

Industrial Identification Systems

Catalog ID 10 • 2011



SIMATIC Ident

Answers for industry.

SIEMENS

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SIMATIC Ident Industrial Identification Systems

Catalog ID 10 · 2011



The products and systems described in this catalog are manufactured/distributed under application of a certified quality management system in accordance with DIN EN ISO 9001. The certificate is recognized by all IQNet countries.

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Refer to the Industry Mall for current updates of this catalog:

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The products contained in this catalog can also be found in the Interactive Catalog CA 01.

Order No.:

E86060-D4001-A500-C9-7600

Please contact your local Siemens branch

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Introduction

Answers for Industry
Totally Integrated Automation
SIMATIC Ident

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MOBY U

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RFID standard cable

RFID software

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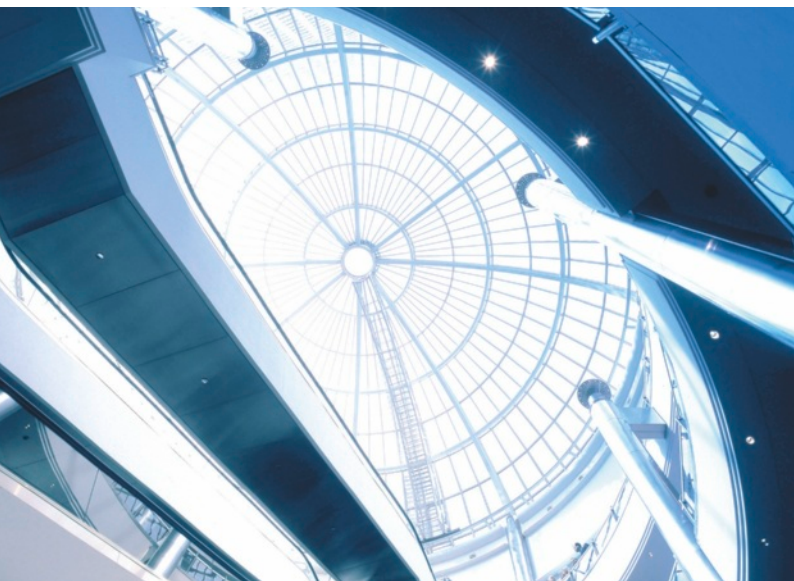
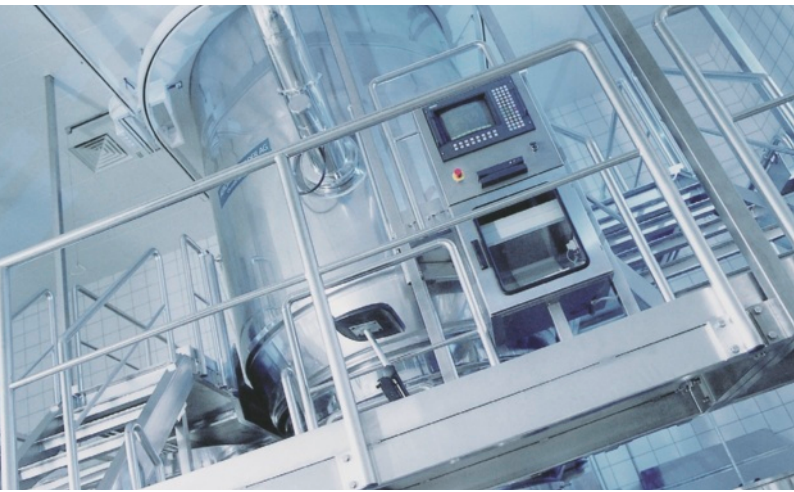
Code reading systems

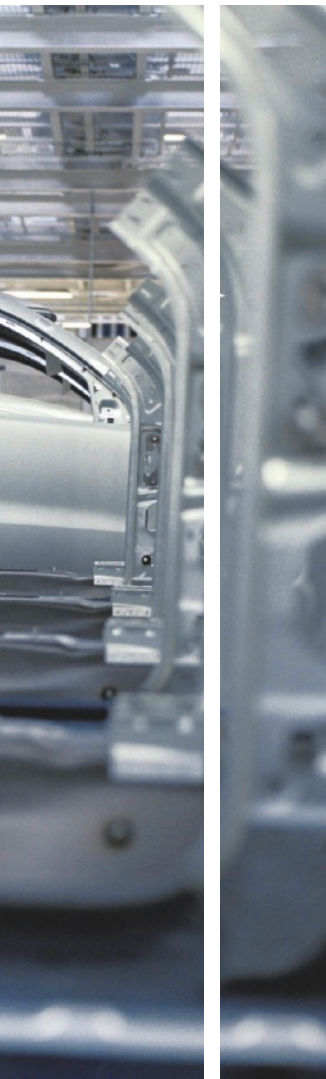
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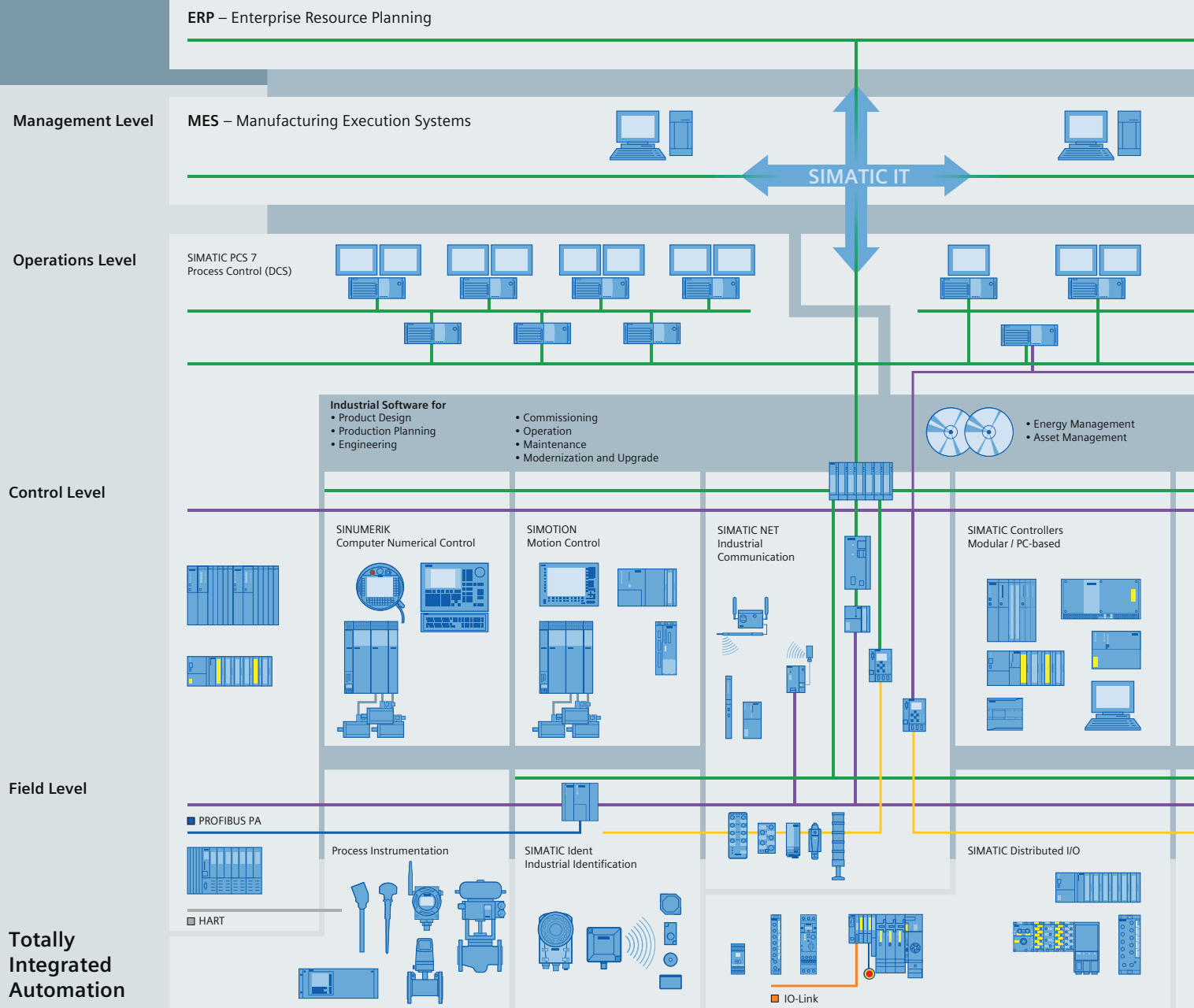
Answers for industry.

Siemens Industry answers the challenges in the manufacturing and the process industry as well as in the building automation business. Our drive and automation solutions based on Totally Integrated Automation (TIA) and Totally Integrated Power (TIP) are employed in all kinds of industry. In the manufacturing and the process industry. In industrial as well as in functional buildings.

Siemens offers automation, drive, and low-voltage switching technology as well as industrial software from standard products up to entire industry solutions. The industry software enables our industry customers to optimize the entire value chain – from product design and development through manufacture and sales up to after-sales service. Our electrical and mechanical components offer integrated technologies for the entire drive train – from couplings to gear units, from motors to control and drive solutions for all engineering industries. Our technology platform TIP offers robust solutions for power distribution.

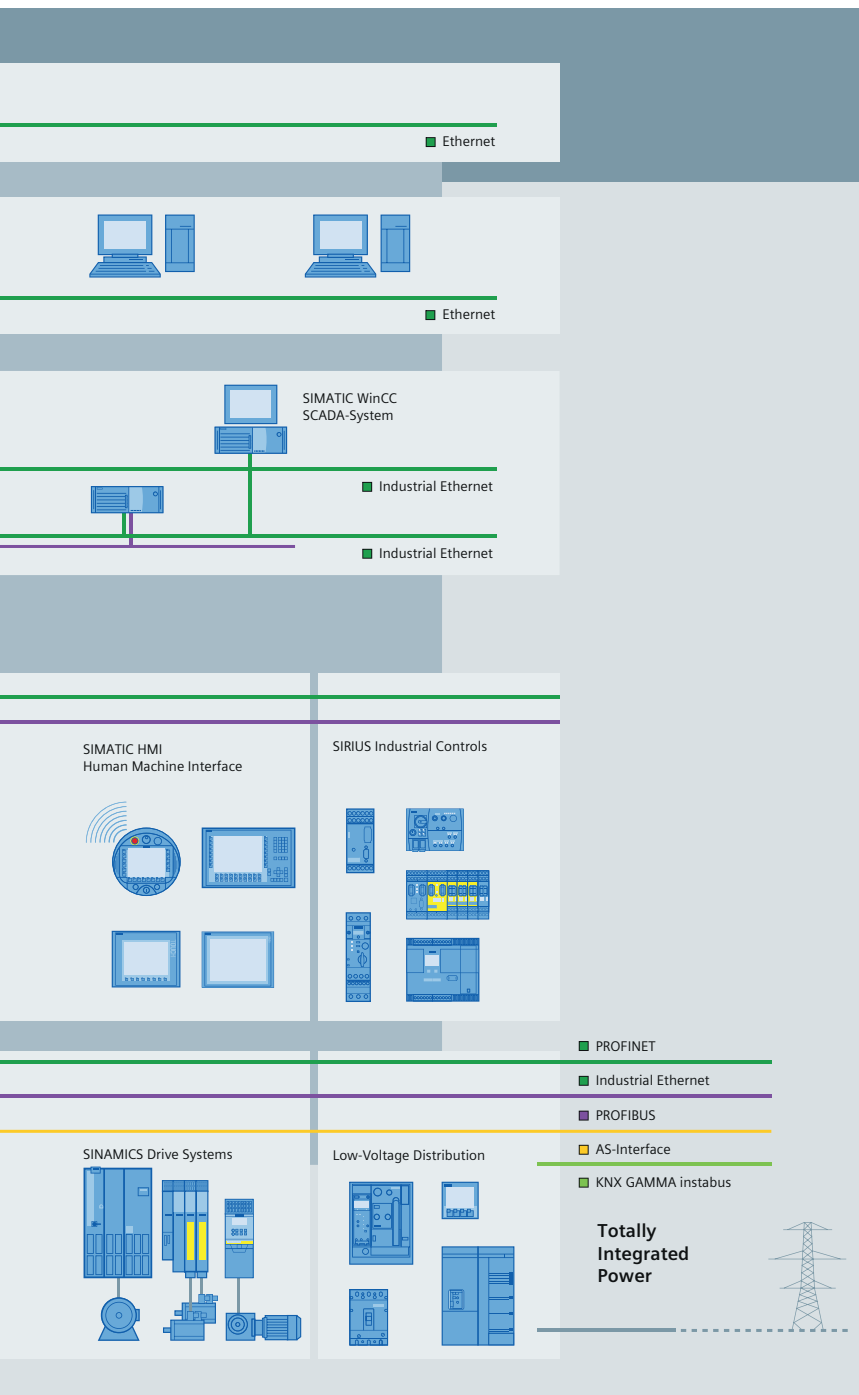
The high quality of our products sets industry-wide benchmarks. High environmental aims are part of our eco-management, and we implement these aims consistently. Right from product design, possible effects on the environment are examined. Hence many of our products and systems are RoHS compliant (Restriction of Hazardous Substances). As a matter of course, our production sites are certified according to DIN EN ISO 14001, but to us, environmental protection also means most efficient utilization of valuable resources. The best example are our energy-efficient drives with energy savings up to 60 %.

Check out the opportunities our automation and drive solutions provide. And discover how you can sustainably enhance your competitive edge with us.



Setting standards in productivity and competitiveness.

Totally Integrated Automation.



TIA is characterized by its unique continuity.

It provides maximum transparency at all levels with reduced interfacing requirements – covering the field level, production control level, up to the corporate management level. With TIA you also profit throughout the complete life cycle of your plant – starting with the initial planning steps through operation up to modernization, where we offer a high measure of investment security resulting from continuity in the further development of our products and from reducing the number of interfaces to a minimum.

The unique continuity is already a defined characteristic at the development stage of our products and systems.

The result: maximum interoperability – covering the controller, HMI, drives, up to the process control system. This reduces the complexity of the automation solution in your plant. You will experience this, for example, in the engineering phase of the automation solution in the form of reduced time requirements and cost, or during operation using the continuous diagnostics facilities of Totally Integrated Automation for increasing the availability of your plant.

Thanks to Totally Integrated Automation, Siemens provides an integrated basis for the implementation of customized automation solutions – in all industries from inbound to outbound.

SIMATIC Ident – for more economic production and logistics processes

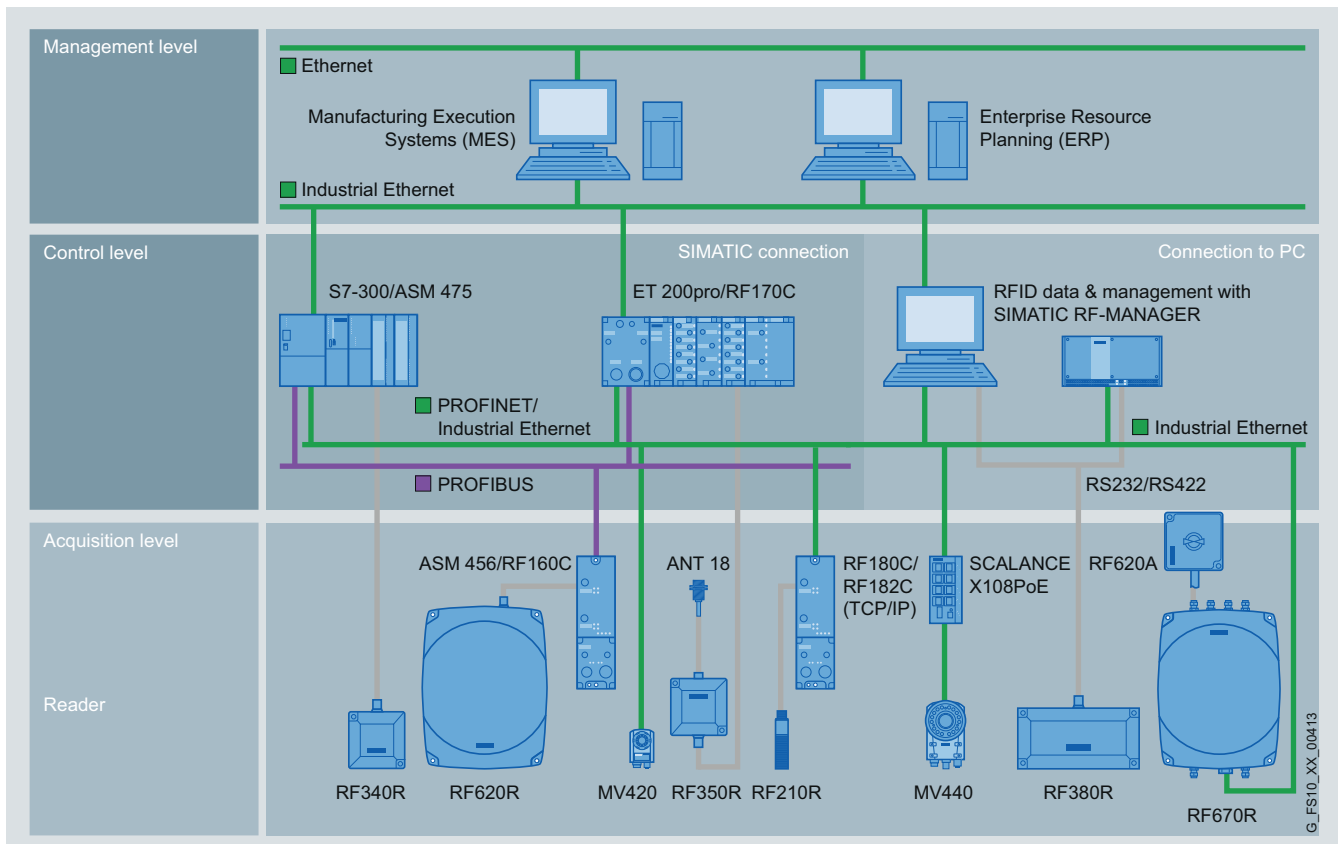
Fiercer competition, stricter standards and legal regulations, shorter product life cycles, more individual customer requirements and increasingly globalized value-adding chains: to stay ahead in dynamic markets, companies must increase the efficiency of their value-adding chains - in production control, asset management, tracking & tracing as well as in supply chain management. Through the use of innovative identification technology, companies gain an important advantage.

But what is best: RFID or optical code reading systems? What is the right technology for the specific application? Where is alternative use relevant, where is joint use relevant, and how flexibly will you be able to respond to different requirements? Siemens can help you here. With SIMATIC Ident, we are offering you a comprehensive portfolio that covers all aspects of industrial identification, supplies you with the perfect solution for your requirements, and gives you flexibility for the future

Both technologies build a single system

The right identification technology depends on factors such as sensing distance, lighting conditions, single or repeat markings, as well as environmental effects such as temperature and pollution. Depending on the application, optical and RFID systems can be used in the same production line alongside each other in the form of a hybrid solution, e.g. DMC for direct part marking on the product and RFID for pallets or workpiece carriers.

In this case, seamless interlinking of both technologies is necessary. With our SIMATIC Ident portfolio we can offer you the right solution for this: using joint communication modules and function blocks, connection of optical and RFID systems to the SIMATIC PLC is simple. This ensures that you have a system-wide, uniform software architecture and saves considerable outlay and costs in engineering, commissioning and maintenance



Identification systems: RFID and optical codes

Whether barcode, DMC, RFID or OCR: every technology has its specific strengths. Character recognition is used for cases in which codes must also be readable by persons, such as use-by dates.

2D codes and RFID impress customers with their high level of data security and have proved reliable even under harsh industrial conditions. The decisive criterion for an identification system: your individual application.



Verification, identification: Code reading systems

When higher performance is required, 2D codes are recommended as an alternative to barcodes, because they offer greater memory capacity and a better read rate. They can be applied inexpensively, e.g. together with shipping labels. They also enable the products to be marked directly (Direct Part Marking, DPM) using lasers, printing or nail punching, which is extremely resistant to external influences. 2D codes can be read with complete reliability even from a small viewing angle or under difficult lighting conditions.

With SIMATIC code reading systems, we offer you the ideal solution for reading and verifying 1D and 2D codes as well as for text recognition (OCR) - for the reliable tracing of production batches beyond the manufacturing plant



Identification, mobile data storage: RFID

RFID is the ideal solution when there is no line of sight between the reader and the marking, large volumes of data or wide ranges are required, or the stored information has to be changed. Here the product or object is fitted with a memory chip that can be programmed and read using radio techniques. With low-cost Smart Labels available for logistics, rugged data memories for assembly lines as well as transponders with a wide range, RFID is perfectly suited to a variety of different applications.

Our intelligent SIMATIC RF system family offers you transparency without gaps. Data is therefore available at any time along the complete production and distribution chain - for perfect control and optimization of material flow and logistics.



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When you have sent the order, you will receive a short e-mail confirmation which you can print out or save. With a click on "Carrier", you will be directly connected to the website of the carrier where you can easily track the delivery status.

Added value due to additional information

So you have found your product and want more information about it? In just a few clicks of the mouse, you will arrive at the image data base, manuals and operating instructions. Create your own user documentation with My Documentation Manager. Also available are FAQs, software downloads, certificates and technical data sheets as well as our training programs. In the image database you will find, depending on the product, 2D/3D graphics, dimension drawings and exploded drawings, characteristic curves or circuit diagrams which you can download.

Convinced? We look forward to your visit!

RFID systems for the HF frequency range



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RFID systems

Introduction

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Overview



RFID systems – for optimization of material flow and logistics

As the world-leading supplier of RFID systems, Siemens offers a unique scalable portfolio for flexible and cost-effective solutions.

RFID systems are offered for the most diverse requirements on performance, range, frequency range as well as HF and UHF.

Easy integration of the RFID systems via communication modules and pre-configured software blocks in the world of Totally Integrated Automation significantly reduces the outlay and costs for commissioning, diagnostics and maintenance.

Thanks to many years of experience in the area of RFID, Siemens is a competent partner for implementation of the most diverse solutions in all sectors, but especially in the areas of production and logistics.

Meaningful data from the outset

The RFID systems ensure that meaningful data accompanies a product or object from the very beginning. The transponders are attached to the product, product carrier, object, or its transport or packing unit and are written to contact-free. This means that all the application-specific data is located on the transponder. This is true whether you are dealing with vehicle body parts in the automotive industry or order picking boxes. Up to 64 KB of data can be stored and individually read and supplemented when required at the various workstations or manufacturing stations. This all means that the flow of material and data is synchronized optimally.

Contactless data transfer and a high degree of industrial compatibility

Powerful readers (read/write devices) in various rugged designs ensure fast and reliable data transfer between the transponders and the higher-level systems (e.g. PLC, PC).

The data and power are transmitted inductively by an electromagnetic alternating field or by radio waves. This principle of contactless data transfer works reliably in the presence of contamination or through non-metallic materials.

Perfectly matched components

The RFID systems consist of perfectly matched individual components:

- Transponder
- Readers
- Antennas
- Communication modules for connection to the automation system (e.g., PROFIBUS, PROFINET)
- Software for system integration

For a wide range of applications in all sectors

- Production control
- Asset management
- Tracking & tracing
- Supply chain

Wide range of transponders

A wide range of different transponders is available using a variety of storage technologies (fixed code, EEPROM or FRAM/SRAM) and geometric designs. Their strength is not only their high level of data security but also the excellent high degree of protection against ambient conditions such as contamination, temperature fluctuations, washing water or shock load.

Flexible system integration

A wide range of communication modules, function blocks, as well as high-performance drivers and function libraries permits easy and quick integration into the application.

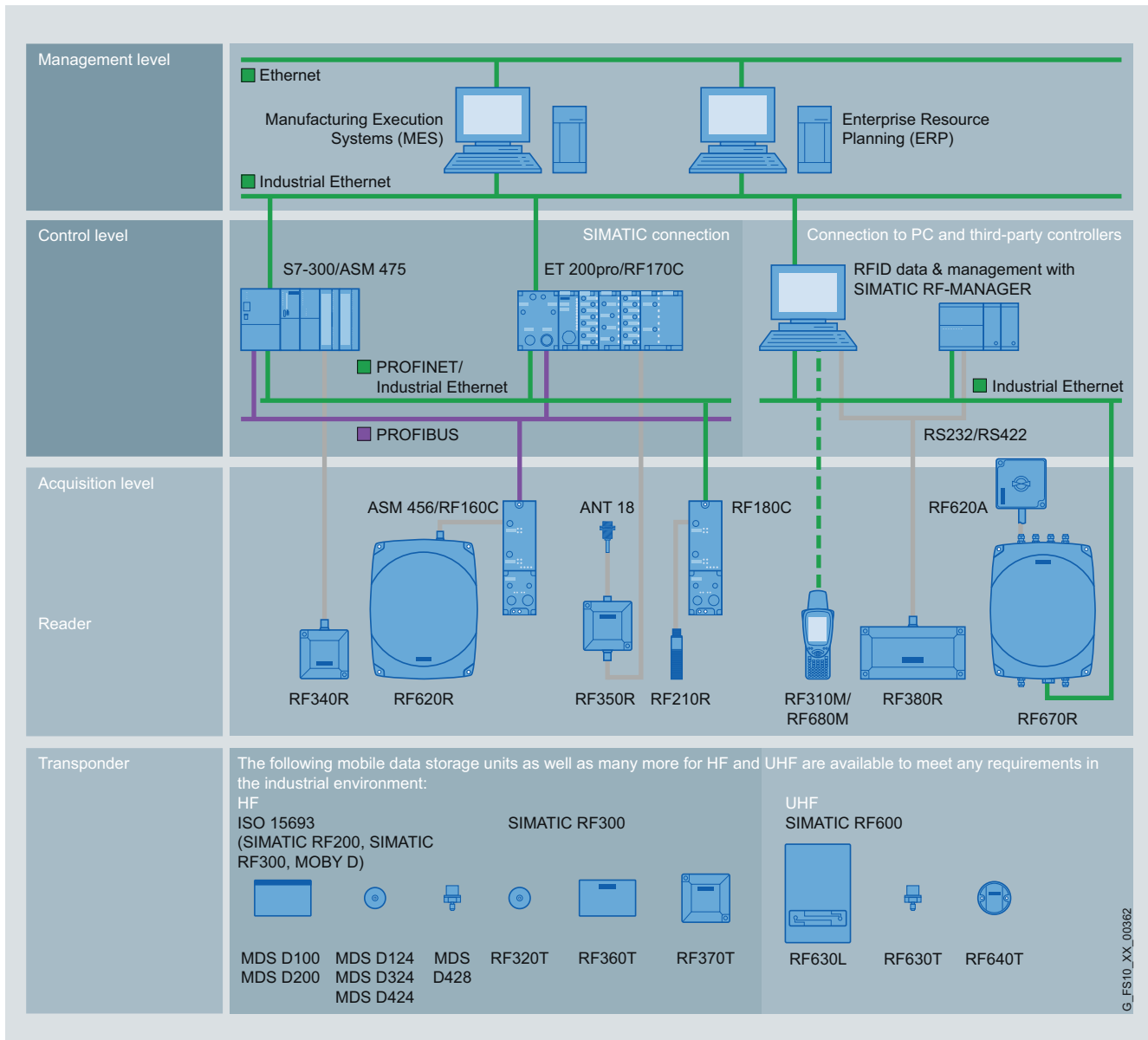
And best of all: SIMATIC RFID is part of Totally Integrated Automation and can be integrated easily and cost-effectively into the SIMATIC world.

For more details on the connection possibilities, see chapter 5 under "Communication modules".

Benefits

- Flexible and economic solutions thanks to the complete and scalable portfolio for the field of industrial identification.
- Simplified engineering, commissioning, diagnostics and maintenance through seamless integration into Totally Integrated Automation:
 - Integrated bus connection to an automation system, such as SIMATIC, SIMOTION or SINUMERIK via communication modules with PROFIBUS and PROFINET.
 - Simple S7 software integration via ready-to-use function blocks.
 - Integrated diagnostic functions.
- High degree of investment protection thanks to:
 - Open standards (e.g. ISO 15693, ISO 18000-6C).
 - Software compatibility between the RFID systems of Siemens AG.
 - Standardized communications interfaces.
- Openness through connection possibilities to different bus systems from different manufacturers and PC environments via communication modules.
- Worldwide Service and Support.

Integration



RFID systems

Introduction

2

Technical specifications

Frequency range	HF		
See chapter	2		
RFID system	SIMATIC RF200	SIMATIC RF300	MOBY D
			
Transmission frequency	13.56 MHz	13.56 MHz	13.56 MHz
Read/write distance, max.	130 mm	210 mm	900 mm
Protocol (air interface)	ISO 15693	RF300 ISO 15693	ISO 15693
Memory capacity, max.	992 byte (EEPROM)/ 2 000 byte (FRAM)	64 KB	992 byte (EEPROM)/ 2 000 byte (FRAM)
Data transmission rate reader – transponder			
• Read, max.	1.5 KB/s	7.8 KB/s	1.5 KB/s
• Writing, max.	0.5 KB/s	7.8 KB/s	0.5 KB/s
Multitag/Bulk capability	No	No	Yes
Special features	- Particularly compact designs - For particularly low-cost RFID solutions	- High data transmission rate - Extended diagnostic possibilities	- SIMATIC or PC/IT integration - Long sensing ranges with excellent interference immunity - External antennas for industrial applications

Frequency range	UHF	Microwave range
See chapter	3	4
RFID system	SIMATIC RF600	MOBY U
		
Transmission frequency	865 ... 868 MHz (ETSI) 902 ... 928 MHz (FCC)	2.4 GHz
Read/write distance, max.	5 m	3 m
Protocol (air interface)	EPCglobal Class 1 Gen 2 ISO 18000-6C	ISO 18000-4
Memory capacity, max.	96 / 240 bit EPC 512 bit user memory	32 KB
Data transmission rate reader – transponder		
• Read, max.	160 kbit/s	8 KB/s
• Write, max.	160 kbit/s	4.8 KB/s
Multitag/Bulk capability	Yes	Yes
Special features	- SIMATIC or PC/IT integration - Configurable data processing in the readers - Special antennas for industrial applications	- Active range limiting - High memory capacity

RFID systems for the HF frequency range

SIMATIC RF200

Overview



The RFID system SIMATIC RF200 is, thanks to its compact and low-cost reader, particularly suitable for use in industrial production in the areas of small assembly lines and intralogistics.

With RF200, identification tasks of medium-performance in the HF range (13.56 MHz, ISO 15693) can be implemented extremely cost effectively. RF200 readers can be operated with all ISO transponders of the product range of MOBY D (MDS Dxxx).

The communication modules that can be used for all MOBY and SIMATIC RF systems (ASM 456, ASM 475, SIMATIC RF1xxC) are available for connecting to SIMATIC S7-300, PROFIBUS, PROFINET and TCP/IP (XML).

The SIMATIC RF200 identification system offers the following features:

- 13.56 MHz operating frequency (operation according to ISO 15693).
- Passive (without battery), maintenance-free transponder (MDS Dxxx) with memory capacities up to 2 000 byte FRAM.
- Rugged, compact components with IP67 degree of protection.
- Simple integration in SIMATIC, PROFIBUS, PROFINET and TCP/IP with the help of tried and tested function blocks (FC44, FC45, FB45).

Benefits

- Price-optimized and compact, space-saving components.
- Operation with the attractively priced and battery-free ISO 15693 transponders of MOBY D for low investment and operating costs.
- Flexible and economic solutions thanks to the complete and scalable portfolio for the field of industrial identification.
- Simplified engineering, commissioning, diagnostics and maintenance through seamless integration into Totally Integrated Automation:
 - Integrated bus connection to an automation system, such as SIMATIC, SIMOTION or SINUMERIK, via communication modules with PROFIBUS and PROFINET
 - Simple S7 software integration via ready-to-use function blocks

- High degree of investment protection thanks to:
 - Open ISO 15693 standard
 - Software compatibility between the RFID systems of Siemens AG
 - Standardized communications interfaces.
- Openness through connection possibilities to different bus systems from different manufacturers and PC environments via communication modules.
- Worldwide Service and Support.

Application

The RFID system SIMATIC RF200 is primarily used for non-contact identification of containers, pallets and workpiece holders where the demands on performance (data transmission rate, memory volume) satisfy the ISO 15693 standard.

The main application areas for SIMATIC RF200 are:

- Assembly and handling systems, assembly lines (identification of workpiece carriers), especially small assembly lines.
- Production logistics (material flow control, identification of containers and other vessels), intralogistics.
- Parts identification (the transponder is attached to the products or pallets).
- Conveyor systems (e.g., suspended monorail).

Integration

A wide range of communication modules, function blocks, as well as high-performance drivers and function libraries permits easy and quick integration into the application.

And best of all: SIMATIC RF200 is part of Totally Integrated Automation and can be integrated easily and cost-effectively into the SIMATIC world.

For more details on the connection possibilities, see chapter 5, under "Communication modules".

Technical specifications

RFID system	SIMATIC RF200
Transmission frequency	13.56 MHz
Read / write distance	Max. 130 mm
Protocol (air interface)	ISO 15693 ISO 18000-3
Memory capacity	Max. 992 bytes (EEPROM) / 2 000 bytes (FRAM)
Data transmission rate reader – transponder	
• Read	Max. 1.5 KB/s
• Write	Max. 0.5 KB/s
Multitag/Bulk capability	No
Special features	• Particularly compact designs • For particularly low-cost RFID solutions

RFID systems for the HF frequency range

SIMATIC RF200

Transponders SIMATIC RF200

Overview



The transponders can be used for the following RFID systems:

- SIMATIC RF200
- SIMATIC RF300 (in ISO 15693 operating mode)
- MOBY D (except MDS D421, MDS D422, MDS D425)

Note

For detailed descriptions and ordering information look up the specified pages.

Transponder	Features	Page
MDS D165	SmartLabel, (PET) in credit card format. Applications range from simple identification such as electronic barcode substitution or supplementation to storage and distribution logistics, right up to product identification. • 112 bytes EEPROM • Up to IP65 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions L x W (mm): 86 x 54	2/42
MDS D261	SmartLabel, (PET) in compact design. Applications range from simple identification such as electronic barcode substitution or supplementation to storage and distribution logistics, right up to product identification. • 256 bytes EEPROM • Up to IP65 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions L x W (mm): 55 x 55	2/42
MDS D100	Universal transponder in credit card format. • 112 bytes EEPROM • IP68 degree of protection • Operating temperature range -25 °C to +80 °C • Dimensions L x W x H (mm): 85.6 x 54 x 0.9	2/43
MDS D200	Universal transponder in credit card format. • 256 bytes EEPROM • IP67 degree of protection • Operating temperature range -20 °C to +60 °C • Dimensions L x W x H (mm): 86 x 54 x 0.8	2/48
MDS D124	Rugged transponder for use in harsh industrial environments and under extreme environmental conditions. • 112 bytes EEPROM • IP68 / IPx9K degree of protection • Operating temperature range -25 °C to +180 °C • Dimensions diameter x height (mm): Ø 27 x 4	2/44

Transponder	Features	Page
MDS D139	Heat-resistant transponder for use in paint shops or applications with high thermal stress. • 112 bytes EEPROM • IP68 / IPx9K degree of protection • Operating temperature range -25 °C to +220 °C • Dimensions diameter x height (mm): Ø 85 x 15	2/46
MDS D160	The transponder has been specially designed for harsh environments in the laundry and cleaning industry. • Its main applications include: - Rented work clothing - Rented laundry - OP textiles, hospital clothing - Hotel laundry - Dirt collection mats • 112 bytes EEPROM • IP68 / IPx9K degree of protection • Operating temperature range -25 °C to +175 °C • Dimensions diameter x height (mm): Ø 16 x 3	2/47
MDS D324	Rugged transponder for use in harsh industrial environments and under extreme environmental conditions. • 992 bytes EEPROM • IP67 degree of protection • Operating temperature range -25 °C to +125 °C • Dimensions diameter x height (mm): Ø 27 x 4	2/49
MDS D424	Rugged transponder for use in production and distribution logistics as well as in assembly and production lines: • 2 000 bytes FRAM • IP67 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions diameter x height (mm): Ø 27 x 4	2/52
MDS D428	Compact and rugged ISO transponder; suitable for screw mounting; for use in assembly and production lines in the powertrain area. • 2 000 bytes FRAM • IP68 / IPx9K degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions diameter x height (mm): Ø 24 x 20 (without M8 grub screw)	2/55
MDS D460	Rugged transponder for use in assembly lines. • 2 000 bytes FRAM • IP67 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions diameter x height (mm): Ø 16 x 3	2/56
MDS D421	Transponder for tool coding according to DIN 69873. It can be used wherever very small data carriers and exact positioning are required (e.g. for tool identification). • 2 000 bytes FRAM • IP67 / IPx9K degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions diameter x height (mm): Ø 10 x 4.5 Note: This transponder is operated exclusively with the following readers/antennas: SIMATIC RF350R with ANT 12 or ANT 18 and SIMATIC RF210R. Operation with the mobile readers (SIMATIC RF310M and MOBY STG D) is not possible.	2/50

RFID systems for the HF frequency range

SIMATIC RF200

Transponders SIMATIC RF200

Customer-specific transponders

Customer-specific transponders (packaging, temperature range, geometry, etc.) on request.

Transponder	Features	Page
MDS D126	Compact and rugged ISO transponder; suitable for identification of transport units in production-related logistics; can also be used under harsh environmental conditions. • 112 bytes EEPROM • IP68 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions L x W x H (mm): 85.6 x 54 x 0.9	2/45
MDS D426	Compact and rugged ISO transponder; suitable for identification of transport units in production-related logistics; can also be used under harsh environmental conditions. • 2 000 bytes FRAM • IP68 / IPx9K degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions diameter x height (mm): ' Ø 50 x 3.6	2/54
MDS D422	Transponder for the identification of metallic workpiece holders, workpieces or containers. • 2 000 bytes FRAM • IP68 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions, thread diameter x height (mm): M20 x 6 Note: This transponder is operated exclusively with the following readers/antennas: SIMATIC RF350R with ANT 12, ANT 18, ANT 30 and SIMATIC RF210R, RF220R. Operation with the mobile handheld readers (SIMATIC RF310M and MOBY STG D) is not possible.	2/51
MDS D425	Compact and rugged ISO transponder; suitable for screw mounting; for use in assembly and production lines in the powertrain area. • 2 000 bytes FRAM • IP68 / IPx9K degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions diameter x height (mm): Ø 24 x 10 (without M6 grub screw)	2/53

Technical specifications

Field data (operating/limit distance) of transponders and readers (all specifications in mm)

The following table shows the field data (unaffected by metal) for all ISO transponders (MDS Dxxx) in connection with RF200 readers. The listed technical data are typical values and are valid for a room temperature of +25 °C.

For detailed descriptions and detailed technical data of the ISO transponders MDS Dxxx: See MOBY D, page 2/40.

	MDS D165	MDS D261	MDS D100	MDS D200	MDS D124	MDS D139	MDS D160	MDS D324
SIMATIC RF210R	–	–	–	–	5 ... 16/18	–	2 ... 10/12	2 ... 8/9
SIMATIC RF220R	10 ... 36/44	10 ... 30/35	10 ... 35/40	10 ... 35/40	5 ... 16/18	10 ... 35/40	5 ... 20/22	10 ... 20/25
SIMATIC RF260R	40 ... 120/135	20 ... 75/90	40 ... 110/130	30 ... 100/120	10 ... 40/48	20 ... 80/110	10 ... 40/45	20 ... 60/70

	MDS D424	MDS D428	MDS D460	MDS D421	MDS D126	MDS D426	MDS D422	MDS D425
SIMATIC RF210R	2 ... 10/12	2 ... 10/12	2 ... 8/9	1 ... 2/4	–	–	2 ... 6/7	3 ... 7/8
SIMATIC RF220R	10 ... 25/28	5 ... 18/20	5 ... 18/20	1 ... 5/6	8 ... 25/28	10 ... 30/35	3 ... 9/10	5 ... 12/14
SIMATIC RF260R	10 ... 60/70	5 ... 30/40	10 ... 35/40	–	15 ... 55/75	20 ... 70/90	–	–

–: Reader-transponder combination not released.

RFID systems for the HF frequency range

SIMATIC RF200

Readers SIMATIC RF200

Overview



SIMATIC RF210R



SIMATIC RF220R



SIMATIC RF260R



SIMATIC RF310M

Reader	Features
SIMATIC RF210R	M18 reader with integrated antenna • ISO 15693 functionality (HF; 13.56 MHz) • IP67 degree of protection • Temperature range -20 °C to +70 °C • Dimensions, thread diameter x length (mm): M18 x 71 • Interface RS422
SIMATIC RF220R	M30 reader with integrated antenna • ISO 15693 functionality (HF; 13.56 MHz) • IP67 degree of protection • Temperature range -20 °C to +70 °C • Dimensions, thread diameter x length (mm): M30 x 71 • Interface RS422
SIMATIC RF260R	Compact reader with integrated antenna • ISO 15693 functionality (HF; 13.56 MHz) • IP67 degree of protection • Temperature range -20 °C to +70 °C • Dimensions L x W x H (mm): 75 x 75 x 41 • Interface RS422
SIMATIC RF310M	• Mobile handheld terminal with integral read/write antenna (for a description, see "RF300") • Degree of protection IP54 (splashproof) • Temperature range -20 °C to +50 °C • Dimensions L x W x H (mm): 280 x 92 x 42 • Can be used for all ISO 15693 transponders (MDS Dxxx), with the exception of MDS D421, D422 • Can be used for all SIMATIC RF300 transponders

RFID systems for the HF frequency range

Readers SIMATIC RF200

SIMATIC RF210R

Overview



SIMATIC RF210R is an M18 reader with integrated antenna. Its extremely compact design makes it ideal for use in small assembly lines.

This reader has an RS422 interface with transmission procedure 3964R for connection to the RFID communication modules ASM 456, ASM 475, SIMATIC RF160C, RF170C, RF180C and RF182C.

Thanks to its high degree of protection and rugged design, the SIMATIC RF210R reader ensures problem-free use even under the toughest industrial conditions. It is connected via an 8-pole M12 plug-in connector.

The reader is operated with ISO 15693-compatible transponders from the extensive product range of MOBY D.

Technical specifications

Reader	SIMATIC RF210R
Transmission frequency	13.56 MHz
Read / write distance	Max. 18 mm
Protocol (air interface)	ISO 15693
Approvals	• EN 300330, 301489, CE (Europe) • FCC Part 15 (USA) • UL/CSA
Data transmission rate reader – transponder	
• Write	Approx. 0.5 KB/s (with saving in EEPROM)
• Read	Approx. 1.5 KB/s
Interfaces by means of communication modules, as well as directly via RS422 (3964R)	• SIMATIC S7-300 • PROFIBUS • PROFINET • Industrial Ethernet (TCP/IP)
Connections	
• RS422 / power supply	M12, 8-pin
Ambient temperature	
• During operation	-25 °C ... +70 °C
• During transportation and storage	-40 °C ... +85 °C
Degree of protection according to EN 60529	IP67
Mechanical stress in accordance with EN 60721 3-7 Class 7 M2	
• Shock	50 g
• Vibration	20 g

Reader	SIMATIC RF210R
Type of construction	
• Dimensions, thread diameter x length (mm)	M18 x 71 (without connector)
• Color	Pastel turquoise/silver
• Weight	Approx. 100 g
• Material	Metal (brass nickel-plated)
Mounting	2 x M18 nuts
Supply voltage	24 V DC
Display elements	2-color LED
Cable length reader – communication module	Max. 1000 m (shielded cable)

Field data

Minimum distance from reader to reader

SIMATIC RF210R	≥ 100 mm
----------------	----------

Selection and ordering data

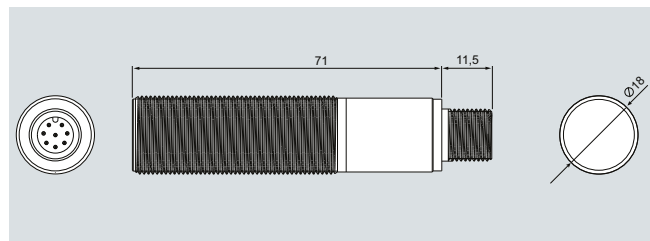
	Order No.
Reader SIMATIC RF210R ▶ B	6GT2 821-1AC10
Accessories	
DVD „RFID-Systems Software & Documentation“ ▶ D	6GT2 080-2AA20

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

D: Subject to export regulations AL = N and ECCN = EAR99S

Dimensions

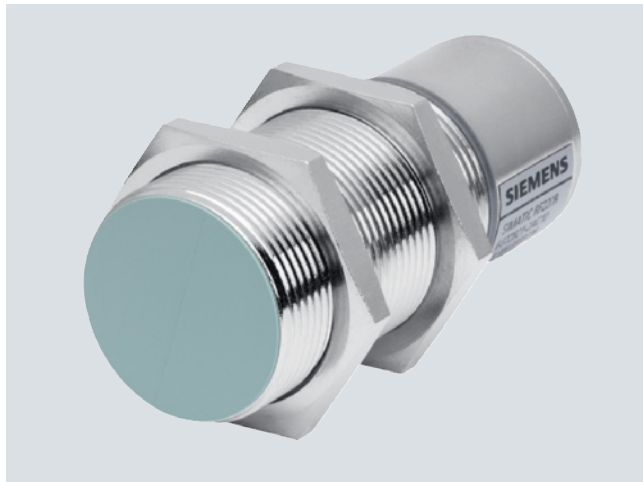


RFID systems for the HF frequency range

Readers SIMATIC RF200

SIMATIC RF220R

Overview



SIMATIC RF220R is an M30 reader with integrated antenna. Its extremely compact design makes it ideal for use in small assembly lines.

This reader has an RS422 interface with transmission procedure 3964R for connection to the RFID communication modules ASM 456, ASM 475, SIMATIC RF160C, RF170C, RF180C and RF182C.

Thanks to its high degree of protection and rugged design, the SIMATIC RF220R reader ensures problem-free use even under the toughest industrial conditions. It is connected via an 8-pole M12 plug-in connector.

The reader is operated with ISO 15693-compatible transponders from the extensive product range of MOBY D.

Technical specifications

Reader	SIMATIC RF220R
Transmission frequency	13.56 MHz
Read / write distance	Max. 40 mm
Protocol (air interface)	ISO 15693
Approvals	• EN 300330, 301489, CE (Europe) • FCC Part 15 (USA) • UL/CSA
Data transmission rate reader – transponder	
• Write	Approx. 0.5 KB/s (with saving in EEPROM)
• Read	Approx. 1.5 KB/s
Interfaces by means of communication modules, as well as directly via RS422 (3964R)	• SIMATIC S7-300 • PROFIBUS • PROFINET • Industrial Ethernet (TCP/IP)
Connections	
• RS422 / power supply	M12, 8-pin
Ambient temperature	
• During operation	-25 °C ... +70 °C
• During transportation and storage	-40 °C ... +85 °C
Degree of protection according to EN 60529	IP67
Mechanical stress in accordance with EN 60721 3-7 Class 7 M2	
• Shock	50 g
• Vibration	20 g

Reader	SIMATIC RF220R
Type of construction	
• Dimensions, thread diameter x length (mm)	M30 x 71 (without connector)
• Color	Pastel turquoise/silver
• Weight	Approx. 200 g
• Material	Metal (brass nickel-plated)
Mounting	2 x M30 nuts
Supply voltage	24 V DC
Display elements	2-color LED
Cable length reader – communication module	Max. 1000 m (shielded cable)

Field data

Minimum distance from reader to reader

SIMATIC RF220R	≥ 150 mm
----------------	----------

Selection and ordering data

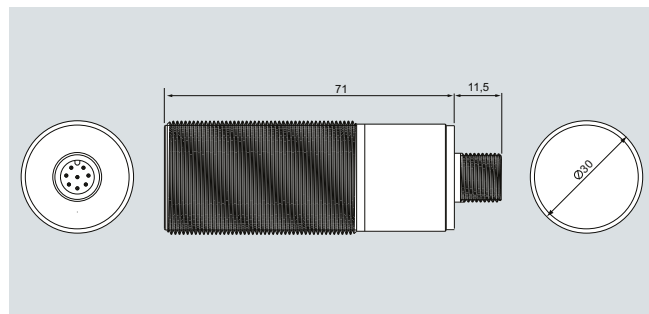
	Order No.
Reader SIMATIC RF220R ▶ B	6GT2 821-2AC10
Accessories	
DVD „RFID-Systems Software & Documentation“ ▶ D	6GT2 080-2AA20

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

D: Subject to export regulations AL = N and ECCN = EAR99S

Dimensions



RFID systems for the HF frequency range

Readers SIMATIC RF200

SIMATIC RF260R

Overview



SIMATIC RF260R is a reader with an integrated antenna. Its compact design makes it ideal for use in assembly lines.

This reader has an RS422 interface with transmission procedure 3964R for connection to the RFID communication modules ASM 456, ASM 475, SIMATIC RF160C, RF170C, RF180C and RF182C.

Thanks to its high degree of protection and rugged design, the SIMATIC RF260R reader ensures problem-free use even under the toughest industrial conditions. It is connected via an 8-pole M12 plug-in connector.

The reader is operated with ISO 15693-compatible transponders from the extensive product range of MOBY D.

Technical specifications

Reader	SIMATIC RF260R
Transmission frequency	13.56 MHz
Read / write distance	Max. 130 mm
Protocol (air interface)	ISO 15693
Approvals	• EN 300330, 301489, CE (Europe) • FCC Part 15 (USA) • UL/CSA
Data transmission rate reader – transponder	
• Write	Approx. 0.5 KB/s (with saving in EEPROM)
• Read	Approx. 1.5 KB/s
Interfaces by means of communication modules, as well as directly via RS422 (3964R)	• SIMATIC S7-300 • PROFIBUS • PROFINET • Industrial Ethernet (TCP/IP)
Connections	
• RS422 / power supply	M12, 8-pin
Ambient temperature	
• During operation	-25 °C ... +70 °C
• During transportation and storage	-40 °C ... +85 °C
Degree of protection according to EN 60529	IP67
Mechanical stress in accordance with EN 60721 3-7 Class 7 M2	
• Shock	50 g
• Vibration	20 g

Reader	SIMATIC RF260R
Type of construction	
• Dimensions L x W x H (mm)	75 x 75 x 41
• Color	Anthracite
• Weight	Approx. 200 g
• Material	Plastic PA 6.6
Mounting	2 x M5 screws
Supply voltage	24 V DC
Display elements	2-color LED
Cable length reader – communication module	Max. 1000 m (shielded cable)

Field data

Minimum distance from reader to reader

SIMATIC RF260R	≥ 150 mm
----------------	----------

Selection and ordering data

	Order No.
Reader SIMATIC RF260R	6GT2 821-6AC10
Accessories	
DVD „RFID-Systems Software & Documentation“	6GT2 080-2AA20

► Preferred type, available from stock.

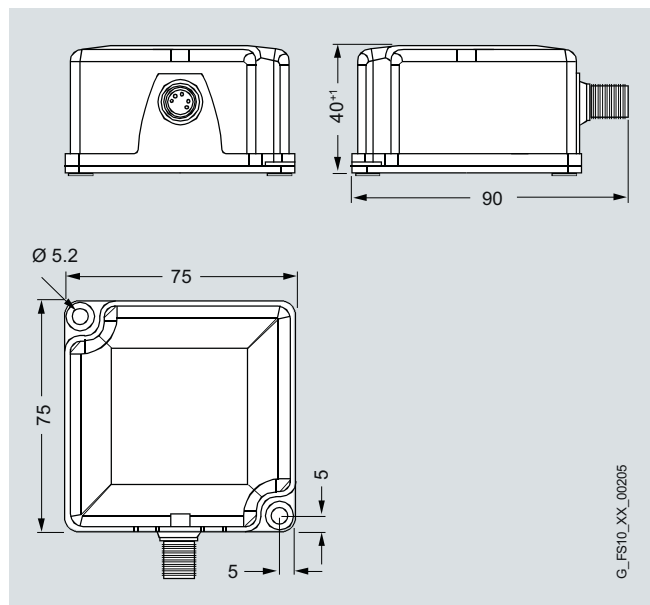
D: Subject to export regulations AL = N and ECCN = EAR99S

Dimensions

CAD data

Dimensional drawing available as CAD graphic (DXF format). You can find additional information in the Internet at:

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90014



RFID systems for the HF frequency range

SIMATIC RF300

Overview



The RFID system SIMATIC RF300 is particularly suitable for use in industrial production in the areas of production control, assembly lines and conveyors.

SIMATIC RF300 is used to implement identification tasks with medium to high performance in the HF range (13.56 MHz).

Depending on the demands on the performance of the identification system, three versions of the system are available:

- A particularly economical solution with a link to SIMATIC S7-300 over the IQ-Sense interface for low requirements in terms of speed and data volume.
- Medium performance: System configuration with SIMATIC RF300 readers in ISO 15963 mode and low-cost MOBY D transponders.
- High performance: System configuration with SIMATIC RF300 readers in RF300 mode and SIMATIC RF300 transponders.

The SIMATIC RF300 identification system offers the following features:

- 13.56 MHz operating frequency
- For operating with ISO 15693 mode or RF300 mode
- Passive (without battery), maintenance-free transponder (MDS Dxxx and RF3xxT) with memory up to 64 KB
- Rugged, compact components with IP67 / IP68 degree of protection
- Very high immunity to noise
- Extensive diagnostic functions
- Extremely fast data transmission
- Easy integration in SIMATIC, PROFIBUS, PROFINET and TCP/IP.

Benefits

- Rugged, compact components with high degree of protection (up to IP68).
- Data communication that is highly resistant to interference with a high degree of data security.
- Maintenance-free data carriers with up to 64 KB.
- Extremely high-speed data transmission between reader and tag (up to 8000 bytes/s).
- Flexible and economic solutions thanks to the complete and scalable portfolio for the field of industrial identification

- Simplified engineering, commissioning, diagnostics and maintenance through seamless integration into Totally Integrated Automation:
 - Integrated bus connection to an automation system, such as SIMATIC, SIMOTION or SINUMERIK via communication modules with PROFIBUS and PROFINET.
 - Simple S7 software integration via ready-to-use function blocks
 - Extensive status and diagnostic functions
- High degree of investment protection thanks to:
 - Open ISO 15693 standard
 - Software compatibility between the RFID systems of Siemens
 - Standardized communications interfaces
- Openness through connection possibilities to different bus systems from different manufacturers and PC environments via communication modules
- Worldwide Service and Support

Application

The RFID system SIMATIC RF300 is used primarily for contact-free identification of containers, pallets and workpiece holders in a closed production cycle. This means that the data carriers (transponders, tags) remain in the production chain and are not shipped out with the products. Thanks to the compact enclosure dimensions of the transponders as well as of the read/write devices, SIMATIC RF300 is particularly suitable for (small) assembly lines where space is at a premium.

The main application areas of SIMATIC RF300 are:

- Assembly and handling systems, assembly lines (identification of workpiece carriers)
- Production logistics (material flow control, identification of containers and other vessels)
- Parts identification (e.g., transponder is attached to product or pallet)
- Conveyor systems (e.g., overhead monorail conveyors)

Integration

A wide range of communication modules, function blocks, as well as high-performance drivers and function libraries permits easy and quick integration into the application.

And best of all: SIMATIC RF300 is part of Totally Integrated Automation and can be integrated easily and cost-effectively into the SIMATIC world.

For more details on the connection possibilities, see chapter 5 under "Communication modules".

Technical specifications

RFID system	SIMATIC RF300
Transmission frequency	13.56 MHz
Read / write distance	Max. 210 mm
Protocol (air interface)	ISO 15693 ISO 18000-3
Memory capacity	Max. 64 KB
Data transmission rate reader – transponder	
• Read	Max. 7.8 KB/s
• Write	Max. 7.8 KB/s
Multitag/Bulk capability	Yes
Special features	• High data transmission rate • Extended diagnostic possibilities

Note regarding the phased-out product MOBY I

The RFID system MOBY I has been a phased-out product since October 1, 2008. For plant expansions, the products will presumably be available for ordering until September 30, 2011. The innovative, high-performance RFID system SIMATIC RF300 is available for new applications.

The main advantages of SIMATIC RF300 over MOBY I are:

- 3 x faster data transmission (typ. 3 KB/s)
- Wide-ranging status and diagnostic functions, LED on read/write device
- Transponder of 20 bytes to 64 KB with unique serial number (UID) and OTP memory area
- Smaller plug connector on the reader (M12)

Existing MOBY I software applications (with FC45/FB45) can be re-used.

Further information is available on the Internet at

<http://www.siemens.com/ident/rfid>

RFID systems for the HF frequency range

SIMATIC RF300

Transponders SIMATIC RF300 (mode RF300)

Overview



Transponders	Features
SIMATIC RF320T	Universal, compact transponder, not for mounting directly on metal. • 20 + 4 bytes EEPROM • Degree of protection IP67 / IPX9K¹⁾ • Operating temperature range -25 °C to +125 °C • Dimensions diameter x height (mm): Ø 27 x 4
SIMATIC RF340T	Universal transponder. • 8 KB FRAM + 24 byte EEPROM • Degree of protection IP68 / IPX9K¹⁾ • Operating temperature range -25 °C to +85 °C • Dimensions L x W x H (mm): 48 x 25 x 15
SIMATIC RF350T	Universal transponder. • 32 KB FRAM + 24 byte EEPROM • IP68 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions L x W x H (mm): 50 x 50 x 20
SIMATIC RF360T	Universal transponder in credit card format. • 8 KB FRAM + 24 byte EEPROM • IP67 degree of protection • Operating temperature range -25 °C to +75 °C • Dimensions L x W x H (mm): 86 x 55 x 2.5
SIMATIC RF370T	Universal transponder. • 32 KB or 64 KB FRAM + 24 byte EEPROM • IP68 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions L x W x H (mm): 75 x 75 x 41
SIMATIC RF380T	Heat-resistant transponder, designed for skid identification in paint shops. • 32 KB FRAM + 24 byte EEPROM • IP68 degree of protection • Operating temperature range -25 °C to +220 °C (cyclic) • Dimensions diameter x height (mm): Ø 114 x 83

1) Extract:

Test equipment: Steam jet-air ejector 0 °C, 30 °C, 60 °C, 90 °C
 Water flow: 10 to 15 l/min with 100 bar (75 °C)
 Distance: 10 to 15 cm

RFID systems for the HF frequency range

Transponders SIMATIC RF300 (mode RF300)

SIMATIC RF320T

Overview



Universal, compact transponder (20 + 4 bytes EEPROM) in button format (Ø 27 mm x 4 mm), not suitable for mounting directly on metal.

Technical specifications

Transponder	SIMATIC RF320T
Transmission frequency	13.56 MHz
Read / write distance	Max. 55 mm
Protocol (air interface)	RF300-specific
Approvals	CE, FCC, UL/CSA
Memory capacity	
• User memory	20 bytes (FRAM)
• Read-only memory (UID)	4 bytes
• OTP (One Time Programmable)	20 bytes (identical to user memory)
Memory organization	Byte by byte access, write protection possible in 4-byte blocks for the 20-byte EEPROM area
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM	min. 100 000
• FRAM	-
Read cycles	Unlimited
Ambient temperature	
• During operation	-25 °C ... +125 °C
• During transportation and storage	-40 °C ... +150 °C
Degree of protection according to EN 60529	IP67 / IPx9K ¹⁾
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	100 g
• Vibration	20 g
Type of construction	
• Dimensions D x H (mm)	Ø 27 x 4
• Color	Black
• Weight	Approx. 5 g
• Material	Epoxy resin
Mounting	M3 screw
Mounting	
• On metal	Yes, with spacer > 20 mm
• Flush-mounted in metal	No

Field data in mm

SIMATIC RF320T to:	SIMATIC RF310R	SIMATIC RF340R	SIMATIC RF350R with ANT 1	SIMATIC RF350R with ANT 18	SIMATIC RF350R with ANT 30	SIMATIC RF380R
Operating distance (S _a)	2 ... 10	2 ... 20	2 ... 20	2 ... 8	2 ... 11	2 ... 40
Limit distance (S _g)	16	25	25	10	15	55
Transmission window (L)	30	45	45	10	15	100

1) Extract:

Test equipment: Steam jet-air ejector 0 °C, 30 °C, 60 °C, 90 °C
 Water flow: 10 to 15 l/min with 100 bar (75 °C)
 Distance: 10 to 15 cm

Selection and ordering data

	Order No.
Transponder SIMATIC RF320T	► B 6GT2 800-1CA00
20 byte EEPROM	
Ordering quantity 20 units or a multiple thereof, price per unit.	

► Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

RFID systems for the HF frequency range

Transponders SIMATIC RF300 (mode RF300)

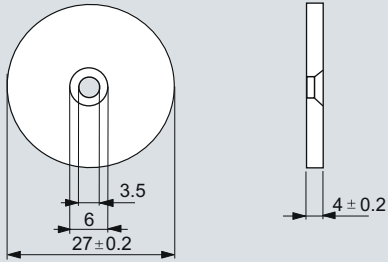
SIMATIC RF320T

Dimensions

CAD data

Dimensions available as CAD graphic (DXF format). Further information is available in the Internet under:

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90117



RFID systems for the HF frequency range

Transponders SIMATIC RF300 (mode RF300)

SIMATIC RF340T

Overview



Universal transponder (8 KB FRAM + 24 byte EEPROM + 4 byte serial number), particularly suitable for small workpiece carriers.

Technical specifications

Transponder	SIMATIC RF340T
Transmission frequency	13.56 MHz
Read / write distance	Max. 80 mm
Protocol (air interface)	RF300-specific
Approvals	CE, FCC, UL/CSA
Memory capacity	
• User memory	8 KB (FRAM)
• Read-only memory (UID)	4 bytes
• OTP (One Time Programmable)	20 bytes (EEPROM)
Memory organization	Byte by byte access, write protection possible in 4-byte blocks for the 20-byte EEPROM area
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM	min. 100 000
• FRAM	Practically unlimited ($>10^{10}$)
Read cycles	Practically unlimited ($>10^{10}$)
Ambient temperature	
• During operation	-25 °C ... +85 °C
• During transportation and storage	-40 °C ... +85 °C
Degree of protection according to EN 60529	IP67 / IPx9K ¹⁾
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	50 g
• Vibration	20 g
Type of construction	
• Dimensions L x W x H (mm)	48 x 25 x 15
• Color	Anthracite
• Weight	Approx. 25 g
• Material	PA 12
Mounting	2 x M3 screws
Mounting	
• On metal	Yes
• Flush-mounted in metal	No

Field data in mm

SIMATIC RF340T to:	SIMATIC RF310R	SIMATIC RF340R	SIMATIC RF350R with ANT 1	SIMATIC RF350R with ANT 18	SIMATIC RF350R with ANT 30	SIMATIC RF380R
Operating distance (S _a)	2 ... 20	5 ... 25	5 ... 25	2 ... 10	5 ... 15	20 ... 80
Limit distance (S _g)	26	35	35	13	20	100
Transmission window (L)	40	80	80	20	25	120

1) Extract:

Test equipment: Steam jet-air ejector 0 °C, 30 °C, 60 °C, 90 °C
 Water flow: 10 to 15 l/min with 100 bar (75°C)
 Distance: 10 to 15 cm

Selection and ordering data

	Order No.
Transponder	► B 6GT2 800-4BB00
SIMATIC RF340T	
8 Kbyte FRAM	
Ordering quantity 5 units or a multiple thereof, price per unit.	

► Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

RFID systems for the HF frequency range

Transponders SIMATIC RF300 (mode RF300)

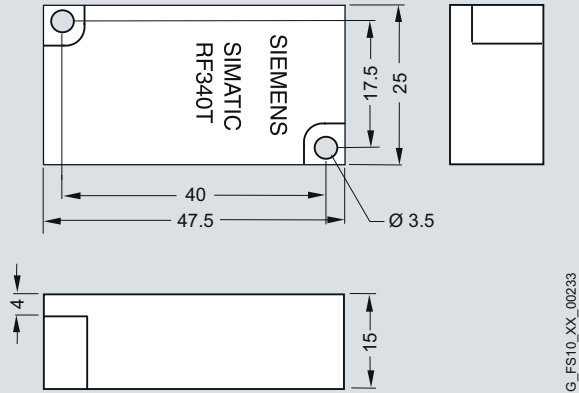
SIMATIC RF340T

Dimensions

CAD data

Dimensions available as CAD graphic (DXF format). Further information is available in the Internet under:

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90119



RFID systems for the HF frequency range

Transponders SIMATIC RF300 (mode RF300)

SIMATIC RF350T

Overview



Versatile transponder (32 KB FRAM + 24 byte EEPROM).

Technical specifications

Transponder	SIMATIC RF350T
Transmission frequency	13.56 MHz
Read / write distance	Max. 130 mm
Protocol (air interface)	RF300-specific
Approvals	CE, FCC, UL/CSA
Memory capacity	
• User memory	32 KB (FRAM)
• Read-only memory (UID)	4 bytes
• OTP (One Time Programmable)	20 bytes (EEPROM)
Memory organization	Byte by byte access, write protection possible in 4-byte blocks for the 20-byte EEPROM area
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM	min. 100 000
• FRAM	Practically unlimited (>10 ¹⁰)
Read cycles	Practically unlimited (>10 ¹⁰)
Ambient temperature	
• During operation	-25 °C ... +85 °C
• During transportation and storage	-40 °C ... +85 °C
Degree of protection according to EN 60529	IP68
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	50 g
• Vibration	20 g
Type of construction	
• Dimensions L x W x H (mm)	50 x 50 x 20
• Color	Anthracite
• Weight	Approx. 25 g
• Material	PA 12
Mounting	2 x M4 screws
Mounting	
• On metal	Yes
• Flush-mounted in metal	No

Field data in mm

SIMATIC RF350T to:	SIMATIC RF310R	SIMATIC RF340R	SIMATIC RF350R with ANT 1	SIMATIC RF350R with ANT 18	SIMATIC RF350R with ANT 30	SIMATIC RF380R
Operating distance (S _a)	5 ... 26	5 ... 35	5 ... 35	–	5 ... 16	35 ... 100
Limit distance (S _g)	35	50	50	–	22	130
Transmission window (L)	45	80	80	–	25	140

–: Reader-transponder combination not released

Selection and ordering data

	Order No.
Transponder SIMATIC RF350T 32 Kbyte FRAM	► B 6GT2 800-5BD00

► Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

RFID systems for the HF frequency range

Transponders SIMATIC RF300 (mode RF300)

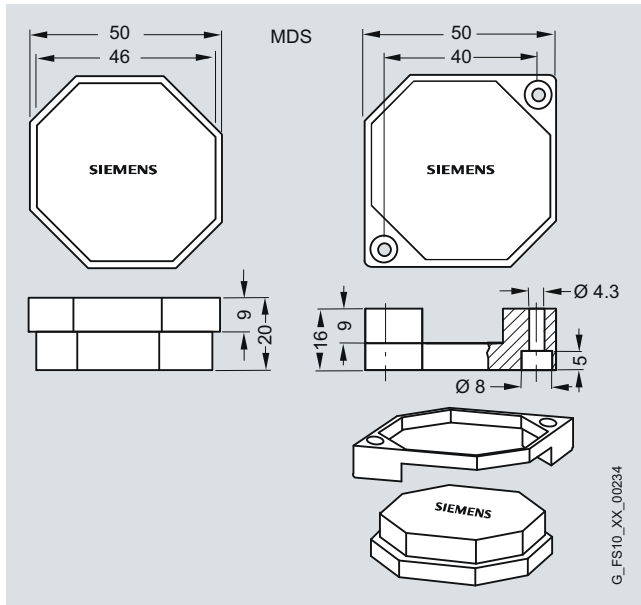
SIMATIC RF350T

Dimensions

CAD data

Dimensional drawing available as CAD graphic (DXF format).
You can find additional information in the Internet at:

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90120



Left: Transponder SIMATIC RF350T.

Top right: Mounting frame.

Lower right: Installation diagram. The transponder can be mounted with the mounting frame as shown.

RFID systems for the HF frequency range

Transponders SIMATIC RF300 (mode RF300)

SIMATIC RF360T

Overview



Universal transponder in credit card format (8 KB FRAM + 24 byte EEPROM).

Technical specifications

Transponder	SIMATIC RF360T
Transmission frequency	13.56 MHz
Read / write distance	Max. 150 mm
Approvals	CE, FCC, UL/CSA
Protocol (air interface)	RF300-specific
Memory capacity	
• User memory	8 KB (FRAM)
• Read-only memory (UID)	4 bytes
• OTP (One Time Programmable)	20 bytes (EEPROM)
Memory organization	Byte by byte access, write protection possible in 4-byte blocks for the 20-byte EEPROM area
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM	min. 100 000
• FRAM	Practically unlimited ($>10^{10}$)
Read cycles	Practically unlimited ($>10^{10}$)
Ambient temperature	
• During operation	-25 °C ... +75 °C
• During transportation and storage	-40 °C ... +85 °C
Degree of protection according to EN 60529	IP67
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	50 g
• Vibration	20 g
Type of construction	
• Dimensions L x W x H (mm)	86 x 55 x 2.5
• Color	Anthracite
• Weight	Approx. 25 g
• Material	Epoxy resin
Mounting	2 screws M3 or with fixing pocket 6GT2190-0AB00
Mounting	
• On metal	Yes, with spacer > 20 mm
• Flush-mounted in metal	No

Field data in mm

SIMATIC RF360T to:	SIMATIC RF310R	SIMATIC RF340R	SIMATIC RF350R with ANT 1	SIMATIC RF350R with ANT 18	SIMATIC RF350R with ANT 30	SIMATIC RF380R
Operating distance (S_a)	5 ... 26	8 ... 40	8 ... 40	—	—	40 ... 120
Limit distance (S_g)	35	60	60	—	—	150
Transmission window (L)	45	90	90	—	—	160

—: Reader-transponder combination not released

Selection and ordering data

	Order No.
Transponder SIMATIC RF360T 8 Kbyte FRAM Ordering quantity 10 units or a multiple thereof, price per unit.	6GT2 800-4AC00
Accessories Fixing pocket for SIMATIC RF360T, only usable together with spacer 6GT2 190-0AA00. Ordering quantity 50 units or a multiple thereof, price per unit.	6GT2 190-0AB00

	Order No.
Spacer For 6GT2 190-0AB00 fixing pocket, thickness 20 mm The purpose of the spacer is to maintain the recommended distance to the metal when installing the transponder. Order quantity 50 units or a multiple thereof, price per unit.	6GT2 190-0AA00

► Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

RFID systems for the HF frequency range

Transponders SIMATIC RF300 (mode RF300)

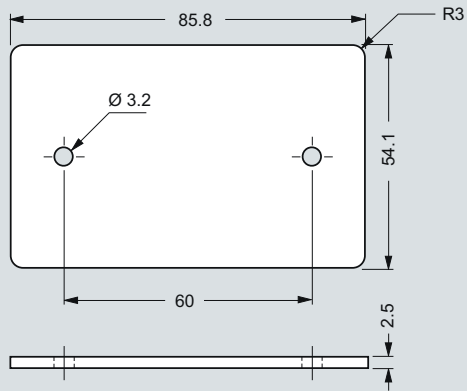
SIMATIC RF360T

Dimensions

CAD data

Dimension drawing available as CAD graphic (DXF format)
You can find additional information in the Internet under

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90118



RFID systems for the HF frequency range

Transponders SIMATIC RF300 (mode RF300)

SIMATIC RF370T

Overview



Universal transponder in block format (available with 32 or 64 KB FRAM + 24 byte EEPROM).

Technical specifications

Transponder	SIMATIC RF370T
Transmission frequency	13.56 MHz
Read / write distance	Max. 135 mm
Protocol (air interface)	RF300-specific
Approvals	CE, FCC, UL/CSA

Transponder	SIMATIC RF370T
Memory capacity	
• User memory	32 or 64 KB (FRAM)
• Read-only memory (UID)	4 bytes
• OTP (One Time Programmable)	20 bytes (EEPROM)
Memory organization	Byte by byte access, write protection possible in 4-byte blocks for the 20-byte EEPROM area
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM	min. 100 000
• FRAM	Practically unlimited ($>10^{10}$)
Read cycles	Practically unlimited ($>10^{10}$)
Ambient temperature	
• During operation	-25 °C ... +85 °C
• During transportation and storage	-40 °C ... +85 °C
Degree of protection according to EN 60529	IP68
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	50 g
• Vibration	20 g
Type of construction	
• Dimensions L x W x H (mm)	75 x 75 x 41
• Color	Anthracite
• Weight	Approx. 200 g
• Material	PA 12
Mounting	2 x M5 screws
Mounting	
• On metal	Yes
• Flush-mounted in metal	No

Field data in mm

SIMATIC RF370T to:	SIMATIC RF310R	SIMATIC RF340R	SIMATIC RF350R with ANT 1	SIMATIC RF350R with ANT 18	SIMATIC RF350R with ANT 30	SIMATIC RF380R
Operating distance (S_a)	*	15 ... 36	15 ... 45	—	—	35 ... 100
Limit distance (S_g)	*	52	65	—	—	135
Transmission window (L)	*	85	85	—	—	160

—: Reader-transponder combination not released

*: The combination of RF370T to RF310R is possible in principle, but it is not recommended because the antenna geometry between the reader and transponder is not optimal.

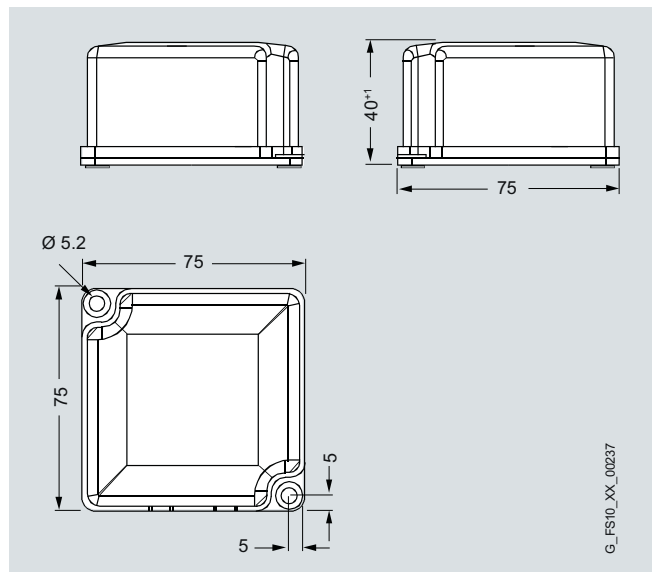
Selection and ordering data

	Order No.
Transponder SIMATIC RF370T With 32 KB FRAM	▶ B 6GT2 800-5BE00
Transponder SIMATIC RF370T With 64 KB FRAM	▶ B 6GT2 800-6BE00

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

Dimensions



RFID systems for the HF frequency range

Transponders SIMATIC RF300 (mode RF300)

SIMATIC RF380T

Overview



Heat-resistant transponder, designed for skid identification in paint shops (32 KB FRAM + 24 byte EEPROM), temperature range up to +220 °C (cyclic).

