RFID Systems SIMATIC RF

for optimization of material flow and logistics

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SIMATIC Sensors

Answers for industry.

SIEMENS

RFID Systems SIMATIC RF

for optimization of material flow and logistics

The clever electronic RFID 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, and thus control and optimize production and the flow of material, and provide for efficient logistics processes.

Users of RFID systems have very specific 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. In transport logistics, however, transponders with a long range are an essential component.

Suitable for every application:

- Assembly lines
- Conveyor systems
- Industrial manufacturing
- Warehouses
- Logistics
- Distribution
- Commissioning
- Transport logistics

RFID systems from Siemens are well-proven over many years and are running in many different applications, safely and reliably, round the clock. Successful industrial manufacturing companies worldwide rely on the RFID systems from Siemens – and have done so for more than 25 years.

Highlights

- Fully automatic and high-speed identification with 100% transmission integrity
- Production and quality data can be stored directly on the product
- Designed to meet the harsh environments of industry (temperature and contamination)
- Wide range of tags that can be reused anytime from Smartlabels to transponders with 64 KByte
- Flexible communication with the automation system: serial, via PROFIBUS, PROFINET or Ethernet
- Seamless integration into SIMATIC reduces engineering costs
- Supports the standards ISO 14443, ISO 15693, ISO 18000-4 as well as EPCglobal and ISO/IEC 18000-6

RFID system	MOBY E	SIMATIC RF300	MOBY D	SIMATIC RF600	MOBY U
Frequency	13.56 MHz	13.56 MHz	13.56 MHz	865 to 868 MHz (Europe) 902 to 928 MHz (North America)	2.4 GHz
Read/write distance	Up to 0.1 m	Up to 2.0 m	Up to 0.9 m	up to 10 m (2 x 2 antennas, mounted on opposite sides)	Up to 3.0 m
Standards	ISO 14443	ISO 15693	ISO 15693 ISO 18000-3	EPC Gen 1, EPC Gen 2, ISO 18000-6B, ISO 18000-6C	ISO 18000-4

RFID Systems SIMATIC RF

The RFID operating principle

Compared with conventional identification systems, the RFID systems from Siemens offer a wide range of benefits:

High degree of reliability through contact-free data transmission, mobile data storage units (tags/transponders) for centralized or distributed data storage as well as the uniform system integration ensure quick and easy integration in the application – this saves time and costs.

Our RFID systems ensure that meaningful data are tied to a product or object from the very beginning. The mobile data storage units are attached to the product, product carrier, object or its shipping 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 in the distribution center.

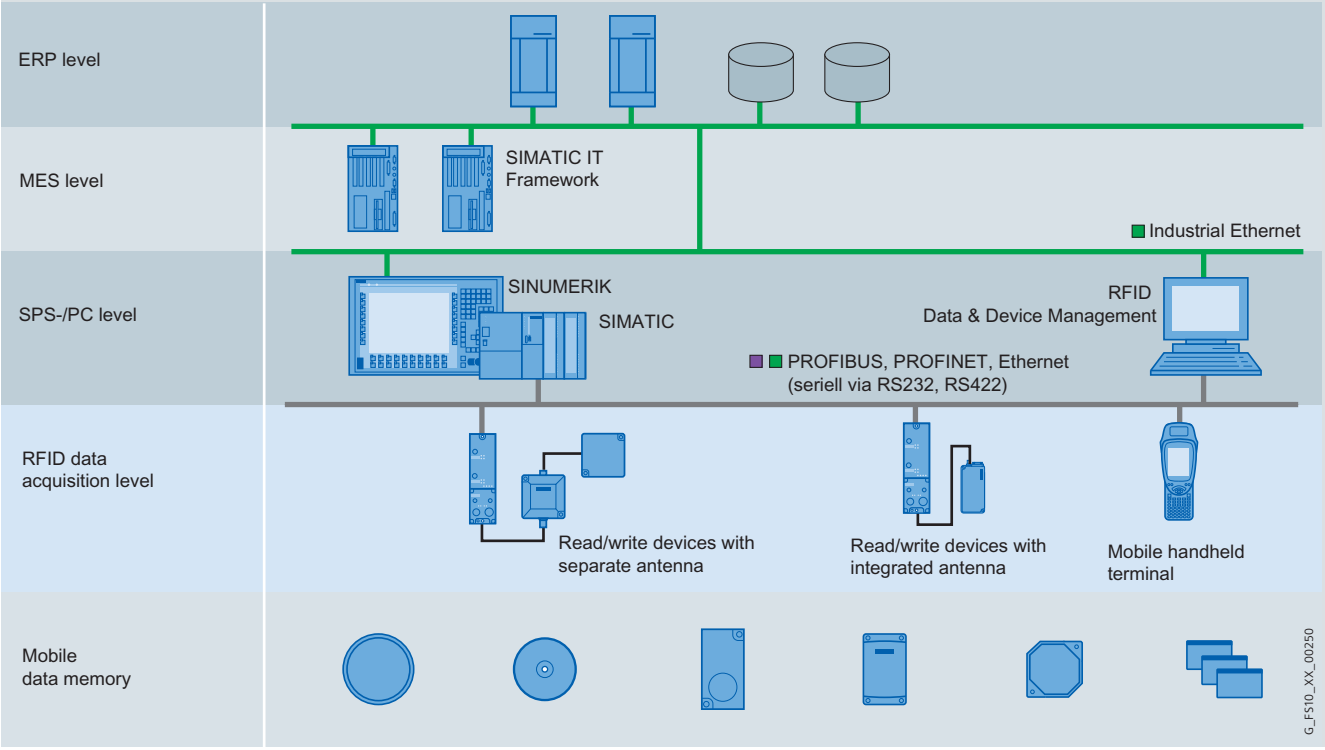
Up to 64 KByte of data can be stored and individually read and supplemented when required at the various steps in the manufacturing process. This all means that the flow of material and data is synchronized optimally.

