SIEMENS

Identification Systems MOBY

Catalog KT 21 · 2002

SYSTEMS ENGINEERING

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Trademarks

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Systems Engineering

Identification Systems MOBY

Catalog KT 21 · 2002

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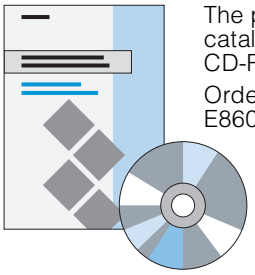


The products included in this catalog are also part of the CD-ROM Catalog CA 01

Order No.:
E86060-D4001-A110-B5-7600

Please contact your local Siemens office

Further information and news on MOBY can also be found in the Internet at:
http://www.ad.siemens.de/moby
e-mail: moby@fthw.siemens.de

The products and systems described in this catalog are marketed using a DQS-certified quality management system to DIN EN ISO 9001 (Certificate Registration No: 1108-03). The DQS certificate is recognized in all EQ Net countries (Reg. No. 1108).

Introduction

MOBY® identification systems

Users working with identification systems all have their own personal requirements. One might require low-price SmartLabels for logistics and another might require rugged data memories for assembly lines. In the automotive industry, such mobile data memories (MDS) must above all be heat-resistant, and for transport control and logistics it is essential to have long-range data memories.

Irrespective of your requirements: we have the solution: MOBY®. These clever electronic identification systems from Siemens are the right choice for pioneering companies that exactly know what they require for the future. The reason: MOBY identification systems control and optimize material flow.

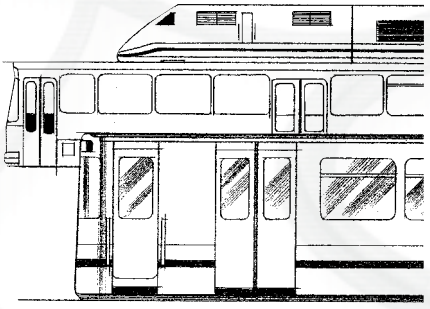
They carry out identification functions reliably, rapidly and economically, are insensitive to contamination, and save data directly on the product. We of course offer our complete servicing facilities worldwide for these systems.

The appropriate identification system for every sector

With MOBY you can therefore react rapidly and appropriately to new industrial requirements.

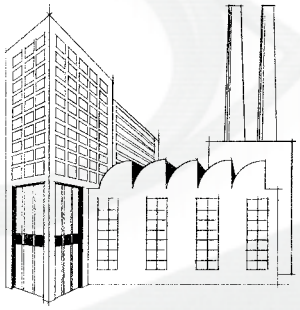
Because the MOBY range of products offers powerful, cost-effective and globally proven inductive identification systems for almost any application, you can most certainly optimize your material flow and production procedures – irrespective of whether industrial production/assembly lines, warehouses/logistics or transport/traffic control are your concern.

Successful industrial companies worldwide use the MOBY identification systems – from the leading supplier.



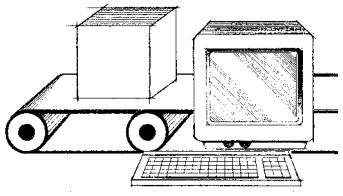
Transport/traffic
Transport logistics

MOBY U
MOBY V



Industrial production
Assembly lines

MOBY U
MOBY E
MOBY I



Warehouse/logistics
Distribution
Order picking

MOBY D
MOBY F

Convincing advantages

The advantages of MOBY data memories compared to other information media, for example barcodes, are quite clear:

- MOBY carries out identification fully automatically, rapidly and with 100% transmission reliability.
- MOBY is insensitive to temperature fluctuations and contamination such as oil, dust, water.
- MOBY data memories can be repeatedly reused.
- Production and quality data can be saved directly on the product; up to 32 KB.
- MOBY has a long service life.
- MOBY has a convincing cost/benefits ratio.

Furthermore, MOBY is fully integrated into the SIMATIC/ SICOMP/PROFIBUS environment or PCs with Windows, can be connected to any PLCs and – particularly important – it can be easily configured and installed exactly according to customer requirements.

Mobile handheld terminals provide even greater flexibility for a wide range of applications.

MOBY functions quite simply

MOBY identification systems mean that a product or object is accompanied by detailed data right from the beginning: in the form of a mobile data memory which can be written, modified and read as desired. All relevant information (up to 32 KB production and quality data) is present exactly where it is required: on the product carrier or on the product itself.

Data transfer between the mobile data memory and the read/write unit is carried out fully automatically and without contact by means of RF (radio frequency), where direct visual contact is not a must. It also functions reliably with contamination or through non-metallic materials.

Further positive effects: loads on the host computer and communications networks are reduced, and faults in the communications system no longer trigger a catastrophe. This is because production can be continued with the data on the products, at least in specific areas.

Concerning commissioning: this is also carried out more rapidly, since autonomous areas/cells can be tested in advance.

MOBY

System overview

MOBY D	MOBY F	MOBY E
		
• For logistics and distribution applications	• For logistics and distribution applications	• For logistics and industrial assembly line applications
• 13.56-MHz identification system	• 125-kHz identification system	• 13.56-MHz identification system
• Read/write distance up to 500 or 900 mm	• Read/write distance up to 420 mm	• Read/write distance up to 100 mm
• Low-cost EEPROM data memory (48 byte) up to +70 °C or +200 °C	• Low-cost read-only or EEPROM data memory (192 byte) up to +130 °C	• Various EEPROM data memories (752 byte) up to +150 °C
• Bulk/multitag capability	• Bulk/multitag capability	—
• Data transfer rate ≥ 5 ms/byte	• Data transfer rate ≤ 10 ms/byte	• High data transfer rate (≥ 2.8 ms/byte)
• Powerful mobile handheld terminal*	• Powerful mobile handheld terminal	• Powerful mobile handheld terminal
• Approvals: EN 300 330 (Europe)	• Approvals: EN 300 330 (Europe)	• Approvals[1]: EN 300 330 (Europe), FCC Part 15 (USA), UL/CSA
Special features:		
• For SmartLabels based on ISO 15693 standard, e.g. I-Code, Tagit, Infineon (SRF55V10)	—	—
• Customer-specific data memories and antennae on request	• Customer-specific data memories and antennae on request	• Tool pill to DIN 69 873
• Standard components (catalog products) for versatile applications and individual solutions		
• High reliability even with contamination (oil, dust, ...) or temperature fluctuations		
• Simple integration into SIMATIC S5/S7 or PROFIBUS-DP/DP-V1		
• Connection possible to any systems/PC via serial interface		
• Worldwide configuring and service support		

1) Without SLA 71, ASM 724/754

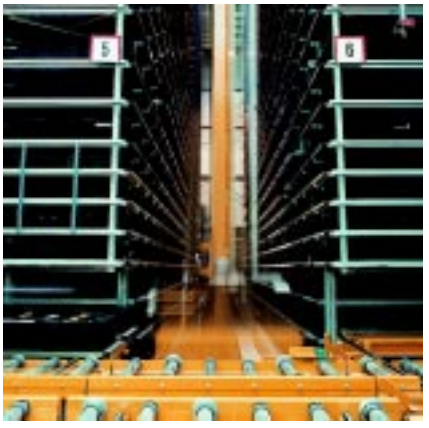
MOBY I	MOBY V	MOBY U NEW
		
• For universal industrial application	• In independent railway systems	• For universal industrial and logistics applications
• 1.81-MHz identification system	• 433-MHz identification system	• 2.4-GHz identification system
• Read/write distance up to 150 mm	• Read/write distance up to 800 mm	• Read/write distance up to 3000 mm
• Comprehensive range of rugged FRAM/EEPROM data memories (max. 32 KB) up to +85 °C or +220 °C	• Compact, rugged RAM data memory (32 KB)	• Comprehensive range of rugged RAM data memories (max. 32 KB) up to +85 °C or +220 °C
—	—	• Bulk/multitag capability
• High data transfer rate (≥ 0.8 ms/byte)	• Very high data transfer rate (≥ 0.8 ms/byte)	• Very high data transfer rate (≥ 0.06 ms/byte)
• Powerful mobile handheld terminal	• Service and test unit	—
• Approvals[2]: EN 300 330 (Europe) FCC Part 15 (USA), UL/CSA	• Approvals: EN 300 220	• Approvals[2]: I-ETS 330 440 FCC Part 15 (USA), UL/CSA
• Battery-free FRAM data memory	—	• Automatic switching to vacant frequency channels (frequency hopping)
• Comprehensive range of read/write units	• Very high interference resistance	• Read/write range can be reduced using software

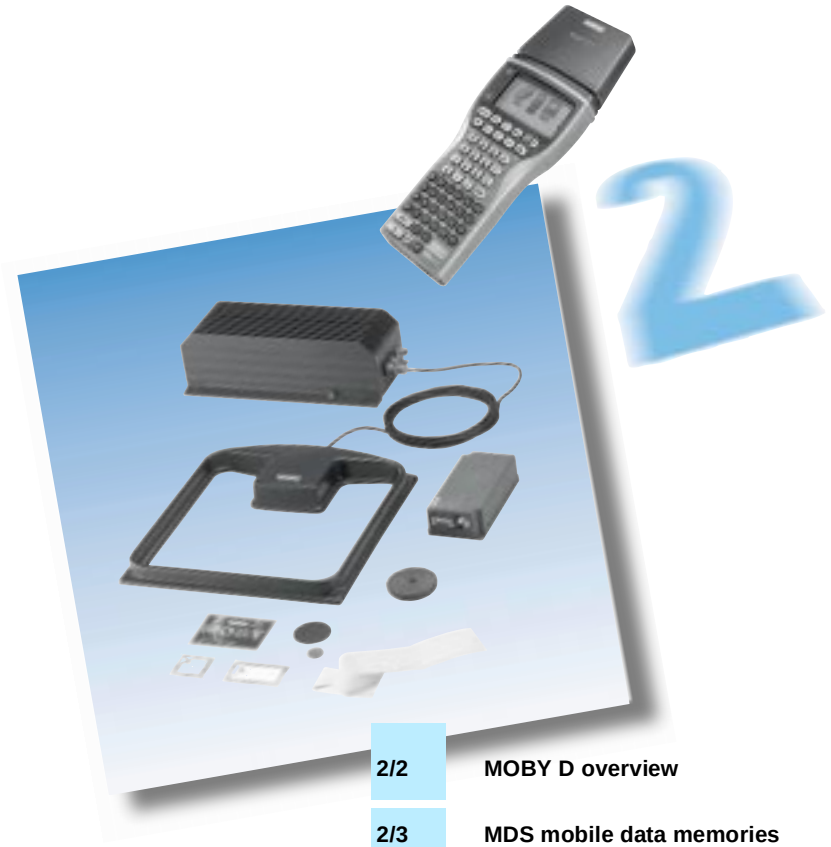
2) Without SIM 4x, ASM 424/454

Applications

Application examples

- Assembly lines for “white” and “brown” goods such as refrigerators, coffee machines, televisions sets, vacuum cleaners, ...
- Assembly lines for anti-skid systems, airbags, low-power motors, doors, cockpits, brakes, ...
- Production lines for motors, gearboxes, steering gear
- Main assembly lines in the automotive industry (body shop, paint shop, assembly)
- PC production lines
- Dispatch warehouses including order picking (e.g. food, tires, writing materials, clothing)
- Cold-storage depots including order picking (e.g. meat, sausages)
- Production of prescription lenses
- Container/vessel identification, e.g. in the chemical industry
- Carriage identification in underground and suburban trains
- Parts identification for textiles (e.g. jeans, medical stockings), baggage, barrels, gas cylinders, window parts, printing cylinders, ...
- Access control and order processing
- Wafer identification during chip production
- Assembly line for contactors, PLCs, switches
- Production lines for dialysis filters
- Production lines in the glass/ceramics industry
- and many other applications worldwide.





RF identification system MOBY D

MOBY D

Overview

Application

MOBY D is a new RF identification system based on the ISO/IEC 15693 standard in the 13.56 MHz range. For the first time, the standard defines a common basis for SmartLabels from different vendors (e.g. I-Code, Tag-it). Applications range from simple identification such as electronic barcode replacement, barcode expansion or product accompanying document, as well as warehouse and distribution logistics, and even up to product identification.

As a result of the low price of the SmartLabels with large-volume applications and simple system integration, MOBY D is a suitable identification system for the above-mentioned applications.

Different read/write units with integral or separate antennae are available depending on the read/write distance.

Main applications of MOBY D

The flexible design of the transponders permits optimum dimensioning for a wide variety of applications.

Low-cost SmartLabels with large-volume applications:

- Vessel and box identification in open systems
- Distribution logistics and identification of products
- Parcel and postal services, shipping and haulage companies
- Baggage check-in and tracking
- Protection against theft (copying, etc.).

Advantages of SmartLabels compared to conventional barcode labels:

- Rugged, reliable detection even with contamination (moisture, dust, etc.)
- Maintenance-free and resistant to aging
- Identification is possible even through packaging and non-metallic materials
- Rewriting possible (unlimited read cycles, typically 1,000,000 write cycles)

Up to 30 SmartLabels can be detected simultaneously (serial number with bulk detection), and the data can be processed selectively (multitag operation).

Hardened data memories (closed systems)

- Vessel and box identification for logistics and distribution
- Production logistics and in assembly lines with increased temperature requirements (e.g. paint shop, temperature range up to +200 °C)
- Parts identification (e.g. data memory is connected directly to the product/pallet).

Features

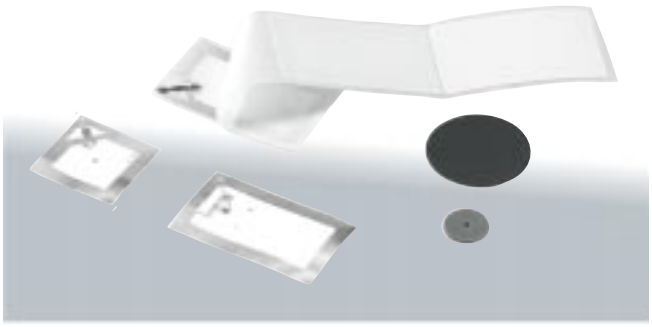
The MOBY D identification system has the following performance features:

- 13.56-MHz identification system for SmartLabels/data memories based on **I-Code, Tag-it or ISO/IEC 15963** with a read/write distance up to 900 mm (depends on MDS/SLG)
- Special heat-resistant data memory (48 byte EEPROM) for paint shops up to +200 °C[1])
- Very high reliability even with contamination, temperature variations and electromagnetic interferences
- Connection possible to any systems, e.g. PC with Windows 9x/NT, via serial interface
- Simple integration into SIMATIC[1]) and PROFIBUS-DP[1])
- Worldwide configuring and service support.

Technical specifications

Type	Non-contact RF identification system
Transmission frequency (power/data)	13.56 MHz
Memory capacity	Depends on chip used I-code: currently 48 byte user memory, 4 byte read-only as serial number
Memory type	EEPROM
Read/write cycles	Unlimited/> 1,000,000
Data organization	8 byte block-by-block
Data transfer rate MDS to SLG	Approx. 3.5 ms/byte (read) Approx. 9.5 ms/byte (write)
Read/write distance	Up to 600 mm (900 mm with customer-specific antenna[2])
Operating temperature (MDS)	–25 to +85 °C/+200 °C
Degree of protection (MDS)	Up to IP 68
Can be connected to	PC with Windows 98/NT, SIMATIC S7[2]), PROFIBUS-DP[2])
Special features	For SmartLabels/data memory on basis of ISO/IEC 15963 standard, e.g. I-Code, Tag-it CRC checksums for reliable data transmission Multitag and password function
Approvals	EN 300 330

1) Available soon.
2) On request.



Application

MOBY identification systems guarantee that detailed data can accompany a product right from the beginning.

As a result of the very low price with large-volume applications, the SmartLabels can be universally used as an "electronic bar-code replacement" or "product accompanying document".

Stationary or mobile read/write units (SLG) can be used to read, supplement or modify the required information (production data, transport routes, …) of mobile data memories without contact (inductively) and without direct visual contact being necessary.

MDS D...[1])	Customer-specific SmartLabel (e.g. 48 byte EEPROM), e.g. with credit card format ▪ Degree of protection up to IP 40 ▪ Temperature range up to +70 °C ▪ Typ. dimensions in mm: 100 x 70, 76 x 45, 46 x 45, 29 x 9 ▪ Max. read/write distance 900 mm (customer-specific antenna)
MDS D139	Reusable data memories for paint shops or applications at high temperatures (48 byte EEPROM, 85 mm diam. x 15 mm) ▪ Degree of protection IP 68 ▪ Temperature range up to +200 °C ▪ Max. read/write distance 0 to 450 mm

Design and function

The MOBY D data memories/SmartLabel basically comprise the logic with integral EEPROM and an antenna.