Applications

Typical applications are:

- Primer application, cataphoresis with the associated drying ovens
- Outer paint coating area with drying ovens
- Washing area with temperatures > +85 °C

Technical specifications

Transponder	SIMATIC RF380T
Transmission frequency	13.56 MHz
Read / write distance	Max. 140 mm
Protocol (air interface)	RF300-specific
Approvals	CE, FCC, UL/CSA, ATEX
Memory capacity	
• User memory	32 KB (FRAM)
• Read-only memory (UID)	4 bytes
• OTP (One Time Programmable)	20 bytes (EEPROM)
Memory organization	Byte by byte access, write protection possible in 4-byte blocks for the 20-byte EEPROM area
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM	min. 100 000
• FRAM	Practically unlimited (>10 ¹⁰)
Read cycles	Practically unlimited (>10 ¹⁰)
Ambient temperature	
• During operation	-25 °C ... +110 °C (permanent)
	-25 °C ... +220 °C (cyclic)
• During transportation and storage	-40 °C ... +110 °C
Degree of protection according to EN 60529	IP68
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	50 g
• Vibration	20 g
Type of construction	
• Dimensions diameter x height (mm)	Ø 114 x 83
• Color	Brown
• Weight	Approx. 900 g
• Material	PPS
Mounting	With special support (to be ordered separately)
Mounting	
• On metal	Yes
• Flush-mounted in metal	No

Field data in mm

SIMATIC RF380T to:	SIMATIC RF310R	SIMATIC RF340R	SIMATIC RF350R with ANT 1	SIMATIC RF350R with ANT 18	SIMATIC RF350R with ANT 30	SIMATIC RF380R
Operating distance (S _a)	*	15 ... 47	15 ... 53	–	–	25 ... 110
Limit distance (S _g)	*	55	65	–	–	140
Transmission window (L)	*	90	90	–	–	180

–: Reader-transponder combination not released

*: The combination of RF380T to RF310R is possible in principle, but it is not recommended because the antenna geometry between the reader and transponder is not optimal.

RFID systems for the HF frequency range

Transponders SIMATIC RF300 (mode RF300)

SIMATIC RF380T

Cyclic operation of the transponder at temperatures > 100 °C

At ambient temperatures between +110 °C and +220 °C, care must be taken to ensure that the internal temperature of the SIMATIC RF380T does not exceed the critical threshold of +110 °C. Each heating phase must therefore be followed by a cooling phase. Some limit cycles are listed in the table below:

Heating up		Cooling down	
Temperature	Time	Temperature	Time
200 °C	2 h	25 °C	> 8 h
200 °C	1 h	25 °C	> 2 h
190 °C	2 h	25 °C	> 7 h
190 °C	1 h	25 °C	> 1 h 45 min
180 °C	2 h	25 °C	> 5 h 30 min
180 °C	2 h	25 °C	> 4 h 30 min

A temperature calculation tool calculates the temperature curve for the heat-proof transponder SIMATIC RF380T (see DVD "RFID Systems Software & Documentation", Order No. 6GT2 080-2AA20).

Selection and ordering data

		Order No.
Transponder	► B	6GT2 800-5DA00
SIMATIC RF380T		
With 32 Kbyte FRAM		
<i>Accessories</i>		
Skid support for SIMATIC RF380T		
• Short type	► B	6GT2 090-0QA00
• Long type	► B	6GT2 090-0QA00-0AX3
Universal support	►	6GT2 590-0QA00
For SIMATIC RF380T, e.g. for attachment to the body with a customer-specific adapter		
Shrouding cover	► B	6GT2 090-0QB00
For skid support		

► Preferred type, available from stock.

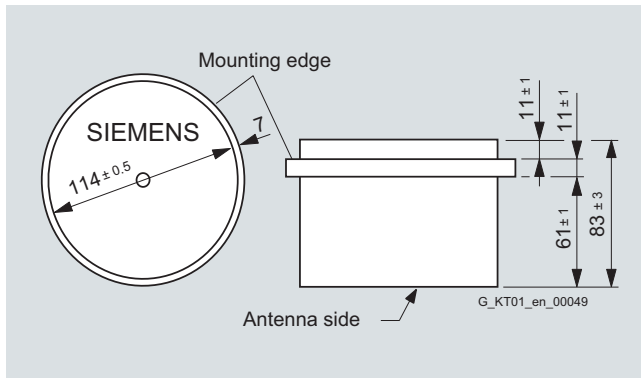
B: Subject to export regulations AL = N and ECCN = EAR99H

RFID systems for the HF frequency range

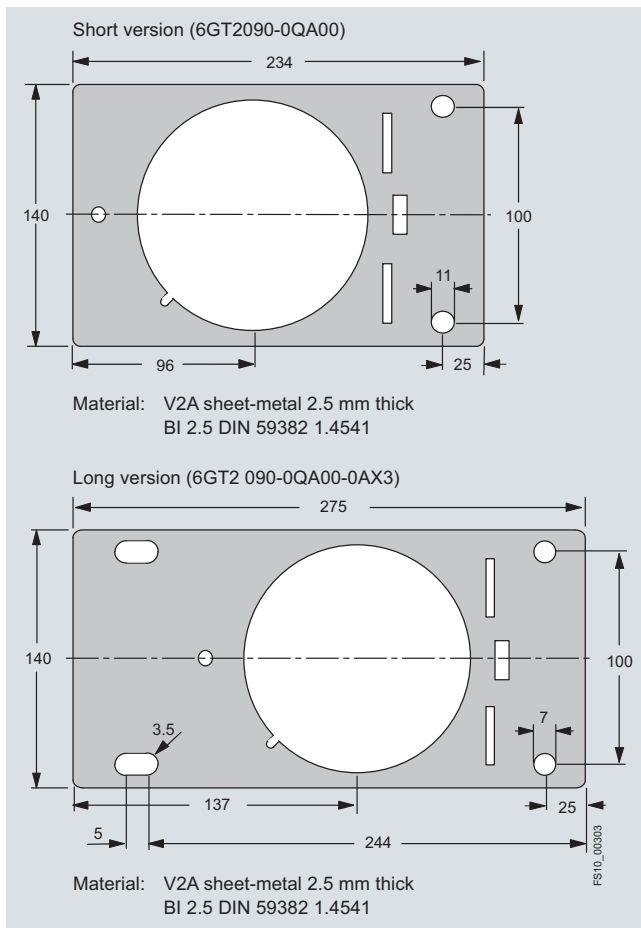
Transponders SIMATIC RF300 (mode RF300)

SIMATIC RF380T

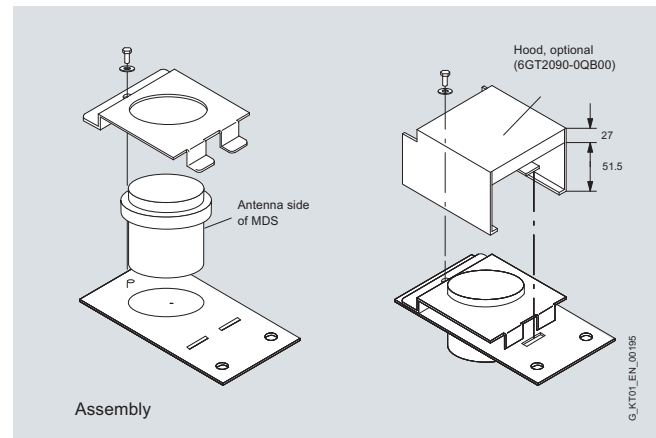
Dimensions



Transponder SIMATIC RF380T



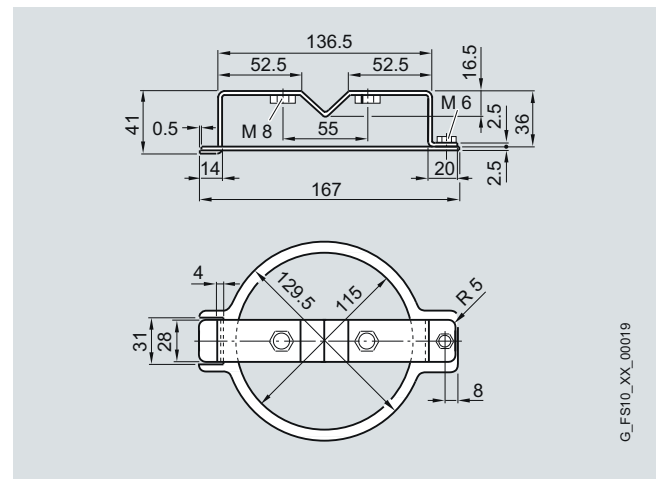
Holder for RF380T



Skid holder, shrouding cover



Universal holder with heat-resistant RF380T transponder



Universal support

RFID systems for the HF frequency range

SIMATIC RF300

Transponders SIMATIC RF300 (ISO mode)

Overview



The transponders can be used for the following RFID systems:

- SIMATIC RF200
- SIMATIC RF300 (in ISO 15693 operating mode)
- MOBY D (except MDS D421, MDS D422, MDS D425)

Transponder	Features	Page
MDS D165	SmartLabel, (PET) in credit card format. Applications range from simple identification such as electronic barcode substitution or supplementation to storage and distribution logistics, right up to product identification. • 112 bytes EEPROM • Up to IP65 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions L x W (mm): 86 x 54	2/42
MDS D261	SmartLabel, (PET) in compact design. Applications range from simple identification such as electronic barcode substitution or supplementation to storage and distribution logistics, right up to product identification. • 256 bytes EEPROM • Up to IP65 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions L x W (mm): 55 x 55	2/42
MDS D100	Universal transponder in credit card format. • 112 bytes EEPROM • IP68 degree of protection • Operating temperature range -25 °C to +80 °C • Dimensions L x W x H (mm): 85.6 x 54 x 0.9	2/43
MDS D200	Universal transponder in credit card format. • 256 bytes EEPROM • IP67 degree of protection • Operating temperature range -20 °C to +60 °C • Dimensions L x W x H (mm): 86 x 54 x 0.8	2/48
MDS D124	Rugged transponder for use in harsh industrial environments and under extreme environmental conditions. • 112 bytes EEPROM • IP68 / IPx9K degree of protection • Operating temperature range -25 °C to +180 °C • Dimensions diameter x height (mm): Ø 27 x 4	2/44
MDS D139	Heat-resistant transponder for use in paint shops or applications with high thermal stress. • 112 bytes EEPROM • IP68 / IPx9K degree of protection • Operating temperature range -25 °C to +220 °C • Dimensions diameter x height (mm): Ø 85 x 15	2/46

Transponder	Features	Page
MDS D160	The transponder has been specially designed for harsh environments in the laundry and cleaning industry. • Its main applications include: - Rented work clothing - Rented laundry - OP textiles, hospital clothing - Hotel laundry - Dirt collection mats • 112 bytes EEPROM • IP68 / IPx9K degree of protection • Operating temperature range -25 °C to +175 °C • Dimensions diameter x height (mm): Ø 16 x 3	2/47
MDS D324	Rugged transponder for use in harsh industrial environments and under extreme environmental conditions. • 992 bytes EEPROM • IP67 degree of protection • Operating temperature range -25 °C to +125 °C • Dimensions diameter x height (mm): Ø 27 x 4	2/49
MDS D424	Rugged transponder for use in production and distribution logistics as well as in assembly and production lines: • 2 000 bytes FRAM • IP67 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions diameter x height (mm): Ø 27 x 4	2/52
MDS D428	Compact and rugged ISO transponder; suitable for screw mounting; for use in assembly and production lines in the power-train area. • 2 000 bytes FRAM • IP68 / IPx9K degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions diameter x height (mm): Ø 24 x 20 (without M8 grub screw)	2/55
MDS D460	Rugged transponder for use in assembly lines. • 2 000 bytes FRAM • IP67 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions diameter x height (mm): Ø 16 x 3	2/56
MDS D421	Transponder for tool coding according to DIN 69873. It can be used wherever very small data carriers and exact positioning are required (e.g. for tool identification). • 2 000 bytes FRAM • IP67 / IPx9K degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions diameter x height (mm): Ø 10 x 4.5 Note: This transponder is operated exclusively with the following readers/antennas: SIMATIC RF350R with ANT 12 or ANT 18 and SIMATIC RF210R. Operation with the mobile readers (SIMATIC RF310M and MOBY STG D) is not possible.	2/50
MDS D126	Compact and rugged ISO transponder; suitable for identification of transport units in production-related logistics; can also be used under harsh environmental conditions. • 112 bytes EEPROM • IP68 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions L x W x H (mm): 85.6 x 54 x 0.9	2/45

RFID systems for the HF frequency range

SIMATIC RF300

Transponders SIMATIC RF300 (ISO mode)

Transponder	Features	Page
MDS D426	Compact and rugged ISO transponder; suitable for identification of transport units in production-related logistics; can also be used under harsh environmental conditions. • 2 000 bytes FRAM • IP68 / IPx9K degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions diameter x height (mm): Ø 50 x 3.6	2/54
MDS D422	Transponder for the identification of metallic workpiece holders, workpieces or containers. • 2 000 bytes FRAM • IP68 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions, thread diameter x height (mm): M20 x 6 Note: This transponder is operated exclusively with the following readers/antennas: SIMATIC RF350R with ANT 12, ANT 18, ANT 30 and SIMATIC RF210R, RF220R. Operation with the mobile readers (SIMATIC RF310M and MOBY STG D) is not possible.	2/51

Transponder	Features	Page
MDS D425	Compact and rugged ISO transponder; suitable for screw mounting; for use in assembly and production lines in the power-train area. • 2 000 bytes FRAM • IP68 / IPx9K degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions diameter x height (mm): Ø 24 x 10 (without M6 grub screw)	2/53

Customer-specific transponders

Customer-specific transponders (packaging, temperature range, geometry, etc.) on request.

Technical specification

Field data (operating/limit distance) of transponders and readers (all specifications in mm)

The following table shows the field data (unaffected by metal) for all ISO transponders (MDS Dxxx) in connection with RF300 readers. The listed technical data are typical values and are valid for a room temperature of +25 °C..

For further information on "SIMATIC RF300 Transponders", see MOBY D, from page 2/40.

	MDS D165	MDS D261	MDS D100	MDS D200	MDS D124	MDS D139	MDS D160	MDS D324
SIMATIC RF310R	–	–	2 ... 78/90	–	2 ... 22/30	–	2 ... 25/37	2 ... 30/38
SIMATIC RF340R	–	–	15 ... 110/140	–	2 ... 55/80	10 ... 80/110	2 ... 35/60	2 ... 55/70
SIMATIC RF350R with ANT 1	–	–	15 ... 110/140	–	2 ... 70/80	10 ... 85/115	2 ... 35/60	2 ... 70/90
SIMATIC RF350R with ANT 12	–	–	–	–	–	–	0 ... 8/15	–
SIMATIC RF350R with ANT 18	–	–	–	–	0 ... 24/35	–	0 ... 18/27	0 ... 22/28
SIMATIC RF350R with ANT 30	–	–	0 ... 50/75	–	0 ... 35/46	0 ... 42/55	0 ... 25/30	0 ... 35/45
SIMATIC RF380R	–	–	15 ... 170/210	–	0 ... 96/120	15 ... 160/200	2 ... 64/80	2 ... 96/120

	MDS D424	MDS D428	MDS D460	MDS D421	MDS D126	MDS D426	MDS D422	MDS D425
SIMATIC RF310R	2 ... 20/30	2 ... 20/30	2 ... 20/30	–	5 ... 40/60	5 ... 35/50	–	2 ... 14/18
SIMATIC RF340R	2 ... 50/70	2 ... 35/50	2 ... 25/40	–	10 ... 70/100	10 ... 60/90	–	2 ... 20/30
SIMATIC RF350R with ANT 1	2 ... 60/80	2 ... 35/50	2 ... 35/50	–	10 ... 70/100	10 ... 60/90	–	2 ... 25/35
SIMATIC RF350R with ANT 12	–	0 ... 10/16	0 ... 8/12	0 ... 3/5	–	–	–	0 ... 5/7
SIMATIC RF350R with ANT 18	0 ... 27/35	0 ... 10/14	0 ... 12/18	0 ... 6/8	–	–	0 ... 10/13	0 ... 10/14
SIMATIC RF350R with ANT 30	0 ... 40/45	0 ... 25/34	6 ... 18/25	–	–	–	0 ... 12/15	0 ... 15/20
SIMATIC RF380R	2 ... 80/110	2 ... 70/95	2 ... 65/90	–	10 ... 120/160	10 ... 100/130	–	2 ... 35/50

–: Reader-transponder combination not released.

RFID systems for the HF frequency range

SIMATIC RF300

Readers SIMATIC RF300

Overview



Reader	Features
SIMATIC RF310R	Ideal for use on small assembly lines. Reader with integrated antenna. • IP67 degree of protection • Operating temperature range -25 °C to +70 °C • Dimensions L x W x H (mm): 55 x 75 x 30 • 2 interface variants (IQ-Sense and RS422) • Can be parameterized for ISO 15693-compatible transponder (only applies to RS422 models)
SIMATIC RF340R	Ideal for use on assembly lines. Reader with integrated antenna. • IP67 degree of protection • Operating temperature range -25 °C to +70 °C • Dimensions L x W x H (mm): 75 x 75 x 41 • Interface RS422 • Can be parameterized for ISO 15693-compatible transponders
SIMATIC RF350R	Ideal for use on assembly lines. Reader for the connection of external antennas (ANT 1, ANT 12, ANT 18, ANT 30). • IP65 degree of protection • Operating temperature range -25 °C to +70 °C • Dimensions L x W x H (mm): 75 x 75 x 41 • Interface RS422 • Can be parameterized for ISO 15693-compatible transponders
SIMATIC RF380R	Ideal for use in assembly lines in which long ranges are required. Reader with integrated antenna. • IP67 degree of protection • Operating temperature range -25 °C to +70 °C • Dimensions L x W x H (mm): 160 x 80 x 41 • Interface RS422 / RS232 • Can be parameterized for ISO 15693-compatible transponders
SIMATIC RF310M	Mobile handheld terminal with integral read/write antenna. • Degree of protection IP54 (splashproof) • Operating temperature range -20 °C to +50 °C • Approx. dimensions L x W x H (mm): 280 x 100 x 45 • WLAN (optional)

RFID systems for the HF frequency range

Readers SIMATIC RF300

SIMATIC RF310R

Overview



Due to its small, compact design, the SIMATIC RF310R reader can be used to considerable advantage in small assembly lines.

This reader is available in two interface variants:

- With IQ-Sense interface for the 8xIQ-Sense module SM338 on S7-300/ET 200M;
- With RS422 interface for the RFID communication modules ASM 456, ASM 475, SIMATIC RF160C, RF170C, RF180C and RF182C.

Due to the high degree of protection and the use of high-quality materials, the SIMATIC RF310R ensures problem-free operation even under the harshest industrial conditions. Connection is either over a 4-pin M12 plug-in connector (IQ-Sense variant) or over an 8-pin M12 plug-in connector (RS422 variant). The RS422 model can also be parameterized for use with ISO 15693-compatible transponders, for example from the MOBY D product spectrum.

Technical specifications

Reader SIMATIC RF310R	6GT2 801-1AB10 (RS422)	GT2 801-0AA00 (IQ-Sense)
Transmission frequency	13.56 MHz	
Read / write distance	Max. 90 mm	
Protocol (air interface)	RF300 / ISO 15693	RF300
Approvals	• EN 300330, 301489, CE (Europe) • FCC Part 15 (USA) • UL/CSA • Japan Others on request.	• EN 300330, 301489, CE (Europe) • FCC Part 15 (USA) • UL/CSA
Data transmission rate reader – transponder (max.)		
• Write	Approx. 7.8 KB/s (RF300 mode) Approx. 0.5 KB/s (ISO mode)	Approx. 40 byte/s
• Read	Approx. 7.8 KB/s (RF300 mode) Approx. 1.5 KB/s (ISO mode)	Approx. 50 byte/s
Interfaces by means of communication modules, as well as directly via RS422 (3964R)	• SIMATIC S7-300 • PROFIBUS • PROFINET • Industrial Ethernet (TCP/IP)	• IQ-Sense (S7-300/ET 200M)
Connections: RS422 / IQ-Sense / power supply	M12, 8-pin	M12, 4-pin
Ambient temperature		
• During operation	-25 °C ... +70 °C	
• During transportation and storage	-40 °C ... +85 °C	
Degree of protection according to EN 60529	IP67	
Mechanical stress in accordance with EN 60721 3-7 Class 7 M2		
• Shock	50 g	
• Vibration	20 g	
Type of construction		
• Dimensions L x W x H (mm)	55 x 75 x 30	
• Color	Anthracite	
• Weight	Approx. 200 g	
• Material	Plastic PA12	
Mounting	4 x M5 screws	
Power supply	24 V DC	
Display elements	2-color LED	
Cable length reader – communication module	Max. 1 000 m (shielded cable)	Max. 50 m

RFID systems for the HF frequency range

Readers SIMATIC RF300

SIMATIC RF310R

Field data

Minimum distance from reader to reader

SIMATIC RF310R	≥ 100 mm
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Selection and ordering data

	Order No.
Reader SIMATIC RF310R	
• With IQ-Sense interface ▶	6GT2 801-0AA00
• With RS422 interface (3964R ▶ B protocol)	6GT2 801-1AB10
Accessories	
IQ-Sense module SM 338 for S7-300 and ET 200M ▶	6ES7 338-7XF00-0AB0
M12 cable plug	
PUR cable 4 x 0.34 mm ² , straight connector for SIMATIC RF310R (IQ-Sense), available in the following lengths:	
5 m ▶	6GT2 891-0LH50
10 m ▶	6GT2 891-0LN10
DVD „RFID-Systems Software & Documentation“ ▶ D	6GT2 080-2AA20

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

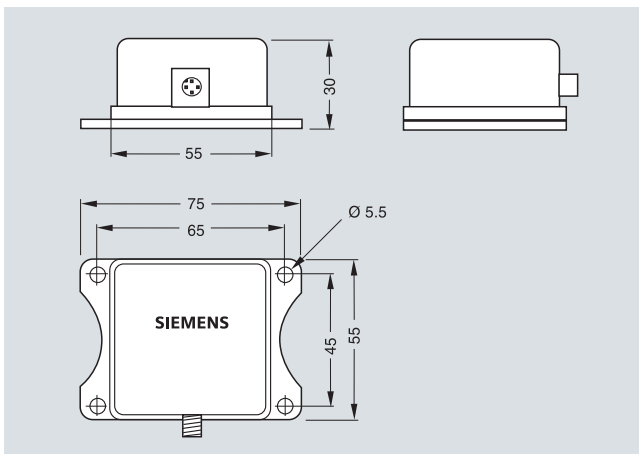
D: Subject to export regulations AL = N and ECCN = EAR99S

Dimensions

CAD data

Dimensions available as CAD graphic (DXF format).
Further information is available in the Internet under:

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90123



RFID systems for the HF frequency range

Readers SIMATIC RF300

SIMATIC RF340R

Overview



The SIMATIC RF340R is a reader with integrated antenna for the medium performance range and can be used to great advantage in assembly lines thanks to its compact design. This reader is also particularly suitable for dynamic applications, in which the transponder does not stop during the read/write process.

This reader has an RS422 interface with transmission procedure 3964R for connection to the RFID communication modules ASM 456, ASM 475, SIMATIC RF160C, RF170C, RF180C and RF182C.

Thanks to the high degree of protection and the use of high-quality materials, the SIMATIC RF340R ensures problem-free use even under the toughest industrial conditions. It is connected via an 8-pole M12 plug-in connector.

The reader can also be parameterized for use with ISO 15693-compatible transponders, for example from the MOBY D product spectrum.

Technical specifications

Reader	SIMATIC RF340R
Transmission frequency	13.56 MHz
Read / write distance	Max. 140 mm
Protocol (air interface)	RF300 / ISO 15693
Approvals	• EN 300330, 301489, CE (Europe), ATEX • FCC Part 15 (USA) • UL/CSA • Japan • Others on request.
Data transmission rate reader – transponder (max.)	
• Write	Approx. 7.8 KB/s (RF300 mode) Approx. 0.5 KB/s (ISO mode)
• Read	Approx. 7.8 KB/s (RF300 mode) Approx. 1.5 KB/s (ISO mode)
Interfaces by means of communication modules, as well as directly via RS422 (3964R)	• SIMATIC S7-300 • PROFIBUS • PROFINET • Industrial Ethernet (TCP/IP)
Connections: RS422 / power supply	M12, 8-pin
Ambient temperature	
• During operation	-25 °C ... +70 °C
• During transportation and storage	-40 °C ... +85 °C
Degree of protection according to EN 60529	IP67

Reader	SIMATIC RF340R
Mechanical stress in accordance with EN 60721 3-7 Class 7 M2	
• Shock	50 g
• Vibration	20 g
Type of construction	
• Dimensions L x W x H (mm)	75 x 75 x 41
• Color	Anthracite
• Weight	Approx. 250 g
• Material	Plastic PA12
Mounting	2 x M5 screws
Power supply	24 V DC
Display elements	2-color LED
Cable length reader – communication module	Max. 1 000 m (shielded cable)

Field data

Minimum distance from Reader to Reader

SIMATIC RF340R	≥ 200 mm
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Selection and ordering data

	Order No.
Reader SIMATIC RF340R ▶ B	6GT2 801-2AB10
Accessories	
DVD „RFID-Systems Software & Documentation“ ▶ D	6GT2 080-2AA20

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

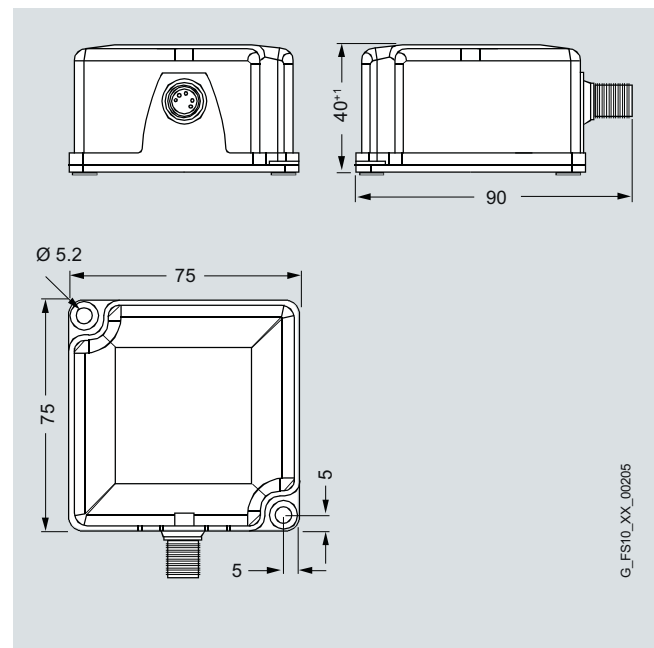
D: Subject to export regulations AL = N and ECCN = EAR99S

Dimensions

CAD data

Dimensions available as CAD graphic (DXF format). Further information is available in the Internet under

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90014



G_FS10_XX_00205

RFID systems for the HF frequency range

Readers SIMATIC RF300

SIMATIC RF350R

Overview



SIMATIC RF350R is a universal reader for operation with external antennas. Due to the different, pluggable antenna designs (flat antenna, round antennas), there are many possible applications in the area of industrial production, especially in assembly lines.

This reader has an RS422 interface with transmission procedure 3964R for connection to the RFID communication modules

ASM 456, ASM 475, SIMATIC RF160C, RF170C, RF180C and RF182C.

Thanks to the high degree of protection and the use of high-quality materials, the SIMATIC RF350R ensures problem-free use even under the toughest industrial conditions. It is connected via an 8-pole M12 plug-in connector.

The reader can also be parameterized for use with ISO 15693-compatible transponders, for example from the MOBY D product spectrum.

One of each of the following antennas can be operated on a SIMATIC RF350R:

- ANT 1, universal flat antenna, also for dynamic applications, dimensions L x W x H (mm): 75 x 75 x 20.
- ANT 12, universal round antenna in M12 design for assembly lines with extremely small workpiece holders, dimensions Ø x L (mm) M12 x 40.
- ANT 18, universal round antenna in M18 design for assembly lines with small workpiece holders, dimensions Ø x L (mm) M18 x 55.
- ANT 30, universal round antenna for assembly lines with small workpiece holders, dimensions Ø x L (mm) M30 x 58.

Technical specifications

Reader	SIMATIC RF350R
Transmission frequency	13.56 MHz
Read / write distance	Max. 140 mm
Protocol (air interface)	RF300 / ISO 15693
Approvals	• EN 300330, 301489, CE (Europe), ATEX • FCC Part 15 (USA) • UL/CSA • Japan Others on request.
Data transmission rate reader – transponder (max.)	
• Write	Approx. 7.8 KB/s (RF300 mode) Approx. 0.5 KB/s (ISO mode)
• Read	Approx. 7.8 KB/s (RF300 mode) Approx. 1.5 KB/s (ISO mode)
Interfaces by means of communication modules, as well as directly via RS422 (3964R)	• SIMATIC S7-300 • PROFIBUS • PROFINET • Industrial Ethernet (TCP/IP)
Connections	
• RS422 / power supply	M12, 8-pin
• Antenna	M8, 4-pole

Reader	SIMATIC RF350R
Ambient temperature	
• During operation	-25 °C ... +70 °C
• During transportation and storage	-40 °C ... +85 °C
Degree of protection according to EN 60529	IP65
Mechanical stress in accordance with EN 60721 3-7 Class 7 M2	
• Shock	50 g
• Vibration	20 g
Type of construction	
• Dimensions L x W x H (mm)	75 x 75 x 41
• Color	Anthracite
• Weight	Approx. 250 g
• Material	Plastic PA12
Mounting	2 x M5 screws
Power supply	24 V DC
Display elements	2-color LED
Cable length reader – communication module	Max. 1 000 m (shielded cable)

Connectable antennas	ANT 1	ANT 12	ANT 18	ANT 30
Inductive interface to the transponder	13,56 MHz			
Read/write distance, max.	140 mm	16 mm	35 mm	55 mm
Antenna cable length (cannot be changed)	3 m			
Ambient temperature				
• During operation	- 25 ... + 70 °C			
• During transportation and storage	- 40 ... + 85 °C			
Degree of protection according to EN 60529	IP67	IP67 (front)		

RFID systems for the HF frequency range

Readers SIMATIC RF300

SIMATIC RF350R

Connectable antennas	ANT 1	ANT 12	ANT 18	ANT 30
Mechanical stress in accordance with EN 60721 3-7 Class 7 M2				
• Shock	50 g (maximum value, no continuous load)			
• Vibration	20 g (maximum value, no continuous load)			
Type of construction				
• Dimensions (mm)	75 x 75 x 20	M12 x 40	M18 x 55	M30 x 58
• Color	Anthracite	Pastel turquoise		
• Weight, approx.	80 g	45 g	120 g	150 g
• Material	Plastic PA 12	Plastic Krastin		
Mounting	2 x M5 screws	2 x M12 nuts	2 x M18 nuts	2 x M30 nuts

Field data in mm

RF350R with antenna	ANT 1	ANT 12	ANT 18	ANT 30
Operating distance (S_a)	See field data of transponders			
Limit distance (S_g)				
Diameter of transmission window (L_d)				
Minimum distance (mm) from antenna to antenna (D):				
• ANT 1	800	400	400	400
• ANT 12	400	80	125	200
• ANT 18	400	125	125	200
• ANT 30	400	200	200	200

Selection and ordering data

	Order No.
Reader SIMATIC RF350R ▶ B	6GT2 801-4AB10
Without antenna	
Antenna ANT 1 ▶	6GT2 398-1CB00
for Reader RF350R	
Antenna ANT 12 ▶	6GT2 398-1CC00
for Reader RF350R	
Antenna ANT 18 ▶	6GT2 398-1CA00
for Reader RF350R	
Antenna ANT 30 ▶	6GT2 398-1CD00
for Reader RF350R	
Accessories	
DVD "RFID-Systems Software & Documentation" ▶ D	6GT2 080-2AA20

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

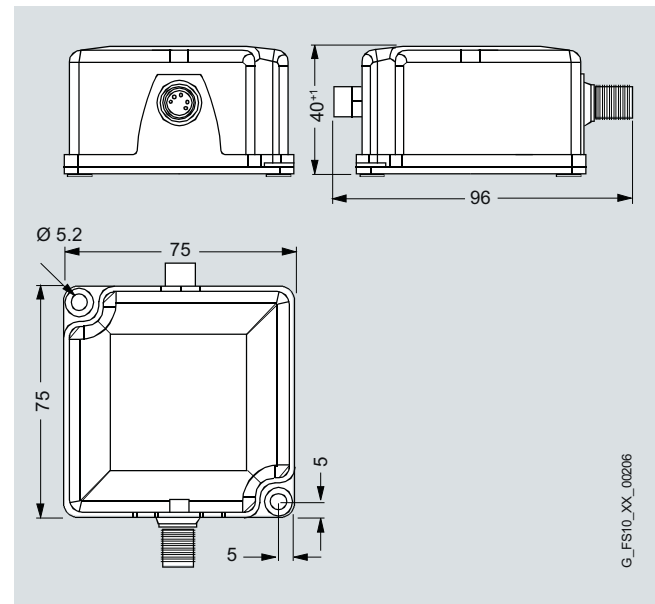
D: Subject to export regulations AL = N and ECCN = EAR99S

Dimensions

CAD data

Dimensional drawing of the SIMATIC RF350R reader available as CAD graphic (DXF format):

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90125



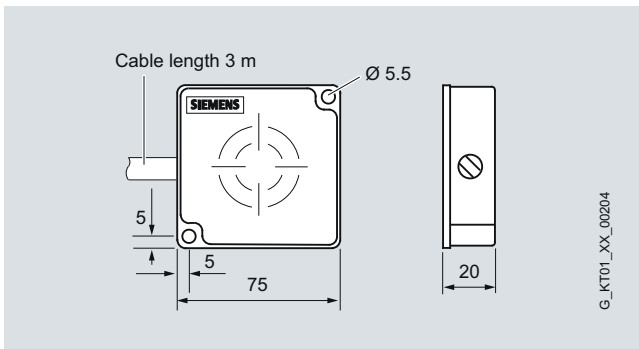
Reader SIMATIC RF350R

RFID systems for the HF frequency range

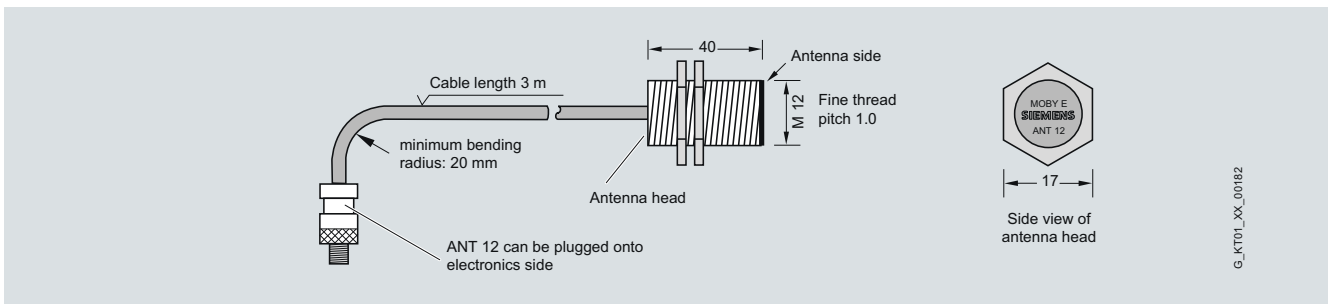
Readers SIMATIC RF300

SIMATIC RF350R

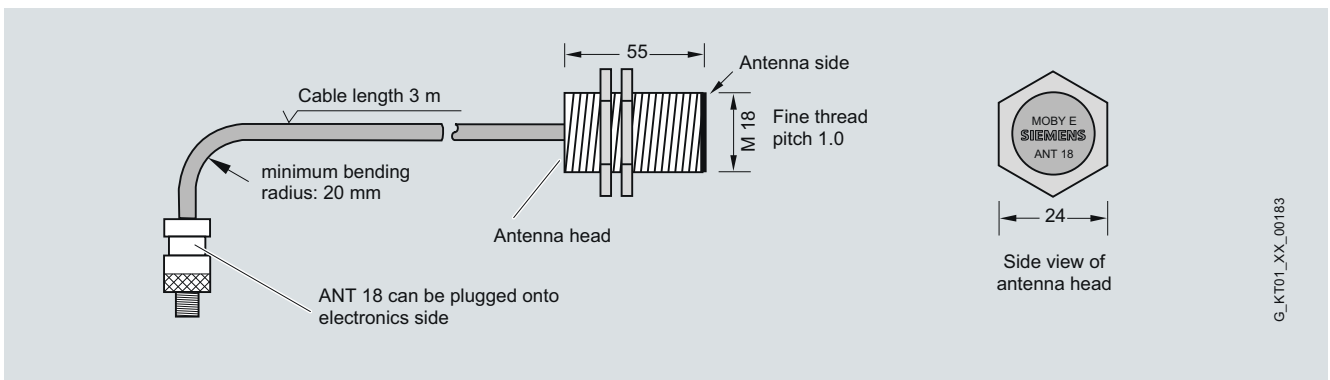
2



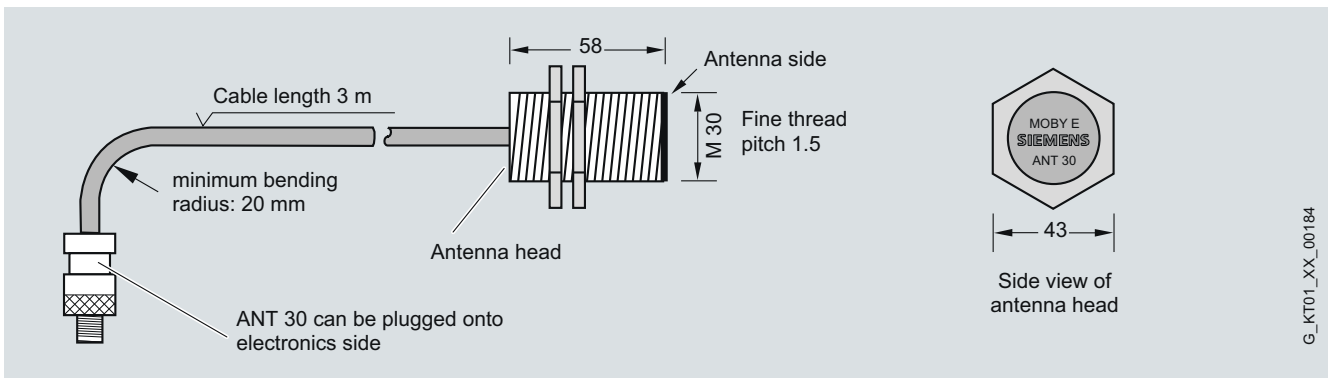
Antenna ANT 1



Antenna ANT 12



Antenna ANT 18



Antenna ANT 30

RFID systems for the HF frequency range

Readers SIMATIC RF300

SIMATIC RF380R

Overview



SIMATIC RF380R is a reader with an integral antenna for the top-end performance range and its compact construction makes it ideal for implementation in assembly lines in which long ranges are required (e.g. body shop/paint shop in the automotive industry). This reader is also particularly well-suited to dynamic applications in which the transponder is not stopped during the read/write process (e.g. baggage conveyors in airports).

This reader has both an RS422 and an RS232 interface with a 3964R transmission procedure for connection to RFID communication modules ASM 456, ASM 475, SIMATIC RF160C, RF170C, RF180C and SIMATIC RF182C as well as to non-Siemens controllers or PCs.

Due to the high degree of protection and the use of high-quality materials, the SIMATIC RF380R ensures problem-free operation even under the harshest industrial conditions. It is connected via an 8-pole M12 plug-in connector.

The reader can also be parameterized for use with ISO 15693-compatible transponders, for example from the MOBY D product spectrum.

Technical specifications

Reader	SIMATIC RF380R
Transmission frequency	13.56 MHz
Read / write distance	Max. 210 mm
Protocol (air interface)	RF300 / ISO 15693
Approvals	• EN 300330, 301489, CE (Europe), ATEX • FCC Part 15 (USA) • UL/CSA • Japan • Others on request.
Data transmission rate reader – transponder (max.)	
• Write	Approx. 7.8 KB/s (RF300 mode) Approx. 0.5 KB/s (ISO mode)
• Read	Approx. 7.8 KB/s (RF300 mode) Approx. 1.5 KB/s (ISO mode)
Interfaces by means of communication modules, as well as directly via RS422 (3964R)	• SIMATIC S7-300 • PROFIBUS • PROFINET • Industrial Ethernet (TCP/IP)
Connections	
• RS422 / RS232 / power supply	M12, 8-pin
Ambient temperature	
• During operation	-25 °C ... +70 °C
• During transportation and storage	-40 °C ... +85 °C

Reader	SIMATIC RF380R
Degree of protection according to EN 60529	IP67
Mechanical stress in accordance with EN 60721 3-7 Class 7 M2	
• Shock	50 g
• Vibration	20 g
Type of construction	
• Dimensions L x W x H (mm)	160 x 80 x 41
• Color	Anthracite
• Weight	Approx. 600 g
• Material	Plastic PA12
Mounting	4 x M5 screws
Power supply	24 V DC
Display elements	2-color LED
Cable length reader – communication module	Max. 1 000 m (shielded cable)

Field data

Minimum distance from reader to reader	
SIMATIC RF380R	≥ 400 mm

Selection and ordering data

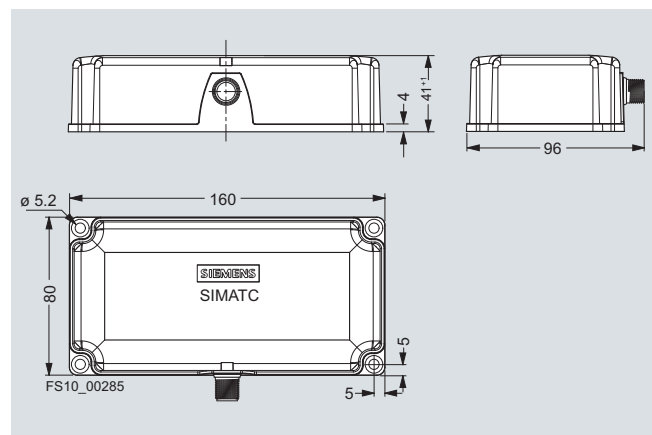
	Order No.
Reader SIMATIC RF380R ▶ B	6GT2 801-3AB10
Accessories	
RS232 connecting cable ▶	6GT2 891-4KH50
between the PC and SIMATIC RF380R, with a connecting cable for a 24 V connector (M12 socket), straight connector, PUR, length 5 m	
DVD "RFID-Systems Software & Documentation" ▶ D	6GT2 080-2AA20

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

D: Subject to export regulations AL = N and ECCN = EAR99S

Dimensions



RFID systems for the HF frequency range

Readers SIMATIC RF300

SIMATIC RF310M mobile handheld terminal

Overview



SIMATIC RF310M with loading/docking station

The SIMATIC RF310M is a powerful mobile handheld terminal with integral read/write antenna for applications in the field of production logistics, distribution and service. In addition, it is an indispensable tool for commissioning and testing.

Design

The SIMATIC RF310M mobile handheld terminal consists of one basic unit (Basis PSION Workabout PRO-G2) and an integrated read/write device for RF300 transponders and MOBY D transponders according to the ISO15693 standard.

The SIMATIC RF310M has a splashwater-proof enclosure (IP54), LCD color monitor 1/4 VGA, 640 x 480 pixels, TFT portrait format, alphanumeric keyboard and various interfaces (for SD memory card, battery charging, USB, Compact Flash for expansion modules, Bluetooth, etc.).

Function

The supplied and pre-installed RF300 software provides the following service and test functions for RF300 and MOBY D MDS Dxxx transponders¹⁾:

- Reading data from the transponder
- Writing data to the transponder
- Reading and displaying the ID number of the transponder
- Displaying and editing the data in hexadecimal, ASCII, decimal and binary formats
- Activate/deactivate password

Based on the operating system and communication standard (WIN CE), the unit ensures simple integration into existing or planned infrastructures. Various optional development tools for the PC and a wide selection of accessories are available for this direct from PSION and Microsoft.

In addition to the standard applications, the user has access to an RFID function library (API), with which he can create his own ".Net"-based applications. The software components required for this purpose are also pre-installed.

¹⁾ Exception: The MDS D421 and MDS D422 transponders cannot be operated with the mobile handheld terminal SIMATIC RF310M.

Technical specification

Mobile handheld terminal	SIMATIC RF310M
Processor	Intel Xscale PXA270- 520 MHz, ARM
Operating system	Microsoft Windows CE.NET 5.0
RAM / Flash EEPROM memory	128 MB / 128 MB
User program	RF300 application RF310M.EXE
Screen	TFT color touch display, 1/4 VGA 640 x 480 (portrait format); adjustable backlighting
Keyboard	alphanumeric
Sound	Piezo signal transmitter
Power supply	• Lithium-ion battery (3.7 V; 3000 mAh) • Fast charging capability (automatic disconnection)
Interfaces	• LIF interface (low insertion force interface) for battery charging and communication with the PC, USB and Ethernet using a loading station (USB) • SD card slot for memory card • CF interface for expansion cards (e.g. WLAN)
Dimensions L x W x H (mm)	277 x 100 x 44
Weight (incl. battery)	Approx. 0.6 kg
Ambient temperature	• During operation -20 °C ... +50 °C • Storage (without batteries) -40 °C ... +60 °C
Relative humidity, non-condensing	5 ... 95 %
Degree of protection	IP65 (rain, dust)
EMC	EN 55022
Electrostatic; RF; EFT	IEC 801-2; IEC 801-3; IEC 801-4
Integral read/write unit, inductive interface to transponder	for SIMATIC RF300 / MOBY D (ISO)
Read/write distance to the transponder	up to 60 mm, depending on the transponder
Energy/data transmission frequency	13.56 MHz
Serial interface (internal, to basic unit)	RS232, 3964R protocol
Functionality of the SW application	Standard user interface for reading/writing of transponders, etc.

RFID systems for the HF frequency range

Readers SIMATIC RF300

SIMATIC RF310M mobile handheld terminal

Selection and ordering data

	Order No.
SIMATIC RF310M mobile handheld terminal ▶ B Basic unit (PSION Workabout PRO-G2) with integrated RFID read/write unit (RF300 and ISO 15693), battery, standard software pre-installed, without loading/docking station.	6GT2 803-0AB00
Loading/docking station ▶ B For a mobile handheld terminal as well as a spare battery, incl. wide-range plug-in power supply 100 to 240 V AC and country-specific adapters as well as USB cable.	6GT2 898-0BA00
SIMATIC RF WLAN module ▶ B Acc. to 802.11B & 802.11G, CF card	6GT2 898-0DA00
Accessories	
Spare battery ▶ B For basic unit (PSION Workabout PRO), High Capacity 3000 mAh, Li-ion.	6GT2 898-0CA00
DVD „RFID-Systems Software & Documentation“ ▶ D	6GT2 080-2AA20

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

D: Subject to export regulations AL = N and ECCN = EAR99S

Accessories

Optional components are available in the Internet under

<http://www.pSIONteklogix.com>

For example:

- SD expansion cards
- CF WLAN adapter
- Handles, belt loops
- Vehicle holder with charging function

Overview



The RFID system MOBY D is particularly suitable for use in industrial production in the areas of production control, asset management and tracking & tracing.

MOBY D is used to implement identification tasks with medium to high performance (ISO 15693) in the HF range (13.56 MHz) that require particularly high ranges.

MOBY D offers a comprehensive portfolio of ISO 15693 transponders for a whole variety of requirements - from low-cost SmartLabels for simple identification tasks through rugged credit card formats, right up to transponders for use in especially harsh environments such as paint shops or in the laundry and cleaning industry.

The communication modules that can be used for all MOBY and SIMATIC RF systems (ASM 456, ASM 475, SIMATIC RF1xxC) are available for connecting to SIMATIC S7-300, PROFIBUS, PROFINET and TCP/IP (XML).

Depending on the read/write distance, different readers are available with integrated or remote antennas.

The MOBY D identification system possesses the following features:

- 13.56 MHz operating frequency
- Operation according to ISO 15693
- Passive (without battery), maintenance-free transponder (MDS Dxxx) with memory of up to 2 000 byte FRAM.
- Rugged, compact components with IP67 degree of protection
- Simple integration in SIMATIC, PROFIBUS, PROFINET and TCP/IP with the help of tried and tested function blocks (FC45, FB45).

Benefits

- High-performance reader with problem-free bulk sensing and range of up to 0.9 m.
- Cost-effective and battery-free ISO 15693 transponders up to 64 KB with IP68 degree of protection and 220 °C temperature range, with ATEX approval
- Flexible and economic solutions thanks to the complete and scalable portfolio for the field of industrial identification
- Simplified engineering, commissioning, diagnostics and maintenance through seamless integration into Totally Integrated Automation:

- Integrated bus connection to an automation system, such as SIMATIC, SIMOTION or SINUMERIK via communication modules with PROFIBUS and PROFINET.
- Simple S7 software integration via ready-to-use function blocks.
- High degree of investment protection thanks to:
 - Open ISO 15693 standard
 - Software compatibility between the RFID systems of Siemens AG
 - Standardized communications interfaces.
- Openness through connection possibilities to different bus systems from different manufacturers and PC environments via communication modules.
- Worldwide Service and Support.

Application

Applications range from simple identification, such as electronic barcode substitution or supplementation, or delivery notes in harsh environments, storage and distribution logistics, right up to product identification.

The main applications for MOBY D are:

- Container and box identification in logistics and distribution in open systems
- Distribution logistics and goods identification
- Parcel and postal services, couriers and logistics companies
- Baggage check-in and baggage tracking
- Protection against plagiarism and theft
- Production logistics and in assembly lines, including those with demanding temperature requirements, (e.g., paint shop, temperature range up to +220 °C)
- Parts identification (e.g., transponder is attached directly to products/pallets).

Integration

A wide range of communication modules, function blocks, as well as high-performance drivers and function libraries permits easy and quick integration into the application.

And best of all: MOBY D is part of Totally Integrated Automation and can be integrated easily and cost-effectively into the SIMATIC world.

For more details on the connection possibilities, see chapter 5 under "Communication modules".

Technical specifications

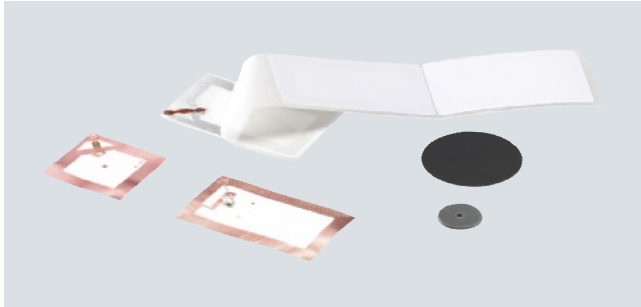
RFID system	MOBY D
Transmission frequency	13.56 MHz
Read / write distance	Max. 900 mm
Protocol (air interface)	ISO 15693 ISO 18000-3
Memory capacity	Max. 2 KB
Data transmission rate reader – transponder	
• Read	Max. 1.5 KB/s
• Write	Max. 0.5 KB/s
Multitag/Bulk capability	Yes
Special features	• SIMATIC or PC/IT integration • Long sensing ranges with excellent interference immunity • External antennas for industrial applications

RFID systems for the HF frequency range

MOBY D

Transponders MOBY D

Overview



The transponders can be used for the following RFID systems:

- SIMATIC RF200
- SIMATIC RF300 (in ISO 15693 operating mode)
- MOBY D

Note

For detailed descriptions and ordering information look up the specified pages.

Transponder	Features	Page
MDS D165	SmartLabel, (PET) in credit card format. Applications range from simple identification such as electronic barcode substitution or supplementation to storage and distribution logistics, right up to product identification. • 112 bytes EEPROM • Up to IP65 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions L x W (mm): 86 x 54	2/42
MDS D261	SmartLabel, (PET) in compact design. Applications range from simple identification such as electronic barcode substitution or supplementation to storage and distribution logistics, right up to product identification. • 256 bytes EEPROM • Up to IP65 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions L x W (mm): 55 x 55	2/42
MDS D100	Universal transponder in credit card format. • 112 bytes EEPROM • IP68 degree of protection • Operating temperature range -25 °C to +80 °C • Dimensions L x W x H (mm): 85.6 x 54 x 0.9	2/43
MDS D200	Universal transponder in credit card format. • 256 bytes EEPROM • IP67 degree of protection • Operating temperature range -20 °C to +60 °C • Dimensions L x W x H (mm): 86 x 54 x 0.8	2/48
MDS D124	Rugged transponder for use in harsh industrial environments and under extreme environmental conditions. • 112 bytes EEPROM • IP68 / IPx9K degree of protection • Operating temperature range -25 °C to +180 °C • Dimensions diameter x height (mm): Ø 27 x 4	2/44

Transponder	Features	Page
MDS D126	Compact and rugged ISO transponder; suitable for identification of transport units in production-related logistics; can also be used under harsh environmental conditions. • 112 bytes EEPROM • IP68 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions L x W x H (mm): 85.6 x 54 x 0.9	2/45
MDS D139	Heat-resistant transponder for use in paint shops or applications with high thermal stress. • 112 bytes EEPROM • IP68 / IPx9K degree of protection • Operating temperature range -25 °C to +220 °C • Dimensions diameter x height (mm): Ø 85 x 15	2/46
MDS D160	The transponder has been specially designed for harsh environments in the laundry and cleaning industry. • Its main applications include: - Rented work clothing - Rented laundry - OP textiles, hospital clothing - Hotel laundry - Dirt collection mats • 112 bytes EEPROM • IP68 / IPx9K degree of protection • Operating temperature range -25 °C to +175 °C • Dimensions diameter x height (mm): Ø 16 x 3	2/47
MDS D324	Rugged transponder for use in harsh industrial environments and under extreme environmental conditions. • 992 bytes EEPROM • IP67 degree of protection • Operating temperature range -25 °C to +125 °C • Dimensions diameter x height (mm): Ø 27 x 4	2/49
MDS D424	Rugged transponder for use in production and distribution logistics as well as in assembly and production lines: • 2 000 bytes FRAM • IP67 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions diameter x height (mm): Ø 27 x 4	2/52
MDS D428	Compact and rugged ISO transponder; suitable for screw mounting; for use in assembly and production lines in the powertrain area. • 2 000 bytes FRAM • IP68 / IPx9K degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions diameter x height (mm): Ø 24 x 20 (without M8 grub screw)	2/55

Transponder	Features	Page
MDS D426	Compact and rugged ISO transponder; suitable for identification of transport units in production-related logistics; can also be used under harsh environmental conditions. • 2 000 bytes FRAM • IP68 / IPx9K degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions diameter x height (mm): Ø 50 x 3.6	2/54
MDS D460	Rugged transponder for use in assembly lines. • 2 000 bytes FRAM • IP67 degree of protection • Operating temperature range -25 °C to +85 °C • Dimensions diameter x height (mm): Ø 16 x 3	2/56

Customer-specific transponders

Customer-specific transponders (packaging, temperature range, geometry, etc.) on request.

Technical specification**Field data (operating/limit distance) of transponders and readers (all specifications in mm)**

The following tables show the field data (unaffected by metal) for all ISO transponders (MDS Dxxx) in connection with MOBY D readers. The listed technical data are typical values and are valid for a room temperature of +25 °C.

	MDS D165	MDS D261	MDS D100	MDS D200	MDS D124	MDS D139	MDS D160	MDS D324
SLG D12/D12S	0 ... 120/150	0 ... 100/140	0 ... 160/220	0 ... 120/150	0 ... 70/100	0 ... 120/150	0 ... 45/65	0 ... 60/80
SLG D11/D11S ANT D5	0 ... 220/300	0 ... 200/280	0 ... 300/380	0 ... 220/320	0 ... 150/220	0 ... 280/350	0 ... 75/110	0 ... 120/160
SLG D11/D11S ANT D2	—	—	—	—	45 ... 70/90	—	35 ... 55/65	35 ... 60/70
SLG D10/D10S ANT D5	0 ... 350/450	0 ... 300/400	0 ... 400/500	0 ... 400/500	0 ... 200/280	0 ... 400/500	0 ... 130/180	0 ... 200/280
SLG D10/D10S ANT D6	0 ... 400/500	0 ... 350/400	0 ... 550/650	0 ... 500/600	0 ... 220/300	0 ... 500/600	0 ... 130/180	0 ... 200/280
SLG D10/D10S ANT D10	0 ... 350/450	0 ... 300/400	0 ... 500/600	0 ... 450/550	0 ... 200/280	0 ... 450/550	0 ... 130/180	0 ... 200/280

	MDS D424	MDS D428	MDS D460	MDS D126	MDS D426
SLG D12/D12S	0 ... 70/100	0 ... 40/60	0 ... 40/60	0 ... 100/140	0 ... 90/120
SLG D11/D11S ANT D5	0 ... 150/200	0 ... 70/100	0 ... 70/100	0 ... 200/260	0 ... 180/220
SLG D11/D11S ANT D2	45 ... 70/90	—	30 ... 50/60	—	—
SLG D10/D10S ANT D5	0 ... 200/280	0 ... 120/160	0 ... 120/160	0 ... 250/350	0 ... 220/300
SLG D10/D10S ANT D6	0 ... 220/300	0 ... 100/150	0 ... 100/150	0 ... 300/400	0 ... 260/350
SLG D10/D10S ANT D10	0 ... 200/280	0 ... 100/150	0 ... 100/150	0 ... 200/260	0 ... 180/220

—: Reader-transponder combination not released

RFID systems for the HF frequency range

Transponders MOBY D (ISO mode)

MDS D165 / MDS D261

Overview



The SmartLabel can be used for the RFID system MOBY D as well as for SIMATIC RF200 and SIMATIC RF300 (ISO mode).

Applications

SmartLabels permit numerous flexible constructions to ensure optimum dimensioning for many different applications.

Thanks to their very reasonable price, the SmartLabels can be used universally as "electronic barcode substitutes or supplements" or "delivery notes".

Technical specifications

SmartLabel	MDS D165 / MDS D261
Transmission frequency	13.56 MHz
Read / write distance	Max. 500 mm
Protocol (air interface)	ISO 15693
Memory capacity	
• User memory	
- MDS D165	112 bytes (EEPROM)
- MDS D261	256 bytes (EEPROM)
• Read-only memory (UID)	8 bytes
• OTP (One Time Programmable)	112 bytes or 256 bytes (only with MOBY D / SIMATIC RF300)
Memory organization	Block by block access (4 byte block size)
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM	> 100 000
• FRAM	-
Read cycles	Unlimited
Ambient temperature	
• During operation	-25 °C ... +85 °C
• During transportation and storage	+20 °C ... +30 °C
Storage duration	2 years, determined by durability of the adhesive
Degree of protection according to EN 60529	Up to IP65
Type of construction	
• Dimensions L x W (mm)	
- MDS D165	86 x 54
- MDS D261	55 x 55
• Color	White
• Weight	Approx. 1 g
• Material	
- Top	PET plastic (label material)
- Inlay	PET plastic (carrier material)
- Antenna	Aluminum
- Imprinting	Yes (heat transfer method)
Mounting	Single-sided adhesive

SmartLabel	MDS D165 / MDS D261
Mounting	
• On metal	No
• Flush-mounted in metal	No
Special features	• Temperature range • High-volume applications • Customer-specific version on request

Selection and ordering data

	Order No.
SmartLabel MDS D165 ▶ B Material: PET User memory: 112 bytes EEPROM Operating temperature range: -25 ... 85 °C Dimensions L x W x H (mm): 86 x 54 x 0.3 Order quantity 1250 units or a multiple thereof, price per unit.	6GT2 600-1AB00-0AX0
SmartLabel MDS D261 ▶ B Material: PET User memory: 256 bytes EEPROM Operating temperature range: -25 ... 85 °C Dimensions L x W x H (mm): 55 x 55 x 0.3 Order quantity 1250 units or a multiple thereof, price per unit.	6GT2 600-1AA00-0AX0

▶ Preferred type, available from stock.

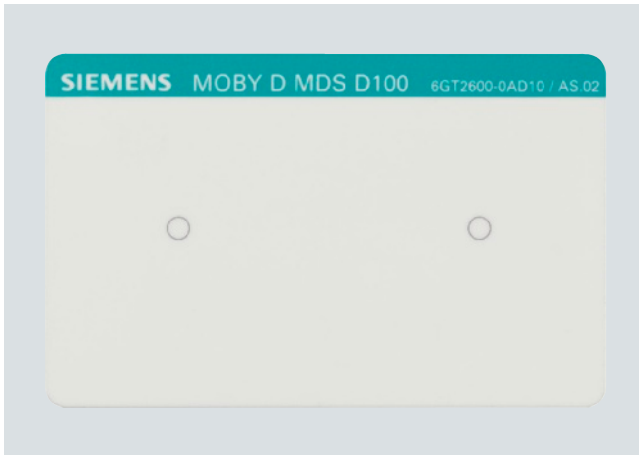
B: Subject to export regulations AL = N and ECCN = EAR99H

RFID systems for the HF frequency range

Transponders MOBY D (ISO mode)

MDS D100

Overview



The transponder in credit card format can be used for the RFID system MOBY D as well as for SIMATIC RF200 and SIMATIC RF300 (ISO mode).

Applications

Applications extend from simple identification, such as electronic bar code substitution or supplementation, over storage and distribution logistics, to product identification.

This transponder can even be used problem-free under extreme environmental conditions (e.g. when subjected to temperatures up to +80 °C).

Technical specifications

Transponder in credit card format	MDS D100
Transmission frequency	13.56 MHz
Read / write distance	Max. 650 mm
Protocol (air interface)	ISO 15693
Memory capacity	
• User memory	112 bytes (EEPROM)
• Read-only memory (UID)	8 bytes
• OTP (One Time Programmable)	112 bytes (only with MOBY D / SIMATIC RF300)
Memory organization	Block by block access (4 byte block size)
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM	> 100 000
• EEPROM (below +40 °C)	typ. 1 000 000
• FRAM	-
Read cycles	Unlimited
Ambient temperature	
• During operation	-25 °C ... +80 °C
• During transportation and storage	-25 °C ... +80 °C
Degree of protection according to EN 60529	IP68
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	ISO 10373/ISO 7810
• Vibration	ISO 10373/ISO 7810
• Torsion and bending	ISO 10373/ISO 7816-1

Transponder in credit card format MDS D100

Type of construction	
• Dimensions L x W x H (mm)	85.6 x 54 x 0.9
• Color	White/petrol
• Weight	Approx. 5 g
• Material	PC plastic laminated, printable on both sides
Mounting	Adhesive, or with fixing pocket
Mounting	
• On metal	Yes, with spacer
• Flush-mounted in metal	No

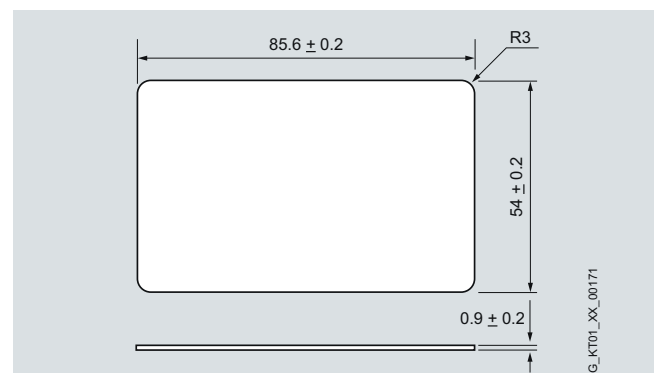
Selection and ordering data

	Order No.
Transponder MDS D100 ▶ B	6GT2 600-0AD10
User memory: 112 bytes EEPROM	
Degree of protection: IP68	
Operating temperature: Max. + 80 °C	
Order quantity 50 units or a multiple thereof, price per unit.	
Accessories	
Fixing pocket ▶	6GT2 190-0AB00
for MDS D100, only usable together with spacer 6GT2 190-0AA00.	
Order quantity 50 units or a multiple thereof, price per unit.	
Holder ▶ B	6GT2 390-0AA00
For MDS D100.	
Order quantity 50 units or a multiple thereof, price per unit.	
Spacer ▶	6GT2 190-0AA00
For fixing pocket (6GT2 190-0AB00), thickness 20 mm	
The purpose of the spacer is to maintain the recommended distance to the metal when installing the transponder.	
Order quantity 50 units or a multiple thereof, price per unit.	

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

Dimensions

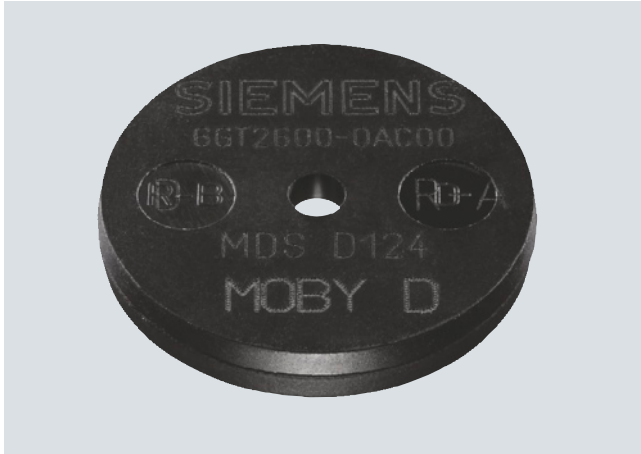


RFID systems for the HF frequency range

Transponders MOBY D (ISO mode)

MDS D124

Overview



The MDS D124 is a mobile, passive, maintenance-free transponder based on ISO 15693.

The MDS D124 can be used for the RFID system MOBY D as well as for SIMATIC RF200 and SIMATIC RF300 (ISO mode).

Applications

This transponder can even be used problem-free under extreme environmental conditions (e.g. when subjected to temperatures up to +180 °C).

Technical specifications

Transponder	MDS D124
Transmission frequency	13.56 MHz
Read / write distance	Max. 300 mm
Protocol (air interface)	ISO 15693
Memory capacity	
• User memory	112 bytes (EEPROM)
• Read-only memory (UID)	8 bytes
• OTP (One Time Programmable)	112 bytes (only with MOBY D / SIMATIC RF300)
Memory organization	Block by block access (4 byte block size)
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM	> 100 000
• EEPROM (below +40 °C)	typ. 1 000 000
• FRAM	-
Read cycles	Unlimited
Ambient temperature	
• During operation	-25 °C ... +125 °C permanently -25 °C ... +160 °C tested for up to 10000 h or for 6000 cycles -25 °C ... +180 °C tested for up to 5000 h or for 3000 cycles
• During transportation and storage	-40 °C ... +125 °C
Degree of protection according to EN 60529	IP68 / IPx9K
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	100 g
• Vibration	20 g
• Torsion and bending	not permissible

Transponder	MDS D124
Type of construction	
• Dimensions diameter x height (mm)	Ø 27 x 4
• Color	Black
• Weight	Approx. 5 g
• Material	Epoxy resin
Mounting	Glue or use M3 screw
Mounting	
• On metal	Yes, with spacer > 25 mm
• Flush-mounted in metal	No

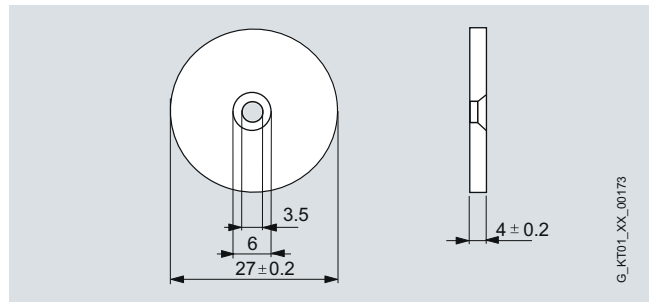
Selection and ordering data

	Order No.
Transponder MDS D124 ▶ B	6GT2 600-0AC10
User memory:	
112 bytes EEPROM	
Degree of protection:	
IP68 / IPx9K	
Operating temperature:	
Max. + 180 °C	
Order quantity 200 units or a multiple thereof, price per unit.	

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

Dimensions



RFID systems for the HF frequency range

Transponders MOBY D (ISO mode)

MDS D126

Overview



The MDS D126 is a passive (maintenance-free) transponder based on ISO 15693.

The MDS D126 can be used for the RFID system MOBY D as well as for SIMATIC RF200 and SIMATIC RF300 (ISO mode).

Applications

Compact and rugged ISO transponder; suitable for identification of transport units in production-related logistics; can also be used under harsh environmental conditions.

Technical specifications

Transponder	MDS D126
Transmission frequency	13.56 MHz
Read / write distance	Max. 400 mm
Protocol (air interface)	ISO 15693
Memory capacity	
• User memory	112 bytes (EEPROM)
• Read-only memory (UID)	8 bytes
• OTP (One Time Programmable)	112 bytes (only with MOBY D / SIMATIC RF300)
Memory organization	Block by block access (4 byte block size)
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM	> 100 000
• EEPROM (below +40 °C)	typ. 1 000 000
• FRAM	-
Read cycles	unlimited
Ambient temperature	
• During operation	-25 °C ... +85 °C
• During transportation and storage	-40 °C ... +100 °C
Degree of protection according to EN 60529	IP68
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	50 g
• Vibration	20 g
• Torsion and bending	not permissible
Type of construction	
• Dimensions diameter x height (mm)	Ø 50 x 3.6
• Color	Black
• Weight	Approx. 13 g
• Material	Plastic PA6.6 GF
Mounting	M4 screw
Mounting	
• On metal	Yes, with spacer > 25 mm
• Flush-mounted in metal	No

Selection and ordering data

	Order No.
Transponder MDS D126 ▶ B	6GT2 600-0AE00
User memory: 112 bytes EEPROM	
Order quantity 250 units or a multiple thereof, price per unit.	

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

RFID systems for the HF frequency range

Transponders MOBY D (ISO mode)

MDS D139

Overview



MDS D139 with spacer

The MDS D139 is a passive (maintenance-free) heat-resistant transponder based on ISO 15693.

The MDS D139 can be used for the RFID system MOBY D as well as for SIMATIC RF200 and SIMATIC RF300 (ISO mode).

Applications

Applications in production logistics and in assembly lines subject to high temperatures (up to +200 °C, e.g. in a paint shop).

Technical specifications

Transponder	MDS D139
Transmission frequency	13.56 MHz
Read / write distance	Max. 600 mm
Protocol (air interface)	ISO 15693
Memory capacity	
• User memory	112 bytes (EEPROM)
• Read-only memory (UID)	8 bytes
• OTP (One Time Programmable)	112 bytes (only with MOBY D / SIMATIC RF300)
Memory organization	Block by block access (4 byte block size)
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM	> 100 000
• EEPROM (below +40 °C)	typ. 1 000 000
• FRAM	-
Read cycles	Unlimited
Ambient temperature	
• During operation	• -25 ... +100 °C permanently • +200 °C (tested up to 5 000 h continuous temperature, or 3 000 temperature cycles) • +220 °C (tested up to 2 000 h continuous temperature, or 1 500 temperature cycles)
• During transportation and storage	-40 °C ... +100 °C
Degree of protection according to EN 60529	IP68 / IPx9K
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	50 g
• Vibration	20 g
• Torsion and bending	not permissible

Transponder	MDS D139
Type of construction	
• Dimensions diameter x height (mm)	Ø 85 x 15
• Color	Black
• Weight	Approx. 50 g
• Material	Plastic PPS
Mounting	M5 screw
Mounting	
• On metal	Yes, with spacer > 30 mm
• Flush-mounted in metal	No
Special features	• ATEX Zone 2G • Silicone-free

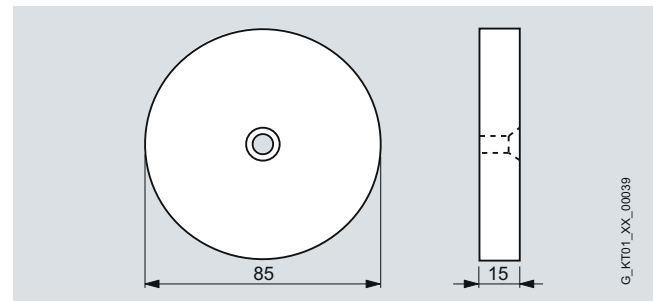
Selection and ordering data

	Order No.
Transponder MDS D139 ▶	6GT2 600-0AA10
User memory: 112 bytes EEPROM	
Degree of protection: IP68 / IPx9K	
Operating temperature: Max. + 220 °C	
Order quantity 10 units or a multiple thereof, price per unit.	
Accessories	
Spacer ▶	6GT2 690-0AA00
Necessary for mounting onto metal surfaces.	
Order quantity 10 units or a multiple thereof, price per unit.	
Quick change holder for MDS D139 ▶ B	6GT2 690-0AH00
Stainless steel, diameter = 22 mm, height = 48 mm.	
Order quantity 10 units or a multiple thereof, price per unit.	

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

Dimensions



RFID systems for the HF frequency range

Transponders MOBY D (ISO mode)

MDS D160

Overview



The MDS D160 transponder can be used for the RFID system MOBY D as well as for SIMATIC RF200 and SIMATIC RF300 (ISO mode).

Applications

Typical applications are, for example:

- Rented work clothing
- Hotel laundry
- Surgical textiles
- Hospital clothing
- Dirt collection mats
- Clothing for nursing homes/hostels

Technical specifications

Transponder	MDS D160
Transmission frequency	13.56 MHz
Read / write distance	Max. 180 mm
Protocol (air interface)	ISO 15693
Memory capacity	
• User memory	112 bytes (EEPROM)
• Read-only memory (UID)	8 bytes
• OTP (One Time Programmable)	112 bytes (only with MOBY D / SIMATIC RF300)
Memory organization	Block by block access (4 byte block size)
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM (at 70 °C)	> 10 000
• EEPROM (below +40 °C)	typ. 1 000 000
• FRAM	-
Read cycles	unlimited
Ambient temperature	
• During operation	• -25 °C ... +85 °C permanently • -25 °C ... +125 °C to 1000 h • -25 °C ... +175 °C to 500 h • +220 °C 1x for 30 s • Above +140 °C processing is not possible
• During transportation and storage	-40 °C ... +100 °C
Degree of protection according to EN 60529	IP68 / IPx9K

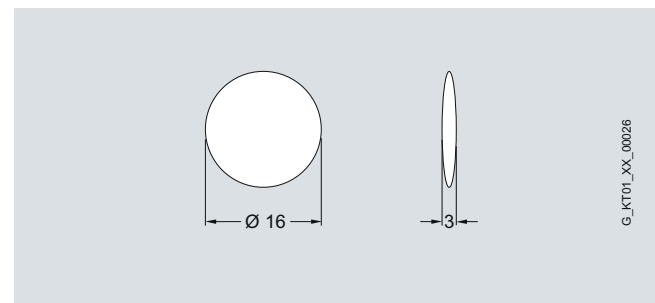
Transponder	MDS D160
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	40 g
• Vibration	10 g
• Torsion and bending	not permissible
Type of construction	
• Dimensions diameter x height (mm)	Ø 16 x 3
• Color	Beige
• Weight	Approx. 1.2 g
• Material	Plastic PPA
Mounting	Patching, sewing, gluing, with spacer
Mounting	
• On metal	Yes, with spacer
• Flush-mounted in metal	No
Special features	• Min. 100 washing cycles • 24 h regeneration time required between washing cycles.

