RFID Systems
for optimization of material flow and logistics

simatic sensors

SIEMENS
RFID Systems for optimization of material flow and logistics

The clever radio frequency identification systems read and write data reliably, quickly and economically. They are unaffected by harsh environments, store data directly on a tag attached to the product, control and optimize the flow of material, and provide for efficient logistics processes.

Users of RFID systems have very different technology needs based on the desired application. One might be looking for economical Smart Labels for logistics, and another for rugged data memories for assembly lines. And in traffic control systems and transport logistics, it is essential to have long-range data memories.

Suitable for every application:
- Assembly lines
- Conveyor systems
- Industrial manufacturing
- Warehouses
- Logistics
- Distribution
- Commissioning
- Transport logistics

RF identification systems from Siemens are installed and running in many different applications for many years, and work reliably on a 24/7 base.

Successful industrial manufacturing companies worldwide rely on the RFID systems from Siemens – and have done so for more than 20 years.

<table>
<thead>
<tr>
<th>Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>■ Fully automatic and high-speed identification with 100% transmission integrity</td>
</tr>
<tr>
<td>■ Production and quality-related data can be stored directly on the product</td>
</tr>
<tr>
<td>■ Designed to meet the harsh environments of Industry (temperature and contamination)</td>
</tr>
<tr>
<td>■ Wide range of tags that can be reused anytime from Smartlabels to 32KB tags</td>
</tr>
<tr>
<td>■ Flexible communication with the automation system: serial, via PROFIBUS or Ethernet</td>
</tr>
<tr>
<td>■ Seamless integration into SIMATIC reduces engineering costs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Read/write distance</th>
<th>MOBY E</th>
<th>MOBY I</th>
<th>RF 300</th>
<th>MOBY U</th>
<th>MOBY F</th>
<th>MOBY D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>up to 0.1 m</td>
<td>up to 0.15 m</td>
<td>up to 0.2 m</td>
<td>up to 3.0 m</td>
<td>up to 0.42 m</td>
<td>up to 0.9 m</td>
</tr>
<tr>
<td>Standards</td>
<td>13.56 MHz</td>
<td>1.81 MHz</td>
<td>13.56 MHz</td>
<td>2.4 GHz</td>
<td>125 kHz</td>
<td>13.56 MHz</td>
</tr>
<tr>
<td>ISO 14443</td>
<td>ISO 18000-4</td>
<td>ISO 15693</td>
<td>ISO 18000-3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Rely on proven technology
The RFID operating principle

Meaningful data from the beginning
Compared with conventional identification systems, the RFID systems from Siemens offer a wide range of benefits: Seamless data transfer provides for high levels of read reliability, and interoperability ensures quick and easy integration into the application, saving time and costs. Our RFID systems ensure that meaningful data are tied to a product or object from the very beginning. The mobile data memories (tag or transponder) are attached to the product, product carrier, object or its carrying or packing unit and are written to seamlessly. This means that all the application-specific data is available on the mobile data storage unit. This is true whether you are dealing with car parts in the automotive industry (body and paint shop) or order boxes and trays. Up to 32 KB of data can be stored and individually read and supplemented when required at the various steps in the manufacturing process. This all means that the flow of material and data is synchronized optimally.

Seamless data transfer and harsh industrial environments
Powerful write/read devices in various rugged designs ensure fast and reliable data transfer between the mobile data storage units and the higher-level control systems (PLC, PC, ...). Data and power is transmitted inductively by an electromagnetic field or by radiofrequency. This principle of seamless data transfer works reliably in harsh industrial environments or through non-metallic materials.

Broad range of mobile data storage units
We can offer you a range of different mobile data storage units using a variety of storage technologies (fixed code, EEPROM or FRAM/SRAM) and form factors. Their strength is not only their high level of data security but also the excellent protection against ambient conditions such as contamination, temperature fluctuations, presence of liquid or shock and mechanical stress.

Flexible system integration
No matter what the requirements are: MOBY RFID systems allow for easy integration into SIMATIC or SINUMERIK, connected through PROFIBUS, Ethernet or a PC environment, and can be integrated with any third party controller. A wide range of interface modules, function blocks and powerful drivers and function libraries support on-site systems integration and help safe integration time and cost and ultimately shorten time-to-market for your products.