If an MDS moves into the transmission field of the SLG, the power required for all circuit components is generated and monitored by the power supply unit. The pulse-coded information is conditioned such that it can be processed further in the form of digital signals. The control unit (SLG) handles the data including check routines, and also manages the user memory.

Customer-specific data memories

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

Field data of MDS and SLG (all data in mm)

The following table lists the field data of all MOBY D components of the MDS and SLG. Correct selection of an MDS and an SLG is therefore very easy. All technical specifications listed are typical data and apply to a room temperature of +25 °C and a power supply of 24 V DC.

	MDS D... (customer-specific)	**MDS D139**
	Operating/limit distance (without influence of metal)	
SLG D12	0–150 (with SmartLabel 79 × 48)	0–120
SLG D10 ANT D5	0–500 (with SmartLabel 79 × 48)	0–450
	Distance from MDS to MDS	

Ordering data

	Order No.
MDS D139 mobile data memory[2]) 48 byte EEPROM, IP 68, max. +200 °C	**6GT2 600-0AA00**
SmartLabel 48 byte EEPROM, customer-specific conversion for large-volume applications	On request

1) For large-volume applications.

MDS D139 mobile data memories

Application

Cost-effective, heat-resistant transponder for use in production logistics and assembly lines at high temperatures (max. +200 °C, e.g. in paint shops incl. cathodic electrodeposition). The MDS D139 is a passive, maintenance-free transponder based on I-Code technology.

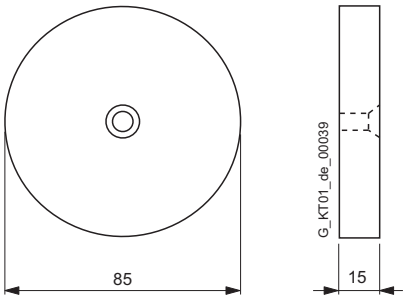
Technical specifications

Memory capacity	48 byte EEPROM, freely available 8 byte serial number
MTBF	2.5×10^6 hours
Read cycles	Unlimited
Write cycles, At +70°C At ≤ 40 °C	Min. 10000 Typ. > 500000
Data retention time	> 10 years (at < +40 °C)
Max. read/write distance	450 mm (see field data)
Memory organization	Block-by-block access
Multitag facility	Yes, depends on SLG
Power source	Inductive power transmission (without battery)
Shock/vibration to EN 60721-3-7, Class 7 M3	50 *g*/20 *g*
Torsion and bending stress	None
Mounting	M5 screw
Recommended distance from metal	> 25 mm
Degree of protection to EN 60 529	IP 68
Chemical stability	See Configuring Manual
Housing ▪ Dimensions in mm ▪ Color/material	 85 diam. x 15 Brown/PPS plastic
Ambient temperature ▪ Operation ▪ Transport and storage	 –25 to +140 °C +200 °C max. 1000 hours –40 to +140 °C
Approx. weight	55 g
Special features	Silicon-free housing

Field data in mm

MDS D139 to:	SLG D12	SLG D10 ANT D5
Operating distance (S_a)	0 to 120	0 to 380
Limit distance (S_g)	140	450
Spectral window (L)	100	300
Minimum distance from MDS to MDS	≤ 800	≤ 2000

Dimensions in mm



SmartLabel (customer-specific design)

The flexible design of the customer-specific SmartLabels permits optimum dimensioning for a wide variety of applications.

As a result of the very low price, the SmartLabels can be universally used as an "electronic barcode replacement" or "product accompanying document".

Technical specifications

Memory capacity (with Icode)	48 byte EEPROM, freely available 8 byte serial number
MTBF	2.5×10^6 hours
Read cycles	Unlimited
Write cycles, at ≤ 40 °C	Typ. > 1,000,000
Data retention time	> 10 years (at < +40 °C)
Max. read/write distance	900 mm (see field data)
Memory organization	Block-by-block access
Multitag facility	Yes, depends on SLG
Power source	Inductive power transmission
Shock/vibration to EN 60721-3-7, Class 7 M3	50 *g*/20 *g*
Torsion and bending stress	Not permanently
Mounting	e.g. bonded on one side
Recommended distance from metal	> 10 mm
Degree of protection to EN 60 529	e.g. IP 40
Chemical stability	See Configuring Manual
Housing ▪ Dimensions in mm ▪ Color/material	 e.g. 103 × 73 or 79 × 48 or 49 × 48 e.g. top: plastic; bottom: double-sided bonding
Ambient temperature ▪ Operation ▪ Transport and storage	 e.g. –25 to +70 °C –40 to +85 °C
Approx. weight	e.g. 3 g
Special features	▪ Temperature range, size, degree of protection, mounting, operating distance etc., depending on customer-specific design of the SmartLabels ▪ For high-volume applications ▪ Sources of supply on request

Field data in mm (depend on customer-specific design)

MDS D... to: (customer-specific design)	SLG D12	SLG D10 ANT D5
Operating distance (S_a)	0 to 150 (size 79 × 48 mm)	0 to 500 (size 79 × 48 mm)

Application

The SLG provides the inductive communication and power supply for the MDS and for the serial interface (RS 232 or RS 422 on request) to the various systems (PC, PLC (SIMATIC available soon)).

Various SLGs are available for small, medium or large distances from the MDS according to customer-specific requirements.

Rugged SLG and antenna housings with a high degree of protection permit use in harsh environments, and guarantee a high stability to many chemical substances. The supporting of SmartLabels based on the ISO/IEC 15963 standard, multitag facility incl. password function, etc. mean that new fields of application are opened up.

SLG D10 ANT D5	Read/write unit for universal application with remote antenna (dimensions 340 mm x 325 mm x 38 mm) ▪ Max. read/write distance 600 mm ▪ Degree of protection IP 65 ▪ Temperature range up to +55 °C ▪ With RS 232 interface for connection to PC/PLC
SLG D10 ANT D5	As above, but with RS 422 interface for connection to PC/PLC, on request
SLG D10 ANT K	As above, but with customer-specific antenna, on request
SLG D12	Read/write unit for universal application with integral antenna (dimensions 160 mm x 80 mm x 40 mm) ▪ Max. read/write distance 150 mm ▪ Degree of protection IP 65 ▪ Temperature range up to +70 °C ▪ With RS 232 interface for connection to PC/PLC
SLG D12	As above, but with RS 422 interface for connection to PC/PLC, on request

Design and functions

The SLG converts the commands (read MDS, ...) received from the PC or interface module (ASM) and generates a magnetic alternating field via the antenna for non-contact communication and power supply to the MDS.

Fail-safe protocols and access mechanisms provide high data reliability and guarantee fast, safe and interference-free communication. The quantity of data which can be transmitted between the SLG/antenna and MDS depends on:

- The speed at which the MDS moves through the spectral window of the antenna
- The length of the spectral window.

The SLG is available with an RS 232 interface (RS 422 on request) and can therefore be directly connected to any host systems:

- PC
- Computer
- PLC.

All SLG versions are operated using a binary protocol. The following C libraries are available on the MOBY software CD to permit simple, fast integration into the application:

- C library MDWAPI (for Windows 9x/2000/NT), extended range of functions including password protection, access privileges and multitag operation

Field data in mm

Minimum distance from SLG to SLG in mm

SLG D10 ANT D5	**SLG D10 ANT D5**	> 2000
SLG D12	**SLG D12**	> 600

Ordering data

	Order No.
SLG D10 ANT D5 read/write unit with RS 232 serial interface	**6GT2 601-0AA00**
SLG D10 ANT D5 read/write unit with RS 422 serial interface	**On request**
SLG D10 read/write unit with customer-specific antenna	**On request**
SLG D12 read/write unit with RS 232 serial interface	**6GT2 601-0AB00**
SLG D12 read/write unit with RS 422 serial interface	**On request**
MOBY software CD, FB/FC for SIMATIC, 3964R driver for DOS/WINDOWS 95/NT, C libraries, PC demonstration program, MOBY documentation (German + English)	**6GT2 080-2AA10**

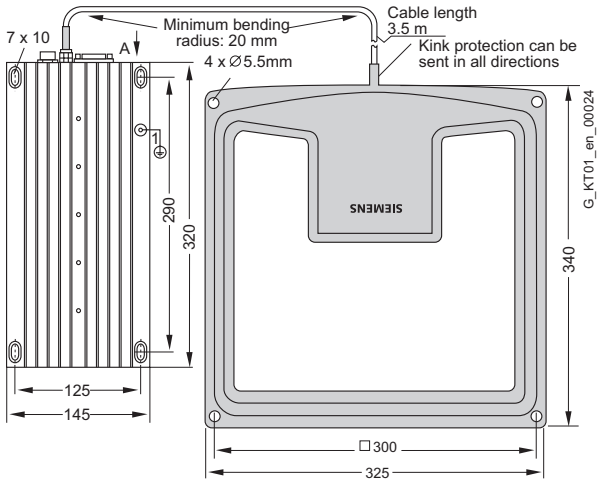
See Section 9 for cables, wide-range power supply unit etc.

SLG D10 ANT D5 read/write unit

Technical specifications

Inductive interface to MDS	Separate antenna
Transmission frequency (power/data)	13.56 MHz, ISO/IEC 15963
Supported data memories/ transponders	For SmartLabels based on ISO/IEC 15963 standard, e.g. I-Code, Tag-it
Multitag capacity	Yes, approx. 20 data memories/s
Read/write distance	Max. 600 mm, see MDS field data
Antenna cable length	3.5 m
Serial interface	RS 232 to PC/PLC RS 422 on request
Max. cable length at 24 V DC	30 m with RS 232
Connector	9-pin sub-D plug
Transfer rate	1200 baud to 115.2 Kbaud (adjustable)
Procedure	Binary
Software functions	
▪ Programming	C library for PC with Windows 9x/2000 and NT
▪ Commands	Read data from MDS, write data to MDS, access privileges, multitag, etc.
Supply voltage Rated value/permissible range	Via 4-pin M12 plug (IP65) 24 V DC/20 to 30 V DC
Current input (at room temperature)	
▪ Inrush current short-term	Up to 2.8 A/50 ms
▪ Operation	Typ. 0.9 A
Housing	
▪ Dimensions (in mm)	
– For antenna head	340 × 325 × 38
– For electronics without connector	320 × 145 × 100
▪ Color	Black/anthracite
▪ Material	ASA plastic/aluminium
Degree of protection to EN 60529	
Housing/antenna (front)	IP 65/IP 65
Shock to EN 60721-3-7	30 *g*, Class 7M2
Vibration to EN 60721-3-7	1.5 *g*, 200-500 Hz, Class 7M2
Mounting of housing	4 x M6 screws
Mounting of antenna	4 x M5 screws
Ambient temperature	
▪ Operation	–20 to +55 °C
Approx. weight	
– Basic unit	3 kg
– Antenna	1 kg

Dimensions in mm

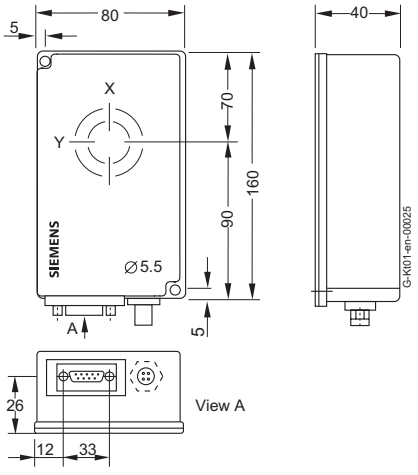


SLG D12 read/write unit

Technical specifications

Inductive interface to MDS	Integral antenna
Transmission frequency (power/data)	13.56 MHz, ISO/IEC 15963
Supported data memories/ transponders	For SmartLabels based on ISO/IEC 15963 standard, e.g. I-Code, Tag-it
Multitag capacity	Yes, approx. 20 data memories/s
Read/write distance	Up to 150 mm, see MDS field data
Serial interface	RS 232 to PC/PLC RS 422 on request
Max. cable length at 24 V DC	30 m with RS 232 300 m with RS 422 (available soon)
Connector	9-pin sub-D plug
Transfer rate	1200 baud to 38.4 Kbaud (adjustable)
Procedure	Binary
Software functions	
▪ Programming	C library for PC with Windows 9x/2000 and NT
▪ Commands	Read data from MDS, write data to MDS, access privileges, multitag, etc.
Supply voltage Rated value/permissible range	Via 4-pin M12 plug (IP65) 24 V DC/20 to 30 V DC
Current input (at room temperature)	
▪ Inrush current short-term	Max. 600 mA
▪ Operation	Typ. 150 mA
Housing	
▪ Dimensions (in mm)	160 × 80 × 40
▪ Color	Anthracite
▪ Material	PA 12 plastic
Degree of protection to EN 60529	
Housing	IP 65
Shock to EN 60721-3-7	30 *g*, Class 7M2
Vibration to EN 60721-3-7	1.5 *g*, 200-500 Hz, Class 7M2
Mounting of housing	2 x M5 screws
Ambient temperature	
▪ Operation	–25 to +70 °C
Approx. weight	0.5 kg

Dimensions in mm

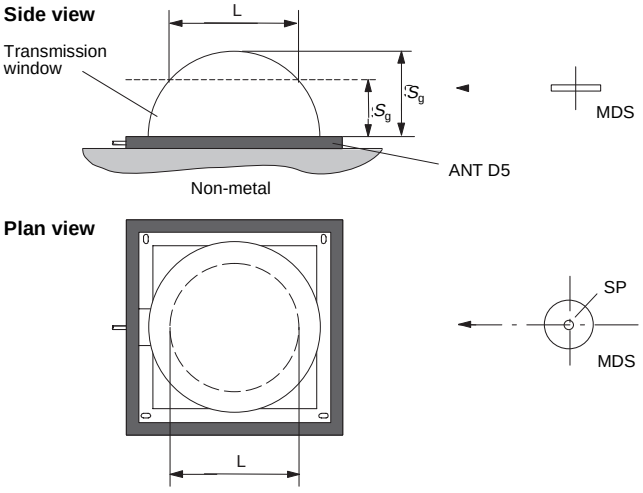


Note:
Detailed configuring and commissioning data are included in the "Configuring, Installation and Service Manual" (see Section 9 for ordering information).

Spectral window

The SLG generates an inductive alternating field. The field is largest in the vicinity of the antenna, and is greatly reduced as the distance from the antenna increases. The field distribution depends on the design and geometry of the antennae in the SLG and MDS.

A requirement for functioning of the MDS is a minimum field strength on the MDS which is achieved at a distance S_g from the SLG. A The following Fig. shows the spectral window between the MDS and SLG:



S_a: Operating distance between MDS and SLG
S_g: Limit distance (the maximum distance between the surface of the antenna and the MDS at which the transmission still just functions under normal conditions)
L: Length of a spectral window
SP: Point of intersection of the axes of symmetry of the MDS

The amount of information which can be transmitted between the SLG and MDS depends on:

- The speed at which the MDS moves past the antenna (so-called target speed)
- The length of the inductive alternating field of the SLG through which the MDS is moving (so-called spectral window).

Max. transversal speed for reading the ID (one MDS in the field)

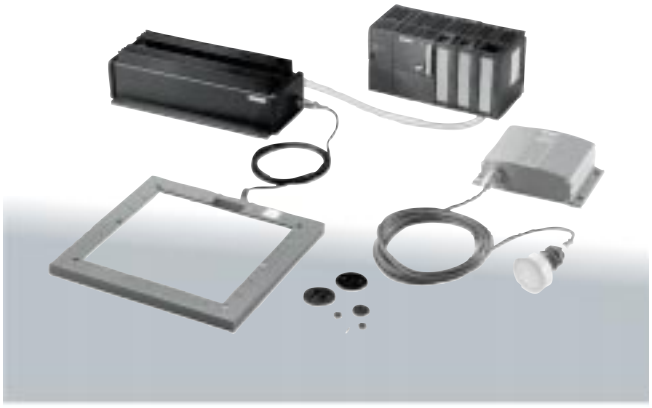
	Read ID No.	v_{MDS} for SLG D12	v_{MDS} for SLG D10 ANT D5
MDS 139	Approx. 50 ms	Approx. 1.6 m/s	Approx. 5 m/s
SmartLabel (79 mm × 48 mm)	Approx. 50 ms	Approx. 1.6 m/s	Approx. 5 m/s

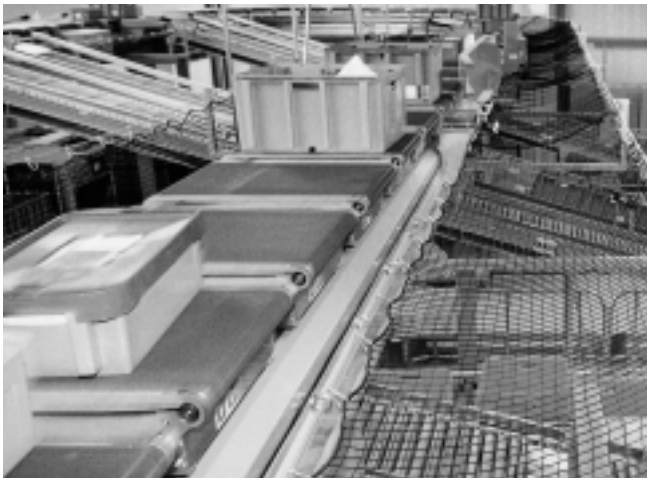
Notes

RF identification system MOBY F

MOBY F

Overview





Application

MOBY F is a non-contact identification system for the low-end performance range which has been specially designed for applications in logistics and distribution. It is used where e.g. containers, boxes and goods carriers have to be identified automatically, reliably, fast and without contact. Different data memories and read/write units are available depending on the requirements (read-only/EEPROM, size, larger distances etc.). As a result of the low price, the data memories can be used e.g. as an “electronic barcode replacement”.