Selection and ordering data

	Order No.
Transponder MDS D160 ▶ B User memory: 112 bytes EEPROM Degree of protection: IP68 Operating temperature: Max. + 175 °C Order quantity 100 units or a multiple thereof, price per unit.	6GT2 600-0AB10
Accessories Spacer for MDS D160 ▶ B Necessary for mounting onto metal surfaces. Diameter = 20 mm, height = 15 mm Order quantity 100 units or a multiple thereof, price per unit.	6GT2 690-0AG00

- ▶ Preferred type, available from stock.
 B: Subject to export regulations AL = N and ECCN = EAR99H

Dimensions



RFID systems for the HF frequency range

Transponders MOBY D (ISO mode)

MDS D200

Overview



The MDS D200 is a mobile, passive, maintenance-free transponder based on ISO 15693.

The MDS D200 can be used for the RFID system MOBY D as well as for SIMATIC RF200 and SIMATIC RF300 (ISO mode)..

Applications

From simple identification, e.g. as electronic barcode replacement or supplementation, through warehouse and distribution logistics, right up to product identification.

Technical specifications

Transponder	MDS D200
Transmission frequency	13.56 MHz
Read / write distance	Max. 450 mm
Protocol (air interface)	ISO 15693
Memory capacity	
• User memory	256 bytes (EEPROM)
• Read-only memory (UID)	8 bytes
• OTP (One Time Programmable)	256 bytes (only with MOBY D / SIMATIC RF300)
Memory organization	Block by block access (4 byte block size)
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM	> 100 000
• EEPROM (below +40 °C)	typ. 1 000 000
• FRAM	-
Read cycles	unlimited
Ambient temperature	
• During operation	-25 °C ... +60 °C
• During transportation and storage	-25 °C ... +60 °C
Degree of protection according to EN 60529	IP67
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	ISO 10373/ISO 7810
• Vibration	ISO 10373/ISO 7810
• Torsion and bending	ISO 10373/ISO 7816-1
Type of construction	
• Dimensions L x W x H (mm)	85.6 x 54 x 0.9
• Color	White
• Weight	Approx. 5 g
• Material	PET plastic
Mounting	Adhesive, or with fixing pocket

Transponder	MDS D200
Mounting	
• On metal	Yes, with spacer
• Flush-mounted in metal	No

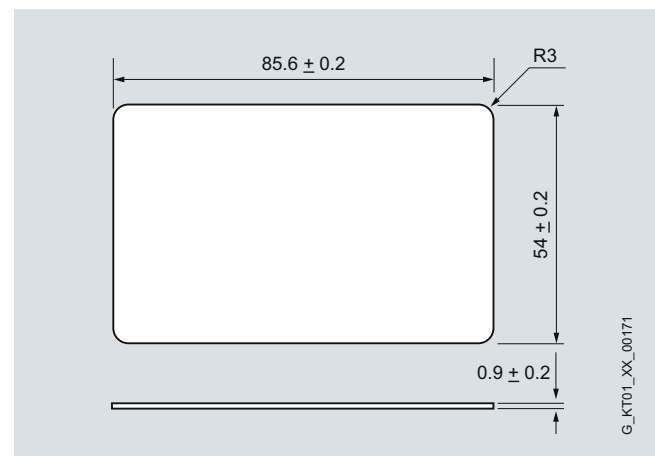
Selection and ordering data

	Order No.
Transponder MDS D200	6GT2 600-1AD00-0AX0
User memory: 256 bytes EEPROM	
Order quantity 250 units or a multiple thereof, price per unit.	
Accessories	
Fixing pocket	6GT2 190-0AB00
for MDS D200	
Order quantity 50 units or a multiple thereof, price per unit.	
Holder	6GT2 390-0AA00
for MDS D200	
Order quantity 50 units or a multiple thereof, price per unit.	
Spacer	6GT2 190-0AA00
for fixing pocket (6GT2 190-0AB00), thickness 20 mm	
The purpose of the spacer is to maintain the recommended distance to the metal when installing the transponder.	
Order quantity 50 units or a multiple thereof, price per unit.	

► Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

Dimensions



RFID systems for the HF frequency range

Transponders MOBY D (ISO mode)

MDS D324

Overview



The MDS D324 is a passive (maintenance-free) transponder based on ISO15693.

The MDS D324 can be used for the RFID system MOBY D as well as for SIMATIC RF200 and SIMATIC RF300 (ISO mode).

Applications

The MDS D324 was developed for applications in production and distribution logistics as well as product identification.

For the user, the usable application memory amounts to 992 byte.

This transponder can also be easily used in harsh environments under extreme environmental conditions (e.g. with higher thermal stress).

Technical specifications

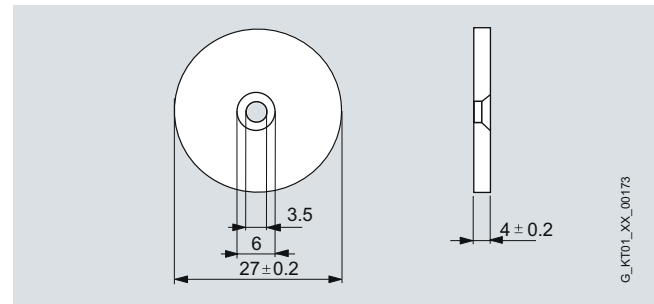
Transponder	MDS D324
Transmission frequency	13.56 MHz
Read / write distance	Max. 280 mm
Protocol (air interface)	ISO 15693
Memory capacity	
• User memory	992 bytes (EEPROM)
• Read-only memory (UID)	8 bytes
• OTP (One Time Programmable)	992 bytes (only with MOBY D / SIMATIC RF300)
Memory organization	Block by block access (4 byte block size)
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM (at 70 °C)	> 100 000
• EEPROM (below +40 °C)	typ. 1 000 000
• FRAM	-
Read cycles	unlimited
Ambient temperature	
• During operation	-25 °C ... +125 °C
• During transportation and storage	-40 °C ... +150 °C
Degree of protection according to EN 60529	IP67
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	100 g
• Vibration	20 g
• Torsion and bending	not permissible

Transponder	MDS D324
Type of construction	
• Dimensions diameter x height (mm)	Ø 27 x 4
• Color	Black
• Weight	Approx. 5 g
• Material	Epoxy resin
Mounting	Glue or use M3 screw
Mounting	
• On metal	Yes, with spacer > 25 mm
• Flush-mounted in metal	No

Selection and ordering data

	Order No.
Transponder MDS D324	6GT2 600-3AC00
Form: Button	
User memory: 992 bytes EEPROM	
Operating temperature: Max. +125 °C	
Order quantity 20 units or a multiple thereof, price per unit.	
► Preferred type, available from stock.	

Dimensions



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RFID systems for the HF frequency range

Transponders MOBY D (ISO mode)

MDS D421

Overview



The MDS D421 is a passive (maintenance-free) transponder based on ISO 15693 with FRAM technology.

Note:

This transponder is operated exclusively with the following readers/antennas: SIMATIC RF350R with ANT 12 or ANT 18 and SIMATIC RF210R.

Operation with the mobile handheld readers (SIMATIC RF310M and MOBY STG D) and the MOBY D readers is not possible.

Applications

The MDS D421 is designed for tool coding according to DIN 69873.

It can be used wherever small transponders and exact positioning are required, for example, for tool identification or on work-piece holders.

Technical specifications

Transponder	MDS D421
Transmission frequency	13.56 MHz
Read / write distance	Max. 8 mm
Protocol (air interface)	ISO 15693
Memory capacity	
• User memory	2 000 bytes (FRAM)
• Read-only memory (UID)	8 bytes
• OTP (One Time Programmable)	2 000 bytes (only with SIMATIC RF300)
Memory organization	Block by block access (8 byte block size)
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM	-
• FRAM	Practically unlimited (>10 ¹⁰)
Read cycles	Practically unlimited (>10 ¹⁰)
Ambient temperature	
• During operation	-25 °C ... +85 °C
• During transportation and storage	-40 °C ... +100 °C
Degree of protection according to EN 60529	IP67 / IPx9K

Transponder	MDS D421
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	100 g
• Vibration	20 g
• Torsion and bending	not permissible
Type of construction	
• Dimensions diameter x height (mm)	Ø 10 x 4.5
• Color	Black
• Weight	Approx. 4 g
• Material	Epoxy resin
Mounting	Gluing
Mounting	
• On metal	Yes
• Flush-mounted in metal	Yes

Selection and ordering data

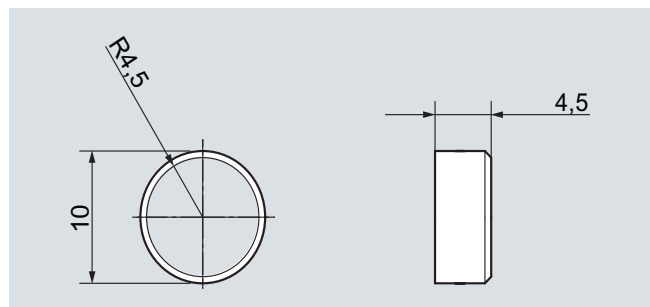
	Order No.
Transponder MDS D421 ▶ B	6GT2 600-4AE00
User memory: 2 000 bytes FRAM	
Ordering quantity 10 units or a multiple thereof, price per unit.	
▶ Preferred type, available from stock.	
B: Subject to export regulations AL = N and ECCN = EAR99H	

Dimensions

CAD data

Dimensional drawing available as CAD graphic (DXF format). You can find additional information in the Internet at:

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90463



RFID systems for the HF frequency range

Transponders MOBY D (ISO mode)

MDS D422

Overview



The MDS D422 is a passive (maintenance-free) transponder based on ISO 15693 with FRAM technology.

The transponder can only be operated with the RFID systems SIMATIC RF200 and SIMATIC RF300 (ISO mode).

Operation with the mobile readers (SIMATIC RF310M and MOBY STG D) and the MOBY D readers is not possible!

Applications

Identification of metallic workpiece holders, workpieces or containers.

Technical specifications

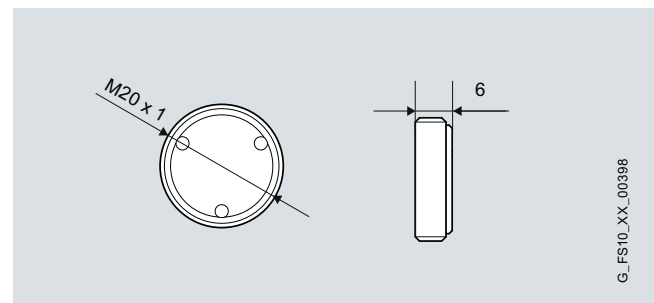
Transponder	MDS D422
Transmission frequency	13.56 MHz
Read / write distance	Max. 15 mm
Protocol (air interface)	ISO 15693
Memory capacity	
• User memory	2 000 bytes (FRAM)
• Read-only memory (UID)	8 bytes
• OTP (One Time Programmable)	2 000 bytes (only with SIMATIC RF300)
Memory organization	Block by block access (8 byte block size)
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM	-
• FRAM	Practically unlimited (>10 ¹⁰)
Read cycles	Unlimited
Ambient temperature	
• During operation	-25 °C ... +85 °C
• During transportation and storage	-40 °C ... +100 °C
Degree of protection according to EN 60529	IP68
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	50 g
• Vibration	20 g
• Torsion and bending	not permissible

Transponder	MDS D422
Type of construction	
• Dimensions, thread diameter x length (mm)	M20 x 6
• Color	Black/silver
• Weight	Approx. 13 g
• Material	Plastic PA6.6 GF and brass, nickel-plated
Mounting	Gluing or screws
Mounting	
• On metal	Yes
• Flush-mounted in metal	Yes

Selection and ordering data

	Order No.
Transponder MDS D422 ▶ B	6GT2 600-4AF00
User memory: 2 000 bytes FRAM.	
One installation tool is included in each packing unit.	
Order quantity 5 units or a multiple thereof, price per unit.	
▶ Preferred type, available from stock.	
B: Subject to export regulations AL = N and ECCN = EAR99H	

Dimensions



RFID systems for the HF frequency range

Transponders MOBY D (ISO mode)

MDS D424

Overview



The MDS D424 is a passive (maintenance-free) transponder based on ISO 15693 with FRAM technology.

The MDS D424 can be used for the RFID system MOBY D as well as for SIMATIC RF200 and SIMATIC RF300 (ISO mode).

Applications

Production and distribution logistics as well as for use in assembly and production lines.

Technical specifications

Transponder	MDS D424
Transmission frequency	13.56 MHz
Read / write distance	Max. 300 mm
Protocol (air interface)	ISO 15693
Memory capacity	
• User memory	2 000 bytes (FRAM)
• Read-only memory (UID)	8 bytes
• OTP (One Time Programmable)	2 000 bytes (only with MOBY D / SIMATIC RF300)
Memory organization	Block by block access (8 byte block size)
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM	-
• FRAM	Practically unlimited ($>10^{10}$)
Read cycles	Practically unlimited ($>10^{10}$)
Ambient temperature	
• During operation	-25 °C ... +85 °C
• During transportation and storage	-40 °C ... +100 °C
Degree of protection according to EN 60529	IP67 / IPx9K
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	100 g
• Vibration	20 g
• Torsion and bending	not permissible
Type of construction	
• Dimensions diameter x height (mm)	Ø 27 x 4
• Color	Black
• Weight	Approx. 5 g
• Material	Epoxy resin
Mounting	Glue or use M3 screw

Transponder

MDS D424

Mounting

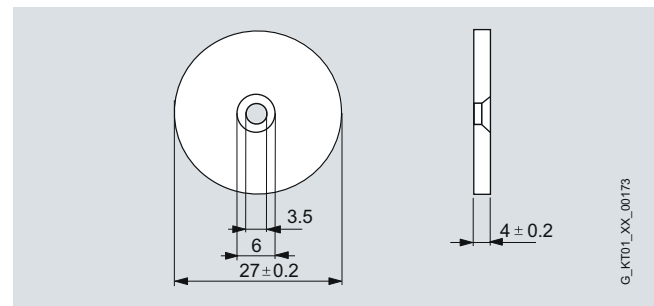
- On metal
- Flush-mounted in metal

Yes, with spacer > 25 mm
No

Selection and ordering data

	Order No.
Transponder MDS D424 ▶ B	6GT2 600-4AC00
User memory: 2 000 bytes FRAM	
Ordering quantity 20 units or a multiple thereof, price per unit.	
▶ Preferred type, available from stock.	
B: Subject to export regulations AL = N and ECCN = EAR99H	

Dimensions



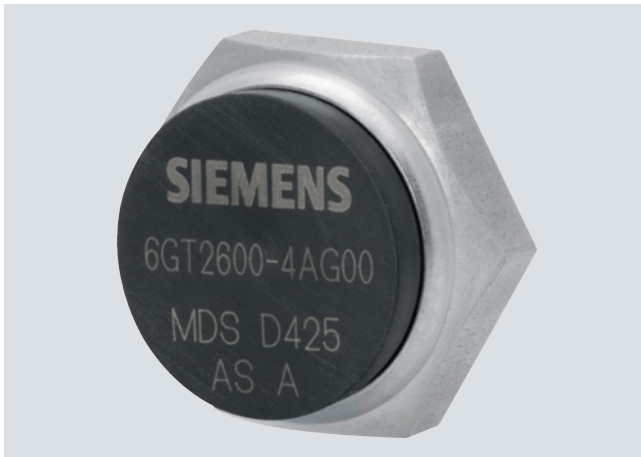
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RFID systems for the HF frequency range

Transponders MOBY D (ISO mode)

MDS D425

Overview



The MDS D425 is a passive (maintenance-free) transponder based on ISO 15693 with FRAM technology.

The MDS D425 can be operated with the RFID systems SIMATIC RF200 and SIMATIC RF300 (ISO mode).

Operation with MOBY D readers is not possible!

Applications

Compact and rugged ISO transponder; suitable for screw mounting.

For use in assembly and production lines in the powertrain area.

Technical specifications

Transponder	MDS D425
Transmission frequency	13.56 MHz
Read / write distance	Max. 50 mm
Protocol (air interface)	ISO 15693
Memory capacity	- User memory: 2 000 bytes (FRAM) - Read-only memory (UID): 8 bytes - OTP (One Time Programmable): 2 000 bytes (only with MOBY D / SIMATIC RF300)
Memory organization	Block by block access (8 byte block size)
Data retention time (below +40 °C)	> 10 years
Write cycles	-
- EEPROM - FRAM	Practically unlimited ($>10^{10}$)
Read cycles	Practically unlimited ($>10^{10}$)
Ambient temperature	-
- During operation - During transportation and storage	-25 °C ... +85 °C -40 °C ... +125 °C
Degree of protection according to EN 60529	IP68 / IPx9K
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	-
- Shock - Vibration - Torsion and bending	See configuration manual See configuration manual not permissible
Type of construction	-
- Dimensions diameter x height (mm) - Color - Weight - Material	Ø 24 x 10 (without thread) Black/silver Approx. 35 g Plastic PA6.6 GF / stainless steel

Transponder	MDS D425
Mounting	M6 screws
Mounting	-
- On metal - Flush-mounted in metal	Yes No

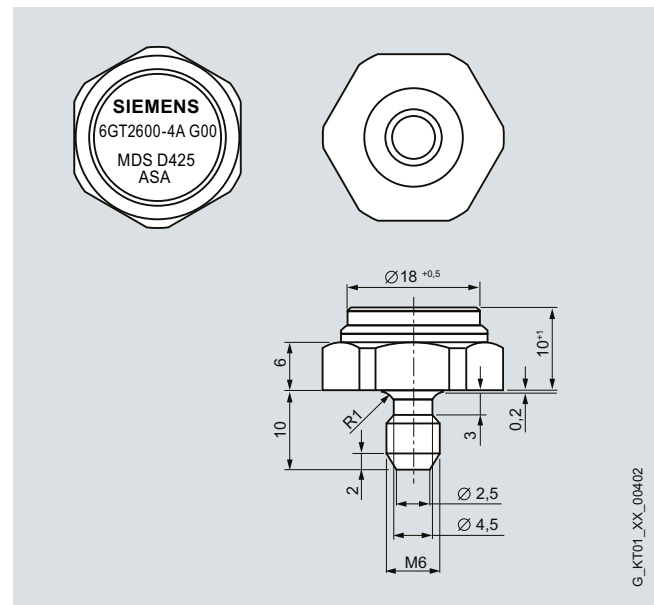
Selection and ordering data

	Order No.
Transponder MDS D425	6GT2 600-4AG00
User memory:	
2 000 bytes FRAM	
Mounting: On metal	
Degree of protection: IP68 / IPx9K	
Order quantity 5 units or a multiple thereof, price per unit.	

► Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

Dimensions



RFID systems for the HF frequency range

Transponders MOBY D (ISO mode)

MDS D426

Overview



The MDS D426 is a passive (maintenance-free) transponder based on ISO 15693 with FRAM technology.

The MDS D426 can be used for the RFID system MOBY D as well as for SIMATIC RF200 and SIMATIC RF300 (ISO mode).

Applications

Compact and rugged ISO transponder; suitable for identification of transport units in production-related logistics; can also be used under harsh environmental conditions.

Technical specifications

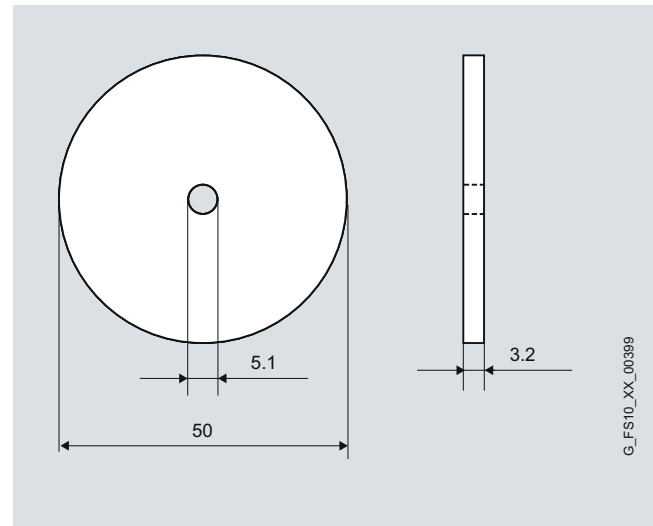
Transponder	MDS D426
Transmission frequency	13.56 MHz
Read / write distance	Max. 350 mm
Protocol (air interface)	ISO 15693
Memory capacity	
• User memory	2 000 bytes (FRAM)
• Read-only memory (UID)	8 bytes
• OTP (One Time Programmable)	2 000 bytes (only with MOBY D / SIMATIC RF300)
Memory organization	Block by block access (8 byte block size)
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM	-
• FRAM	Practically unlimited ($>10^{10}$)
Read cycles	Practically unlimited ($>10^{10}$)
Ambient temperature	
• During operation	-25 °C ... +85 °C
• During transportation and storage	-40 °C ... +100 °C
Degree of protection according to EN 60529	IP68
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	50 g
• Vibration	20 g
• Torsion and bending	not permissible
Type of construction	
• Dimensions diameter x height (mm)	Ø 50 x 3.6
• Color	Black
• Weight	Approx. 13 g
• Material	Plastic PA6.6 GF

Transponder	MDS D426
Mounting	M4 screw
Mounting	
• On metal	Yes, with spacer > 25 mm
• Flush-mounted in metal	No

Selection and ordering data

	Order No.
Transponder MDS D426 ▶ B	6GT2 600-4AH00
User memory: 2 000 bytes FRAM	
Order quantity 50 units or a multiple thereof, price per unit.	
▶ Preferred type, available from stock.	
B: Subject to export regulations AL = N and ECCN = EAR99H	

Dimensions



RFID systems for the HF frequency range

Transponders MOBY D (ISO mode)

MDS D428

Overview



The MDS D428 is a passive (maintenance-free) transponder based on ISO 15693 with FRAM technology.

The MDS D428 can be used for the RFID system MOBY D as well as for SIMATIC RF200 and SIMATIC RF300 (ISO mode).

Applications

Compact and rugged ISO transponder; suitable for screw mounting.

For use in assembly and production lines in the powertrain area.

Technical specifications

Transponder	MDS D428
Transmission frequency	13.56 MHz
Read / write distance	Max. 150 mm
Protocol (air interface)	ISO 15693
Memory capacity	
• User memory	2 000 bytes (FRAM)
• Read-only memory (UID)	8 bytes
• OTP (One Time Programmable)	2 000 bytes (only with MOBY D / SIMATIC RF300)
Memory organization	Block by block access (8 byte block size)
Data retention time (below +40 °C)	> 10 years
Write cycles	
• EEPROM	-
• FRAM	Practically unlimited ($>10^{10}$)
Read cycles	Practically unlimited ($>10^{10}$)
Ambient temperature	
• During operation	-25 °C ... +85 °C
• During transportation and storage	-40 °C ... +125 °C
Degree of protection according to EN 60529	IP68 / IPx9K
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	50 g
• Vibration	20 g
• Torsion and bending	not permissible
Type of construction	
• Dimensions diameter x height (mm)	Ø 24 x 20 (without thread)
• Color	Black/silver
• Weight	Approx. 35 g
• Material	Plastic PA6.6 GF / stainless steel

Transponder	MDS D428
Mounting	M8 screws
Mounting	
• On metal	Yes
• Flush-mounted in metal	Yes

Selection and ordering data

	Order No.
Transponder MDS D428	6GT2 600-4AK00
User memory: 2 000 bytes FRAM	
Mounting: On metal	
Degree of protection: IP68 / IPx9K	
Order quantity 5 units or a multiple thereof, price per unit.	

► Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

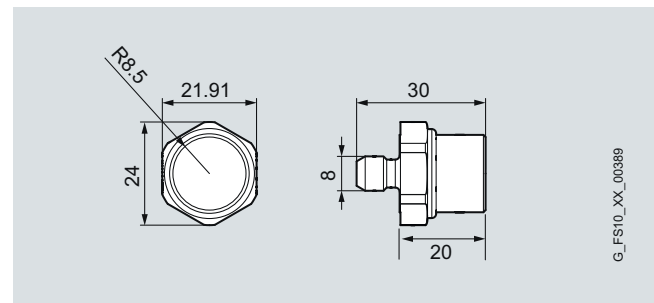
Dimensions

CAD data

Dimensioned drawing available as CAD graphics (DXF format). You can find additional information in the Internet at:

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90468

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90470



RFID systems for the HF frequency range

Transponders MOBY D (ISO mode)

MDS D460

Overview



The MDS D460 is a passive (maintenance-free) transponder based on ISO 15693 with FRAM technology.

The MDS D460 can be used for the RFID system MOBY D as well as for SIMATIC RF200 and SIMATIC RF300 (ISO mode).

Applications

Identification on small assembly lines.

Technical specifications

Transponder	MDS D460
Transmission frequency	13.56 MHz
Read / write distance	Max. 160 mm
Protocol (air interface)	ISO 15693
Memory capacity	- User memory: 2 000 bytes (FRAM) - Read-only memory (UID): 8 bytes - OTP (One Time Programmable): 2 000 bytes (only with MOBY D / SIMATIC RF300)
Memory organization	Block by block access (8 byte block size)
Data retention time (below +40 °C)	> 10 years
Write cycles	- EEPROM: - - FRAM: Practically unlimited ($>10^{10}$)
Read cycles	Practically unlimited ($>10^{10}$)
Ambient temperature	- During operation: -25 °C ... +85 °C - During transportation and storage: -40 °C ... +100 °C
Degree of protection according to EN 60529	IP67 / IPx9K
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	- Shock: 50 g - Vibration: 20 g - Torsion and bending: not permissible
Type of construction	- Dimensions diameter x height (mm): Ø 16 x 3 - Color: Black - Weight: Approx. 3 g - Material: Epoxy resin
Mounting	Glue or use spacer
Mounting	- On metal: Yes, with spacer - Flush-mounted in metal: No

Selection and ordering data

	Order No.
Transponder MDS D460 ▶ B User memory: 2 000 bytes FRAM Degree of protection: IP67 / IPx9K Order quantity 50 units or a multiple thereof, price per unit.	6GT2 600-4AB00
Accessories Spacer for MDS D460 ▶ B Necessary for mounting onto metal surfaces. Diameter = 20 mm, height = 15 mm Order quantity 50 units or a multiple thereof, price per unit.	6GT2 690-0AG00

▶ Preferred type, available from stock.

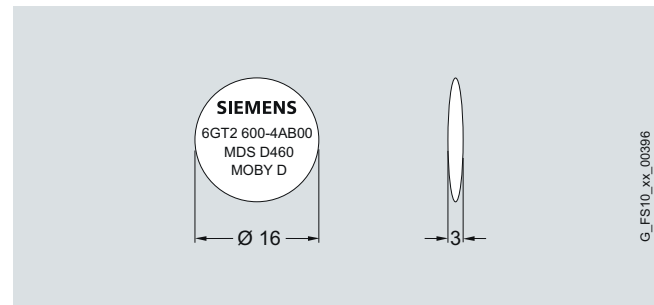
B: Subject to export regulations AL = N and ECCN = EAR99H

Dimensions

CAD data

Dimensioned drawing available as CAD graphics (DXF format). You can find additional information in the Internet at:

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90471



G_FS10_xx_00396

.Overview



Reader	Features
SLG D10 basic unit	Reader for connection of an external antenna (ANT D5 / ANT D6 / ANT D10). • IP65 degree of protection • Operating temperature range -20 °C to +55 °C • RS232 interface for connection to PC/PLC
SLG D10 ANT D5	Universal reader with external antenna ANT D5 (340 mm x 325 mm x 38 mm). • Max. range 500 mm • IP65 degree of protection • Operating temperature range -20 °C to +55 °C • With RS232 interface for connection to PC/PLC
SLG D10S basic unit	Reader for connection of an external antenna (ANT D5 / ANT D6 / ANT D10). • IP65 degree of protection • Operating temperature range -20 °C to +55 °C • RS422 interface for connection to SIMATIC S7 / PROFIBUS / PROFINET / Ethernet TCP/IP via ASM 456, ASM 475, SIMATIC RF160C, RF170C, RF180C or RF182C
SLG D10S ANT D5	Like SLG D10 ANT D5, but with RS422 interface for connection to SIMATIC S7 / PROFIBUS / PROFINET / Ethernet TCP/IP via ASM 456, ASM 475, SIMATIC RF160C, RF170C, RF180C or RF182C
SLG D11 basic unit	Reader for connection of an external antenna (ANT D2 / ANT D5). • IP65 degree of protection • Operating temperature range -25 °C to +55 °C • RS232 interface for connection to a standard PC or external controllers
SLG D11 ANT D5	Universal reader with external antenna ANT D5 (340 mm x 325 mm x 38 mm). • Max. range 380 mm • IP65 degree of protection • Operating temperature range -20 °C to +55 °C • With RS232 interface for connection to PC/PLC

Reader	Features
SLG D11S basic unit	Reader for connection of an external antenna (ANT D2 / ANT D5). • IP65 degree of protection • Operating temperature range -25 °C to +55 °C • RS422 interface for connection to SIMATIC S7 / PROFIBUS / PROFINET / Ethernet TCP/IP via ASM 456, ASM 475, SIMATIC RF160C, RF170C, RF180C or RF182C
SLG D11S ANT D5	Like SLG D11 ANT D5, but with RS422 interface for connection to SIMATIC S7 / PROFIBUS / PROFINET / Ethernet TCP/IP via ASM 456, ASM 475, SIMATIC RF160C, RF170C, RF180C or RF182C
SLG D12	Universal reader with integrated antenna (160 mm x 80 mm x 40 mm). • Max. range 160 mm • IP65 degree of protection • Operating temperature range -25 °C to +55 °C • With RS232 interface for connection to PC/PLC
SLG D12S	Like SLG D12, but with RS422 interface for connection to SIMATIC S7 / PROFIBUS / PROFINET / Ethernet TCP/IP via ASM 456, ASM 475, SIMATIC RF160C, RF170C, RF180C or RF182C

Antennas	Features
ANT D2	Universal antenna (75 mm x 75 mm x 40 mm), connectable to basic units SLG D11 / SLG D11S. • IP65 degree of protection • Operating temperature range -20 °C to +55 °C • Cable length 3.3 m (for plugging in at both ends)
ANT D5	Universal antenna (340 mm x 325 mm x 38 mm), connectable to basic units SLG D10 / SLG D10S, SLG D11 / SLG D11S. • IP65 degree of protection • Operating temperature range -20 °C to +55 °C • Cable length 3.6 m (permanently connected on antenna side)
ANT D6	Universal antenna (580 mm x 480 mm x 110 mm), connectable to basic units SLG D10 / SLG D10S. • IP65 degree of protection • Operating temperature range -20 °C to +55 °C • Cable length 3.3 m (connectable at both ends, included in scope of delivery)
ANT D10	Antenna (1150 mm x 365 mm x 115 mm) for storage, logistics and distribution. Ideally suited to the clothing industry/laundries. For connection to SLG D10 and SLG D10S. Advantageous geometry for small transponders and long transmission fields. • IP65 degree of protection • Operating temperature range -20 °C to +55 °C • Cable length 3.3 m (connectable at both ends, included in scope of delivery) • Cover included in scope of supply

RFID systems for the HF frequency range

Readers MOBY D

SLG D10/SLG D10S basic unit for ANT D5,
ANT D6 and ANT D10 antennas

Overview



The SLG D10 / SLG D10S basic units are readers in the upper performance range and can be operated with the ANT D5, ANT D6 and ANT D10 antennas.

The readers are equipped with an RS232 serial interface for connection to PCs/PLCs or RS422, which permits communication via the communication modules ASM 456, ASM 475, SIMATIC RF160C, RF170C, RF180C or SIMATIC RF182C to SIMATIC S7, PROFIBUS/PROFINET or Ethernet TCP/IP.

Connectable switch and antennas:

Antenna switch

The antenna switch enables several individual antennas or portal solutions to be operated with only one reader (SLG D10 / SLG D10S).

ANT D5

An antenna for universal applications designed for warehouse, logistics and distribution applications. The high degree of protection (IP65) enables the antenna to be used under harsh industrial conditions.

ANT D6

An antenna in the upper performance range, designed for warehouse, logistics and distribution applications. It can be used wherever high speeds are required together with a large read/write distance.

ANT D10

The ANT D10 is suitable for use in warehouses, logistics and distribution. An antenna with this geometry is required in the clothing industry and laundries in particular.

Technical specifications

Readers	SLG D10	SLG D10S
Transmission frequency	13.56 MHz	
Read / write distance	Max. 650 mm	
Protocol (air interface)	ISO 15693	
Approvals	• EN 300330, 301489, CE (Europe) • FCC Part 15 (USA) • UL/CSA	
Transmit power	max. 10 W	
Number of antennas	1 (without antenna switch)	
Data transmission rate	1 200 to 115 200 bit/s (this can be parameterized using application software)	19 200 to 115 200 bit/s (this can be parameterized via the communication module)
Multitag/Bulk capability	Yes	No
Interfaces by means of communication modules, as well as directly via RS422 (3964R)	Serial (RS232)	• SIMATIC S7-300 • PROFIBUS • PROFINET • Industrial Ethernet (TCP/IP)
Connections • Antennas • Power supply • RS422 • RS232	TNC M12, 4-pin - Sub-D, 9-pin (male)	TNC M12, 4-pin Sub-D, 9-pin (male) -
Ambient temperature • During operation • During transportation and storage	-20 °C ... +55 °C -25 °C ... +70 °C	
Degree of protection according to EN 60529	IP65	
Mechanical stress in accordance with EN 60721 3-7 Class 7 M2 • Shock • Vibration	30 g 1 g	
Type of construction • Dimensions L x W x H (mm) • Color • Weight • Material	320 x 145 x 100 Anthracite Approx. 3.5 kg Aluminum, painted	
Mounting	4 x M6 screws	
Power supply	24 V DC	
Current, inrush current	Typ. 0.9 A, max. 2.8 A	
Cable length reader – communication module	Max. 30 m	Max. 300 m

RFID systems for the HF frequency range

Readers MOBY D

SLG D10/SLG D10S basic unit for ANT D5,
ANT D6 and ANT D10 antennas

2

Antennas	ANT D5	ANT D6	ANT D10
			
Transmission frequency	13,56 MHz		
Read / write distance	max. 500 mm	max. 650 mm	max. 600 mm
Antenna cable length (cannot be changed)	TNC, cable length 3.6 m (for plugging into a reader)		
Ambient temperature			
• During operation	- 20 ... + 55 °C		
• During transportation and storage	- 25 ... + 70 °C		
Degree of protection according to EN 60529	IP65		
Mechanical stress in accordance with EN 60721 3-7 Class 7 M2			
• Shock	30 g		
• Vibration	1 g		
Type of construction			
Dimensions L x W x H (mm)	340 x 325 x 38 (without range adjustment kit)	580 x 480 x 110 (without cover)	1150 x 365 x 115
Weight	Approx. 1 kg	Approx. 3.3 kg	Approx. 10 kg
Color	Black	Black/gray	Pastel turquoise
Material	Plastic ASA	Aluminum/plastic	Aluminum/plastic
Mounting	4 x M5 screws	4 x M6 screws	4 x M6 screws
Mounting			
• On metal	Yes		
• Flush-mounted in metal	No		

Antenna switch		
		
Max. input power	10 W	Vibration-resistant to EN 60721-3-7, Class 7 M2
Transmission frequency	13.56 MHz	Shock-resistant to EN 60721-3-7, Class 7 M2
Power supply	Not required	Degree of protection according to EN 60529
Connector (inputs and outputs)	TNC	Resistance to chemicals
Enclosure L x W x H (mm)	160 x 80 x 40 (without connector)	Ambient temperature
• Color	Anthracite	• During operation
• Material	Plastic PA 12	• During transportation and storage
• Mounting	2 x M5 screws	MTBF
		Weight
		Approval

RFID systems for the HF frequency range

Readers MOBY D

SLG D10/SLG D10S basic unit for ANT D5,
ANT D6 and ANT D10 antennas

Selection and ordering data

	Order No.
Reader SLG D10 ▶ B	6GT2 698-1AA00
Basic unit (without antenna) with RS232 serial interface for connection to PC/PLC	
Reader SLG D10S ▶ B	6GT2 698-2AA00
Basic unit (without antenna) with RS422 serial interface for connection to SIMATIC S7/PROFIBUS/PROFINET or Ethernet TCP/IP	
Accessories	
Antenna ANT D5 ▶ B	6GT2 698-5AA00
for SLG D10 / SLG D10S basic units	
Spacer kit for ANT D5	6GT2 690-0AB00
Antenna ANT D6 ▶ B	6GT2 698-5AB00
for SLG D10 / SLG D10S basic units	
Covering hood for ANT D6 ▶	6GT2 690-0AD00
Serves as protection against contact	
Antenna ANT D10 ▶	6GT2 698-5AF00
For SLG D10 / SLG D10S basic units, cover and antenna cable included in scope of supply	
Antenna switch ▶ B	6GT2 690-0AC00
For connecting several antennas (ANT D5 or ANT D6) to one reader SLG D10 / SLG D10S, IP65, -25 °C to +65 °C	
MOBY D cables	
• Cable between ANT D6 and SLG D10/SLG D10S, antenna switch; PVC, length 3.3 m ▶ B	6GT2 691-0CH33
• Cable between ANT D6 and SLG D10/SLG D10S, antenna switch; PVC, length 10 m ▶ B	6GT2 691-0CN10
• Cable extension between ANT D6 and SLG D10/SLG D10S, antenna switch; PVC, length 7.2 m ▶ B	6GT2 691-0DH72
RS232 connecting cable	
between the PC and SLG D10 reader, material PUR	
5 m ▶	6GT2 691-4BH50
20 m ▶	6GT2 691-4BN20
Connector for reader and SIM of MOBY D ▶	6GT2 490-1AA00
IP65 degree of protection, 9-pin sub D connector	
Reader cable SIMATIC	
Without connector, between communication module and reader; 6 x 0.25 mm ² , material PUR	
50 m ▶	6GT2 090-4AN50
120 m ▶	6GT2 090-4AT12
800 m	6GT2 090-4AT80
Note: The total length of a reader cable must not exceed 300 m.	

	Order No.
Wide-range power supply	
Primary side: AC 100 ... 240 V, secondary side: 24 V DC, 3 A, with no-load protection, with continuous short-circuit protection	
• EU connector version ▶ B	6GT2 898-0AA00
• UK connector version ▶ B	6GT2 898-0AA10
• US connector version ▶ B	6GT2 898-0AA20
Cable for wide-range power supply ▶	6GT2 491-1HH50
24 V DC, length 5 m, PUR	
24 V connector (M12 socket) ▶ B	6GT2 390-1AB00
For ASM 424/724/754 communication modules, SLG Ux readers (over PC connecting cable)	
DVD "RFID Systems Software & Documentation" ▶ D	6GT2 080-2AA20

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

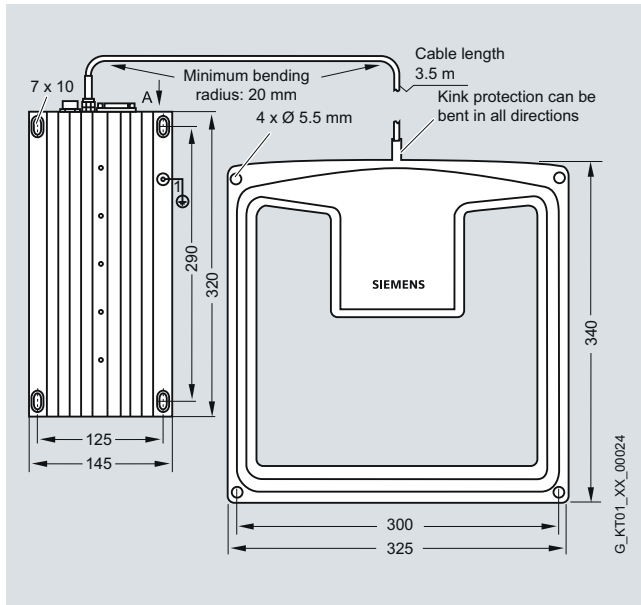
D: Subject to export regulations AL = N and ECCN = EAR99S

RFID systems for the HF frequency range

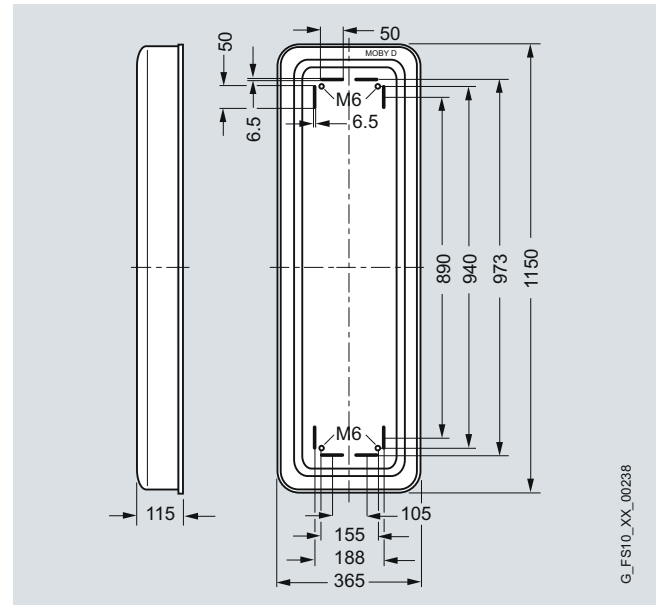
Readers MOBY D

SLG D10/SLG D10S basic unit for ANT D5,
ANT D6 and ANT D10 antennas

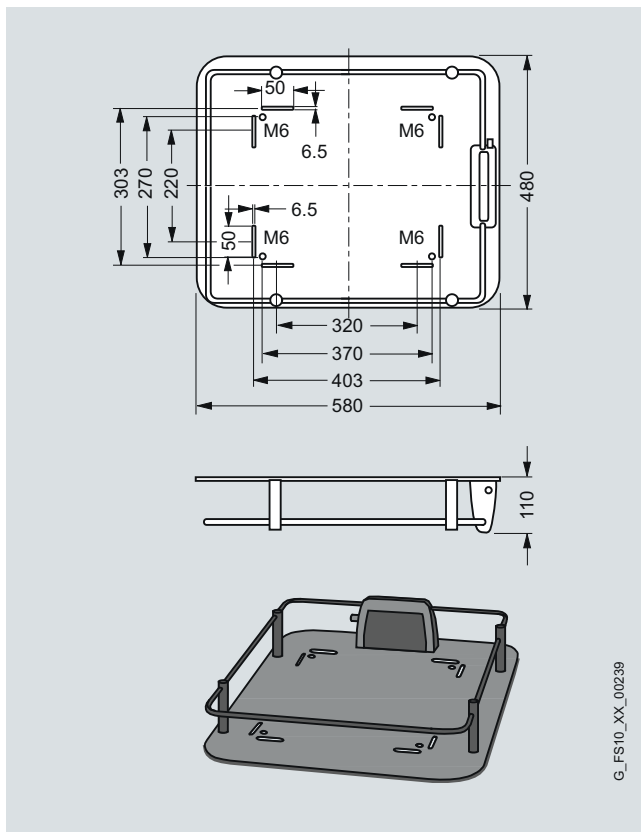
Dimensions



Basic unit (left), ANT D5 antenna (right)



Antenna ANT D10



Antenna ANT D6

RFID systems for the HF frequency range

Readers MOBY D

SLG D10 ANT D5 / SLG D10S ANT D5

Overview



Technical specifications

Readers	SLG D10 ANT D5	SLG D10S ANT D5
Transmission frequency	13.56 MHz	
Read / write distance ¹⁾	Max. 500 mm	
Protocol (air interface)	ISO 15693	
Approvals	• EN 300330, 301489, CE (Europe) • FCC Part 15 (USA) • UL/CSA	
Transmit power, max.	4 W	
Number of antennas	1 (without antenna switch), cable length 3.6 m (for plugging into a reader)	
Data transmission rate	1 200 to 115 200 bit/s (this can be parameterized using application software)	19 200 to 115 200 bit/s (this can be parameterized via the communication module)
Multitag/Bulk capability	Yes	No
Interfaces by means of communication modules, as well as directly via RS422 (3964R)	Serial (RS232)	• SIMATIC S7-300 • PROFIBUS • PROFINET • Industrial Ethernet (TCP/IP)
Connections		
• Antennas	TNC	TNC
• Power supply	M12, 4-pin	M12, 4-pin
• RS422	-	Sub-D, 9-pin (male)
• RS232	Sub-D, 9-pin (male)	-
Ambient temperature		
• During operation	-20 °C ... +55 °C	
• During transportation and storage	-25 °C ... +70 °C	
Degree of protection according to EN 60529	IP65	
Mechanical stress in accordance with EN 60721 3-7 Class 7 M2		
• Shock	30 g	
• Vibration	1 g	
Type of construction		
• Dimensions L x W x H (mm)	320 X 145 x 100 (basic unit) 340 x 325 x 38 (antenna)	
• Color	Anthracite (basic unit) black (antenna)	
• Weight	Approx. 3.5 kg (basic unit) approx. 1 kg (antenna)	
• Material	Aluminum, painted (basic unit) plastic ASA (antenna)	
Mounting	4 x M6 screws (basic unit) 4 x M5 screws (antenna)	
Power supply	24 V DC	
Current, inrush current	Typ. 0.9 A, max. 2.8 A	
Cable length reader – communication module	Max. 30 m	Max. 300 m

¹⁾ In order to guarantee optimum field data in metallic environments, the antenna is calibrated at the factory at a distance of 100 mm from metal (see adjustment kit 6GT2 690-0AB00).

RFID systems for the HF frequency range

Readers MOBY D

SLG D10 ANT D5 / SLG D10S ANT D5

Selection and ordering data

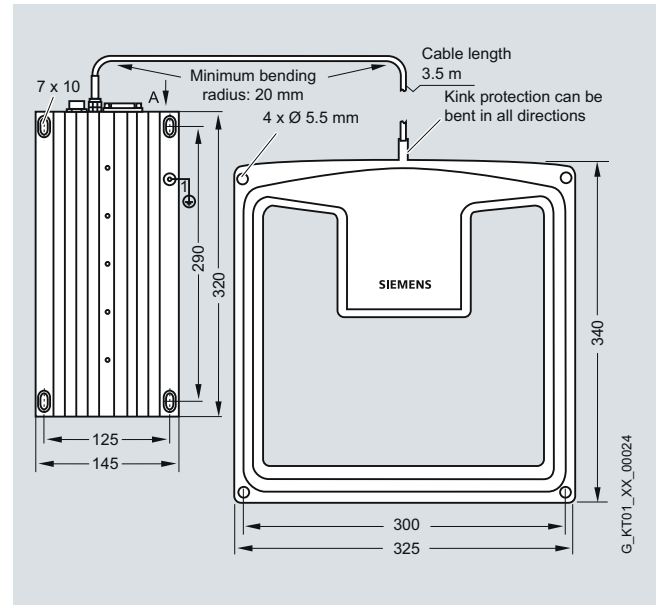
	Order No.
Reader SLG D10 ANT D5 ▶ B	6GT2 601-0AA00
With RS232 serial interface	
Reader SLG D10S ANT D5 ▶ B	6GT2 602-0AA00
With RS422 serial interface	
Accessories	
Spacer kit for ANT D5	6GT2 690-0AB00
Antenna switch ▶ B	6GT2 690-0AC00
For connecting several antennas (ANT D5 or ANT D6) to one reader SLG D10 / SLG D10S, IP65, -25 °C to +65 °C	
Antenna multiplexer SIMATIC RF260X	6GT2 894-0EA00
includes antenna cable, 0.4 m. The multiplexer lets you connect up to six antennas to one reader	
RS232 connecting cable	
Between PC and SLG D10 reader	
5 m ▶	6GT2 691-4BH50
20 m ▶	6GT2 691-4BN20
Connector for reader ▶	6GT2 490-1AA00
IP65 degree of protection, 9-pin sub D connector	
Wide-range power supply	
Primary side: AC 100 ... 240 V, secondary side: 24 V DC, 3 A, with no-load protection, with continuous short-circuit protection	
• EU connector version ▶ B	6GT2 898-0AA00
• UK connector version ▶ B	6GT2 898-0AA10
• US connector version ▶ B	6GT2 898-0AA20
Cable for wide-range power supply ▶	6GT2 491-1HH50
24 V DC, 5 m in length	
24 V connector (M12 socket) ▶ B	6GT2 390-1AB00
For ASM 424/724/754 communication modules, SLG Ux readers (over PC connecting cable)	
DVD „RFID-Systems Software & Documentation“ ▶ D	6GT2 080-2AA20

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

D: Subject to export regulations AL = N and ECCN = EAR99S

Dimensions



RFID systems for the HF frequency range

Readers MOBY D

SLG D11 / SLG D11S basic unit for antennas ANT D2 and ANT D5

Overview



The SLG D11/SLG D11S basic units are readers in the mid-performance range and can be operated with the ANT D2 and ANT D5 antennas.

SLG D11

Equipped with RS232 serial interface for connection to PC/PLC

SLG D11S

Equipped with an RS422 serial interface, which permits communication via the communication modules ASM 456, ASM 475, SIMATIC RF160C, RF170C and SIMATIC RF180C, or RF182C to SIMATIC S7, PROFIBUS/PROFINET or Ethernet TCP/IP.

Connectable antennas:

ANT D2

Designed for transponders that are directed sideways past the antenna. This antenna is specially designed for high speeds, e.g. in overhead conveyors, assembly lines, production and order picking. It can be mounted directly onto metal surfaces.

ANT D5

An antenna for universal applications designed for warehouse, logistics and distribution applications. The high degree of protection (IP65) enables the antenna to be used under harsh industrial conditions. A spacer kit is required for mounting on metal surfaces.

Technical specifications

Reader	SLG D11	SLG D11S
Transmission frequency	13.56 MHz	
Read / write distance ¹⁾	Max. 380 mm	
Protocol (air interface)	ISO 15693	
Approvals	• EN 300330, 301489, CE (Europe) • FCC Part 15 (USA) • UL/CSA	
Transmit power	max. 1 W	
Number of antennas	1	
Data transmission rate	1 200 to 38 400 bit/s (this can be parameterized using application software)	19 200 to 38 400 bit/s (this can be parameterized via the communication module)
Multitag/Bulk capability	Yes	No
Interfaces by means of communication modules, as well as directly via RS422 (3964R)	Serial (RS232)	• SIMATIC S7-300 • PROFIBUS • PROFINET • Industrial Ethernet (TCP/IP)
Connections		
• Antennas	TNC	TNC
• Power supply	M12, 4-pin	M12, 4-pin
• RS422	-	Sub-D, 9-pin (male)
• RS232	Sub-D, 9-pin (male)	-
Ambient temperature		
• During operation	-20 °C ... +55 °C	
• During transportation and storage	-25 °C ... +70 °C	
Degree of protection according to EN 60529	IP65	
Mechanical stress in accordance with EN 60721 3-7 Class 7 M2		
• Shock	30 g	
• Vibration	1 g	
Type of construction		
• Dimensions L x W x H (mm)	160 x 80 x 40	
• Color	Anthracite	
• Weight	Approx. 600 g	
• Material	Plastic PA12	
Mounting	2 x M5 screws	
Power supply	24 V DC	
Current, inrush current	Typ. 0.15 A, max. 0.6 A	
Cable length reader – communication module	Max. 30 m	Max. 300 m

¹⁾ In order to guarantee optimum field data in metallic environments, the antenna is calibrated at the factory at a distance of 100 mm from metal (see adjustment kit 6GT2 690-0AB00).

RFID systems for the HF frequency range

Readers MOBY D

SLG D11 / SLG D11S basic unit for
antennas ANT D2 and ANT D5

2

Antennas	ANT D2	ANT D5
		
Inductive interface to the transponder	13.56 MHz	13.56 MHz
Read / write distance ¹⁾	Max. 90 mm	Max. 650 mm
Ambient temperature		
• During operation	-20 °C ... +70 °C	- 20 ... + 55 °C
• During transportation and storage	-25 °C ... +85 °C	- 25 ... + 70 °C
Degree of protection according to EN 60529	IP65	
Mechanical stress in accordance with EN 60721 3-7 Class 7 M2		
• Shock	50 g	30 g
• Vibration	10 g	1 g
Type of construction		
• Dimensions L x W x H (mm)	75 x 75 x 40	340 x 325 x 38 (without range adjustment kit)
• Color	Anthracite	Black
• Weight	Approx. 260 g	Approx. 1 kg
• Material	Plastic PA12	Plastic ASA
Mounting	2 x M5 screws	4 x M5 screws
Mounting		
• On metal	Yes	Yes
• Flush-mounted in metal	No	No

1) In order to guarantee optimum field data in metallic environments, the antenna is calibrated at the factory at a distance of 100 mm from metal (see adjustment kit 6GT2 690-0AB00).

Selection and ordering data

	Order No.
Reader SLG D11 ▶ B	6GT2 698-1AC00
Basic unit (without antenna) with RS232 serial interface for connection to PC/PLC	
Reader SLG D11S ▶ B	6GT2 698-2AC00
Basic unit (without antenna) with RS422 serial interface for connection to SIMATIC S7/PROFIBUS/PROFINET via communication module	
Accessories	
Antenna ANT D2 ▶ B	6GT2 698-5BB00
for SLG D11 / SLG D11S basic units, incl. antenna cable, PVC, length 3.3 m	
Antenna ANT D5 ▶ B	6GT2 698-5AA00
For SLG D11 / SLG D11S basic units	
Spacer kit for ANT D5 ▶	6GT2 690-0AB00

	Order No.
Wide-range power supply 100 V ... 240 V AC / 24 V DC, 3 A	
• With EU plug ▶ B	6GT2 898-0AA00
• With UK plug ▶ B	6GT2 898-0AA10
• With US plug ▶ B	6GT2 898-0AA20
Connecting cable for 24 V DC ▶	6GT2 491-1HH50
for wide-range power supply, PUR, length 5 m	
RS232 cable for SLG D11, PUR	
5 m ▶	6GT2 691-4BH50
20 m ▶	6GT2 691-4BN20
DVD "RFID Systems Software & Documentation" ▶ D	6GT2 080-2AA20

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

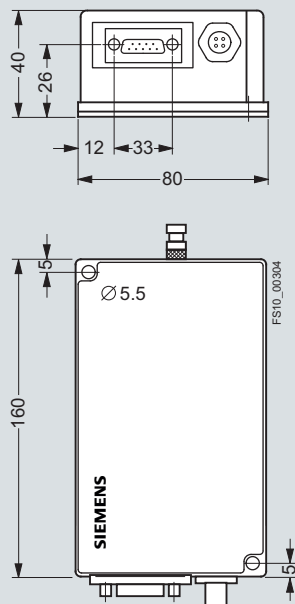
D: Subject to export regulations AL = N and ECCN = EAR99S

RFID systems for the HF frequency range

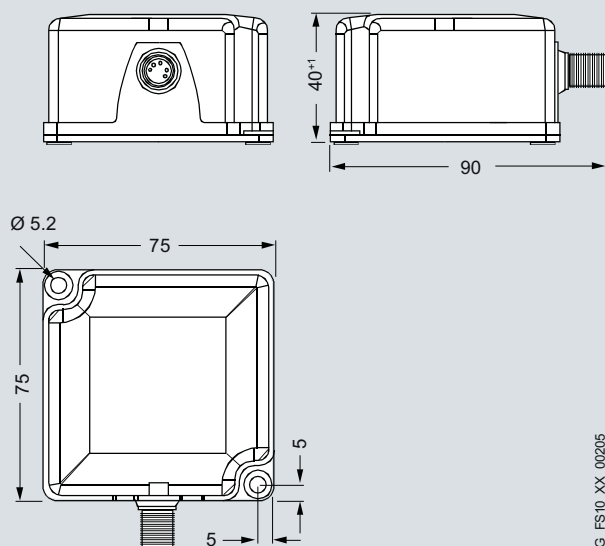
Readers MOBY D

SLG D11 / SLG D11S basic unit for
antennas ANT D2 and ANT D5

Dimensions



SLG D11/SLG D11S basic unit



ANT D2 antenna

Dimensions for ANT D5 antenna:
Refer to "SLG D10/D10S basic unit for ANT D5 antenna", Page
2/61".

RFID systems for the HF frequency range

Readers MOBY D

SLG D11 ANT D5 / SLG D11S ANT D5

Overview



2

Technical specifications

Reader	SLG D11 ANT D5	SLG D11S ANT D5
Transmission frequency	13.56 MHz	
Read / write distance ¹⁾	Max. 380 mm	
Protocol (air interface)	ISO 15693	
Approvals	• EN 300330, 301489, CE (Europe) • FCC Part 15 (USA) • UL/CSA	
Transmit power	max. 1 W	
Number of antennas	1, cable length 3.6 m (for plugging into a reader)	
Data transmission rate	1 200 to 38 400 bit/s (this can be parameterized using application software)	19 200 to 38 400 bit/s (this can be parameterized via the communication module)
Multitag/Bulk capability	Yes	No
Interfaces by means of communication modules, as well as directly via RS422 (3964R)	Serial (RS232)	• SIMATIC S7-300 • PROFIBUS • PROFINET • Industrial Ethernet (TCP/IP)
Connections		
• Antennas	TNC	TNC
• Power supply	M12, 4-pin	M12, 4-pin
• RS422	-	Sub-D, 9-pin (male)
• RS232	Sub-D, 9-pin (male)	-
Ambient temperature		
• During operation	-20 °C ... +55 °C	
• During transportation and storage	-25 °C ... +70 °C	
Degree of protection according to EN 60529	IP65	
Mechanical stress in accordance with EN 60721 3-7 Class 7 M2		
• Shock	30 g	
• Vibration	1 g	
Type of construction		
• Dimensions L x W x H (mm)	160 X 80 x 40 (basic unit) 340 x 325 x 38 (antenna)	
• Color	Anthracite (basic unit) black (antenna)	
• Weight	Approx. 0.6 kg (basic unit) approx. 1 kg (antenna)	
• Material	Plastic PA12 (basic unit) plastic ASA (antenna)	
Mounting	2 M5 screws (basic unit) 4 M5 screws (antenna)	
Power supply	24 V DC	
Current, inrush current	Typ. 0.15 A, max. 0.6 A	

¹⁾ In order to guarantee optimum field data in metallic environments, the antenna is calibrated at the factory at a distance of 100 mm from metal (see adjustment kit 6GT2 690-0AB00).

RFID systems for the HF frequency range

Readers MOBY D

SLG D11 ANT D5 / SLG D11S ANT D5

Selection and ordering data

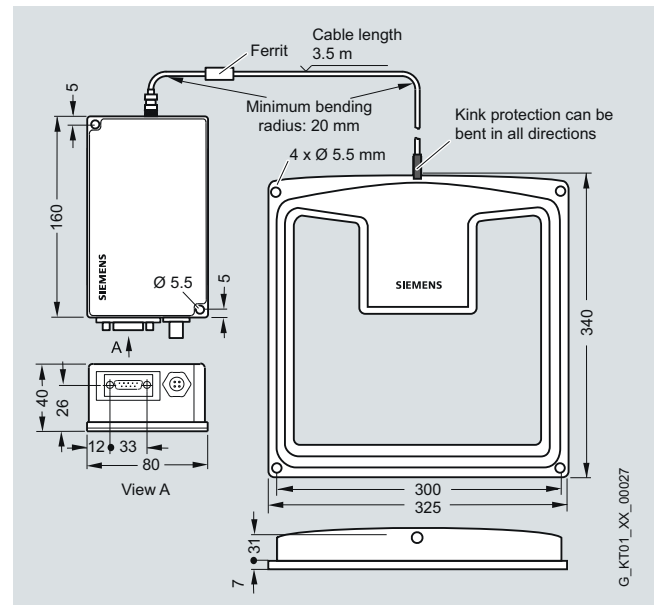
	Order No.
Reader SLG D11 ▶ B With ANT D5 external antenna and with RS232 serial interface	6GT2 601-0AC00
Reader SLG D11S ▶ B With ANT D5 external antenna and with RS422 serial interface	6GT2 602-0AC00
Accessories	
Spacer kit for ANT D5 ▶	6GT2 690-0AB00
RS232 connecting cable between the PC and SLG D11, PUR	
5 m ▶	6GT2 691-4BH50
20 m ▶	6GT2 691-4BN20
Connector for reader ▶	6GT2 490-1AA00
IP65 degree of protection, 9-pin sub D connector	
Wide-range power supply Primary side: AC 100 ... 240 V, secondary side: 24 V DC, 3 A, with no-load protection, with continuous short-circuit protection	
• EU connector version ▶ B	6GT2 898-0AA00
• UK connector version ▶ B	6GT2 898-0AA10
• US connector version ▶ B	6GT2 898-0AA20
Cable for wide-range power supply ▶	6GT2 491-1HH50
24 V DC, PUR, length 5 m	
24 V connector (M12 socket) ▶ B	6GT2 390-1AB00
For ASM 424/724/754 communication modules, SLG Ux readers (over PC connecting cable)	
DVD "RFID Systems Software & Documentation" ▶ D	6GT2 080-2AA20

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

D: Subject to export regulations AL = N and ECCN = EAR99S

Dimensions



G_KT01_XX_00027

RFID systems for the HF frequency range

Readers MOBY D

SLG D12 / SLG D12S

Overview



2

Technical specifications

Readers	SLG D12	SLG D12S
Transmission frequency	13.56 MHz	
Read / write distance ¹⁾	Max. 220 mm	
Protocol (air interface)	ISO 15693	
Approvals	• EN 300330, 301489, CE (Europe) • FCC Part 15 (USA) • UL/CSA	
Transmit power	1 W	
Data transmission rate	1 200 to 38 400 bit/s (this can be parameterized using application software)	19 200 to 38 400 bit/s (this can be parameterized via the communication module)
Multitag/Bulk capability	Yes	No
Interfaces by means of communication modules, as well as directly via RS422 (3964R)	Serial (RS232)	• SIMATIC S7-300 • PROFIBUS • PROFINET • Industrial Ethernet (TCP/IP)
Connections • Power supply • RS422 • RS232	M12, 4-pin - Sub-D, 9-pin (male)	M12, 4-pin Sub-D, 9-pin (male) -
Ambient temperature • During operation • During transportation and storage	-25 °C ... +55 °C -25 °C ... +70 °C	
Degree of protection according to EN 60529	IP65	
Mechanical stress in accordance with EN 60721 3-7 Class 7 M2 • Shock • Vibration	30 g 1 g	
Type of construction • Dimensions L x W x H (mm) • Color • Weight • Material	160 x 80 x 40 Anthracite Approx. 0.5 kg (basic unit) approx. 1 kg (antenna) Plastic PA12 (basic unit) plastic ASA (antenna)	
Mounting	2 M5 screws (basic unit) 4 M5 screws (antenna)	
Power supply	24 V DC	
Current, inrush current	Typ. 0.15 A, max. 0.6 A	

¹⁾ In order to achieve optimum field data in metallic environments, the antenna is calibrated at the factory at a distance of 100 mm from metal..

RFID systems for the HF frequency range

Readers MOBY D

SLG D12 / D12S

Selection and ordering data

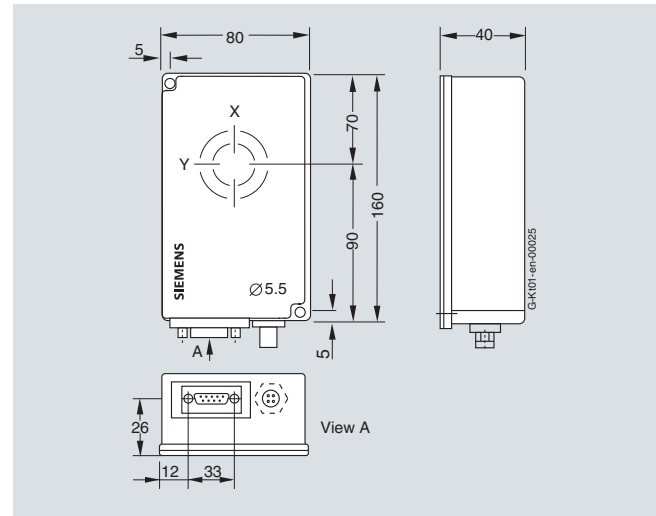
	Order No.
Reader SLG D12 ▶ B With RS232 serial interface and integrated antenna	6GT2 601-0AB00
Reader SLG D12S ▶ B With RS422 serial interface and integrated antenna	6GT2 602-0AB00
Reader SLG D12S, for single-cable connection ▶ B With RS422 serial interface and integrated antenna. Only one connector for data and voltage supply. Power supply via communication module. Connector: M12, 8-pin (male)	6GT2 602-0AB10-0AX0
Accessories	
RS232 connecting cable between the PC and SLG D12, PUR	
5 m ▶	6GT2 691-4BH50
20 m ▶	6GT2 691-4BN20
Connector for reader ▶	6GT2 490-1AA00
IP65 degree of protection, 9-pin sub D connector	
Wide-range power supply Primary side: AC 100 ... 240 V, secondary side: 24 V DC, 3 A, with no-load protection, with continuous short-circuit protection	
• EU connector version ▶ B	6GT2 898-0AA00
• UK connector version ▶ B	6GT2 898-0AA10
• US connector version ▶ B	6GT2 898-0AA20
Cable for wide-range power supply ▶	6GT2 491-1HH50
24 V DC, PUR, length 5 m	
24 V connector (M12 socket) ▶ B	6GT2 390-1AB00
For ASM 424/724/754 communication modules, SLG Ux readers (over PC connecting cable), SLG D1x	
DVD "RFID Systems Software & Documentation" ▶ D	6GT2 080-2AA20

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

D: Subject to export regulations AL = N and ECCN = EAR99S

Dimensions



RFID systems for the HF frequency range

Readers MOBY D

STG D mobile handheld terminal

Overview



The STG D is a powerful mobile handheld terminal with integral read/write antenna for applications in the field of production logistics, distribution and service. In addition, it is an indispensable tool for commissioning and testing.

Design

The STG D mobile handheld terminal consists of one basic unit (Basis PSION Workabout PRO) and a removable compact read/write head. It has a splashwater-proof enclosure (IP54), LCD color monitor 1/4 VGA, 320 x 240 pixels, TFT portrait format, alphanumeric keyboard and various interfaces (for SD memory card, charging batteries, USB, Bluetooth, etc.).

Functions

The pre-installed MOBY software provides service and test functions for MOBY D transponders¹⁾:

- Reading data from the transponder
- Writing data to the transponder
- Reading and displaying the ID number of the transponder
- Displaying and editing the data in hexadecimal, ASCII, decimal and binary formats
- Activate/deactivate password

User applications that were developed for the predecessor model Workabout^{MX} can be transferred to this device with little effort. For this purpose, various optional development tools for the PC are available directly from PSION. This is opening up further applications in the field of logistics and distribution, for example, the mobile handheld terminal enables commissioning data to be recorded or processed offline and forwarded to the PC/computer with a time delay.

Note:

With the mobile handheld terminal RF310M (6GT2803-0AB00), MOBY D transponders (except for: MDS D421, D422) can also be processed. Customer-specific software applications can be easily created on the basis of ".Net".

Technical specification

Mobile handheld terminal	STG D
Processor	400 MHz Intel Xscale PXA255
Operating system	Microsoft Windows CE .NET 4.20
RAM/Flash memory/EEPROM memory	128 MB / 32 MB
User program	MOBY standard application
Screen	TFT color touch display, 1/4 VGA 320 x 240 pixels (portrait format); adjustable backlighting
Keyboard	alphanumeric
Sound	Piezo signal transmitter
Power supply	• Lithium-ion battery (3.7 V; 3000 mAh) • Quick charging possible (automatic shut-off) or 3 x 1.5 V type AA • Backup battery: 3 V ML 2032 lithium cell
Interfaces	• LIF interface (low insertion force interface) for battery charging and communication with the PC using a docking and loading station (USB) • CF interface for expansion cards (e.g. WLAN)
Dimensions (mm)	305 x 90 x 44
Weight (incl. battery)	Approx. 0.5 kg
Ambient temperature	• During operation • Storage (without batteries)
Relative humidity, non-condensing	5 ... 90 %
Degree of protection	IP54 (splashwater proof)
EMC	EN 55022, EN 55024

Integral read/write unit, inductive interface to transponder	for MOBY D
Read/write distance to the transponder	up to 80 mm, depending on the transponder
Energy/data transmission frequency	13.56 MHz
Serial interface (to basic unit)	TTL, 3964R protocol
Functionality of the SW application	Standard user interface for reading/writing of transponders, etc.

1) Exception: The MDS D421 and MDS D422 transponders cannot be operated with this STG D mobile handheld terminal.

RFID systems for the HF frequency range

Readers MOBY D

STG D mobile handheld terminal

Selection and ordering data

	Order No.
STG D mobile handheld terminal with MOBY D read/write head ▶ B Basic unit (PSION Workabout PRO) with MOBY D read/write head, battery, standard software pre-installed, without charging/docking station	6GT2 603-0AA10
Loading/docking station ▶ B For a mobile handheld terminal as well as a spare battery, incl. wide-range plug-in power supply 100 ... 240 V AC and country-specific adapters as well as USB cable	6GT2 898-0BA00
MOBY D read/write head ▶ B For basic unit (PSION Workabout ^{mx} and PSION Workabout PRO)	6GT2 603-1AA10
Basic unit ▶ B Basic unit (PSION Workabout PRO) with adapter for MOBY RFID read/write heads	6GT2 003-0AA10
Accessories	
Spare battery ▶ B For basic unit (PSION Workabout PRO), High Capacity 3000 mAh, Li-ion	6GT2 898-0CA00
DVD „RFID-Systems Software & Documentation“ ▶ D	6GT2 080-2AA20

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

D: Subject to export regulations AL = N and ECCN = EAR99S

Accessories

Optional components are available in the Internet under

<http://www.psionteklogix.com>

For example:

- SD expansion cards
- Handles, belt loops
- Vehicle holder with charging function

Overview

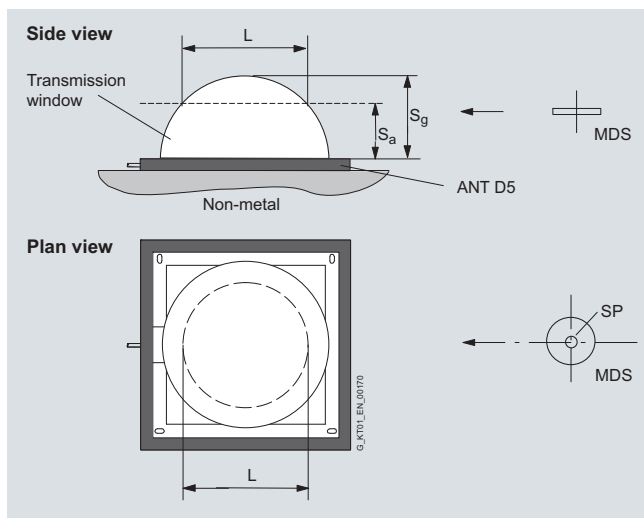
Note

Detailed configuration and commissioning data is contained in the "Manual for Configuration, Assembly and Service".

Transmission window

The reader generates an inductive alternating field. The field is at its strongest near the antenna and declines considerably as the distance from the antenna increases. The distribution of the field depends on the structure and geometry of the antennas in the reader and transponder.

A prerequisite for the function of the transponder is a minimum field strength at the transponder that is achieved at a distance S_g from the reader. The picture below shows the transmission window between the transponder and reader:



S_a : Operating distance between transponder and reader

S_g : Limit distance (maximum clear distance between upper surface of antenna and transponder, at which the transmission can still function under normal conditions)

L: Length of a transmission window

SP: Intersection of the axes of symmetry of the transponder

The transmittable quantity of information between reader and transponder depends on:

- the speed at which the transponder passes the antenna ("passing speed")
- Length of the inductive alternating field of the reader, through which the transponder moves ("transmission window").

Communication between reader and transponder

Communication between the reader and transponder is asynchronous.

Data transfer, reader - transponder

Read	≥ 3.5 ms/byte
Write	≥ 9.5 ms/byte
Transmission time of ID number	
• SLG D10 ANT D5, ANT D6, ANT D10	30 ms (8 byte at 115,2 kbit/s)
• SLG D11S ANT D5	
• SLG D12S ANT D5, ANT D6, ANT D10	90 ms (8 byte at 19,2 kbit/s)
• SLG D11S ANT D5	
• SLG D12 ANT D5, ANT D6, ANT D10	60 ms (8 byte at 38,4 kbit/s)
• SLG D11 ANT D5	

Passing velocity for SLG D1x / ANT Dx
(or one transponder in the field)

	SLG D10			SLG D11			SLG D12	SLG D10S			SLG D11S		SLG D12S
	ANT D10*	ANT D6	ANT D5	ANT D2	ANT D5			ANT D10*	ANT D6	ANT D5	ANT D2	ANT D5	
UID number (8 bytes)	≤ 15	≤ 8.0	≤ 5.0	≤ 1.2	≤ 3.5	≤ 2.5	≤ 6.0	≤ 3.8	≤ 2.0	≤ 0.4	≤ 1.0	≤ 0.8	
ISO transponder e.g. MDS D100													
Read (with 4 bytes of user data / 1 block)	≤ 10	≤ 6.0	≤ 3.5	≤ 1.2	≤ 1.6	≤ 1.2	≤ 6.5	≤ 4.0	≤ 2.2	≤ 0.4	≤ 3.0	≤ 1.4	
Write (with 4 bytes of user data / 1 block)	≤ 9	≤ 5.5	≤ 3.0	≤ 0.2	≤ 1.2	≤ 1.0	≤ 5.5	≤ 3.4	≤ 1.8	≤ 0.3	≤ 2.8	≤ 1.2	
Read (with 112 bytes of complete user data)	≤ 7.5	≤ 4.0	≤ 2.4	≤ 0.4	≤ 1.4	≤ 0.8	≤ 5.0	≤ 3.0	≤ 1.6	≤ 0.2	≤ 2.2	≤ 1.0	
Write (with 112 bytes of complete user data)	≤ 2.0	≤ 1.0	≤ 0.6	≤ 0.1	≤ 0.4	≤ 0.2	≤ 2.0	≤ 1.0	≤ 0.6	≤ 0.1	≤ 0.5	≤ 0.2	

All values in the table in m/s

* Passing velocity in the transverse direction as for SLG D10 ANT D5/SLG D10S ANT D5

RFID systems for the HF frequency range

Notes

2

RFID systems for the UHF frequency range



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RFID systems for the UHF frequency range

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SIMATIC RF600

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Transponders SIMATIC RF600

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SIMATIC RF630L

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SIMATIC RF680L

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SIMATIC RF610T

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SIMATIC RF620T

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SIMATIC RF630T

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SIMATIC RF640T

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SIMATIC RF680T

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Readers SIMATIC RF600

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SIMATIC RF620R / SIMATIC RF630R

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SIMATIC RF670R

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SIMATIC RF610M mobile handheld terminal

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Antennas SIMATIC RF600

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SIMATIC RF620A

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SIMATIC RF640A / SIMATIC RF642A

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SIMATIC RF660A

RFID systems for the UHF frequency range

SIMATIC RF600

Overview



Identification tasks in the UHF range (865 to 868 MHz and 902 to 928 MHz) that demand a wide range of up to 5 m are implemented with SIMATIC RF600. The system is suitable for storing and recording a unique identification according to the EPCglobal standard (Electronic Product Code) on products, containers or transport units. Storage of additional, freely-definable user data is also possible.