Perfectly matched components

- Mobile data storage units
- Read/write devices as well as mobile handheld terminals
- Antennas
- Communication modules for connection to the automation system (PROFIBUS, PROFINET, Ethernet)
- Software for system integration

Flexible system integration

No matter what the requirements are: SIMATIC RF 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 communication 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 SIMATIC RF

Maximum data transparency for greater efficiency

Fiercer competition, stricter standards and legal regulations, shorter product life cycles, more individual customer requirements: companies must assert themselves in ever more dynamic markets. In addition, due to increasing globalization, more and more closed value added chains are reaching their limits and are being replaced by global networks. This also places greater demands on the supply chain. There is a demand for greater efficiency in tracking and tracing, asset management and production control.
The prerequisite for this is: maximum data transparency – with RFID (Radio Frequency Identification).

Automatic yet flexible:

Production control
- Integrated solutions through the use of standards
- Accessible mounting locations due to extended read/write ranges
- Identification of workpiece holders or products

The right part in the right place at the right time:

Material flow control
- Optimized inventory management
- Minimization of storage quantities
- Automatic, synchronous feeding of parts or components

100% traceability:

Tracking & tracing
- Improved product quality
- Focused after-sales support (e.g. product recalls)
- Observation of legal regulations

Keeping an overview:

Asset management
- Increased rate of inventory turnover
- Reduction of inventory and less need for replenishment
- Increase of availability

Commanding global logistics:

Supply chain management
- Greater transparency in logistics
- Improved options for process control
- Support of new logistics concepts

RFID Systems SIMATIC RF

System overview

RFID systems can be used in a wide range of different applications. Identification is performed either directly on the object or indirectly via the workpiece holder, skid, container, box, pallet or outer packaging.
Depending on the application, the transponders are either reused (closed loop) or they remain permanently attached to the object (open loop).

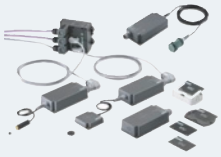
Other important selection criteria for RFID systems are frequency range, data throughput, memory size, working range, standards, type of construction, transponder costs or bulk capability.

	Production control	Material flow	Tracking & tracing	Asset management	Supply chain
					
MOBY E	• medium data throughput • medium-sized memory • short range • indirect identification • closed loop	• short range • small-sized memory • indirect identification • closed loop			
RF300	• high data throughput • large memory • short range • indirect identification • closed loop	• medium range • small-sized memory • indirect identification • closed loop			
MOBY D		• medium range • indirect identification • closed loop	• cost-efficient data carrier • open standard • direct identification • open loop	• cost-efficient data carrier • open standard • direct identification • closed loop	
RF600	• open standard • medium range • small-sized memory • direct identification • closed loop/ open loop	• long range • small-sized memory • direct/indirect identification • closed loop	• open standard • cost-efficient data carrier • direct identification • open loop	• Long range • Open standard • Cost-efficient data carrier • Direct identification • Closed loop	• cost-efficient data carrier • open standard • long range • mass recording • indirect identification • open loop
MOBY U	• long range • large memory • high data throughput • direct identification • closed loop				

Due to the different application requirements and the versatile nature of our RFID systems, individual system design advice is usually recommended. The RFID specialists in our application support department are available for this purpose. Please contact your Siemens representative.