Perfectly matched components
The RFID systems consist of perfectly matched individual components:
- Mobile data storage units (tags)
- Write/read devices and mobile handheld terminals
- Antennas
- Interfaces for connection to the automation system (PROFIBUS, Ethernet)
- Software for system integration

Flexible system integration
No matter what the requirements are: MOBY RFID systems allow for easy integration into SIMATIC or SINUMERIK, connected through PROFIBUS, Ethernet or a PC environment, and can be integrated with any third party controller. A wide range of interface modules, function blocks and powerful drivers and function libraries support on-site systems integration and help safe integration time and cost and ultimately shorten time-to-market for your products.
RFID Systems for manufacturing
Strong performance, heavy duty

The MOBY I, MOBY E, MOBY D and RF 300 RFID systems have already been used in a great number of industrial applications around the world, in some cases for many years, and have proven successful even in the toughest of industrial environments. They enable objects to be identified extremely reliably while at the same time saving costs. The principle applied is always the same: Mobile data storage units contain all the production and manufacturing data. They travel with your product through assembly lines, transfer lines and production lines, controlling your material flow optimally.

Applications
- Main assembly lines in the automotive industry such as body shop, paint shop, final assembly
- Production lines for engines, gearboxes or steering gear
- Conveyor systems for the assembly of anti-skid brake systems, airbags, brake systems, doors and cockpits
- Assembly lines for household electrical appliances, consumer electronics or electronic communication equipment
- Assembly lines for PCs, low-power motors, contactors or switches
- Production lines in the glass and ceramics industry
Overview of RFID Systems for manufacturing

<table>
<thead>
<tr>
<th>MOBY E</th>
<th>MOBY I</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Read/write distance</strong></td>
<td>up to 100 mm</td>
</tr>
<tr>
<td><strong>Data transmission rate</strong></td>
<td>&gt; 2.55 ms/byte reading, &gt; 2.8 ms/byte writing</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>EEPROM</td>
</tr>
<tr>
<td><strong>Standards</strong></td>
<td>ISO 14443</td>
</tr>
<tr>
<td><strong>Approvals</strong></td>
<td>ETS 300 330 (Europe); FCC Part 15 (USA), UL/CSA</td>
</tr>
<tr>
<td><strong>Bulk capability</strong></td>
<td>• (only with SIM)</td>
</tr>
<tr>
<td><strong>Multitag capability</strong></td>
<td>• (only with SIM)</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>13.56 MHz</td>
</tr>
</tbody>
</table>

### Mobile data storage units (tags)

<table>
<thead>
<tr>
<th>Designation</th>
<th>Memory size</th>
<th>Operating temperature</th>
<th>Degree of protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDS E600</td>
<td>752 bytes</td>
<td>-25 ... +60°C</td>
<td>IP65</td>
</tr>
<tr>
<td>MDS E624</td>
<td>752 bytes</td>
<td>-25 ... +125°C</td>
<td>IP67/IPX9K</td>
</tr>
<tr>
<td>MDS E611</td>
<td>752 bytes</td>
<td>-25 ... +75°C</td>
<td>IP67/IPX9K</td>
</tr>
<tr>
<td>MDS E623</td>
<td>752 bytes</td>
<td>-25 ... +85°C</td>
<td>IP67/IPX9K</td>
</tr>
<tr>
<td>MDS 402</td>
<td>8 KB FRAM</td>
<td>-25 ... +70°C</td>
<td>IP67/IPX9K</td>
</tr>
<tr>
<td>MDS 401</td>
<td>8 KB FRAM</td>
<td>-25 ... +70°C</td>
<td>IP67/IPX9K</td>
</tr>
<tr>
<td>MDS 403</td>
<td>8 KB FRAM</td>
<td>-25 ... +70°C</td>
<td>IP67/IPX9K</td>
</tr>
<tr>
<td>MDS 404</td>
<td>8 KB FRAM</td>
<td>-25 ... +70°C</td>
<td>IP67/IPX9K</td>
</tr>
<tr>
<td>MDS 506</td>
<td>32 KB FRAM</td>
<td>-25 ... +70°C</td>
<td>IP67/IPX9K</td>
</tr>
<tr>
<td>MDS 514</td>
<td>32 KB FRAM</td>
<td>-25 ... +70°C</td>
<td>IP67/IPX9K</td>
</tr>
<tr>
<td>MDS 493E</td>
<td>8 KB EEPROM</td>
<td>-25 ... +110°C (+220°C)</td>
<td>IP67/IPX9K</td>
</tr>
</tbody>
</table>