Various data carriers - from low-cost SmartLabels through to heat-resistant transponders that can be used for several thousand cycles - are available for industrial applications.

SIMATIC RF600 can be used with SIMATIC controllers and PC/IT systems.

Benefits

SIMATIC RF600 has been specially developed for the requirements of industry. It enables economical and reliable use of RFID in production, Materials management and logistics.

- Flexibility due to compact designs and remote antennas
- Rugged, industry-standard components with a high degree of protection
- Safe and selective individual acquisition or mass recording is possible
- High reading speed: Even fast-moving transponders are reliably detected
- Offers a uniform system environment over the entire process chain
- Simplified engineering, commissioning, diagnostics and maintenance through seamless integration into Totally Integrated Automation:
 - Data exchange from the field via the automation to the corporate management level via the SIMATIC RF-MANAGER
 - Integrated bus connection to an automation system, such as SIMATIC, SIMOTION or SINUMERIK via communication modules with PROFIBUS and PROFINET
 - Integrated processing logic allows data preprocessing in the reader and saves costs for external PCs, software modules, etc.
 - Simple S7 software integration via ready-to-use function blocks
 - Extensive diagnostic functions

- High degree of investment protection thanks to
 - Open standards EPCglobal Class 1 Gen 2 / ISO 18000-6C
 - Software compatibility between the RFID systems of Siemens
 - Standardized communications interfaces
 - Openness through connection possibilities to different bus systems from different manufacturers and PC environments via communication modules
 - Worldwide Service and Support
- Tried and tested in numerous customer projects

Application

SIMATIC RF600 is used for the contactless identification of every kind of object, e.g. transport containers, pallets, production goods, or it can be used generally for recording goods in bulk. As a rule, these applications are open loops in which passive SmartLabels on goods, products, bulk containers or transport units are used. In this case, the system distinguishes itself due to its high reading speeds, large data transmission rates and the fact that it can handle long reading distances.

In addition, the system is suitable for reading and writing reusable transponders that are used in closed loops.

Typical applications include:

- Acquisition of deliveries in the incoming goods / outgoing goods departments
- Identification of transport containers, barrels or containers at important stations in the process; creation of a "Container passport" for automatic creation of a usage history
- Control of Material flow and production in multi-variant, order-related production
- Labeling of products under severe ambient conditions, e.g. dust, dirt, high temperatures
- Stock monitoring and usage monitoring of tools and devices
- Automation of warehouses and distribution centers with industrial trucks

Design

- Stationary UHF Reader with offset antennas or integrated antenna.
- Separately connectable UHF antennas.
- Mobile UHF reader for flexible acquisition of the transponder.
- Transponder with rugged enclosure for multiple use or low-cost SmartLabels.
- SIMATIC RF-MANAGER software for configuration, diagnostics and data processing..

Functions

SIMATIC RF600 identification systems ensure that important data accompanies the product from the very beginning. Different transponders or SmartLabels store product-specific data and information. Up to 240 bits can be stored for the Electronic Product Code (EPC) and 512 bits of user data.

Integration

A wide range of communication modules, function blocks, as well as high-performance drivers and function libraries permits easy and quick integration into the application.

And best of all: SIMATIC RF600 is part of Totally Integrated Automation and can be integrated easily and cost-effectively into the SIMATIC world.

For more details on the connection possibilities, see chapter 5 under section "Communication modules".

Technical specifications

RFID system	SIMATIC RF600
Transmission frequency	865 ... 868 MHz (ETSI) 902 ... 928 MHz (FCC)
Read / write distance	Max. 5 m
Protocol (air interface)	EPCglobal Class 1 Gen 2 / ISO 18000-6C
Memory capacity	Max. 96/240 bit EPC, 512-bit user memory
Data transmission rate	
• Read	Max. 160 Kbit/s
• Write	Max. 160 Kbit/s
Multitag/Bulk capability	Yes
Special features	• SIMATIC or PC/IT integration • Configurable data processing in the readers • Special antennas for industrial applications • Diagnostic functions

RFID systems for the UHF frequency range

Transponders SIMATIC RF600

SIMATIC RF630L

Overview



6GT2810-2AB00



6GT2810-2AB01



6GT2810-2AB02-0AX0



6GT2810-2AB03

The SIMATIC RF630L SmartLabels are suitable for (permanent) identification of products or shipping units with the Electronic Product Code (EPC) as well as with other user data. Thanks to its broadband design, the SIMATIC RF630L SmartLabel can be used in numerous countries.

Technical specification

SmartLabel SIMATIC RF630L	6GT2 810-2AB00	6GT2 810-2AB01	6GT2 810-2AB02-0AX0	6GT2 810-2AB03
Transmission frequency	860 ... 960 MHz			
Read / write distance (depends on ambient conditions, reader and antenna, see SIMATIC RF600 System Manual)	Max. 5 m			
Protocol (air interface)	EPCglobal Class 1 Gen 2 / ISO 18000-6C			
Memory capacity	96 bit	96 bit	96/128 bit	96/240 bit
• EPC	-	-	512 bit	512 bit
• User memory	-	-	-	-
Data retention time	10 years (at 25 °C)			
Write cycles	100 000			
• Minimum	500 000			
• Typical	unlimited			
Read cycles	unlimited			
Lock function	Yes			
Ambient temperature in operation	-40 °C ... +65 °C continuously; +80 °C (200 cycles)			
Storage	+15 °C ... +25 °C			
• Storage temp. (recommended)	40 % ... 60 %			
• Storage humidity (recommended)	2 years			
• Storage capability	-			
Degree of protection according to EN 60529	IP65			
Type of construction	101 x 152 (circa 4" x 6")			
• Dimensions L x W x H (mm)	101 x 50 (circa 4" x 2")			
• Color	97 x 27 (circa 3.8" x 1.1")			
• Material	54 x 34 (circa 2.1" x 1.3")			
Mounting	Adhesive (single-sided) on paper/cardboard			
Mounting	Adhesive (single-sided) on plastic/film			
• On metal	No			
• On non-conducting Materials	Yes			
Special features	Yes, thermal transfer			
• For printing	Yes, thermal transfer (currently only using Toshiba B-SX4T)			
	No			

RFID systems for the UHF frequency range

Transponders SIMATIC RF600

SIMATIC RF630L

Selection and ordering data

	Order No.
Smartlabel SIMATIC RF630L Transmission frequency 865 to 928 MHz (ETSI, FCC)	
• Paper, adhesive on one side, ▶ B 100 mm x 150 mm (4" x 6"); 1 600 units minimum order quantity (supplied on two rolls), price per SmartLabel.	6GT2 810-2AB00
• Paper, adhesive on one side, ▶ B 101 mm x 55 mm (4" x 2"); 1000 units minimum order quantity (supplied on one roll), price per SmartLabel.	6GT2 810-2AB01
• Plastic PET, adhesive on one ▶ B side, 97 mm x 27 mm (3.8" x 1.1"); 5 000 units minimum order quantity (supplied on one roll), price per SmartLabel.	6GT2 810-2AB02-0AX0
• Plastic PET, adhesive on one ▶ B side, non-printing, 54 mm x 34 mm (2.1" x 1.3"); 2 000 units minimum order quantity (supplied on one roll), price is valid for 100 SmartLa- bels.	6GT2 810-2AB03

▶ Preferred type, available from stock.

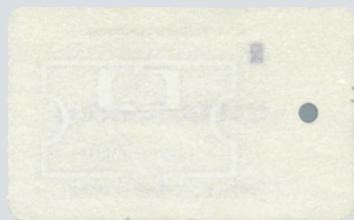
B: Subject to export regulations AL = N and ECCN = EAR99H

RFID systems for the UHF frequency range

Transponders SIMATIC RF600

SIMATIC RF680L

Overview



SIMATIC RF680L is a heat-resistant SmartLabel that is suitable for the identification of objects in production and logistics with high temperature requirements (e.g. for the identification of products in the paint shop/drying area).

The storage capacity is 96/240 bits for the Electronic Product Code (EPC) and 512 bits for user memory. Thanks to its broad-band design, the SIMATIC RF680L SmartLabel can be used in numerous countries.

Selection and ordering data

	Order No.
SmartLabel SIMATIC RF680L ▶ B	6GT2 810-2AG80
Frequency 865 to 928 MHz (ETSI, FCC)	
Minimum order quantity 1000 units (supplied on a roll). Price is for one SmartLabel.	
▶ Preferred type, available from stock.	
B: Subject to export regulations AL = N and ECCN = EAR99H	

Technical specifications

SmartLabel	SIMATIC RF680L
Transmission frequency	860 ... 960 MHz
Read / write distance (depending on ambient conditions, reader and antenna, see SIMATIC RF600 System Manual)	Max. 4 m
Protocol (air interface)	EPCglobal Class 1 Gen 2 / ISO 18000-6C
Approvals	CE/FCC
Memory capacity	EPC 96/240 bit
• EPC	96/240 bit
• User memory	512 bit
Data retention time	> 10 years (at 25 °C)
Read cycles	Unlimited
Write cycles at +40 °C	
• Minimum	100 000
• Typical	500 000
Lock function	Yes
Ambient temperature	
• During operation	• -25 °C ... +85 °C (permanent) • +200 °C (up to 6 hours) • +220 °C (up to 1 hour) • +240 °C (temporary)
• During transportation and storage	-40 °C ... +85 °C
Type of construction	
• Dimensions L x W x H (mm)	89 x 54 x 0.3
• Color	Beige
• Material	Paper (silicone-free)
• Weight	Approx. 3 g
Mounting	Screw fixing and gluing
Mounting	
• On metal	No
• On non-conducting Materials	Yes
Special features	
• For printing	Yes, thermal transfer

RFID systems for the UHF frequency range

Transponders SIMATIC RF600

SIMATIC RF610T

Overview



The transponder SIMATIC RF610T is a flexible card in ISO format that is suitable for a wide variety of applications, e.g. for identification of containers, pallets, vessels, or trolleys. SIMATIC RF610T can be attached to many different Materials, including plastic, wood, glass and metal (with spacer).

The plastic enclosure is designed for food safety and is therefore also suitable for use with food and beverages. Thanks to its broadband design, the transponder can be used in numerous countries.

Technical specifications

ISO-Card transponder	SIMATIC RF610T
Transmission frequency	860 ... 960 MHz
Read / write distance (depending on ambient conditions, reader and antenna, see SIMATIC RF600 System Manual)	Max. 5 m
Protocol (air interface)	EPCglobal Class 1 Gen 2 / ISO 18000-6C
Approvals	CE, FCC, UL/CSA
Memory capacity	
• EPC	96/240 bit
• User memory	512 bit
Data retention time	10 years
Read cycles	Unlimited
Write cycles	
• Minimum	100 000
• Typical	500 000
Lock function	Yes
Ambient temperature	
• During operation	-25 °C ... +85 °C
• During transportation and storage	-40 °C ... +85 °C
Degree of protection according to EN 60529	IP67
Type of construction	
• Dimensions L x W x H (mm)	89 x 54 x 0.4
• Color	White
• Material	Plastic (PVC), food safe
• Weight	3 g
Mounting	Cable tie, screw fixing, gluing
Mounting	
• On metal	Yes, with spacer
• On non-conducting Materials	Yes
Special features	
• For printing	Yes, with thermal transfer

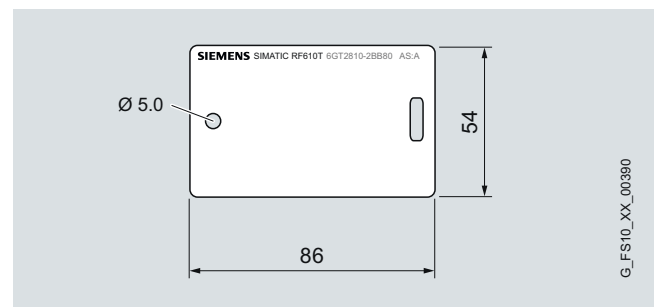
Selection and ordering data

	Order No.
ISO card transponder SIMATIC RF610T Frequency 865 MHz to 928 MHz (ETSI, FCC) Order quantity 1000 units or a multiple thereof, price per unit.	6GT2 810-2BB80
Accessories Fixing pocket for SIMATIC RF610T For attaching to metal surfaces, in combination with the spacer 6GT2 190-0AA00 Order quantity 50 units or a multiple thereof, price per unit.	6GT2 190-0AB00
Spacer for SIMATIC RF610T For attaching to metal surfaces, in combination with the fixing pocket 6GT2 190-0AB00 Order quantity 50 units or a multiple thereof, price per unit.	6GT2 190-0AA00

► Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

Dimensions



RFID systems for the UHF frequency range

Transponders SIMATIC RF600

SIMATIC RF620T

Overview



The SIMATIC RF620T container transponder is designed for industrial requirements and has a high immunity to environmental effects and cleaning agents. It can be attached to plastic, wood or glass; and with a spacer even on metal and ESD plastic.

The SIMATIC RF620T is suitable for identification of transport containers, pallets or vessels. The plastic enclosure is food safe. Thanks to its broadband design, the transponder can be used in numerous countries.

Technical specification

Container transponder	SIMATIC RF620T
Transmission frequency	865 ... 928 MHz
Read / write distance (depending on ambient conditions, reader and antenna, see SIMATIC RF600 System Manual)	Max. 5 m
Protocol (air interface)	EPCglobal Class 1 Gen 2 / ISO 18000-6C
Approvals	CE, FCC
Memory capacity	
• EPC	96 bit
• User memory	–
Data retention time	> 10 years (at +25 °C)
Read cycles	Unlimited
Write cycles	
• Minimum	100 000
• Typical	500 000
Lock function	Yes
Ambient temperature	
• During operation	-25 °C ... +80 °C
• During transportation and storage	-40 °C ... +80 °C
Degree of protection according to EN 60529	IP67
Mechanical stress in accordance with EN 60721-3-7 Class 7 M3	
• Shock	100 g
• Vibration	50 g
Design (transponder)	
• Dimensions L x W x H (mm)	127 x 38 x 6
• Color	Anthracite
• Material	Plastic (PP, polypropylene), food safe
• Weight	18 g

Container transponder	SIMATIC RF620T
Design (spacer)	
• Dimensions L x W x H (mm)	155 x 39 x 12
• Color	Anthracite
• Material	Plastic (PP, polypropylene), food safe
• Weight	18 g
Mounting	Adhesive, screws
Mounting	
• On metal/conductive plastic	Yes, with spacer
• On non-conducting Materials	Yes

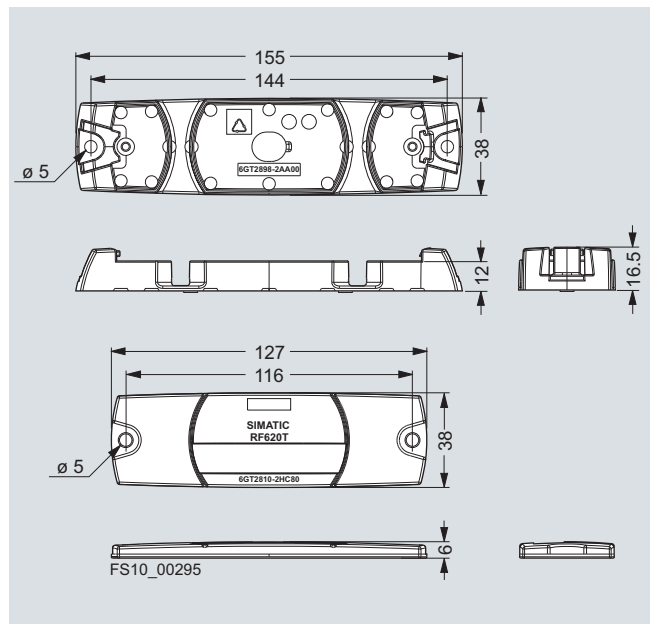
Selection and ordering data

	Order No.
Container transponder SIMATIC RF620T ▶ B	6GT2 810-2HC80
Frequency 865 MHz to 928 MHz (ETSI, FCC)	
Order quantity 20 units or a multiple thereof, price per unit.	
Accessories	
Spacer for SIMATIC RF620T ▶ B	6GT2 898-2AA00
For mounting on metal; dimensions L x W x H (mm)	
155 x 38 x 12	
Order quantity 20 units or a multiple thereof, price per unit.	

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

Dimensions



RFID systems for the UHF frequency range

Transponders SIMATIC RF600

SIMATIC RF630T

Overview



The SIMATIC RF630T screw transponder is particularly suitable for controlling and monitoring production processes. It can be automatically screwed on to products such as motors or gearbox casings by means of robots and using the M6 grub screw.

The screw transponder for industrial requirements is rugged and highly resistant to cleaning agents. It can be attached to Materials such as plastic or wood as well as directly onto metal. SIMATIC RF630T is available in two frequency versions, for 868 MHz (Europe) and 915 MHz (USA).

Technical specifications

Screw-Transponder	SIMATIC RF630T
Transmission frequency	865 ... 868 MHz (Europe) 902 ... 928 MHz (USA)
Read / write distance (depending on ambient conditions, reader and antenna, see SIMATIC RF600 System Manual)	Max. 1.5 m
Protocol (air interface)	EPCglobal Class 1 Gen 2 / ISO 18000-6C
Approvals	CE, FCC, UL/CSA
Memory capacity	
• EPC	96/240 bit
• User memory	512 bit
Data retention time	> 10 years (at 25 °C)
Read cycles	unlimited
Write cycles	
• Minimum	100 000
• Typical	500 000
Lock function	Yes
Ambient temperature	
• During operation	-25 °C ... +85 °C
• During transportation and storage	-40 °C ... +125 °C
Degree of protection according to EN 60529	IP68 / IPx9K
Mechanical stress in accordance with EN 60721-3-7 Class 7 M3	
• Shock	100 g
• Vibration	20 g

Screw-Transponder

SIMATIC RF630T

Design (transponder)	
• Dimensions diameter x height (mm)	21 x 20 (without thread)
• Color	Black/silver
• Material	Plastic/stainless steel
• Weight	approx. 22 g
Mounting	Screws (with integrated M6 grub screw)
Mounting	
• On metal	Yes
• On non-conducting Materials	Yes

Selection and ordering data

	Order No.
Screw transponder SIMATIC RF630T ▶ B	6GT2 810-2EC00
Frequency 865 to 868 MHz (Europe)	
Ordering quantity 10 units or a multiple thereof, price per unit.	
Screw transponder SIMATIC RF630T ▶ B	6GT2 810-2EC10
Frequency 902 to 915 MHz (USA)	
Ordering quantity 10 units or a multiple thereof, price per unit.	

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

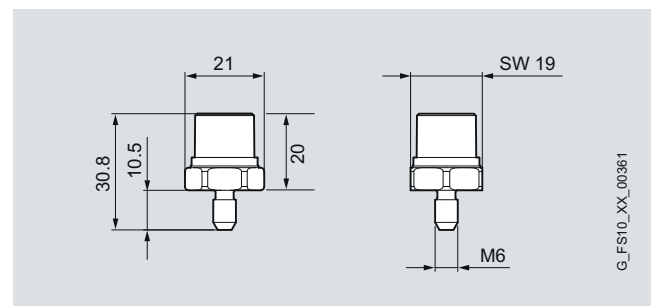
Dimensions

CAD data

Dimensional drawing available as CAD graphic (DXF format). You can find additional information in the Internet at:

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90385

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90386



RFID systems for the UHF frequency range

Transponders SIMATIC RF600

SIMATIC RF640T

Overview



The SIMATIC RF640T tool transponder can be used directly on metal, and is therefore particularly suitable for tracking tools, containers and metallic equipment (asset management).

Its rugged and still compact design, its high degree of protection and the resistance to mineral oils, lubricants and cleaning agents make it the first choice in industrial environments. The European version also has ATEX approval (EX Zone II).

This tool transponder is available in two frequency variants: 868 MHz (Europe) and 915 MHz (USA).

Technical specifications

Tool-Transponder	SIMATIC RF640T
Transmission frequency	865 ... 868 MHz (Europe) 902 ... 928 MHz (USA)
Read / write distance (depending on ambient conditions, reader and antenna, see SIMATIC RF600 System Manual)	Max. 3 m
Protocol (air interface)	EPCglobal Class 1 Gen 2 / ISO 18000-6C
Approvals	CE, FCC, UL/CSA, ATEX
Memory capacity	
• EPC	96/240 bit
• User memory	512 bit
Data retention time	> 10 years (at 25 °C)
Write cycles	
• Minimum	100 000
• Typical	500 000
Read cycles	unlimited
Lock function	Yes
Ambient temperature	
• During operation	-25 °C ... +85 °C
• During transportation and storage	-40 °C ... +125 °C
Degree of protection according to EN 60529	IP68 / IPx9K
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	100 g
• Vibration	20 g
Type of construction	
• Dimensions diameter x height (mm)	50 x 8
• Color	Anthracite
• Weight	13 g
• Material	Plastic (PA12)

Tool-Transponder	SIMATIC RF640T
Mounting	2 x M4 screws
Mounting	
• On metal	Yes
• On non-conducting Materials	No
Special features	
ATEX approval (only for the European version 6GT2 810-2DC00)	• Ex Zone II 2 G Ex ib IIC T6 to T3 • EX Zone II 2 D Ex ibD 21 T140°C, -25 °C < T_a < +85 °C

Selection and ordering data

	Order No.
Tool transponder SIMATIC RF640T For ETSI (frequency 865 to 868 MHz) ▶ B Ordering quantity 10 units or a multiple thereof, price per unit.	6GT2 810-2DC00
Tool transponder SIMATIC RF640T For FCC (frequency 902 to 928 MHz) ▶ B Ordering quantity 10 units or a multiple thereof, price per unit.	6GT2 810-2DC10

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

RFID systems for the UHF frequency range

Transponders SIMATIC RF600

SIMATIC RF680T

Overview



The heat-resistant transponder SIMATIC RF680T has a wide range and, thanks to the high IP68 / IPx9K degree of protection and its resistance to chemicals, it can even be used in harsh industrial applications, for example, in automotive production (including identification of skids in paint shops) or in the chemical industry.

The transponder is silicon-free and withstands temperatures up to 220 °C. The storage capacity is 96/240 bit Electronic Product Code (EPC) plus 512-bit user memory.

Thanks to its broadband design, the transponder can be used in numerous countries.

Technical specifications

High-temperature transponder	SIMATIC RF680T
Transmission frequency	865 ... 928 MHz
Read / write distance (depending on ambient conditions, reader and antenna, see SIMATIC RF600 System Manual)	Max. 4 m
Protocol (air interface)	EPCglobal Class 1 Gen 2 / ISO 18000-6C
Approvals	CE, FCC, UL/CSA
Memory capacity	
• EPC	96/240 bit
• User memory	512 bit
Data retention time	> 10 years (at 25 °C)
Read cycles	Unlimited
Write cycles	
• minimum	100 000
• typical	500 000
Lock function	Yes
Ambient temperature	
• During operation	-25 °C ... +100 °C: permanent +100 °C ... 140 °C: 20 % reduction of the limit distance +200 °C: Tested for up to 5000 hours or for 3000 cycles +220 °C: Tested for up to 2000 hours or for 1500 cycles
• During transportation and storage	-40 °C ... +100 °C
Degree of protection according to EN 60529	IP68 / IPx9K
Mechanical stress in accordance with EN 60721-3-7 Class 7 M3	
• Shock	50 g
• Vibration	20 g

High-temperature transponder

SIMATIC RF680T

Design (transponder)

• Dimensions L x W x H (mm)	130 x 32 x 15
• Color	Black
• Material	Plastic (PPS)
• Weight	50 g

Mounting 2 x M5 screws

Mounting

• On metal	Yes
• On non-conducting materials	Yes

Selection and ordering data

	Order No.
High-temperature transponder SIMATIC RF680T ▶ B	6GT2 810-2HG80
Frequency 865 to 928 MHz (ETSI, FCC)	
Order quantity 10 units or a multiple thereof, price per unit.	

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

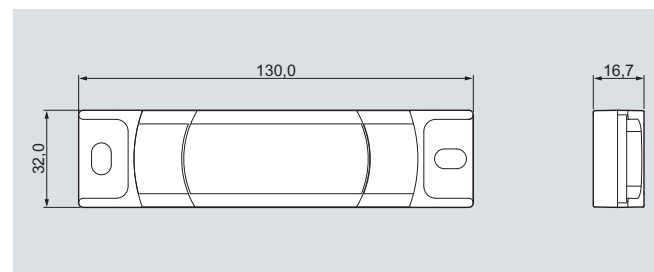
Dimensions

CAD data

Dimensional drawing available as CAD graphic (DXF format). You can find additional information in the Internet at:

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90438

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90439



RFID systems for the UHF frequency range

SIMATIC RF600

Readers SIMATIC RF600

Overview



SIMATIC RF620R

The SIMATIC RF620R reader features an integrated antenna and can be linked to SIMATIC automation systems via the SIMATIC RF communication modules.

SIMATIC RF630R

In the case of the SIMATIC RF630R reader, one or two external antennas can be connected. The SIMATIC-RF communication modules are used for integration into SIMATIC automation systems.

SIMATIC RF670R

SIMATIC RF670R is a powerful RFID reader and supports as many as four independent read stations. It is integrated into higher-level IT systems by means of XML protocol and Ethernet.

SIMATIC RF610M mobile handheld terminal

The mobile handheld terminal reads the transponder data via an integrated UHF module, displays it and makes it available either via WLAN or the interface of the docking station to the downstream systems.

RFID systems for the UHF frequency range

Readers SIMATIC RF600

SIMATIC RF620R, SIMATIC RF630R

Overview



SIMATIC RF620R



SIMATIC RF630R

The UHF RFID readers SIMATIC RF620R and SIMATIC RF630R have been specially designed for the requirements in production. While the SIMATIC RF630R operates with up to two external antennas (SIMATIC RF620A/640A/642A/660A), SIMATIC RF620R has one integrated antenna, so installation outlay is reduced. Both devices are integrated into automation systems via the RS422 system interface. Connection to PROFIBUS, PROFINET, and Industrial Ethernet or directly to SIMATIC S7-300 is supported (via communication modules SIMATIC RF170C/180C/182C or ASM 456/475).

The reader is easily configured by selecting pre-defined profiles and using the well-known FB45 and FC55 functional modules. These are available on the DVD "RFID Systems Software & Documentation" that can be ordered separately (Order No. 6GT2 080-2AA20).

For further information on configuration, runtime behavior of SIMATIC RF620R and SIMATIC RF630R, as well as for integration with SIMATIC controllers, please refer to the relevant documentation.

Applications

The stationary readers SIMATIC RF620R and SIMATIC RF630R are ideal for use in production as well as in logistics scenarios close to the production process. Thanks to the IP65 degree of protection, the high degree of noise immunity and special algorithms, the readers are specially prepared for industrial use in metallic environments.

Mounting and integration are particularly easy using the SIMATIC RF communication modules. The devices support the established standard EPCglobal Class 1, Gen 2 and are offered in two versions, for Europe (ETSI) and the USA/Canada (FCC).

Technical specifications

UHF RFID reader	SIMATIC RF620R	SIMATIC RF630R
Transmission frequency	865 ... 869 MHz (ETSI) 902 ... 928 MHz (FCC)	
Read / write distance	Max. 2.0 m	Max. 3.5 m
Protocol (air interface)	EPCglobal Class 1 Gen 2 / ISO 18000-6C	
Approvals	ETSI EN 302208, CE, FCC, UL	
Transmit power (adjustable)	–	18 ... 27 dBm
Radiated power (adjustable, for RF630R depending on the antennas and antenna cables used)		
• ETSI	max. 500 mW ERP	Max. 1.5 W ERP
• FCC	Max. 795 mW EIRP	Max. 2.4 W EIRP
Number of antennas	1 integrated	1 or 2 external antennas, monostatic (configurable), 50 Ω
Data transmission rate		
• Read	Max. 160 Kbit/s	
• Write	Max. 160 Kbit/s	
Multitag/Bulk capability	Yes	
Interfaces	PROFIBUS, PROFINET, Industrial Ethernet, SIMATIC S7-300 (via RF160C, RF170C, RF180C, RF182C, ASM 475, ASM 456 communication modules)	
Connections		
• External antenna	–	2 (reverse TNC)
• RS422 / power supply	1 (M12 8-pole)	1 (M12 8-pole)

RFID systems for the UHF frequency range

Readers SIMATIC RF600

SIMATIC RF620R, SIMATIC RF630R

UHF RFID reader	SIMATIC RF620R	SIMATIC RF630R
Ambient temperature • During operation • During transportation and storage	-25 ... +55 °C -40 ... +85 °C	
Degree of protection according to EN 60529	IP65	
Mechanical stress in accordance with EN 60068 • Shock • Vibration	50 g 20 g	
Type of construction • Dimensions L x W x H (mm) • Color • Weight • Material	260 x 193 x 52 Pastel turquoise/silver 1 850 g Plastic (ABS GF20) / aluminum	Anthracite/silver 1 640 g
Mounting	4 x M6 screws Optional: Flexible mounting with articulated bracket by means of Antenna Mounting Kit	4 x M6 screws
Power supply	Via communication module	
Display elements	3-color LED	
Additional functions	• Integrated filtering of the transponder data for higher detection accuracy • Automatic increase in transmit power when writing • SIMATIC integration • Diagnostics data for device monitoring	

Selection and ordering data

	Order No.
SIMATIC RF620R for Europe ▶ B (ETSI) UHF reader with integrated antenna, for SIMATIC integration.	6GT2 811-5BA00-0AA0
SIMATIC RF630R for Europe ▶ B (ETSI) UHF reader for connecting up to two external UHF antennas, for SIMATIC Integration.	6GT2 811-4AA00-0AA0
SIMATIC RF620R for the USA ▶ B (FCC) UHF reader with integrated antenna, for SIMATIC integration.	6GT2 811-5BA00-1AA0
SIMATIC RF630R for the USA ▶ B (FCC) Compact UHF reader for connecting up to two external UHF antennas, for SIMATIC integration.	6GT2 811-4AA00-1AA0
Accessories Note: For proper functioning of the SIMATIC RF630R reader, we recommend using the SIMATIC RF620A / 640A / 642A / 660 antennas.	
Antenna mounting kit ▶ B For flexible mounting, with articulated bracket.	6GT2 890-0AA00
DVD "RFID Systems Software & Documentation" ▶ D	6GT2 080-2AA20

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

D: Subject to export regulations AL = N and ECCN = EAR99S

RFID systems for the UHF frequency range

Readers SIMATIC RF600

SIMATIC RF620R, SIMATIC RF630R

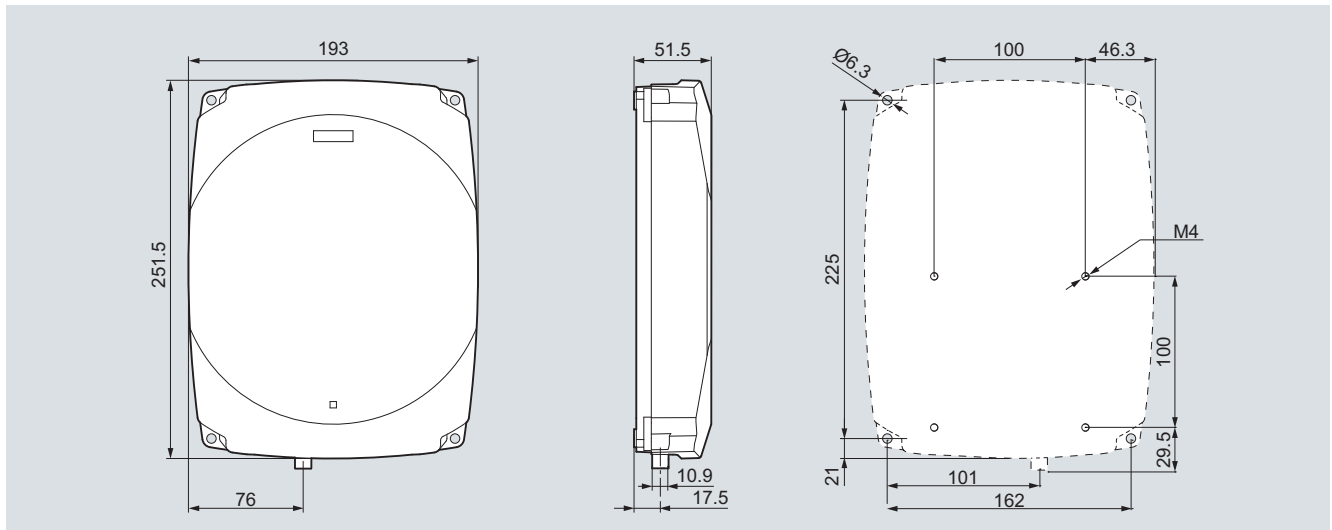
Dimensions

CAD data

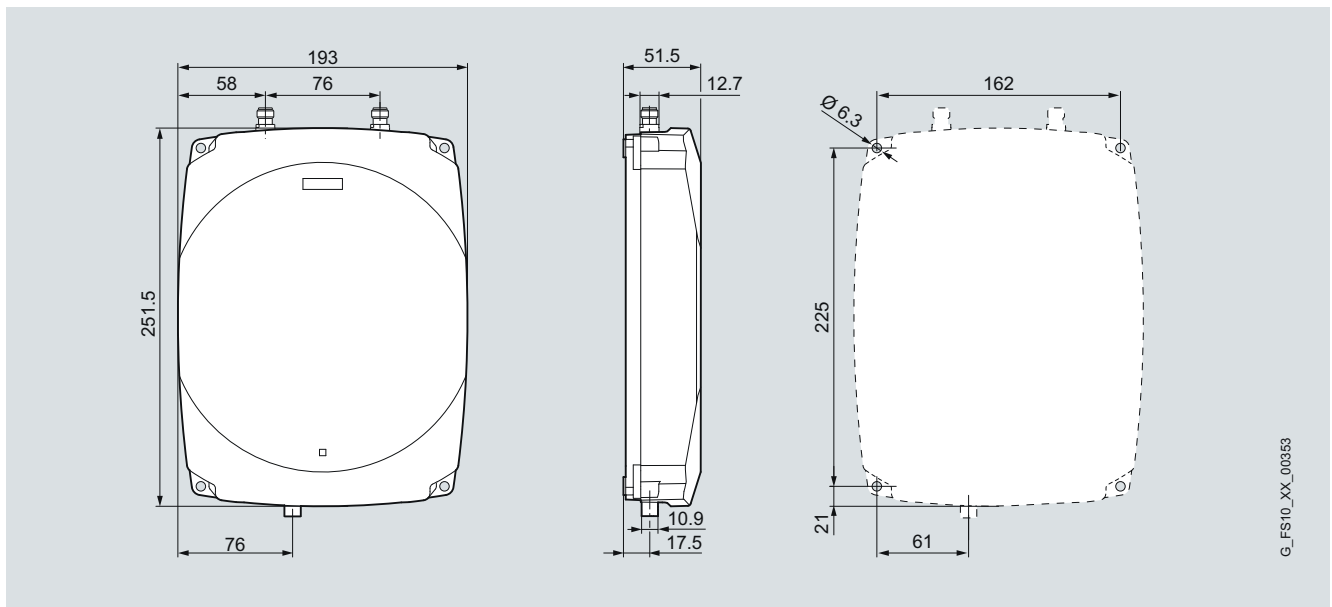
Dimensions available as CAD drawing (DXF format).
You can find additional information in the Internet at:

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90359

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90361



SIMATIC RF620R



SIMATIC RF630R

G_FS10_XX_00353

RFID systems for the UHF frequency range

Readers SIMATIC RF600

SIMATIC RF670R

Overview



SIMATIC RF670R is a high-performance RFID reader with four antenna connections which can be configured as required for individual read stations, detecting at conveyor systems, or as gates. The high transmit power of up to 2 W ERP / 4 W EIRP (dependent on antenna and cable) permits large ranges of up to 10 m in gate applications. The high degree of protection of the overall system is a guarantee for problem-free use, even under the most difficult environmental conditions.

Due to the monostatic antenna principle, as many as four independent read stations can be implemented. All antenna types of the RF600 series are supported (SIMATIC RF620A, RF640A, RF642A, RF660A). The reader offers 4 digital inputs (24 V) and 4 digital outputs (typ. 24 V / 0.5 A) that have protection circuits for industrial use.

The integrated processing logic of the reader enables numerous functions of the higher-level software layers to be executed in the device itself. For example, the reader offers extensive, intelligent filter functions, a parameterizable state machine for forwarding the data, the automatic control of the digital outputs for signaling functions, and the extensive configuration of response message frames. The advantage: Thanks to its intelligence, this considerably reduces the cost for additional software modules (RFID middleware). The reader is configured by means of the easy-to-use SIMATIC RF-MANAGER Basic software, which is provided on a free CD supplied with each reader.

Data communication for the RF670R is performed by means of an XML protocol with TCP/IP; the reader provides an Ethernet interface for this purpose. To supplement this, the RF-MANAGER software can be used for managing the data of several readers or for implementing complex processing functions.

Applications

The stationary SIMATIC RF670R UHF portal reader with up to four antennas is suitable for applications in production (with PC/IT interface), production-level logistics, distribution, supply chain management, asset management, service processes, or Material flow control.

The digital inputs and outputs (DI/DO) are used for simple process interfacing (sensors, actuators). The device supports the established standard EPCglobal Class 1, Gen 2 and is offered in two versions, for Europe (ETSI) and the USA/Canada (FCC).

Technical specifications

UHF RFID reader	SIMATIC RF670R
Transmission frequency	865 ... 868 MHz (ETSI) 902 ... 928 MHz (FCC)
Read / write distance - With 1 antenna - With 2 antennas, mounted opposite each other (portal application)	Max. 5 m Max. 10 m
Protocol (air interface)	EPCglobal Class 1 Gen2 / ISO 18000-6C
Approvals	ETSI EN 302208, CE, FCC, UL
Transmit power - ETSI (Europe) - FCC (USA)	max. 30 dBm max. 31 dBm
Radiant power (adjustable in steps of 100 mW, depending on the antenna and antenna cable used) - ETSI (Europe) - FCC (USA)	0.1 W ... 2 W ERP 0.4 W ... 4 W EIRP
Number of antennas	1 to 4 external antennas, monostatic (configurable as required on up to 4 independent read points), 50 Ω
Data transmission rate - Read - Write	Max. 80 Kbit/s Max. 160 Kbit/s
Multitag/Bulk capability	Yes
Interfaces	XML protocol
Connections - Antenna - Ethernet - Digital I/O - Power supply	4 (reverse TNC) 1 (AIDA push-pull, according to IEC 24702) 1 combination port with 4 x In, 4 x Out (In: 4 x 24 V DC, Out: 4 x 24 V DC; 0.5 A each; M12, 12-pole) 1 (M12, 4-pole)
Ambient temperature - During operation - During transportation and storage	-25 ... +55 °C -40 ... +85 °C
Degree of protection according to EN 60529	IP65
Mechanical stress in accordance with EN 60068 - Shock - Vibration	50 g 20 g
Type of construction - Dimensions L x W x H (mm) - Color - Weight - Material	260 x 193 x 52 Anthracite/silver 1 800 g Plastic (ABS GF20) / aluminum
Mounting	4 x M6 screws
Power supply	24 V / 1.95 A
Display elements	3-color LED

RFID systems for the UHF frequency range

Readers SIMATIC RF600

SIMATIC RF670R

UHF RFID reader	SIMATIC RF670R
Special features	• Filtering and pre-processing of the transponder data for higher detection accuracy • Automatic increase in transmit power when writing • Triggering by means of digital inputs or XML commands for each read station • Configurable, event-controlled switching of the digital outputs • Configuration using software • Firmware update

Selection and ordering data

	Order No.
SIMATIC RF670R reader	
• UHF RFID reader for frequencies 865 to 868 MHz (ETSI), incl. SIMATIC RF-MANAGER Basic on CD	6GT2 811-0AB00-0AA0
• UHF RFID reader for frequencies 902 to 928 MHz (FCC), incl. SIMATIC RF-MANAGER Basic on CD	6GT2 811-0AB00-1AA0
Accessories	
DI/DO cable ▶ For the connection of digital sensors and actuators to SIMATIC RF670R. M12 connector on reader side, open stranded wires on the sensor side. DI/DO cable, material PUR, black, shielded, M12, 12 x 0.14 mm ² , length 5 m	6GT2 891-0CH50
Set of protective caps ▶ For achieving IP65 degree of protection if not all connections on the reader are assigned. Content: 3x protective caps for antenna connection, 1x protective cap for DI/DO connection; design: Metal	6GT2 898-4AA00
Wide-range power supply Primary side: 100 ... 240 V AC, 120 ... 353 V DC, secondary side: 24 V DC, 3 A, with no-load protection, with continuous short-circuit protection • EU connector version ▶ B • UK connector version ▶ B • US connector version ▶ B	6GT2 898-0AA00 6GT2 898-0AA10 6GT2 898-0AA20
Cable for wide-range power supply ▶ 24 V DC, material PUR, length 5 m Note: This cable is not suitable for SIMATIC RF660R.	6GT2 891-0NH50
Ethernet connection • Twisted connecting cable, IP65 on reader side, length 10 m. • Push-pull cable connector for RJ45, not pre-assembled. • Covers for push-pull sockets, RJ45, 5 units per pack. Price per pack.	6GT2 891-1HN10 6GK1 901-1BB10-6AA0 6ES7 194-4JD50-0AA0

▶ Preferred type, available from stock.

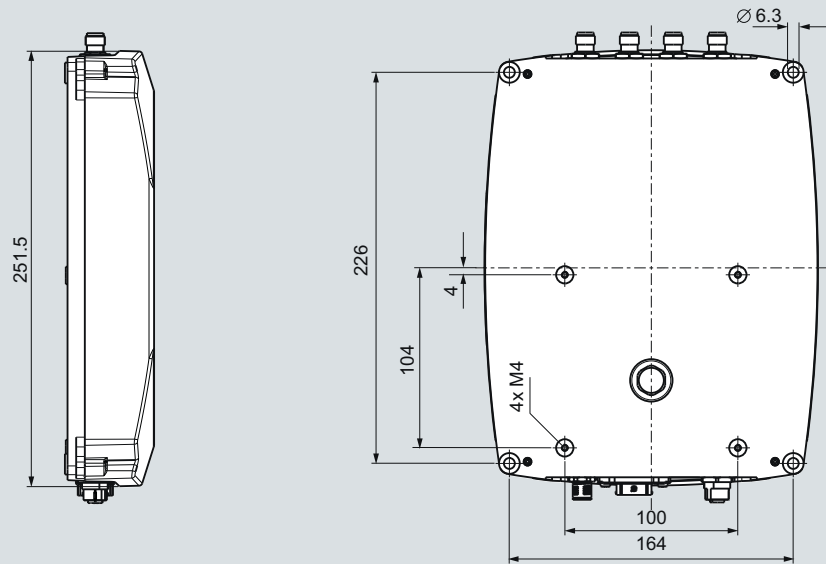
B: Subject to export regulations AL = N and ECCN = EAR99H

RFID systems for the UHF frequency range

Readers SIMATIC RF600

SIMATIC RF670R

Dimensions



G_FS10_XX_00414

RFID systems for the UHF frequency range

Readers SIMATIC RF600

SIMATIC RF610M mobile handheld terminal

Overview



SIMATIC RF610M is a high-performance, mobile, handheld terminal with an read/write antenna that has been adapted for applications in the fields of production logistics, warehouse management, inventories and service. It is also an important tool for commissioning and testing of RFID systems.

Design

The SIMATIC RF610M mobile handheld terminal comprises a basic unit (based on the PSION Workabout PRO) and a read/write device for RF600 transponders and SmartLabels. It has a rugged, splashproof housing, an LCD color display with touch functionality and an alphanumeric keyboard with function keys.

Functions

The supplied and pre-installed RF600 software provides service and test functions for reading and writing the RF600 data storage units and SmartLabels. Data that has been read can be saved in file structures.

In addition, an already installed API library is included. This allows the customer to program his/her own RFID applications for the mobile handheld terminal. For the actual programming, a Software Development Kit (SDK) can be ordered from PSION Teklogix.

Based on the operating system and communication standards (WIN CE), the device ensures easy integration in existing or planned IT networks or in the process infrastructure. For this purpose, various optional development tools are available for the PC as well as a wide range of accessories directly from PSION Teklogix and MICROSOFT

Technical specification

Mobile handheld terminal	SIMATIC RF610M
Processor	PXA270, 32 bit RISC CPU
Operating system	Microsoft Windows. CE 5.0
RAM/Flash EEPROM memory	128 MB / 128 MB
User program	RF610M application and API interface
Screen	Color display TFT, ¼ VGA 320 x 240 (portrait format) with touch function and adjustable backlighting
Keyboard	Alphanumeric plus function keys and touch screen
Sound	Piezo sensor
Power supply	- Lithium-ion battery (3.7 V; 3000 mAh), fast charging capability (automatic shutdown) or 3 x 1.5 V batteries of Type AA - Back-up battery: 3 V lithium cell ML 2032
Interfaces	LIF interface (LIF: Low Insertion Force) for battery charging and communication with the PC over a USB interface; additional CF slot for expansion cards (e.g. WLAN)
Dimensions (in mm) without barcode scanner	265 x 92 x 42
Weight (incl. battery)	approx. 0.6 kg
Temperature - Operation - Storage	-10 ... +50 °C -25 ... +60 °C (without batteries)
Relative humidity, non-condensing	5 ... 95 %
Degree of protection	IP54 (splashwater proof)
EMC	EN 55022; FCC Part 15
Electrostatic; RF; EFT	IEC 801-2; IEC 801-3; IEC 801-4
Integrated read/write unit UHF module with antenna	
Read/write distance	Up to 600 mm depending on the transponder type
Transmission frequency energy/data, UHF frequency band - ETSI - FCC	868 MHz 912.5 ... 917 MHz
Functionality of the SW application	Standard user interface for reading/writing data storage units and for saving the data

RFID systems for the UHF frequency range

Readers SIMATIC RF600

SIMATIC RF610M mobile handheld terminal

Selection and ordering data

	Order No.
RF610M mobile handheld terminal (Europe) ▶ B Basic unit (PSION Workabout PRO) with adapted UHF module (ISO 18000-6B/ -6C), battery, standard software pre-installed, without loading / docking station European frequency band (868 MHz)	6GT2 813-0AB00
RF610M mobile handheld terminal (USA) ▶ B Basic unit (PSION Workabout PRO) with adapted UHF module (ISO 18000-6B/ -6C), battery, standard software pre-installed, without loading / docking station Frequency band USA/Canada (912.5 – 917 MHz)	6GT2 813-0AB10
Accessories Barcode scanner with pistol grip ▶ B Barcode module for mounting on RF610M with pistol grip and release button.	6GT2 898-0DB00
WLAN module ▶ B WLAN interface for mounting in the CF slot. Communication to IEEE 802.11 b/ g	6GT2 898-0DA00
Loading / docking station ▶ B For a mobile handheld terminal as well as for spare batteries. Including a plug-in power supply with a wide-range input of 100 to 240 VAC and country-specific adapters as well as USB interface and USB cable.	6GT2 898-0BA00

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

Accessories

Further optional components are available in the Internet under:

<http://www.pSIONteKlogix.com>

RFID systems for the UHF frequency range

Antennas SIMATIC RF600

Overview



SIMATIC RF600 UHF antennas are used in many different applications in production, Material handling, and logistics. Thanks to their rugged design and high degree of protection, they are also suitable for harsh industrial environments.

Antenna	Feature
SIMATIC RF620A	Particularly compact antenna for applications in production, e.g. assembly lines or conveyor systems.
SIMATIC RF640A	Universal and compact standard antenna for wide ranges.
SIMATIC RF642A	Compact antenna with linear polarization for strongly reflective environments.
SIMATIC RF660A	Antenna with increased degree of protection (IP67).

RFID systems for the UHF frequency range

Antennas SIMATIC RF600

SIMATIC RF620A

Overview



The SIMATIC RF620A antenna is characterized by an especially compact enclosure. It is particularly suitable for use in production, e.g. on assembly lines or track-guided conveyor systems. The effects of reflections and overshooting can be reliably reduced thanks to the linear polarization and high degree of signal attenuation.

The antenna can be operated with the UHF readers SIMATIC RF630R and RF670R.

Technical specifications

UHF compact antenna	SIMATIC RF620A
Transmission frequency	865 ... 868 MHz (ETSI) 902 ... 928 MHz (FCC)
Antenna gain	-10 ... -5 dBi
Impedance (nominal)	50 Ω
Polarization	Linear
Connection	30 cm coaxial cable with reverse TNC coupling
Approvals	FCC, CE, ETSI EN 302208, UL

UHF compact antenna	SIMATIC RF620A
Ambient temperature	
• During operation	-25 ... +75 °C
• During transportation and storage	-40 ... +85 °C
Degree of protection	IP67
Type of construction	
• Dimensions L x H x W (mm)	75 x 75 x 20
• Color	Pastel turquoise
• Weight	100 g
• Material	Plastic (PA12)
Mounting	2 x M5 screws

Selection and ordering data

	Order No.
Compact antenna SIMATIC RF620A (ETSI) ▶ B	6GT2 812-1EA00
Linear polarized UHF antenna for frequency range 865 to 868 MHz.	
Compact antenna SIMATIC RF620A (FCC) ▶ B	6GT2 812-1EA01
Linear polarized UHF antenna for frequency range 902 to 928 MHz.	
Accessories	
Note:	
To ensure optimal functioning of the antenna, it is recommended that a Siemens antenna cable is used.	
Antenna cable	
PE Material, UV-resistant, halogen-free, 50 Ω impedance, reverse TNC, UL-certified.	
• Length 3 m, $\varnothing$ 5 mm, attenuation 1 dB ▶ B	6GT2 815-0BH30
• Length 10 m, $\varnothing$ 7.6 mm, attenuation 2 dB ▶ B	6GT2 815-1BN10

▶ Preferred type, available from stock.

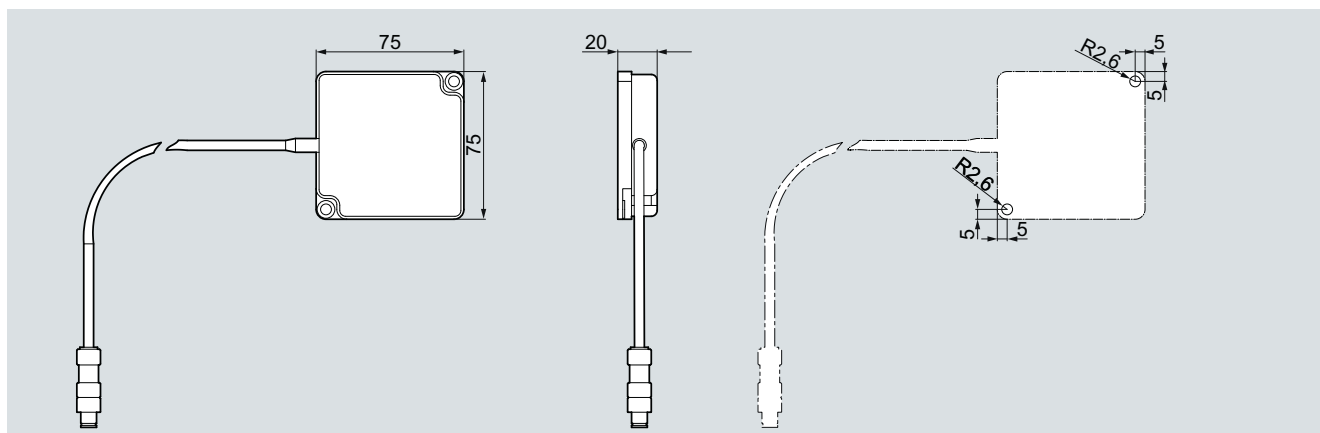
B: Subject to export regulations AL = N and ECCN = EAR99H

Dimensions

CAD data

Dimensional drawing available as CAD graphic (DXF format). You can find additional information in the Internet at:

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90459



RFID systems for the UHF frequency range

Antennas SIMATIC RF600

SIMATIC RF640A, SIMATIC RF642A

Overview



The SIMATIC RF640A/RF642A are rugged and compact antennas for industrial applications in production and logistics.

- The SIMATIC RF640A is a universal antenna for numerous applications.
- The SIMATIC RF642A is, with its linear polarization, particularly suitable for severely metallic environments.

Both antennas can operate both in Europe and the USA (broadband) and with the UHF readers SIMATIC RF630R and RF670R.

Technical specifications

Antenna	SIMATIC RF640A	SIMATIC RF642A
Transmission frequency	865 ... 928 MHz	
Antenna gain	4 dBi	4.3 dBi
Impedance (nominal)	50 Ω	
Polarization	Circular	Linear
Approvals	ETSI EN 302208, CE, FCC, UL	
Connection	30 cm coax cable with reverse TNC coupling	
Ambient temperature		
• During operation	-25 ... +75 °C	
• During transportation and storage	-40 ... +85 °C	
Degree of protection according to EN 60529	IP65	
Type of construction		
Dimensions L x W x H (mm)	185 x 185 x 45	
Color	Pastel turquoise	
Weight	600 g	
Material	Plastic (PA12)	
Mounting	4 screws M4 Optional: Flexible mounting by antenna assembly kit	

Selection and ordering data

	Order No.		Order No.
SIMATIC RF640A ▶	6GT2 812-0GA08	Antenna cable	
Circularly polarized antenna for UHF frequency 865 MHz to 928 MHz (ETSI, FCC)		PE Material, UV-resistant, halogen-free, 50 Ω impedance, reverse TNC, UL certified	
SIMATIC RF642A ▶	6GT2 812-1GA08	Length 3 m, $\varnothing$ 5 mm, attenuation 1 dB ▶ B	6GT2 815-0BH30
Linearly polarized antenna for UHF frequency 865 MHz to 928 MHz (ETSI, FCC)		Length 10 m, $\varnothing$ 5 mm, attenuation 4 dB ▶ B	6GT2 815-0BN10
Accessories		Length 10 m, $\varnothing$ 7.6 mm, attenuation 2 dB ▶ B	6GT2 815-1BN10
Note:		Length 20 m, $\varnothing$ 7.6 mm, attenuation 4 dB ▶ B	6GT2 815-0BN20
To ensure proper functioning of the antennas, it is recommended that Siemens antenna cables are used.		Antenna mounting kit ▶ B	6GT2 890-0AA00
		For flexible mounting with articulated bracket, VESA adapter 75 x 75 mm is supplied	

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

RFID systems for the UHF frequency range

Antennas SIMATIC RF600

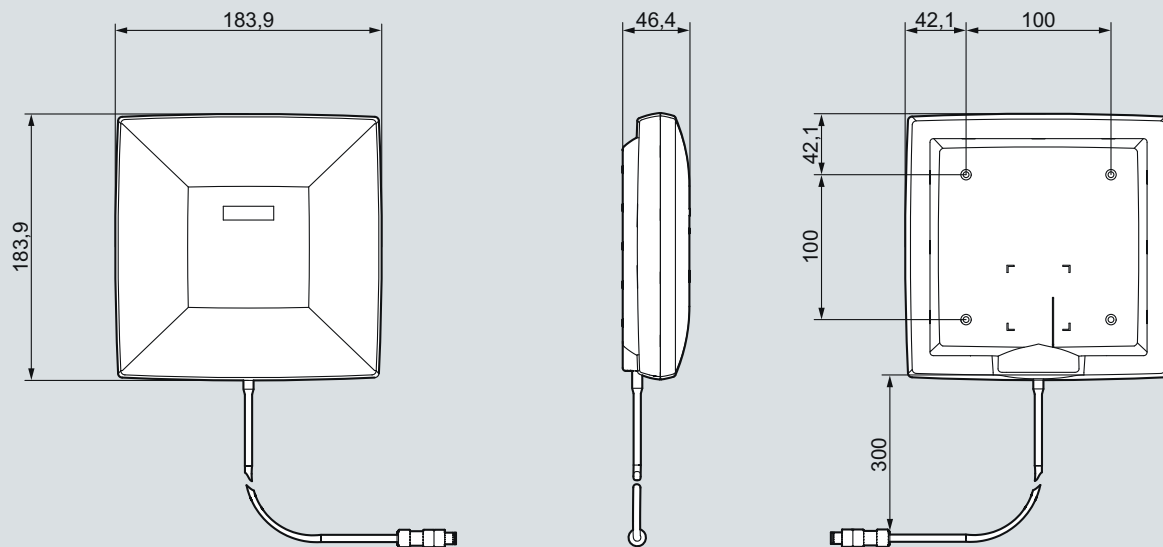
SIMATIC RF640A, SIMATIC RF642A

Dimensions

CAD data

Dimensional drawing available as CAD graphic (DXF format).
You can find additional information in the Internet at:

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90481



RFID systems for the UHF frequency range

Antennas SIMATIC RF600

SIMATIC RF660A

Overview



The universal UHF antenna SIMATIC RF660A is suitable for numerous applications in production and logistics that require a greater range. Typical applications are conveyor systems in Material handling and logistics systems as well as gates, such as in the incoming goods department.

Thanks to their rugged design and high degree of protection, the SIMATIC RF660A antennas are also suitable for harsh industrial environments. The antenna can be operated with the UHF readers SIMATIC RF630R and RF670R.

Technical specifications

UHF antenna	SIMATIC RF660A
Transmission frequency	865 ... 868 MHz (ETSI) 902 ... 928 MHz (FCC)
Antenna gain	5 ... 7 dBi (ETSI) > 6 dBic (FCC)
Impedance (nominal)	50 Ω
Polarization	Circular
Connection	Reverse TNC coupling
Approvals	ETSI EN 302208, CE, FCC, UL
Ambient temperature	
• During operation	-25 ... +75 °C
• During transportation and storage	-40 ... +85 °C
Type of protection	IP67
Type of construction	
• Dimensions L x W x H (mm)	313 x 313 x 80
• Color	Pastel turquoise
• Weight	1 600 g
• Material	Plastic (PA12)
Mounting	4 screws M4 Optional: Flexible mounting by antenna assembly kit

Selection and ordering data

	Order No.
Antenna SIMATIC RF660A (ETSI) ▶ B Circular polarized UHF antenna for frequency range 865 to 868 MHz.	6GT2 812-0AA00
Antenna SIMATIC RF660A (FCC) ▶ B Circular polarized UHF antenna for frequency range 902 to 928 MHz.	6GT2 812-0AA01
Accessories Note: To ensure proper functioning of the SIMATIC RF660A antenna, it is recommended that Siemens antenna cables are used.	
Antenna cable PE material, UV-resistant, halogen-free, 50 Ω impedance, reverse TNC, UL certified.	
Length 3 m, Ø 5 mm, attenuation 1 dB ▶ B	6GT2 815-0BH30
Length 10 m, Ø 5 mm, attenuation 4 dB ▶ B	6GT2 815-0BN10
Length 10 m, Ø 7.6 mm, attenuation 2 dB ▶ B	6GT2 815-1BN10
Length 20 m, Ø 7.6 mm, attenuation 4 dB ▶ B	6GT2 815-0BN20
Antenna mounting kit ▶ B For flexible mounting with articulated bracket, VESA adapter 75 x 75 mm is supplied.	6GT2 890-0AA00

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

RFID systems for the UHF frequency range

Antennas SIMATIC RF600

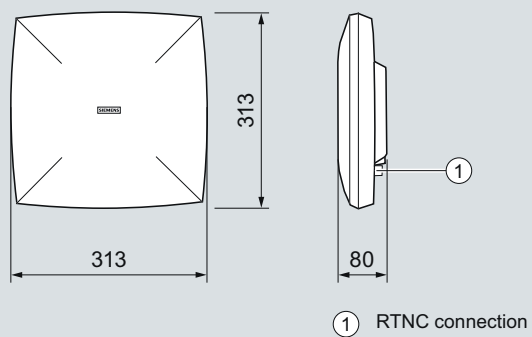
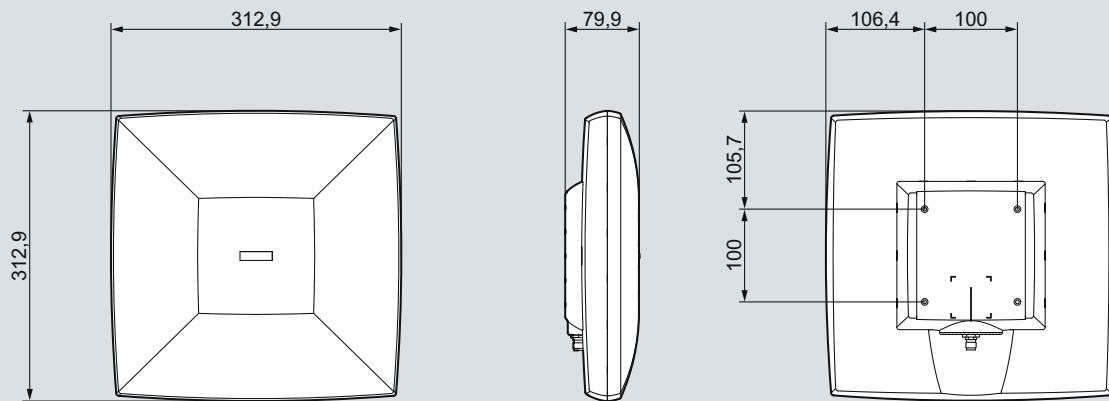
SIMATIC RF660A

Dimensions

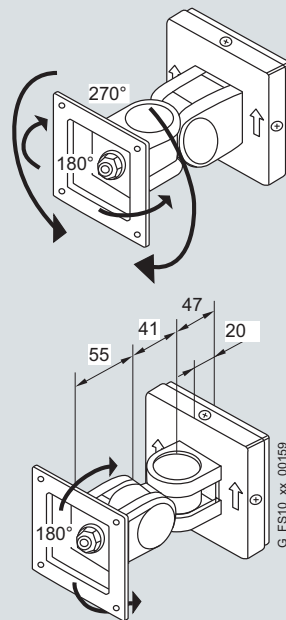
CAD data

Dimensional drawing available as CAD graphic (DXF format).
You can find additional information in the Internet at:

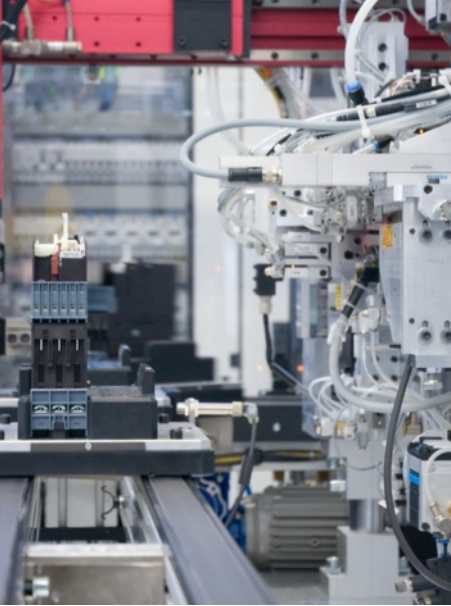
http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90485



G_FS10_XX_00391



RFID systems for the microwave frequency range



4/2

RFID systems for the microwave frequency range

4/2

MOBY U

4/4

Transponders MOBY U

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MDS U315 / MDS U525

4/7

MDS U589

4/9

MDS U Service

4/10

Readers MOBY U

4/10

SLG U92

4/13

STG U mobile handheld terminal

4/15

MOBY U configuring notes

RFID systems for the microwave frequency range

MOBY U

Overview



MOBY U is used to implement identification tasks with medium to high performance in the microwave frequency range (2.4 ... 2.4835 GHz) that require particularly high ranges.

MOBY U eliminates familiar sources of interference, such as reflections, electromagnetic interference and overreach, by means of appropriate technical measures.

Correspondingly constructed antennas ensure a homogeneous transmission field to guarantee reliable recognition of the transponders (MDS) even from unfavorable locations.

In addition, special coding procedures ensure that the data transmission functions without errors and the data integrity is guaranteed. To achieve this, methods and algorithms that have been tried and tested in mobile radio technology (GSM, UMTS) have been transferred to the identification technology.

The MOBY U UHF identification system features:

- 2.4 GHz identification system with a read/write distance of up to 3 000 mm
- Designed for the upper and medium performance range
- 2.4 GHz identification system with a read/write distance of up to 3 000 mm
- Designed for the upper and medium performance range
- Extensive range of rugged transponders for a vast range of applications
- Special heat-resistant transponders for use in the automobile industry (paint shops)
- Very high level of reliability even in the presence of contamination, temperature fluctuations, and electromagnetic interference
- Simple integration in SIMATIC, PROFIBUS, PROFINET and TCP/IP with the help of tried and tested function blocks (FC/FB 45, FC/FB 55)
- Can be connected via serial interface to any system, e.g. PC with Windows 98/NT/2000/XP
- Mobile handheld terminal available
- High memory capacity
- Innovative technology (GSM/UMTS technology) guarantees simple installation/migration and maintenance-free operation for many years:
 - Active suppression of overreach
 - Automatic frequency hopping
 - Homogeneous transmission field with circular polarization
 - Multitag-capability, max. 12 transponders
 - Automatic synchronization of up to 3 readers
 - Service functions for fast error analysis
- Extensive range of rugged transponders for a vast range of applications

Benefits

- Rugged transponders with large data memories (up to 32 KB) and high degree of protection (up to IP68) and thermal stability +220 °C with ATEX approval.
- Unlimited read/write cycles for the transponder thanks to RAM technology.
- Powerful read/write devices with high data transmission rates up to 8 000 bytes/s.
- Read/write distances of 0.15 to 3 m can be parameterized.
- Active suppression of overshoot; parameterizable write distances of 0.15 to 3 m.
- Parallel operation with WLAN and Bluetooth is possible.
- Flexible and economic solutions thanks to the complete and scalable portfolio for the field of industrial identification
- Simplified engineering, commissioning, diagnostics and maintenance through seamless integration into Totally Integrated Automation:
 - Integrated bus connection to an automation system, such as SIMATIC, SIMOTION or SINUMERIK via communication modules with PROFIBUS and PROFINET.
 - Simple S7 software integration via ready-to-use function blocks
 - Extensive status and diagnostic functions.
- High degree of investment protection thanks to
 - Open standard ISO 18000-4
 - Software compatibility between the RFID systems of Siemens
 - Standardized communications interfaces.
- Openness through connection possibilities to different bus systems from different manufacturers and PC environments via communication modules.
- Worldwide Service and Support.

RFID systems for the microwave frequency range

MOBY U

Application

The MOBY U identification system has been specially designed for applications in automobile production, logistics etc., where considerable demands are made, for example, in terms of immunity to noise, large read/write distance in the case of a moving transponder, fast and secure data transmission, simple installation and reliable functioning even in harsh environments. It uses the universally approved ISM frequency band at 2.4 GHz and the radiated power is well below the limits recommended by major health authorities from around the world.

MOBY U covers a transmission range from a few centimeters to three meters and thus creates the requirement for an integrated identification solution, e.g. in automotive production.

Depending on the requirement, various transponders (max. 32 KB RAM) and readers are available for connection to SIMATIC, PROFIBUS, Industrial Ethernet and PCs/PLCs.

The main applications for MOBY U are:

- Main assembly lines in the automotive industry (body in white, surface and assembly)
- Vehicle identification/access control in transport companies, vehicle depots, etc.
- Container/ carrier identification in transport logistics and distribution
- Traffic control systems
- Assembly lines

Function

The readers of MOBY U scan the environment permanently for transponders and measure the distance to them. The transponders are only processed if they are within the set range.

Integration

A wide range of communication modules, function blocks, as well as high-performance drivers and function libraries permits easy and quick integration into the application.

And best of all: MOBY U is part of Totally Integrated Automation and can be integrated easily and cost-effectively into the SIMATIC world.

For more details on the connection possibilities, see the Chapter 5 under "Communication Modules".

Technical specifications

Contact-free UHF identification system for the medium to upper performance range	MOBY U
Transmission frequency	2.4 GHz
Write / read distance	Max. 3 m
Protocol (air interface)	ISO 18000-4
Memory capacity	Max. 32 Kbyte
Data transfer rate, reader - transponder	
• Read	Max. 4.8 Kbyte/s
• Write	Max. 8 Kbyte/s
Bulk capability, multitag capability	Yes
Special features	• Active range limiting • High Memory capacity

RFID systems for the microwave frequency range

Transponder

Transponders MOBY U

Overview



MOBY U records the data of objects quickly and reliably. MOBY U thereby ensures efficient and cost-effective automation.

Technical specifications

Field data (all dimensions in mm)

	Transponder MDS U315, MDS U525, MDS U589, MDS U Service
Reader SLG U92	Operating/limit distance 150 to 2 100 / 3 000, adjustable in 500 mm steps

Note:

The listed field data are typical values and valid for a room temperature of +25 °C and a supply voltage of 24 V DC.

4

Transponder	Features
MDS U315	Universal mobile transponder (2 KB RAM) preferred for transport and logistics applications. • Enclosure dimensions (mm) 111 x 67 x 23.5 • IP65 degree of protection • Operating temperature -25 °C to +70 °C • With replaceable battery
MDS U525	Rugged and mobile transponder (32 KB RAM) for universal applications. • Enclosure dimensions (mm) 111 x 67 x 23.5 • IP68 degree of protection • Operating temperature -25 °C to +85 °C • With replaceable battery
MDS U589	Heat-resistant and rugged transponder (32 KB RAM) for use in paint shops (automotive industry, priming/finishing coats) or applications with similarly high temperature requirements. • Enclosure dimensions (mm) Ø 114 x 83 • IP68 degree of protection • Operating temperature -25 °C to +85 °C, up to +220 °C cyclically • Silicone-free Options: • Universal installation kit • Support for attachment to skid • Cover for support • Additional supports available on request
MDS U Service	The MDS U Service is a transponder for use in the start-up phase and during servicing in the automotive industry and other industrial production plants with similar requirements. Memory capacity 32 KB RAM, two LED displays for communication, replaceable battery. • With On/Off switch • Enclosure dimensions (mm) 111 x 67 x 23.5 • IP40 degree of protection • Operating temperature -25 °C to +70 °C

Overview

**MDS U315**

Universal transponder (2 KB RAM) for universal applications, preferably in transport and logistics applications, enclosure dimensions (mm) 111 x 67 x 23.5, IP65 degree of protection, operating temperature -25 °C to +70 °C, with replaceable battery.

MDS U525

Rugged and mobile transponder (32 KB RAM) for universal use, enclosure dimensions 111 mm x 67 mm x 23.5 mm, IP65 degree of protection, operating temperature -25 °C to +85 °C, with replaceable battery.

Technical specifications

Transponder	MDS U315	MDS U525
Transmission frequency	2.4 ... 2.4835 GHz in the ISM band	
Read / write distances	max. 150 mm ... 3 000 mm	
Protocol (air interface)	ISO 18000-4	
Approvals ¹⁾	CE, FCC, UL	
Memory capacity		
• User memory	2 KB RAM	
• Read-only memory (UID)	32 bit serial number	
• OTP (One Time Programmable)	128 bit, to be written once by user	
Data retention time	Corresponds to battery service life	
Battery service life ²⁾	≥ 5 years	≥ 8 years
Write cycles	Unlimited	
Read cycles	Unlimited	
Ambient temperature		
• During operation	-25 °C ... +70 °C	-25 °C ... +85 °C
• During transportation and storage	-40 °C ... +85 °C	-40 °C ... +85 °C
Degree of protection according to EN 60529	IP65	IP65
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3		
• Shock	50 g	
• Vibration	10 g	
Design of the transponder		
• Dimensions L x W x H (mm)	111 x 67 x 23,5	
• Color		
• Weight	approx. 100 g	
• Material	Plastic PA 12 GF 25	
Mounting	4 screws M4	
Mounting		
• On metal	Yes	
• Flush-mounted in metal	No	
Special features	Universal transponder for preferred deployment in transport and logistics.	Rugged and mobile transponder for universal applications.

1) Also refer to the "Manual for Configuration, Assembly and Service".

2) The battery service life depends on the temperature, the time in which the transponder is located within the antenna field of the reader (Zones 1 and 2) and the volume of data that is read/written.

RFID systems for the microwave frequency range

MOBY U Transponder

MDS U315 / MDS U525

Field data (all dimensions in mm)
MDS U315 / MDS U525 to SLG U92

Write / read distances (S_g) of the reader can be limited in 500 mm steps up to 3 500 mm.

	Minimum	Standard	Maximum
Limit distance (S_g), approx.	500	2 000	3 000
Operating distance (S_a)	350	1 400	2 100
Transmission window at S_a length / width	700 700 (with FCC approval)	2 400 2 000 (with FCC approval)	3 000 2 100 (with FCC approval)

The Field data apply for reading and writing the transponder.

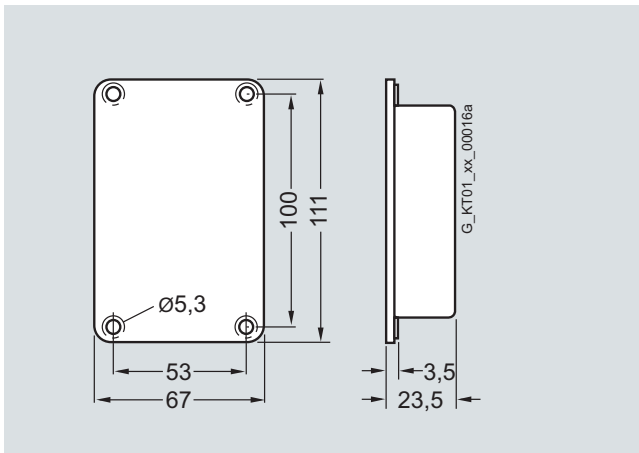
Selection and ordering data

	Order No.
Transponder MDS U315 ▶ B 2 KB RAM	6GT2 500-3BF10
Transponder MDS U525 ▶ B 32 KB RAM, replaceable battery	6GT2 500-5CF10

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

Dimensions



RFID systems for the microwave frequency range

Transponders MOBY U

MDS U589

Overview



Heat-resistant, rugged transponder for use in paint shops (automobile industry, primer/top coat) or applications with similar temperature requirements, Memory capacity 32 KB RAM, temperature range -25 °C to + 85 °C, up to +220 °C cyclically, degree of protection IP68, enclosure dimensions (mm) Ø 114 x 83.

Technical specifications

Heat-resistant transponder	MDS U589
Transmission frequency	2.4 ... 2.4835 GHz in the ISM band
Write / read distance	max. 150 mm ... 3 000 mm
Protocol (air interface)	ISO 18000-4
Approvals ¹⁾	CE, FCC, UL
Memory capacity	
• User memory	32 Kbyte RAM
• Read-only memory (UID)	32 bit serial number
• OTP (One Time Programmable)	128 bit, to be written once by user

Field data (all dimensions in mm) MDS U589 to SLG U92

Write / read distances (S_g) of the reader can be limited in 500 mm steps up to 3 500 mm

	Minimum	Standard	Maximum
Limit distance (S_g), approx.	500	2 000	3 000
Operating distance (S_a)	350	1 400	2 100
Transmission window at S_a length / width	700 700 (with FCC approval)	2 400 2 000 (with FCC approval)	3 000 2 100 (with FCC approval)

The Field data apply for reading and writing the transponder.