RFID systems in the HF range

Technology overview

RFID system	MOBY E				SIMATIC RF300	
						
Read/write distance	Up to 100 mm				Up to 200 mm	
Data transmission rate						
■ Reading	Typically 400 byte/s				Typically 3 Kbyte/s, (ISO mode typ. 0.6 Kbyte/s)	
■ Writing	Typically 350 byte/s				Typically 3 Kbyte/s, (ISO mode typ. 0.4 Kbyte/s)	
Memory	EEPROM				FRAM / EEPROM	
Standards	ISO 14443-A				ISO 15693	
Approvals	CE, UL, FCC, CSA				CE, UL, FCC, CSA	
Bulk capability	■ (only with SIM)				No	
Multitag capability	■ (only with SIM)				No	
Frequency	13.56 MHz				13.56 MHz	
Mobile data storage units (tags)	**Designation**	**Memory size**	**Operating temperature**	**Degree of protection**	**Designation**	**Memory size**
	MDS E600	752 byte	-25 ... +60 °C	IP68	RF320T	20 byte
	MDS E624	752 byte	-25 ... +125 °C	IP67/IPX9K	RF340T	8 Kbyte
	MDS E611	752 byte	-25 ... +75 °C	IP67	RF350T	32 Kbyte
	MDS E623	752 byte	-25 ... +85 °C	IP67/IPX9K	RF360T	8 Kbyte
					RF370T	32 Kbyte/64 Kbyte
					RF380T	32 Kbyte
					MDS D100	112 byte
					MDS D124	112 byte
					MDS D139	112 byte
					MDS D160	112 byte
					MDS D324	992 byte
Read/write devices	**Designation**	**Operating temperature**		**Degree of protection**	**Designation**	**Operating temperature**
■ Stationary, with detached antenna	SIM 70 with ANT 0	-25 ... +70°C		IP65/67	RF350R	-25 ... +70°C
	SIM 70 with ANT 1	-25 ... +70°C		IP65/67		
	SLG 75	-25 ... +70°C		IP65		
■ Stationary, with integrated antenna	SLG 72	-25 ... +70°C		IP65	RF310R	-25 ... +70 °C
	SIM 72	-25 ... +70°C		IP65	RF340R	-25 ... +70 °C
					RF380R	-10 ... +70 °C
■ Mobile handheld terminal with integrated antenna	STG E	-20 ... +60 °C		IP54	RF310M	-10 ... +50°C
Antennas	**Designation**	**Operating temperature**		**Degree of protection**	**Designation**	**Ambient temperature**
	SLA 71	-25 ... +70°C		IP67	ANT 1	-25 ... +70°C
	ANT 1	-25 ... +70°C		IP67	ANT 18	-25 ... +70°C
	ANT 4	-25 ... +70°C		IP67	ANT 30	-25 ... +70°C
	ANT 12	-25 ... +70°C		IP67		
	ANT 18	-25 ... +70°C		IP67		
	ANT 30	-25 ... +70°C		IP67		
Connection to the automation system						
■ Direct	Serial interface to other controllers, PCs, any other systems				Serial interface to other controllers, PCs, any	
■ Via communication module (ASM)	SIMATIC S7-300, S7-400; PROFIBUS DP; PROFINET; Serial interface to other controllers, PCs, any other systems				SIMATIC S7-300, S7-400; PROFIBUS DP; PROFINET	
Product selection code	**6GT23**				**6GT280**	

