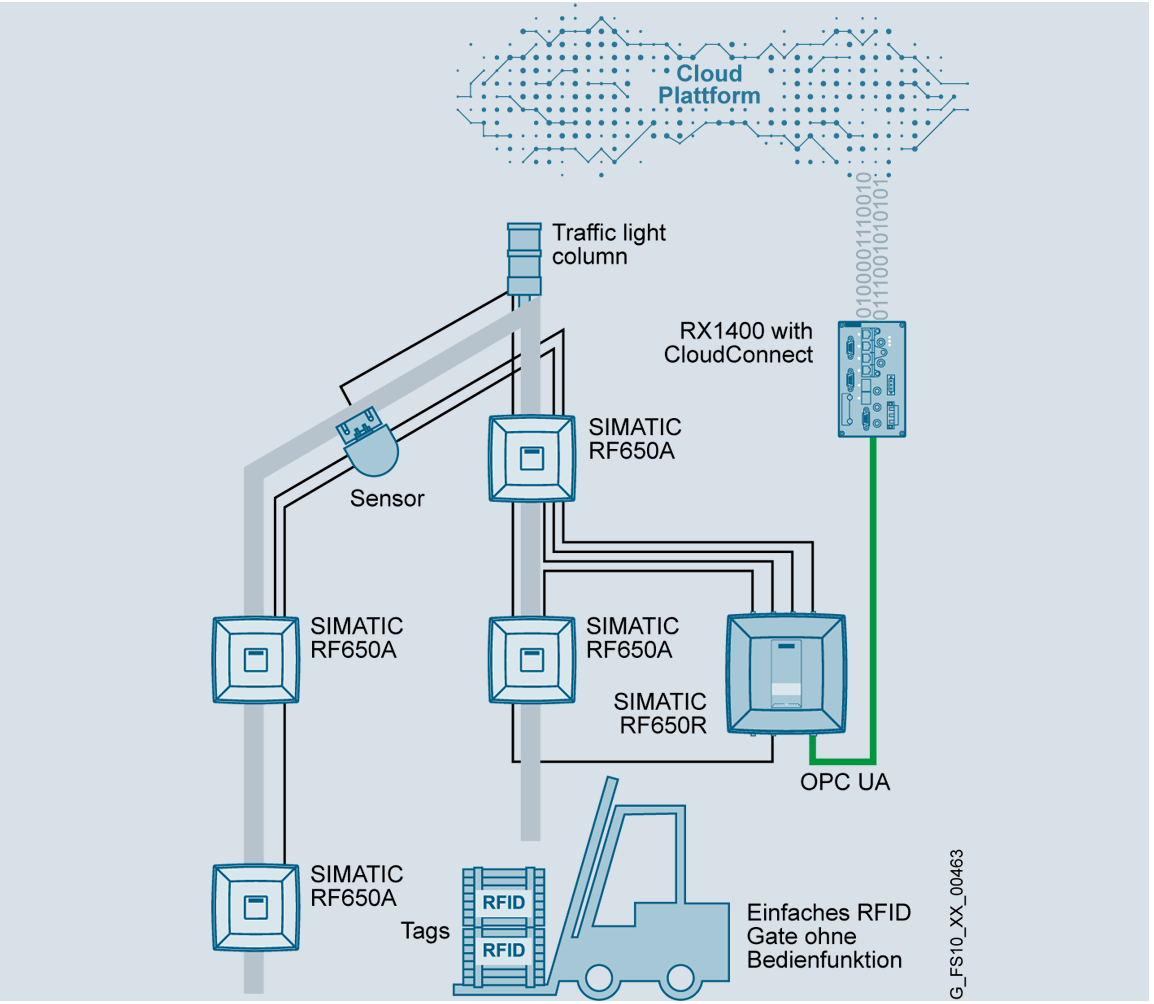
Automatic, cross-site tracking & tracing of goods

Solution

- A reader SIMATIC RF650R with up to four antennas, sensors and signals is permanently mounted at one gate.
- Via the sensor, the reading process of the transponder attached to the product is started and if necessary, terminated.
- A signal displays "red" for error and "green" allowed for passage and loading.
- The data automatically collected is forwarded to a cloud platform.