Cyclic operation of the transponder at temperatures > 85 °C

No cyclic operation is required at temperatures up to +85 °C. In other words, the transponder can be operated permanently up to this temperature.

Heating up		Cooling down	
Temperature	Time	Temperature	Time
220 °C	Momentary	25 °C	> 30 min
200 °C	1 h	25 °C	> 4 h
200 °C	0,5 h	25 °C	> 1 h
180 °C	1 h	25 °C	> 3 h

Heat-resistant transponder	MDS U589
Data retention time	Corresponds to battery service life
Battery service life ²⁾	≥ 3 years
Write cycles	Unlimited
Read cycles	Unlimited
Ambient temperature	
• During operation	-25 °C ... +85 °C, to 220 °C cyclic
• During transportation and storage	-40 °C ... +85 °C
Degree of protection according to EN 60529	IP68
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3	
• Shock	50 g
• Vibration	5 g ³⁾
Design of the transponder	
• Dimensions diameter x height (mm)	Ø 114 x 83, without holder
• Color	brown
• Weight	approx. 600 g
• Material	PPS
Mounting	Universal installation kit or skid support
Mounting	
• On metal	Yes
• Flush-mounted in metal	No
Special features	Designed for integrated use in body-in-white and paint shops (KTL, top coat, etc.)

- 1) Also refer to the "Manual for Configuration, Assembly and Service".
- 2) The battery service life depends on the temperature, the time in which the transponder is located within the antenna field of the reader (Zones 1 and 2) and the volume of data that is read/written.
- 3) Applies only in connection with original bracket.

RFID systems for the microwave frequency range

Transponders MOBY U

MDS U589

Selection and ordering data

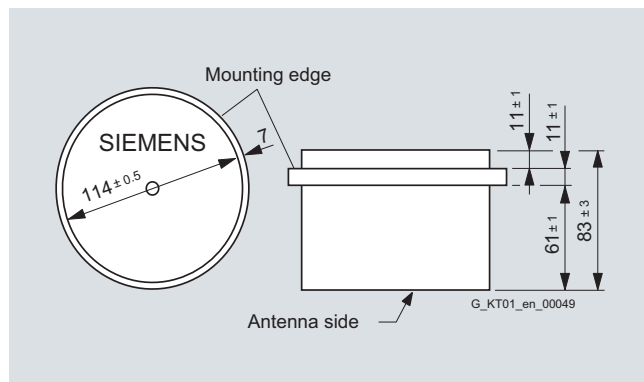
	Order No.
Transponder MDS U589 ▶ User memory: 32 KB RAM Operating temperature: Up to 220 °C cyclic	6GT2 500-5JK10
Accessories	
Skid-support for MDS U589 Short type ▶ B	6GT2 090-0QA00
Shrouding cover For skid support ▶ B	6GT2 090-0QB00
Universal support ▶ For MDS U589, e.g. for attachment to the body with a customer-specific adapter	6GT2 590-0QA00

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

Dimensions

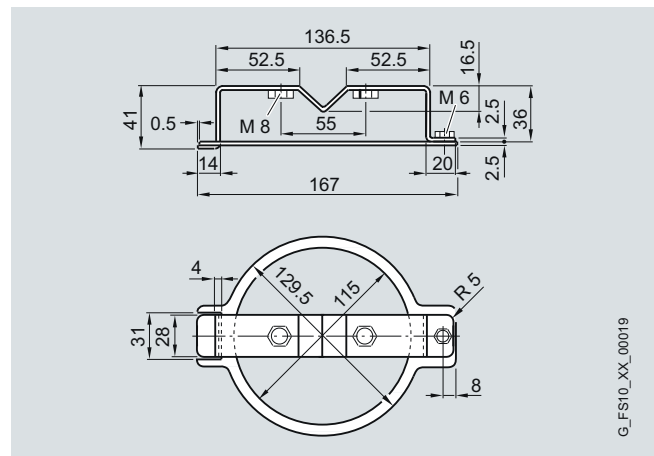
MDS U 589 data carrier



Universal holder with MDS U589 heat-proof data carrier

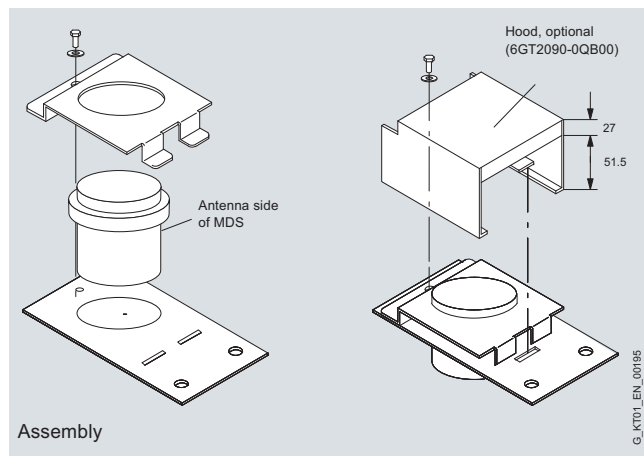


Universal support



4

Skid support



RFID systems for the microwave frequency range

Transponders MOBY U

MDS U Service

Overview

MDS U Service

The MDS U Service is a transponder for use in the start-up phase and during servicing in the automotive industry and other industrial production plants with similar requirements.

The Service transponder has an On/Off switch. Two LEDs indicate presence in the field of a reader and the communications quality.

Technical specifications

Transponder	MDS U Service
Transmission frequency	2.4 ... 2.4835 GHz in the ISM band
Write / read distances	max. 150 mm ... 3 000 mm
Protocol (air interface)	ISO 18000-4
Approvals ¹⁾	CE, FCC, UL
Memory capacity	
• User memory	32 Kbyte RAM
• Read-only memory (UID)	32 bit serial number
• OTP (One Time Programmable)	128 bit, to be written once by user ⁴⁾
Data retention time	Corresponds to battery service life
Battery service life at 25 °C	
• Transponder switched on, no communication and transponder outside antenna range	approx. 1 year ²⁾
• Transponder switched on, with communication	< 1 year ³⁾
• Transponder switched off	≥ 10 years

Field data (all dimensions in mm)

MDS U Service to SLG U92

Write / read distances (S_g) of the reader can be limited in 500 mm steps up to 3500 mm

	Minimum	Standard	Maximum
Limit distance (S_g), approx.	500	2 000	3 000
Operating distance (S_a)	350	1 400	2 100
Transmission window at S_a length / width	700	2 400	3 000
	700 (with FCC approval)	2 000 (with FCC approval)	2 100 (with FCC approval)

The field data are valid for reading and writing the transponder.

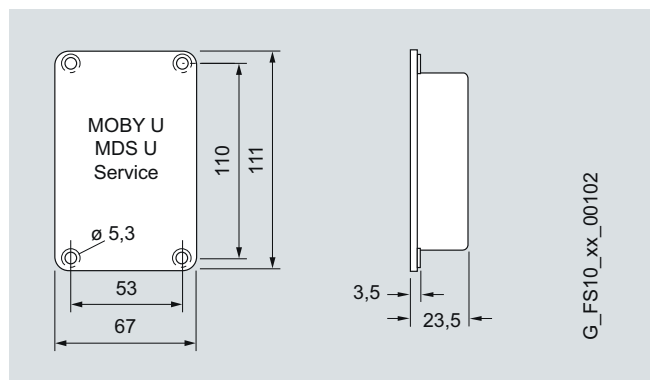
Selection and ordering data

	Order No.
Transponder MDS U Service ▶	6GT2 500-5BF20
Transponder for use in the start-up phase and during servicing. 32 KB RAM	
▶ Preferred type, available from stock.	

Transponder	MDS U Service
Write cycles	Unlimited
Read cycles	Unlimited
Ambient temperature	
• During operation	-25 °C ... +70 °C
• During transportation and storage	-40 °C ... +85 °C
Degree of protection according to EN 60529	IP40
Type of construction	
• Dimensions L x W x H (mm)	111 x 67 x 23,5
• Color	
• Weight	approx. 120 g
• Material	Plastic PA 12 GF 25
Mounting	
• On metal	Yes
• Flush-mounted in metal	No
Special features	On/off switch; 2 LEDs

- 1) Also refer to the "Manual for Configuration, Assembly and Service".
- 2) The transponder must not be located within the antenna range of the reader (Zones 1 and 2).
- 3) The service life depends on the temperature, the time in which the transponder is located within the antenna field of the reader (Zones 1 and 2) and the volume of data that is read/written.
- 4) After "voltage off" the information in the read-only memory is lost and must/can be written again.

Dimensions



RFID systems for the microwave frequency range

Readers MOBY U

SLG U92

Overview



The compact and low-cost SLG U92 is a universal reader with integrated antenna for applications in which read/write distances of up to 3000 mm are required. Thanks to the automatic reader synchronization via cable, it is possible to install up to 3 readers in a very small space.

Two different interfaces are available for the connection to a wide variety of systems:

- RS232
serial interface for connection to any system (PC/PLC)
- RS422
serial interface to the PC/PLC or to the communication modules (SIMATIC RF170C, SIMATIC RF180C, ASM 475, ASM 456) for integration into SIMATIC S7, PROFIBUS, or Industrial Ethernet

Software tools such as the SIMATIC S7 functions (FB/FC45 / FC46 / FC55 / FC56) and the C library MOBY API for applications under Windows 98/NT/2000/XP allow for easy implementation in the respective application.

The integrated file management system (compatible with the familiar MOBY I file handler and supplemented with multitag-handling commands) ensures simple and user-friendly management of data on the transponder.

Reader	Features
SLG U92	Compact and low-cost reader with integral antenna for universal applications, read/write distances of up to 3000 mm (adjustable by software in 500 mm steps to 3500 mm) incl. file handler, degree of protection IP65, enclosure dimensions (mm) 290 x 135 x 42.
SLG U92 with RS232	As above, but with RS232 interface for connection to PC/PLC.
SLG U92 with RS422	As above, but with RS422 interface for connection to communication modules (e.g. ASM 456, ASM 475, SIMATIC RF170C) or PC/PLC.

FCC model of the SLG U92

For use in the USA and Canada, a version with radio approval FCC Part 15C is available.

The FCC model of the SLG U92 functions with a very low transmitting power and has small antenna dimensions. The FCC model may also be used in ETSI countries. However, the ETSI model may not be operated in FCC countries for technical reasons concerning radio communication.

Functions

The Reader SLG U92 operates with a Transmission frequency in the ISM band between 2.4 and 2.4835 GHz. This supports transmission ranges from a few centimeters up to three meters with an extremely low transmit power of < 10 mW EIRP and high net transmission rates of up to 8 KB/s. Thanks to the selected Transmission frequency, rugged modulation techniques and appropriate check mechanisms, sources of electromagnetic interference can be disregarded and fault-free data transmission and data integrity are assured. MOBY U technology blocks the types of fault sources familiar in UHF transmissions such as reflections, interference and overrange. Appropriately constructed antennas provide a homogeneous transmission field and ensure a 100% detection rate for transponders (MDS). There is no need for time-consuming shielding measures and antenna alignment.

The antenna field of the reader can be activated or deactivated for the duration of communication with a transponder by means of a function call or automatically through triggering by proximity switches.

To manage the data on the transponders, there are 2 possibilities:

- Byte-oriented addressing via absolute addresses (start address, length)
- Conveniently via a file management system (compatible with the MOBY I file handler)

In file handler mode, the MOBY U reader always fetches the required file management information directly from the transponder and it can be operated in three steps:

1. For existing system solutions with MOBY I, MOBY U can be operated with the default settings and unmodified file handler functions without the MOVE and LOAD commands that were previously required.
2. The default settings and requests for diagnostic data can be easily changed with just a few additional commands.
3. Utilization of all features including multitag processing. In this step, the commands and/or useful data can also be uniquely assigned to the particular transponder number.

Two LEDs indicate the current status (e.g. transponder in the field) and make start-up easier.

For easy start-up and diagnostics during normal operation, a separate service and diagnostics interface (RS232) is available. This interface can also be used by the service function "Load software in the reader" to integrate future function expansions into existing applications without replacing the reader.

The system interface (RS232 or RS422) can be used for serial connection to any other system (PC/PLC).

RFID systems for the microwave frequency range

Readers MOBY U

SLG U92

Technical specifications

Reader	SLG U92
Transmission frequency	2.4 ... 2.4835 GHz in the ISM band
Read / write distances	max. 150 ... 3 000 mm, see transponder field data
Protocol (air interface)	ISO 18000-4
Approvals	CE, FCC, UL
Radiant power	Radiant power / intensity • For SLG U92 version without FCC approval < 10 mW EIRP / < 0.5 $\mu\text{W}/\text{cm}^2$ (at 1 m distance) • For SLG U92 version with CC approval < 50 mV/m at a distance of 3 m
Ambient temperature • During operation • During transportation and storage	-25 °C ... +70 °C -40 °C ... +85 °C
Degree of protection according to EN 60529	IP65
Mechanical stress in accordance with EN 60721 3-7 Class 7 M3 • Shock • Vibration	30 g 1.5 g
Data transmission rate reader – transponder • Write • Read	8 Kbyte/s 4.8 Kbyte/s
Type of construction • Dimensions L x W x H (mm) • Color • Weight • Material	290 x 135 x 42 (without connector) 900 g Plastic PA 12
Interfaces	RS232 or RS422 (SLG U92 variant), 6-pin reader connector according to EN 175201-804
Mounting	4 screws M6
Power supply	DC 24 V (rated value), range DC 20 ... 30 V
Multitag/Bulk capability	Up to 12 transponders
Additional functions	• Active suppression of overreach • Automatic frequency hopping • Service functions for fast error analysis • MOBY I - call-compatible (FC)

RFID systems for the microwave frequency range

Readers MOBY U

SLG U92

Selection and ordering data

	Order No.
Reader SLG U92 with RS422	
• Antenna integrated, for Europe ▶	6GT2 501-0CA00
• Antenna integrated, FCC approval, for USA, Europe ▶	6GT2 501-0BA00
Reader SLG U92 with RS232	
• Antenna integrated, for Europe ▶	6GT2 501-1CA00
• Antenna integrated, FCC approval, for USA, Europe ▶	6GT2 501-1BA00
Accessories	
RS232 connecting cable Between the PC and SLG U92, with a connecting cable for a 24 V connector (M12 socket), angled connector, PUR, CMG approval, suitable for tow chains, in the following lengths:	
5 m ▶	6GT2 591-5CH50
20 m ▶	6GT2 591-5CN20
RS 232 plug-in cable for service interface ▶	6GT2 591-5AH50
Between PC and 11-pin service interface connector, PUR, CMG approval, suitable for tow chains, length 5 m	
Connector for SLG U92 service interface ▶	6GT2 590-0BA00
11-pin, with angled output	
Connector on reader side (MOBY U)	
6-pin DIN 43651 connector with female contacts for crimping	
• with angled output, 1 piece ▶ B	6GT2 090-0BA00
• With angled output, 10 units, price per unit ▶ B	6GT2 090-0BA10
• with straight output, 1 piece ▶ B	6GT2 090-0UA00
Reader cable	
Without connector, between the communication module and reader; 6 x 0.25 mm ² , PUR, CMG approval, suitable for tow chains, in the following lengths:	
50 m ▶	6GT2 090-4AN50
120 m ▶	6GT2 090-4AT12
800 m ▶	6GT2 090-4AT80
Wide-range power supply	
Primary side: 100 ... 240 V AC, 120 ... 353 V DC, secondary side: 24 V DC, 3 A, with no-load protection, with continuous short-circuit protection	
• EU connector version ▶ B	6GT2 898-0AA00
• UK connector version ▶ B	6GT2 898-0AA10
• US connector version ▶ B	6GT2 898-0AA20
Cable for wide-range power supply ▶	6GT2 491-1HH50
24 V DC, PUR, length 5 m	

Order No.

24 V connector (M12 socket) ▶ B 6GT2 390-1AB00

For ASM 424/724/754 communication modules, SLG Ux readers (over PC connecting cable)

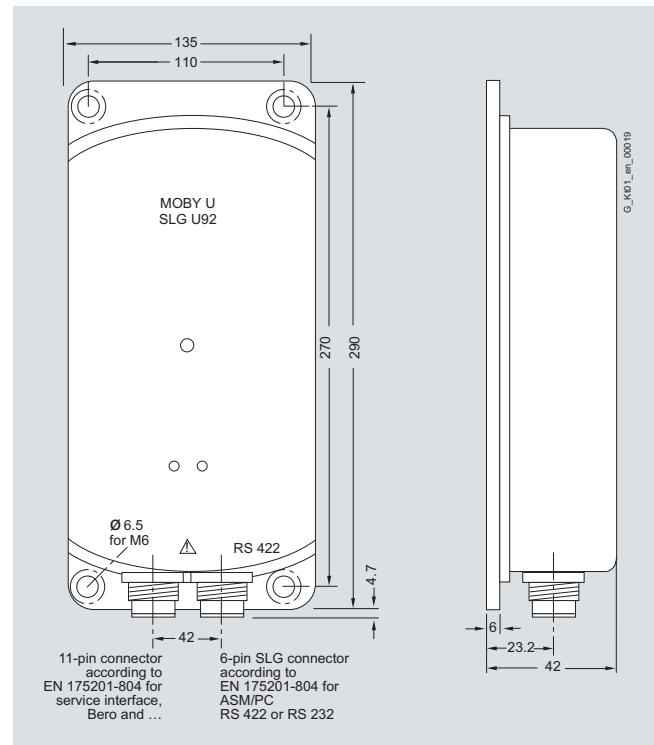
DVD „RFID-Systems Software & Documentation“ ▶ D 6GT2 080-2AA20

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

D: Subject to export regulations AL = N and ECCN = EAR99S

Dimensions



RFID systems for the microwave frequency range

Readers MOBY U

STG U mobile handheld terminal

Overview



The STG U is a powerful mobile handheld terminal with integral read/write antenna for applications in the field of production, logistics and service. In addition, it is an indispensable tool for commissioning and testing.

Design

The STG U mobile handheld terminal comprises a basic unit (based on the PSION Workabout™) and an antenna of the MOBY U type. It has a splash-proof enclosure (IP 54), LCD display with 240 × 100 pixels, alphanumeric keypad and various interfaces (for EEPROM card, charging the battery, RS232/TTL for the MOBY U antenna, battery charger interface incl. RS232 for connecting to the PC, etc.).

Functions

The supplied MOBY software (memory card) provides service and test functions for reading, writing, etc. of the MOBY U transponder:

- Reading data from the transponder
- Writing data to the transponder
- Reading and displaying the ID number of the transponder
- Reading MDS status
- Reading data from OTP memory
- Writing data to OTP memory
- Displaying and editing the data in hexadecimal, ASCII, decimal and binary formats
- Activate/deactivate password

On the basis of the optional C library, custom applications including a customized mask interface for the reading/writing of data memories can be very easily programmed. Various optional development tools for the PC and a wide selection of accessories are available directly from PSION. This is opening up new applications in the field of logistics and distribution, for example, the handheld terminal enables commissioning data to be recorded or processed offline and forwarded to the PC/computer with a time delay.

Technical specifications

Mobile handheld terminal	STG U
RAM/ROM	2 MB / 2 MB
User program	1 MB (with MOBY service and test program)
Screen	Graphic LCD screen with 240 × 100 pixels; gray scale; selectable backlighting
Keyboard	Alphanumeric with 57 keys
Sound	Piezzo signal transmitter
Power supply	NiCd battery pack with 2 type AA cells (850 mAh); fast-charging; automatic shutdown Operating time: approx. 20 hours (antenna inactive, display unit)
Dimensions L x W x H (mm)	282 x 235 x 93 (incl. MOBY U antenna)
Weight	Approx. 1,450 g (incl. MOBY U antenna)
Operating/storage temperature	• During operation • Storage (without battery)
	-20 ... +60 °C -25 ... +70 °C
Relative humidity	0 ... 90%, without condensation
Degree of protection	IP54 (splashproof); for STG U only as complete unit
Impact resistance	Max. drop onto concrete: 0.5 m
EMC	EN 55022
Electrostatic; RF; EFT	IEC 801-2; IEC 801-3; IEC 801-4

MOBY U antenna	Air interface to the transponder
Transmission frequency	2.4 ... 2.4835 GHz in the ISM band
Bandwidth	2 × 1 MHz within 83 MHz
Gross bit rate of the radio channel	384 Kbit/s
Net data rate (read/write)	Approx. 8 / 4.8 KB/s without bulk
Antenna	
• Direction of radiation	Perpendicular to the rear panel of the MOBY U antenna
• Aperture angle	Approx. 70 ° (conical antenna field)
• Polarization	Circular
• Radiant power	< 50 mV/m at a distance of 3 m
• Radiation density	< 0.5 μW/cm² at a distance of 1 m
Read / write distance	150 ... 3000 mm
Local resolution	Adjustable in steps of 0.5 m by means of range limitation
Transponder acquisition time	Approx. 3 s for one transponder (after actuation of the communication key)
Power supply	Lithium-ion battery pack 2SIP CGR18650 HG 7.2 V 1.8 Ah for rapid charging automatic switch-off Service life: Approx. 500 charging cycles
Power consumption (antenna on)	< 800 mA
Operating time	> 2 months (antenna inactive) 2 hours (antenna active)
The operating time corresponds to the ON time of the antenna; this means for every transponder function, the time between pressing the communication key and closing or terminating the selected transponder function.	
The antenna is switched on by means of the communication key only for communication and automatically switched off after the function has been performed.	

RFID systems for the microwave frequency range

Readers MOBY U

STG U mobile handheld terminal

MOBY U antenna	Air interface to the transponder
Operating modes • off • Search • Communication	Antenna switched off Ready to receive and evaluate search information sent by the transponder Communication with the transponder: Write, read or initialize
Minimum distance to an SLG U92 reader or another STG U reader	> (set range + 0.5 m)
Serial interface (to basic unit)	RS232 / 115.2 Kbit/s / 3964R
Interface for battery charging	4-pin socket for connecting the STG U power supply unit 12 V DC / 1.225 A > 1.5 h (Lithium-ion battery pack 2SIP CGR18650 HG)
Control element	Communication key (for triggering the communication)
Display elements • LED for loading the batteries - Lights up - Does not light up • LEDs for communication - Lights up - Does not light up	LEDs Power supply unit connected • Red: device is defective • Yellow: batteries are being charged • Green: batteries are fully charged Power supply unit is not connected Communication key pressed and communication not complete • Red: battery capacity insufficient for communication • Yellow: antenna is switched to active Communication terminated or not yet started
Enclosure • Color • Material	Black VALOX® 357X
Approvals	RF: EN 300 440-2 SAR: EN 50 371 Safety: EN 60 950-1 EMC: • EN 301 489-01 • EN 301 489-03 • ENV 50 204 FCC Part 15C UL/CSA Not critical with regard to heart pacemakers
Programming	Standard user interface for reading/writing of transponders

Selection and ordering data

	Order No.
STG U mobile handheld terminal ▶ B MOBY U handheld terminal STG U, complete (PSION Workabout ^{mx}), antenna STG U, battery, EEPROM card. With MOBY software, operating instructions, without power pack for STG U	6GT2 503-0AA00
Accessories STG U antenna ▶ For basic unit (PSION Workabout ^{mx})	6GT2 503-1AA00
STG U power supply unit ▶ Wide-range power supply unit 90 V to 264 V AC, with cable switch, for the antenna STG U and the mobile handheld terminal STG U, with charging adapter	6GT2 503-1DA00
Spare battery ▶ B NiMH battery pack Workabout ^{mx} 2.4 V; 1 800 mAh	6GT2 094-0AB01
STG software ▶ B For MOBY D, E, F and U, incl. operating instructions, 1 MB EEPROM card	6GT2 303-1CA00
DVD "RFID Systems Software & Documentation" ▶ D	6GT2 080-2AA20

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

D: Subject to export regulations AL = N and ECCN = EAR99S

Overview

Note

Detailed information (clearance from metal, reader - reader clearance, etc.) can be found in the "MOBY U Manual for Configuration, Assembly and Service".

Field characteristics (battery-saving mode)

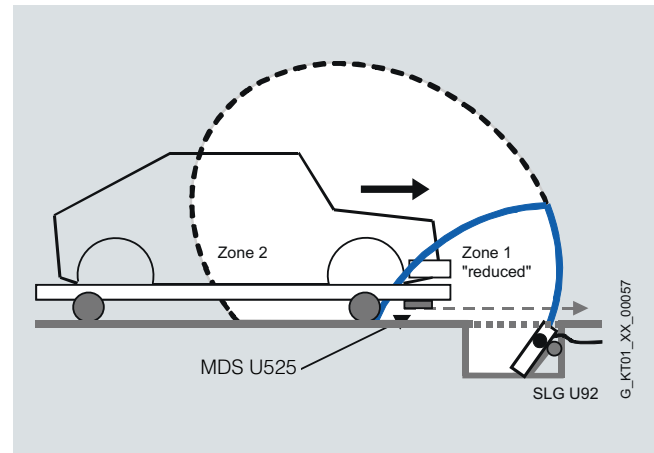
In contrast to the inductive RFID systems, UHF systems exhibit transmission behavior like electromagnetic waves. The wave length is approx. 13 cm. Metal surfaces reflect the waves and cannot be penetrated.

Despite a low radiation output, UHF systems have a relatively long range. The emission field has a directional characteristic which depends, however, on the antenna design. In order to keep the energy requirement low for the transponder and to make the determination of the location comprehensible, MOBY U has various function areas that are dependent on direction and distance. The three different zones of the transmission field are identified by different states and reactions of the components affected.

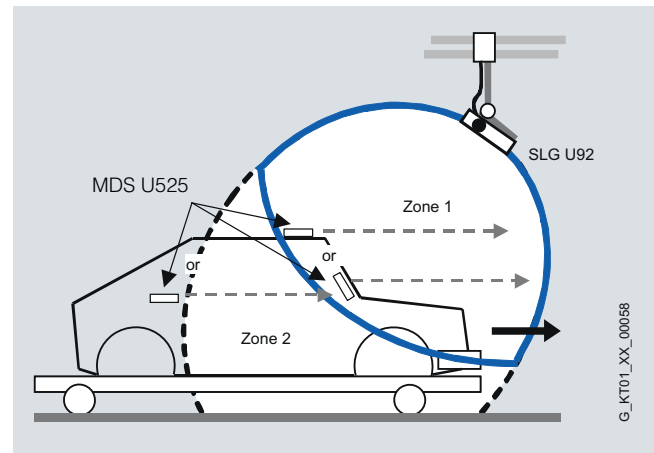
Put simply, Zone 3 is a reader-field-free area. The transponder "sleeps" and only listens momentarily every 0.5 s for a sign of life from a reader. This means that the power consumption is very low. If other UHF users in the vicinity are occupying the same frequency band, it has no effect on the transponder, as the latter requires a special code to wake it up. If the transponder in the vicinity of an active reader then receives this special code, it enters Zone 2 (see Fig.). It immediately accepts the reader and responds briefly with its own identification. The reader however ignores every transponder unless it is in Zone 1, whose radius parameter can be set in stages in the reader. The power consumption in Zone 2 is not significantly higher than in Zone 3.

If the transponder enters Zone 1, it is duly registered by the reader and the data exchange can begin. Now all read and write functions can be performed. However, as the transmission rate at the air interface is very high (80 Kbit/s), the overall communication time is very short. For example, all bytes of the 32 KB memory are read in about 8 seconds. This means that the data exchange imposes hardly any load on the battery.

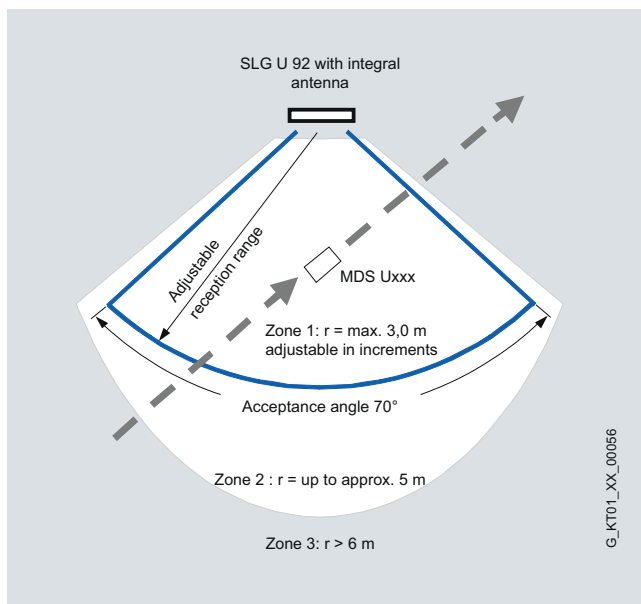
Example: car body identification



Example: skid identification



SLG U92 with integral antenna



RFID systems for the microwave frequency range

Notes

Communication modules

RFID standard cable

RFID software

5

**5/2****Communication modules for
RFID systems and
code reading systems**

5/4

ASM 456, SIMATIC RF160C

5/8

SIMATIC RF180C / RF182C

5/12

SIMATIC RF170C

5/15

ASM 475

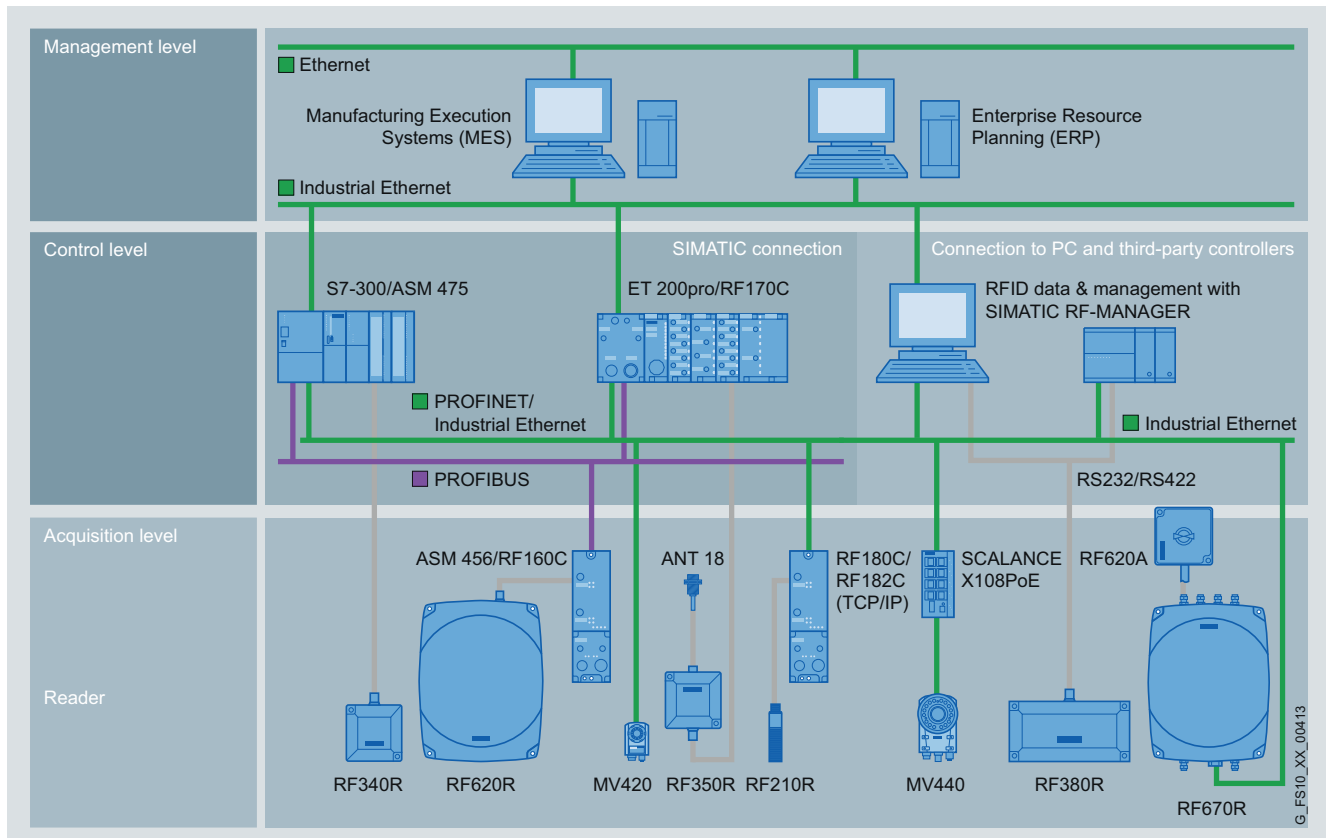
5/18**RFID standard cable****5/20****RFID software**

5/21

SIMATIC RF-MANAGER

RFID Communication modules

Overview



G_FS10_XX_00413

There are various powerful communication modules (ASM) for integrating SIMATIC RFID, SIMATIC MV and MOBY identification systems in SIMATIC, SINUMERIK, SIMOTION, PROFIBUS and PROFINET.

Selection aid for communication modules and software

System	Communication modules without file handler	Identification system	Available software
SIMATIC S7-300 (direct), S7-300/400, PC with SIMATIC WinAC via ET 200M, SINUMERIK 840D/810D	ASM 475	RF200, RF300, RF600, MV400, MOBY U/D	FC/FB45; FC/FB55 (multitag)
Serial link ¹⁾ , to PCs, PLCs, any other systems	Direct via SLG Dx,	MOBY D	MOBY D MDWAPI, MOBY API, C library incl. drivers for Windows 98/NT/2000/XP
	Direct via SLG U92	MOBY U	
	Directly via RF2xxR, RF3xxR (RS422 / RF232)	RF200, RF300	
PROFIBUS DP ¹⁾ (SIMATIC S7; PC, any other systems)	RF160C	RF200, RF300, RF600, MOBY U/D	FC44 for S7-300/400, PC with SIMATIC WinAC
SIMATIC S7-300/-400, PC with SIMATIC WinAC, via ET 200pro	RF170C	RF200, RF300, RF600, MV400, MOBY U/D	FC/FB45; FC/FB55 (multitag)
PROFIBUS DP-V1 ¹⁾ (SIMATIC S7; PC, any systems)	ASM 456	RF200, RF300, RF600, MV400 MOBY U/D	FC/FB45 for S7-300/400, PC with SIMATIC WinAC, FC/FB55 (multitag), FB101/116/132
PROFINET IO	RF180C	RF200, RF300, RF600, MV400, MOBY U/D	FB45, FB55
Ethernet TCP/IP	RF182C	RF200, RF300, RF600, MOBY U/D	XML application examples

System	Communication modules with file handler	MOBY system	Available software
SIMATIC S7; PC, any system, SIMOTION SCOUT	ASM 456	MOBY U, RF300	FC56/ FB101/116/132
SIMATIC S7-300 (direct), SIMATIC S7-300/400, via ET 200M	ASM 475	MOBY U	FC56

1) The programming interface is described for connecting to any system.

Functions

Corresponding software blocks (FB, FC, libraries, examples) ensure simple and quick integration into the application.

As many as 2 readers can be connected in series to one ASM communication module with a maximum connecting cable length of 1000 m (depending on the ASM, reader, etc.). Corresponding procedures guarantee a very high reliability of data transmission.

The following option exists for the serial connection of SIMATIC RFID to any system (PC, PLC, etc.):

- Directly via a reader with serial interface (SLG Ux, SLG Dx, SIMATIC RF380R).

Note on software and licensing:

When purchasing a communication module or reader, no software and no documentation is supplied. The DVD "RFID Systems Software & Documentation" contains all the available FBs/FCs for SIMATIC, C libraries for Windows 95/98/NT/2000/XP, demo programs, etc. and is to be ordered separately. In addition, the DVD contains the complete RFID documentation (German and English) in PDF format.

The purchase of a communication module or reader includes a payment for the use of the software, including documentation, on the DVD "RFID Systems Software & Documentation" and the purchaser acquires the right to make copies (copy license), insofar as they are required as part of the project for the plant.

The contract pertaining to the use of software products against a one-off payment shall apply.

RFID Communication modules

ASM 456, SIMATIC RF160C

Overview



Communication modules ASM 456 and SIMATIC RF160C

The cost-efficient ASM 456 and SIMATIC RF160C communication modules are stand-alone PROFIBUS DP slaves used to operate the RFID systems MOBY D/U and SIMATIC RF200 / RF300 / RF600 as well as the MV400 code reading systems via PROFIBUS DP:

- SIMATIC S7 (including FB/FC software)
- SINUMERIK
- PC, IPC, non-Siemens PLC
- SIMOTION (with integrated software library)

Thanks to their high degree of protection and ruggedness, they are particularly suitable for machine-level use. The modular structure with different PROFIBUS connection systems allows them to be used in all applications. The uniform plug-in connection system ensures rapid commissioning.

Benefits

- Two parallel MOBY channels ensure real-time mode at dynamic read points.
- Modular design with different bus interfacing possibilities ensures universal implementation.
- Reader connection using an 8-pin M12 connector for quick mounting of all components.
- High-performance hardware ensures fast data exchange with the reader. Consequently the data are available for the application even faster.
- Easy downloading of firmware via SIMATIC RF-MANAGER for function expansions and error rectification ensure high availability of the identification system.
- The parameterizable identification-system-specific PROFIBUS diagnostics facilitate start-up and troubleshooting.
- A wide selection of pre-assembled PROFIBUS connecting cables can be ordered for the communication modules. This saves time and money during installation and assures better quality.

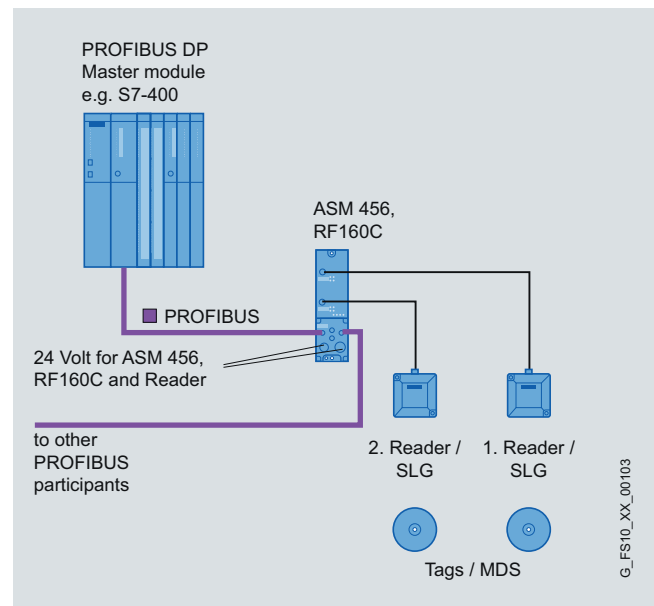
Application

The ASM 456 and SIMATIC RF160C communication modules have been specifically designed for a wide range of applications in industrial automation and logistics. Thanks to the high degree of protection of IP 67, the ASM 456 and RF160C can be installed in the process without a control cabinet.

Main application areas for ASM 456 and SIMATIC RF160C:

- Mechanical engineering, automation systems, conveyor systems
- Ancillary assembly lines in the automobile industry/suppliers
- Small assembly lines
- Production, packaging, textile, plastics and printing machines

Design



Functions

The ASM 456 and the RF160C comprise a basic module and a connection block that must be ordered separately. When connecting PROFIBUS, the customer can choose between ECOFAST connections and M12, 7/8" connections.

A pre-assembled reader cable is used to connect one or two readers/SLGs to the communication module. The standard length of the cable is 2 m. If other cable lengths to the reader are required, an extension cable measuring between 2 m and 50 m can be used. The cable can also be assembled by the customer as required.

The PROFIBUS DP procedure according to EN 50170 Vol. 2 PROFIBUS for communication between the communication module and SIMATIC S7 (or any PROFIBUS master) and the MOBY-specific procedures for communication between ASM and reader are implemented on the communication modules.

The data in the transponder can be accessed in the following manner.

- Direct addressing via absolute addresses
- Conveniently via the MOBY file handler (MOBY U, RF300 only) using file names (for ASM 456 only)

On the PROFIBUS DP, the ASM occupies a node address on the bus that is set on the connection block. The communication module is integrated into the hardware configuration by means of a device master (GSD) file. Then the communication module can be configured by means of the software tool HW_Config of the SIMATIC Manager or another PROFIBUS tool.

Error messages and operating states (MDS in the field, transmission, etc.) are indicated additionally by means of LEDs and simplify commissioning and service.

The ASM 456 and RF160C have two reader interfaces which also provides the readers with power. In the communication module, the power supply of the readers has an electronic fuse.

ASM 456

The data in the transponder or in the Data Matrix Code can be directly accessed by means of absolute addresses (FB/FC45, FC55) or more conveniently using the MOBY file handler (FC56) by means of the file names. The communication module is operated in non-cyclic mode over PROFIBUS DP V1. Consequently, a very large amount of data can be transferred to/from the communication module without overloading the PROFIBUS cycle. This has advantages when transferring large volumes of data. In addition, the communication module can process concatenated transponder commands very quickly in this mode.

Function blocks FB101/116/132 in the SIMATIC S7 are available for the "RFID standard profile" mode. The data in the transponder can be addressed either via absolute addresses or via the file handler. This mode additionally integrates the communication module in SIMOTION.

SIMATIC RF160C

The data in the transponder is accessed via absolute addresses. The FC44 function block is available for SIMATIC S7 for this purpose. The RF160C is operated in cyclic mode over PROFIBUS DP-V0. This ensures a deterministic response in data communication in every case. Where large volumes of data are transferred in large-scale bus configurations, the data throughput should be tested with a tool which is provided on the DVD "RFID Systems, Software and Documentation". The programming interface to RF160C is extremely easy to use and can be programmed efficiently in any controller. The RF160C is therefore particularly suitable for use with non-Siemens controllers and older PROFIBUS masters.

Technical specifications

Communication module	ASM 456	SIMATIC RF160C
Ambient temperature		
• During operation	0 ... 55 °C temperature change 10 K/h, all mounting positions	
• During storage	-40 ... +70 °C 20 K/h	
Relative humidity		
• During operation	15 up to max. 95%, no condensation	
• During storage	5 up to max. 95%, no condensation	
Atmospheric pressure		
• During operation	1 080 ... 795 hPa (corresponds to altitude of -1000 to 2000 m)	
• During storage	1 080 ... 660 hPa (corresponds to altitude of -1000 to 3500 m)	
Contaminant concentration		
• SO ₂	< 0.5 ppm (rel. humidity < 60%, no condensation)	
• H ₂ S	< 0.1 ppm (rel. humidity < 60%, no condensation)	
Supply voltage		
• Rated value	24 V DC	
• Permissible range	20 ... 30 V DC	
Current consumption		
	• Max. 200 mA without reader • Typ. 80 mA without reader • Max. 800 mA with two readers	
Degree of protection	IP67	
Housing color	IP Basic 714	
Dimensions W x H x D (mm)		
• ASM 456 only	60 x 210 x 30	
• ASM 456 with ECOFAST connection block	60 x 210 x 60	
Weight (without connection block)	Approx. 210 g	
Mounting	2 screws M5 x 20 mm	

RFID Communication modules

ASM 456, SIMATIC RF160C

Communication module	ASM 456	SIMATIC RF160C
PROFIBUS	EN 50170	
• Data transmission rate	9.6 Kbit/s ... 12 Mbit/s	
• Protocol	DP-V1	DP-V0
• Data exchange	Acyclic using data sets	Process image
Serial SLG interface (gross transmission rate)		
• MOBY U/D	19 200, 38 400, 57 600, 115 200 bit/s	
• SIMATIC RF200 / RF300 / RF600	19 200, 57 600, 115 200 bit/s	
Supported identification systems	MOBY U/D, RF200 / RF300 / RF600 / MV400	MOBY U/D, RF200 / RF300 / RF600
SIMATIC function blocks	FB / FC45, FC55, FB101 / 116 / 132	FC44
Multitag	Yes	No
Cable length to reader		
• Standard length	2 m	
• Optional preassembled cables	5 m, 10 m, 20 m, 50 m	
• Self-assembled cables	Reader-dependent, up to 1 000 m	
Supply voltage to reader	24 V / up to 0.3 A per reader	

Selection and ordering data

	Order No.		Order No.
ASM 456 communication module ▶ B	6GT2 002-0ED00	7/8" connector for voltage	
For connecting 2 readers to PROFIBUS DP-V1		Pack of 5, 1 pack minimum order quantity, price per pack	
		• With male insert	6GK1 905-0FA00
SIMATIC RF160C communication module ▶ B	6GT2 002-0EF00	• With female insert ▶	6GK1 905-0FB00
For connecting 2 readers to PROFIBUS DP-V0		7/8" cover caps ▶	6ES7 194-3JA00-0AA0
Accessory: ECOFAST connection		for unused 24 V extension, pack of 10, 1 pack minimum order quantity, price per pack	
ECOFAST connection block ▶ B	6ES7 194-3AA00-0AA0	Energy cable 5 x 1.5	6XV1 830-8AH10
PROFIBUS ECOFAST HYBRID plug 180		not assembled, stranded wire, trailing capability; minimum order quantity 20 m	
• With male insert (5-pack)	6GK1 905-0CA00	Accessories for RFID	
• With female insert (5-pack)	6GK1 905-0CB00	Reader cable for MOBY U	
PROFIBUS ECOFAST termination plug	6GK1 905-0DA10	PUR material, CMG approved, suitable for cable carriers	
with terminating resistors		2 m ▶	6GT2 091-4FH20
ECOFAST hybrid cable	6XV1 830-7B ■■■	5 m ▶	6GT2 091-4FH50
(assembled) ¹⁾		Reader cable for MOBY D ▶	6GT2 691-4FH20
ECOFAST hybrid cable	6XV1 830-7AH10	PUR material, CMG approved, suitable for cable carriers, 2 m	
(non-assembled)		Reader cable for SIMATIC RF200 / RF300 / RF600 / MV400	
Accessory: M12, 7/8" connection		Or extension cable MOBY U/D and SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, CMG approved, suitable for cable carriers, straight connector	
M12 connection block, 7/8" ▶	6ES7 194-3AA00-0BA0	2 m ▶	6GT2 891-4FH20
M12 terminating resistor for PROFIBUS	6GK1 905-0EC00	5 m ▶	6GT2 891-4FH50
Pack of 5, 1 pack minimum order quantity, price per pack.		10 m ▶	6GT2 891-4FN10
PROFIBUS cable with M12 connectors	6XV1 830-3D ■■■	20 m ▶	6GT2 891-4FN20
assembled ¹⁾		50 m ▶	6GT2 891-4FN50
Supply voltage cable with 7/8" connectors	6XV1 822-5B ■■■	2 m, plug angled at reader ▶	6GT2 891-4JH20
assembled ¹⁾			
PROFIBUS FC standard cable	6XV1 830-0EH10		
non-assembled			
PROFIBUS M12 connector			
Pack of 5, 1 pack minimum order quantity, price per pack.			
• With male insert	6GK1 905-0EA00		
• With female insert	6GK1 905-0EB00		

RFID Communication modules

ASM 456, SIMATIC RF160C

Order No.	
M12 sealing caps for unused reader connections 10 units minimum order quantity, price per 100 units	3RX9 802-0AA00
DVD "RFID Systems Software & Documentation"	6GT2 080-2AA20

1) These cables are available in different lengths (refer to page 7/5 or IK PI catalog))

► Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

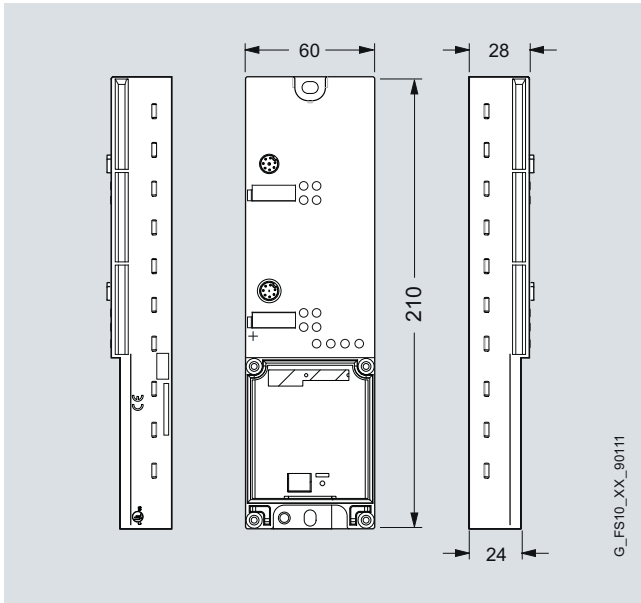
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Dimensions

CAD data

Dimensional drawing available as CAD graphic (DXF format).

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90111



Dimensions of ASM 456 and SIMATIC RF160C

RFID Communication modules

SIMATIC RF180C / RF182C

Overview



SIMATIC RF180C and SIMATIC RF182C are communication modules for direct connection of SIMATIC identification systems to PROFINET IO/Ethernet. The readers (SLGs) of the RFID systems MOBY D/U, SIMATIC RF300/RF600 as well as MV400 (RF180C only) can be operated on the SIMATIC RF180C/RF182C.

Due to the high degree of protection and its ruggedness, SIMATIC RF180C/RF182C is ideally suited to use at the machine level. The uniform plug-in connection system ensures rapid commissioning.

Benefits

- Two parallel reader channels ensure real-time mode at dynamic read points.
- Reader connection with an 8-pole M12 connector for rapid assembly of all components
- Different connection systems to suit any application
 - M12, 7/8", the well-proven round connectors
 - Push-pull connectors for quick assembly with RJ45 data connectors
- Easy changeover from PROFIBUS applications to PROFINET with SIMATIC RF180C thanks to software compatibility
- The integrated switch allows several PROFINET/Ethernet modules to be installed in a star or bus topology. Each application can then be built up quickly and inexpensively
- Powerful hardware ensures rapid data communication with the reader (SLG). So that the data are available to the application more quickly
- Simple firmware downloading in the case of function expansions and error rectification ensures high availability of the identification system
- Adjustable and parameterizable identification-system-specific diagnostics facilitate commissioning and troubleshooting
- A broad selection of pre-assembled connecting cables can be ordered for connecting PROFINET/Ethernet and readers to SIMATIC RF180C/RF182C. This saves time and money during installation and increases the quality

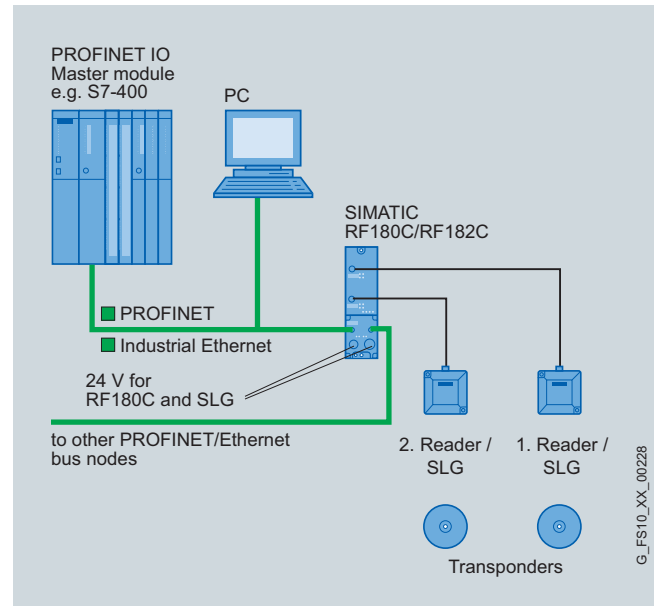
Applications

The PROFINET SIMATIC RF180C/RF182C communication module has been specially designed for a wide range of applications in industrial automation and logistics. Due to its high degree of protection IP67, SIMATIC RF180C/RF182C can be installed in the process outside the control cabinet.

Main applications for SIMATIC RF180C/RF182C:

- Machine manufacturing, automation systems, conveyor systems
- Ancilliary assembly lines in the automotive industry / suppliers
- Small assembly lines

Design



Functions

The SIMATIC RF180C/RF182C comprises a basic module and a connection block that must be ordered separately.

The connection block is available in three versions:

- **M12, 7/8" (5-pole):**
PROFINET/Ethernet is connected by means of an M12 connector, the power supply is connected by means of a 5-pole 7/8" connector. There are 2 connections each for PROFINET/Ethernet as well as for the power supply. This ensures that the SIMATIC RF180C/RF182C can be connected to additional bus nodes without the need for external distributors. The removable connection block allows a base module to be replaced without interrupting the supply voltage to other bus stations.
- **Push-pull connector (according to IEC 61918):**
PROFINET/Ethernet and the power supply are connected by means of a push-pull connector. There are 2 connections each for PROFINET/Ethernet as well as for the power supply. This ensures that the SIMATIC RF180C/RF182C can be connected to additional bus nodes without the need for external distributors. The supply voltage connectors can conduct currents of up to 12 A (1L+ and 2L+). The removable connection block allows a base module to be replaced without interrupting the supply voltage to other bus stations.
- **M12, 7/8" (4-pole; only RF182C):**
Ethernet is connected by means of an M12 connector, the power supply is connected by means of a 4-pole 7/8" connector. There are 2 connections for Ethernet and one connection is available for the power supply. This connection block can be used in applications where the 5-pole 7/8" connector is already being used for other functions and therefore cannot be used for the power supply.

A pre-assembled reader cable is used to connect one or two readers to the communication module. The standard cable length is 2 m. If other reader cable lengths are required, an extension cable from 2 to 50 m in length can be used. The cable can also be assembled by the customer as required.

The data in the transponder can be accessed in the following manner: Direct addressing via absolute addresses.

Error messages and operating states (tag in field, transfer, etc.) are also displayed on LEDs and support commissioning and service.

SIMATIC RF180C/RF182C has two reader interfaces from which the readers are also supplied with voltage. There is an electronic fuse in SIMATIC RF180C/RF182C for the readers' power supply. The maximum current permitted for the readers per SIMATIC RF180C/RF182C is 1 A. It is not important here whether the current is drawn by one or 2 readers.

SIMATIC RF180C

The SIMATIC RF180C is designed for use in PROFINET networks. SIMATIC RF180C is integrated in SIMATIC STEP 7 via the GSDML file. SIMATIC RF180C can then be configured via the SW tool HW Config of SIMATIC Manager or another PROFINET tool.

The application accesses the tag via FB45. FB45 accesses the tag/Data Matrix Code via absolute addresses. For large volumes of data and complex tag operations, the FB45 can process chained commands.

Data is exchanged between SIMATIC RF180C and the application by means of acyclic data records. This ensures that a large quantity of data can be transferred from/to SIMATIC RF180C without loading the bus cycle. This is advantageous when large volumes of data are being transferred. SIMATIC RF180C can also process chained tag commands in this mode extremely quickly.

SIMATIC RF182C

The SIMATIC RF182C is designed for use in Ethernet networks based on TCP/IP. The IP address of the SIMATIC RF182C is set using the "Primary Setup Tool". The RF182C is then ready for operation. This tool can be downloaded at <http://support.automation.siemens.com/WW/view/com/19440762>

Communication with the SIMATIC RF182C is implemented using XML commands. XML commands have a very simple structure. This makes programming of the RF182C under any operating system very easy. The simple command command set of the RF182C can also be programmed easily in any Ethernet-capable controller.

Technical specifications

Communication modules	SIMATIC RF180C	SIMATIC RF182C
Ethernet connection		
Protocol	PROFINET IO	Ethernet TCP/IP
Data rate	10 / 100 Mbit/s	
Connection versions	M12, 7/8" (5-pole) Push-pull	M12, 7/8" (5-pole) Push-pull M12, 7/8" (4-pole)
Programming	FB 45	XML-structured data
Supply voltage		
• Rated value	24 V DC	
• Permissible range	20 ... 30 V DC	
Current consumption		
• Without reader, typ.	100 mA	
• With two readers, max.	1 000 mA	
Serial reader interface (gross transmission rate)		
• MOBY U/D, RF200, RF300, RF600	19 200, 57 600, 115 200 bit/s	
Cable connector for reader	2 x connector plug M12, 8-pin	
Cable length to reader		
• Standard length	2 m	
• Optional preassembled cables	5 m, 10 m, 20 m, 50 m	
Self-assembled cables	Reader-dependent, up to 1 000 m	

RFID Communication modules

SIMATIC RF180C / RF182C

Communication modules	SIMATIC RF180C	SIMATIC RF182C
Supply voltage to reader	24 V	
Max. current per reader	0.5 A	
• 2 readers connected	1.0 A	
• 1 reader connected		
Ambient temperature	-0 ... 60 °C	
• During operation	-40 ... +70 °C, 20 K/h	
• During storage		
Shock load during operation acc. to IEC 61131-2	30 g	
Vibratory load during operation acc. to IEC 61131-2	0.75 mm (10 Hz to 58 Hz)	
	10 g (58 Hz to 150 Hz)	
Enclosure	Thermoplastic (fiberglass reinforced)	
• Material	IP Basic 714	
• Color	IP67	
• Degree of protection		
Dimensions W x H x D (mm)	60 x 210 x 30	
• without connection block	60 x 210 x 54	
• with M12, 7/8" connection block	60 x 216 x 100	
• with push pull connection block		
Weight	210 g	
• Base module only	230 g	
• M12, 7/8" connection block only	120 g	
• Push pull connection block only		

Selection and ordering data

	Order No.		Order No.
SIMATIC RF180C communication module ▶ B	6GT2 002-0JD00	Reader cable for SIMATIC RF200 / RF300 / RF600 / MV420 / MV440 Or extension cable MOBY U/D and SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, CMG approval, suitable for cable carriers, straight connector	
For PROFINET, for connecting 2 readers; without a connection block		2 m ▶	6GT2 891-4FH20
SIMATIC RF182C communication module ▶ B	6GT2 002-0JD10	5 m ▶	6GT2 891-4FH50
For Ethernet for connecting 2 readers, without connection block		10 m ▶	6GT2 891-4FN10
PROFINET connection block ▶ B for SIMATIC RF180C/RF182C, M12 d-coded, 7/8" (5-pole)	6GT2 002-1JD00	20 m ▶	6GT2 891-4FN20
PROFINET connection block ▶ B for SIMATIC RF180C/RF182C, push pull RJ45	6GT2 002-2JD00	50 m ▶	6GT2 891-4FN50
PROFINET connection block ▶ B for SIMATIC RF182C, M12 d-coded, 7/8" (4-pole)	6GT2 002-4JD00	2 m, plug angled at reader ▶	6GT2 891-4JH20
Accessories for RFID		M12 sealing caps for unused reader connections ▶ 10 units minimum order quantity, price per 100 units	3RX9 802-0AA00
Reader cable for MOBY U PUR material, CMG approved, suitable for cable carriers		Accessories for network connection M12, 7/8" (5-pole)	
2 m ▶	6GT2 091-4FH20	PROFINET cable with M12 plugs preassembled; suitable for cable carriers	6XV1 870-8A■■■¹⁾
5 m ▶	6GT2 091-4FH50	Cable for supply voltage with 7/8" connectors preassembled	6XV1 822-5B■■■¹⁾
Reader cable for MOBY D ▶ PUR material, CMG approved, suitable for cable carriers, 2 m	6GT2 691-4FH20	7/8" connector for voltage Pack of 5, 1 pack minimum order quantity, price per pack	
		• With male insert ▶	6GK1 905-0FA00
		• With female insert ▶	6GK1 905-0FB00

RFID Communication modules

SIMATIC RF180C / RF182C

	Order No.
IE M12 cabinet bushing ▶ B for conversion from M12 (D-coded) to RJ45; pack with 5 units, minimum ordering quantity 1 pack, price per pack	6GK1 901-0DM20-2AA5
PROFINET cable from M12 (D-coded) to RJ45 ▶ B especially for commissioning and testing; 2 m	6GF3440-8BB1
IE FC RJ45 PLUG 180 RJ45 connector ▶ with rugged metal enclosure and FC connection system; straight cable outlet	6GK1 901-1BB10-2AA0
Sealing caps 7/8" ▶ Pack with 10 units, 1 pack minimum order quantity, price per pack	6ES7 194-3JA00-0AA0
Accessories for push pull RJ45 network connection	
Push-pull cable connector for 1L+/ 2L+ ▶ not pre-assembled	6GK1 907-0AB10-6AA0
Push-pull cable connector for RJ45 ▶ not pre-assembled	6GK1 901-1BB10-6AA0
Cover caps for push pull sockets ▶ (1L+/ 2L+), 5 units per pack	6ES7 194-4JA50-0AA0
Cover caps for push pull sockets RJ45 ▶ 5 units per pack	6ES7 194-4JD50-0AA0
Accessories for network connection M12, 7/8" (4-pole)	
Network wiring with M12	Accessories as for M12, 7/8" (5-pole)
Power supply with 7/8" (4-pole)	No cables and connectors from Siemens
Accessories for network connection cable	
PROFINET standard cable 2x2 Type A, not pre-assembled; minimum order quantity 20 m	6XV1 840-2AH10
Energy cable 5 x 1.5 not assembled, stranded wire, trailing capability; minimum order quantity 20 m	6XV1 830-8AH10
DVD "RFID Systems Software & Documentation" ▶ D	6GT2 080-2AA20

1) This cable is available in different lengths (see key length in the appendix, page 7/5, or IK PI Catalog)

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

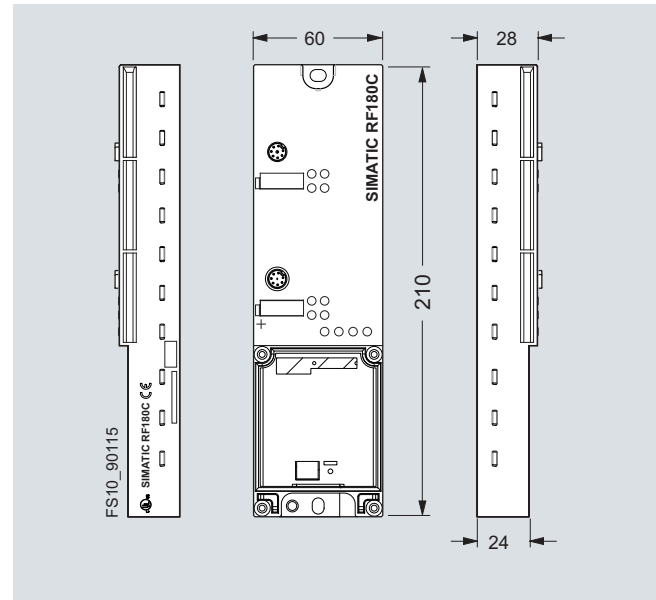
D: Subject to export regulations AL = N and ECCN = EAR99S

Dimensions

CAD data

Dimensional drawing available as CAD graphic (DXF format).

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90115



RFID Communication modules

SIMATIC RF170C

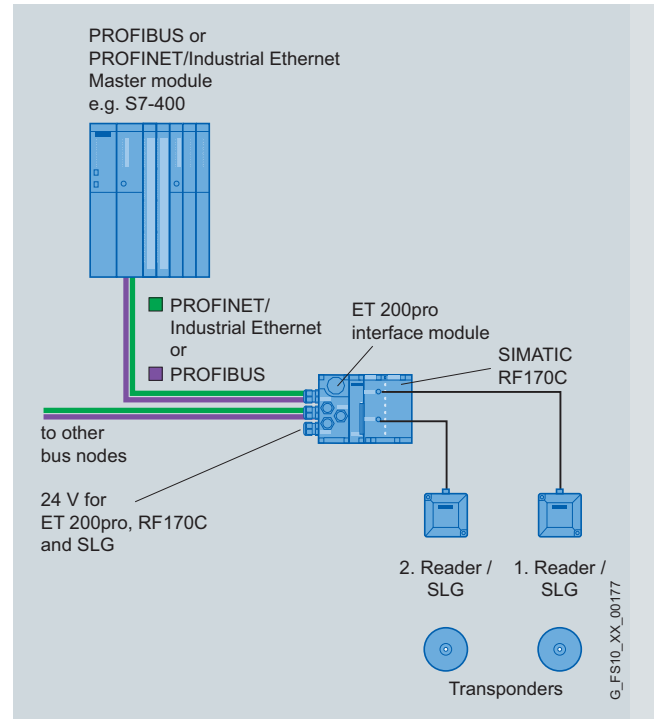
Overview



The SIMATIC RF170C is a communication module for connecting the SIMATIC identification systems to the ET 200pro distributed I/O system. The readers (SLGs) of all RFID systems as well as the MV400 code-reading systems can be operated on the SIMATIC RF170C.

Thanks to its high degree of protection and ruggedness, ET 200pro is particularly suitable for machine-level use. The modular structure with PROFIBUS and PROFINET connection systems allows them to be used in all applications. The uniform plug-in connection system ensures rapid commissioning.

Design



Benefits

- Two parallel reader channels ensure real-time mode at dynamic read points.
- By selecting the relevant header module, the RFID systems can be connected via PROFIBUS or PROFINET.
- The modular design with interface modules for PROFIBUS and PROFINET supports universal implementation.
- Reader connection using an 8-pin M12 connector for fast installation of all components.
- Powerful hardware ensures maximum data exchange speed with the SLG (reader) so that data is made available to the application even faster.
- Very easy downloading of firmware via the SIMATIC Manager for function expansions and error rectification ensure high availability of the identification system.
- Adjustable and parameterizable identification-system-specific diagnostics facilitate commissioning and troubleshooting.
- A wide selection of pre-assembled connecting cables can be ordered for ET 200pro and SIMATIC RF170C. This saves time and money during installation and assures better quality.

Application

The ET 200pro distributed I/O system with the SIMATIC RF170C communication module has been specially designed for a wide range of applications in industrial automation and logistics. Thanks to the high degree of protection of IP67, the SIMATIC RF170C can be installed without a control cabinet.

Used primarily for the SIMATIC RF170C:

- Mechanical engineering, automation systems, conveyor systems
- Ancillary assembly lines in the automobile industry/suppliers
- Small assembly lines

Functions

The SIMATIC RF170C comprises an electronics module and a connection block that must be ordered separately. The interface module is available in the PROFIBUS or PROFINET variants. For the PROFIBUS connection, you can choose from the connection systems of ECOFAST, M12, 7/8", or screwed cable gland. For the PROFINET interface module, M12, 7/8" connection is available.

Integration of SIMATIC RF170C into SIMATIC STEP 7 is achieved by means of an object manager (OM). The GSD file of the ET 200pro system is available for integration into non-Siemens systems. Then the SIMATIC RF170C can be configured by means of the software tool HW_Config of the SIMATIC Manager or another PROFIBUS/PROFINET tool.

A pre-assembled reader cable is used to connect one or two readers to the communication module. The standard length of the cable is 2 m. If other cable lengths to the reader are required, an extension cable measuring between 2 m and 50 m can be used. The cable can also be assembled by the customer as required.

The data in the transponder can be accessed in the following manner: Direct addressing via absolute addresses.

Error messages and operating states (transponder in the field, transmission, etc.) are indicated additionally by means of LEDs and simplify commissioning and service.

The SIMATIC RF170C has two reader interfaces from which the readers are also supplied with power. In the SIMATIC RF170C, the power supply for the readers has an electronic fuse. The maximum permissible current per SIMATIC RF170C for the readers is 0.8 A. It is of no importance here whether the current is drawn by one or two readers.

The data in the transponder or in the Data Matrix Code can be directly accessed by means of absolute addresses (FB/FC45, FB/FC55) or more conveniently using the MOBY file handler (FC56) by means of the file names. When the ET 200pro is operated with a PROFINET interface, use of the FB (FB45, FB55) is mandatory.

RFID Communication modules

SIMATIC RF170C

Communication between the SIMATIC RF170C and the controller is acyclic. Consequently, a very large amount of data can be transferred to/from the SIMATIC RF170C without overloading the bus cycle. This has advantages when transferring large volumes of data. The SIMATIC RF170C can also process concatenated transponder commands very quickly in this mode.

Notice: When connecting high-speed RFID systems (e.g. RF300), the data throughput can decrease due to the distributed configuration of the ET 200pro. Therefore use the data throughput calculation tool when configuring. You can find the tool on the DVD 6GT2080-2AA20.

Technical specifications

Communication module	SIMATIC RF170C
Ambient temperature	
• During operation	-25 ... 55 °C
• During storage	-40 ... +70 °C 20 K/h
Relative humidity	5 ... max. 100%
Atmospheric pressure	795 ... 1 080 hPa
Resistance to shock	as for ET 200pro
Vibration	as for ET 200pro
Supply voltage	
• Rated value	24 V DC
• Permissible range	20.4 ... 28.8 V DC
Current consumption	
• Without reader	typ. 130 mA
• With 2 readers	Max. 1 000 mA
Enclosure	
• Degree of protection	IP67
• Enclosure material	Thermoplastic (fiberglass reinforced)
• Housing color	IP Basic 714
Dimensions W x H x D (mm)	
• SIMATIC RF170C without connection block	90 x 130 x 35
• SIMATIC RF170C with connection block	90 x 130 x 60
Weight	
• Without connection block	Approx. 270 g
• With connection block	Approx. 770 g
Serial reader interface (gross transmission rate) MOBY U/D, RF200 / RF300 / RF600	19 200, 57 600, 115 200 bit/s
Connectors	2 x connector plug M12, 8-pin
Cable length to reader	
• Standard length	2 m
• Optional preassembled cables	5 m, 10 m, 20 m, 50 m
• Self-assembled cables	Reader-dependent, up to 1 000 m
Supply voltage to reader	24 V
Max. current; 2 readers connected	0.4 A per reader
Max. current; 1 readers connected	0.8 A per reader

Selection and ordering data

	Order No.
SIMATIC RF170C communication module ▶ B For connecting to the distributed I/O system ET 200pro	6GT2 002-0HD00
Accessories	
Connection block for SIMATIC RF170C ▶ B For connecting 2 readers via an M12 connector	6GT2 002-1HD00
Reader cable for MOBY U PUR material, CMG approved, suitable for cable carriers	
2 m ▶	6GT2 091-4FH20
5 m ▶	6GT2 091-4FH50
Reader cable for MOBY D ▶	6GT2 691-4FH20
PUR material, CMG approved, suitable for cable carriers, 2 m	
Reader cable for SIMATIC RF200 / RF300 / RF600 / MV400 Or extension cable MOBY U/D and SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, CMG approved, suitable for cable carriers, straight connector	
2 m ▶	6GT2 891-4FH20
5 m ▶	6GT2 891-4FH50
10 m ▶	6GT2 891-4FN10
20 m ▶	6GT2 891-4FN20
50 m ▶	6GT2 891-4FN50
2 m, plug angled at reader ▶	6GT2 891-4JH20
M12 sealing caps for unused reader connections ▶ 10 units minimum order quantity, price per 100 units	3RX9 802-0AA00
DVD "RFID Systems Software & Documentation" ▶ D	6GT2 080-2AA20

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

D: Subject to export regulations AL = N and ECCN = EAR99S

RFID Communication modules

SIMATIC RF170C

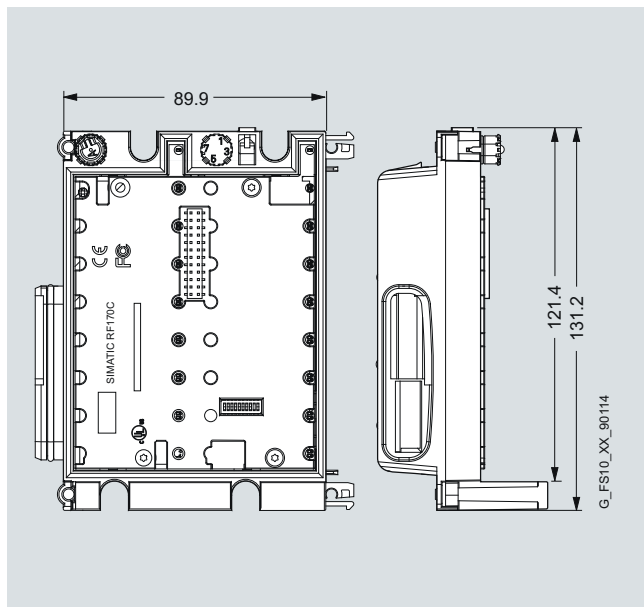
Dimensions

CAD data

Dimensional drawing available as CAD graphic (DXF format).

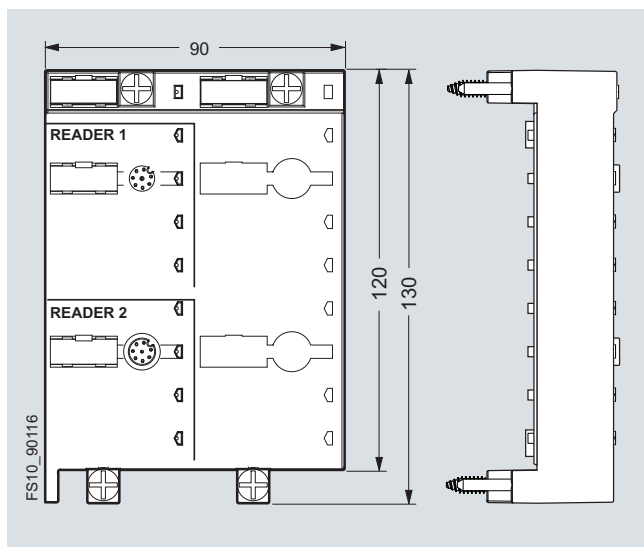
http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90114

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90116



SIMATIC RF170C communication module

5



Connector block for SIMATIC RF170C

Overview



The ASM 475 is a low-cost module for connecting the MOBY D, MOBY U, SIMATIC RF200, RF300, RF600 and SIMATIC MV400 identification systems to the S7-300 and ET 200M.

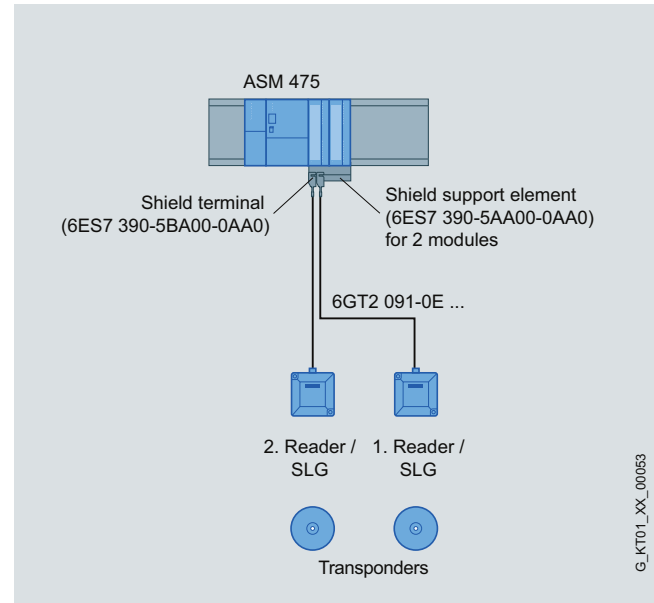
Applications

The ASM 475 communication module integrates the identification systems into the following automation systems:

- SIMATIC S7-300
- S7-400, PC (CP5412 (A2)) over ET 200M
- SINUMERIK 840D/810D

A maximum of two readers can be connected in parallel and operated in parallel mode.