The main applications for MOBY F are:

- Logistics (identification of e.g. pallets, barrels, goods carriers, order picking containers, rented clothing/laundry, etc.)
- Distribution (data memory as “electronic accompanying document”)
- Parts identification (e.g. data memory is attached to products or pallets)
- Production lines (identification e.g. of workpiece carriers)

Features

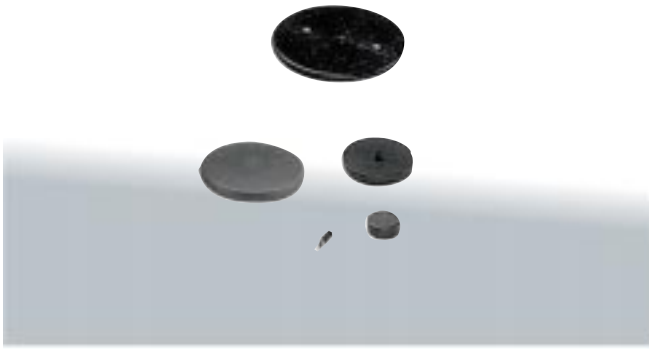
The standard MOBY F components enable fast and reliable design of application-specific identification systems, freeing capacity for the production of the application software.

The MOBY F identification system has the following performance features:

- 125-kHz identification system with read/write distance up to 420 mm
- Comprehensive range of low-price data memories without batteries (read-only or EEPROM)
- High reliability even with contamination and temperature fluctuations
- Connection possible to any systems, e.g. PC with Windows 95/NT, via serial interface
- Customer-specific data memories on request
- Worldwide configuring and service support.

Technical specifications

Transmission frequency (power/data)	125 kHz
Memory capacity	Up to 224 bytes read/write user memory and 4 bytes ID number (r/o) or 40 bits read-only memory
Memory type: r/w MDS	EEPROM
Memory type: read-only MDS	Laser programmed memory
Read/write cycles	Unlimited/typ. 1,000,000
Data organization (MDS)	Byte-by-byte access
Data transfer rate MDS to SLG	≤ 6 ms/byte reading ≤ 10 ms/byte writing Read ID No.: ≤ 60 ms
Read/write distance	Up to 420 mm
Operating temperature (MDS)	–25 °C to +100 °C
Degree of protection (MDS)	IP 68
Can be connected to	SIMATIC S5/S7, PC, non-Siemens PLC, PROFIBUS-DP
Special features	▪ DSP for suppression of interfering frequencies (SLG/SIM 80) ▪ Multitag/password-compatible EEPROM data memory ▪ Customer-specific data memories or antennae on request
Approvals	EN 300 330 (Europe)



Application

Mobile data memories are used where objects, e.g. containers or order picking boxes, have to be identified automatically, reliably, fast and without contact.

Different low-price mobile data memories are available depending on the requirements (type of memory, size etc.).

As a result of the low price and large reading distance, the MOBY F data memories can be frequently used e.g. as an "electronic barcode".

MDS F124	Read-only data memory for universal application in compact housing (30 mm diam. x 1 mm) • Degree of protection IP 67 • Temperature range up to +100 °C • Max. read distance 280 mm
MDS F125	As above, but disk housing (50 mm diam. x 1 mm) • Max. read distance 420 mm
MDS F160	The read-only data memory (16 mm diam. x 3 mm) has been specially designed for harsh use in the washing and cleaning industry. • Main applications: – Rented working clothes – hospital clothing – Hotel laundry – Rented laundry • Degree of protection IP 68 • Temperature range up to +160 °C • Max. read/write distance 160 mm
MDS F 415	EEPROM data memory (224 byte) for universal use in disk housing (50 mm diam. x 1 mm) • Degree of protection IP 67 • Temperature range up to +100 °C • Max. read/write distance 340 mm

Design and functions

The battery-free MOBY F data memories basically comprise an ASIC, an antenna and a housing.

The read/write data memories contain an EEPROM in the ASIC including a serial number, the read-only data memories contain a laser-programmed read-only memory.

The data memories do not require a battery since they obtain their power from the inductive field of the antenna.

The read-only data memories are laser-programmed with a fixed ID number. This procedure guarantees data memories which are forgery-proof and which cannot be deleted.

Transmission and data security are guaranteed using common mechanisms such as CRC, multiple reading etc.

Field data of MDS and SLG (all data in mm)

The following table lists the field data of all MOBY F components of the MDS and SLG/SIM. Correct selection of an MDS and an SLG/SIM is therefore very easy. All technical specifications listed are typical data and apply to an ambient temperature of 0 °C to +50 °C and a power supply of 22 V DC to 27 V DC.

	MDS F124	MDS F125	MDS F160	MDS F415
	Operating distance (S_a)/limit distance (S_g)			
SLG 80/SIM 80 with ANT 5[1])	0–240/280	0–380/420	0–140/160	0–300/340
SLG 82/SIM 82, SLA 81	0–65/80	0–110/140	0–60/70	0–90/110

1) ANT F5 100 mm away from metal.

Ordering data

	Order No.
MDS F124 mobile data memory Minimum order: 100 units	**6GT2 400-1CE00**
MDS F125 mobile data memory Minimum order: 100 units	**6GT2 400-1CF00**
MDS F160 mobile data memory Minimum order: 100 units	**6GT2 400-1GA00**
MDS F415 mobile data memory Minimum order: 100 units	**6GT2 400-4BF00**

Customer-specific data media (housing, temperature range, size etc.) on request.

MDS F124 mobile data memory

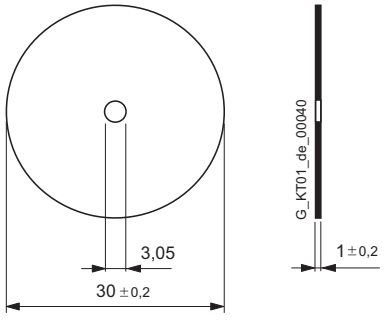
Technical specifications

Memory capacity	40 bit (ID number)
MTBF	2.5 × 10^6 hours
Read cycles	Unlimited
Data retention time	10 years
Max. read distance	280 mm (see field data)
Memory organization	Fixed code
Multitag facility	No
Power source	Inductive power transmission
Shock/vibration to EN 60721-3-7, Class 7M3	100/20 *g*
Mounting	Bonding/M3 screw
Recommended distance from metal	≥ 30 mm
Torsion and bending stress	None
Degree of protection to EN 60529	IP 67
Chemical stability	See Installation and Configuring Manual
Housing ▪ Dimensions ▪ Color/material	Button 30 mm diam. x 1 mm Black/plastic
Ambient temperature ▪ Operation ▪ Transport and storage	 –25 to +100 °C –40 to +130 °C
Approx. weight	5 g

Field data in mm

MDS F124 to:	SLG 80/SIM 80 with ANT F5	SLG 82/SIM 82, SLA 81
Operating distance (S_a)	0 to 240	0 to 65
Limit distance (S_g)	280	80
Spectral window (L)	280	70 diam.
Minimum distance from MDS to MDS	≥ 1000	≥ 300

Dimensions in mm



MDS F125 mobile data memory

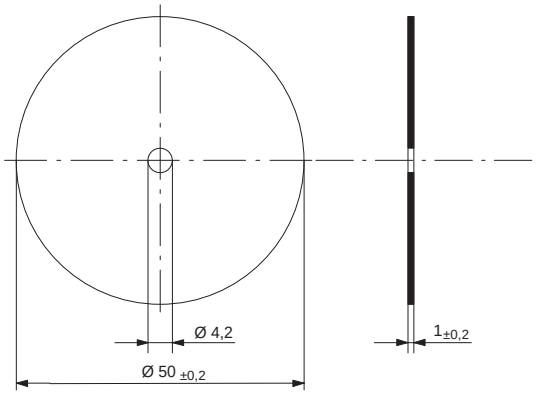
Technical specifications

Memory capacity	40 bit (ID number)
MTBF	2.5 × 10^6 hours
Read cycles	Unlimited
Data retention time	10 years
Max. read distance	420 mm (see field data)
Memory organization	Fixed code
Multitag facility	No
Power source	Inductive power transmission
Shock/vibration to EN 60721-3-7, Class 7M3	100/20 *g*
Mounting	Bonding/M4 screw
Recommended distance from metal	≥ 50 mm
Torsion and bending stress	None
Degree of protection to EN 60529	IP 67
Chemical stability	See Installation and Configuring Manual
Housing ▪ Dimensions ▪ Color/material	Disk 50 mm diam. x 1 mm Black/epoxy material
Ambient temperature ▪ Operation ▪ Transport and storage	 –25 to +100 °C –40 to +130 °C
Approx. weight	5 g

Field data in mm

MDS F125 to:	SLG 80/SIM 80 with ANT F5	SLG 82/SIM 82, SLA 81
Operating distance (S_a)	0 to 380	0 to 110
Limit distance (S_g)	420	140
Spectral window (L)	280	70 diam.
Minimum distance from MDS to MDS	≥ 1000	≥ 400

Dimensions in mm



MDS F160 mobile data memory

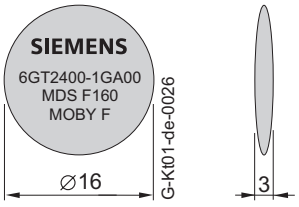
Technical specifications

Memory capacity	40 bit (ID number)
MTBF	2.5 × 10^6 hours
Read cycles	Unlimited
Data retention time	> 10 years
Max. read distance	160 mm (see field data)
Memory organization	Fixed code
Multitag facility	No
Power source	Inductive power transmission
Mechanical stability	
Isostatic pressure	300 bar for 5 minutes
Axial pressure	800 N
Radial pressure	800 N
Shock/vibration to EN 60721-3-7, Class 7M3	100/20 *g*
Mounting	e.g. bonding, patching, sewing in
Recommended distance from metal	≥ 30 mm
Degree of protection to EN 60529	IP 68 (20 °C, 24 hours)
Chemical stability	All chemicals usually used in washing processes
Housing	Button
▪ Dimensions	16 mm diam. x 3 ±0.1 mm
▪ Color/material	Black/epoxy resin
Ambient temperature	
▪ Operation	–25 °C to +85 °C
▪ Transport and storage	–25 °C to +100 °C for 1000 hours –25 °C to +160 °C for 10 hours
Approx. weight	1.2 g

Field data in mm

MDS F160 to:	SLG 80/SIM 80 with ANT F5	SLG 82/SIM 82, SLA 81
Operating distance (S_a)	0 to 140	0 to 60
Limit distance (S_g)	160	70
Spectral window (L)	230	40 diam.
Minimum distance from MDS to MDS	≥ 1000	≥ 300

Dimensions in mm



MDS F415 mobile data memory

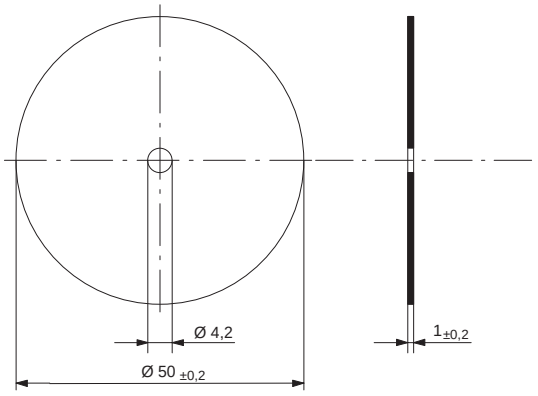
Technical specifications

Memory capacity	256 byte EEPROM 192 bytes freely available with SLG 224 bytes freely available with SIM
MTBF	2.5 × 10^6 hours
Read cycles	Unlimited
Write cycles At < 40 °C	Min. 200,000 Typ. > 1,000,000
Data retention time	> 10 years (at < +40 °C)
Max. read/write distance	420 mm (see field data)
Memory organization	Free access
Multitag facility	Yes
Power source	Inductive power transmission
Shock/vibration to EN 60721-3-7, Class 7M3	100/20 *g*
Mounting	Bonding/M4 screw
Recommended distance from metal	≥ 50 mm
Torsion and bending stress	None
Degree of protection to EN 60529	IP 67
Chemical stability	See Installation and Configuring Manual
Housing	Disk
▪ Dimensions	50 mm diam. x 1 mm
▪ Color/material	Black/epoxy material
Ambient temperature	
▪ Operation	–25 to +100 °C
▪ Transport and storage	–40 to +130 °C
Approx. weight	5 g

Field data in mm

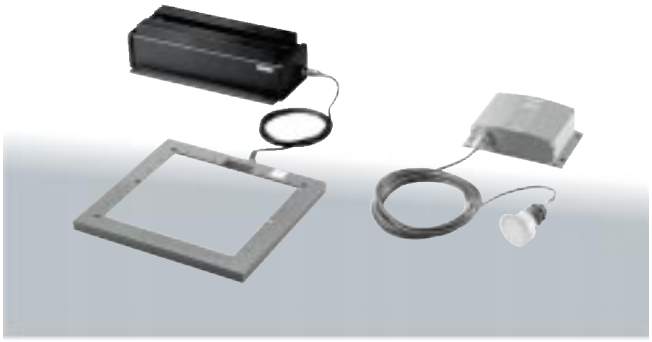
MDS F415 to:	SLG 80/SIM 80 with ANT F5	SLG 82/SIM 82, SLA 81
Operating distance (S_a)	0 to 300	0 to 90
Limit distance (S_g)	340	110
Spectral window (L)	280	70 diam.
Minimum distance from MDS to MDS	≥ 1000[2])	≥ 1000

Dimensions in mm



1) The regeneration time for the MDS F160 between the washing cycles must be at least 24 hours!
2) A reduction in the minimum distance is permissible for the SIM 80 in multitag mode. The MDSs can be positioned next to one another, but overlapping is not permissible.

SLG, SIM read/write units



Application

The SLG/SIM provides the inductive communication and power supply for the MDS and for the serial interface to the various systems (SIMATIC, PC, ...).

The SIM 80 additionally allows the use of extended functions of the EEPROM mobile data memory (MDS F4xx) such as the selective reading and writing of several memories in the spectral window (bulk recognition and multitag function). Furthermore, the EEPROM MDS (MDS F4xx) offers a password function for data protection.

The C library MFWAPI (MOBY software) for the Windows 95/NT operating systems is available for simple, fast integration into the PC application.

SLG 80 with ANT F5	Read/write unit for universal usage with: • Remote loop antenna (dimensions 350 mm × 350 mm × 20 mm) • Max. read/write distance 420/340 mm • DSP for suppression of interfering frequencies • Degree of protection IP 65 • Temperature range up to +60 °C • RS 422 interface for connection to ASM
SIM 80 with ANT F5	Same as SLG 80 with ANT F5, but with RS 232 interface for connection to PCs and PLCs
SLG 82	Low-cost read/write unit • For universal applications with remote SLA 81 antenna • Max. read/write distance 140 mm • Degree of protection IP 65 (antenna only) • Temperature range up to +55 °C • RS 422 interface for connection to ASM • Includes read/write antenna (SLA 81) and 5 m antenna cable
SIM 82	Same as SLG 82, but with RS 232 interface for connection to PCs and PLCs, including read/write antenna (SLA 81) and 5 m antenna cable
SLA 81	Low-cost read/write antenna (without connecting cable) for universal use • Max. four SLA 81 can be connected to ASM 824/854 (only one SLA 81 to ASM 850) • Max. read/write distance 140 mm • Degree of protection IP 67 (antenna) • Temperature range up to +70 °C

Design and functions

The SLG/SIM or the SLA converts the commands (e.g. read MDS, ...) received from the interface module (ASM) or via the respective interface and generates a magnetic alternating field via the antenna for non-contact communication and power supply to the MDS.

The digital signal processor (DSP) suppresses interfering frequencies and increases the functional reliability (SLG/SIM 80 only).