Benefit

- Transparency in material flow as well as error avoidance and a high degree of automation.
- Worldwide availability of current data – also across company boundaries.



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SIMATIC RF600
Use case – Production control

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Task

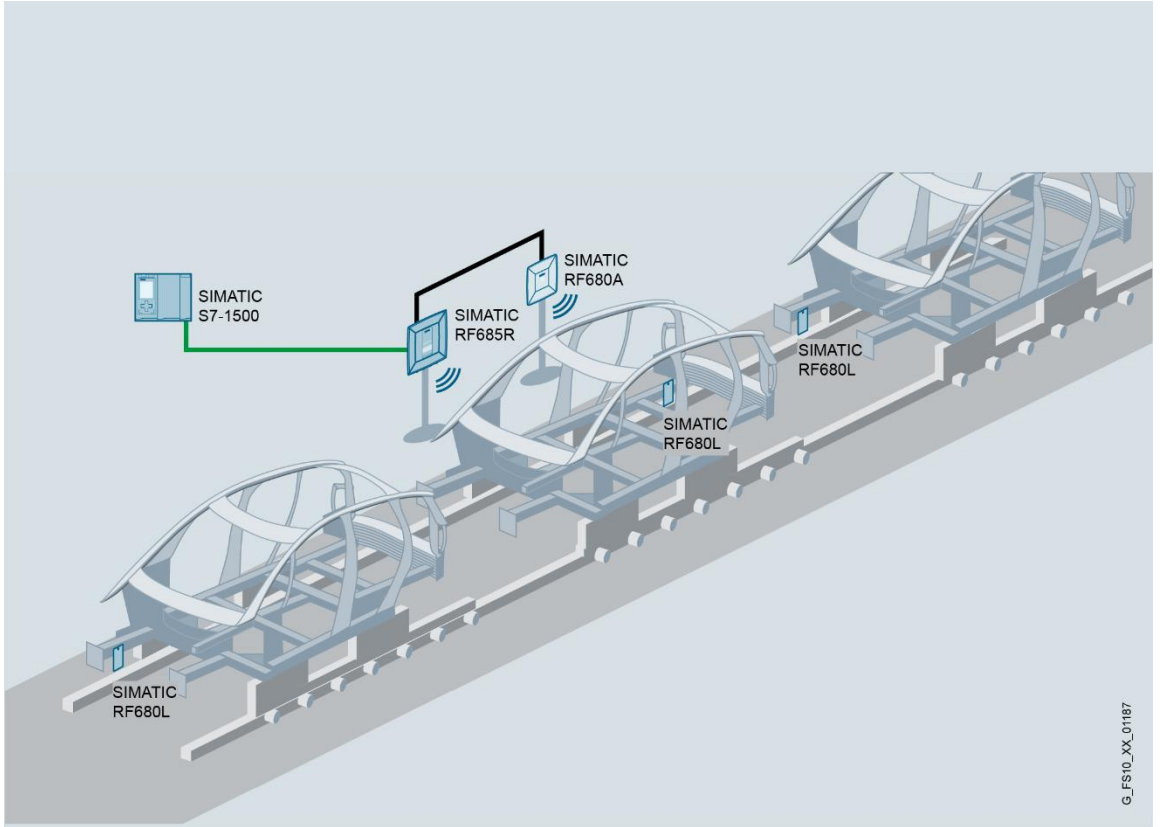
End-to-end identification of bodies from shell construction to final assembly.

Solution

- The heat-resistant SmartLabel RF680L, on which product data on the number, type, color etc. are stored, is automatically attached to the first main part of the body.
- The SIMATIC RF685R reader can be connected directly via PROFINET or via ASM456 via PROFIBUS.
- The additive adaptive antenna SIMATIC RF680A ensures reliable reading results even in a demanding, metallic environment.