Design



Configuration

Functions

As many as 8 ASM 475 communication modules can be plugged into one SIMATIC S7-300 rack and operated. In a configuration with several racks (max. 4), the ASM 475s can be plugged into and operated on any rack. This means that as many as 32 ASM 475s can be operated in the maximum configuration of a SIMATIC S7-300. The electrical isolation between the reader and SIMATIC S7-300 bus ensures a noise-resistant setup.

Error messages and operating states (transponder in field, command active, etc.) are indicated using LEDs.

Communication between the ASM 475 and S7-CPU takes place by means of acyclic message frames of the P bus, so that the user data (max. 238 bytes) is transmitted very quickly and effectively. The ASM 475 is fully integrated into the diagnostics of the SIMATIC Manager by means of an Object Manager (OM). Depending on the PROFIBUS master, as many as 126 ET 200M modules can be operated on one PROFIBUS line.

ASM 475 (for MOBY U / D / RF200 / RF300 / RF600 / MV400)

The data in the transponder or Data Matrix Code is accessed direct by means of physical addresses using the ASM 475. The data is transferred between FC/FB45, FC55 and ASM at great speed and without placing a great load on the CPU. In the MOBY U mode, the ASM 475 can also be operated with the FC56 (file handler).

Technical specifications

Communication modules	ASM 475	ASM 475 (with MOBY U file handler)
Serial interface to the reader	RS422	
Connection point for reader	Max. 2 units via screw or spring-loaded terminals in the front connector	
Interface/cable length, max. connectable length	RS422 / 1 000 m, depending on reader and cable type	
Readers that can be connected	MOBY U/D, RF 200 / RF300 / RF600, MV400	MOBY U
Interface for 24 V DC	Via screw terminals in front connector	
SIMATIC S7 function blocks	FC/FB45, FC55 (multitag)	FC56
Transponder addressing	Direct access via addresses	Access via DOS-like file system
Commands	Initialize transponder, read data from transponder, write data to transponder, etc.	Format transponder, read file, write file, etc.

RFID Communication modules

ASM 475

Communication modules	ASM 475	ASM 475 (with MOBY U file handler)
Supply voltage		
• Rated value	24 V DC	
• Permissible range	20 ... 30 V DC	
Electrical isolation between S7-300 and MOBY	Yes	
Current consumption from S7 bus terminal, max.	100 mA	
Power loss, typically	1 W	
Ambient temperature		
During operation		
• Horizontal configuration of SIMATIC	0 ... +60 °C	
• Vertical configuration of SIMATIC	0 ... +40 °C	
During transportation and storage	-40 ... +70 °C	
Dimensions W x H x D (mm)	40 x 125 x 120	
Weight	Approx. 0.2 kg	

Selection and ordering data

	Order No.
MOBY communication module ASM 475 ▶	6GT2 002-0GA10
For SIMATIC S7-300 and ET 200M, parameterizable	
Accessories	
Front connector (1 x per ASM 475)	
• with screw terminals ▶	6ES7 392-1AJ00-0AA0
• with spring-loaded terminals ▶	6ES7 392-1BJ00-0AA0
MOBY U connecting cable	
preassembled, between the ASM 475 and reader, angled connector, PUR material, in the following lengths:	
2 m ▶	6GT2 091-4EH20
5 m ▶	6GT2 091-4EH50
10 m ▶	6GT2 091-4EN10
20 m ▶	6GT2 091-4EN20
50 m ▶	6GT2 091-4EN50
pre-assembled, between ASM 475 and reader, straight connector, PUR material, in the following lengths:	
2 m ▶	6GT2 091-6EH20
5 m ▶	6GT2 091-6EH50
10 m ▶	6GT2 091-6EN10
50 m ▶	6GT2 091-6EN50
MOBY D connecting cable	
preassembled, between ASM 475 and reader D1xS, 9-pole Sub-D plug, PUR material, CMG approved, suitable for cable carriers, in the following lengths:	
5 m ▶	6GT2 491-4EH50
20 m ▶	6GT2 491-4EN20
50 m ▶	6GT2 491-4EN50

	Order No.
SIMATIC RF200 / RF300 / RF600 / MV400 connecting cable	
preassembled, between the ASM 475 and RF200 / RF300 / RF600 / MV400, IP65, straight connector, PUR material, suitable for cable carriers, CMG approval, in the following lengths ¹⁾ :	
2 m ▶	6GT2 891-4EH20
5 m ▶	6GT2 891-4EH50
Extension cable	
SIMATIC RF200 / RF300 / RF600 / MV400, PUR material, CMG approval, suitable for cable carriers, straight connector	
2 m ▶	6GT2 891-4FH20
5 m ▶	6GT2 891-4FH50
10 m ▶	6GT2 891-4FN10
20 m ▶	6GT2 891-4FN20
50 m ▶	6GT2 891-4FN50
DVD "RFID Systems Software & Documentation" ▶ D	6GT2 080-2AA20

¹⁾ The connecting cables can be extended using the RF300 connecting cables of type 6GT2891-4Fxxx. These connecting cables are available in the lengths 2 m, 5 m, 10 m, 20 m and 50 m.

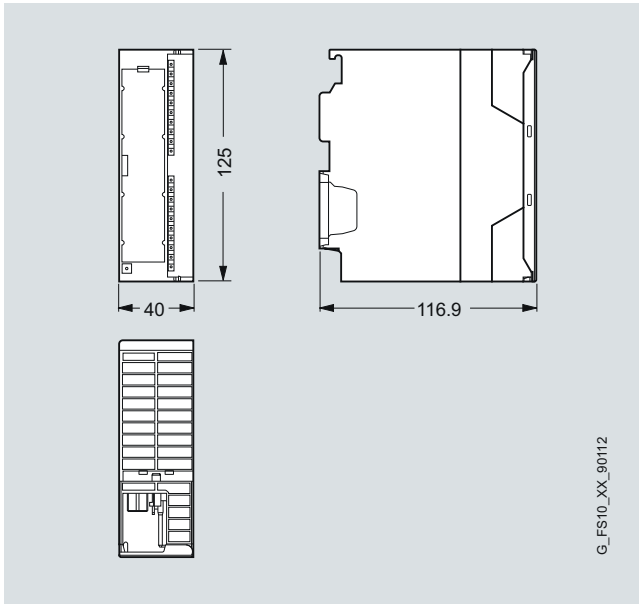
D: Subject to export regulations AL = N and ECCN = EAR99S

Dimensions

CAD data

Dimensional drawing available as CAD graphic (DXF format).

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90112



RFID standard cable

Overview



RFID standard cable that is used with SIMATIC RFID systems, preassembled in various lengths.

Benefits

Due to the cETLus certification with CMG test and marking, the cable can also be installed in fire protection critical building parts (e.g. vertical installation in a cable duct)

The SIMATIC RFID standard cable can also be used in dynamic applications such as tow chains with a minimum bending radius of 75 mm.

Applications

In addition to the normal areas of application in industry, the cable can also be laid:

- in areas subject to high heat
- for highly flexible applications; e.g. in tow chains
- in oily industrial environments
- in outdoor applications under solar radiation (UV radiation).

Technical specifications

Product type designation	SIMATIC RFID standard cable
Product description	Highly flexible communication line (6-wire)
Suitability for use	Also for constant motion in a tow chain
Cable designation	L-YC11Y 6x1x0.25 6x24 AWG CMG
Loop resistance per length/ maximum	80 Ω/km
Mechanical data	
Number of electrical wires	6
Type of screen	Tin-plated braided shield made of copper wires with 0.13 mm diameter (36 AWG)
Wire diameter of the AWG24 wire	0.70 mm
Outer diameter	
• of the inner conductor	0.70 mm
• of the wire insulation	1.2 mm
• of the cable sheath	5.4 mm
Symmetrical tolerance of the outer diameter/of the cable jacket	0.2 mm
Material	
• of the wire insulation	PVC
• of the cable sheath	PUR
Color	
• of the data wire insulation	white / yellow / gray / pink / brown / green
• of the cable sheath	black

Product type designation	SIMATIC RFID standard cable
Bending radius	
• for one-off bending / minimum permissible	21.6 mm
• for repeated bending / minimum permissible	43 mm
• with continuous bending	75 mm
Number of bending cycles	3 million
Number of bending cycles / note	Suitable as trailing cable for 3 million bending cycles with a bending radius of 75 mm
Tensile load / maximum	200 N
Permitted ambient conditions	
Ambient temperature	
• during operation	-30 °C ... 80 °C
• during storage	-30 °C ... 80 °C
• during transport	-30 °C ... 80 °C
• during installation	-30 °C ... 80 °C
Ambient temperature / note	Electrical properties measured at 20 °C
Behavior in fire	Flame-retardant acc. to IEC 60332-1-2
Resistance	
• to mineral oil	resistant
• to grease	resistant
• Radiological resistance / to UV radiation	resistant
Product properties, functions, components / general	
• Halogen-free	No
• Silicon-free	Yes
Standards, specifications, approvals	
• UL listing / at 300 V rating	Yes: CMG
• UL listing / at 600 V rating	No

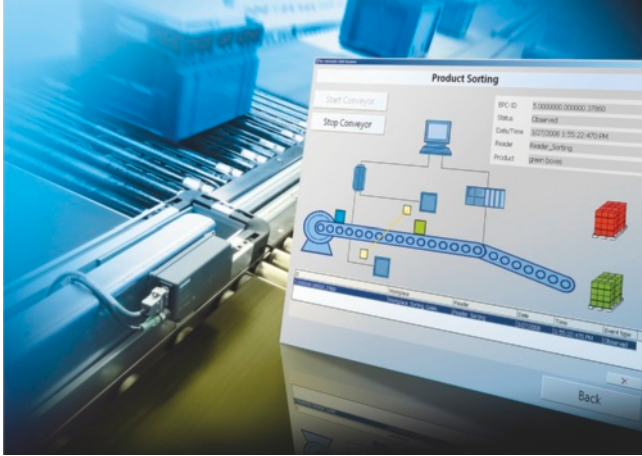
Selection and ordering data

	Order No.
Connecting cable communication module - reader, without connector	
50 m ▶	6GT2 090-4AN50
120 m ▶	6GT2 090-4AT12
800 m	6GT2 090-4AT80
MOBY U, connecting cable 470/475 communication module - reader	
2 m ▶	6GT2 091-4EH20
5 m ▶	6GT2 091-4EH50
10 m ▶	6GT2 091-4EN10
20 m ▶	6GT2 091-4EN20
50 m ▶	6GT2 091-4EN50
With straight reader connector 2 m ▶	6GT2 091-6EH20
With straight reader connector, 5 m ▶	6GT2 091-6EH50
With straight reader connector 10 m ▶	6GT2 091-6EN10
With straight reader connector, 50 m ▶	6GT2 091-6EN50
MOBY U, connecting cable ASM 456, RF160C, RF170C, RF180C, RF182C - Reader	
2 m ▶	6GT2 091-4FH20
5 m ▶	6GT2 091-4FH50
MOBY D, connecting cable ASM 475 - SLG D1xS	
5 m ▶	6GT2 491-4EH50
20 m ▶	6GT2 491-4EN20
50 m ▶	6GT2 491-4EN50
MOBY D, connecting cable PC (RS232) - SLG D1x	
5 m ▶	6GT2 691-4BH50
20 m ▶	6GT2 691-4BN20
MOBY D, connecting cable ASM 456, RF160C, RF170C, RF180C, RF182C - SLG D1xS	
2 m ▶	6GT2 691-4FH20
RF200/300/600, connecting cable ASM 475 - Reader	
2 m ▶	6GT2 891-4EH20
5 m ▶	6GT2 891-4EH50
RF200/300/600, M12-connecting cable ASM 456, RF160C, RF170C, RF180C, RF182C - Reader; angled reader connector	
2 m ▶	6GT2 891-4JH20

	Order No.
RF200/300/600, connecting cable ASM 456, RF160C, RF170C, RF180C, RF182C - reader.	
Can also be used as RF200/300/600, MOBY D/U extension cable to ASM 456, RF160C, RF170C, RF180C, RF182C, straight connector	
2 m ▶	6GT2 891-4FH20
5 m ▶	6GT2 891-4FH50
10 m ▶	6GT2 891-4FN10
20 m ▶	6GT2 891-4FN20
50 m ▶	6GT2 891-4FN50
RF300, connecting cable PC (RS232) - RF380R	
5 m ▶	6GT2 891-4KH50
MOBY U, connecting cable PC (RS232) - SLG U92 and power supply unit	
5 m ▶	6GT2 591-5CH50
20 m ▶	6GT2 591-5CN20
MOBY U, connecting cable PC (RS232) - service interface SLG U92	
5 m ▶	6GT2 591-5AH50

▶ Preferred type, available from stock.

Overview



SIMATIC RF-MANAGER

The SIMATIC RF-MANAGER is a software tool designed for fast and simple creation and commissioning of RFID applications as well as their smooth operation in combination with a higher-level enterprise system or SIMATIC S7 controllers.

The current version, RF-MANAGER 2008 + Service Pack 2, supports read/write devices of the RFID systems RF300 and RF600. Depending on the scope of the RFID application, various software packages are available which differ in the number of supported readers (maximum 50).

Benefits

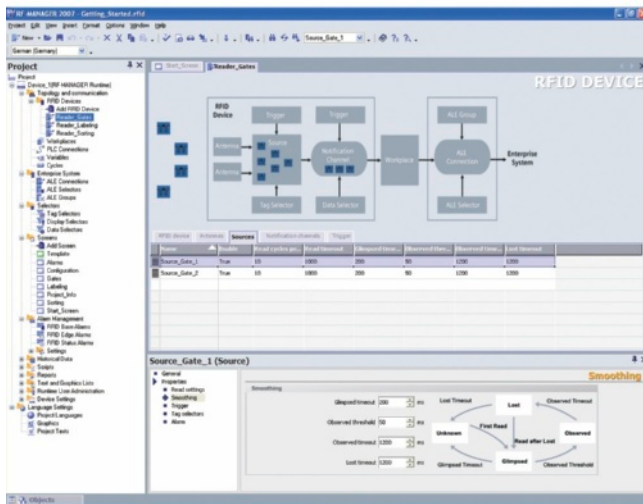
- Management and operation of readers (read/write devices)
- Collection, visualization and preprocessing of RFID data
- Transmission of RFID data to higher-level enterprise systems
- Linking of RFID data with the automation data of the S7 controller

Applications

RF-MANAGER supports a series of different RFID readers. All reader types can be used in applications in combination.

The main areas of application range from the recognition of goods at loading gates to goods receipt and dispatch, through product flow control on conveyer belts, up to deployment in warehouses or distribution centers and high-bay inventory control. Industrial use in factories, e.g. in paintshops or on assembly lines in the automotive industry, is also possible.

Overview



SIMATIC RF-MANAGER is data & device management software for RFID applications:

- For the quick and easy creation and commissioning of RFID applications
- For smooth operation of the connected readers (read/write devices)
- For preprocessing and transmission of RFID data to a higher-level enterprise system
- For linking of RFID data with automation data of SIMATIC S7 control systems

The current version, RF-MANAGER 2008 + Service Pack 2, supports all readers of the RFID systems RF300 and RF600. Service Pack 2 can be downloaded free of charge from the Service & Support pages:

<http://www.siemens.com/automation/service&support>

The RF-MANAGER comprises the Engineering System and Runtime components. With the help of the Engineering System, all necessary configuration tasks are performed and the components involved are parameterized. The RFID project created in this manner is subsequently executed in the Runtime system. The Runtime can run on the same PC as the Engineering System or on a different PC or a SIMATIC Microbox 420/427B.

Depending on the scope of the RFID application, different software packages are available. Every product version contains both an Engineering System and a Runtime. The packages only differ with regard to the number of readers supported by Runtime. Several Runtime licenses can also be added.

The following RF-MANAGER packages are available:

- SIMATIC RF-MANAGER 2008 – 1 Reader
- SIMATIC RF-MANAGER 2008 – 5 Readers
- SIMATIC RF-MANAGER 2008 – 20 Readers
- SIMATIC RF-MANAGER 2008 – 50 Readers

In addition, every package is also offered as an upgrade version. For this purpose an older version of the RF-MANAGER must already be available.

Benefits

- Configuring instead of programming and therefore easy and convenient creation of RFID applications.
- Fast commissioning and diagnosis of complex RFID systems with ready-made solution aids.
- Standardized, consistent operation of the RF300 and RF600 readers facilitates joint processing of barcodes and RFID data.
- Preprocessing / filtering of the RFID data make special preparation of the data in the enterprise system superfluous.
- More independence from the Enterprise System used thanks to an open interface (ALE)¹⁾.
- Linking of RFID data with automation data by connecting SIMATIC S7 controllers (e.g. point control dependent on the read RFID data).
- Future-oriented thanks to EPCglobal-compatible software architecture.
- Hardware and software from a single source and therefore perfectly interacting components.

1) Application Level Events.

Application

The RF-MANAGER can be used together with the connected RFID read/write devices to implement the most diverse scenarios. For example, identification of products, automatic acquisition of goods flow or RFID-supported asset management

The focus is on the following areas of application:

- Asset management
- Incoming and outgoing goods
- Internal logistics / production logistics
- Warehouse management
- Tracking & tracing
- Material handling control
- PC workplaces in production

Depending on the application, commissioning, monitoring and diagnosis of the readers is considerably simplified by using RF-MANAGER.

RFID Software

SIMATIC RF-MANAGER

Function

Engineering System for configuration of RFID applications:

- Efficient mass data editors
- Clearly comprehensible graphical editors
- Multi-language user interface
- Project assistant with different scenarios

Management of RFID readers (read/write devices):

- Support of up to 50 readers in parallel operation
- Universal support of the RF300 and RF600 readers
- Special online dialogs for fine tuning and monitoring of the RFID application
- Display of status information and error messages
- Support for maintenance scenarios (e.g. expansion of the plant without downtime)

Preprocessing of RFID data:

- Multilevel filters, from sorting of non-relevant read events to filtering according to EPC criteria
- Reading, writing, display and transfer of RFID data
- Linking of RFID and automation data via connection to S7 controllers

Connection to the higher-level enterprise level:

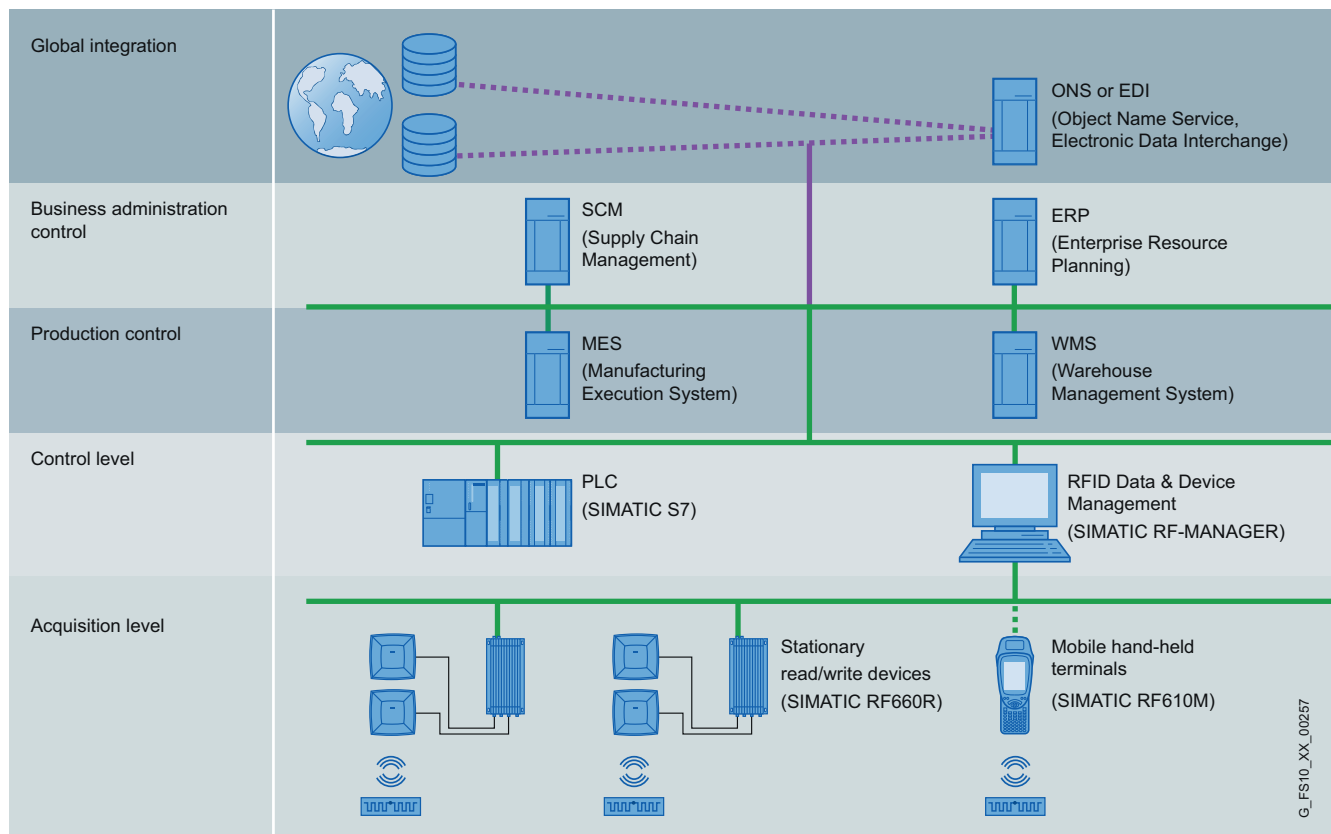
- Provision of preprocessed RFID data
- Transmission of application-internal information (e.g. messages)

EPCglobal-compliant:

- Implementation of the EPCglobal reader protocol layer for communication with the readers
- Open ALE¹⁾ interface for communication with higher-level enterprise systems

1) Application Level Events

Integration



Technical specifications

SIMATIC RF-MANAGER	
General data	
Current version	2008
Supported devices	• SIMATIC RF610M, RF620R, RF630R, RF660R • SIMATIC RF310M, RF310R, RF340R, RF350R, RF380R
Target systems	• Standard PC • SIMATIC Microbox PC 420 • SIMATIC Microbox PC 427B
Functions	• Commissioning, management and diagnosis of RFID devices • Collection, filtering, displaying and writing of RFID data • Preparation and forwarding of RFID data to higher-level applications and S7 controllers
Type of delivery	• RF-MANAGER configuring software • RF-MANAGER Runtime • Automation License Manager • Documentation as PDF • Getting Started project • ALE Demo Client • RF660R Configuration Software • Floating license for configuring software • Single license for Runtime (as countable licenses)
• Product CD	
• Licenses on the USB stick (for Automation License Manager)	
Packages	• RF-MANAGER 2008 – 1 Reader • RF-MANAGER 2008 – 5 Readers • RF-MANAGER 2008 – 20 Readers • RF- MANAGER 2008 – 50 Readers The packages are available both as complete versions and upgrades.
Languages	• German • English • German • English • German • English
• Documentation	
• Configuring software	
• Runtime software	

SIMATIC RF-MANAGER	
Hardware requirements	
Configuring software	Pentium IV with 1.6 GHz processor or higher • Resolution: 1024 x 768 or higher / 1280 x 1024 recommended • Colors: At least 256 At least 1.0 GB / 2.0 GB recommended At least 1.5 GB • CD-ROM drive (for installing the software) • USB connection (for transfer of licenses)
• Processor	
• Graphics	
• Main memory	Pentium III with 933 MHz processor or higher • Resolution: 640 x 480 or higher • Colors: At least 256 At least 512 MB / 1024 MB recommended • Standard-PC: At least 256 MB without taking archives into account • Microbox: Compact Flash card with at least 512 MB • CD-ROM drive (for installing the software) • USB connection (for transfer of licenses)
• Memory space required on the hard disk	
• Additional hardware	
Runtime software	Operating system • Standard-PC: Windows XP Professional + SP2 • Microbox: Windows XP Embedded + SP2
• Processor	
• Graphics	
• Main memory	Microsoft Internet Explorer V6.0 SP1 / SP2 • Adobe Acrobat Reader 5.02
• Memory space required on the hard disk	
• Additional hardware	
Software requirements	
Operating system	
Additional software	

Selection and ordering data

	Order No.		Order No.
SIMATIC RF-MANAGER		Full version:	
Data & Device Management Software for RFID applications, Version 2008		• License for one reader	▶ D 6GT2 080-3CA00-8AA5
Service Pack 2 is available free of charge under http://support.automation.siemens.com		• License for 5 readers	D 6GT2 080-3CC00-8AA5
-> Product Support		• License for 20 readers	D 6GT2 080-3CE00-8AA5
-> Sensors, measuring and testing technology		• License for 50 readers	D 6GT2 080-3CG00-8AA5
-> RFID systems		Upgrade:	
-> Software		• License for one reader	D 6GT2 080-3CA00-8AE5
-> SIMATIC RF-MANAGER		• License for 5 readers	D 6GT2 080-3CC00-8AE5
		• License for 20 readers	D 6GT2 080-3CE00-8AE5
		• License for 50 readers	D 6GT2 080-3CG00-8AE5

▶ Preferred type, available from stock.

D: Subject to export regulations AL = N and ECCN = EAR99S

Notes

Code reading systems



6/2	Code reading systems Introduction
6/4	Stationary code reading systems
6/6	SIMATIC MV420
6/11	SIMATIC MV440
6/22	SIMATIC VS130-2
6/30	Lenses
6/34	Handheld reading systems
6/36	SIMATIC HawkEye 40/40T
6/42	SIMATIC HawkEye 45/45T
6/48	Verification systems
6/48	Veri-Genius for SIMATIC MV440
6/52	Text recognition (OCR)
6/52	Text-Genius for SIMATIC MV440

Code reading systems

Introduction

Overview



Code reading systems – Reading and verification of 1D/2D codes

For state-of-the-art production systems, tracing products and parts with machine-readable identification is a central requirement. A unique coding system permits the planning of each and every step of production for every part manufactured and changes within the production process or in the materials used. Direct marking of products also allows the implementation of specified legal requirements for tracing production batches throughout the production system.

What is Direct Part Marking (DPM) ?

Direct Part Marking (DPM) indicates the application of a mark directly on the surface of a product without the use of a separate carrier material such as e.g. an adhesive label. This makes it possible to identify products in production and tracing them after delivery as well. So-called 2D codes have been used for years in a coding method that meets all user requirements. 2D codes consist of easy to implement, point-shaped basic elements. Laser and needle marking technologies are outstanding regarding durability, marking speed and material independence. Because of mechanical deformation, 2D codes can still be read using 2D read devices after multiple processing steps on metallic work pieces for example. 2D codes also provide the advantage of being able to encode data in more limited spaces than comparable barcodes or text.

The product range of Siemens code reading systems

Stationary code reading systems



SIMATIC MV440 and MV420 stationary code reading systems

The stationary code reading systems include compact basic and high-performance reading devices. The devices read various two-dimensional (2D) codes as well as one-dimensional (1D) barcodes. Many readers use data matrix print quality monitoring (verification) for process control.

SIMATIC MV440 can also read plain text (OCR stands for Optical Character Recognition)

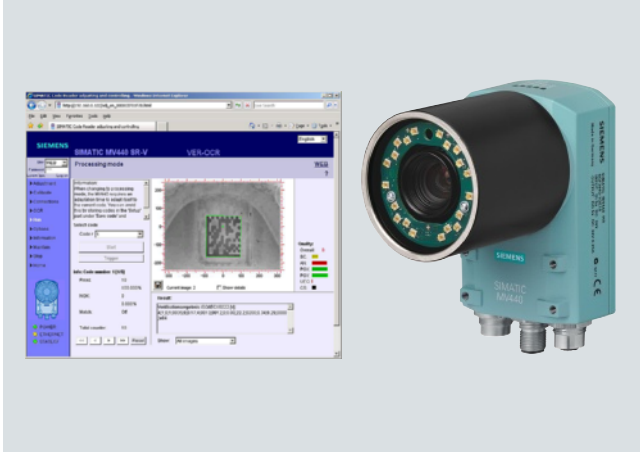
Handheld reading systems



Handheld reading system SIMATIC HawkEye 40T

These handheld reading systems are powerful, high-resolution read devices for either two-dimensional (2D) data matrix codes and/or one-dimensional bar codes (1D). The devices can communicate with a host computer using RS232, USB, PS2 and Bluetooth depending on the selected variant.

Verification systems



By using verification systems, the readability of marks is guaranteed throughout the entire production process regardless of any possible contamination or when using different read devices. Moreover, the marking can continue to be read after the production process throughout the lifespan of the product.

With the "Veri-Genius" verification license the SIMATIC MV440 can be expanded at any time by the verification functionality, in addition to reading 1D barcodes and 2D matrix codes. This license is supplied as a "Single License" on a USB flash drive and can be copied via the SIMATIC Automation License Manager (ALM) to the SIMATIC MV440 using a plug-in. The license is executable on any SIMATIC MV440 with firmware version 4.0 and higher.

Optical character recognition



With the OCR license "Text Genius" SIMATIC MV440 can also be used for text recognition in addition to reading 1D bar codes and 2D matrix codes. This is also known as OCR (Optical Character Recognition). It is also possible to read and compare plain text and machine-readable code in the same image field.

The license is supplied as a "Single License" on a USB stick and can be copied to the device with the SIMATIC Automation License Manager (ALM) using a plug-in. The license can be installed on a SIMATIC MV440 with firmware version 3.0 and higher.

Benefits

- Unique identification of products or product parts – Direct Part Marking is the key technology for tracing products
- Part-specific documentation of the production process
- Automation of the manufacturing process
- Verification for product liability cases (e.g. recall actions)

Code reading systems

Stationary code reading systems

Overview



The stationary code reading systems read various two-dimensional (2D) codes and one-dimensional (1D) barcodes. Some readers also feature the functions for measurement of the marking quality (verification) for process control purposes and the function text recognition (Optical Character Recognition, OCR). All devices can be easily and flexibly integrated into the automation system thanks to standardized industry-compatible interfaces and function blocks.

SIMATIC MV420

The SIMATIC MV420 family extends the range of basic, compact and integrated code readers. The MV420 is particularly suited for close up to mid-range reading distances (ca. 15 mm to 220 mm).

SIMATIC MV420 is an optical code reading system that has been specially designed for detecting and evaluating a variety of machine readable codes in the packaging industry (e.g. F&B, pharmaceuticals and tobacco) and industrial production (e.g. automotive, electronics and solar). The list of readable codes includes all standard matrix codes and bar codes which are reliably detected - mostly independent of the printing technology applied and carrier medium used. One key feature of the unit is its ability to read data matrix codes (DMC). The SIMATIC MV420 device family is flexible, reliable and easy to use.

The MV420 also features integrated optics, which can be adjusted to the required reading distances. The unit also includes integrated high-performance lighting for its size. All of the components are housed in an extremely compact enclosure with a high IP67 degree of protection.

SIMATIC MV440

The SIMATIC MV440 is an optical code reading system specially designed for recognizing and evaluating a variety of machine-readable codes in industrial production. The SIMATIC MV440 device family is characterized by highly reliable reading, high-speed reading and flexible process interfacing. The product is also rugged, has a high degree of protection and is easy to use. The professional decoding software is suitable for almost all types of marking, especially for sophisticated "Direct Part Marking", on a wide range of different carrier materials.

With the verification license "Veri-Genius", MV440 code readers are able to verify the marking quality of codes in accordance with the applicable standards. The device determines the quality of the applied code and helps you ensure the readability using the following process steps. Verification can be performed simultaneously with the other functions, e.g. 1D and 2D code reading.

With the text recognition license "Text-Genius", MV440 code readers can be used for text recognition (Optical Character Recognition, OCR). Text recognition can be performed simultaneously with the other functions, e.g. 1D and 2D code reading.

SIMATIC VS130-2

The SIMATIC VS130-2 code reading system has been specially developed for reading data matrix codes (DMC) ECC200 and various 1D/2D codes in an industrial environment. The complete packages comprise lighting, signal evaluator, sensor and cables. Due to separation of the signal evaluator, sensor and lighting, very different arrangements of the sensor and lamp are feasible. Another special feature of this device is that PROFIBUS and PROFINET are available directly on the device.

Code reading systems

Stationary code reading systems

Major differences

Code reading system	SIMATIC MV420	SIMATIC MV440	SIMATIC VS130-2
Enclosure	Very compact design, IP67	Compact design, IP67	Modular design (signal evaluator, sensor head and light separately), IP65
Sensor / resolution	CMOS 640 x 480 pixels 752 x 480 pixels	CCD 640 x 480 pixels 1024 x 768 pixels 1600 x 1200 pixels	CCD 640 x 480 pixels
Lens system	Flexible lens system (M12)	Freely selectable lenses due to C-Mount lens connection	Integrated fixed focus lens, or freely selectable lenses due to C-Mount lens connection
Lighting	Integrated lighting	Integrated or external lighting	External lighting
Commissioning and operation	• Integrated web server • Auto-optimizing of parameters • Languages: E/G/F/I/S/CH	• Integrated web server • Auto-optimizing of parameters • Languages: E/G/F/I/S/CH	• Integrated web server • Onboard operator controls • Auto-optimizing of parameters • Languages: E/G/F/I/S/CH
Communication	• PROFIBUS (via ASM module; M12) • PROFINET (on-board, M12 or via ASM module, different interfaces) • Ethernet (onboard, M12) • RS232 (onboard, M16)	• PROFIBUS (via ASM module, M12) • PROFINET (on-board, M12 or via ASM module, different interfaces) • Ethernet (onboard, M12) • RS232 (onboard, M16)	• PROFIBUS (onboard; DB9) • PROFINET (onboard, RJ45) • Ethernet
Text recognition	–	Polyfont	–
Verification	–	• ISO/IEC 16022:2000 • ISO/IEC 15415:2004 • AS9132 Rev A, 2005 • ISO/IEC 15416:2000 • ANSI X3.182-1990 • Siemens DPM • AIM DPM-1-2006	ISO16022 based

Applications

- Automobile industry
 - Needle punched markings on various automotive power train components (cylinder heads, cylinder blocks, manifolds, etc.)
 - Laser markings on various automotive power train components (camshafts, crankshafts, pistons, connecting rods, transmission components, etc.)
 - Laser markings on electronic components, printed circuit boards, or enclosures
- Packaging industry (e.g. pharmaceuticals, F&B, tobacco)
 - Printed or laser markings on folded boxes, plastic containers, etc.
- Aerospace industry
 - Needle punched markings on gas turbine blades
 - Needle punched markings on various aluminium components of propulsion units
- Medical equipment
 - Laser markings on pacemakers and other implantable devices
 - Laser markings on various medical device components and enclosures
- Electronics
 - Laser markings on ESD sensitive hard drive components or even on printed labels
- Semiconductors
 - Laser markings on rigid and flexible circuit boards
 - Laser markings on packaged semiconductor devices, heat sinks or heat dissipators

Code reading systems

Stationary code reading systems

SIMATIC MV420

Overview



The SIMATIC MV420 supplements the portfolio of basic, compact and integrated code readers. The MV420 is particularly suited for close up to mid-range reading distances (ca. 15 mm to 220 mm).

SIMATIC MV420 is an optical code reading system that has been specially designed for detecting and evaluating a variety of machine readable codes in the packaging industry (e.g. F&B, pharmaceuticals and tobacco) and industrial production (e.g. automotive, electronics and solar). The list of readable codes includes all standard matrix codes and bar codes which are reliably detected - mostly independent of the printing technology applied and carrier medium used. One key feature of the unit is its ability to read data matrix codes (DMC). The SIMATIC MV420 device family is flexible, reliable and easy to use.

The MV420 also features integrated optics, which can be adjusted to the required reading distances. The unit also includes integrated high-performance lighting for its size. All of the components are housed in an extremely compact enclosure with a high degree of protection IP67.

Highlights at a glance:

- Compact design with degree of protection IP67
- Integrated optics: variable reading distances
- Integrated high-performance lighting
- Web server technology: parameterizable with regular Web browser
- Interfaces: Ethernet, PROFINET, RS232, DI/DO and direct connection to RFID communication modules (ASM)
- Exceptionally high reading speeds, depending on the model

Further important product characteristics are:

- Excellent read algorithms based on the code reading systems SIMATIC MV440 and VS130-2 and many years of experience in the market.
- No special knowledge required for reliable parameterization of reading features. Parameterization usually only required for hard to read codes. "Setup" is performed automatically by presenting a readable code pattern.
- Autotrigger mode (availability depends on model): Automatically detects when a code is in front of the reader, ensuring that no external trigger signal is required. No proximity switch or cable is required for the trigger. This feature is also useful for applications in which a proximity switch cannot be used, such as for objects that are linked together.
- Multicode (availability depends on model): Reads multiple codes in one step within the same image field.
- ID-Genius (availability depends on model): a high-performance code reading algorithm for difficult DPM data matrix codes.

- Code quality evaluation: displays the key quality parameters of the code to be read.
- Customized user interface can be easily generated with SIMATIC WinCC flexible/WinCC.
- Web-based user interface; can run on a variety of platforms meeting the following requirements: Internet browser (IE 6.0 or higher), JAVA-VM (MS, SUN).
- Password protected user interface with integrated access rights administration.
- Web-based user interface available for easy integration with an HMI device. The browser and JAVA VM requirements previously mentioned also apply in this case.
- 6 language versions are available (operator interface, manual and online help are available in German, English, French, Spanish, Italian, and Chinese).

Application

Key features of the SIMATIC MV420:

- Code reading
- Comparing the read result with a preset value
- Formatting of read results for further use

The range of application for the SIMATIC MV420 product family extends to practically all areas of industrial production. The possibilities for use range from identification of stationary parts to fast moving parts on conveyor systems. The high-performance integrated lighting allows for an extremely compact design. The unit is protected from environmental influences with a degree of protection IP67. The SIMATIC MV420 code readers are therefore suitable for all industrial applications, also for direct marking (Direct Part Marking - DPM). In addition to industrial production, thanks to its small size and flexibility, the SIMATIC MV420 code reader is also ideally suited to the packaging industry (e.g. F&B, pharmaceuticals and tobacco).

The MV420 code readers include all common communication interfaces, such as Ethernet or PROFINET, and can therefore be connected to a wide variety of systems. An integrated RS422 interface makes it possible to use all of the RFID communication modules, such those required for the PROFIBUS connection. In this case, the combination of code reader and RFID reader is also possible on one communication module.

The reading devices are particularly easy to use and commission despite the wide variety of options for use. Parameters are automatically configured for most applications. If reconfiguration is required, however, parameterization can be carried out without the need for pre-installed software via the integrated Web server using an Internet browser.

More information is available in the accompanying manual.

Code reading systems

Stationary code reading systems

SIMATIC MV420

Design

The SIMATIC MV420 is a complete system with a compact design. You do not need to configure the device based on individual components. It already contains everything required for reading codes (integrated optics, lighting and, of course, signal processing). The MV420 is available in two versions:

- Basic model: SIMATIC MV420 SR-B
- Performance model: SIMATIC MV420 SR-P

The reading speed and some software functions differ depending on the model. The Performance model features almost all of the software functions found in the MV440 and offers a very high reading speed. The Basic model has a slower reading speed and does not include some of the software functions found in the Performance model, such as multi-code reading and the ID Genius code reading algorithm.

The following accessories are available for the SIMATIC MV420:

- Power DIO RS232 cable (M16 connector on open end)
- M12 Ethernet cable (varying lengths)
- Ethernet cable (M12 to RJ45) for commissioning/lab operation; 2 m in length
- Flexible mounting angle
- Special ASM cable for M16 connector (M16 to M12) for connecting to RFID communication modules (ASM) May be expanded using standard ASM cables, if necessary
- Plug-in power supply for demonstration and lab operation (for office environment only)
- CD with installation/operating instructions (supplied with unit)

More information is available in the accompanying manual.

Functions

Key features of the SIMATIC MV420:

- Code reading (refer to "Overview" and "Range of application")
- Formatting of read results for further use and/or comparison
- Comparing the read result with a preset value
 - Specification of a comparison string via one of the serial ports (PROFINET (ASM and onboard), PROFIBUS (ASM), RS232)
 - Comparison of the formatted read results with the comparison string

The functions can be used individually or they can be combined.

The SIMATIC MV420 reads the following codes:

- 1D codes (barcodes):
 - Int. 2/5 (no checksum)
 - Int. 2/5+CS (checksum included)
 - Code 128
 - Code 39 (no checksum)
 - Code 39+CS (checksum included)
 - EAN 13
 - EAN 8
 - UPC-A
 - UPC-E
 - UPC Suppl.
 - GS1 Databar 14
 - GS1 Databar Stacked
 - GS1 Databar Limited
 - GS1 Databar Expanded
- 2D codes:
 - DMC
 - PDF417
 - QR
 - Vericode

The SIMATIC MV420 reads the codes found on a wide variety of components and surfaces, including:

- Paper or plastic labels
- Plastic parts
- Circuit boards
- Metallic objects

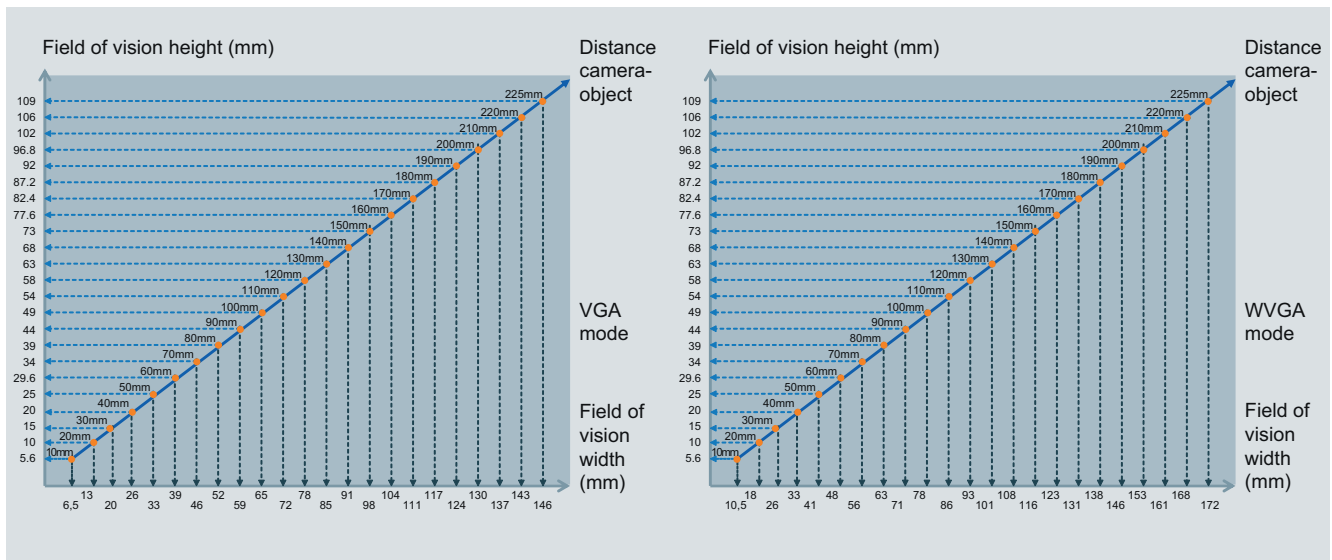
The SIMATIC MV420 reads codes of a wide variety of marking types, such as:

- Printed
- Dot peened
- Laser
- Stamped
- Drilled

Code reading systems

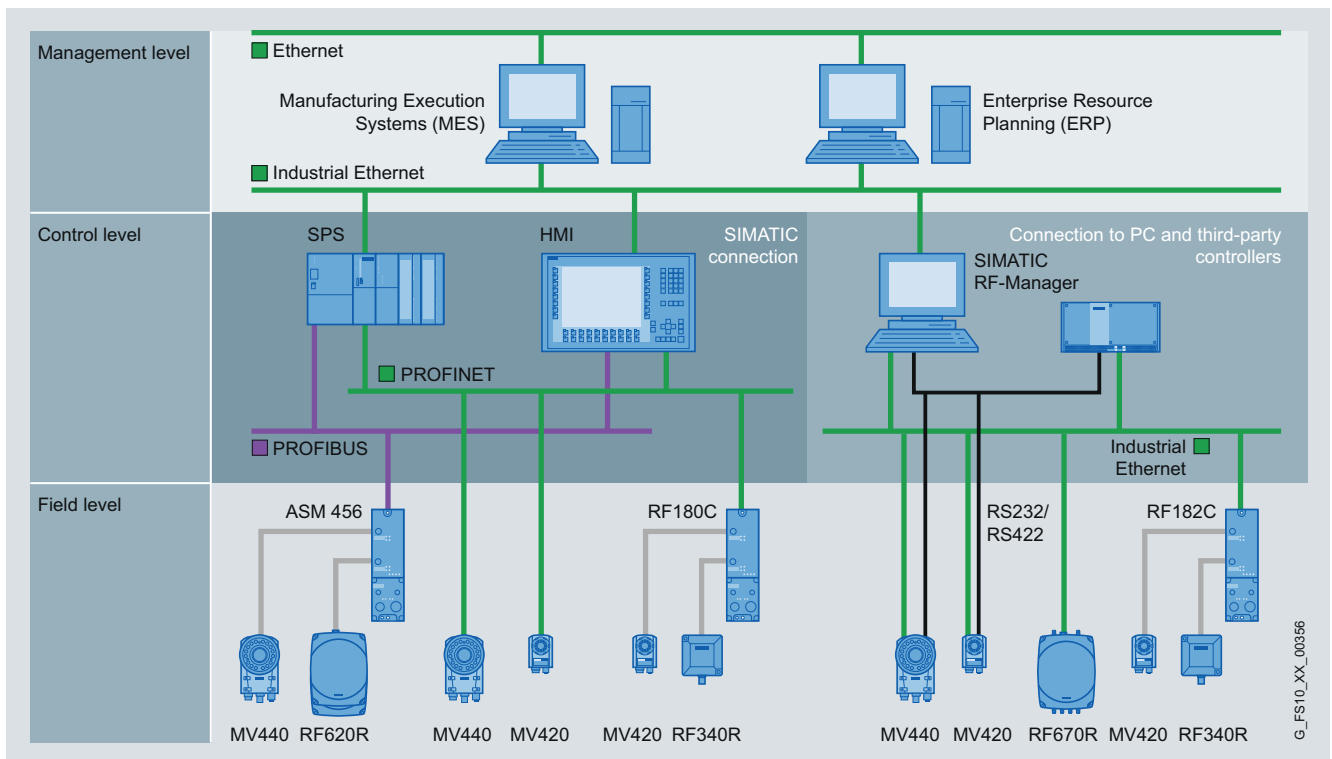
Stationary code reading systems

SIMATIC MV420



SIMATIC MV420 field of view dimensions

Automation Environment Integration



Integration of the SIMATIC MV420 in the automation environment

The following communication services can be used

PROFINET IO (FB79)	Onboard MV420 PROFINET interface
PROFINET IO (FB45, PIB)	Via the MV420 ASM interface when used with the SIMATIC RF180C ASM module
PROFINET IO (FB45, PIB)	Via the MV420 ASM interface when used with the ASM 456 ASM module
TCP/IP native	Onboard MV420 PROFINET interface

More information is available in the accompanying manual.

Code reading systems

Stationary code reading systems

SIMATIC MV420

Technical specifications

Stationary code reading system	SIMATIC MV420
Image acquisition	CMOS chip - VGA: 640 x 480 pixels - WVGA: 752 x 480 pixels
Available versions	- SIMATIC MV420 SR-B (Basic model) - SIMATIC MV420 SR-P (Performance model)
Field of view	The size of the field of view depends on the reading distance.
Input voltage range	24 V DC, $\pm 20\%$
Max. current consumption (at 24 V DC)	200 mA (no I/O signals)
Inrush current	max. 2 A; < 1 ms
Power failure bridging time (at 24 V DC)	10 ms
Ambient temperature	0 ... +50 °C
Interfaces	
2 digital, potential-free outputs 1 quick trigger input 1 quick trigger output for external lighting - RS232 - Communication module interface	Parameterizable Connection to the communication module interface via the ASM cable (6GF3 420-0AC00-2CB0)

Stationary code reading system	SIMATIC MV420
Ethernet/PROFINET I/O interface	M12 (4-pin) for parameterization, real-time transmission of test results and process interfacing
Supply voltage	
- Rated value - Permissible range (SELV to IEC/EN/DIN EN 60950-1 and LPS/NEC Class2) - Fuse protection	24 V DC 19.2 to 28.8 V DC 4 A max.
Enclosure	
- Material - Color - Dimensions without connector W x H x D (mm) - Degree of protection to EN 60529 - Weight	Die-cast aluminum Petrol 52.5 x 70.7 x 39.5 IP67 Approx. 0.25 kg
Mechanical load	
Vibration, as per IEC 60068-2-6, Test Fc 5 to 8.4 Hz 8.4 to 100 Hz - Shock, as per IEC 60068-2-27, Test Ea	Deflection: 3.5 mm 9.81 m/s ² , 10 cycles Acceleration: 150 m/s ²

Selection and ordering data

	Order No.
SIMATIC MV420 SR-B ▶ B	6GF3 420-0AA20
Basic model without multicode and ID-Genius algorithm	
SIMATIC MV420 SR-P ▶ B	6GF3 420-0AA40
Performance model Very vast reading speeds; with multicode and ID Genius algorithm	
Accessories	
Mounting bracket for SIMATIC MV420 ▶ B	6GF3 420-0AC00-1AA0
Plug-in power supply (EU, US) ▶ B	6GF3 420-0AC00-1PS0
For demo and lab operation (for office environment only)	
Built-in ring lamp ▶	6GF3 420-0AC00-2LT0
White, suitable for mounting in SIMATIC MV420 SR-B (6GF3 420-0AA20) and SIMATIC MV420 SR-P (6GF3 420-0AA40)	
Cable power supply DIO RS232 Power IO RS232 cable, M16 pre-assembled at one end, other end unconnected. Various lengths:	
10 m ▶ B	6GF3 440-8BA2
30 m ▶ B	6GF3 440-8BA4

	Order No.
Cable Ethernet / PROFINET	
Ethernet cable ▶ B for commissioning and service, M12 connector, 8-pin, RJ45 connector, length: 2 m	6GF3 440-8BB1
Industrial Ethernet cable for commissioning, service and installation, M12 connector, 8-pin, RJ45 connector (IE FC RJ45 Plug 145), length: 2 m	6XV1 871-5TH20
Industrial Ethernet cable (M12-180/M12-180) for installation Pre-assembled IE FC P Trailing Cable GP 2 x 2 (PROFINET Type C) with two 4-pin M12 connectors (D-coded), IP65/67 degree of protection, RJ45 assembly possible with plug-in connector 6GK1 901-1BB10-2AA0 (see below). Various lengths:	
0.3 m	6XV1 870-8AE30
0.5 m	6XV1 870-8AE50
1 m	6XV1 870-8AH10
1.5 m	6XV1 870-8AH15
2 m	6XV1 870-8AH20
3 m	6XV1 870-8AH30
5 m	6XV1 870-8AH50
10 m	6XV1 870-8AN10
15 m	6XV1 870-8AN15

Code reading systems

Stationary code reading systems

SIMATIC MV420

Order No.	
Industrial Ethernet FastConnect plug connector, 2x2, 180° cable outlet RJ45 plug connector (10/100 Mbit/s) with rugged metal enclosure and FastConnect connection method, for Industrial Ethernet FastConnect cable 2x2. For further cables, see Catalog IK PI under "Passive network components".	6GK1 901-1BB10-2AA0
Cable for communication module interface Adapter cable for RFID communication modules (ASM) M16 connector (MV420) to M12 connector (ASM); length: 2 m; expandable to any length with standard communication module cables	6GF3 420-0AC00-2CB0
Cable for communication module interface Standard ASM cable for installation, assembled plug-in cable for ASM 456, RF170C and RF180C. Various lengths:	
2 m	6GT2 891-4FH20
5 m	6GT2 891-4FH50
10 m	6GT2 891-4FN10
20 m	6GT2 891-4FN20
50 m	6GT2 891-4FN50

B: Subject to export regulations AL = N and ECCN = EAR99H

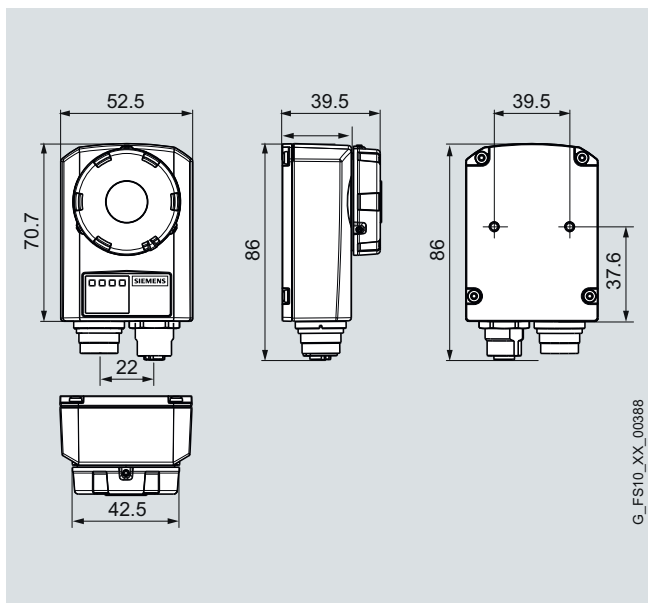
Dimensions

CAD data

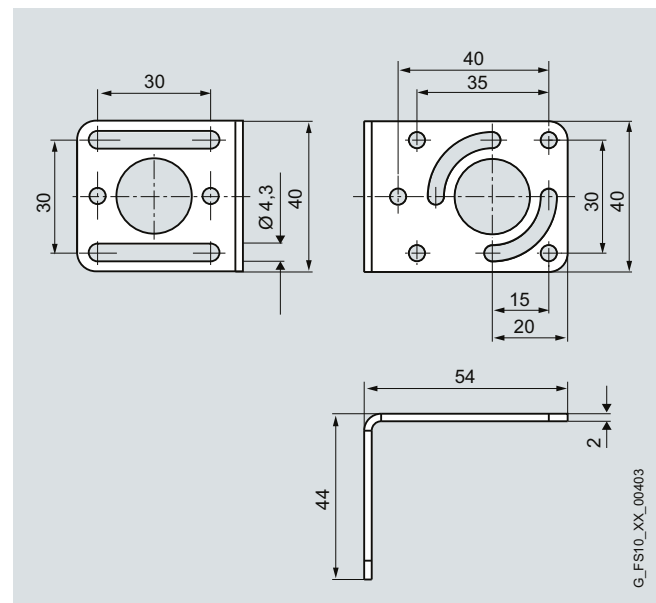
Dimensional drawing available as CAD graphic (DXF format). You can find additional information in the Internet at:

http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90455

6



Code reading system SIMATIC MV420



Mounting bracket for code reading system SIMATIC MV420

Code reading systems

Stationary code reading systems

SIMATIC MV440

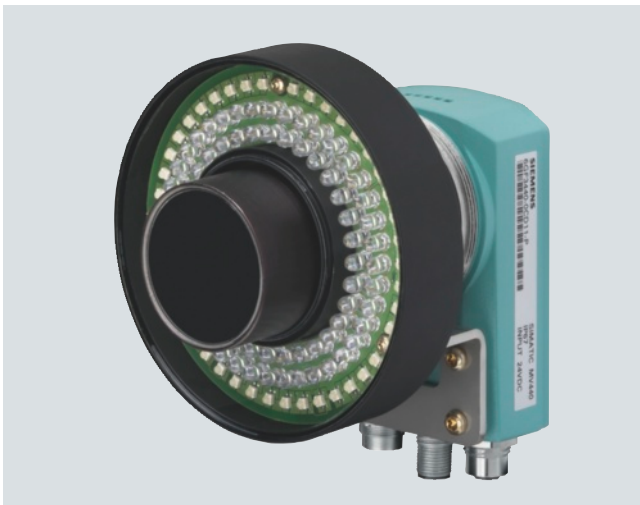
Overview



SIMATIC MV440 front view, with built-in ring lamp and protective tube D6



SIMATIC MV440 with built-in ring lamp and protective tube D65



SIMATIC MV440 with external ring light and protective tube D50

The SIMATIC MV440 readers have been specially developed for use in industrial production. The devices offer professional decoding algorithms for machine-readable codes and text recognition in one device for production and logistics. The SIMATIC MV440 device family is characterized by flexibility, reliability and ease of use.

The list of readable codes includes all common matrix and barcodes which, regardless of the printing technology and the carrier medium used, are recognized reliably. A special feature of the device is its ability to read Data Matrix Code (DMC), which is frequently used especially in production for direct part marking (DPM) and places the highest requirements on the readers.

The operating range of the devices reaches from close range 7 cm to distant range 300 cm. Due to the freely selectable lenses and lighting, the working range as well as implementation in applications with special requirements is almost unrestricted. Integration in industrial automation environments is via standardized fieldbus technology, but open interfaces are also supported.

Benefits

Highlights at a glance:

- Compact design with IP67 degree of protection.
- Very high reading reliability and read rates thanks to Siemens decoding algorithms.
- Different screen resolutions can be selected application-specifically.
- Flexible adaptation to the application by means of freely selectable lenses and lighting.
- Integrated high-performance lighting.
- Variety of interfaces: Ethernet (PoE), PROFINET (PoE), RS232, DI/DO, ASM interface.
- Wide range of connector technology can be used by means of ASM communication modules.
- Function block for PROFINET/PROFIBUS can be used with SIMATIC and SIMOTION.
- Web-based user interface can be used, without the need for installation, for parameter assignment and monitoring.

Further important product characteristics are:

- No special knowledge required for reliable parameterization of reading features. "Setup" is performed automatically by presenting a readable code pattern.
- Autotrigger mode: Automatically detects when a code is in front of the reader. Ensuring that no external trigger signal is required. Advantages: Savings in sensor technology and cabling; reduced potential for error as there are fewer components; solution for applications in which proximity switches and light barriers cannot be used.
- Multicode: Reads multiple codes in one step within the same image field.
- ID-Genius: High-performance code reading algorithm for difficult directly marked data matrix codes (DPM).
- Code quality evaluation: displays the key quality parameters of the code to be read.
- Customized user interface can be generated with SIMATIC WinCC flexible/WinCC.
- Web-based user interface; can run on a variety of platforms meeting the following requirements: Internet browser (IE 6.0 or higher), JAVA-VM (MS, SUN).
- Extensive diagnostics functions ensure operation at the maximum read rate.
- User/password-protected user interface with integrated management of access rights.
- 6 language versions are available (operator interface, manual and online help are available in German, English, French, Spanish, Italian, and Chinese).

Code reading systems

Stationary code reading systems

SIMATIC MV440

Applications

The main functions of SIMATIC MV440 are

- Reading 1D and 2D codes
- Text recognition (OCR)
- Verification (measuring of the code quality)
- Comparing the read result with a preset value
- Formatting of read results for further use

The application range of the SIMATIC MV440 product family covers all sectors and areas of industrial production and logistics. The possible applications include the identification of stationary parts through to extremely fast moving parts on a conveyor belt. The powerful integrated lighting allows a very compact design. The device has IP67 degree of protection and is therefore equipped for harsh industrial environments.

MV440 code readers are suitable for all industrial applications in the area of code reading. Due to its particularly powerful lighting, lenses and sensor technology, MV440 specializes in Direct Part Marking (DPM) applications. Due to the high picture quality, MV440 recommends itself for measuring the marking quality (verification) in the area of DPM.

Due to the properties and functions described, the emphasis for MV440 is on the following sectors and applications:

- Automobile industry:
 - Needle markings on various drive components (DPM), e.g. cylinder heads, cylinder blocks, manifolds.
 - Laser markings on various power train components (DPM), e.g. camshafts, crankshafts, cylinder piston, connecting rods, gearbox components.
 - Laser markings on electronic components, printed circuit boards, or enclosures.
- Pharmaceutical industry, food industry (F&B), tobacco industry:
 - Print or laser markings on medicines (DPM, OCR).
 - Detection of the contents of cartons (up to 150 codes).
 - Read portal through linking several cameras.
- Aerospace industry:
 - Needle or laser markings on gas turbine blades (DPM).
 - Needle or laser markings on jet engine components (DPM).
- Medical equipment:
 - Laser markings on heart pacemakers and other implants (DPM).
 - Laser markings on medical devices (DPM).
- Electronics:
 - Needle or laser markings on hard disk components.
 - Lasered or etched markings on hard disk components (DPM).
- Semiconductors:
 - Laser markings on rigid and flexible circuit boards (DPM).
 - Laser markings on enclosed semiconductor components, heat sinks or heat exchangers (DPM).

More information is available in the accompanying manual.

Code reading systems

Stationary code reading systems

SIMATIC MV440

Design

SIMATIC MV440 is a compact, stationary code reading system. It consists of one basic unit, which can be configured with other individual components (lens, ring light and protective tube). This allows the MV440 to be optimally adapted to the application conditions.

The SIMATIC MV440 basic unit is available in three versions that only differ with regard to the resolution of the CCD sensor and the associated recording speed mode and read rate. All three versions of the basic unit have identical functionality:

- SIMATIC MV440 SR
640 pixels x 480 pixels, 50 full screens/s
- SIMATIC MV440 HR
1024 pixels x 768 pixels, 20 full screens/s
- SIMATIC MV440 UR
1600 pixels x 1200 pixels, 15 full screens/s

The basic units can be configured with lens, ring light and protective tube:

- Configuration for close range:
Basic unit with lens, built-in ring light and protective tube for lens D65.
- Configuration for distant range:
Basic unit with lens, external ring light and protective tube for lens D50

Configurations of SIMATIC MV440 basic unit, lens system, ring light and protective tube:

Configuration for close range	Lenses	Built-in ring lights	Protective tube for lens
	Mini lens 8.5 mm	The built-in ring light cannot be used (alternative: external mounting of a ring light).	Protective tube for lens D65 can be used.
	Mini lens 12 mm	Built-in ring lights can be used.	
	Mini lens 16 mm		
	Mini lens 25 mm		
	Mini lens 35 mm		
	Mini lens 50 mm		
	Mini lens 75 mm		Protective tube cannot be used for lens.

Configuration for distant range	Lenses	External ring lights	Protective tube for lens
	Mini lens 8.5 mm	External ring lights can be used.	Protective tube for lens D50 can be used.
	Mini lens 12 mm		
	Mini lens 16 mm		
	Mini lens 25 mm		
	Mini lens 35 mm		
	Mini lens 50 mm		
	Mini lens 75 mm		

For these two configurations of SIMATIC MV440, comprehensive accessories are available with which the requirements of the application can be met. The following accessories can be combined with the SIMATIC MV440 basic units:

- Lenses
- Protective tube for lens
- Ring lights
- Cable
- Supports

Code reading systems

Stationary code reading systems

SIMATIC MV440

Functions

The main functions of SIMATIC MV440 are:

- Reading 1D and 2D codes
- Optical character recognition (OCR)
- Verification (measuring the code quality)
- Comparing the read result with a preset value
- Formatting the read result for forwarding

All the functions can be used individually or they can be combined.

The SIMATIC MV440 reads the following 1D and 2D codes (detailed information can be found in the manual):

- 1D codes (barcodes):
 - Int. 2/5 (with/without checksum)
 - Code 128
 - Code 93
 - Code 39 (with/without checksum)
 - Code 32
 - EAN 13
 - EAN 8
 - UPC-A
 - UPC-E
 - CodeBar
 - GS1 DataBar (Omnidirectional, Stacked, Limited, Expanded)
 - Pharmacode (0° and 180°)
 - Postnet
- 2D codes:
 - Data Matrix Code (ECC 0 - 200)
 - PDF417 (without: Truncated, Micro and Macro)
 - QR (without: Micro and Macro)
 - Vericode (demo mode/VeriCode license)

Code verification is the term used for measuring the marking quality of 1D and 2D codes. This additional functionality is subject to license and is available for every SIMATIC MV440 by installing the "Veri-Genius license". The following verification methods are supported:

- AIM DPM-1-2006 (future ISO standard)
- Siemens DPM
- ISO/IEC 15415
- AS9132 Rev. A (previously IAQG)
- ISO/IEC 15416 (previously ANSI X3.182-1990)

If the license is not installed, the verification function is available in demo mode. For more detailed information, refer to the chapter "Verification systems".

Text recognition is used to detect plain text (Optical Character Recognition: OCR). This additional functionality is subject to license and is available for every SIMATIC MV440 by installing the "Text-Genius license". The text recognition function is able, without training, to recognize characters of almost any font. Particularly suitable fonts are:

- OCR-A
- Semifont M13
- and similar fonts

If the license is not installed, the verification function is available in demo mode. For additional information, refer to the chapter "Text recognition".

Note: In demo mode, the full functionality of the devices is available. Testing of a licensed function is therefore possible at any time. However, the output result is unusable, because one or more characters of the result will be randomly replaced by the character '?'. Binary results are completely suppressed.

Integration into the automation environment

The SIMATIC MV440 code readers have industry-standard PROFINET and ASM interfaces on the device. In addition, communications interfaces, such as Ethernet and RS232, are directly available on the device.

Via the specified interfaces, the following communication services can be used:

Usable communication services	Interface
PROFINET IO (FB79)	Onboard MV440 PROFINET interface
PROFINET IO (FB45, PIB)	Via the MV440 ASM interface, using the communication module RF180C
PROFIBUS DP V0/1 (FB45, PIB)	Via the MV440 ASM interface, using the communication module ASM 456
TCP/IP native	Onboard MV440 PROFINET interface

Via the ASM interface, all communication modules, for example for the PROFIBUS connection, can be used. The ASM interface on the SIMATIC MV440 is compatible with all available communication modules both electrically and with regard to protocol. Connection via a communication module makes it easy to switch between optical code reading with SIMATIC MV440 and RFID readers, simply by reconnection. Programming on the PLC is performed with the aid of function blocks that are available for SIMATIC and SIMOTION.

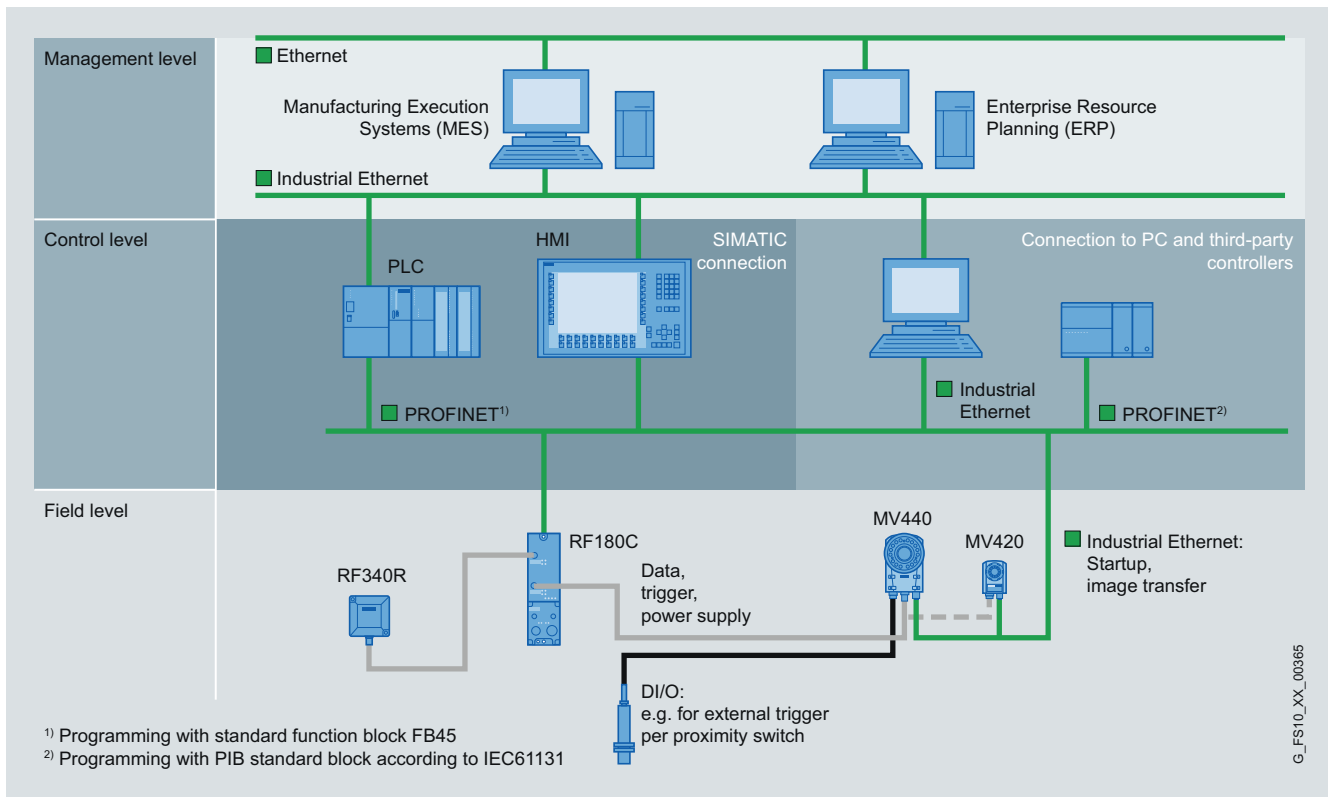
The advantage of connecting SIMATIC MV440 to a communication module is that a uniform programming interface is available for a wide variety of PLC types and fieldbus systems. In addition, the complete cable portfolio for the ASM interface is available.

At the same time as being connected via a communication module to the process (transmission of read result), the PROFINET interface on the device can also be used for a separate interface to HMI or a control desk.