Fail-safe protocols and access mechanisms provide high data reliability and guarantee fast and safe communication.

The quantity of data which can be transmitted between the SLG and MDS depends on:

- The speed at which the MDS moves past the antenna
- The length of the inductive alternating field of the SLG through which the MDS moves.

The SIM combines an ASM and an SLG in a rugged housing. It is available with an RS 232 interface and can therefore be directly connected to any host systems:

- PC
- Computer
- Non-Siemens PLC.

Field data in mm

SLG type	Minimum distance from SLG to SLG
SLG/SIM 80 with ANT F5	> 5000 mm
SLG/SIM 82, SLA 81	> 400 mm

Ordering data

	Order No.
SLG 80 with ANT F5	**6GT2 401-0AF00**
SIM 80 with ANT F5	**6GT2 405-0AF00**
SLG 82	**6GT2 401-2CB00**
SIM 82	**6GT2 405-2CB00**
SLA 81	**6GT2 401-2BB00**
MOBY software CD, FB/FC for SIMATIC, 3964R driver for DOS/WINDOWS 95/NT, C libraries, PC demonstration program, MOBY documentation (German + English)	**6GT2 080-2AA10**

See Section 9 for further cables, power supply unit and documentation.

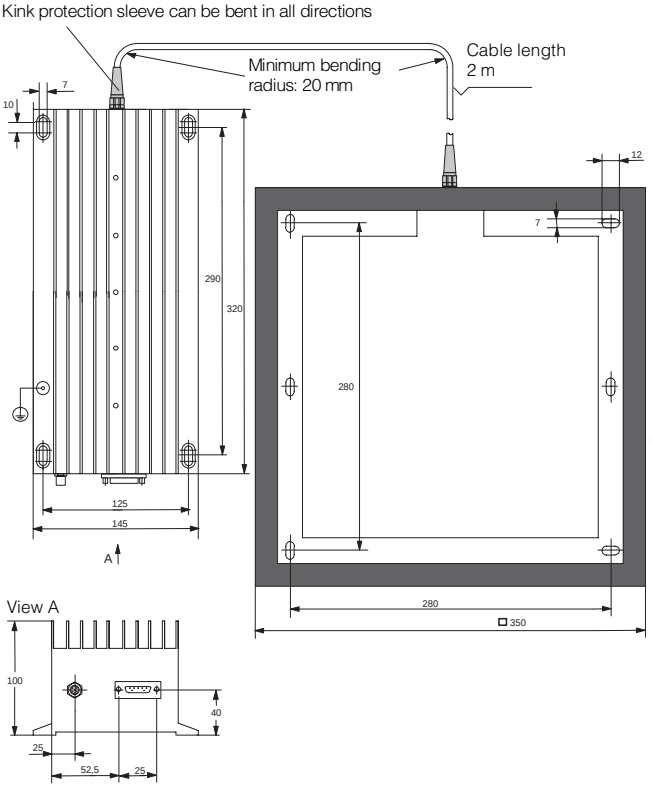
SLG 80/SIM 80 read/write units with ANT F5

Technical specifications

	SLG 80 with ANT F5	SIM 80 with ANT F5
Inductive interface to MDS		
Transfer rate from MDS to SLG	2 kbits/s (r/o) or 4 kbits/s (r/w), mode-dependent	
Transmission frequency (power/data)	125 kHz	
Read distance MDS - SLG	Up to 420 mm, dependent on MDS, SLG, temperature, distance to metal	
Distance ANT F5 - ANT F5	> 5 m	
Serial interface	To ASM	To PC/PLC
Interface to user	RS 422 9-pin sub-D connector	RS 332 9-pin sub-D connector
Max. cable length at 24 V DC	1000 m	30 m
Transfer rate/procedure	9600 bits/s, ASCII protocol	
Special features	Digital signal processor (DSP) for suppression of interfering signals	
Software functions		
▪ Programming	See ASM	Dependent on PC/PLC
▪ Available software (included in CD MOBY software)	FB/FC for SIMATIC S5/S7	C library MFWAPI for PC with Windows 95/NT
▪ Commands	Initialize MDS, write data to MDS, read data from MDS, …	
		Define password/ access privileges, multitag functions, etc.
Cable length		
Antenna - SLG/SIM	2 m, can be plugged into SLG/SIM	
MTBF (at 25 °C)	10^5 hours	
Supply voltage	Via separate connector	
Rated value/permissible range	24 V DC / 20 V to 30 V DC	
Current input (at room temperature)		
Inrush current short-term/operation	Typ. 1.5 A / typ. 600 mA	
Housing, dimensions		
▪ For antennas	350 x 350 x 20	
▪ For electronics without connector	320 x 145 x 100	
SLG/SIM housing		
▪ Color of antenna/ SLG, SIM housing	Anthracite/anthracite	
▪ Material of antenna/ SLG, SIM housing	Aluminium/aluminium	
Degree of protection to EN 60529		
Electronics/antenna	IP 65/IP 65	
Shock to EN 60721-3-7, Class 7M2	30 *g*	
Vibration to EN 60721-3-7, Class 7M2	1.5 *g* (200 Hz to 500 Hz) 1 *g* (9 Hz to 200 Hz)	
Mounting of SLG/SIM	4 x M6 screws	
Mounting of antenna	At least 4 x M6 screws	
Ambient temperature		
▪ Operation	–25 to +60 °C	
Approx. weight		
▪ SLG, SIM	3.5 kg	
▪ Antenna	1.2 kg	

Dimensions in mm

Kink protection sleeve can be bent in all directions



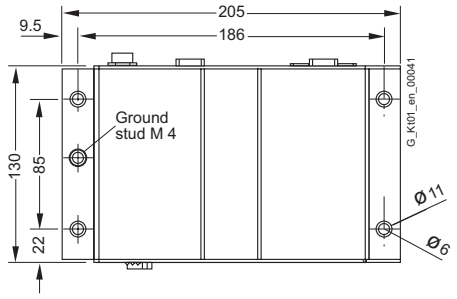
SLG 82/SIM 82 read/write units

Technical specs.	SLG 82	SIM 82
Antenna	SLA 81 (included)	
Inductive interface to MDS	See SLA 81	
Transmission frequency	See SLA 81	
Serial interface Interface to user	To ASM RS 422 9-pin sub-D connector	To PC/PLC RS 232 9-pin sub-D connector
Transfer rate, protocol	9600 bit/s, ASCII protocol	
Software functions		
Programming	See ASM	Dependent on PC/PLC
Available software (included in CD MOBY software)	FB/FC for SIMATIC S7	C library MFWAPI for Windows 95/NT 4.0 (without special functions: multitag, access privileges, etc.)
Commands	Initialize MDS, write data to MDS read data from MDS, ...	
Supply voltage		
▪ Rated value	24 V DC (separate connector)	
▪ Permissible range	20 to 30 V DC	
Current input	250 mA (typically)	
Max. inrush current	1.1 A	
Housing (see SLA 81 for antenna)		
▪ Dimensions (W×H×D) in mm	205 × 130 × 60 without connector	
▪ Color	Anthracite	
▪ Material	Aluminium	
Degree of protection to EN 60529	IP 40 (higher degree on request)	
MTBF (at 40 °C)	1 × 10^5 hours	
Mounting	4 x M5 screws or DIN rail	
Ambient temperature		
▪ Operation	–25 to +55 °C (with no condensation)	
Approx. weight		
▪ SLG	1.3 kg	
▪ SLA	0.15 kg	

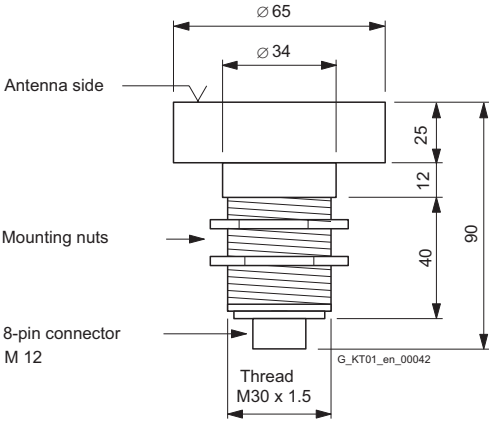
SLA 81 read/write antenna

Technical specs.	SLA 81
Inductive interface to MDS	
Transmission frequency (power, data)	125 kHz
Read/write distance to MDS, max.	140 mm (see field data under "Read/write units")
Serial interface, suitable for connection to	RS 422 ASM 824/850/854 or SLG 82/SIM 82 via SLA cable 6GT2 391-1AH50
Cable length to SLA 81, max.	55 m
Supply voltage	Via ASM, SIM, SLG
Current input, typ.	180 mA
Housing	
▪ Dimensions	65 mm diam. × 90 mm
▪ Color	Anthracite, pastel turquoise
▪ Material	Krastin plastic
Degree of protection to EN 60 529	IP 65
MTBF (at 40 °C)	1 × 10^5 hours
Mounting	2 plastic nuts M 30 × 1.5
Ambient temperature	
▪ Operation	–25 to +70 °C
Approx. weight	0.15 kg

Dimensions in mm (without SLA 81 and antenna cable)



Dimensions in mm

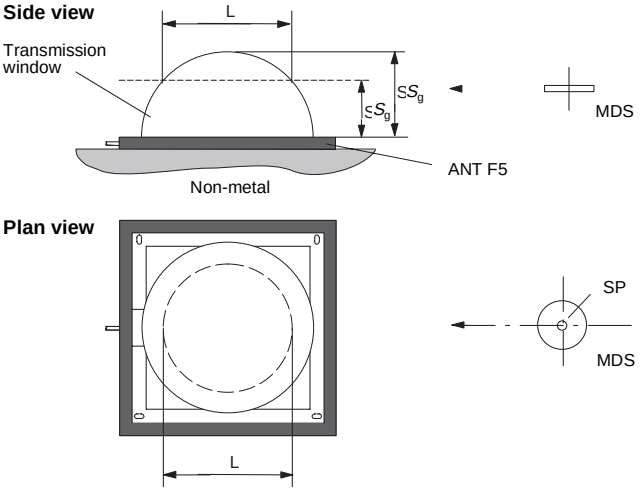


Note:
Detailed configuring and commissioning data are included in the "Configuring, Installation and Service Manual" (see Section 9 for ordering information).

Spectral window

The SLG generates an inductive alternating field. The field is largest in the vicinity of the antenna, and is greatly reduced as the distance from the antenna increases. The field distribution depends on the design and geometry of the antennae in the SLG and MDS.

A requirement for functioning of the MDS is a minimum field strength on the MDS which is achieved at a distance S_g from the SLG. The following Fig. shows the spectral window between the MDS and SLG:



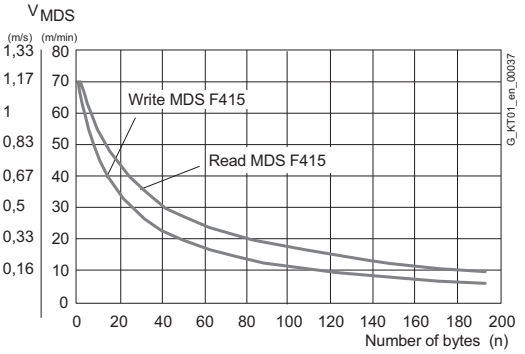
S_a: Operating distance between MDS and SLG
S_g: Limit distance (the maximum distance between the surface of the antenna and the MDS at which the transmission still just functions under normal conditions)
L: Length of a spectral window
SP: Point of intersection of the axes of symmetry of the MDS

The amount of information which can be transmitted between the SLG and MDS depends on:

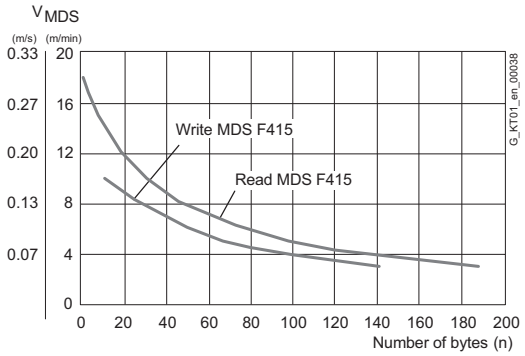
- The speed at which the MDS moves past the antenna (so-called target speed)
- The length of the inductive alternating field of the SLG through which the MDS is moving (so-called spectral window).

Relationship between speed and data quantity

The curves displayed here facilitate preselection of the MOBY F components MDS and SLG for dynamic use. The curves apply to operation within the spectral window (L) and the operating distance (S_a).



Example: SLG 80 ANT F5 with MDS F415



Example: SLA 81 with MDS F415

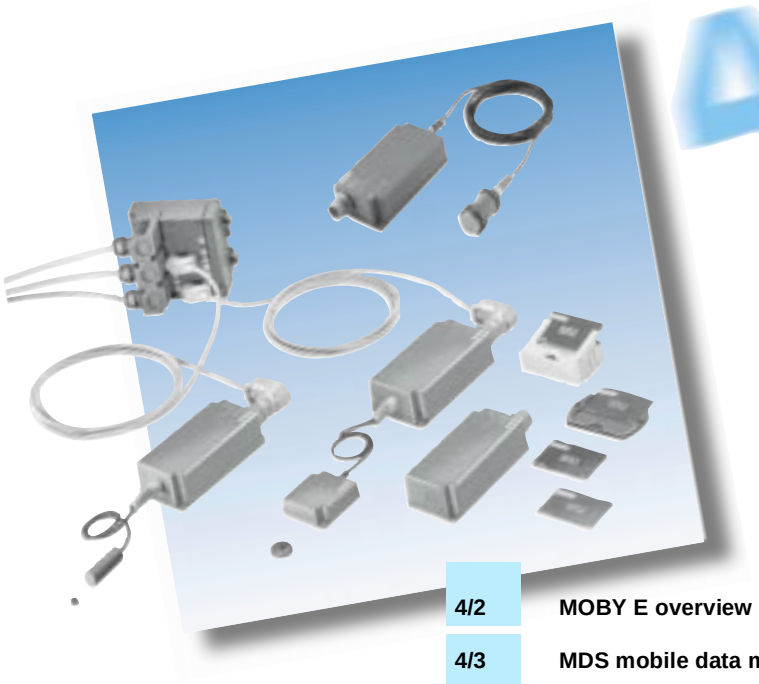
Transmission time of ID number

	Read ID No.
MDS F124, MDS F125	50 ms
MDS F415	60 ms

Max. transversal speed for reading the ID number

	Read ID No.	V_{MDS} for SLG/SIM 82, SLA 81	V_{MDS} for SLG/SIM 80, with ANT F5
MDS F124	50 ms	1.1 m/s	4.4 m/s
MDS F125	50 ms	1.1 m/s	4.4 m/s
MDS F415	60 ms	0.9 m/s	3.7 m/s
MDS F160	50 ms	0.9 m/s	3.7 m/s

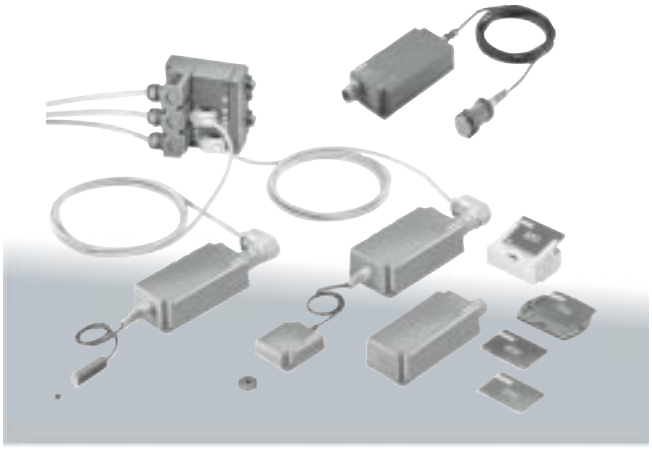
Notes



RF identification system MOBY E

MOBY E

Overview



Application

MOBY E is a non-contact identification system which has been specially designed for applications in logistics, distribution and industrial production. It is used where e.g. containers, boxes, goods carriers, workpiece carriers, tools, overhead monorail conveyor carriages have to be identified automatically, reliably, fast and without contact. Different data memories and read/write units are available depending on the requirements (EEPROM, size, ambient conditions, larger distances etc.). As a result of the low price, the data memories can be used e.g. as an “electronic barcode expansion” or “electronic barcode replacement”.

The main applications for MOBY E are:

- Logistics (identification of e.g. pallets, goods carriers, containers etc.)
- Distribution (data memory as "electronic barcode expansion" or "product accompanying document")
- Identification (e.g. data memory is attached to products or pallets)
- Production lines (e.g. data memory is attached to workpiece carriers)
- Conveyor technology (e.g. data memory is attached to the suspension of an overhead monorail conveyor)

Features

The standard MOBY E components enable fast and reliable design of application-specific identification systems, freeing capacity for the production of the application software.