		MOBY D				RFID system
						
		Up to 680 mm (900 mm with customer-specific antenna)				Read/write distance
		Typically 600 byte/s EEPROM: Typically 200 byte/s; FRAM: Typically 500 byte/s				Data transmission rate ■ Reading ■ Writing
		FRAM / EEPROM				Memory
		ISO 15693, ISO 18000-4				Standards
		CE, UL, FCC, CSA				Approvals
		■ (PC variant with RS 232)				Bulk capability
		■ (PC variant with RS 232)				Multitag capability
		13.56 MHz				Frequency
Operating temperature	**Degree of protection**	**Designation**	**Memory size**	**Operating tempera-ture**	**Degree of protec-tion**	**Mobile data storage units (tags)**
-25 ... +125 °C -25 ... +85 °C -25 ... +85 °C -25 ... +75 °C -25 ... +85 °C -25 ... +110 °C (+220 °C cyclic) -25 ... +80 °C -25 ... +125 °C -25 ... +220 °C -25 ... +85 °C -25 ... +125°C	IP67/IPX9K IP68/IPX9K IP68 IP67 IP68 IP68 IP68 IP67 IP68 IP68 IP67	MDS D100 MDS D124 MDS D139 MDS D160 MDS D324 Smart Label (customer-specific version for large quantities)	112 byte 112 byte 112 byte 112 byte 992 byte 112/256 byte	-25 ... +80 °C -25 ... +125 °C -25 ... +220 °C -25 ... +175 °C -25 ... +125 °C -25 ... +85 °C	IP68 IP67 IP68 IP68 IP67 IP65	
	Degree of protection	**Designation**	**Operating temperature**		**Degree of protection**	**Read/write devices**
	IP65	SLG D10 SLG D10S SLG D11 ANT D5 SLG D11S ANT D5	-20 ... +55°C -20 ... +55°C -25 ... +55°C -25 ... +55°C		IP65 IP65 IP65 IP65	■ Stationary, with detached antenna
	IP67 IP67 IP67	SLG D12 SLG D12S	-25 ... +55°C -25 ... +55°C		IP65 IP65	■ Stationary, with integrated antenna
	IP65	STG D	-20 ... +60 °C		IP54	■ Mobile handheld terminal with integrated antenna
	Degree of protection	**Designation**	**Ambient temperature**		**Degree of protection**	**Antennas**
	IP65 IP65 IP65	ANT D2 ANT D5 ANT D6 ANT D10	-20 ... +70 °C -20 ... +55 °C -20 ... +55 °C -20 ... +55 °C		IP65 IP65 IP65 IP65	
						Connection to the automation system
other systems		Serial interface to other controllers, PCs, any other systems				■ Direct
		SIMATIC S7-300, S7-400; PROFIBUS DP; PROFINET, Ethernet (TCP/IP)				■ Via communication module (ASM)
		6GT26				**Product selection code**

RFID systems in the UHF range

Technology overview

RFID system	SIMATIC RF600			
				
Read/write distance	Up to 10 m (2 x 2 antennas, mounted on opposite sides)			
Data transmission rate				
■ Reading	EPC Gen 2, a max. of 160 Kbit/s; ISO 18000-6B, a max. of 160 bit/s			
■ Writing	EPC Gen 2, a max. of 128 Kbit/s; ISO 18000-6B, a max. of 40 bit/s			
Memory				
Standards	EPC Gen 1, EPC Gen 2, ISO 18000-6B, ISO 18000-6C			
Approvals	CE, UL, FCC			
Bulk capability	■			
Multitag capability	■			
Frequency	865 to 868 MHz (Europe), 902 to 928 MHz (USA)			
Mobile data storage units (tags)	**Designation**	**Memory size**	**Operating temperature**	**Degree of protection**
	RF630L	EPC 96/240 bit, additional memory 512 bit	-40 ... +65 °C up to +80 °C (200 cycles)	–
	RF620T	EPC 96 bit	-25 ... +80 °C	IP67
	RF630T	EPC 96/240 bit, additional memory 512 bit	-25 ... +85 °C	IP68/IPX9K
	RF640T	EPC 96/240 bit, additional memory 512 bit	-25 ... +85 °C	IP68/IPX9K
	RF680T	EPC 96/240 bit, additional memory 512 bit	-25 ... +100 °C, up to 220 °C cyclically	IP68/IPX9K
Read/write devices	**Designation**	**Operating temperature**	**Degree of protection**	
■ Stationary, with detached antenna	RF630R	-25 ... +55 °C	IP65	
	RF660R	-25 ... +55 °C	IP65	
■ Stationary, with integrated antenna	RF620R	-20 ... +55 °C	IP65	
■ Mobile handheld terminal with integrated antenna	RF610M	-10 ... +50 °C	IP56	
Antennas	**Designation**	**Operating temperature**	**Degree of protection**	
	RF660A	-25 ... +75 °C	IP67	
Connection to the automation system				
■ Direct	Ethernet (TCP/IP); Serial interface to other controllers, PCs, any other systems			
■ Via communication module (ASM)	SIMATIC S7-300, S7-400; PROFIBUS DP			
Product selection code	**6GT281**			