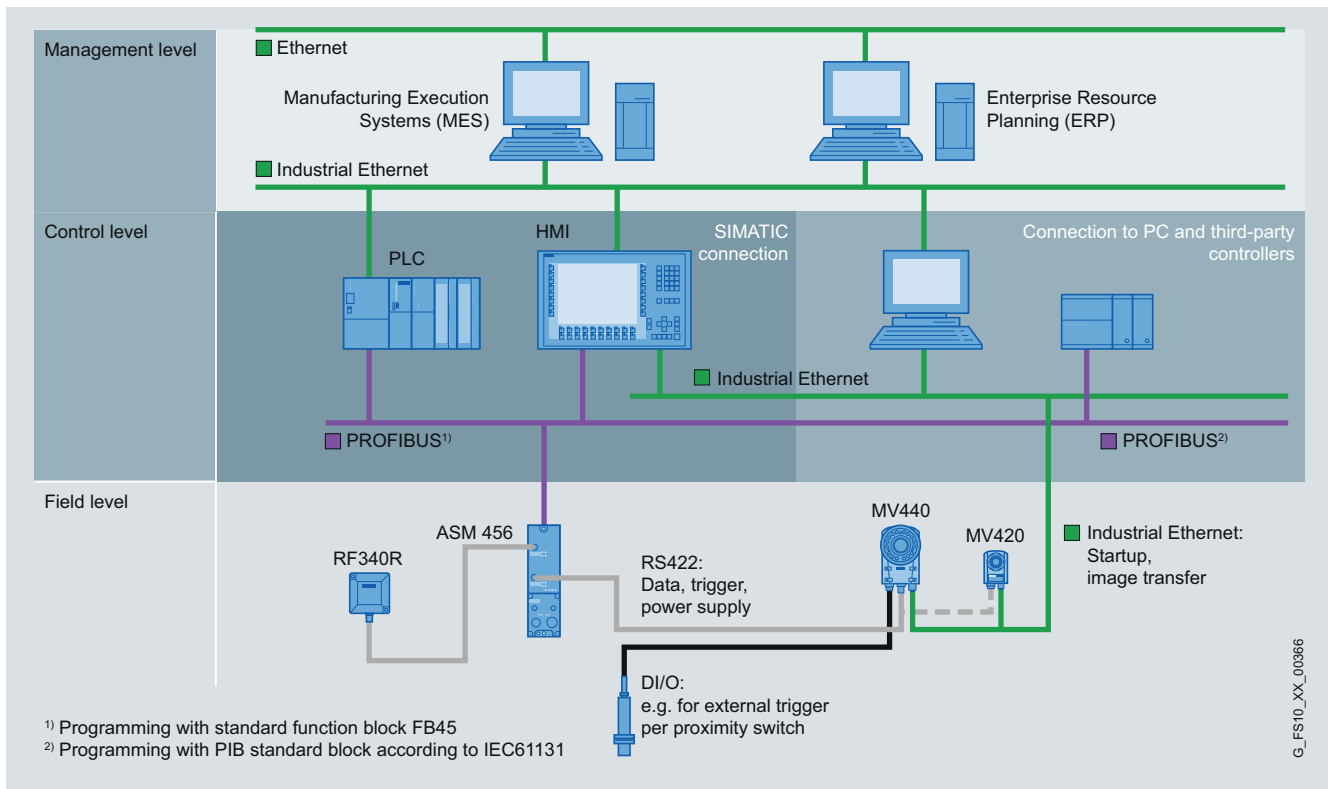
Code reading systems

Stationary code reading systems

SIMATIC MV440



Integration of SIMATIC MV420/MV440 with the SIMATIC RF180C communication module

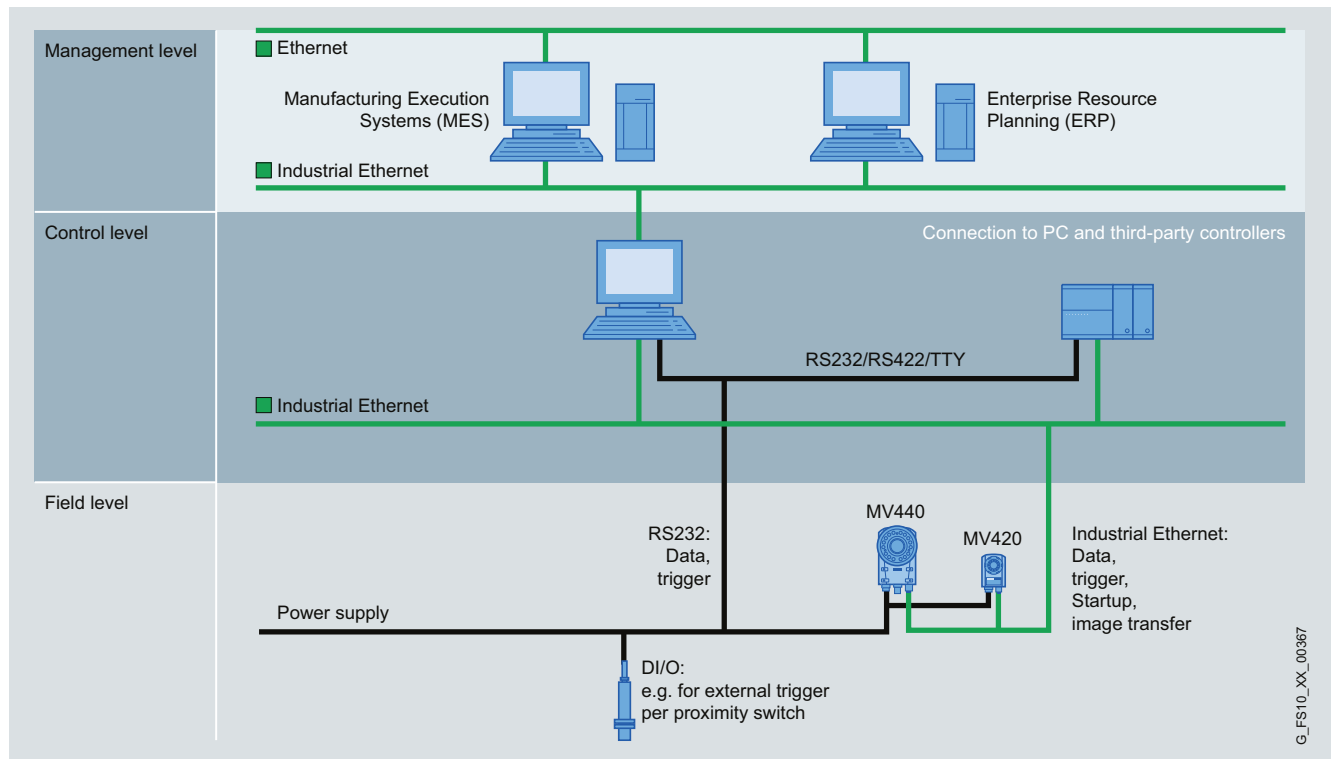


Integration of SIMATIC MV420/MV440 with the ASM 456 communication module

Code reading systems

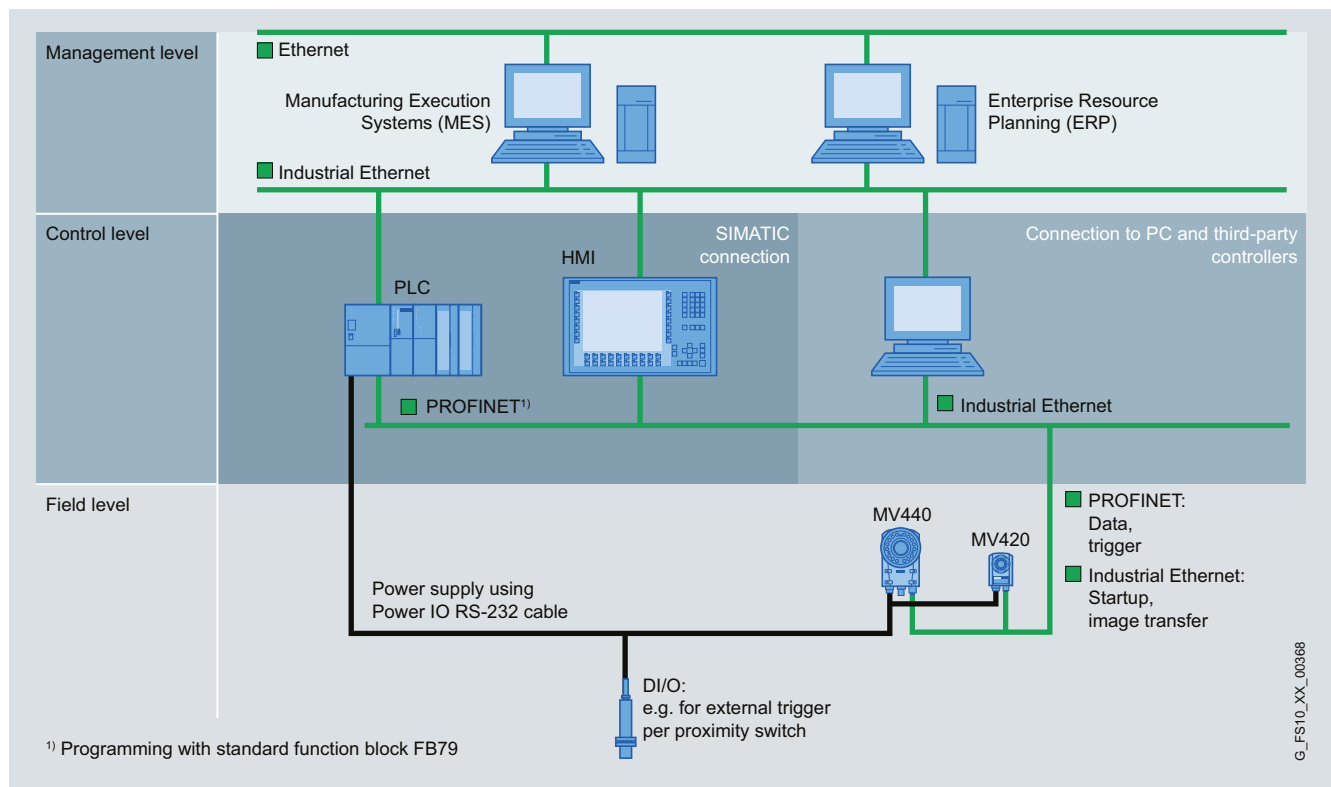
Stationary code reading systems

SIMATIC MV440



Integration of SIMATIC MV420/MV440 with a non-Siemens controller

6



Integration of SIMATIC MV420/MV440 with a direct connection to PROFINET or Ethernet

Code reading systems

Stationary code reading systems

SIMATIC MV440

Technical specifications

Code reading system	SIMATIC MV440
Basic unit	
Image acquisition	- SIMATIC MV440 SR: CCD chip 1/3", 640 x 480 square pixels - SIMATIC MV440 HR: CCD chip 1/3", 1024 x 768 square pixels - SIMATIC MV440 UR: CCD chip 1/1.8", 1600 x 1200 square pixels
Shutter	Full frame shutter with automatic exposure time
Image data transfer	Triggered frame transfer
Available versions	
• Variable field of view	Freely selectable image field size, reading distance and sensor resolution, depending on selected lens
Supply voltage	
• From power / IO connector M16	24 V DC
• From Power-over-Ethernet (PoE) according to IEEE802.3af	48 V DC (min. 36 V DC, max. 57 V DC) Type 1, Class 2 (6.49 W)
Current	
• At 24 V DC, without I/O signals	Max. 270 mA
• For PoE, without I/O signals	Max. 135 mA
• Inrush current	Max. 2 A, < 1 ms
Effective power loss	
• At 24 V DC	6.48 W
• With Power-over-Ethernet according to IEEE802.3af	6.48 W
Vibration	
• $10 \text{ Hz} \leq f < 58 \text{ Hz}$	Const. 1 mm amplitude
• $58 \text{ Hz} \leq f < 500 \text{ Hz}$	Const. 1 g acceleration
Shock according to IEC 60068-2-29	
• Type of shock for the reader	half-sine
• Strength of shock for the reader	10 g peak value, 16 ms duration
• Number and direction of shocks	100 shocks in each of the 3 axes arranged vertically to each other
Digital output signals	
(all output signal values refer to the OUTPUT_COMMON signal)	
• OUTPUT1 ... OUTPUT5	
- Isolated and short-circuit proof	Yes
- Max. load current	50 mA
- Max. short-circuit current	240 mA
- Delay times when switching on and off	0 ... 2 ms
Input signals	
(all output signal values refer to the OUTPUT_COMMON signal)	
• INPUT1	
- Input resistance at 24 V DC	16 k Ω
- Input voltage for "1" signal	15 ... 30 V
- Input current for "1" signal	2 ... 5 mA
- Input voltage for "0" signal	0 ... 5 V
- Input current for "0" signal	0 ... 1.4 mA
• INPUT2 ... INPUT5	
- Input resistance at 24 V DC	16 k Ω
- Input voltage for "1" signal	15 ... 30 V
- Input current for "1" signal	0.6 ... 2 mA
- Input voltage for "0" signal	0 ... 5 V
- Input current for "0" signal	0 ... 0.3 mA

Code reading system	SIMATIC MV440
Strobe signal	
(all strobe signal values refer to the ground of the power supply)	
Rapid strobe output (max. load current at 24 V DC)	25 mA
Interfaces	
• Digital, isolated inputs/outputs	6 parameterizable inputs/outputs; one as high-speed input for triggering image capture 1 image-synchronous output for controlling an external light
• ASM interface	M12 (8-pin) for connecting to a communication module (PROFIBUS/PROFINET)
• Ethernet / PROFINET I/O interface	M12 (4-pin) for operator software, real-time transfer of test results and process interfacing
• Lighting control	10-pin female multipoint connector (socket) for power supply and triggering the built-in ring lamp
Supply voltage	
• Rated value	24 V DC
• Permissible range	20.4 to 28.8 V DC (safety extra-low voltage, SELV)
Fuse protection	Max. 10 A
Enclosure	
• Material/color	Cast aluminum, petrol
• Dimensions W x H x D (mm)	65 x 122 x 55
• Degree of protection	IP67 according to DIN EN 60529
• Weight, approx.	0.45 kg (without protective tube for lens) 0.55 kg (with protective tube for lens)

Code reading systems

Stationary code reading systems

SIMATIC MV440

Selection and ordering data

	Order No.		Order No.
SIMATIC MV440 SR ▶ D For one and two dimensional codes, optional: Text recognition (OCR) and verification, variable image field and distance. Resolution: 640 x 480 pixels PoE; IP67 using protective tube for lens and sealing caps, otherwise IP40; package comprises reader, CD and plastic protective tube for lens.	6GF3 440-1CD10	Lenses with fixed focal length, adjustable aperture and focus Mini lens 8.5 mm, 1:1.5 PENTAX C815B (TH) ▶ H D = 42 mm, L = 47 mm, not suitable in combination with built-in ring lights. Mini lens 12 mm, 1:1.4 PENTAX H1214-M (KP) ▶ H D = 29.5 mm, L = 35.7 mm Mini lens 16 mm, 1:1.4 PENTAX C1614-M (KP) ▶ H D = 29.5 mm, L = 37.2 mm Mini lens 25 mm, 1:1.4 PENTAX C2514-M (KP) ▶ H D = 29.5 mm, L = 38.9 mm Mini lens 35 mm, 1:1.6 PENTAX C3516-M (KP) ▶ H D = 29.5 mm, L = 41.4 mm Mini lens 50 mm, 1:2.8 PENTAX C5028-M (KP) ▶ H D = 29.5 mm, L = 38 mm Mini lens 75 mm, 1:2.8 PENTAX C7528-M (KP) ▶ H D = 34 mm, L = 63.6 mm, not suitable in combination with protective tube for lens D65, suitable in combination with protective tube for lens D50.	6GF9 001-1BE01 6GF9 001-1BL01 6GF9 001-1BF01 6GF9 001-1BG01 6GF9 001-1BH01 6GF9 001-1BJ01 6GF9 001-1BK01
SIMATIC MV440 HR ▶ D For one and two dimensional codes, optional: Text recognition (OCR) and verification, variable image field and distance. Resolution: 1024 x 768 pixels PoE; IP67 using protective tube for lens and sealing caps, otherwise IP40; package comprises reader, CD and plastic protective tube for lens.	6GF3 440-1GE10	Protective tube for lens Protective tube for lens D65 made of metal, for built-in ring lights, internal diameter 57 mm, max. lens length 57 mm, IP67 degree of protection. • Glass front pane ▶ • Plastic front pane ▶	6GF3 440-8AC11 6GF3 440-8AC21
SIMATIC MV440 UR ▶ D For one and two dimensional codes, optional: Text recognition (OCR) and verification, variable image field and distance. Resolution: 1600 x 1200 pixels PoE; IP67 using protective tube for lens and sealing caps, otherwise IP40; package comprises reader, CD and plastic protective tube for lens.	6GF3 440-1LE10	Protective tube for lens D65 ▶ B made of plastic; to achieve IP67 degree of protection; suitable for all variants of MV440 and for use with built-in ring lights; max. internal diameter 55 mm, max. lens length 48 mm Protective tube for lens D50 made of metal, for external ring lights, internal diameter 41 mm, length from joint 65 mm IP65 degree of protection. With 3 cm extension piece for particularly long lenses.	6GF3 440-8AC12 6GF9 002-7AA 6GF9 002-7AA01
Optional software modules Text recognition module "Text-Genius" D License for the module "Text-Genius", supplied on USB flash drive; executable on SIMATIC MV440 firmware V3.0 and higher (MV440 not included in the scope of supply). Description see page 6/52	6GF3 400-0SL01		
Verification module "Veri-Genius" D License for the module "Text-Genius", supplied on USB flash drive; executable on SIMATIC MV440 firmware V3.0 and higher (MV440 not included in the scope of supply). Description see page 6/48	6GF3 400-0SL02		
Accessories Mounting-Accessories Mounting plate for external ring lights B Dimensions W x H x D (mm) 92 x 79 x 42, plate thickness: 4 mm	6GF3 440-8CA		
		• Glass front pane ▶ • Plastic front pane ▶	

Code reading systems

Stationary code reading systems

SIMATIC MV440

Order No.	
Built-in ring lights	
• Built-in ring light, red ▶ B Light source: Red LED (630 nm), range of illumination 800 mm, mounting materials included, IP67 degree of protection when using protective tube for lens.	6GF3 440-8DA11
• Built-in ring light, white ▶ B Light source: LED white (440 nm ... 650 nm), flash duration 20 µs to 10 ms, range of illumination up to 800 mm, mounting materials included, IP67 degree of protection when using protective tube for lens.	6GF3 440-8DA2
External ring lights	
 Figure shows metal ring light with protective lens enclosure; 2 small mounting brackets are enclosed	
• Ring light, metal, IR, diffuse Light source infrared LED Light source 850 nm, range of illumination 75 mm ... 250 mm, suitable for protective tube for lens D50, dimensions W x H x D (mm) 116 x 116 x 42, IP67 degree of protection.	6GF9 004-7AA01
• Ring light, metal, IR, clear Light source infrared LED, light source 850 nm, range of illumination 500 mm ... 3 000 mm, suitable for protective tube for lens D50, dimensions W x H x D (mm) 116 x 116 x 42, IP65 degree of protection.	6GF9 004-7BA01
• Ring light, metal, red, diffuse ▶ Light source red LED Range of illumination 75 mm ... 250 mm, suitable for protective tube for lens D50, dimensions W x H x D (mm) 116 x 116 x 42, IP67 degree of protection.	6GF9 004-8BA01
• Ring light, metal, red, clear Light source red LED, range of illumination 150 mm ... 2 000 mm, suitable for protective tube for lens D50, dimensions W x H x D (mm) 116 x 116 x 42, IP67 degree of protection.	6GF9 004-8CA01

Order No.	
• Ring light, metal, red, clear ▶ Light source red LED, range of illumination 500 mm ... 3 000 mm, suitable for protective tube for lens D50, dimensions W x H x D (mm) 116 x 116 x 42, IP67 degree of protection.	6GF9 004-8DA01
Mounting plate for external ring lights B Dimensions W x H x D (mm) 92 x 79 x 42, plate thickness: 4 mm.	6GF3 440-8CA
Cable for external ring lights ▶ suitable for 6GF9 004-7AA01, ... -7BA01, ... -8BA01, ... -8CA01, ... -8DA01, M12, open end, 4-pole, non-trailing type, length 10 m.	6GF3 440-8BC4
Cable for external ring lights ▶ B suitable for 6GF9 004-7AA01, ... -7BA01, ... -8BA01, ... -8CA01, ... -8DA01, M12-90 male connector / M12-180 female connector, 4-pole, length 10 m.	6GF9 002-8CG
Rail-mounted power supply for external ring lights ▶ suitable for 6GF9 004-7AA01, ... -7BA01, ... -8BA01, ... -8CA01, ... -8DA01, input voltage 110 V ... 230 V AC, output voltage 16.5 V DC.	6GF9 002-8PS
Cable power supply DIO RS232 Power IO RS232 cable, M16 pre-assembled at one end, other end unconnected.	
Length 10 m ▶ B	6GF3440-8BA2
Length 30 m ▶ B	6GF3440-8BA4
Ethernet cable for commissioning and service ▶ B M12 connector, 8-pin, RJ45 connector, length: 2 m.	6GF3 440-8BB1
Industrial Ethernet cable for commissioning, service and installation M12 connector, 8-pin, RJ45 connector (IE FC RJ45 Plug 145), length: 2 m.	6XV1 871-5TH20

Code reading systems

Stationary code reading systems

SIMATIC MV440

Order No.	
Industrial Ethernet cable (M12-180/M12-180) for installation ▶ Pre-assembled IE FC P Trailing Cable GP 2 x 2 (PROFINET Type C) with two 4-pin M12 connectors (D-coded), IP65/67 degree of protection, RJ45 assembly possible with 6GK1 901-1BB10-2AA0 (see below). Available in the following lengths:	
0.3 m	6XV1 870-8AE30
0.5 m	6XV1 870-8AE50
1 m	6XV1 870-8AH10
1.5 m	6XV1 870-8AH15
2 m	6XV1 870-8AH20
3 m	6XV1 870-8AH30
5 m	6XV1 870-8AH50
10 m	6XV1 870-8AN10
15 m	6XV1 870-8AN15
Industrial Ethernet FastConnect plug connector, 2x2, 180° cable outlet ▶ RJ45 plug connector (10/100 Mbit/s) with rugged metal enclosure and FastConnect connection method, for Industrial Ethernet FastConnect cable 2x2. For further cables, see Catalog IK PI under "Passive network components".	6GK1 901-1BB10-2AA0
Cable for communication module interface ASM cable for connection to communication modules, e.g. ASM 456, RF160C, RF170C, RF180C, and RF182C, plug-in cable pre-assembled for SIMATIC MV440. Available in the following lengths:	
2 m ▶	6GT2 891-4FH20
5 m ▶	6GT2 891-4FH50
10 m ▶	6GT2 891-4FN10
20 m ▶	6GT2 891-4FN20
50 m ▶	6GT2 891-4FN50

▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

D: Subject to export regulations AL = N and ECCN = EAR99S

H: Subject to export regulations AL = 91999 and ECCN = N

Code reading systems

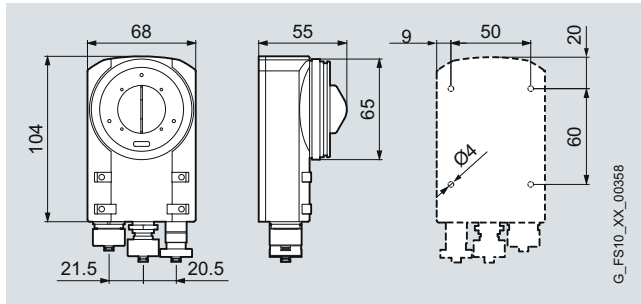
Stationary code reading systems

SIMATIC MV440

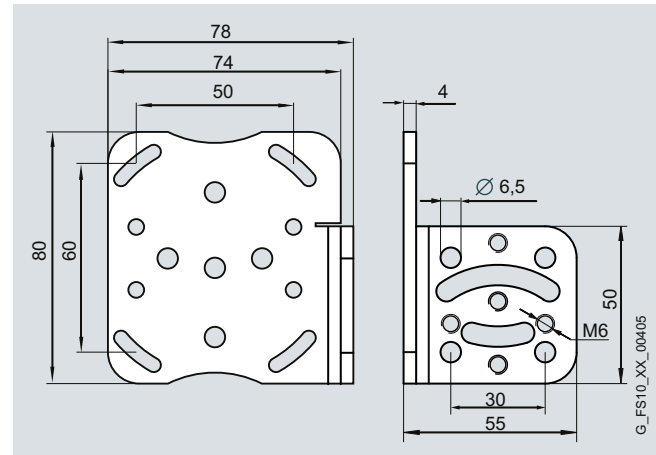
Dimensions

Dimensional drawing available as CAD graphic (DXF format).
You can find additional information in the Internet at:

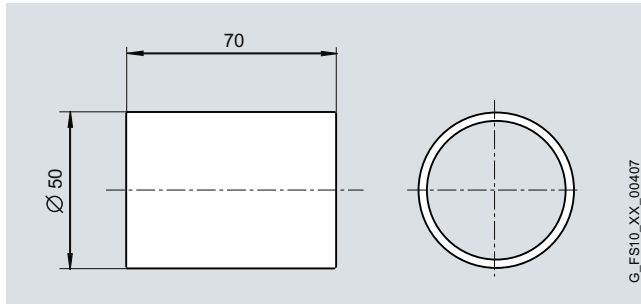
http://www.automation.siemens.com/bilddb/index.asp?objKey=G_FS10_XX_90374



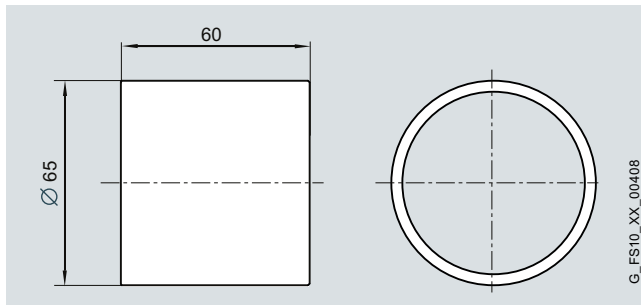
Stationary SIMATIC MV440 code reading system



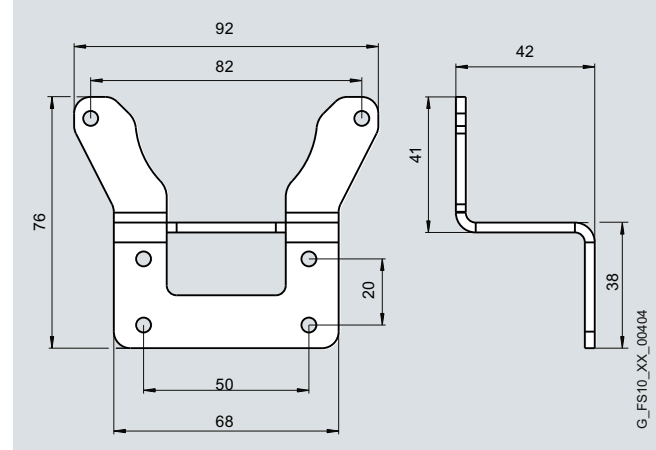
Mounting bracket for code reading system SIMATIC MV440



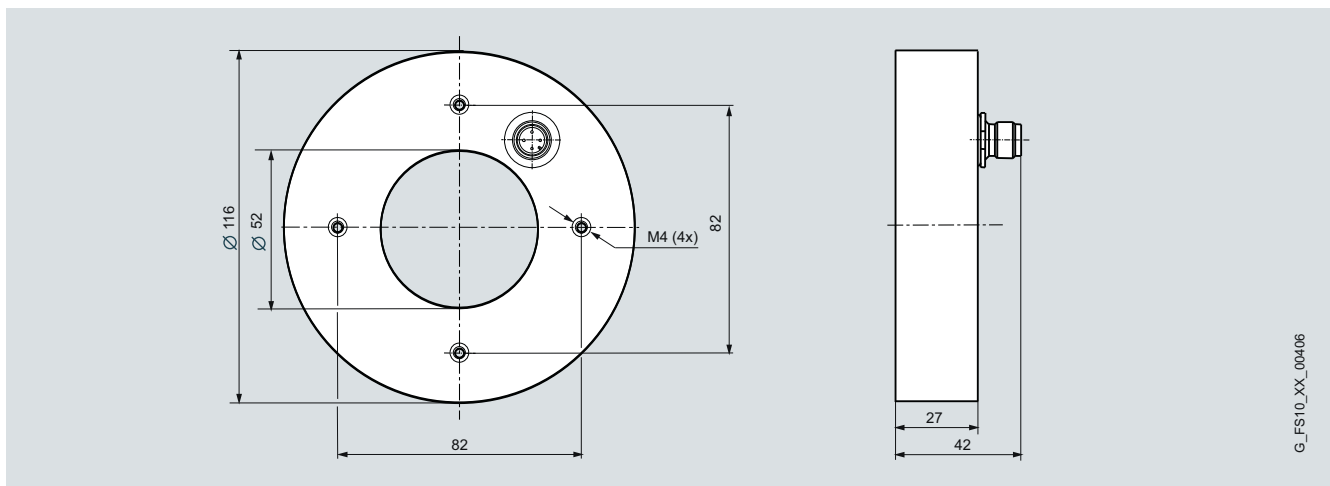
D50 protective tube for lens (without the 3 cm extension piece)



D65 protective tube for lens



Mounting bracket for external ring light



External ring light

Code reading systems

Stationary code reading systems

SIMATIC VS130-2

Overview



The SIMATIC VS130-2 has been specially developed for reading Data Matrix Codes (DMC) ECC200 in industrial environments. It can, however, also read other 2D codes and 1D codes.

The SIMATIC VS130-2 combines industry-standard code reading with industry-standard communication - PROFIBUS and PROFINET (optionally). The reader is perfectly integrated into the SIMATIC S7 automation environment using a standardized function block.

The SIMATIC VS130-2 reads codes on many different components and surfaces, such as paper or plastic labels, plastic parts, printed circuit boards, metallic objects.

The SIMATIC VS130-2 reads codes of marked using different methods, e.g. printed, punched, lasered, drilled.

No parameters have to be entered by the user for adapting to the different carrier materials and marking types. "Training" is performed automatically by presenting a readable code pattern. Programming and parameterization are not required.

The user parameterizes the SIMATIC VS130-2 by means of a web-based user interface which runs on various platforms with the following requirements: Browser (IE5.5 and higher), JAVA-VM (MS, SUN).

The web-based operator interface is also used for controlling the device from an HMI device. The specified conditions also apply in this case regarding the browser and JAVA-VM.

The SIMATIC VS130-2

- offers a remote maintenance concept via a web-based user interface
- can be remote-controlled via integrated digital inputs, PROFIBUS or PROFINET IO
- is available as a complete package in several variants for different code sizes
- is available in 6 language versions (operator interface, manual and online help are available in German, English, French, Spanish, Italian, and Chinese).

Readable codes

1D codes (barcodes)

- Code 39,
- Code 128,
- Interleave 2/5,
- EAN13.

2D codes

- Data matrix code (DMC) according to ECC200,
- QR (alphanumeric characters; without sub-variants: truncated, macro, micro),
- PDF417 (without subvariants: macro, micro),

Application

The SIMATIC VS130-2 can be generally used for the following applications:

- Coded information can be read out.
- Comparing the coded information with a defined character sequence.
- Measurement of the code quality (exclusively DMC).

Barcodes

The SIMATIC VS130-2 reads the barcodes (Code 39, Code 128, Interleave 2/5, EAN13) in different sizes:

- Fixed focus sensor head (640 x 480): up to 60 mm code width,
- C/CS sensor head (640 x 480 or 1024 x 768): Code width depends on the selected lens.

The main condition for reading is that the smallest code structure element (the thinnest line) has to be at least 3 pixels wide to ensure good readability.

Data matrix code

The SIMATIC VS130-2 can decode data matrix codes of the following matrices in various sizes:

- Square: 10 x 10 dots up to 72 x 72 dots
- Rectangular: 8 x 18 dots up to 16 x 48 dots

The parameter "Dot size" and the reading distance are defined by the optics selected and can vary over a wide range:

- Readable dot size 0.1 mm to >3 mm.
- Reading distance 80 mm to 3000 mm.

PDF417

The SIMATIC VS130-2 can decode PDF417 in various sizes:

- Fixed focus / C/CS sensor head (640 x 480): Up to 50 lines of code, up to 7 columns of code
- C/CS sensor head (1024 x 768): Up to 80 lines of code, up to 15 columns of code.

QR

The SIMATIC VS130-2 can decode QR in various sizes:

- Fixed focus / C/CS sensor head (640 x 480): Up to 89 x 89 dots
- C/CS sensor head (1024 x 768): Up to 145 x 145 dots.

Common properties

Code readability is basically not connected to the type of marking or support material, as long as the marked structure and the background are different optically.

Possible marking systems include, for example:

- Laser inscription systems
- Inkjet printers

Examples of possible surfaces and materials are:

- Different types of PCB.
- Plastic parts of various colors.
- Labels of various colors.
- Electronic components.
- Metallic objects, etc.

Code reading systems

Stationary code reading systems

SIMATIC VS130-2

Design

The following components are necessary when using the SIMATIC VS130-2 and are included in the scope of supply of a fixed-focus complete package (working distance approx. 100 mm):

- Fixed focus sensor head (3 image field sizes selectable)
- Incident light in the form of a ring lamp, matched to the application and sensor head
- Processing unit
- Plug-in cables
- CD with mounting/operating instructions

"C/CS-Mount complete packages" are available for working distances between 80 mm and 3000 mm:

- C/CS-Mount sensor head (standard resolution 640 x 480 pixels, high-resolution 1024 x 768 pixels)
- Processing unit
- Plug-in cables
- CD with mounting/operating instructions

The core of this package is a C/CS-Mount sensor head whose imaging behavior is determined by selecting a suitable C/CS-Mount lens. The lens is not a component part of the package and can be selected under accessories. The lighting (including cables) must also be selected in accordance with the working distance and is not included in the "C/CS-Mount complete package".

For commissioning, the following items are also required (not included in the scope of supply):

- Ethernet cable (see accessories) for connecting the processing unit to any preferred web client. The web client, e.g. PC with installed web browser, is used to adjust the sensor head and the lighting.

Sensor head

The sensor head is equipped with:

- Aluminum profile housing to IP65 degree of protection.
- CCD chip (640 x 480 square pixels, 1024 x 768 square pixels).
- Lens, permanently installed (possible image field sizes: 70 x 50 mm, 40 x 30 mm, 20 x 15 mm for 640 x 480 pixels in each case) or prepared for C/CS-Mount lens (freely selectable image field size with 640 x 480 pixels or 1024 x 768 pixels)
- Interface for digital transmission of the image data to the processing unit.

The fixed focus sensor head offers IP65 degree of protection. Even when C/CS-Mount lenses are used, IP65 degree of protection can be achieved by means of the optional protective enclosure.

Processing unit

The processing unit has:

- Plastic enclosure designed for cabinet-free installation (IP40).
- Connections for:
 - 24 V DC power supply
 - Lighting
 - Sensor head
 - Digital inputs and outputs
 - PROFIBUS DP
 - Ethernet (DHCP client, DHCP server, fixed IP address)
- Operator prompting on the device (4-line text display, 6 keys).
- User guidance in web-based user interface (HTML, JAVA VM)
- Access protection using password

The following communication services are included:

- PROFINET IO (slave)
- PROFIBUS DP V0 (slave)
- TCP/IP native

Incident lighting

- Designed as ring lamp, pushed onto the sensor head or protective lens enclosure
- Can be removed and fixed at a different angle on the machine
- Housing to IP65 degree of protection
- Equipped with different LEDs for different applications:
 - Unfocussed, for short reading distances (0.08 m to 0.5 m)
 - Focussed, for long reading distances (0.5 m to 3 m)
 - Infrared LED for operation without daylight
 - Red LED to generate high light levels
 - Operation in flash mode
 - Energy control for the flash integrated into the lamp.

Function

The following functions are available:

- "Training" the SIMATIC VS130-2 on the basis of a code (DMC) pattern.
- Reading out the coded information.
- Comparing the coded information with a defined character sequence.
- Measuring the code quality.
- Processing code on moving or stationary objects.
- Output of the decoding results on three control outputs:
 - READ: Code is being decoded.
 - MATCH: Decoded contents of the code matches the reference exactly.
 - N_OK: Code cannot be decoded.
- The decoded DMC information is output over PROFIBUS DP or Ethernet or via a converter on the RS232 interface.
- Formatting the output.
- Integrated DI/O, for example, for "stand-alone" operation without additional controller.
- Remote control capability over PROFIBUS DP, PROFINET IO, DI/O or Ethernet.
- Remote maintenance capability over web-based Intranet or Internet user interface:
 - Monitoring (live image in reading mode).
 - Diagnostics (fault descriptions, log information, etc.).
 - System administration (software update, etc.).
 - Fault analysis for searching for the causes of failed reads.
- Activation of the ring lighting

Mode of operation

The following steps are necessary for using the SIMATIC VS130-2:

- Mounting the SIMATIC VS130-2 and lighting.
- Manual alignment of the camera, checking the light level:

The web server integrated into the device complete with a web-based user interface is available for this purpose. The user interface displays the camera image and the decoded result. The sensor head can be aligned in the alignment phase on the basis of the live image in the user interface. The user interface is executable on any PC with Microsoft Internet Explorer and a JAVA VM installation. If the sensor head is correctly aligned, the VS130-2 automatically continues with the subsequent procedure:

 - Optimization of the lighting control.
 - "Training" the image processing parameters by presenting a code pattern. The image processing parameters are saved for the current code (carrier material, type of marking, dot size, matrix size, etc.). No other parameters have to be entered.

Code reading systems

Stationary code reading systems

SIMATIC VS130-2

- Evaluation mode (RUN mode) starts using the training results and the start of a read:
The Data Matrix Code can be fed manually or over a conveyor. The Data Matrix Code must lie within the inspection window at the moment of triggering (start of reading) and can move at a maximum speed of 5000 mm/s. Any angle of rotation is permitted within the inspection window of the sensor head.

SIMATIC VS130-2 has three basic operating modes which can also be combined:

- Operating mode 1 "Code decoding":
The character string is transferred to the controller filtered or unfiltered. The filters that can be used are separators, start position and length of the character string or company-specific identification numbers.
- Operating mode 2 "Comparing decoded information with any preferred character string":
The comparison can refer to the decoded character string or only a specific part of it. Partial comparison is possible using one of the above-mentioned filter functions.
- Operating mode 3 "Measuring the code quality":
Absolute or relative measuring is possible. With the relative method, a reference pattern is presented during the training phase to calibrate the reading system. Quality values measured in this mode relate to the reference pattern. VS130-2 can also be used for absolute measurements. In this case, neither a calibration procedure nor reference pattern is required.
- Set the digital control outputs READ, MATCH or N_OK according to the operating mode and evaluation result.
- Output the decoded information over PROFIBUS DP, PROFIBUS IO, Ethernet or serial interface (converter required) as required and on the device display.

Programming

The SIMATIC VS130-2 is not programmed or parameterized in the same manner as conventional vision systems. It configures the lighting and trains the algorithms without the need for user entries on the basis of a code pattern or during the first read.

Training is possible with the conveyor running. Self-parameterization can be started externally via the control keys on the device or remote-controlled from the user interface. Self-parameterization can also start during reading if a read attempt fails. The reliability of reading is maximized due to the lack of user input and due to automatic self-parameterization.

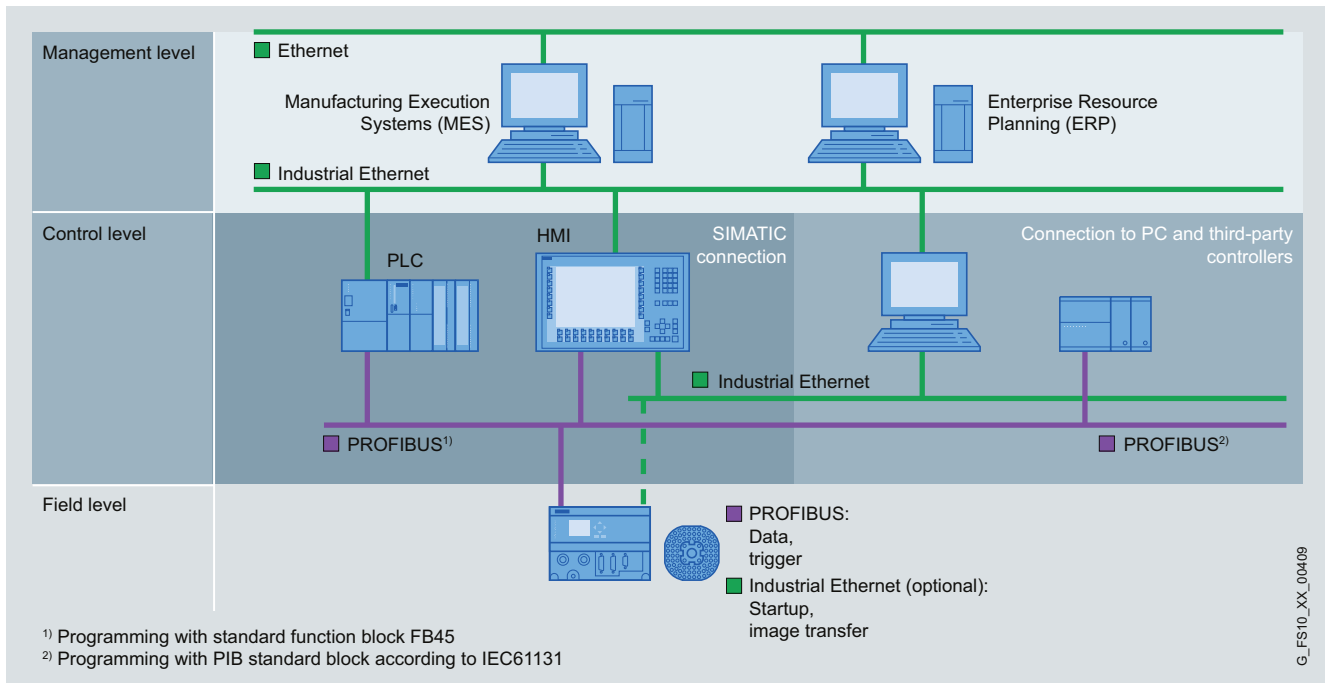
Up to 15 different parameter sets can be saved in the device. These can be called up by the operator or from an external controller at any time and can be used for code reading or for another training phase..

Code reading systems

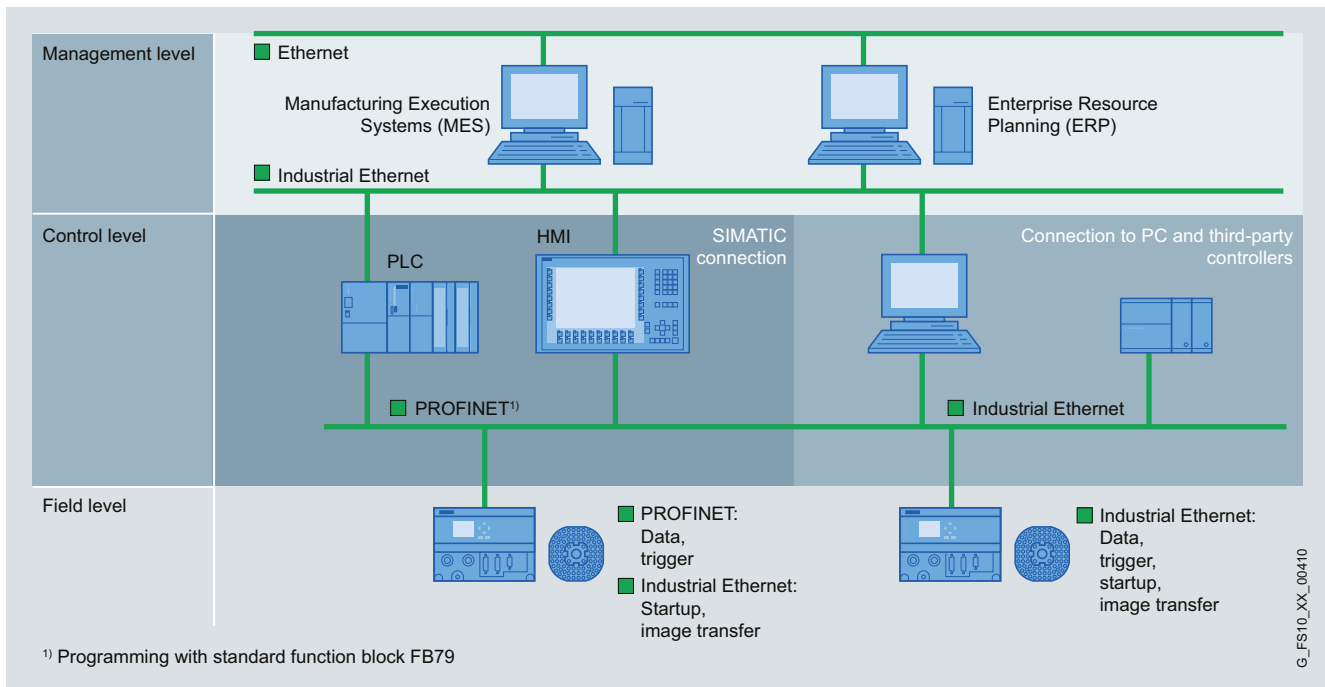
Stationary code reading systems

SIMATIC VS130-2

Integration into the automation environment



Integration of the SIMATIC VS130-2 with direct connection to PROFIBUS



Integration of the SIMATIC VS130-2 with a direct connection to PROFINET or Industrial Ethernet

Code reading systems

Stationary code reading systems

SIMATIC VS130-2

Technical specifications

Code reading system	SIMATIC VS130-2
Sensor head	
Image acquisition	CCD chip 1/4", 640 x 480 square pixels; CCD chip 1/3", 1024 x 768 square pixels; Full frame shutter with automatic exposure
Image data transfer	Triggered frame transfer
Available versions	- Non-adjustable lens for three different image field sizes and reading distances, only available for 640 x 480 - Two C/CS-Mount versions (without lens): User-defined image field size and scanning distance
• Large field of view	Size of field of view: 70 mm x 50 mm Dot size: 0.60 mm - 3.5 mm (edge length) Operating distance: 120 mm
• Medium-sized field of view	Size of field of view: 40 mm x 30 mm Dot size: 0.35 mm - 2.0 mm (edge length) Operating distance: 85 mm
• Small field of view	Size of field of view: 20 mm x 15 mm Dot size: 0.2 mm - 1.0 mm (edge length) Operating distance: 75 mm
• Variable field of view	Freely selectable image field size, scanning distance and sensor resolution, depending on: - Selected lens - Selected sensor head resolution 640 x 480 pixels or 1024 x 768 pixels Minimum requirement: 5 pixels/dot
Enclosure	Extruded aluminum housing, black anodized
Dimensions W x H x D (mm)	42 x 42 x 100
Degree of protection	IP65
Ambient temperature	0 ... 50 °C
Mechanical load	
• Vibrations	1 g (60 ... 500 Hz)
• Shock	70 g (6 ms, 3 shocks)
Lighting	
Illuminant	LED, wavelength 630 nm (red) or infrared, designed as a flash of 20 µs to 10 ms, diffuse or clear
Enclosure	Plastic ring light, operating range up to 500 mm or metal ring light, operating range up to 3000 mm, suitable for protective tube for lens
Dimensions W x H x D (mm)	
• Plastic	102 x 102 x 26.5
• Metal	116 x 116 x 42
Degree of protection	IP65
Ambient temperature	0 ... 50 °C

Code reading system	SIMATIC VS130-2
Processing unit	
Operator controls	4-line text display and 6 operator buttons
"Teach-in" of DMC ("training")	Fully-automatic training procedure
Number of objects saved	15 different parameter sets, selectable using operator buttons or digital inputs, powerfail-proof storage
Triggering inspection	External (through digital input)
Permissible object rate, max.	20 reads/s
Infeed direction of the objects	
• For external triggering	Any
• Setup software	Software for displaying the sensor image when mounting and adjusting the sensor head and lighting. The software makes the integral web server available directly and requires an installed browser (Internet Explorer 5.5 and higher) and installed JAVA-VM (Microsoft or SUN).
Enclosure	Plastic, all cables can be plugged in, suitable for installation without cabinet
Dimensions W x H x D (mm)	170 x 140 x 76
Degree of protection	IP40
Ambient temperature	0 ... 50 °C
Mechanical load	
• Vibrations	1 g (60 ... 500 Hz)
• Shock	70 g (6 ms, 3 shocks)
Interfaces on processing unit	
• Digital inputs for 24 V DC	8; of which one interrupt-capable trigger input for standard binary sensors, 7 further PLC-capable control inputs
• Digital outputs for 24 V DC	6; of which 3 quality outputs 0.5 A are for the direct activation of pneumatic valves (15-pin Sub-D socket for inputs/outputs)
• Integral PROFIBUS DP interface	DP (9-pin sub-D socket) for real-time transfer of the test results
• Integral PROFINET I/O interface	RJ45 (socket) for operator software, real-time transfer of test results and process interfacing
• Integrated Ethernet interface	RJ45 (socket) for operator software, transfer (not real-time) of test results and process interfacing
• Lighting control	4-pin circular connector (female) for power supply and for triggering the flash
• Sensor head interface	Digital interface (26-pin Sub-D socket) for connecting the VS110 sensor head
Supply voltage	
• Rated value	24 V DC
• Permissible range	20 to 30 V DC
Current consumption, max.	4 A, of which up to 1.5 A for supplying the pneumatic valves that can be connected

Code reading systems

Stationary code reading systems

SIMATIC VS130-2

Selection and ordering data

	Order No.		Order No.
SIMATIC VS130-2 Complete package for object inspection; comprising sensor head, LED incident light (ring lamp 6GF9 004-8BA), processing unit and the following cables: • Cable between processing unit and sensor head, for lengths see below • Cable between lighting and processing unit (except for reading system with variable field of view), for length see below • Cable for power supply, length 10 m • Cable for connecting digital I/O devices, length 10 m Incl. documentation package for SIMATIC VS130-2. • Field of view 70 mm x 50 mm - With cable length 2.5 m ▶ D 6GF1 130-1BA - With cable length 10 m ▶ D 6GF1 130-1BA01 • Field of view 40 mm x 30 mm - With cable length 2.5 m ▶ D 6GF1 130-2BA - With cable length 10 m ▶ D 6GF1 130-2BA01 • Field of view 20 mm x 15 mm - With cable length 2.5 m ▶ D 6GF1 130-4BA - With cable length 10 m ▶ D 6GF1 130-4BA01 • Variable field of view with 640 x 480 pixels and prepared for IP65 protective housing (note: Delivery without light and light cable). - With cable length 2.5 m ▶ D 6GF1 130-3BB - With cable length 10 m ▶ D 6GF1 130-3BB01 • Variable field of view with 1024 x 768 pixels and prepared for IP65 protective housing (note: Delivery without light and light cable). - With cable length 2.5 m ▶ D 6GF1 130-3BC - With cable length 10 m ▶ D 6GF1 130-3BC01		Protective tube for lens for external lighting, internal diameter: 41 mm, length from mount: 65 mm, IP65 degree of protection. 	
		Protective tube for lens D50, glass ▶ Front pane: Glass	6GF9 002-7AA
		Protective tube for lens D50, PMMA ▶ Front pane: PMMA	6GF9 002-7AA01
		LED ring lamps (plastic) Dimensions H x W x D (mm) 102 x 102 x 26.5 IP65 degree of protection, not suitable for protective tube for lens D50.	
		LED ring light, red, diffuse ▶ Operating range 75 mm to 0.5 m	6GF9 004-8BA
		LED ring light, red, clear Operating range 75 mm to 1000 mm	6GF9 004-8CA
		LED ring light, infrared, diffuse Operating range 75 mm to 0.5 m	6GF9 004-7AA
		LED ring lights (metal) Dimensions W x H x D (mm) 116 x 116 x 42, suitable for protective tube for lens D50. 	
		Figure shows protective tube for lens; 2 small mounting brackets enclosed	
		LED ring light, infrared, diffuse Light source: 850 nm, range of illumination: 75 mm to 250 mm, degree of protection: IP65.	6GF9 004-7AA01
		LED ring light, infrared, clear Light source: 850 nm, range of illumination: 500 mm to 3 000 mm, degree of protection: IP65.	6GF9 004-7BA01
Accessories Lenses See separate section "Lenses" on page 6/30 			

Code reading systems

Stationary code reading systems

SIMATIC VS130-2

	Order No.
LED ring light, red, diffuse ▶ Light source: 75 mm to 250 mm, degree of protection: IP67.	6GF9 004-8BA01
LED ring light, red, clear Light source: 150 mm to 2 000 mm, degree of protection: IP67.	6GF9 004-8CA01
LED ring light, red, clear ▶ Light source: 500 mm to 3 000 mm, degree of protection: IP67.	6GF9 004-8DA01
Lamp multiplexer for connecting several ring lights to a VS130-2 evaluation unit 	6GF9 002-7BA
Cables	
Power supply cable ▶ Length 10 m, VS-side plug-in, one free end. This cable is included in the VS130-2 complete package.	6GF9 002-8CA
Cable for LED ring light M12-90 plug / M12-180 socket, trailing type, suitable for: 6GF9 004-7AA01, ...-7BA01, ...-8BA01, ...-8CA01, ...-8DA01, M12, 4-pin, in the following lengths	
2.5 m ▶	6GF9 002-8CE
10 m ▶	6GF9 002-8CG
Digital communication cable ▶ Length 10 m, VS-side plug-in, one free end. This cable is included in the VS130-2 complete package.	6GF9 002-8CB
Sensor cable for sensor head connection Length 10 m, pluggable at both ends, suitable for trailing.	
Length 2.5 m ▶	6GF9 002-8CD
Length 10 m ▶ This cable is included in the VS130-2 complete package.	6GF9 002-8CF
Industrial Ethernet crossed twisted-pair cable 4 x 2, RJ45/RJ45 connector, for commissioning, service and installation, Cat. 6, pre-assembled with 2 RJ45 connectors, length 2 m	6XV1 870-3RH20
Industrial Ethernet twisted-pair cable 4 x 2, RJ45/RJ45 connector, for commissioning, service and installation, Cat. 6, pre-assembled with 2 RJ45 connectors, length 2 m	6XV1 870-3QH20

	Order No.
Supports	
Support for connecting the sensor head with the ring light and for fixing it at the mounting location and adjusting it.	
Ring light holder, coaxial, solid ▶ 2 units 	6GF9 002-7AB
Sensor head support, triple-plate ▶ 	6GF9 002-7AD
Sensor head/ring light holder, solid ▶ 	6GF9 002-7AC

Code reading systems

Stationary code reading systems

SIMATIC VS130-2

	Order No.
IP65 protective enclosure for processing units ▶  contains DIN rail (TH35 according to EN 60715), IP65 degree of protection, ambient temperature (0 ... 50 °C), dimensions W x H x D (mm) 300 x 400 x 210 Possible built-in components (example): 1 VS130-2 processing unit (6GF1 018-3BA), 1 lamp multiplexer (6GF9 002-7BA), 1 Industrial Ethernet Switch (6GK1 08-0BA00), 1 power supply 230 V/120 V AC 1.3/2.2 A; 24 V DC/5 A (6ES7 307-1EA00-0AA0) Cable glands (example): 1 VS100 power supply cable, D = 5.4 mm (6GF9 002-8CA), 1 sensor cable D = 6.8 mm (6GF9 002-8CD or 6GF9 002-8CF), 4 lighting cables D = 4.5 mm (6GF9 002-8CE or 6GF9 002-8CG) 1 digital communication cable D = 7.4 mm (6GF9 002-8CB), 1 serial communication cable D = 5.0 mm (6ES7 90-1BF00-0XA0), 3 Ethernet cables with 2 RJ45 connectors (e.g.: 6XV1 850-2GH20)	6GF9 002-7CA
Standard rail mounting ▶ For mounting the VS130-2 processing unit on a standard rail support.	6GF9 002-7AD

▶ Preferred type, available from stock.

D: Subject to export regulations AL = N and ECCN = EAR99S

Code reading systems

Stationary code reading systems

Lenses

Overview



With a lens suitable for the respective image evaluation task, the size of the image field is determined for the camera image for the required operating distance.

High light intensity and the geometry of the image are extremely important for image evaluation (code reading, form recognition and position detection). High light intensity permits short shutter speeds and consequently a reduction of the blurring due to motion as well as maximizing the range.

Fault-free image geometry optimizes the fault tolerance of image analysis with regard to perspective and unevenness of the surface of the depicted object.

Lenses with fixed focal length and a settable aperture and focus are ideal for this purpose and are therefore preferred.

Application

Code and text recognition

The algorithms of code and text recognition tolerate variations in form and size of the marking. In many applications, code readers must tolerate the influence of perspective distortion. Geometric errors resulting from the imaging often reduce the reading performance of the overall system.

Important selection criteria for the lenses of code readers are fast shutter speeds which guard against blurring due to motion, as well as maximization of the reading distance.

All lenses in this accessories list meet the requirements for code reading and text recognition. In addition, lens accessories (e.g. filters) are available which in conjunction with the accessories of the readers support project-specific configurations.

Form recognition and position location

For form recognition with high reproducibility, is a format-filling high-resolution image is required. Geometric errors resulting from the imaging often reduce the reading performance of the overall system.

Important selection criteria for the lenses of code readers are a fast shutter speed which guards against blurring due to motion, as well as maximization of the range. It is particularly important to maximize the range, since the stability of image analysis rises as the angle of the image field reduces. This is why a large distance from the test object is advantageous.

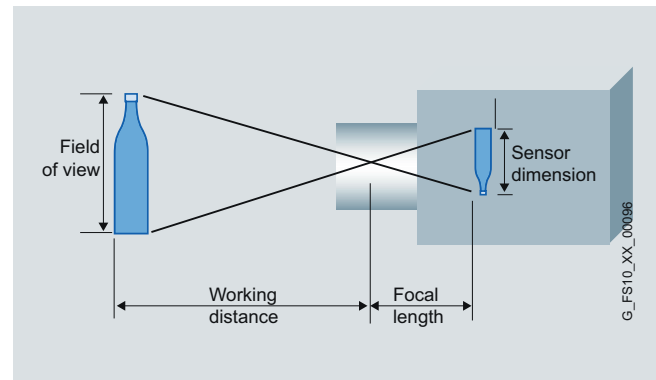
All lenses in this accessories list meet the requirements for shape recognition. In addition, lens accessories (e.g. filters) are available that in conjunction with the accessories of the readers support project-specific configurations.

Function

Image types

The optical path of the lens is defined by its construction.

For **spherical lenses** the solid angle depends on the focal length, focus adjustment and aperture; all rays run through the focal point of the lens (central projection). Objects that are further away from the lens are depicted smaller; objects that are closer to the lens are depicted larger:



The required image field size (height and width of the image), the size of the sensor chip and the focal length of the lens determine the operating distance:

$$d = (f \times IS) / b$$

d = Operating distance (distance from lens to test object) in mm

f = Focal length of the lens in mm

IS = Size of image in the plane of the test object in mm

b = effective dimensions of the sensor in mm

In the case of lenses used in image processing systems, the focal length is fixed, the aperture and focus settings can be fixed. The focal length, the maximum focal aperture and the focusing range are normally specified on the lenses.

Focal distance

The focal length makes a statement about the angle of the image field or magnification of the lens.

The focal length of the lens is determined by the size of the required image field and the size of the camera chip when a specific distance has to be maintained. The most common chip sizes in cameras today are 1/2", 1/3" and 1/4". If the distance to the object lies below the adjustable focusing range of the lens, i.e. at close range, the focus can be adjusted using intermediate rings.

If the back focal length for this camera is dimensioned for CS-Mount lenses, as for VS 130-2, a C-Mount lens can also be focused if a 5 mm extension tube is used.

Aperture

Reduction of the light intensity by interrupting the optical path.

Focus

Setting the focus of the lens to a specific distance.

Depth of field

Depth of field is the area within which (in front of and behind the object) that is displayed with sufficient sharpness of focus. The larger the aperture (the smaller the aperture number), the smaller the depth of field.

Lenses with a larger focal length have a smaller depth of field, the effect is considerable for images at close range.

Lens types

Lenses with smaller focal length are called wide-angle lenses, they can also be used at short operating distances, but produce intense distortion of the image. At a suitable distance, they have a large image field.

Lenses with a long focal length are called telephoto lenses; they have a large magnification but cannot be focused at close range, so macro lenses are used that can be focused by means of large telescopic extensions or intermediate rings. At a suitable distance, they have a small image field.

In the case of telecentric lenses, at least the optical path at the object end is almost parallel (parallel projection). This means that objects at different distances are depicted in the same size. Objects can, however, only be displayed that are smaller than the diameter of the lens. It is not possible to adjust the range of focus with these lenses.

The optical characteristics can be restricted by means of optical filter glasses to counteract distortion in the image. Colored filters limit the spectral range, gray filters limit the light intensity and polarization filters restrict the transmission plane. Filters of this type can be attached either by using the internal thread or the flange on the front of the lens. The holder for the filter glass is designed to fit the lens.

Code reading systems

Stationary code reading systems

Lenses

Selection and ordering data

	Order No.
Lenses for reading code and plain text and parts recognition with fixed focal length, adjustable aperture and focus, with locking screw	
• Mini lens 8.5 mm, 1:1.5 ▶ H 6GF9 001-1BE01 D = 42 mm, L = 47 mm; successor type for 6GF9001-1BE • Mini lens 12 mm, 1:1.4 ▶ H 6GF9 001-1BL01 D = 29.5 mm, L = 35,7 mm • Mini lens 16 mm, 1:1.4 ▶ H 6GF9 001-1BF01 D = 29.5 mm, L = 37,2 mm; successor type for 6GF9001-1BF • Mini lens 25 mm, 1:1.4 ▶ H 6GF9 001-1BG01 D = 29.5 mm, L = 38.9 mm; successor type for 6GF9001-1BG • Mini lens 35 mm, 1:1.6 ▶ H 6GF9 001-1BH01 D = 29.5 mm, L = 41.4 mm • Mini lens 50 mm, 1:2.8 ▶ H 6GF9 001-1BJ01 D = 29.5 mm, L = 38,0 mm; successor type for 6GF9001-1AH • Mini lens 75 mm, 1:2.8 ▶ H 6GF9 001-1BK01 D = 34,0 mm, L = 63,6 mm Cannot be used in conjunction with a ring light	
CS-Mount for C-Mount adapter ring 5 mm B 6GF9 001-1AP02	
Accessories for utilizing the mini lenses at close range:	
Set of extension rings ▶ H 6GF9 001-1BU with 0.5 mm, 1.0 mm, 5.0 mm, 10.0 mm, 20.0 mm, 40 mm rings with 31 mm diameter C thread, to be screwed in between the lens and the camera body for image capture in the macro range.	
Accessories for utilizing the mini lenses in telephoto range:	
Focal length doubler ▶ H 6GF9 001-1BV D = 30.5 mm, L = 17.9 mm, with C-thread to be screwed in between the lens and camera to extend the focal length by a factor of 2. Suitable lenses: 6GF9001-1BE01, ...-1BL01, ...-1BF01, ...-1BG01, ...-1BH01, ...-1BJ01, ...-1BK01	
Filter for utilization of the mini lenses in the limited field of view:	
Infrared filter H 6GF9 001-2AD Function: Visible light is largely or completely filtered out, infrared light can pass through. Application: When used with infrared lamps, it is possible to achieve independence from daylight. Suitable lenses: 6GF9001-1BL01, ...-1BF01, ...-1BG01, ...-1BH01, ...-1BJ01	

	Order No.
Blue filter H 6GF9 001-2AE Function: Blue light can pass through. Application: e.g. to improve the visualization of structures. Suitable lenses: 6GF9001-1BL01, ...-1BF01, ...-1BG01, ...-1BH01, ...-1BJ01	
Polarization filter H 6GF9 001-2AF Function: Filters out light which is directed at right angles to the polarization direction of the filter. Application: e.g. to reduce reflections from metal. Suitable lenses: 6GF9001-1BL01, ...-1BF01, ...-1BG01, ...-1BH01, ...-1BJ01	

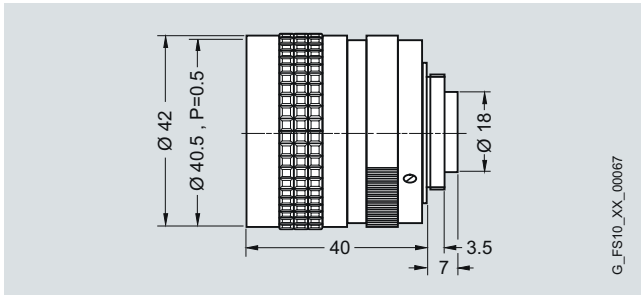
▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

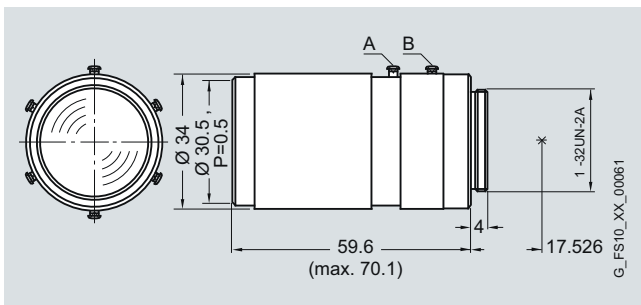
H: Subject to export regulations AL = 91999 and ECCN = N

Dimensions

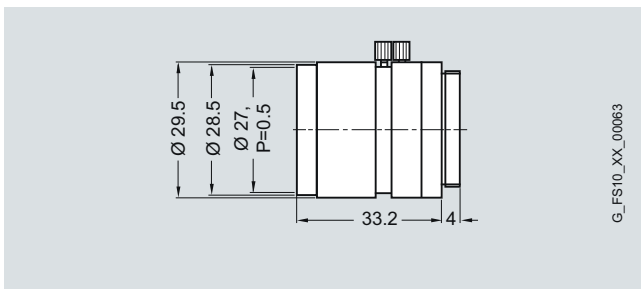
Lenses for reading code and plain text and parts recognition



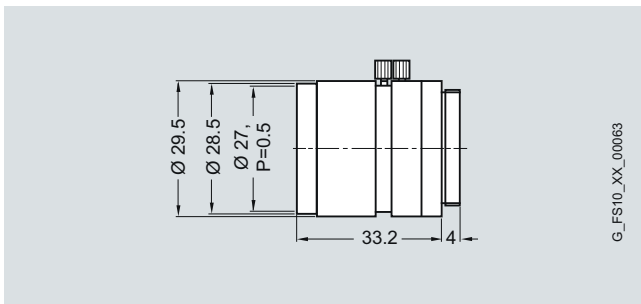
Lens 6GF9 001-1BE01



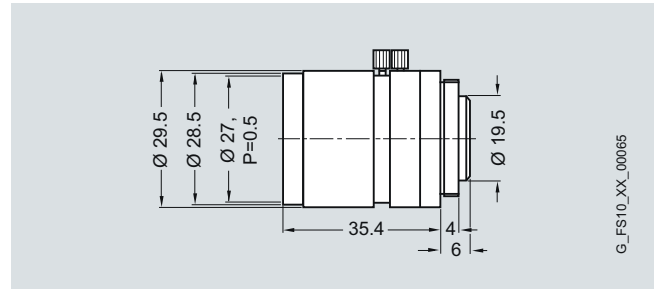
Lens 6GF9 001-1BK01



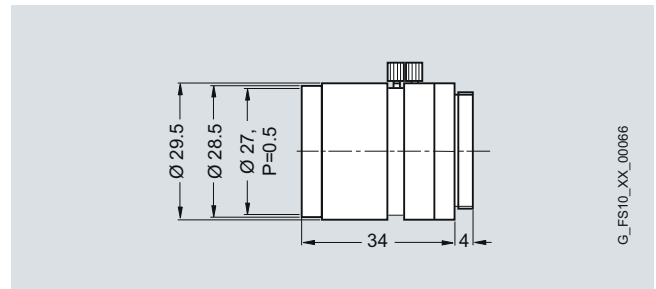
Lens 6GF9 001-1BF01



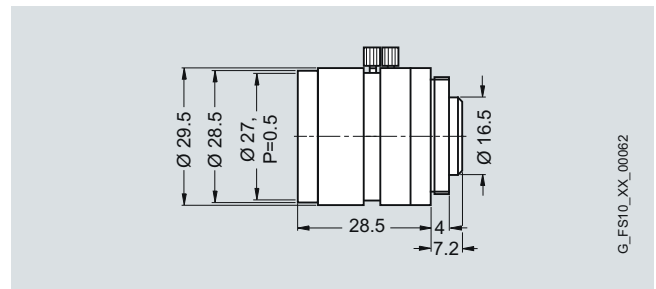
Lens 6GF9 001-1BG01



Lens 6GF9 001-1BH01

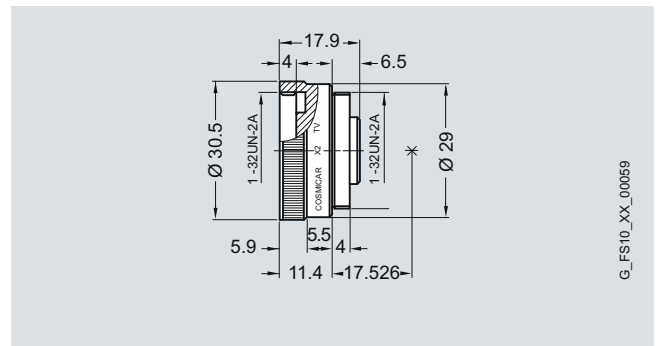


Lens 6GF9 001-1BJ01

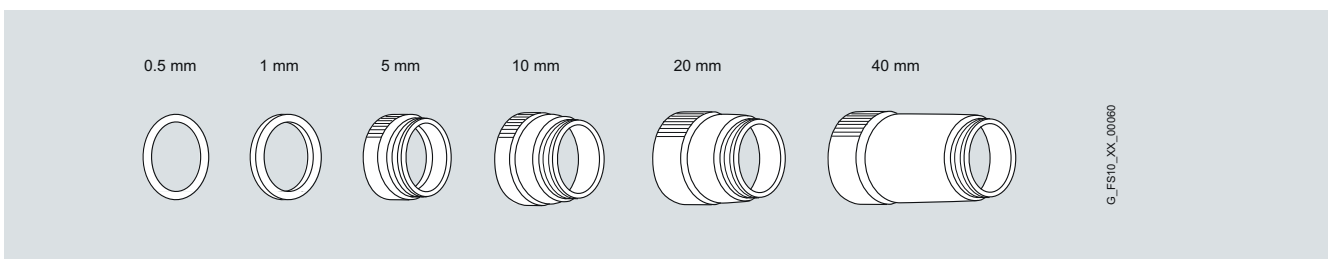


Lens 6GF9 001-1BL01

Accessories for lenses



Focal range doubler 6GF9 001-1BV



Pentax intermediate ring set 6GF9 001-1BU

Code reading systems

Hand-held reading systems

Overview



SIMATIC HawkEye 40/40T

- Handheld read devices that are powerful and suitable for high-resolutions.
- Reading two dimensional (2D) data matrix codes and one-dimensional barcodes.
- Complex image processing functions and lighting technology to read codes on different surfaces.
- SIMATIC HawkEye 40 is suitable for labels with high contrasts. SIMATIC HawkEye 40T is designed for codes with low contrasts, such as are made by e.g. dot peen, laser printers or inkjet printers.
- The HawkEye 40T is also approved as a "Department of Defense Unique Identifier (UID) String Validator".
- Simple connection thanks to various cable standards (USB, RS232, PSD2) and wireless connection with Bluetooth.

SIMATIC HawkEye 45/45T

- Handheld read devices, which combine the best image processing technology with a graphic display and a robust keypad.
- Reads large linear and compressed data matrix codes as well as one-dimensional barcodes without any time delay.
- Continuous adaptation for resolution, lighting and image field to any imaginable code and to the scanned surface, to the size of the characters and to the ambient light.
- High reading speed in decoding data matrix symbols.
- SIMATIC HawkEye 45 is suitable for labels with high contrasts. SIMATIC HawkEye 45T is designed for codes with low contrasts, such as are made by e.g. dot peen, laser printers or inkjet printers.
- The HawkEye 45T is also certified as a "Department of Defense Unique Identifier (UID) String Validator".
- Simple connection thanks to various cable standards and wireless connections.

Major differences

Handheld reading systems	SIMATIC HawkEye 40/45	SIMATIC HawkEye 40T/45T
Operating distance		
• Minimum (code-dependent)	50 mm (1.9")	50 mm (1.9")
• Maximum (code-dependent)	375 mm (14.8")	375 mm (14.8")
Image field		
• Near	25 mm x 15 mm (0.98" x 0.6") at 50 mm (1.9") distance	25 mm x 15 mm (0.98" x 0.6") at 50 mm (1.9") distance
• Distant	150 mm x 90 mm (5.9" x 3.5") at 375 mm (14.8") distance	150 mm x 90 mm (5.9" x 3.5") at 375 mm (14.8") distance
Decoding capability	1D: Code 128, Code 39, Code 93, Int I2of5, Codabar, UPC/EAN/JAN, RSS, Composite, Postal, Codablock F, Code 11, Matrix 2 of 5, MSI Plessy, NEC 2 of 5, Pharmacode, Telepen 2D: Data Matrix, PDF417, Micro PDF 417, QR Code, MicroQR Code, Maxicode, Aztec, GoCode	1D: Code 39, Code 128, Codabar, Code 93, I2of5, UPC/EAN, UPC-E, UPC Supplementals 2D: Data Matrix, PDF417, QR Code
Code creation	Laser, printing	Laser, printing
Interfaces	USB, RS232, PS2, Bluetooth Class 1 (90 m, 300 ft)	USB, RS232, PS2, Bluetooth Class 1 (90 m, 300 ft)

Benefits

- Industry leading Data Matrix reading performance on hard-to-read direct part marks.
- Rugged designs for plant floor use.
- Multiple supported communication protocols including RS232, USB, PS2 and Wireless.
- Read linear barcodes, Data Matrix and other symbologies.
- Drop in replacement for handheld linear barcode readers.

Applications

- Automotive industry
 - Marks on various drive components (cylinder heads, cylinder blocks, elbow joints, etc.)
 - Laser marks on various drive components (cam shafts, crankshafts, pistons, piston rods, gearbox components, etc.)
 - Laser marks on electronic components, PCBs or enclosures
- Aircraft and space industry
 - Marks on various aluminium components of propulsion units
- Medical equipment
 - Laser marks on pacemakers and other implanted devices
 - Laser marks on various medical equipment components and housings
- Electronics
 - Laser marks on rigid and flexible PCBs
- Semiconductors
 - Laser marks on enclosed semiconductor components, heat-sinks or heat exchangers

Code reading systems

Hand-held reading systems

SIMATIC HawkEye 40, 40T

Overview

SIMATIC HawkEye 40 and SIMATIC HawkEye 40T are powerful handheld readers suitable for high resolutions. Both handheld readers can read two-dimensional (2D) data matrix codes and one-dimensional barcodes.

The readers possess complex image processing functions and illumination technology in order to read codes on many different surfaces.

The HawkEye 4xx series includes models for cable-based and wireless communications standards. This permits simple integration into your applications.

The HawkEye 40 and 40T models are modular packages containing the reader, the handle and a connection cable (RS232 models also contain a power supply). The wireless versions include a Bluetooth transmitter (integrated in the reader) and a battery.

The HawkEye 40T is also approved as a "Department of Defense Unique Identifier (UID) String Validator". This function allows the HawkEye 40T to compare the contents of a string with a corresponding control document. Typical applications include e.g. the checking of UID codes which have been applied by the supplier. A further function, the conversion of UID into "Unique Item Identifier" (UII), makes it possible to use the HawkEye 40T in UID logistics.

SIMATIC HawkEye 40

The SIMATIC HawkEye 40 is a rugged industrial barcode and data matrix reader which can read data matrix codes with medium to high contrasts. The cell size should be larger than 0.13 mm. Barcodes can be read if the width of a bar is larger than 0.12 mm.

SIMATIC HawkEye 40T

Compared to the HawkEye 40, the SIMATIC HawkEye 40T achieves a significantly higher reading reliability through the application of Siemens image processing algorithms in particular for code templates which have a low contrast and/or are damaged. The HawkEye 40T is therefore particularly suitable for reading direct part mark (DPM) codes which have been applied by laser or inkjet.



Benefits

SIMATIC HawkEye 40

- Cost-effective if the code possesses high contrast (e.g. codes located on paper labels)

SIMATIC HawkEye 40/40T

- Cost-effective and sturdy handheld reader for high to medium contrast labels
- Automatically switches between barcodes and data matrix codes. The codes can be oriented in any direction
- Outfitted with a high resolution reader head that can read even the smallest codes
- High-performance processor for high decoding speed and very robust reading
- Easy reading of one-dimensional barcodes
- Dynamic illumination and internal settings optimize readability of codes
- Can communicate through almost all existing standard industrial protocols

Additionally for SIMATIC HawkEye 40T

- Masters hard-to-read low contrast Data Matrix codes, which were created, for example, by laser marks, dot peen systems or inkjet
- Can read a wide variety of codes which were printed directly on the surface of parts, without the need of parameter adjustment
- Ruggedized and ergonomic design provides a more durable unit for hard industrial use and a more comfortable handling for the user

Application

Industrial and commercial part identification and unit level traceability applications where the part is identified by a Data Matrix (DM) code or barcode and where a handheld reader is required.

SIMATIC HawkEye 40

For applications that involve paper labels (i.e. codes offering good contrast)

SIMATIC HawkEye 40T

Typical applications in the following industries:

- Automotive industry:
Identification of various automotive power train components (e.g. cylinder heads, cylinder blocks, manifolds, etc.)
- Aerospace:
Codes located on gas turbine blades
- Medical devices:
Laser marks on various medical device components and enclosures
- Electronics:
Laser marks on ESD sensitive hard drive components

Code reading systems

Hand-held reading systems

SIMATIC HawkEye 40, 40T

Design



Rugged ergonomic handle with integral battery, for wireless and batch mode

Both handheld readers are equipped with a handle. The handles are equally suitable for right-handed or left-handed persons. The read process is triggered by a switch on the handle. The handle can be disconnected.

The SIMATIC HawkEye 40 is the starter model.

The SIMATIC HawkEye 40T operates with the high-quality Siemens image processing algorithms, and has a very stable and ergonomic handle which remains undamaged even following greater heights of fall and which is even more comfortable to hold.

Stable and ergonomic handles, with or without batteries, are optionally available. The handles with batteries are available in two versions: with 1950 mAh lithium ion (Li-Ion) battery or with 3900 mAh lithium ion (Li-Ion) battery.

The readers are made of stable plastic.

Integration

The SIMATIC HawkEye 40/40T can communicate with a host computer via RS232, USB, PS2 and Bluetooth. No special software is required, since the SIMATIC HawkEye 40/40T are configured by reading the supplied data matrix codes.

In addition to direct transfer of the codes to the host computer via RS232, USB, PS2 or Bluetooth, the reader can also be operated in a batch mode. This is important if the connection to the host computer is not available. Codes read in during operation in batch mode are saved in a buffer memory. As soon as the connection to the host computer is available again, the codes are transmitted either manually or automatically. A battery is required for batch mode.

The accessory "Charger station" is available for charging the battery when operating the reader together with the stable and ergonomic handle with integral battery (included in the HawkEye 40T Bluetooth package, or ordered separately). Automatic charging is carried out by placing the reader together with the handle into the charger station. The charger station can also accommodate the accessory "Bluetooth modem". The Bluetooth modem receives the data from the Bluetooth transmitter in the reader, and transfers it to the host computer.