Benefit

- Cost reduction through uniform identification system directly on the body.
- Increase in quality/productivity through continuous identification in every workplace



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SIMATIC RF600

Use case – Asset / container management

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Task

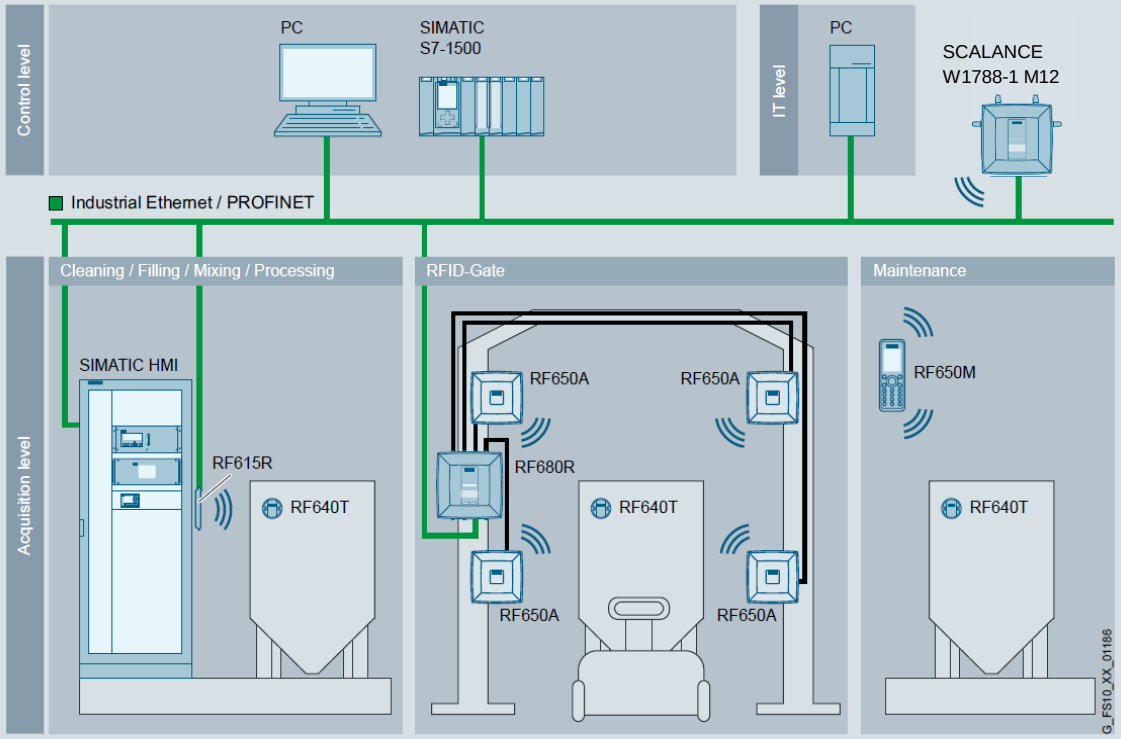
At any time up-to-date information on the location, condition, content of the use of assets such as containers.

Solution

- RFID gates and reading points at the stations of the individual processing processes provide information about the location or
  Area where the assets are located.
- Extensive documentation is thus generated for each process step.
- The transponders are described with information about the condition and content of the assets.