RFID systems in the microwave range

Technology overview

MOBY U				RFID system
				
150 mm to 3000 mm				Read/write distance
				Data transmission rate
Typically 8 KByte/s				■ Reading
Typically 4.8 KByte/s without bulk				■ Writing
RAM				Memory
ISO 18000-4				Standards
EN 330 440-2, FCC Part 15C (USA), UL/CSA				Approvals
■				Bulk capability
■				Multitag capability
2.4 GHz				Frequency
Designation	**Memory size**	**Operating temperature**	**Degree of protection**	**Mobile data storage units (tags)**
MDS U315	2 KByte RAM	-25 ... +70 °C	IP65	
MDS U524	32 KByte RAM	-25 ... +85 °C	IP68/IPX9K	
MDS U525	32 KByte RAM	-25 ... +85 °C	IP65	
MDS U589	32 KByte RAM	-25 ... +85 °C, up to +220 °C cyclically	IP68	
MDS U Service	32 KByte RAM	-25 ... +70 °C	IP40	
Designation		**Operating temperature**	**Degree of protection**	**Read/write devices**
				■ Stationary, with detached antenna
SLG U92		-25 ... +70°C	IP65	■ Stationary, with integrated antenna
STG U		-20 ... +60 °C	IP54	■ Mobile handheld terminal with integrated antenna
Designation		**Operating temperature**	**Degree of protection**	**Antennas**
				Connection to the automation system
Serial interface to other controllers, PCs, any other systems				■ Direct
SIMATIC S7-300, S7-400; PROFIBUS DP; Ethernet (TCP/IP); PROFINET				■ Via communication module (ASM)
6GT25				**Product selection code**

SIMATIC RF-MANAGER software

Technology overview

With our SIMATIC RF-MANAGER, we are offering a totally integrated software solution for read/write devices of the SIMATIC RF600 RFID system, from the acquisition level through to the ERP and MES level.
Compatible with the EPCglobal standards, SIMATIC RF-MANAGER stands for efficient engineering and smooth operation. What possibilities does this open up for you? You can commission readers quickly and simply, preprocess tag data effectively, manage individual devices – and save significant time and overhead!

	RF-MANAGER Engineering System	RF-MANAGER Runtime
General data		
Current version	2008, Service Pack 1	
Supported devices	All read/write devices from the SIMATIC RF600 and SIMATIC RF300 product ranges	
Target systems	Standard PC	Standard PC, SIMATIC Microbox PC 420, SIMATIC Microbox PC 427B,
Languages		
Documentation / configuration software / runtime software	English, German	
Hardware and software requirements		
Operating system	Windows XP Professional/SP2	Windows XP Professional/SP2 (standard PC) Windows XP Embedded/SP2 (SIMATIC Microbox)
Processor	Pentium 4 with 1.6 GHz processor, or higher	Pentium 3 with 933 MHz processor, or higher
Graphics		
Resolution	at least 1024 x 768; recommended: 1280 x 1024	at least 640 x 480
Colors, at least	256	256
RAM	at least 1.0 GB; recommended: 2.0 GB	at least 512 MB; recommended: 1.0 GB
Spare memory / hard disk	at least 1.5 GB	at least 512 MB (standard PC), CF card with at least 512 MB (SIMATIC Microbox)
Additional hardware	CD-ROM drive (for software installation)	
Internet browser	Microsoft Internet Explorer V6.0 SP1 / SP2	