Charger station with Bluetooth modem and ergonomic handle (charging also possible when the reader and handle are plugged together)



Charger station with two charging possibilities. With plugged-in HawkEye 40 and standby 1950 mAh Li-Ion battery

Code reading systems

Hand-held reading systems

SIMATIC HawkEye 40, 40T

Technical specifications

Handheld reading system	SIMATIC HawkEye 40/40T
Operating distance (code-dependent)	
• Minimum	50 mm (1.9")
• Maximum	375 mm (14.8")
Image field	
• Near (50 mm (1.9") distant)	25 mm x 15 mm (0.98" x 0.6")
• Distant (375 mm (14.8") distant)	150 mm x 90 mm (5.9" x 3.5")
Decoding capability	
SIMATIC HawkEye 40	1D: Code 128, Code 39, Code 93, Int 2 of 5, Codabar, UPC/EAN/JAN, RSS, Composite, Postal, Codablock F, Code 11, Matrix 2 of 5, MSI Plessey, NEC 2 of 5, Pharmacode, Telepen 2D: Data Matrix, PDF417, Micro PDF 417, QR Code, MicroQR Code, Maxicode, Aztec, GoCode
SIMATIC HawkEye 40T	1D: Code 39, Code 128, Codabar, Code 93, Int 2 of 5, UPC/EAN, UPC-E, UPC Supplementals 2D: Data Matrix, PDF417, QR Code
Smallest code size	
• 1D barcode	0.114 mm line thickness (0.0045")
• 2D Matrix Code	0.128 mm cell size (0.005")
Contrast measured as the absolute light/dark difference at 650 nm of light	
• 1D symbols	25 %
• PDF417	35 %
Target beam	Visible LED laser light with 630 nm
Permissible ambient light	Sunlight up to 96890 Lux
Image formats	JPEG, Raw (uncompressed)
Focal field selection	Near, distant
Resolution, max.	1024 x 640 pixels
Gray levels	256
Resolution selection	1024 x 640 (multiple window options)

Handheld reading system	SIMATIC HawkEye 40/40T
Inclination	±60° (from front to rear)
Angle	±60° to a plane that is parallel to the code (page to page)
Rotational tolerance	±180°
Code quality	Code readability index
Field selection	Near or distant
Sensor	Progressive scan CMOS 1.33 MP (1024 x 1280)
Editing of data	Code XML ready
Light source	Embedded Class 1 LED
Operating time per battery charge	3000 read procedures or 6 to 8 h of intensive use
Permissible air humidity, no dewing	5 % to 95 % rel.
Operating temperature	0 °C ... 40 °C (32 °F ... 104 °F)
Storage temperature	-20 °C ... 60 °C (-4 °F ... 140 °F)
Dimensions	
• Reader W x H x D, in mm [inch]	33 x 109 x 46 [1.3 x 4.3 x 1.8]
• Ergonomic handle W x H x D, in mm [inch]	139.7 x 127.0 x 50.8 [5.5 x 5.0 x 2.0]
• Ergonomic handle with integral battery W x H x D, in mm [inch]	139.7 x 101.6 x 50.8 [5.5 x 4.0 x 2.0]
Weights	
• Reader with battery insert, without battery	85 g
• Reader with battery	131 g
• Ergonomic handle (without cable)	113 g
• Ergonomic handle (without cable) with integral 1950 mAh battery	136 g
• Ergonomic handle (without cable) with integral 3900 mAh battery	181 g
Length of cable	1.80 m (6 ft)
Shock resistance	Resistant to multiple falls onto concrete from 2 m height
Interfaces	USB, RS232, PS2, Bluetooth Class 1 (V1.2, 90 m, 300 ft)
Processor	400 MHz

Selection and ordering data

	Order No.
SIMATIC HawkEye 40	
Rugged industrial barcode and data matrix reader, with handle and cable	
• With USB connection ▶ B	6GF3 020-1HE40-0XX0
• With PS2 connection ▶ B	6GF3 020-1HE40-0XX1
• With RS232 connection, power supply for Europe ▶ B	6GF3 020-1HE40-0XX4
• With RS232 connection, power supply for UK ▶ B	6GF3 020-1HE40-0XX5
• With Bluetooth and USB, battery ▶ B	6GF3 020-1HE40-2BT0

	Order No.
SIMATIC HawkEye 40T	
Rugged industrial barcode and data matrix reader, with ergonomic handle and cable	
• With USB connection ▶ B	6GF3 020-1HT40-0XX0
• With PS2 connection ▶ B	6GF3 020-1HT40-0XX1
• With RS232 connection, power supply for U.S.A. ▶ B	6GF3 020-1HT40-0XX3
• With RS232 connection, power supply for Europe ▶ B	6GF3 020-1HT40-0XX4
• With RS232 connection, power supply for UK ▶ B	6GF3 020-1HT40-0XX5
• With Bluetooth and USB, with battery (integrated in handle) ▶ B	6GF3 020-1HT40-2BT0

Code reading systems

Hand-held reading systems

SIMATIC HawkEye 40, 40T

	Order No.
Accessories	
Ergonomic handle with integral Li-ion battery (1950 mAh) ▶ B	6GF3 020-0AC40-0AB3
Ergonomic handle with integral Li-ion battery (3900 mAh) ▶ B	6GF3 020-0AC40-0AB4
Ergonomic handle for use with cable. Incompatible with the 1950 mAh Li-ion battery module ▶ B	6GF3 020-0AC40-0AH2
RS232 cable	
• 2438 mm long, spiralled ▶ B	6GF3 020-0AC40-0AC1
• 2438 mm long, spiralled, with power supply for U.S.A. ▶ B	6GF3 020-0AC40-0AC3
• 2438 mm long, spiralled, with power supply for Europe/South America ▶ B	6GF3 020-0AC40-0AC4
• 2438 mm long, spiralled, with power supply for UK ▶ B	6GF3 020-0AC40-0AC5
USB cable , 1828 mm long, not spiralled ▶ B	6GF3 020-0AC40-0AC0
PS2 accessory cable for HawkEye handheld readers, 2428 mm long ▶ B	6GF3 020-0AC40-0AC6
Spare battery insert , not applicable in conjunction with the ergonomic handle ▶ B	6GF3 020-0AC40-0AB0
Rechargeable battery , lithium ion, 1950 mAh, no handle, cannot be used in conjunction with ergonomic handles ▶ B	6GF3 020-0AC40-0AB2
Battery charging unit for 1950 mA battery with 2 charging bays	
• For 2 batteries, with U.S.A. PSU ▶ B	6GF3 020-0AC40-0AA2
• For 2 batteries, with EU PSU ▶ B	6GF3 020-0AC40-0AA3
• For 2 batteries, with UK PSU ▶ B	6GF3 020-0AC40-0AA4
Charging station with battery handle, suited only for ergonomic handle with integrated battery	
• Battery charging station with power supply for the U.S.A. ▶ B	6GF3 020-0AC40-0AA5
• Battery charging station with EU power supply ▶ B	6GF3 020-0AC40-0AA6
• Battery charging station with power supply for the UK ▶ B	6GF3 020-0AC40-0AA7
HawkEye 40 Elastomer protective cover , not applicable with HawkEye 45/45T, 4xT ergonomic handles without batteries ▶ B	6GF3 020-0AC40-0AV3
Power supplies	
• For U.S.A. ▶ B	6GF3 020-0AC40-0AP1
• For Europe/South America ▶ B	6GF3 020-0AC40-0AP2
• For UK ▶ B	6GF3 020-0AC40-0AP3

	Order No.
Metal stands for HawkEye handheld readers ▶ B	6GF3 020-0AC40-0AS1
Bluetooth modem	
Note: It is also possible to operate the Bluetooth modem with a USB interface. Order modem (6GF3020-0AC00-2BT0) and USB cable (6GF3020-0AC40-0AC0) for this configuration	
Configuration with matrix code label	
• With PS2 cable ▶ B	6GF3 020-0AC00-2BT0
• With RS232 interface, power supply for U.S.A. ▶ B	6GF3 020-0AC10-3BT0
• With RS232 interface, power supply for Europe/South America ▶ B	6GF3 020-0AC10-4BT0
• With RS232 interface, power supply for UK ▶ B	6GF3 020-0AC10-5BT0

▶ Preferred type, available from stock.

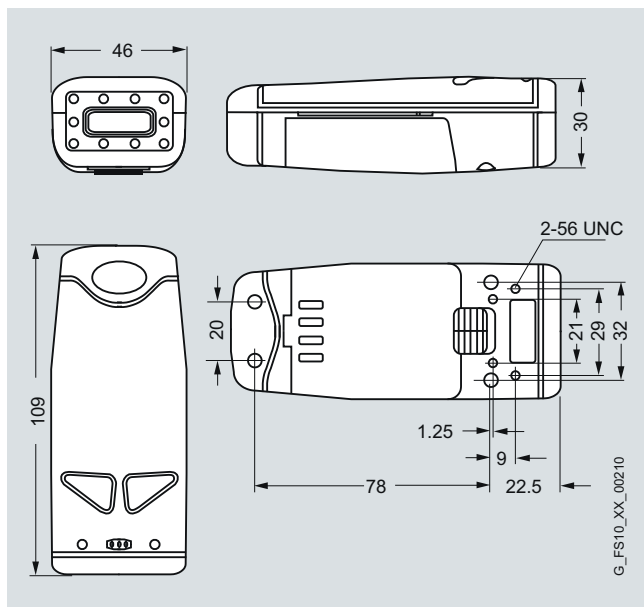
B: Subject to export regulations AL = N and ECCN = EAR99H

Code reading systems

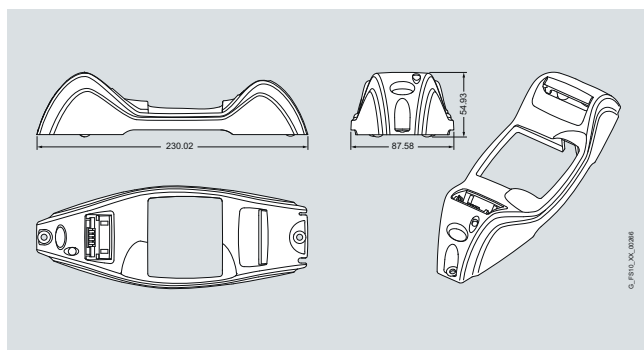
Hand-held reading systems

SIMATIC HawkEye 40, 40T

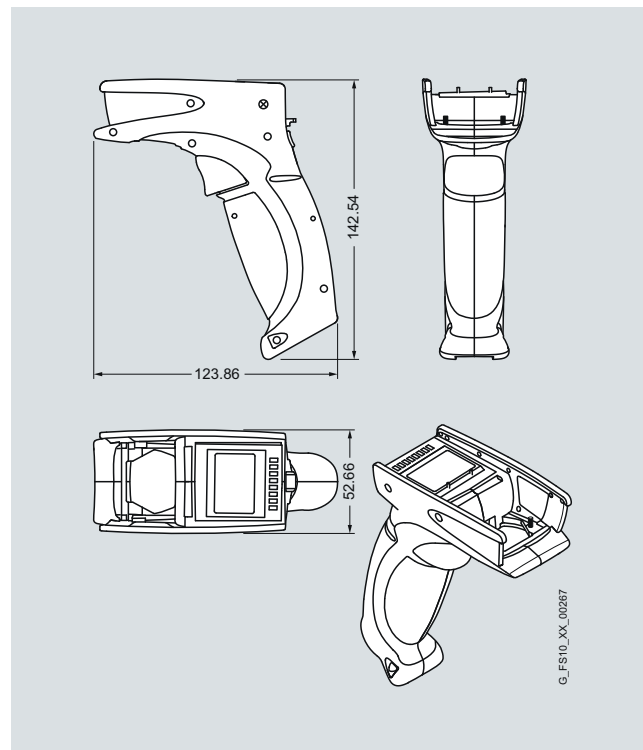
Dimensions



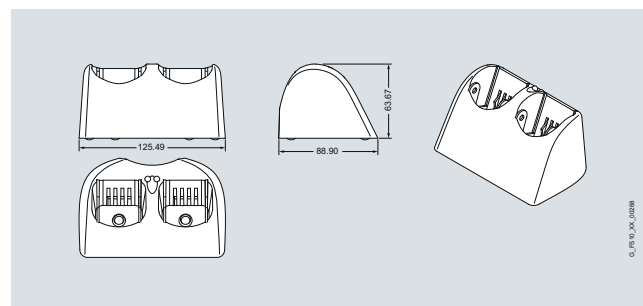
SIMATIC HawkEye 40/40T



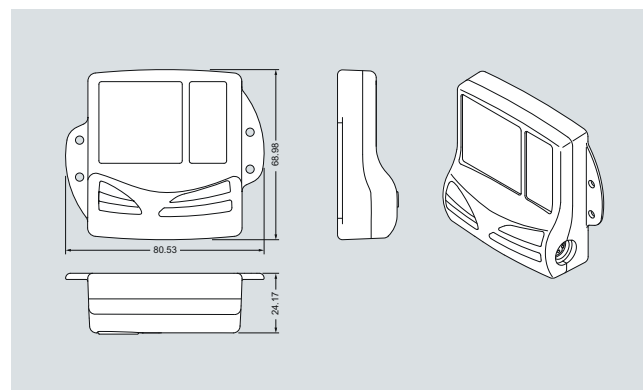
Charging unit for battery handle



Rugged ergonomic handle

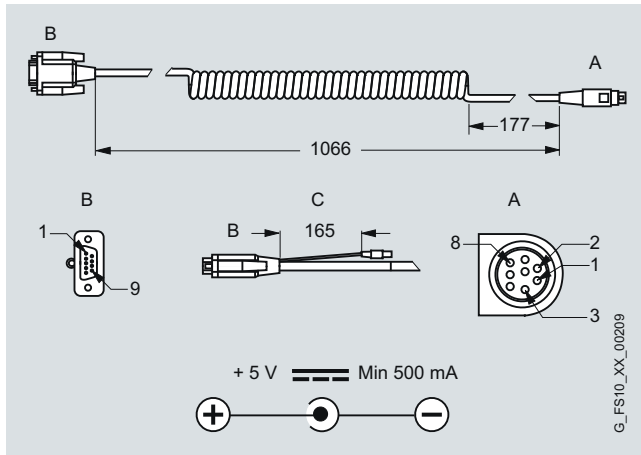


Battery charging unit with 2 charging bays

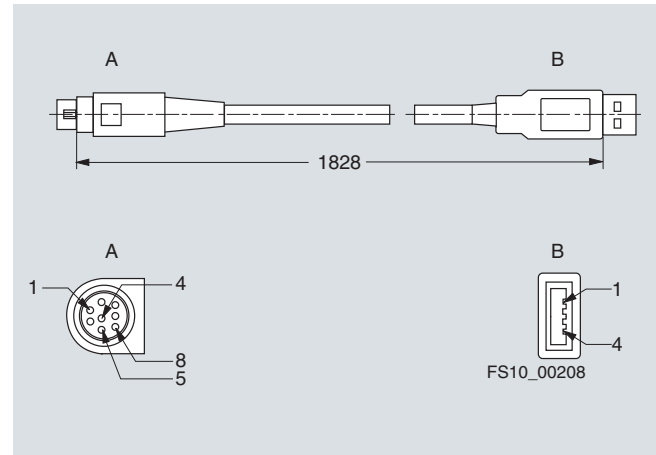


Bluetooth modem

Schematics



RS232 cable



USB cable

Connector A Pin No.	Connector B Pin No.	Connector C	Designation	Wire thickness	Color
1	1	Center contact	V+ (5 V ±0.5 V)	24 AWG	rot
2	2	–	TX	28 AWG	brown
3	3	–	RX	28 AWG	orange
4	–	–	Not assigned	–	–
5	–	–	Not assigned	–	–
6	–	–	Not assigned	–	–
7	–	–	Not assigned	–	–
8	5	Ring	Ground	24 AWG	Black
9	–	–	Not assigned	–	–
Connector enclosure	–	–	Shield	–	Bright

Contact assignment RS232 cable

Connector A Pin No.	Connector B Pin-No.	Designation	Wire thickness	Color
1	1	V+ (5 V ±0.5 V)	24 AWG	rot
2	–	Not assigned	–	–
3	–	Not assigned	–	–
4	3	D+	28 AWG	Green (twisted)
5	2	D-	28 AWG	White (twisted)
6	–	Not assigned	–	–
7	–	Not assigned	–	–
8	4	Ground	24 AWG	Black
Connector enclosure	Connector enclosure	Shield	–	Bright

Contact assignment USB cable

Code reading systems

Hand-held reading systems

SIMATIC HawkEye 45, 45T

Overview

The SIMATIC HawkEye 45 and SIMATIC HawkEye 45T establish a new benchmark for portable data terminals and handheld computers by combining the industry's best imaging technology with a graphic display and rugged keyboard to create the smallest and lightest full-featured Data Matrix reading terminal on the market.

The HawkEye 45 and HawkEye 45T instantly read large linear as well as high density Data Matrix symbols. The units continuously adapt the resolution, illumination, and image field for the fastest automatic symbology identification and decoding over the widest range of symbology types, sizes, recording surfaces and ambient lighting. The HawkEye 45 and HawkEye 45T achieve matrix symbol decoding at speeds that are similar to linear bar code decoding, while preserving battery energy.

Both products from the HawkEye 45 series are able to transmit data using wired and wireless communication standards. This guarantees an easy integration to your application.

The HawkEye 45 and 45T products are packages that include the reader, a handle plus the cable for interfacing and power supply. In case of the wireless version, it comes additionally with a rechargeable battery.

The HawkEye 45T is also a Department of Defense Unique Identifier (UID) string validator. This includes checking the string content against the appropriate controlling documents. Typical uses are incoming inspection of UID codes marked by external vendors. UID to Unique Item Identifier (UII) conversion functionality allows vendors to use the HawkEye 45T in UID logistics applications.

SIMATIC HawkEye 45

The SIMATIC HawkEye 45 is a rugged industrial barcode and Data Matrix reader designed to read medium to high contrast Data Matrix codes with cell sizes as small as 0.005 inches. Barcodes with a bar width as small as .0045" are also easily read. The integrated display shows read data and allows for reader configuration



Code reading systems

Hand-held reading systems

SIMATIC HawkEye 45, 45T

Benefits

SIMATIC HawkEye 45

- Cost-effective if the code possesses high contrast (e.g. codes located on paper labels)

SIMATIC HawkEye 45/45T

- Cost-effective and sturdy handheld reader for high to medium contrast labels
- Integrated screen displays read data and allows for reader configuration.
- Automatically switches between barcodes and Data Matrix codes. The codes can be oriented in any direction
- Outfitted with a high resolution reader head that can read even the smallest codes
- High-performance processor for high decoding speed and very robust reading
- Easy reading of one-dimensional barcodes
- Dynamic illumination and internal settings optimize readability of codes
- Can communicate through almost all existing standard industrial protocols

Additionally for SIMATIC HawkEye 45T

- Masters hard-to-read low contrast Data Matrix codes, which were created, for example, by laser markers, dot peen systems or inkjet
- Can read a wide variety of codes which were printed directly on the surface of parts, with out the need of parameter adjustment
- Optimized ergonomic design providing a comfortable handling for the user

Applications

Industrial and commercial part identification and unit level traceability applications where the part is identified by a Data Matrix (DM) code and where a handheld reader is required.

SIMATIC HawkEye 45

For applications that involve paper labels (i.e. codes offering good contrast)

SIMATIC HawkEye 45T

Typical applications in the following industries:

- Automotive industry: Identification of various automotive power train components (cylinder heads, cylinder blocks, manifolds, etc.)
- Aerospace: Dot peen marks on gas turbine blades
- Medical devices: Laser marks on various medical device components and enclosures
- Electronics: Laser marks on ESD sensitive hard drive components

Design



Ergonomic handle for wired applications

They are handheld imaging readers with a handle. The reader may be held in the right or left hand. Reading is commanded by a trigger in front of the handle. The handle is removable.

The SIMATIC HawkEye 45 is the entry level offering and is equipped with a lightweight and economical pistol grip handle.

The SIMATIC HawkEye 45T with Siemens image processing algorithm, a higher level offering, is equipped with a ruggedized, ergonomic handle which provides greater drop resilience and a more comfortable feel.

Optional ruggedized, ergonomic handles with or without integrated batteries are available. Ruggedized, ergonomic handles with integrated batteries are available in two configurations: either with a 1950 mAh Lithium Ion (Li-Ion) battery or with a 3900 mAh Li-Ion battery.

The readers are constructed of a high impact durable plastic.

Integration

The SIMATIC HawkEye 45/45T connects to a host system via RS232, USB, PS2 or Bluetooth. There is no need for special software. All configurations are done by reading specific data matrix codes.

Besides the direct transfer of codes to the host system via RS232, USB, PS2 or Bluetooth, the reader can also be run in "Batch mode" when no connection to a host system is available. Codes that are read when the reader is in "Batch Mode" are saved in a buffer of the reader. Next time the reader has a connection to the host system the codes can be transferred manually or automatically. For "Batch mode" a rechargeable battery is needed.

When using the code reader with the ruggedized ergonomic handle, that has an integrated rechargeable battery (included in HawkEye 45T Bluetooth package or separately orderable) it can easily be charged using the available accessory "Cradle". The handle is easily be installed on the cradle and will be charged automatically. The cradle can also hold the Bluetooth modem, which receives the codes and transfers it to the host system.

Code reading systems

Hand-held reading systems

SIMATIC HawkEye 45, 45T



Cradle with Bluetooth modem and ergonomic handle (can also be charged with reader in handle)

Technical specifications

Handheld reading system	SIMATIC HawkEye 45/45T
Display	128 x 128 monochrome
Memory	4 MB for data and programs
Operating distance (code-dependent)	
• Minimum	50 mm (1.9")
• Maximum	375 mm (14.8")
Image field	
• Near (50 mm (1.9") distant)	25 mm x 15 mm (0.98" x 0.6")
• Distant (375 mm (14.8") distant)	150 mm x 90 mm (5.9" x 3.5")
Decoding capability	
SIMATIC HawkEye 45	1D: Code 128, Code 39, Code 93, Int 2 of 5, Codabar, UPC/EAN/JAN, RSS, Composite, Postal, Codablock F, Code 11, Matrix 2 of 5, MSI Plessey, NEC 2 of 5, Pharmacode, Telepen 2D: Data Matrix, PDF417, Micro PDF 417, QR Code, MicroQR Code, Maxicode, Aztec, GoCode
SIMATIC HawkEye 45T	1D: Code 39, Code 128, Codabar, Code 93, Int 2 of 5, UPC/EAN, UPC-E, UPC Supplementals 2D: Data Matrix, PDF417, QR Code
Smallest code size	
• 1D barcode	0.114 mm line thickness (0.0045")
• 2D Matrix Code	0.128 mm cell size (0.005")
Contrast measured as the absolute light/dark difference at 650 nm of light	
• 1D symbols	25 %
• PDF417	35 %
Target beam	Class IIa, visible LED laser light with 630 nm
Permissible ambient light	Sunlight up to 96890 Lux
Image formats	JPEG, Raw (uncompressed)
Focal field selection and optical resolution	
• Near	1024 x 640 pixels
• Distant	1024 x 640 pixels
Gray levels	256
Resolution selection	1024 x 640 (multiple window options)
Inclination	±60° (from front to rear)
Angle	±60° to a plane that is parallel to the code (page to page)

Handheld reading system	SIMATIC HawkEye 45/45T
Rotational tolerance	±180°
Code quality	Code readability index
Field selection	Near or distant
Sensor	Progressive scan CMOS 1.33 MP (1024 x 1280)
Real-time clock	With on-board battery, 7 year lifetime
Editing of data	Code XML ready
Light source	Embedded Class 1 LED
Operating time per battery charge	3000 read procedures or 6 to 8 h of intensive use
Permissible air humidity, no dewing	5 % to 95 % rel.
Operating temperature	0 °C ... 40 °C (32 °F ... 104 °F)
Storage temperature	-20 °C ... 60 °C (-4 °F ... 140 °F)
Dimensions	
• Reader W x H x D, in mm [inch]	41 x 113 x 46 [1.6 x 4.4 x 1.8]
• Ergonomic handle W x H x D, in mm [inch]	139.7 x 127.0 x 50.8 [5.5 x 5.0 x 2.0]
• Ergonomic handle with integral battery W x H x D, in mm [inch]	139.7 x 101.6 x 50.8 [5.5 x 4.0 x 2.0]
Weights	
• Reader with battery insert, without battery	125 g
• Reader with battery	172 g
• Ergonomic handle (without cable)	113 g
• Ergonomic handle (without cable) with integral 1950 mAh battery	136 g
• Ergonomic handle (without cable) with integral 3900 mAh battery	181 g
Shock resistance	Resistant to multiple falls onto concrete from 1.2 m height
Interfaces	USB, RS232, PS2, Bluetooth Class 1 (V1.2, 90 m, 300 ft)
Processor	400 MHz

Code reading systems

Hand-held reading systems

SIMATIC HawkEye 45, 45T

Selection and ordering data

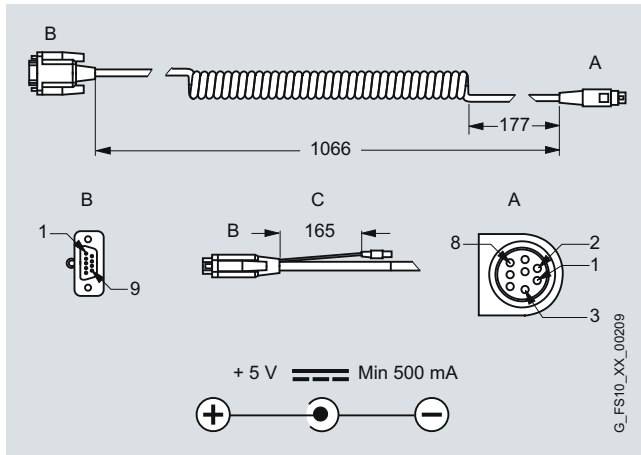
	Order No.
SIMATIC HawkEye 45	
Rugged industrial barcode and data matrix reader, with integral display, with handle and cable	
• With USB connection ▶ B	6GF3 020-1HE45-0XX0
• With PS2 connection ▶ B	6GF3 020-1HE45-0XX1
• With RS232 connection, power supply for U.S.A. ▶ B	6GF3 020-1HE45-0XX3
• With RS232 connection, power supply for Europe ▶ B	6GF3 020-1HE45-0XX4
• With RS232 connection, power supply for UK ▶ B	6GF3 020-1HE45-0XX5
• With Bluetooth and USB, battery ▶ B	6GF3 020-1HE45-2BT0
SIMATIC HawkEye 45T	
Rugged industrial barcode and data matrix reader, with integral display, with ergonomic handle and cable	
• With USB connection ▶ B	6GF3 020-1HT45-0XX0
• With PS2 connection ▶ B	6GF3 020-1HT45-0XX1
• With RS232 connection, power supply for Europe ▶ B	6GF3 020-1HT45-0XX4
• With Bluetooth and USB, battery integrated in handle ▶ B	6GF3 020-1HT45-2BT0
Accessories	
Ergonomic handle with integral Li-ion battery (1950 mAh) ▶ B	6GF3 020-0AC40-0AB3
Ergonomic handle with integral Li-ion battery (3900 mAh) ▶ B	6GF3 020-0AC40-0AB4
Ergonomic handle for use with cable. Incompatible with the 1950 mAh Li-ion battery module ▶ B	6GF3 020-0AC40-0AH2
RS232 cable	
• 2438 mm long, spiralled ▶ B	6GF3 020-0AC40-0AC1
• 2438 mm long, spiralled, with power supply for U.S.A. ▶ B	6GF3 020-0AC40-0AC3
• 2438 mm long, spiralled, with power supply for Europe/South America ▶ B	6GF3 020-0AC40-0AC4
• 2438 mm long, spiralled, with power supply for UK ▶ B	6GF3 020-0AC40-0AC5
USB cable , 1828 mm long, not spiralled ▶ B	6GF3 020-0AC40-0AC0
PS2 accessory cable for HawkEye handheld readers, 2428 mm long ▶ B	6GF3 020-0AC40-0AC6
Plastic housing for rechargeable battery (without function) for use in read device ▶ B	6GF3 020-0AC40-0AB0

	Order No.
Rechargeable battery , lithium ion, 1950 mAh, no handle, cannot be used in conjunction with ergonomic handles ▶ B	6GF3 020-0AC40-0AB2
Battery charging unit for 1950 mA battery with 2 charging bays	
• For 2 batteries, with U.S.A. PSU ▶ B	6GF3 020-0AC40-0AA2
• For 2 batteries, with European PSU ▶ B	6GF3 020-0AC40-0AA3
• For 2 batteries, with UK PSU ▶ B	6GF3 020-0AC40-0AA4
Charging station with battery handle , suited only for ergonomic handle with integrated battery	
• Battery charging station with power supply for the U.S.A. ▶ B	6GF3 020-0AC40-0AA5
• Battery charging station with power supply for Europe ▶ B	6GF3 020-0AC40-0AA6
• Battery charging station with power supply for the UK ▶ B	6GF3 020-0AC40-0AA7
Power supplies	
• For U.S.A. ▶ B	6GF3 020-0AC40-0AP1
• For Europe/South America ▶ B	6GF3 020-0AC40-0AP2
• For UK ▶ B	6GF3 020-0AC40-0AP3
Metal stands for HawkEye handheld readers ▶ B	6GF3 020-0AC40-0AS1
Bluetooth modem	
Note: It is also possible to operate the Bluetooth modem with a USB interface. Order modem (6GF3020-0AC00-2BT0) and USB cable (6GF3020-0AC40-0AC0) for this configuration	
Configuration with matrix code label	
• With PS2 cable ▶ B	6GF3 020-0AC00-2BT0
• With RS232 interface, power supply for U.S.A. ▶ B	6GF3 020-0AC10-3BT0
• With RS232 interface, power supply for Europe/South America ▶ B	6GF3 020-0AC10-4BT0
• With RS232 interface, power supply for UK ▶ B	6GF3 020-0AC10-5BT0

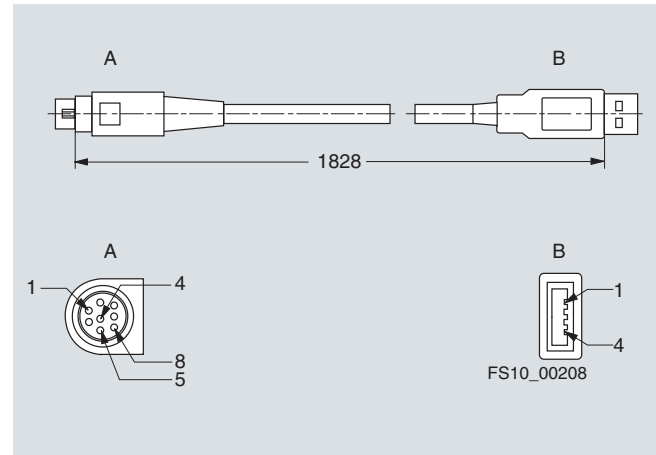
▶ Preferred type, available from stock.

B: Subject to export regulations AL = N and ECCN = EAR99H

Schematics



RS232 cable



USB cable

Connector A Pin No.	Connector B Pin No.	Connector C	Designation	Wire thickness	Color
1	1	Center contact	V+ (5 V ±0.5 V)	24 AWG	rot
2	2	–	TX	28 AWG	brown
3	3	–	RX	28 AWG	orange
4	–	–	Not assigned	–	–
5	–	–	Not assigned	–	–
6	–	–	Not assigned	–	–
7	–	–	Not assigned	–	–
8	5	Ring	Ground	24 AWG	Black
9	–	–	Not assigned	–	–
Connector enclosure	–	–	Shield	–	Bright

Contact assignment RS232 cable

Connector A Pin No.	Connector B Pin No.	Designation	Wire thickness	Color
1	1	V+ (5 V ±0.5 V)	24 AWG	rot
2	–	Not assigned	–	–
3	–	Not assigned	–	–
4	3	D+	28 AWG	Green (twisted)
5	2	D-	28 AWG	White (twisted)
6	–	Not assigned	–	–
7	–	Not assigned	–	–
8	4	Ground	24 AWG	Black
Connector enclosure	Connector enclosure	Shield	–	Bright

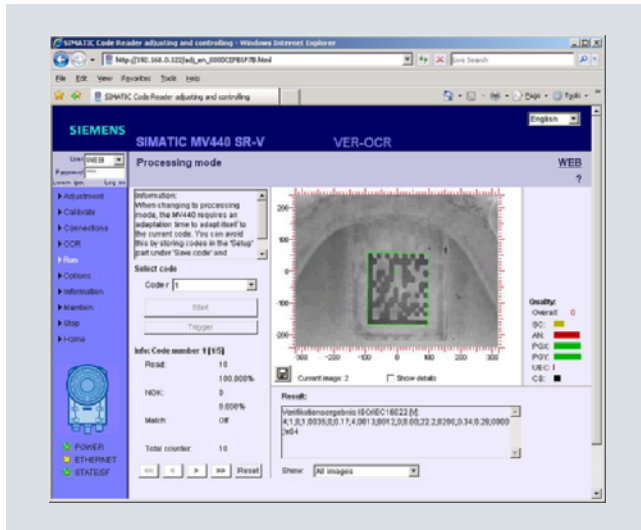
Contact assignment USB cable

Code reading systems

Verification systems

Veri-Genius for MV440

Overview



With the verification license "Veri-Genius", devices of the SIMATIC MV440 family can be used for checking the marking quality of codes (verification) in addition to reading 1D barcodes and 2D matrix codes.

The license is supplied as a "Single License" on a USB flash drive and can be installed via the SIMATIC Automation License Manager (ALM) on any reader of the SIMATIC MV440 series. The license is executable on a SIMATIC MV440 as of firmware version 4.0.

Benefits

Support for all important sectors and code types through the following verification standards:

- AIM DPM-1-2006 (future ISO standard)
 - Code type: Data Matrix Code
 - Type of marking: All - focus on DPM, e.g. needle-punched and lasered markings
 - Sectors: All - focus on DPM, e.g. needle-punched and lasered markings
- Siemens DPM
 - Code type: Data Matrix Code
 - Type of marking: All - focus on DPM, e.g. needle-punched and lasered markings
 - Sectors: All
- ISO/IEC 15415
 - Code type: Data Matrix Code
 - Type of marking: Printed
 - Sectors: All - focus: Pharmaceutical industry
- AS9132 Rev. A (previously IAQG)
 - Code type: Data Matrix Code
 - Type of marking: Printed
 - Sectors: All - focus: Aerospace
- ISO/IEC 15416 (previously ANSI X3.182-1990)
 - Code type: Barcode
 - Type of marking: Printed
 - Sectors: All - printed labels

Further highlights

- Different resolutions are available (640 x 480 pixels, 1024 x 768 pixels and 1600 x 1200 pixels)
- License includes calibration card
- Simultaneous reading and verifying in one image field
- Flexible retrofitting of the license to each device of the SIMATIC MV440 series via the Automation License Manager of SIMATIC - advantage: Savings in stocking of spare parts
- Simple integration of verification in the automation environment via SIMATIC MV440 using a function block (FB79 and FB45)

Application

Applications for verification span across almost all sectors. To maximize read rates in production and logistics and to make them predictable, it is essential to measure the marking quality.

The following sectors and applications are a particular focus for MV440 verification systems:

Automobile industry

- Needle marking (DPM): e.g. cylinder heads, cylinder blocks, etc.
- Laser marking (DPM): Cylinder pistons, gearbox components, etc.
- Laser markings on electronic components, printed circuit boards, or enclosures

Pharmaceutical industry

- Print or laser markings on medicines (DPM, OCR)
- Aerospace industry
- Needle or laser markings on gas turbine blades (DPM)
- Needle or laser markings on jet engine components (DPM)

Medical equipment

- Laser markings on implants (DPM)
- Laser markings on medical devices (DPM).

Electronics

- Needle or laser markings on hard disk components
- Lasered or etched markings on hard disk components (DPM)

Semiconductors

- Laser markings on rigid and flexible circuit boards (DPM)
- Laser markings on enclosed semiconductor components, heat sinks or heat exchangers (DPM)

"Veri-Genius" can be used anywhere where environmental conditions permit the use of MV440 code readers - for details, see SIMATIC MV440. Standard ring lights and lenses are designed to achieve IP67 degree of protection by means of the protective tube, and for glass-free use in the food and beverages industry. If light sources or lenses are used outside the protective tube, they must be used in compliance with their specification.

Any host and HMI systems required must be selected sector-specifically and project-specifically. The range of application of the selected test method is defined in the specification of the test method and compliance is essential if universally valid results are to be obtained.

Design

All SIMATIC MV440 stationary code readers are basic units under the terms of the license. The verification functionality is enabled by transferring the license key from the USB flash drive on which it is supplied to the MV440 code reader by means of SIMATIC License Manager.

Verification with MV440 verification systems is suitable for both inline and offline measurements. In both cases, the specification of the verification standard used must be observed to ensure a robust measurement result. This means, for example, that the lighting and alignment of the light source, camera and test object must be in accordance with the definitions of the respective standard.

If only one light source is used, the MV440 can control an external light source using the existing image-synchronized digital output, or the external light source can be operated continuously.

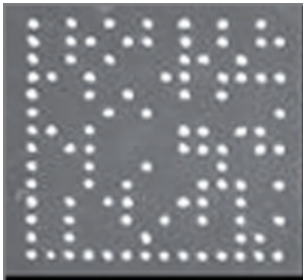
If more lighting directions are required, an external controller can be used to activate the desired lighting and to start each individual measurement by means of triggering. The result from the quality measurement or the relevant partial measurement is output directly by the MV440 after completion of the measurement. In the case of more than one measurement, it is the task of the external controller to combine the partial results into an overall result and to visualize this.

If the test method requires calibration, the calibration card included in the scope of supply can be used in most cases. In cases with extreme imaging requirements (e.g. with very small or very large codes), the task of calibration must be resolved application-specifically.

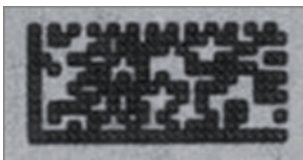
Function

Verification of code quality is an additional function subject to a license that can be activated on any SIMATIC MV440 by installing the "Veri-Genius license". The functionality is available without a license in demo mode.

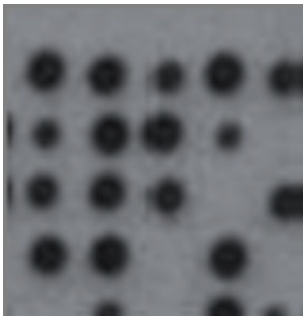
The following typical types of fault can be detected by measuring the marking quality - the following pictures show examples of correct code and faults in the marking quality:



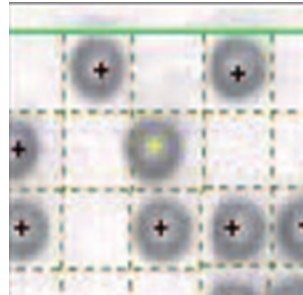
Correct code



Incorrect or non-uniform cell size in the marking



Incorrect or non-uniform cell size in the marking



Incorrect or non-uniform cell position in the marking



Incorrect overall geometry of the marking



Damaged surface of the marking or part, smudging



Very little or non-uniform contrast in the marking

Code reading systems

Verification systems

Veri-Genius for MV440



Very little or non-uniform contrast in the marking

- AIM DPM-1-2006
- Siemens DPM
- ISO/IEC 15415
- AS9132 Rev. A (previously IAQG)
- ISO/IEC 15416 (previously ANSI X3.182-1990)

The measurement result is output as an overall result in 5 stages, which are designated by letters or numbers:

Overall result as a digit	Overall result as letters	Overall result as text
4	A	Top quality
3	B	Good quality
2	C	Satisfactory quality
1	D	Adequate quality
	E	(not used)
0	Error	Marking quality inadequate

The components of a measurement result and calculation of the overall result are dependent on the test method used.

The overall result and the components of a measurement result can be output after a test, and are then available for further processing on an external system, e.g. for archiving or creating a test report.

Integration

The MV440 verification systems can use all communication services that the basic units of the SIMATIC MV440 family offer:

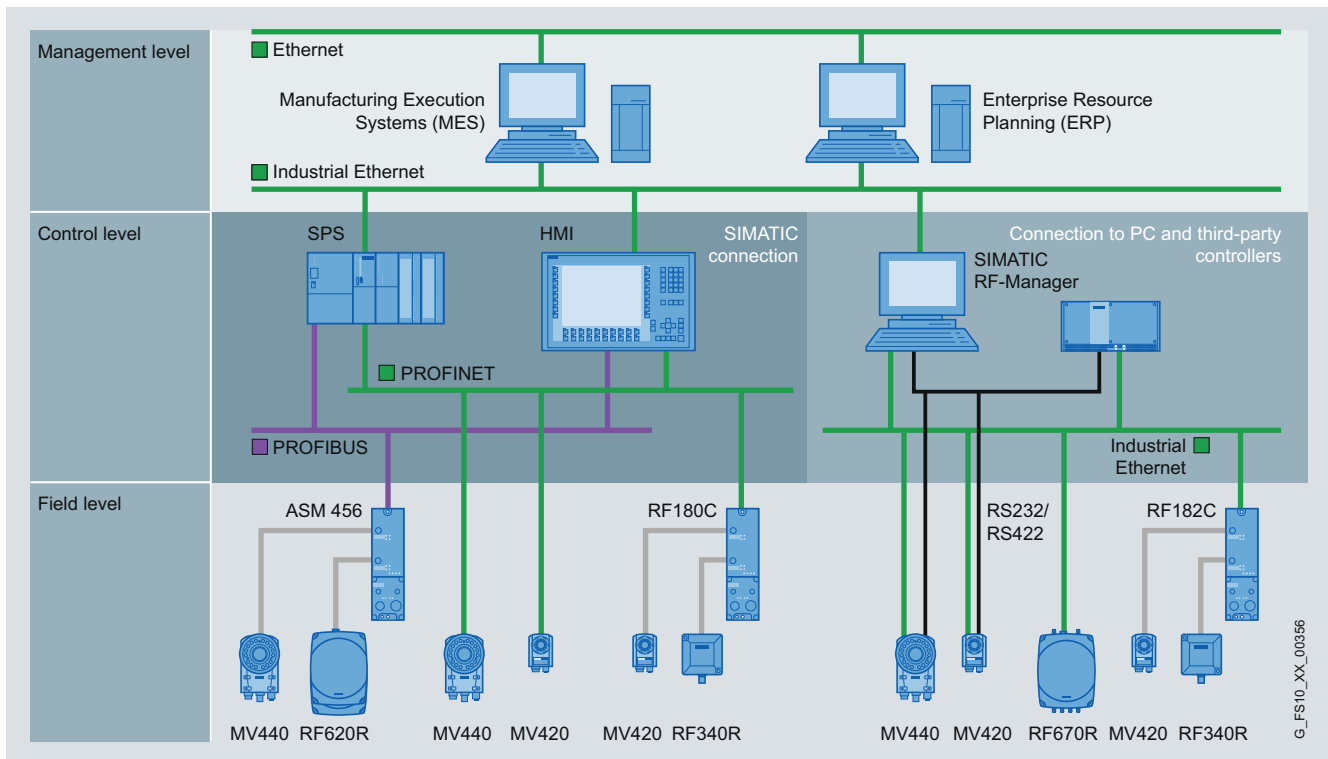
Usable communication services	
PROFINET IO (FB79)	Onboard MV440 PROFINET interface.
PROFINET IO (FB45, PIB)	Via the MV440 ASM interface using the communication module RF180C.
PROFIBUS DP V0/1 (FB45, PIB)	Via the MV440 ASM interface using the communication module ASM 456.
TCP/IP native	Onboard MV440 PROFINET interface.

The most important types of interface in the automation environment are shown in the overview below. For further details, refer to the chapter SIMATIC MV440 (see page 6/11).

Code reading systems

Verification systems

Veri-Genius for MV440



Selection and ordering data

	Order No.
Verification module Veri-Genius ▶ D Software license for verification of machine-readable 1D bar codes and Data Matrix Codes. The license is supplied on a USB flash drive; executable on all SIMATIC MV440 code reading systems as of firmware V4.0 (SIMATIC MV440 not included in the scope of supply). The scope of supply includes the calibration card.	6GF3 400-0SL02
Calibration card ▶ Spare part	6GF3 400-8CE

▶ Preferred type, available from stock.

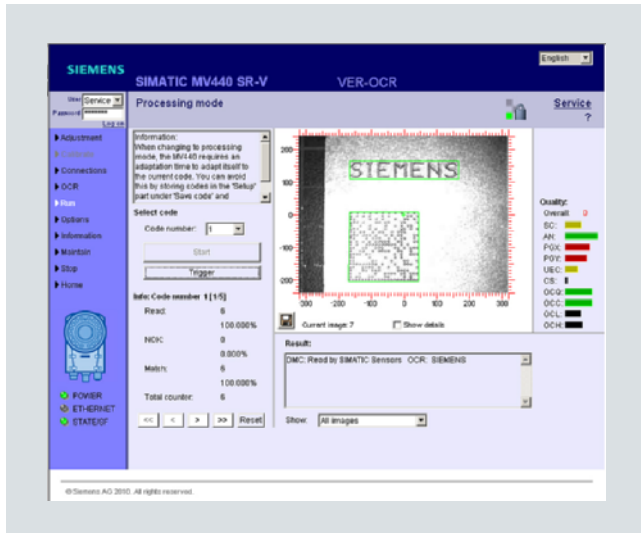
D: Subject to export regulations AL = N and ECCN = EAR99S

Code reading systems

Text recognition (OCR)

Text-Genius for SIMATIC MV440

Overview



With the OCR license "Text Genius", SIMATIC MV440 can also be used for text recognition in addition to reading 1D bar codes and 2D matrix codes. This is also known as OCR (Optical Character Recognition). It is also possible to read and compare plain text and machine-readable code in the same image field.

The license is supplied as a "Single License" on a USB stick and can be copied to the device with the SIMATIC Automation License Manager (ALM) using a plug-in.

The license can be installed on a SIMATIC MV440 with firmware version 3.0 and higher.

Benefits

The highlights at a glance

- Flexible reading of many fonts without time-consuming teach-in
- Fast and reliable reading (up to 1000 reads per minute) for high-speed applications
- Reading and comparing of plain text and machine-readable code in the same image field
- Automatic text localization without the use of predefined areas means that text can be read even when its position varies
- Automatic line detection for max. 5 freely definable image regions with max. 15 lines
- Automatic character height recognition between 15 and 55 pixels
- Individual parameter settings can be stored for max. 5 freely definable image regions
- Reading of mirrored, rotated and inverted text
- A number of filter and comparison functions produce a stable read result
- Flexible retrofitting of the text recognition function via the Automation License Manager of SIMATIC
- Simple integration in the automation environment, e.g. via function block of the SIMATIC MV440 devices

Applications

Applications for text recognition span across almost all sectors. The application areas can be generally divided in two tasks areas:

- Comparison of the result of text recognition with the content of the adjacent machine-readable identification - e.g. Data Matrix Code (DMC)
- The text recognition result is used to record and check a plain text identification

Applications for different sectors are listed below. The list is incomplete and only serves to illustrate the wide range of possible applications.

Application areas of OCR include the pharmaceuticals industry (serialization/expiry date on packaging), the automobile/electronics industry (e.g. production number on PCBs), the solar industry (serial numbers on thin-layer modules), or food and beverages (e.g. best-before date on packaging).

Automobile industry, aerospace industry

- Detection and checking of plain text identifiers for type identification of components
- Pharmaceutical industry
- Comparison of DMC and plain text
- Acquisition of a unique ID of a product - serialization
- Acquisition and checking the expiry date

Medical equipment

- Laser markings on implants (DPM)
- Laser markings on medical devices (DPM).

Electronics

- Detection of a unique plain text identifier for identification of devices, e.g. electricity meters
- Detection and checking of plain text identifiers for type identification of PCBs
- Solar industry
- Acquisition of a unique plain text identifier on thin-layer modules - serialization

"Text-Genius" can be used anywhere where environmental conditions permit the use of MV440 code readers - for details, see SIMATIC MV440. Standard ring lights and lenses are designed to achieve IP67 degree of protection by means of the protective tube, and for glass-free use in the food and beverages industry. If light sources or lenses are used outside the protective tube, they must be used in compliance with their specification.

The text recognition function can be implemented in applications without the need to consider the type of font used for marking (Polyfont) or the marking method. In the "Function" chapter, the fonts which enable a maximum read rate to be achieved are listed. Similarly, no marking methods are excluded. The read rate improves when the font varies only minimally and there is a good contrast between the background and marking.

Code reading systems

Text recognition (OCR)

Text-Genius for SIMATIC MV440

Design

All SIMATIC MV440 stationary code readers are basic units under the terms of "Text-Genius" license. The text recognition functionality is enabled by transferring the license key from the USB flash drive on which it is supplied to the MV440 code reader by means of SIMATIC License Manager.

If a light source is used from the range of accessories of SIMATIC MV440, the MV440 must be configured accordingly and text recognition must be started by triggering the reader. The measurement result is output immediately after measurement on the predefined process interface. Special sources of light can be used at any time. Their connection is described in the chapter "MV440". A decisive factor in the selection of lighting is the required homogeneity of the illumination and contrast obtained.

Functions

The outstanding feature of Text Genius is that it is easy to set up. To achieve stable read results for text recognition, it is only necessary to set a few, simple parameters. The Text-Genius uses a generic approach for text recognition, so no individual training is required for most fonts and the characters (letters and digits) of the ASCII character set. There are also no complex settings required for optimizing recognition performance.

The following fonts are ideal for recognition of the text:

- OCR-A
- Semifont M13
- and similar fonts

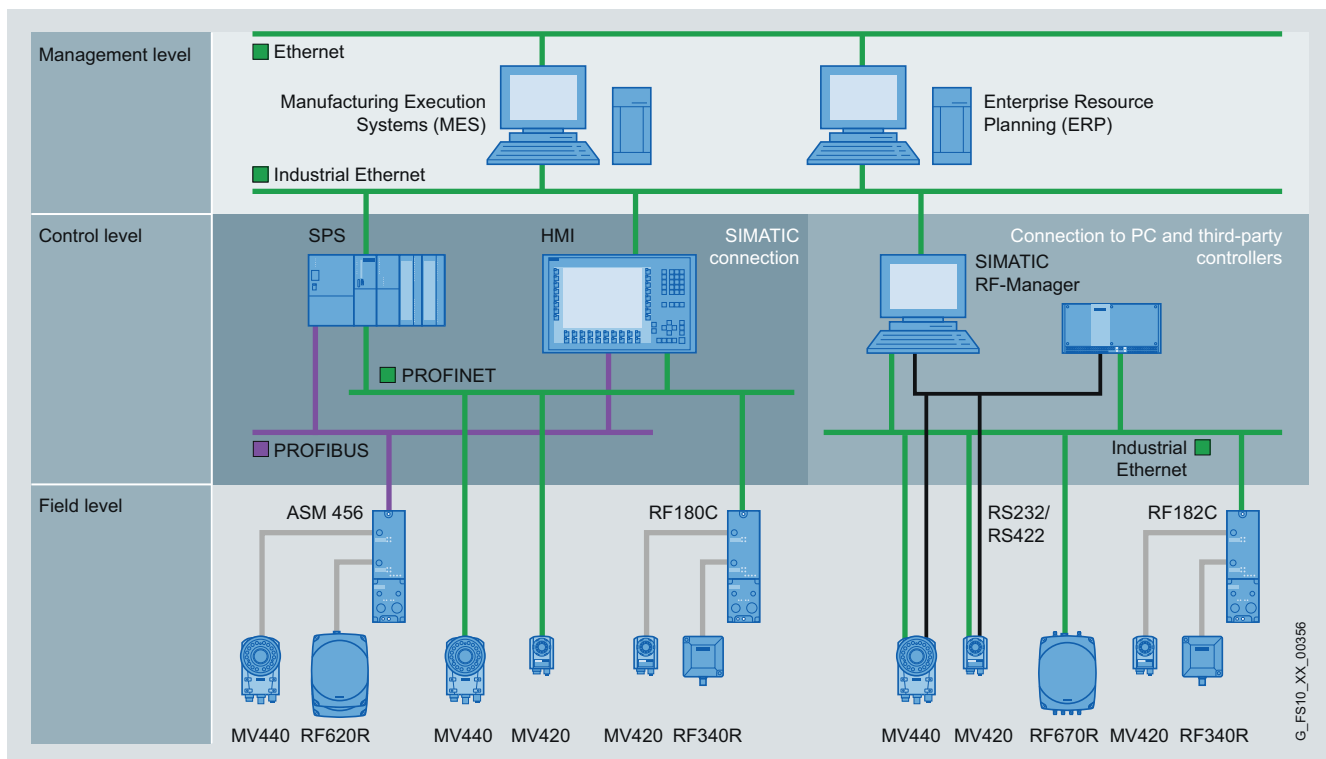
Arial, OCR-B and similar fonts also produce good reading results.

Integration

The MV440 text recognition systems can use all communication services that the SIMATIC MV440 basic unit offers:

Usable communication services	
PROFINET IO (FB79)	Onboard MV440 PROFINET interface.
PROFINET IO (FB45, PIB)	Via the MV440 ASM interface using the communication module RF180C.
PROFIBUS DP V0/1 (FB45, PIB)	Via the MV440 ASM interface using the communication module ASM 456.
TCP/IP native	Onboard MV440 PROFINET interface.

The most important types of interface in the automation environment are shown in the overview below. For further details, refer to the chapter SIMATIC MV440 (see page 6/11).



Code reading systems

Text recognition (OCR)

Text-Genius for SIMATIC MV440

Selection and ordering data

	Order No.
OCR module Text-Genius ▶ D	6GF3400-0SL01
Software license for reading machine-readable 1D bar codes and 2 D matrix codes, as well as for optical character recognition. License is supplied on a USB flash drive; executable on SIMATIC MV440 code reading system as of firmware V3.0 (SIMATIC MV440 not included in the scope of supply).	

▶ Preferred type, available from stock.

D: Subject to export regulations AL = N and ECCN = EAR99S

Appendix



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Appendix

Training

Faster and more applicable know-how: Hands-on training from the manufacturer

SITRAIN® – the Siemens Training for Automation and Industrial Solutions – provides you with comprehensive support in solving your tasks.

Training by the market leader in automation and plant engineering enables you to make independent decisions with confidence. Especially where the optimum and efficient use of products and plants are concerned. You can eliminate deficiencies in existing plants, and exclude expensive faulty planning right from the beginning.



First-class know-how directly pays for itself: In shorter startup times, high-quality end products, faster troubleshooting and reduced downtimes. In other words, increased profits and lower costs.

Achieve more with SITRAIN

- Shorter times for startup, maintenance and servicing
- Optimized production operations
- Reliable configuration and startup
- Minimization of plant downtimes
- Flexible plant adaptation to market requirements
- Compliance with quality standards in production
- Increased employee satisfaction and motivation
- Shorter familiarization times following changes in technology and staff

Contact

Visit our site on the Internet at:

<http://www.siemens.com/sitrain>

or let us advise you personally.

SITRAIN Customer Support Germany:

Phone: +49 (0) 911 / 895 7575

Fax: +49 (0) 911 / 895 7576

E-Mail: info@sitrain.com

SITRAIN highlights

Top trainers

Our trainers are skilled teachers with direct practical experience. Course developers have close contact with product development, and directly pass on their knowledge to the trainers.

Practical experience

The practical experience of our trainers enables them to teach theory effectively. But since theory can be pretty drab, we attach great importance to practical exercises which can comprise up to half of the course time. You can therefore immediately implement your new knowledge in practice. We train you on state-of-the-art methodically/didactically designed training equipment. This training approach will give you all the confidence you need.

Wide variety

With a total of about 300 local attendance courses, we train the complete range of Siemens Industry products as well as interaction of the products in systems.

Tailor-made training

We are only a short distance away. You can find us at more than 50 locations in Germany, and in 62 countries worldwide. You wish to have individual training instead of one of our 300 courses? Our solution: We will provide a program tailored exactly to your personal requirements. Training can be carried out in our Training Centers or at your company.

The right mixture: Blended learning

"Blended learning" means a combination of various training media and sequences. For example, a local attendance course in a Training Center can be optimally supplemented by a teach-yourself program as preparation or follow-up. Additional effect: Reduced traveling costs and periods of absence.



Partner at Industry Automation and Drive Technologies



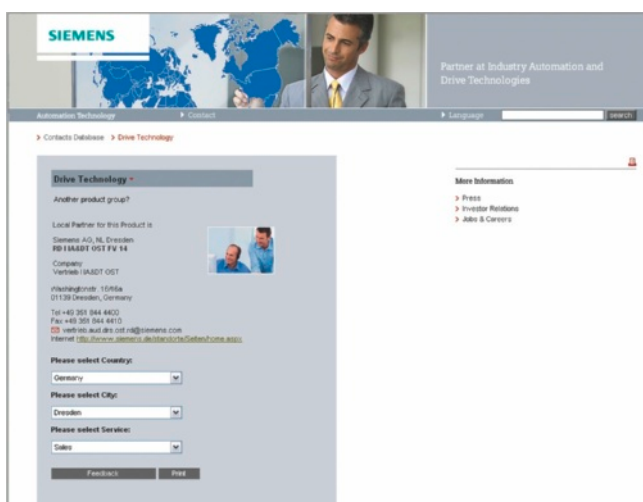
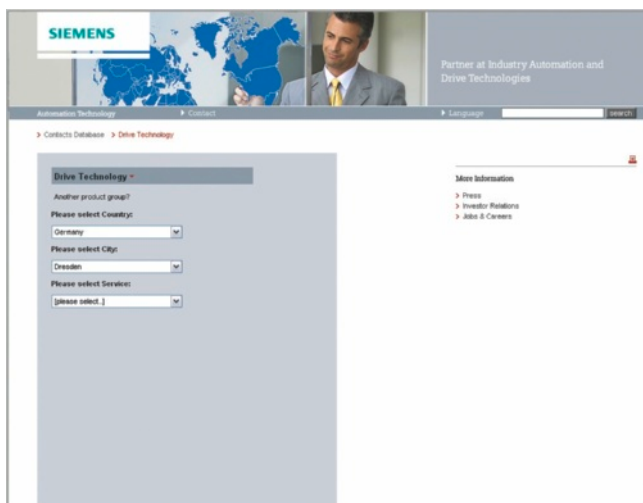
At Siemens Industry Automation and Drive Technologies, more than 85 000 people are resolutely pursuing the same goal: long-term improvement of your competitive ability. We are committed to this goal. Thanks to our commitment, we continue to set new standards in automation and drive technology. In all industries – worldwide.

At your service locally, around the globe for consulting, sales, training, service, support, spare parts ... on the entire Industry Automation and Drive Technologies range.

Your personal contact can be found in our Contacts Database at: www.siemens.com/automation/partner

You start by selecting a

- Product group,
- Country,
- City,
- Service.



Appendix

Partner at Industry Automation and Drive Technologies

Siemens Solution Partner

Overview

Solution Partner

Automation

SIEMENS

Siemens Solution Partner Automation

The products and systems from Siemens Industry Automation and Drive Technologies offer the ideal platform for all automation applications.

Under the name of Siemens Solution Partners, selected system integrators around the world act as uniformly qualified solution providers for the Siemens range of products and services in the fields of automation and drives. Day after day, they utilize their qualified product and system know-how as well as their excellent industry expertise to your advantage – for all requirements.

The partner emblem is the guarantee and indicator of proven quality. The basis for this are defined quality features that identify Solution Partners as reliable and competent solution providers:

- **Solution quality**
Always a good result with tried and tested solution know-how.
- **Expert quality**
Certified technical competence ensures maximum efficiency.
- **Project quality**
With proven project experience straight to the target.
- **Offer quality**
Comprehensive portfolio for state-of-the-art solutions from a single source.

Solution Partner Finder

The Siemens Solution Partner Program helps you to find the optimum partner for your specific requirements. Support is provided by the Solution Partner Finder, a comprehensive online database that showcases the profiles of all our solution partners. You can convince yourself of the competence of the respective Solution Partner by means of the references provided.

The following search criteria are possible:

- Country
- Technology
- Sector
- Company
- Zip code

Once you have located a partner, you are only one small step from contacting them.

You can locate the Solution Partner Finder as follows:

<http://www.siemens.com/automation/partnerfinder>



Additional information on the Siemens Solution Partner Program is available online at:

<http://www.siemens.com/automation/solutionpartner>



Length codes for cables 6XV

For cables whose length can be selected according to the following list, complete the empty positions (■ ■ ■) of the order number according to the specified length code. Note the different length codes! Other lengths on request.

Standard lower price lengths are available for many cables. Standard lengths can be supplied from the central warehouse in Nürnberg, Germany (LZN) within three days.

Special lengths can only be supplied from the factory. Delivery may take up to thirty days.

Cables 6XV. ...

Length of cable = multiplier x length digit		Order No. extension for cable			
Multiplier:	0.01 m	▶ 6XV. ... - ..	■	■	
	0.1 m		E		
	1.0 m		H		
	10.0 m		N		
	100.0 m		T		
Length digit:	10			1 0	
	12			1 2	
	15			1 5	
	16			1 6	
	20			2 0	
	25			2 5	
	32			3 2	
	40			4 0	
	50			5 0	
	60			6 0	
	63			6 3	
	80			8 0	

Order example

The cable 6XV1 404-0A■■■ must be 16 m long. Multiplier 1.0 m (N) x length digit 16 (16) provides a length of 16 m. The order number extension is N16. You enter it in the empty spaces of the order number. The complete order number for the cable 16 m long is therefore

6XV1 404-0AN16.

Appendix Online Services

Information and Ordering in the Internet and on DVD

Siemens Industry Automation and Drive Technologies in the WWW



A detailed knowledge of the range of products and services available is essential when planning and configuring automation systems. It goes without saying that this information must always be fully up-to-date.

Siemens Industry Automation and Drive Technologies has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

Under the address

www.siemens.com/industry

you will find everything you need to know about products, systems and services.

Product Selection Using the Interactive Catalog CA 01 of Industry



Detailed information together with convenient interactive functions:

The interactive catalog CA 01 covers more than 80 000 products and thus provides a full summary of the Siemens Industry Automation and Drive Technologies product base.

Here you will find everything that you need to solve tasks in the fields of automation, switchgear, installation and drives.

All information is linked into a user interface which is easy to work with and intuitive.

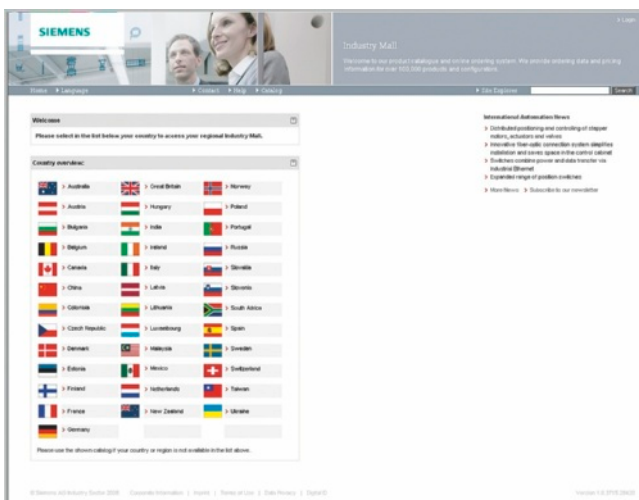
After selecting the product of your choice you can order at the press of a button, by fax or by online link.

Information on the interactive catalog CA 01 can be found in the Internet under

www.siemens.com/automation/ca01

or on DVD.

Easy Shopping with the Industry Mall



The Industry Mall is the virtual department store of Siemens AG in the Internet. Here you have access to a huge range of products presented in electronic catalogs in an informative and attractive way.

Data transfer via EDIFACT allows the whole procedure from selection through ordering to tracking of the order to be carried out online via the Internet.

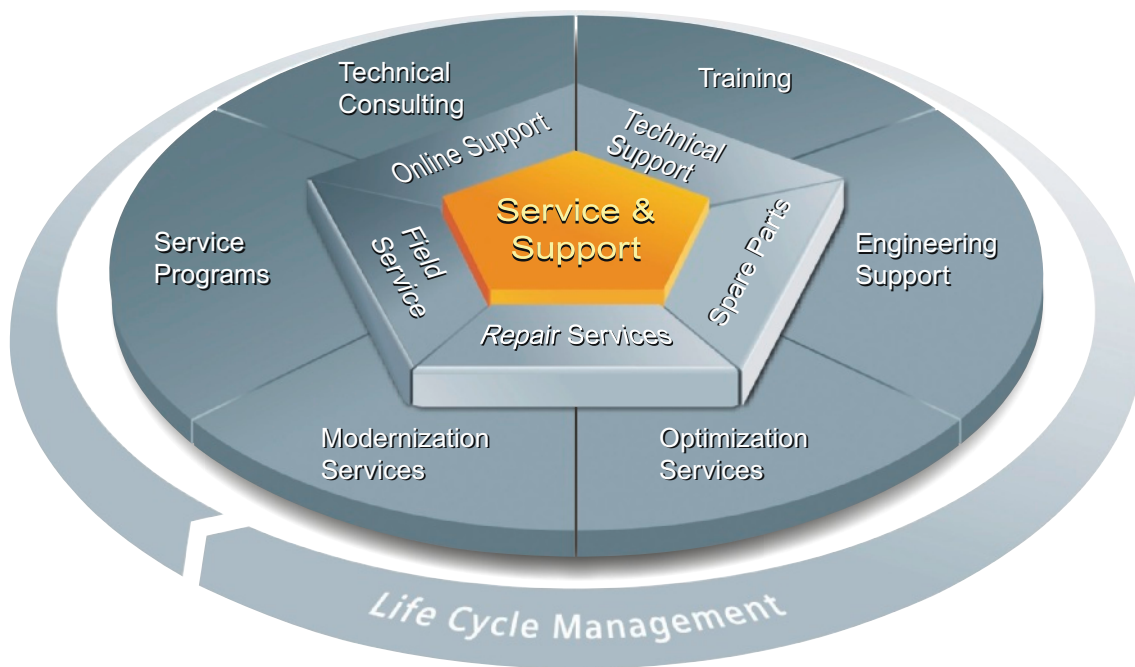
Numerous functions are available to support you.

For example, powerful search functions make it easy to find the required products, which can be immediately checked for availability. Customer-specific discounts and preparation of quotes can be carried out online as well as order tracking and tracing.

Please visit the Industry Mall on the Internet under:

www.siemens.com/industrymall

The unmatched complete service
for the entire life cycle



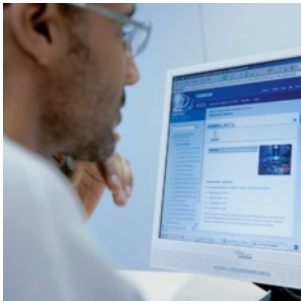
For machine constructors, solution providers and plant operators: The service offering from Siemens Industry, Automation and Drive Technologies includes comprehensive services for a wide range of different users in all sectors of the manufacturing and process industry

To accompany our products and systems, we offer integrated and structured services that provide valuable support in every phase of the life cycle of your machine or plant - from planning and implementation through commissioning as far as maintenance and modernization.

Our Service & Support accompanies you worldwide in all matters concerning automation and drives from Siemens. We provide direct on-site support in more than 100 countries through all phases of the life cycle of your machines and plants.

You have an experienced team of specialists at your side to provide active support and bundled know-how. Regular training courses and intensive contact among our employees - even across continents - ensure reliable service in the most diverse areas.

Online Support



The comprehensive online information platform supports you in all aspects of our Service & Support at any time and from any location in the world.

www.siemens.com/automation/service&support

Technical Consulting



Support in planning and designing your project: From detailed actual-state analysis, definition of the goal and consulting on product and system questions right through to the creation of the automation solution.

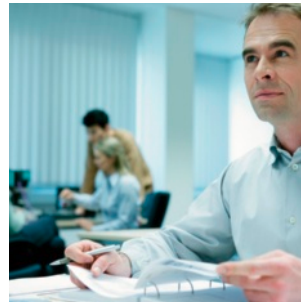
Technical Support



Expert advice on technical questions with a wide range of demand-optimized services for all our products and systems.

www.siemens.com/automation/support-request

Training



Extend your competitive edge - through practical know-how directly from the manufacturer.

www.siemens.com/sitrain

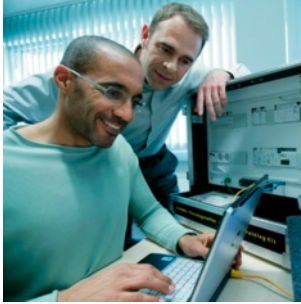
Contact information is available in the Internet at:
www.siemens.com/automation/partner

Appendix

Service & Support

The unmatched complete service
for the entire life cycle

Engineering Support



Support during project engineering and development with services fine-tuned to your requirements, from configuration through to implementation of an automation project.

Modernization



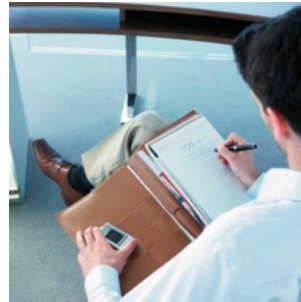
You can also rely on our support when it comes to modernization - with comprehensive services from the planning phase all the way to commissioning.

Field Service



Our Field Service offers you services for commissioning and maintenance - to ensure that your machines and plants are always available.

Service programs



Our service programs are selected service packages for an automation and drives system or product group. The individual services are coordinated with each other to ensure smooth coverage of the entire life cycle and support optimum use of your products and systems.

The services of a Service Program can be flexibly adapted at any time and used separately.

Spare parts



In every sector worldwide, plants and systems are required to operate with constantly increasing reliability. We will provide you with the support you need to prevent a standstill from occurring in the first place: with a worldwide network and optimum logistics chains.

Examples of service programs:

- Service contracts
- Plant IT Security Services
- Life Cycle Services for Drive Engineering
- SIMATIC PCS 7 Life Cycle Services
- SINUMERIK Manufacturing Excellence
- SIMATIC Remote Support Services

Advantages at a glance:

- Reduced downtimes for increased productivity
- Optimized maintenance costs due to a tailored scope of services
- Costs that can be calculated and therefore planned
- Service reliability due to guaranteed response times and spare part delivery times
- Customer service personnel will be supported and relieved of additional tasks
- Comprehensive service from a single source, fewer interfaces and greater expertise

Repairs



Downtimes cause problems in the plant as well as unnecessary costs. We can help you to reduce both to a minimum - with our worldwide repair facilities.

Optimization



During the service life of machines and plants, there is often a great potential for increasing productivity or reducing costs. To help you achieve this potential, we are offering a complete range of optimization services.

Contact information is available in the Internet at:
www.siemens.com/automation/partner

Knowledge Base on DVD



For locations without online connections to the Internet there are excerpts of the free part of the information sources available on DVD (Service & Support Knowledge Base). This DVD contains all the latest product information at the time of production (FAQs, Downloads, Tips and Tricks, Updates) as well as general information on Service & Support.

The DVD also includes a full-text search and our Knowledge Manager for targeted searches for solutions. The DVD will be updated every 4 months.

Just the same as our online offer in the Internet, the Service & Support Knowledge Base on DVD comes complete in 5 languages (German, English, French, Italian, Spanish).

You can order the **Service & Support Knowledge Base** DVD from your Siemens contact.

Order no. **6ZB5310-0EP30-0BA2**

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Small card - great support

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Card number and PIN are on the back of the Automation Value Card. When delivered, the PIN is covered by a scratch field, guaranteeing that the full credit is on the card.

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Automation Value Card order numbers

Credits	Order no.
200	6ES7 997-0BA00-0XA0
500	6ES7 997-0BB00-0XA0
1 000	6ES7 997-0BC00-0XA0
10 000	6ES7 997-0BG00-0XA0

Detailed information on the services offered is available on our Internet site at:

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Service & Support à la Card: Examples

Technical Support

"Priority"	Priority processing for urgent cases
"24 h"	Availability round the clock
"Extended"	Technical consulting for complex questions
"Mature Products"	Consulting service for products that are not available any more

Support Tools in the Support Shop

Tools that can be used directly for configuration, analysis and testing

Appendix

Service & Support

Software Licenses

Overview

Software types

Software requiring a license is categorized into types. The following software types have been defined:

- Engineering software
- Runtime software

Engineering software

This includes all software products for creating (engineering) user software, e.g. for configuring, programming, parameterizing, testing, commissioning or servicing.

Data generated with engineering software and executable programs can be duplicated for your own use or for use by third parties free-of-charge.

Runtime software

This includes all software products required for plant/machine operation, e.g. operating system, basic system, system expansions, drivers, etc.

The duplication of the runtime software and executable programs created with the runtime software for your own use or for use by third-parties is subject to a charge.

You can find information about license fees according to use in the ordering data (e.g. in the catalog). Examples of categories of use include per CPU, per installation, per channel, per instance, per axis, per control loop, per variable, etc.

Information about extended rights of use for parameterization/configuration tools supplied as integral components of the scope of delivery can be found in the readme file supplied with the relevant product(s).

License types

Siemens Industry Automation & Drive Technologies offers various types of software license:

- Floating license
- Single license
- Rental license
- Trial license

Floating license

The software may be installed for internal use on any number of devices by the licensee. Only the concurrent user is licensed. The concurrent user is the person using the program. Use begins when the software is started.

A license is required for each concurrent user.

Single license

Unlike the floating license, a single license permits only one installation of the software.

The type of use licensed is specified in the ordering data and in the Certificate of License (CoL). Types of use include for example per device, per axis, per channel, etc.

One single license is required for each type of use defined.

Rental license

A rental license supports the "sporadic use" of engineering software. Once the license key has been installed, the software can be used for a specific number of hours (the operating hours do not have to be consecutive).

One license is required for each installation of the software.

Trial license

A trial license supports "short-term use" of the software in a non-productive context, e.g. for testing and evaluation purposes. It can be transferred to another license.

Factory license

With the Factory License the user has the right to install and use the software at one permanent establishment only. The permanent establishment is defined by one address only. The number of hardware devices on which the software may be installed results from the order data or the Certificate of License (CoL).

Certificate of license

The Certificate of License (CoL) is the licensee's proof that the use of the software has been licensed by Siemens. A CoL is required for every type of use and must be kept in a safe place.

Downgrading

The licensee is permitted to use the software or an earlier version/release of the software, provided that the licensee owns such a version/release and its use is technically feasible.

Delivery versions

Software is constantly being updated. The following delivery versions

- PowerPack
- Upgrade

can be used to access updates.

Existing bug fixes are supplied with the ServicePack version.

PowerPack

PowerPacks can be used to upgrade to more powerful software. The licensee receives a new license agreement and CoL (Certificate of License) with the PowerPack. This CoL, together with the CoL for the original product, proves that the new software is licensed.

A separate PowerPack must be purchased for each original license of the software to be replaced.

Upgrade

An upgrade permits the use of a new version of the software on the condition that a license for a previous version of the product is already held.

The licensee receives a new license agreement and CoL with the upgrade. This CoL, together with the CoL for the previous product, proves that the new version is licensed.

A separate upgrade must be purchased for each original license of the software to be upgraded.

ServicePack

ServicePacks are used to debug existing products.

ServicePacks may be duplicated for use as prescribed according to the number of existing original licenses.

License key

Siemens Industry Automation & Drive Technologies supplies software products with and without license keys.

The license key serves as an electronic license stamp and is also the "switch" for activating the software (floating license, rental license, etc.).

The complete installation of software products requiring license keys includes the program to be licensed (the software) and the license key (which represents the license).

Detailed explanations concerning license conditions can be found in the "Terms and Conditions of Siemens AG" or under <http://www.siemens.com/industrymall> (Industry Mall Online-Help System)

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Catalog improvement suggestions

Fax form

To

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Appendix

Notes

Notes



Appendix

Notes

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