### Write/read devices

<table>
<thead>
<tr>
<th>Designation</th>
<th>Operating temperature</th>
<th>Degree of protect.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIM 70 with ANT 0</td>
<td>-25 ... +75°C</td>
<td>IP56/S67</td>
</tr>
<tr>
<td>SIM 70 with ANT 1</td>
<td>-25 ... +75°C</td>
<td>IP56/S67</td>
</tr>
<tr>
<td>SLG 75</td>
<td>-25 ... +70°C</td>
<td>IP65</td>
</tr>
<tr>
<td>SLG 72</td>
<td>-25 ... +70°C</td>
<td>IP65</td>
</tr>
<tr>
<td>SLG 71</td>
<td>-25 ... +70°C</td>
<td>IP65</td>
</tr>
<tr>
<td>SLG 41</td>
<td>-25 ... +70°C</td>
<td>IP65</td>
</tr>
<tr>
<td>SLG 41 C</td>
<td>-25 ... +70°C</td>
<td>IP65</td>
</tr>
<tr>
<td>SLG 42</td>
<td>-25 ... +70°C</td>
<td>IP65</td>
</tr>
<tr>
<td>SLG 43</td>
<td>-25 ... +70°C</td>
<td>IP65</td>
</tr>
<tr>
<td>SLG 405</td>
<td>-25 ... +70°C</td>
<td>IP65</td>
</tr>
<tr>
<td>STG E</td>
<td>-20 ... +60°C</td>
<td>IP54</td>
</tr>
<tr>
<td>STG I</td>
<td>-20 ... +60°C</td>
<td>IP54</td>
</tr>
</tbody>
</table>

### Antennas

<table>
<thead>
<tr>
<th>Designation</th>
<th>Operating temperature</th>
<th>Degree of protect.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIMATIC S7-300/400</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>PROFIBUS DP</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Ethernet (TCP/IP)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Serial interface to other controllers, PC, any other systems</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

### Connection to the automation system

<table>
<thead>
<tr>
<th></th>
<th>direct</th>
<th>using interface module (ASM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIMATIC S7-300/400</td>
<td>–</td>
<td>•</td>
</tr>
<tr>
<td>PROFIBUS DP</td>
<td>–</td>
<td>•</td>
</tr>
<tr>
<td>Ethernet (TCP/IP)</td>
<td>–</td>
<td>•</td>
</tr>
<tr>
<td>Serial interface to other controllers, PC, any other systems</td>
<td>–</td>
<td>•</td>
</tr>
</tbody>
</table>

### Product selection code

| 6GT23 | 6GT29 |
## SIMATIC RF 300

<table>
<thead>
<tr>
<th>Designation</th>
<th>Memory size</th>
<th>Operating temperature</th>
<th>Degree of protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF 320-T</td>
<td>20 bytes</td>
<td>-25 ... +85 °C</td>
<td>IP67</td>
</tr>
<tr>
<td>RF 340-T</td>
<td>818 bytes</td>
<td>-25 ... +85 °C</td>
<td>IP67</td>
</tr>
</tbody>
</table>

## MOBY U

<table>
<thead>
<tr>
<th>Designation</th>
<th>Memory size</th>
<th>Operating temperature</th>
<th>Degree of protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOS L113</td>
<td>2 KB RAM</td>
<td>-25 ... +70 °C</td>
<td>IP67</td>
</tr>
<tr>
<td>MOS L115</td>
<td>2 KB RAM</td>
<td>-25 ... +70 °C</td>
<td>IP67</td>
</tr>
<tr>
<td>MOS L24</td>
<td>32 KB RAM</td>
<td>-25 ... +85 °C</td>
<td>IP67</td>
</tr>
<tr>
<td>MOS L589</td>
<td>32 KB RAM</td>
<td>-25 ... +85 °C, up to +220°C cyclic</td>
<td>IP67</td>
</tr>
<tr>
<td>MOS L89</td>
<td>32 KB RAM</td>
<td>-25 ... +85 °C</td>
<td>IP67</td>
</tr>
</tbody>
</table>