Benefit

- Transparency regarding inventory and level of use
- Extensive documentation in product quality and legal guidelines



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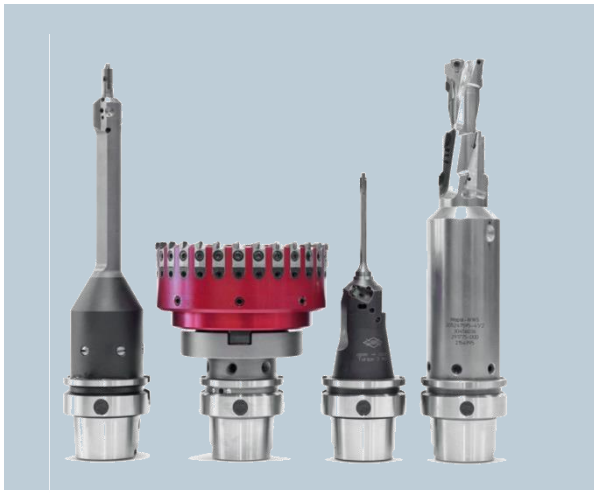
Powertrain – Tool identification in machining

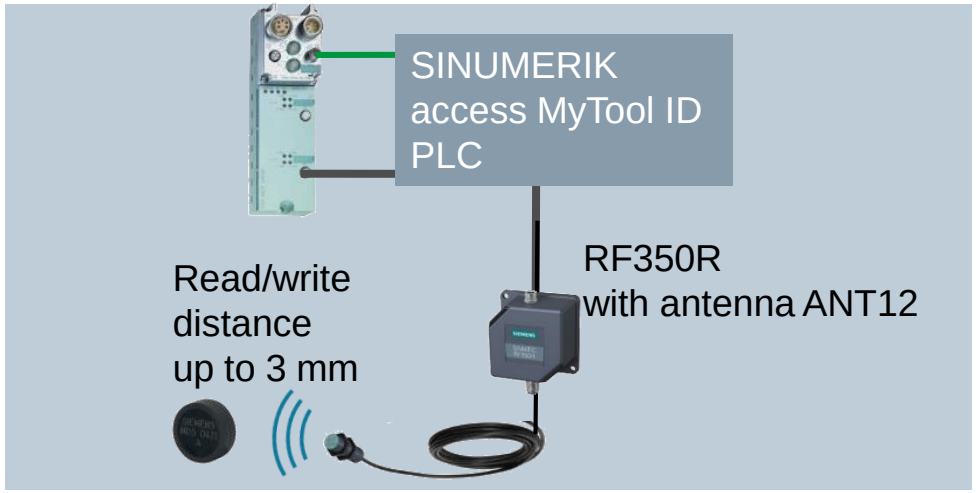
Today, most tools are equipped with small RFID pills in order to identify the tool in the machine or during re-sharpening. The tag gives every tool a unique ID and contains also correction parameters, tool life, dimension, etc. This way the machine can automatically check and select the right tool.

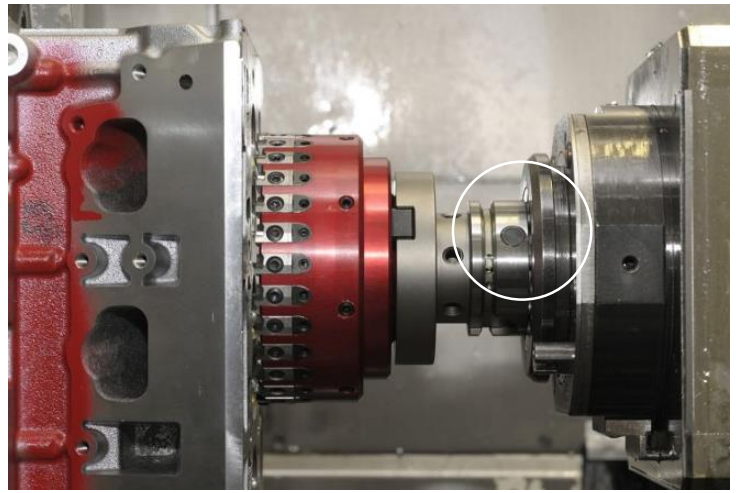
The solution: SIMATIC Ident with tool tag D421 (Ø 10mm)

The advantages:

Seamless integration into SINUMERIK with the tool management software access MyTool ID (TDI Ident Connection) reduces integration costs. This offers highest utilization of the full potential of the tool stock through precise recording of the inventory and localization of tools during operation