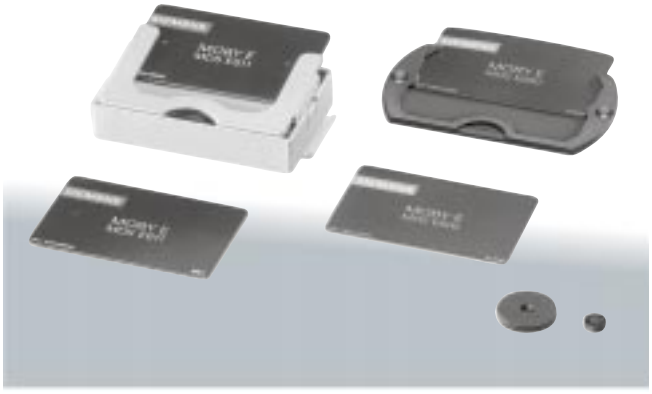
The MOBY E identification system has the following performance features:

- 13.56-MHz identification system with read/write distance up to 100 mm
- Comprehensive range of data memories without batteries (752 byte EEPROM, up to +150 °C) including a special data memory for workpiece identification
- Very high reliability even with contamination, temperature fluctuations and electromagnetic interferences
- Simple integration into SIMATIC and the PROFIBUS-DP
- Connection possible to any systems, e.g. PC with Windows 95/NT, via serial interface
- Worldwide configuring and service support

Technical specifications

Transmission frequency (power/data)	13.56 MHz
Memory capacity	752 bytes user memory 4 bytes read-only as serial number
Memory type	EEPROM
Read/write cycles	Unlimited/typ. 1,000,000
Data organization	Byte-by-byte access (16-byte internal block organization)
Data transfer rate MDS – SLG	≥ 2.8 ms/byte
Read/write distance	Up to 100 mm
Operating temperature	–25 °C to +125 °C
Degree of protection	IP 67, IP 68
Can be connected to	SIMATIC S5/S7, PC, non-Siemens PLC, PROFIBUS-DP
Special features	▪ CRC checksum for reliable data transfer ▪ High resistance to interfering frequencies ▪ Multitag and password function (only SIM)
Approvals	EN 300 330 (Europe) FCC[1)] Part 15 (USA) UL/CSA[1)]

1) Without SLA 71, SLG 75 ANT xx, ASM 724/754.



Application

MOBY identification systems guarantee that detailed data can accompany a product right from the beginning.

Mobile data memories ("electronic product accompanying documents") are used instead of barcodes and already contain all production-specific data in addition to the product number. Up to 752 bytes user data can be stored and managed in this manner. This amount also permits the quality data to be saved as well.

Stationary or mobile read/write units (SLG) can be used to read or modify the required information (production data, transport routes, ...) of mobile data memories without contact (inductively) and without direct visual contact being necessary. Object data are recorded rapidly and reliably using MOBY identification systems, thus guaranteeing effective, economical automation.

MDS E600	Data memory for universal application (752 byte EEPROM) with credit card format (85 × 54 × 0.8 mm) ▪ Degree of protection IP 68 ▪ Temperature range up to +60 °C ▪ Max. read/write distance 70 mm
MDS E611	Data memory for universal application (752 byte EEPROM) with credit card format (85 × 54 × 2.5 mm) ▪ Degree of protection IP 67 ▪ Temperature range up to +85 °C ▪ Max. read/write distance 100 mm
MDS E623	Small data memory (10 mm diam. x 4.5 mm, 752 byte EEPROM) especially for tool coding to DIN 69873 ▪ Degree of protection IP 67/IP X9K[1] to DIN 40 050 Part 9 ▪ Temperature range up to +85 °C ▪ Max. read/write distance 6 mm
MDS E624	Compact data memory for universal application (27 mm diam. x 4 mm, 752 byte EEPROM) ▪ Degree of protection IP 67/IP X9K[1] to DIN 40 050 Part 9 ▪ Temperature range up to +125 °C ▪ Max. read/write distance 40 mm

Design and functions

The MOBY E data memories basically comprise the logic, an antenna and an EEPROM.

If an MDS moves into the transmission field of the SLG, the power required for all circuit components is generated and monitored by the power supply unit. The pulse-coded information is conditioned such that it can be processed further in the form of digital signals. The control unit handles the data including check routines, and also manages the user memory.

Field data of MDS and SLG (all data in mm)

The following table lists the field data of all MOBY E components of the MDS and SLG. Correct selection of an MDS and an SLG is therefore very easy. All technical specifications listed are typical data and apply to an ambient temperature of 0 °C to +50 °C, a power supply of 22 V DC to 27 V DC, and a metal-free environment.

	MDS E600	MDS E611	MDS E623	MDS E624
	Operating distance/limit distance (without influence of metal)			
SLG 70 with ANT 0/ SIM 70 with ANT 0	–	–	0–4/6	0–8/15
SLG 70 with ANT 1/ SIM 70 with ANT 1	0–50/70	10–70/100	–	0–25/40
SLG 72/SIM 72	0–50/70	10–70/100	–	0–30/40
SLA 71	0–50/70	10–70/100	–	0–25/40
SLG 75 ANT 12	–	–	0–4/5	–
SLG 75 ANT 30	–	–	–	0–18/24
	Distance from MDS to MDS			
SLG 70 with ANT 0/ SIM 70 with ANT 0	–	–	> 30	> 50
SLG 70 with ANT 1/ SIM 70 with ANT 1	> 400	> 400	–	> 250
SLG 72/SIM 72/ SLA 71	> 400	> 400	–	> 250
SLG 75 ANT 12	–	–	> 20	–
SLG 75 ANT 30	–	–	–	> 60

Ordering data

	Order No.
MDS E600 mobile data memory Minimum order: 100 units	**6GT2 300-0AA00**
MDS E611 mobile data memory Minimum order: 10 units	**6GT2 300-0BB00**
MDS E623 mobile data memory	**6GT2 300-0CD00**
MDS E624 mobile data memory Minimum order: 100 units	**6GT2 300-0CE00**
Stick-on holder for MDS E600	**6GT2 390-0AA00**
Screw-on holder for MDS E600/E611	**6GT2 190-0AB00**
Spacer for screw-on holder, 20 mm thick	**6GT2 190-0AA00**

1) Extract:
Test equipment: Steam jet 0 °C, 30 °C, 60 °C, 90 °C
Water flow: 10 to 15 l/min at 100 bar (75 °C)
Distance: 10 to 15 cm

MDS E600 mobile data memory

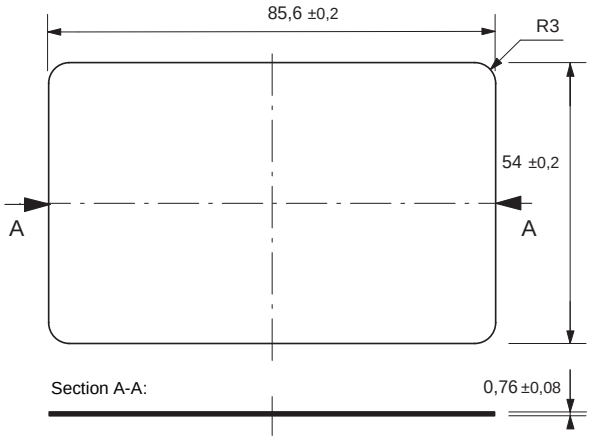
Technical specifications

Memory capacity MTBF	752 byte EEPROM, freely available 2 × 10^6 hours
Read cycles Write cycles, min. At ≤ 40 °C, typ.	Unlimited 200,000 > 1,000,000
Data retention time	> 10 years (at < +40 °C)
Max. read/write distance	70 mm (see field data)
Memory organization	Byte-by-byte access (16 bytes internal block organization)
Power source	Inductive power transmission
Shock/vibration	ISO 10373/ISO 7810
Torsion and bending stress	ISO 10373/ISO 7816-1
Mounting	Stick-on holder
Recommended distance from metal	≥ 20 mm
Degree of protection to EN 60529	IP 68
Chemical stability	See Configuring Manual
Housing ▪ Dimensions (L × W × H) in mm ▪ Color/material	ISO card 85.6 x 54 x 0.8 Anthracite/white/PVC
Ambient temperature ▪ Operation ▪ Transport and storage	 –25 to +60 °C –25 to +60 °C
Approx. weight	6 g

Field data in mm

MDS E600 to:	SLG 70/ SIM 70 ANT 1	SLG 72/ SIM 72	SLA 71
Operating distance (S_a)	0 to 50	0 to 50	0 to 50
Limit distance (S_g)	70	70	70
Spectral window (L)	60	75 50	60
Minimum distance from MDS to MDS	> 400	> 400	> 400

Dimensions in mm



MDS E611 mobile data memory

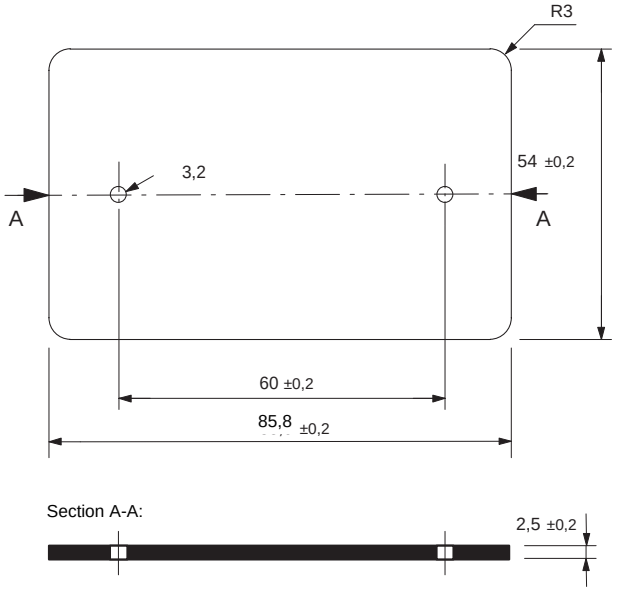
Technical specifications

Memory capacity MTBF	752 byte EEPROM, freely available 2.5 × 10^6 hours
Read cycles Write cycles, min. At ≤ 40 °C, typ.	Unlimited 200,000 > 1,000,000
Data retention time	> 10 years (at < +40 °C)
Max. read/write distance	100 mm (see field data)
Memory organization	Byte-by-byte access (16 bytes internal block organization)
Power source	Inductive power transmission
Shock/vibration	50 *g*/20 *g* to EN 60721-3-7
Torsion and bending stress	None
Mounting	Screw-on holder
Recommended distance from metal	≥ 20 mm
Degree of protection to EN 60529	IP 67
Chemical stability	See Configuring Manual
Housing ▪ Dimensions (L × W × H) in mm ▪ Color/material	Epoxy card 85.8 x 54.8 x 2.5 Anthracite/black/epoxy resin
Ambient temperature ▪ Operation ▪ Transport and storage	 –25 to +70 °C –40 to +85 °C
Approx. weight	21 g

Field data in mm

MDS E611 to:	SLG 70/ SIM 70 ANT 1	SLG 72/ SIM 72	SLA 71
Operating distance (S_a)	10 to 70	10 to 70	10 to 70
Limit distance (S_g)	100	100	100
Spectral window (L)	80	90 60	80
Minimum distance from MDS to MDS	> 400	> 400	> 400

Dimensions in mm



MDS E623 mobile data memory

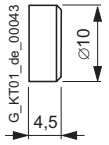
Technical specifications

Memory capacity MTBF	752 byte EEPROM, freely available 2.5 × 10^6 hours
Read cycles Write cycles, min. At ≤ 40 °C, typ.	Unlimited 200,000 > 1,000,000
Data retention time	> 10 years (at < +40 °C)
Max. read/write distance	6 mm (see field data)
Memory organization	Byte-by-byte access (16 bytes internal block organization)
Power source	Inductive power transmission
Shock/vibration	100 *g*/20 *g*
Torsion and bending stress	None
Mounting	Bonding, e.g. UHU Plus endfest 300
Recommended distance from metal	Can be fitted flush
Degree of protection to ▪ EN 60529 ▪ DIN 40050 Part 9	 IP 67 PI X9K[1]
Chemical stability	See Configuring Manual
Housing ▪ Dimensions in mm ▪ Color/material	DIN pill 10 diam. x 4.5 to DIN 69873 Black/epoxy resin
Ambient temperature ▪ Operation ▪ Transport and storage	 –25 to +85 °C –40 to +100 °C
Approx. weight	4 g

Field data in mm

MDS E623 to:	SLG 70 ANT 0 SIM 70 ANT 0	SLG 75 ANT 12
	Metal-free installation	
Operating distance (S_a)	0 to 6	0 to 4
Limit distance (S_g)	6	5
Spectral window (L)	4 (deviation at center ±2)	8 (deviation at center ±4)
	Flush installation in metal	
Operating distance (S_a)	0 to 3.5	0 to 3
Limit distance (S_g)	4	4
Spectral window (L)	4 (deviation at center ±1.5)	4 (deviation at center ±2)
Minimum distance from MDS to MDS	> 30	> 20

Dimensions in mm



MDS E624 mobile data memory

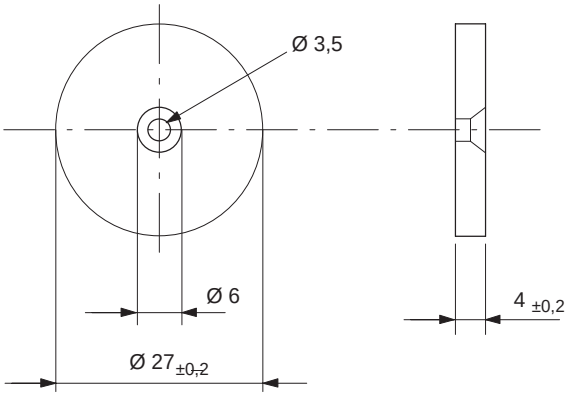
Technical specifications

Memory capacity MTBF	752 byte EEPROM, freely available 2.5 × 10^6 hours
Read cycles Write cycles, min. At ≤ 40 °C, typ.	Unlimited 200,000 > 1,000,000
Data retention time	> 10 years (at < +50 °C)
Max. read/write distance	40 mm (see field data)
Memory organization	Byte-by-byte access (16 bytes internal block organization)
Power source	Inductive power transmission
Shock/vibration to EN 60721-3-7 Class 7 M3	100 *g*/20 *g*
Torsion and bending stress	None
Mounting	Stick-on/M3 screws
Recommended distance from metal	≥ 20 mm
Degree of protection to ▪EN 60529 ▪DIN 40050 Part 9	 IP 67 PI X9K[1]
Chemical stability	See Configuring Manual
Housing ▪ Dimensions in mm ▪ Color/material	Button 27 diam. x 4 Black/epoxy resin
Ambient temperature ▪ Operation ▪ Transport and storage	 –25 to +125 °C –40 to +150 °C
Approx. weight	5 g

Field data in mm

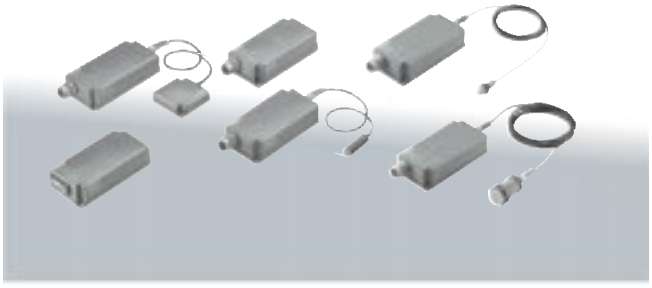
MDS E624 to:	SLG 70/ SIM 70 ANT 0	SLG 70/ SIM 70 ANT 1, SLA 71	SLG 72	SLG 75 ANT 30
Operating distance (S_a)	0 to 8	0 to 25	0 to 30	0 to 18
Limit distance (S_g)	15	40	40	24
Spectral window (L)	12	38	60	14
Minimum distance from MDS to MDS	> 50	> 250	> 250	> 60

Dimensions in mm



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

SLG read/write units



Application

The SLG/SIM provides the inductive communication and power supply for the MDS and for the serial interface to the various systems (SIMATIC, PC, ...).

Various SLG/SIM are available for small, medium and large distances from the MDS in line with customer requirements.

A rugged housing permits use in harsh environments and guarantees high resistance to many chemical substances.