### Standards

- CE, UL, FCC, CSA
- EN 330 440-2, FCC Part 15C (USA), UL/CSA

### Approvals

- CE, UL, FCC, CSA
- EN 330 440-2, FCC Part 15C (USA), UL/CSA

### Specifications

- **Data transmission rate**
  - 50 byte/s or 3 KB/s
  - approx. 8 / 4.8 KB/s without bulk (net)
  - approx. 8 / 4.8 KB/s without bulk (net)
- **Frequency**
  - 13.56 MHz
  - 2.4 GHz
- **Operating temperature**
  - -25 ... +70 °C
  - -25 ... +85 °C

### Connection to the Automation System

- PROFIBUS DP
- Ethernet (TCP/IP)
- Serial interface to other controllers, PC, any other systems

### Product selection code

- 6GT25
RFID Systems for manufacturing
Features and highlights

For the toughest conditions
Regardless of the field of application, our identification systems wholly match your production requirements. Not only do they ensure high levels of data security, provide enormous storage capacity of up to 32 KB and offer an extremely high degree of protection up to IP 68, they also stand out above all because of their exceptional ruggedness in the face of even the toughest ambient conditions. The strength of the performance of our identification systems is matched by their toughness.

Noise-immune
The transmission frequency of 1.81 MHz, 13.56 MHz or 2.4 GHz makes our RFID systems largely immune to electromagnetic interference. Even extreme environmental influences will not interfere with our systems.
Thanks to the integration of GSM/UMTS functions and technologies such as range limitation, MOBY U sets new standards in respect of easy commissioning, reliability and low-maintenance operation.
With new functions such as automatic selection of free frequency channels (frequency hopping), it interacts perfectly with other 2.4 GHz systems (wireless LAN, Bluetooth, ...).

Assembly lines with small tool carriers
The FRAM storage technology combines the advantages of RAM and EEPROM. The result: An almost unlimited number of write cycles are available to you. Service life is extended because there is no need for a backup battery. For assembly lines with small tool carriers we offer small data storage units, which can be flush mounted on metal.

High-temperature data storage units
We developed high-temperature data storage units specifically for use in paint shops. These have been in successful operation in the automotive industry around the world for many years.

The small, compact "power pill"
A small, compact "power pill" is revolutionizing tool identification. Flush mounted in metal, it can be attached to any commercially available tool holder and stores all the data required for tool management, such as automatic tool presetting, up to a maximum of 752 bytes.

RFID system with IQ Sense
In the SIMATIC RF 300 RFID system, communication between the write/read device and the SIMATIC controller takes place via a low-cost two-wire cable. Other features include system diagnosis, such as for wire breakage or a short-circuit, an individual write/read device and replacement of the device in ongoing operation. This provides for higher levels of availability and reduced downtimes.
RFID Systems for logistics and distribution
Warehouses and commissioning

The MOBY F and MOBY D RFID systems have already been in successful use in a wide variety of applications, in various industries, in some cases for many years. Applications extend from simple identification, such as barcode substitution or supplementation, logistics applications in harsh environments, storage and distribution logistics, right up to product identification.

Applications
- Dispatch warehouses including order picking (“brown goods”, food, tires etc.)
- Storehouses for deep-frozen goods (including order picking)
- Container or vessel identification
- Identification of load carriers, pallets, cases or mini-load containers
- Distribution and loading control with electronic delivery note
- Parts identification for textiles (e.g. professional rental clothing, operating room textiles) in laundries
- Identification of window parts, items of furniture etc. in the logistics chain
- Parts identification in the clothing industry (e.g. shirts, suits, medical stockings), in production and shipping
- Goods distribution in open distribution chains, e.g. in parcel and postal services, mail order companies or express companies
- Luggage transport and tracking
Overview of RFID Systems for logistics and distribution

MOBY F

- Read/write distance: up to 420 mm
- Data transmission rate: > 6 mbyte reading, > 10 mbyte writing
- Memory: Fixed code / EEPROM
- Standards: –
- Approvals: FTZ 17 TR.2100 (D), ETS 300, 330 (Europe), partly FCC
- Bulk capability: • (in the case of MDS 4xx and SIM 80)
- Multitag capability: • (in the case of MDS 4xx and SIM 80)
- Frequency: 125 kHz
- Mobile data storage units (tags)
  - Designation: MDS F160, MDS F124, MDS F125, MDS F415
  - Memory size: 40 Bit UID, 40 Bit UID, 192 bytes
  - Operating temperature: -25 ... +85°C
  - Degree of protection: IP68