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Use case – Powertrain machining
Controlling crankcase production using bold tag

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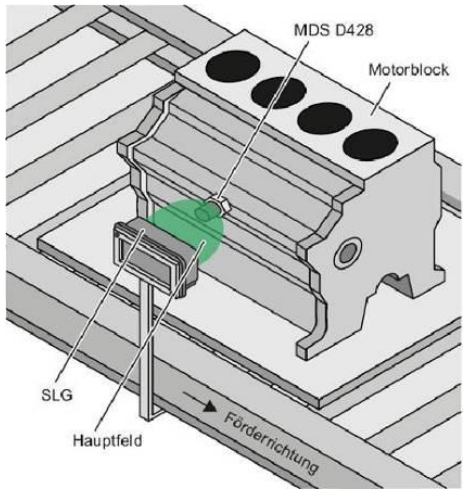
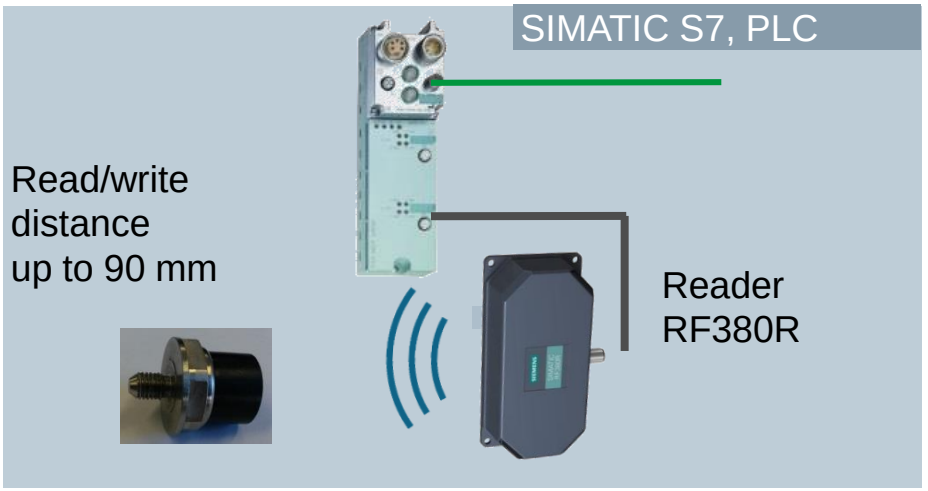
Using RFID in Assembly lines for optimizing the production is state of the art. Now RFID is also more and more used in machining and replaces mechanical code systems.

The solution: SIMATIC Ident with bolt tag MDS D428

Every crankcase is marked with a mobile tag MDS D428 which can be automatically fixed/removed by a robot. The tag contains up to 8 Kilobyte FRAM memory. Enough for storing the production/quality data which can be read/modified at any time by a reader e.g. RF380R. The reading distance is up to 95 mm.

The advantages: Fast and secure identification even if there is oil, dust, etc. because the tag is designed for harsh environments (vibration sorter, washing machine, vacuum dryer, etc.).





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Volkswagen AG plant Kassel/Germany
Increasing productivity at transmission production

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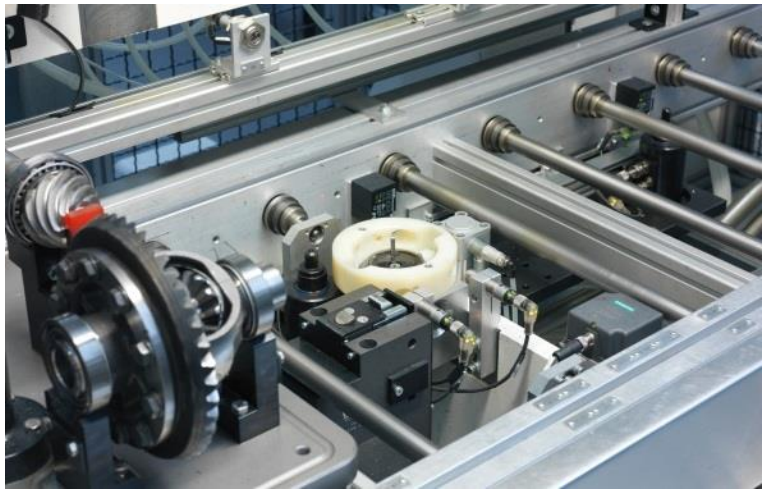
Without RFID marking, the organization of a modern transmission production is virtually impossible. Even though the contactless identification has long been considered state-of-the-art, it still offers many options to increase productivity..