SLG 70 with ANT 0	For optimum use in small assembly lines ▪ Read/write unit with separate antenna (dimensions 18 mm diam. x 1 × 50 mm) ▪ Max. read/write distance 15 mm ▪ Degree of protection IP 65 ▪ Temperature range up to +70 °C
SIM 70 with ANT 0	Same as SLG70 with ANT 0, but with RS 232/RS 422 interface for connection to PC/PLC
SLG 70 with ANT 1	For universal use ▪ Read/write unit with separate antenna (dimensions 75 × 75 × 20 mm) ▪ Max. read/write distance 100 mm ▪ Degree of protection IP 65 ▪ Temperature range up to +70 °C
SIM 70 with ANT 1	Same as SLG 70 with ANT 1, but with RS 232/RS 422 interface for connection to PC/PLC
SLA 71	For universal use, low-price and compact ▪ Read/write antenna for connection to ASM 724/754 (dimensions 75 × 75 × 20 mm) ▪ Max. read/write distance 100 mm ▪ Degree of protection IP 65 ▪ Temperature range up to +70 °C
SLG 72	For universal use ▪ Read/write unit with integral antenna (dimensions 160 × 80 × 40 mm) ▪ Max. read/write distance 100 mm ▪ Degree of protection IP 65 ▪ Temperature range up to +70 °C
SIM 72	Same as SLG 72, but with RS 232/RS 422 interface for connection to PC/PLC
SLG 75 ANT 12	For optimum use for tool identification ▪ Read/write unit with small plug-on antenna (dimensions 12 diam. × 1.5 × 40 mm) ▪ Max. read/write distance 5 mm ▪ Degree of protection IP 65 ▪ Temperature range up to +70 °C
SLG 75 ANT 30	Read/write unit for universal use ▪ With plug-on antenna (dimensions 30 diam. × 1.5 × 58 mm) ▪ Max. read/write distance 24 mm ▪ Degree of protection IP 65 ▪ Temperature range up to +70 °C

Design and functions

The SLG/SLA converts the commands (read MDS, ...) received from the interface module (ASM) and generates a magnetic alternating field via the antenna for non-contact communication and power supply to the MDS.

High data reliability is achieved using fail-safe protocols and access mechanisms, and guarantees fast and safe communication insensitive to interferences.

The quantity of data which can be transmitted between the SLG/SLA/SIM and MDS depends on:

- The speed at which the MDS moves through the spectral window of the SLG/SLA
- The length of the spectral window.

The SIM combines an ASM and an SLG in a rugged housing. It is available with an RS 422/RS 232 interface and can therefore be directly connected to any host systems, PCs, computers and non-Siemens PLCs.

All SIM versions are operated using a 3964R procedure. The following C libraries are available on the MOBY software CD to permit simple, fast integration into the application:

- MOBY API (for Windows 98/NT 4.0) with basic MOBY functions (read, write etc.)
- CCT32 (for Windows 98/NT 4.0), extended range of functions including password protection, access privileges and multitag recognition.

Field data in mm

Minimum distance from SLG/SIM to SLG (antennae)

SLG/SIM 70 with ANT 0	**SLG 70 with ANT 0**	> 200
SLG/SIM 70 with ANT 1	**SIM 70 with ANT 1**	> 800
SLG 72/SIM 72	**SLG 72/SIM 72**	> 800
SLG 75 ANT 12	**SLG 75 ANT 12**	> 80
SLG 75 ANT 30	**SLG 75 ANT 30**	> 125

Ordering data

	Order No.
SLG 70 with ANT 0	**6GT2 301-0AA00**
SLG 70 with ANT 1	**6GT2 301-0AB00**
SLG 72	**6GT2 301-0CA00**
SIM 70 with ANT 0	**6GT2 305-0AA00**
SIM 70 with ANT 1	**6GT2 305-0AB00**
SIM 72	**6GT2 305-0CA00**
SLG 75 ANT 12	**6GT2 301-0FC00**
SLG 75 ANT 30	**6GT2 301-0FD00**
MOBY software CD, FB/FC for SIMATIC, 3964R driver for DOS/WINDOWS 95/NT, C libraries, PC demonstration program, MOBY documentation (German + English)	**6GT2 080-2AA10**

See Section 9 for documentation and SLG/RS 232 cable.

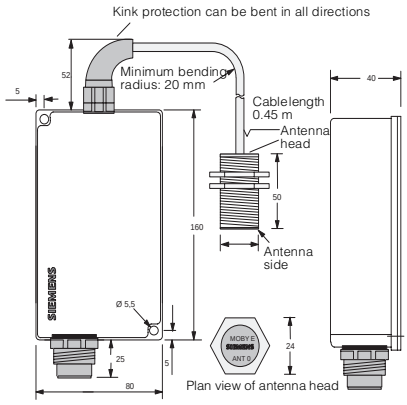
SLG 70/SIM 70 read/write units with ANT 0

Technical specifications	SLG 70 ANT 0	SIM 70 ANT 0
Inductive interface to MDS	Separate antenna	
Read/write distance	Max. 15 mm, see MDS field data	
Transmission frequency (power/data)	13.56 MHz	
Serial interface	RS-422 to ASM	RS-232/RS-422
Max. cable length at 24 V DC	1000 m (ASM-SLG)	30 m (RS-232)
Connector	6-pin SLG plug to DIN 43651	15-pin sub-D plug
Transfer rate	19200 baud	9600 baud
Procedure	MOBY I procedure	3964 R
Software functions		
▪ Programming		Depends on PC, PLC etc.
▪ Available software (included in MOBY software CD)	See ASM and associated S5/S7 FB/FC	C library for PC:CCT32 MOBY API (Windows 98/NT 4.0)
▪ Commands	Read, write, initialize MDS, ...	Multitag and password functions
Digital input/output via 15-pin sub-D plug	–	1/1, short-circuit-proof
Supply voltage Rated value	Via connector 24 V DC	24 V DC
Current input (at room temperature)		
▪ Inrush current short-term	Max. 700 mA	
▪ Operation	Typ. 180 mA	
Housing		
▪ Dimensions in mm		
For antenna head	M18 × 1.5 × 50	
For electronics without connector	160 × 80 × 40	
▪ Color		
Antenna/SLG housing	Anthracite/anthracite	
▪ Material		
Antenna/SIM/SLG housing	Krastin/PA 12	
Degree of protection to EN 60529		
Housing/antenna (front)	IP 65/IP 67	
Shock to EN 60721-3-7	30 *g*, Class 7M2	
Vibration to EN 60721-3-7	1.5 *g*, Class 7M2	
Mounting of housing	2 x M5 screws	
Mounting of antenna	2 x M18 × 5 plastic nuts	
Ambient temperature		
▪ Operation	–25 to +70 °C	
Approx. weight	0.51 kg	

SLG 70/SIM 70 read/write units with ANT 1

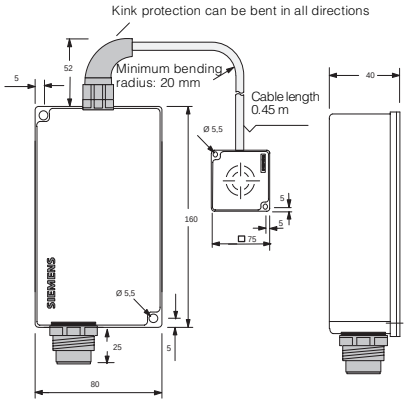
Technical specifications	SLG 70 ANT 1	SIM 70 ANT 1
Inductive interface to MDS	Separate antenna	
Read/write distance	Max. 100 mm, see MDS field data	
Transmission frequency (power/data)	13.56 MHz	
Serial interface	RS-422 to ASM	RS-232/RS-422
Max. cable length at 24 V DC	1000 m (ASM-SLG)	30 m (RS-232)
Connector	6-pin SLG plug to DIN 43651	15-pin sub-D plug
Transfer rate	19200 baud	9600 baud
Procedure	MOBY I procedure	3964R
Software functions		
▪ Programming		Depends on PC, PLC etc.
▪ Available software (included in MOBY software CD)	See ASM and associated S5/S7 FB/FC	C library for PC:CCT32 MOBY API (Windows 98/NT 4.0)
▪ Commands	Read, write, initialize MDS, ...	Multitag and password functions
Digital input/output via 15-pin sub-D plug	–	1/1, short-circuit-proof
Supply voltage Rated value	Via connector 24 V DC	24 V DC
Current input (at room temperature)		
▪ Inrush current short-term	Max. 700 mA	
▪ Operation	Typ. 180 mA	
Housing		
▪ Dimensions in mm		
For antenna head	75 × 75 × 20	
For electronics without connector	160 × 80 × 40	
▪ Color		
Antenna/SLG housing	Anthracite/anthracite	
▪ Material		
Antenna/SIM/SLG housing	PA 12	
Degree of protection to EN 60529		
Housing/antenna	IP 65/IP 67	
Shock to EN 60721-3-7	30 *g*, Class 7M2	
Vibration to EN 60721-3-7	1.5 *g*, Class 7M2	
Mounting of housing	2 x M5 screws	
Mounting of antenna	2 x M5 screws	
Ambient temperature		
▪ Operation	–25 to +70 °C	
Approx. weight	0.62 kg	

Dimensions in mm



A 15-pin sub-D plug is present on the SIM 70 instead of the 6-pin SLG plug.

Dimensions in mm

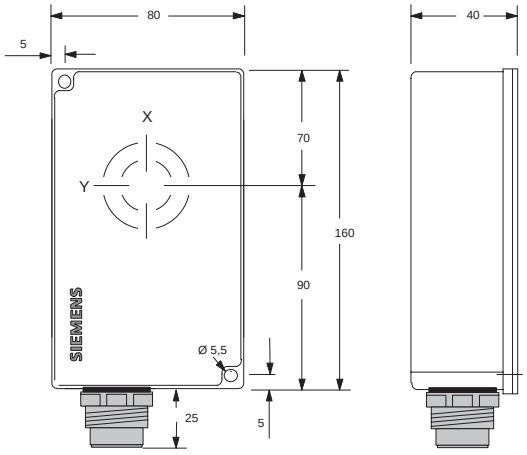


A 15-pin sub-D plug is present on the SIM 70 instead of the 6-pin SLG plug.

SLG 72/SIM 72 read/write units

Technical specifications	SLG 72	SIM 72
Inductive interface to MDS		
Read/write distance	Max. 100 mm	
Transmission frequency (power/data)	13.56 MHz	
Serial interface	RS-422 to ASM	RS-232/RS-422
Max. cable length at 24 V DC	1000 m (ASM-SLG)	30 m (RS-232)
Connector	6-pin SLG plug to DIN 43651	15-pin sub-D plug
Transfer rate	19200 baud	9600 baud
Procedure	MOBY I procedure	3964R
Software functions ▪ Programming		Depends on PC, PLC etc.
▪ Available software (included in MOBY software CD)	See ASM and associated S5/S7 FB/FC	C library for PC:CCT32 MOBY API
▪ Commands	Read, write, initialize MDS, ...	Multitag and password functions
Digital input/output via 15-pin submin-D plug	–	1/1, short-circuit-proof
Supply voltage Rated value	Via connector 24 V DC	24 V DC
Current input (at room temperature) ▪ Inrush current short-term ▪ Operation (24 V DC)	Max. 700 mA Typ. 180 mA	Max. 700 mA Typ. 180 mA without DO
Housing ▪ Dimensions in mm ▪ Color ▪ Material	160 × 80 × 40 Anthracite PA 12	
Degree of protection to EN 60529 Shock to EN 60721-3-7 Vibration to EN 60721-3-7	IP 65 30 *g*, Class 7M2 1.5 *g*, Class 7M2	
Mounting	2 x M5 screws	
Ambient temperature ▪ Operation	–25 to +70 °C	
Approx. weight	0.55 kg	

Dimensions in mm

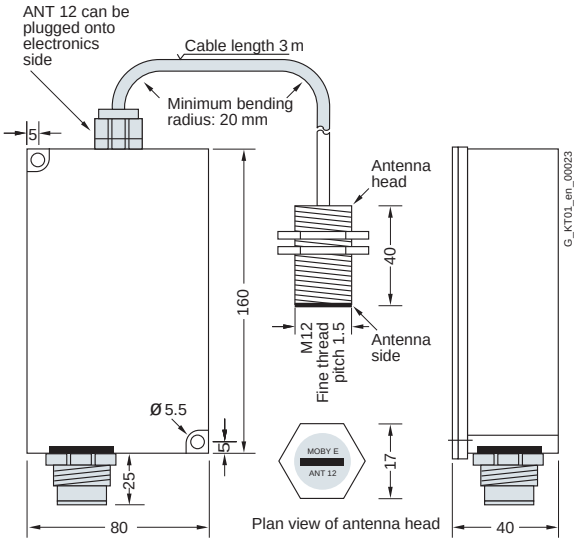


A 15-pin sub-D plug is present on the SIM 72 instead of the 6-pin SLG plug.

SLG 75 ANT 12 read/write unit

Technical specifications	SLG 75 ANT 12
Inductive interface to MDS	Separate antenna, plug-on
Read/write distance	Max. 5 mm, see MDS field data
Antenna cable length	3 m, plug-on
Transmission frequency (power/data)	13.56 MHz
Serial interface	RS-422 to ASM
Max. cable length at 24 V DC	1000 m (ASM-SLG)
Connector	6-pin SLG plug to DIN 43651
Transfer rate	19200 baud
Procedure	MOBY I procedure
Software functions ▪ Programming	See ASM and associated S5/S7 FB/FC
▪ Commands	Read, write, initialize MDS, ...
Supply voltage Rated value	Via connector 24 V DC
Current input (at room temperature) ▪ Inrush current short-term ▪ Operation	Max. 700 mA Typ. 180 mA
Housing ▪ Dimensions in mm – For antenna head – For electronics without connector	M12 × 1.5 × 40 160 × 80 × 40
Color ▪ Antenna ▪ SLG housing	Pastel turquoise Anthracite
Material ▪ Antenna ▪ SLG housing	Krastin Polyamide 12
Degree of protection to EN 60 529 ▪ SLG housing ▪ Antenna	IP 65 IP 67 (front)
Shock to EN 60 721-3-7	30 g, Class 7M2
Vibration to EN 60 721-3-7	1.5 g, Class 7M2
Mounting of antenna	2 x M12 × 1.5 plastic nuts
Mounting of SLG	2 x M5 screws
Ambient temperature ▪ Operation	–25 to +70 °C
Approx. weight	0.52 kg

Dimensions in mm

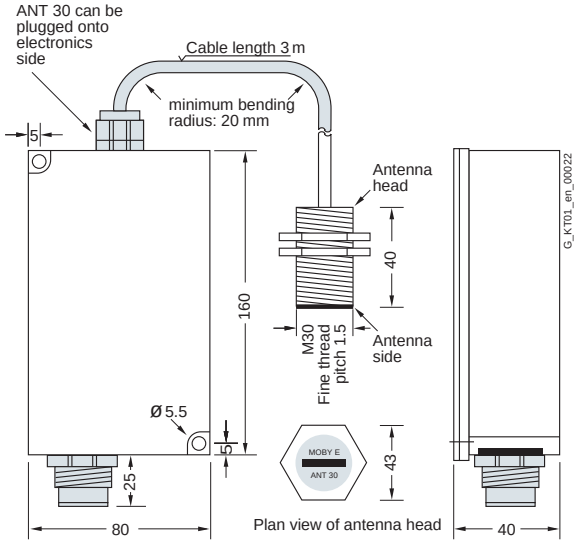


SLG 75 ANT 30 read/write unit

Technical specifications

Technical specifications	SLG 75 ANT 30
Inductive interface to MDS	Separate antenna, plug-on
Read/write distance	Max. 24 mm, see MDS field data
Antenna cable length	3 m, plug-on
Transmission frequency (power/data)	13.56 MHz
Serial interface	RS-422 to ASM
Max. cable length at 24 V DC	1000 m (ASM-SLG)
Connector	6-pin SLG plug to DIN 43651
Transfer rate	19200 baud
Procedure	MOBY I procedure
Software functions ▪ Programming ▪ Commands	 See ASM and associated S5/S7 FB/FC Read, write, initialize MDS, ...
Supply voltage Rated value	Via connector 24 V DC
Current input (at room temperature) ▪ Inrush current short-term ▪ Operation	 Max. 700 mA Typ. 180 mA
Housing ▪ Dimensions in mm – For antenna head – For electronics without connector	 M30 × 1.5 × 58 160 × 80 × 40
Color ▪ SLG housing ▪ Antenna	 IP 65 IP 67 (front)
Material ▪ Antenna ▪ SLG housing	 Krastin Polyamide 12
Degree of protection to EN 60 529 ▪ Antenna ▪ SLG housing Shock to EN 60 721-3-7 Vibration to EN 60 721-3-7 Mounting of antenna Mounting of SLG	 Pastel turquoise Anthracite 30 g, Class 7M2 1.5 g, Class 7M2 2 x M12 × 1.5 plastic nuts 2 x M5 screws
Ambient temperature ▪ Operation	 –25 to +70 °C
Approx. weight	0.52 kg