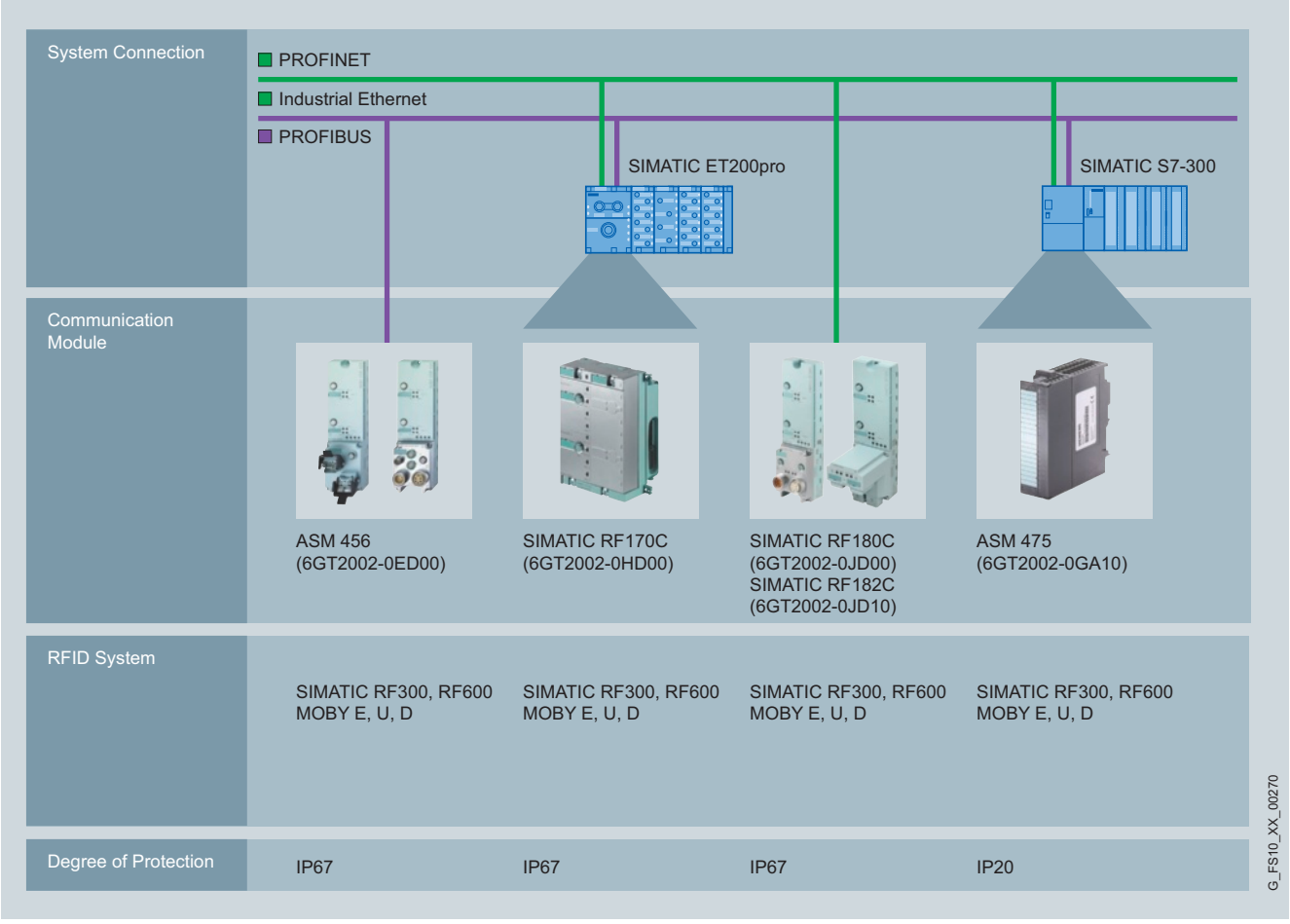
SIMATIC RF communication modules

Technology overview

Whichever RFID system you connect to SIMATIC PLCs, PCs or PLCs from other manufacturers: the communication module performs the necessary adaptation. Communication modules can be implemented in both manufacturing and logistics. The readers of all RFID systems can be operated in the same manner using the function block FC/FB 45. This ensures that existing RFID applications can continue to be used, and do not need to be rewritten, as soon as another reader type is implemented.

Highlights

- Optimal integration in the SIMATIC world (TIA)
- Different connector concepts (e.g. M12, RJ45, AIDA or ECOFAST) for integration in the application
- Comprehensive diagnostics functions
- Firmware update through SIMATIC Manager
- All RFID systems are programmed easily and identically in the SIMATIC PLC
- Easy, high-level management of all RFID components through the Identification & Maintenance functions
- RFID systems can be connected to the PC and PLCs from other manufacturers due to support for the RFID standard profile (PROFIBUS & PROFINET International)



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