The solution: SIMATIC RF300

Every carrier is marked with a mobile tag RF340T which contains up to 32 Kilobyte production/quality data which can be read/modified at any time by a reader e.g. RF340R.

The advantages: “It is reassuring to know that we can not only realize shorter cycle times with it, but also possess a powerful as well as flexible solution for other manufacturing models – such as the just-in-sequence production down to a batch size of one,” says Alexander Hermann of the transmission production planning at Volkswagen Kassel.



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Volkswagen – plant Hannover/Germany
„Lean“ and reliable identification of the car bodies

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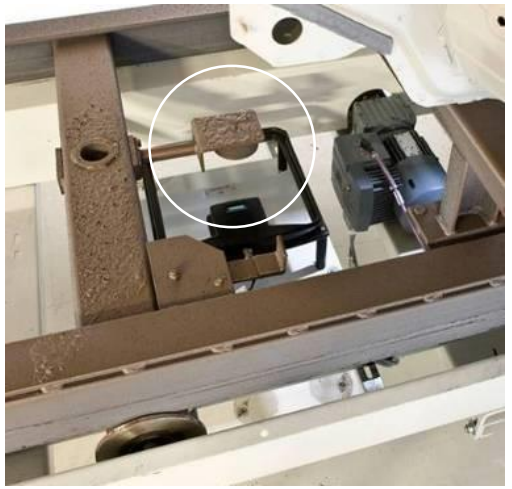
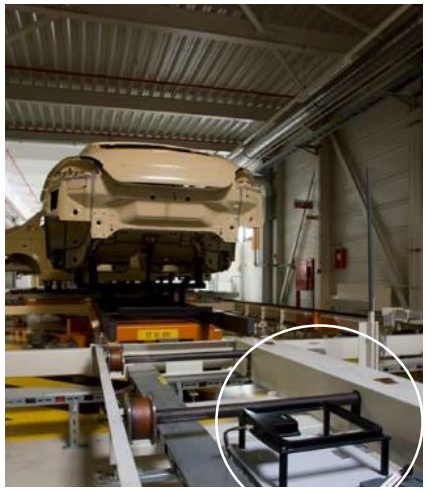
VW was looking for a reliable body identification for the Transporter VW T5, Porsche Panamera, etc. which guarantees a fast and safe identification.

The solution: SIMATIC Ident in Body Shop and Paint Shop

Every skid in the Body Shop carries a tag RF360T and every skid in the Paint Shop carries a high temperature tag MDS D139 (up to +220°C). More than 200 read/write units read the tags and identify the skids at important locations.
“… we were looking for an as simple as possible, reliable and at the same time cost-optimized solution,” states Meik-Axel Gensler from the management for computer systems in the vehicle construction technical department at VW.”