Dimensions in mm

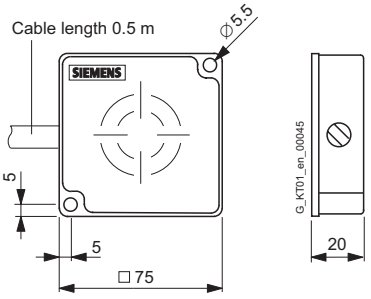


SLA 71 read/write unit

Technical specifications

Technical specifications	SLA 71
Inductive interface to MDS	
Transmission frequency (power/data)	13.56 MHz
Read/write distance to MDS, max.	100 mm (see field data under "Read/write units")
Serial interface, suitable for connection to	ASM 724/754
Cable length to SLA 71, max.	55 m
Plug connection	0.5 m cable with 8-pin M12 plug (pins on instrument side) 5 m cable 6GT2391-1AH50 required
Software functions	See ASM
Supply voltage	Via ASM
Housing ▪ Dimensions (W × H × D) in mm ▪ Color ▪ Material	 75 × 75 × 20 Anthracite PA12
Degree of protection to EN 60 529 Shock to EN 60 721-3-7/Class 7M2 Total shock response spectrum type II	IP 65 30 g
Vibration to EN 60 721-3-7/ Class 7M2 ▪ 9 to 200 Hz ▪ 200 to 500 Hz	 5 g 10 g
Mounting Ambient temperature ▪ Operation	2 x M5 screws –20 to +70 °C
Approx. weight	0.15 kg

Dimensions in mm



Configuring information

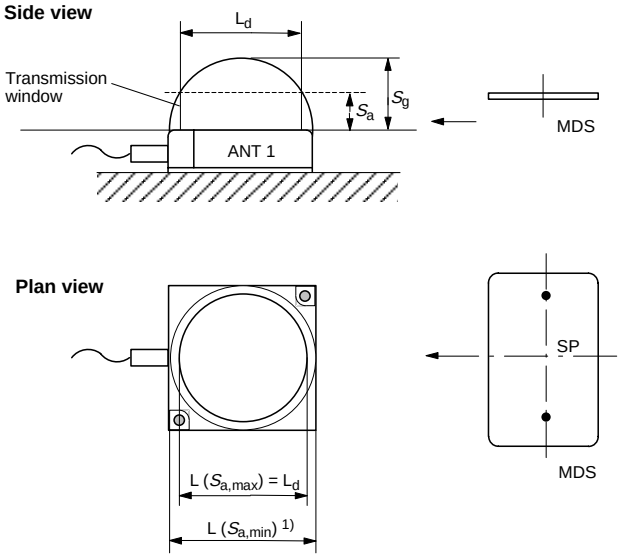
Note:
Detailed configuring and commissioning data are included in the "Configuring, Installation and Service Manual" (see Section 9 for ordering information).

Spectral window

The SLG generates an inductive alternating field. The field is largest in the vicinity of the SLG, and is greatly reduced as the distance from the SLG increases. The field distribution depends on the design and geometry of the antennae in the SLG and MDS.

A requirement for functioning of the MDS is a minimum field strength on the MDS which is achieved at a distance S_g from the SLG.

The following Fig. shows the spectral window between the MDS and SLG:

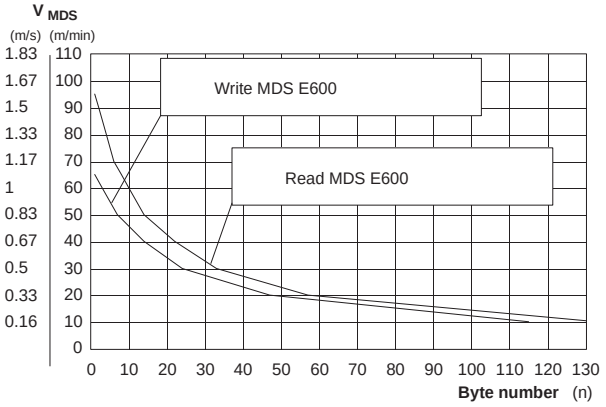


S_a: Operating distance between MDS and SLG
S_g: Limit distance (the maximum distance between the surface of the SLG and the MDS at which the transmission still just functions under normal conditions)
L: Length of a spectral window
SP: Point of intersection of the axes of symmetry of the MDS

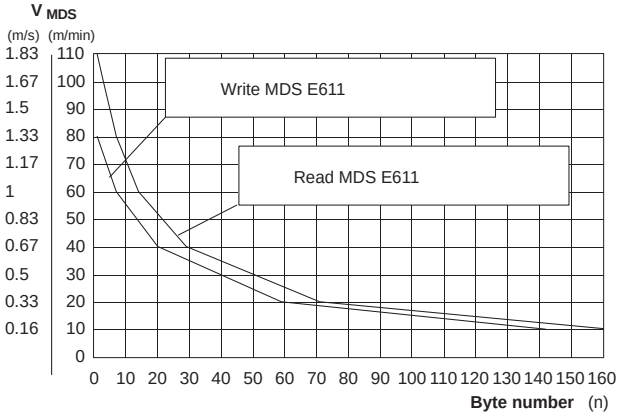
The active field to the MDS consists of a circle (see plan view). The MDS can be processed as soon as the point of intersection (SP) of the MDS enters the circle of the spectral window. The moving and rotating directions of the MDS are insignificant.

Relationship between speed and data quantity

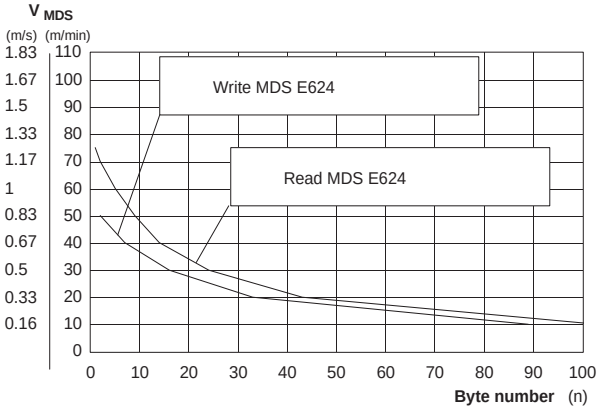
The curves displayed here facilitate preselection of the MOBY E components MDS and SLG for dynamic use. The curves apply to operation within the spectral window (L) and the operating distance (S_a).



SLG 70 ANT 1/SLA 71/SLG 72 with MDS E600



SLG 70 ANT 1/SLG 72 with MDS E611

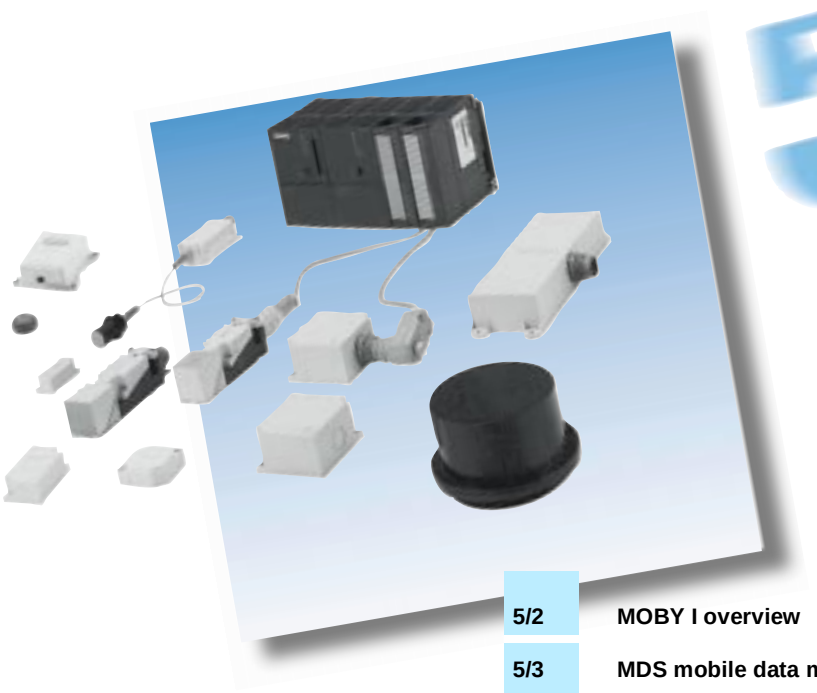


SLG 70 ANT 1/SLG 72 with MDS E624

Read transmission time of ID number

Type	ID No. size	Read ID No.
MDS E6xx	4 bytes	20 ms

1) The spectral window may be increased at $S_{a, min}$.

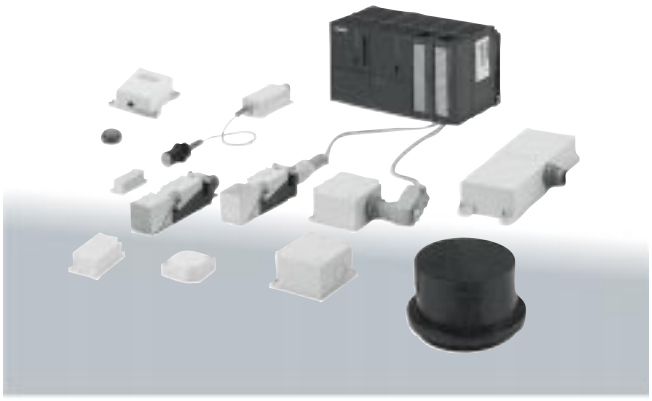


5

RF identification system MOBY I

MOBY I

Overview



Application

The MOBY I non-contact identification system has been successfully used in a wide range of applications worldwide for many years already. It has been specially designed for applications in industrial production where high demands are placed on reliability, reading and writing in dynamic mode, high degree of protection etc. It is used where e.g. workpiece carriers, skids or overhead monorail conveyor carriages have to be automatically identified rapidly, reliably and without contact. Different data memories and read/write units are available depending on the requirements (size, ambient conditions, larger distances etc.).

The main applications for MOBY I are:

- Assembly lines (data memory is attached to workpiece carrier)
- Manufacturing processes (data memory is attached e.g. to product carrier)
- Conveyor technology (data memory is attached e.g. to overhead monorail conveyor)
- Assembly lines in the automotive industry (e.g. heat-resistant data memories).

Features

The standard MOBY I components enable fast and reliable design of application-specific identification systems, freeing capacity for the production of the application software.

Powerful interface modules including software interfaces are used for connection to SIMATIC, PROFIBUS-DP or PCs/non-Siemens PLCs.

The MOBY I identification system has the following performance features:

- 1.81-MHz identification system with read/write distance up to 150 mm
- High data transfer rate
- Already in use worldwide for many years
- Comprehensive range of rugged, battery-free data memories (FRAM/EEPROM) for many different applications
- Data memory with increased degree of protection IP X9K[1)] (steam jet 100 bar ...)
- Heat-resistant data memories for the automotive industry (paint shop) up to +220 °C cyclic
- Very high reliability even with contamination, temperature fluctuations or electromagnetic interferences
- Simple integration into SIMATIC and the PROFIBUS-DP
- Connection possible to any systems, e.g. PC with DOS/Windows 98/NT, via serial interface
- Worldwide configuring and service support.

Technical specifications

Transmission frequency (power/data)	134 kHz/1.81 MHz
Memory capacity	8 or 32 KB
Memory type	FRAM or EEPROM
Read/write cycles	Depending on memory type
Data organization	File or address-oriented
Data transfer rate MDS to SLG	Typ. 0.8 ms/byte
Read/write distance	Up to 150 mm
Operating temperature	–25 to +85 °C/+220 °C
Degree of protection	IP 65 to IP 68/IP X9K[1)]
Can be connected to	SIMATIC S5/S7, PCs, computers, non-Siemens PLCs, PROFIBUS-DP
Special features	Optional file management system similar to DOS
Approvals	EN 300 330 (Europe) FCC[2)] Part 15 (USA) UL[2)]/CSA[2)]

1) Extract:
Test equipment: Steam jet 0 °C, 30 °C, 60 °C, 90 °C
Water flow: 10 to 15 l/min at 100 bar (75 °C)
Distance: 10 to 15 cm

2) Does not apply to SIM 4x, ASM 424/454, ASM 410

Application

MOBY identification systems guarantee that detailed data can accompany a product right from the beginning.

Mobile data memories are initially attached to the product or its transport/packing unit, e.g. workpiece carrier, and labelled, modified and read without contact. All important information for production and material flow control is thus present on the product.

A rugged housing permits use in rough environments and makes the MDS resistant to many chemical substances.

MDS 401	Compact data memory (8 KB FRAM, button shape, suitable for flush mounting in metal), for the identification of small workpiece carriers ▪ Housing dimensions 27 mm diam. x 9 mm ▪ Degree of protection IP 67 ▪ Temperature range up to +85 °C
MDS 402	Compact data memory (8 KB FRAM) for the identification of e.g. small workpiece carriers (MDS 302-compatible) ▪ Housing dimensions 47.5 mm × 25 mm × 15 mm ▪ Degree of protection IP 68/IP X9K[1)] ▪ Temperature range up to +70 °C
MDS 403	Compact data memory (8 KB FRAM) with an R/W distance up to 70 mm for the identification of e.g. small workpiece carriers (compatible with MDS 302 housing) ▪ Housing dimensions 47.5 mm × 25 mm × 15 mm ▪ Degree of protection IP 68/IP X9K[1)] ▪ Temperature range up to +85 °C
MDS 404	Data memory for universal use (8 KB FRAM) ▪ Housing dimensions 50 mm × 50 mm × 20 mm ▪ Compatible with MDS 413 E and MDS 114) ▪ Degree of protection IP 68/IP X9K[1)] ▪ Temperature range up to +85 °C
MDS 506	Data memory for universal use (32 KB FRAM) ▪ Housing dimensions 75 mm × 75 mm × 40 mm ▪ Degree of protection IP 68 ▪ Temperature range up to +70 °C
MDS 514	Data memory for universal use (32 KB FRAM) ▪ Housing dimensions 50 mm × 50 mm × 20 mm ▪ Degree of protection IP 68/IP X9K[1)] ▪ Temperature range up to +85 °C
MDS 439 E	Designed for skid identification in paint shops, max. 220 °C cyclically, 8 KB EEPROM ▪ Housing dimensions 114 mm diam. x 83 mm ▪ Degree of protection IP 68

Note: FRAM has the electrical properties of a RAM, but a battery is not required.

Field data

The following table lists the field data of all MOBY I components of the MDS and SLG. Correct selection of an MDS and an SLG is therefore very easy.

	MDS 401 MDS 402	MDS 403	MDS 404 MDS 514
	Operating distance S_a/limit distance S_g		
SLG 40	2–8/10	–	–
SLG 40-S	2–6/8	–	–
SLG 41/SLG 41 S/ SLG 41 C/CC	0–6/10	4–15/30	0–12/25
SLG 42	–	10–30/80	0–30/60
SLG 43	–	–	0–50/90
SIM 41/42/43	–	0–25/40	0–20/30

	MDS 506	MDS 439 E
	Operating distance S_a/limit distance S_g	
SLG 40	–	–
SLG 40-S	–	–
SLG 41/SLG 41 S/ SLG 41 C/CC	–	–
SLG 42	10–35/70	10–55/70
SLG 43	20–100/150	20–80/125
SIM 41/42/43	0–25/40	0–25/33

Note:

All field data listed are typical values and apply to a room temperature of +25°C and a power supply of 24 V DC.

Ordering data

	Order No.
MDS 401 mobile data memory 8 KB FRAM	**6GT2 000-0CA10**
MDS 402 mobile data memory 8 KB FRAM	**6GT2 000-0CA20**
MDS 403 mobile data memory 8 KB FRAM	**6GT2 000-1CF00**
MDS 404 mobile data memory 8 KB FRAM, with mounting frame	**6GT2 000-0EG00**
MDS 506 mobile data memory 32 KB FRAM	**6GT2 000-0DC00-0AA0**
MDS 514 mobile data memory 32 KB FRAM, with mounting frame	**6GT2 000-0DG10**
MDS 439 E mobile data memory 8 KB EEPROM	**6GT2 000-0CD30-0AC0**
Holder for MDS 439 E ▪ Short version ▪ Long version	**6GT2 090-0QA00** **6GT2 090-0QA00-Z** The order code **A31** is essential for the long version
▪ **Hood**	**6GT2 090-0QB00**

See Section 9 for documentation.