MOBY D

- Read/write distance: up to 680 mm max. (900 mm with customer-specific antenna)
- Data transmission rate: > 3.5 mbyte reading, > 9.5 mbyte writing
- Memory: EEPROM
- Standards: ISO 15693
- Approvals: ISO 18000-4
- Bulk capability: • (PC version with RS 232)
- Multitag capability: • (PC version with RS 232)
- Frequency: 13.56 MHz
- Mobile data storage units (tags)
  - Designation: MDS D160, MDS D100, MDS D124, MDS D139
  - Memory size: 44 bytes, 112 bytes, 112/256 bytes
  - Operating temperature: -25 ... +85°C
  - Degree of protection: IP68

Write/read devices

- Stationary, with detached antenna
  - Designation: SLG 80 with ANT F5, SIM 80 with ANT F5
  - Operating temperature: -25 ... +60°C
  - Degree of protection: IP65

- Stationary, with integrated antenna
  - Designation: SLG D10, SLG D10S, SLG D11 ANT D5, SLG D11S ANT D5
  - Operating temperature: -20 ... +55°C
  - Degree of protection: IP65

- Mobile handheld terminal with integrated antenna
  - Designation: STG F
  - Operating temperature: -20 ... +60°C
  - Degree of protection: IP54

Antennas

- Designation: S LA 81, S LA 82
  - Operating temperature: -25 ... +70°C
  - Degree of protection: IP65

Connection to the automation system

- Direct
  - SIRIUS ST-400/400
  - PROFINET
  - Ethernet (TCP/IP)
  - Serial interface to other controllers, PC, any other systems

- Using interface module (ASM)
  - ANT 05
  - ANT 06

Product selection code

- 6GT24
- 6GT26

Find the right product faster with the product selection code!

In the A&D Mall: select “Find” and enter the product selection code to display a list of relevant products.

In Catalog FS 10: use the product selection code in the order number index in Chapter 6 to find the chapter and page of suitable products.
RFID Systems for logistics and distribution
Features and highlights

Managing your operations
The powerful RF identification systems deal with even the most complex tasks quickly and efficiently. Unlike conventional barcode systems, they don't simply identify objects and read data, they also manage logistical sequences with rewritable electronic data storage units/SmartLabels. This means that your product has what might be called an electronic delivery note, by means of which you or your customers immediately have all necessary information to hand – at all times and everywhere, seamlessly and fully automatically. And best of all, if you need to, you can even identify several data memories at once and process the data selectively. This works reliably and in harsh environments, including reads through wood, plastic, paper or non-metallic materials.

Variety of data storage units
A broad range of SmartLabels is available – some of them conforming to ISO 15693 or ISO 18000-4. The MOBY D RFID system is based on the standard ISO 15693 and allows the use of SmartLabels from different manufacturers.

Mobile and flexible with handheld terminals
The mobile handheld terminal that is available for the MOBY identification systems gives you even greater flexibility. It enables data from data storage units/SmartLabels to be read or modified locally without contact. The mobile handheld terminal can be used as a data collector or also be connected to the host by radio or IR. The optional function library can also be used to create your own specific screen menus.

Customer-specific SmartLabels/antennas
If you have high-volume applications, we can develop cost-efficient SmartLabels/data memories for you that are precisely tailored to meet your requirements. If necessary, we can also provide you with a tailor-made antenna (for example a gate antenna) specially designed for your application.
SIMATIC Sensors
Sensors for factory automation

Sensors are the ears and eyes of machines and systems on which automated manufacturing processes are running. SIMATIC Sensors from Siemens comprise a complete range of sensor systems for a wide variety of applications in the manufacturing industry:

- Proximity switches for reliable detection of objects,
- RF identification systems for product recognition and tracking,
- Image processing systems for quality assurance and safety sensors for personnel and machine protection in hazardous areas.

With innovative, intelligent products that are integrated in Totally Integrated Automation, SIMATIC Sensors ensure increased productivity, availability, efficiency and cost effectiveness.

Comprehensive information and expertise at your service!
- Product information on SIMATIC Sensors: www.siemens.com/simatic-sensors
- SIMATIC Sensors success stories: www.siemens.com/simatic-sensors/references
- Ordering on the Internet: www.siemens.com/automationmall
- Your personal contact partner - at an office near you: www.siemens.com/automationpartner
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An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract. Availability and technical specifications are subject to change without notice.