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Daimler AG plant Rastatt/Germany and Kecskemet/Hungary
Optimization of the new A-/B-class production with UHF

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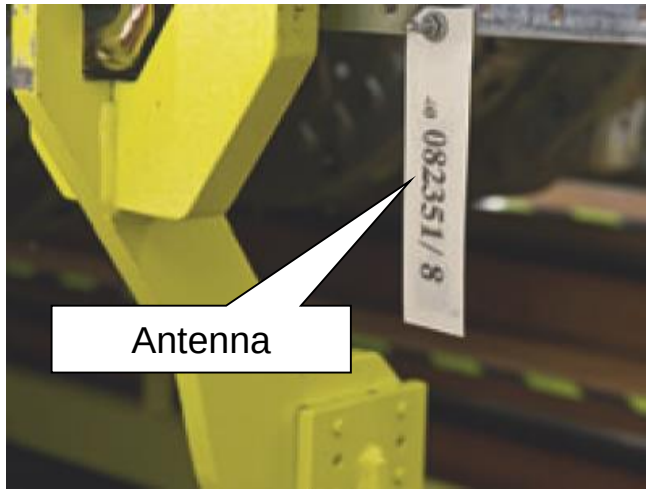
Daimler was looking for a new identification concept in order to identify the car body from the beginning of the Body Shop via Paint Shop (up to +220°C) to final Assembly

The solution: SIMATIC RF600 with the one-way UHF smart label RF680L

The cost efficient smart label is automatically fixed to the first main part (longitudinal carrier) and contains the most important production data (number, body type, color, etc.) Over 300 read/write units of RF620R guarantee a reliable identification. Also 200 readers were installed at the new plant in Kecskemet/Hungary.

The advantages: 99.99% read/write rate and the car body can be identified at any time.



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Use case – Identification of vehicles during distribution from EOL-Point to the car dealer

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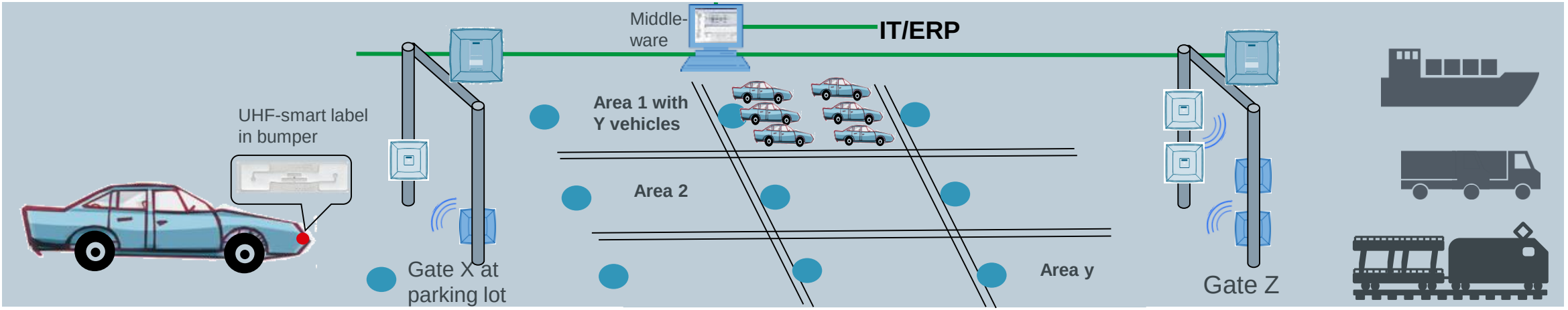
Car maker wants to automatically identify the vehicle and track and trace the way in order to optimize the shipping process from EOL-Point to the car distributer. Also the car distributer wants to identify the vehicle on the way to the car dealer.

The solution: UHF-Smartlabel RF630L is in the bumper on e.g.: left side

Via UHF-reader or UHF-Gates the vehicle can be identified up to a distance of 5 m. Gates on the Gateway/Exit of defined parking areas realize a locating system and the IT/Middleware knows at every time in which area the vehicle is positioned. Thanks to UHF, raining, snow, dust, etc. does not disturb the automatic identification.

The advantages: Automatic identification with the same smart label at EOL and during distribution reduces cost and minimizes wrong shipments.



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SIMATIC Ident – Get more information online

Product information

SIMATIC Ident

SIMATIC RFID

References

SIMATIC RF200 / 300 / 600 / MV500

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