1) Extract:
Test equipment: Steam jet 0 °C, 30 °C, 60 °C, 90 °C
Water flow: 10 to 15 l/min at 100 bar (75 °C)
Distance: 10 to 15 cm

MDS 401 mobile data memories

Technical specifications

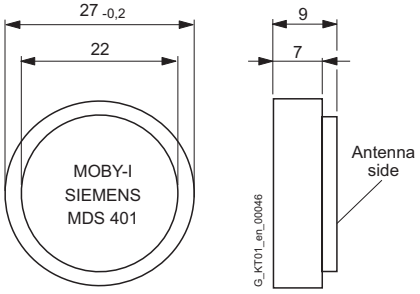
Memory capacity	8 KB FRAM
MTBF (without battery, at 40 °)	1.5 × 10^6 hours
Read/write cycles	> 1 × 10^9
Max. read/write distance	10 mm (see field data)
Memory organization	Byte-by-byte access
Shock (DIN IEC 60068-2-29)	50 *g*
Vibration (DIN IEC 60068-2-6)	20 *g*
Directional	No
Mounting	Adhesive or customer holder
Degree of protection to DIN 40050	IP 67
Housing ▪ Color ▪ Material ▪ Dimensions	 Black Macromelt molding 27 mm diam. × 9 mm
Ambient temperature ▪ Operation ▪ Transport and storage	 –25 to +85 °C –40 to +85 °C
Weight	7 g
Miscellaneous	Suitable for flush mounting in metal

Field data in mm

MDS 401 to:	SLG 40	SLG 40 S	SLG 41/ SLG 41 S	SLG 41 C/ CC
Operating distance (S_a)	2 to 8	2 to 6	0 to 6	0 to 6
Limit distance (S_g)	10	8	10	10
Spectral windows ▪ L: vertical ▪ 2L: horizontal	 – –	 – –	 30 50	 20 40
Spectral window diameter	18	9	–	–
Minimum distance from MDS to MDS	> 50	> 50	> 80	> 80

The field data apply to reading and writing the MDS.

Dimensions in mm



MDS 402 mobile data memories

Technical specifications

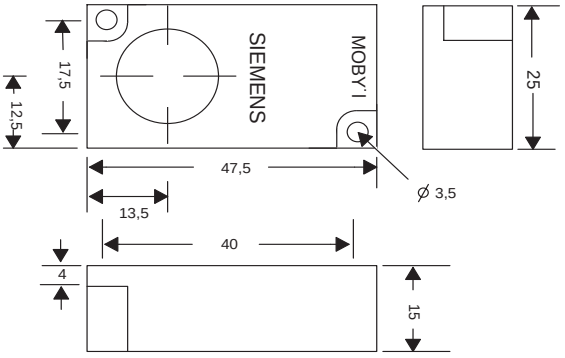
Memory capacity	8 KB FRAM
MTBF (without battery, at 40 °)	1.5 × 10^6 hours
Read/write cycles	> 1 × 10^9
Max. read/write distance (depends on SLG)	10 mm
Memory organization	Byte-by-byte access
Shock (DIN IEC 60068-2-29) Vibration (DIN IEC 60068-2-6)	50 *g* 20 *g*
Mounting	2 x M3 screws
Degree of protection to DIN 40050	IP 68/IP X9K[1)]
Housing Dimensions in mm Color/material	 47.5 × 25 × 15 Ergo gray/polyamide 12
Ambient temperature ▪ Operation ▪ Transport and storage	 –25 to +70 °C –40 to +70 °C
Weight	25 g
Miscellaneous	Compatible with MDS 302

Field data in mm

MDS 402 to:	SLG 40	SLG 40 S	SLG 41/ SLG 41 S	SLG 41 C/ CC
Operating distance (S_a)	2 to 8	2 to 6	0 to 6	0 to 6
Limit distance (S_g)	10	8	10	10
Spectral windows ▪ L: vertical ▪ 2L: horizontal	 – –	 – –	 30 50	 20 40
Spectral window diameter	18	9	–	–
Minimum distance from MDS to MDS	> 50	> 50	> 80	> 80

The field data apply to reading and writing the MDS.

Dimensions in mm



1) Extract:
Test equipment: Steam jet 0 °C, 30 °C, 60 °C, 90 °C
Water flow: 10 to 15 l/min at 100 bar (75 °C)
Distance: 10 to 15 cm

MDS 403 mobile data memories

Technical specifications

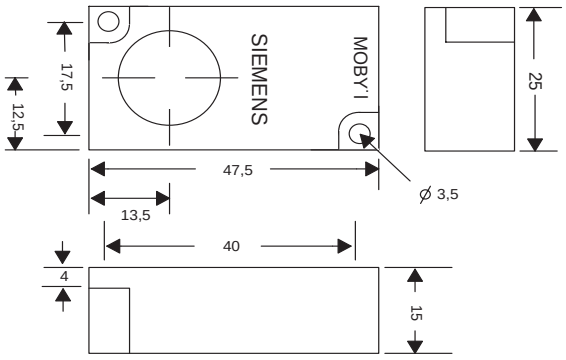
Memory capacity	8 KB FRAM
MTBF (at 40 °C)	1.5 × 10^6 hours
Read/write cycles, typ	> 1 × 10^9
Max. read/write distance (depends on SLG)	80 mm
Memory organization	Byte-by-byte access
Shock (DIN IEC 60 068-2-29)	50 *g*
Vibration (DIN IEC 60 068-2-6)	20 *g*
Mounting	2 x M3 screws
Degree of protection to DIN 40050	IP 68/IP X9K[1)]
Housing	
▪ Color	Ergo gray
▪ Material	Polyamide 12
▪ Dimensions	47.5 mm × 25 mm × 15 mm
Ambient temperature	
▪ Operation	–25 to +85 °C
▪ Transport and storage	–40 to +85 °C
Approx. weight	25 g
Miscellaneous	▪ Same design as MDS 402 housing ▪ Dynamic read/write possible, polarized field by means of ferrite antenna

Field data in mm

MDS 403 to:	SLG 41/ SLG 41 S/ SLG 41 C	SLG 42	SIM 41/42/43
Operating distance (S_a)	4 to 15	10 to 30	0 to 25
Limit distance (S_g)	30	80	40
Spectral window (L × B)	65 × 25	110 × 50	80 × 45
Minimum distance from MDS to MDS	> 120	> 200	> 200

The field data apply to reading and writing the MDS.

Dimensions in mm



MDS 404 mobile data memories

Technical specifications

Memory capacity	8 KB FRAM
MTBF (at 40 °)	1.5 × 10^6 hours
Battery	No battery required
Read/write cycles, typ.	> 1 × 10^9
Max. read/write distance (depends on SLG)	90 mm
Memory organization	Byte-by-byte access
Shock (DIN IEC 60068-2-29)	50 *g*
Vibration (DIN IEC 60068-2-6)	20 *g*
Mounting	2 x M4 screws
Degree of protection to DIN 40050	IP 68/IP X9K[1)]
Housing	
▪ Dimensions in mm	50 × 50 × 20
▪ Color/material	Ergo gray/polyamide 12
Ambient temperature	
▪ Operation	–25 to +85 °C
▪ Transport and storage	–40 to +85 °C
Weight	50 g

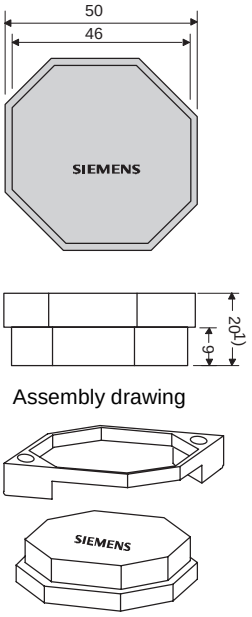
Field data in mm

MDS 404 to:	SLG 41/ SLG 41 S/ SLG 41 C	SLG 42	SLG 43	SIM 41/42/43
Operating distance (S_a)	0 to 12	0 to 30	0 to 50	0 to 20
Limit distance (S_g)	25	60	90	33
Spectral window				
▪ L: vertical	36	90	140	60
▪ 2L: horizontal	72	180	260	80
Minimum distance from MDS to MDS	> 90	> 250	> 500	> 200

The field data apply to reading and writing the MDS.

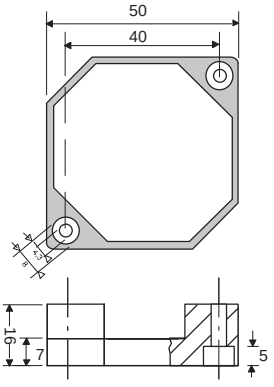
Dimensions in mm

MDS



Assembly drawing

Mounting frame



The MDS can be mounted using the mounting frame in the shown manner.

1) Extract:
Test equipment: Steam jet 0 °C, 30 °C, 60 °C, 90 °C
Water flow: 10 to 15 l/min at 100 bar (75 °C)
Distance: 10 to 15 cm

MDS 506 mobile data memories

Technical specifications

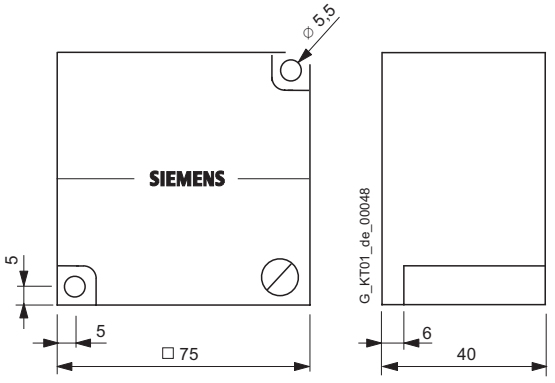
Memory capacity	32 KB FRAM
MTBF (without battery, at 40 °)	1.5 × 10^6 hours
Read/write cycles	1 × 10^9
Max. read/write distance (depends on SLG)	150 mm
Memory organization	Byte-by-byte access
Shock (DIN IEC 60068-2-29) Vibration (DIN IEC 60068-2-6)	50 *g* 20 *g*
Mounting	2 x M5 screws
Degree of protection to DIN 40050	IP 68
Housing ▪ Dimensions in mm ▪ Color/material	 75 × 75 × 40 Ergo gray/polyamide 12
Ambient temperature ▪ Operation ▪ Transport and storage	 –25 to +70 °C –40 to +70 °C
Weight	200 g

Field data in mm

MDS 506 to:	SLG 42	SLG 43	SIM 41/42/43
Operating distance (S_a)	10 to 35	20 to 100	0 to 25
Limit distance (S_g)	70	150	40
Spectral window ▪ L: vertical ▪ 2L: horizontal	 120 190	 220 400	 85 100
Minimum distance from MDS to MDS	> 300	> 600	> 300

The field data apply to reading and writing the MDS.

Dimensions in mm



MDS 514 mobile data memories

Technical specifications

Memory capacity	32 KB FRAM
MTBF (without battery, at 40 °C)	2.5 × 10^6 hours
Read/write cycles	> 1 × 10^9
Max. read/write distance (depends on SLG)	90 mm
Memory organization	Byte-by-byte access
Shock (DIN IEC 60068-2-29) Vibration (DIN IEC 60068-2-6)	50 *g* 20 *g*
Mounting	2 x M4 screws
Degree of protection to DIN 40050	IP 68/IPX9K[1)]
Housing ▪ Dimensions in mm ▪ Color/material	 50 × 50 × 20 Ergo gray/polyamide 12
Ambient temperature ▪ Operation ▪ Transport and storage	 –25 to +85 °C –40 to +85 °C
Weight	50 g

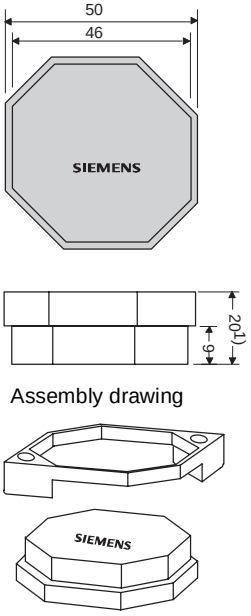
Field data in mm

MDS 514 to:	SLG 41/ SLG 41 S/ SLG 41 C	SLG 42	SLG 43	SIM 41/42/43
Operating distance (S_a)	0 to 12	0 to 30	0 to 50	0 to 20
Limit distance (S_g)	25	60	90	33
Spectral window ▪ L: vertical ▪ 2L: horizontal	 36 72	 90 180	 140 260	 60 80
Minimum distance from MDS to MDS	> 90	> 250	> 500	> 200

The field data apply to reading and writing the MDS.

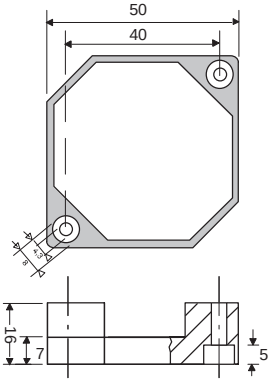
Dimensions in mm

MDS



Assembly drawing

Mounting frame



The MDS can be mounted using the mounting frame in the shown manner.

1) Extract:
Test equipment: Steam jet 0 °C, 30 °C, 60 °C, 90 °C
Water flow: 10 to 15 l/min at 100 bar (75 °C)
Distance: 10 to 15 cm

Application

The heat-resistant data memory can be used wherever such memories are exposed to temperatures above 85 °C but below 220 °C during a process step. Its IP 68 degree of protection guarantees safe operation under rough operating conditions. The size of the MDS is such that it can be secured either on a skid or directly on a body.

Typical applications are:

- Priming, cathodic electrodeposition with the associated drying ovens
- Coating applications with drying ovens
- Washing applications at temperatures >85 °C

Technical specifications

Memory capacity	8 KB EEPROM
MTBF (at 40 °)	2.5×10^6 hours
Read cycles	Unlimited
Write cycles	
▪ At 70 °C, min.	10,000
▪ At 40 °C, typ.	500,000
Max. read/write distance, (depends on SLG)	125 mm
Memory organization	Byte-by-byte access
Shock (DIN IEC 60068-2-29)	50 *g*
Vibration (DIN IEC 60068-2-6)	5 *g*
Mounting	Using optional support
Degree of protection to DIN 40050	IP 68
Housing	
▪ Dimensions (without welding seam) in mm	114 diam. x 83
▪ Color/material	Brown/PPS
Ambient temperature	
▪ Operation	–25 to +220 °C cyclic
Weight without support	900 g

Field data in mm

MDS 439 E to:	SLG 42	SLG 43	SIM 41/ 42/43
Operating distance (S_a)	10 to 55	20 to 80	0 to 25
Limit distance (S_g)	70	125	33
Spectral window			
L: vertical	120	190	75
2L: horizontal	210	330	100
Minimum distance from MDS to MDS	>500	>600	>300

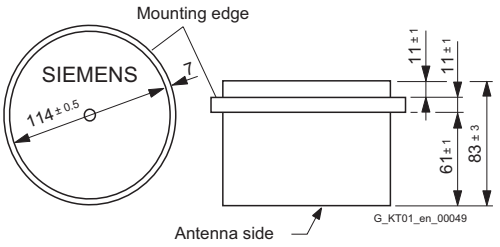
The field data apply to reading and writing the MDS.

Cyclic operation of MDS at temperatures >100 °C

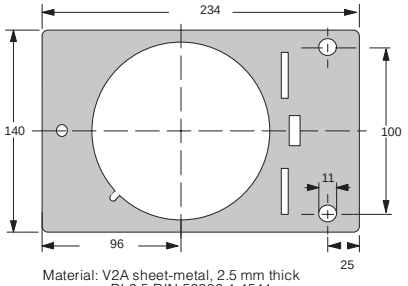
At ambient temperatures between 110 °C and 200 °C it is important to ensure that the internal temperature of the MDS does not exceed the critical threshold of 110 °C. Every heating phase must therefore be followed by a cooling phase.
The following table lists a few limit cycles:

Heating		Cooling	
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
170 °C	2 h	25 °C	> 4 h 30 min

Dimensions in mm

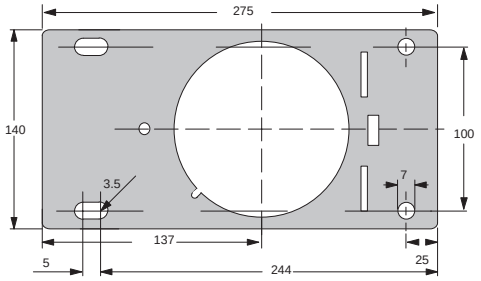


Short version (6GT2090-0QA00)



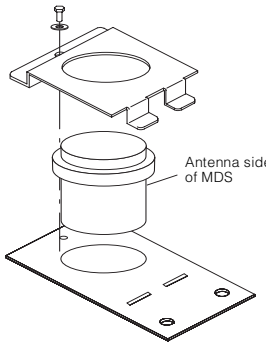
Material: V2A sheet-metal, 2.5 mm thick
BI 2.5 DIN 59382 1.4541

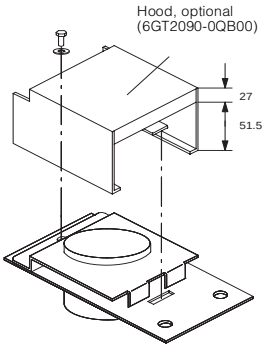
Long version (6GT2090-0QA00-ZA31)



Material: V2A sheet-metal, 2.5 mm thick
BI 2.5 DIN 59382 1.4541

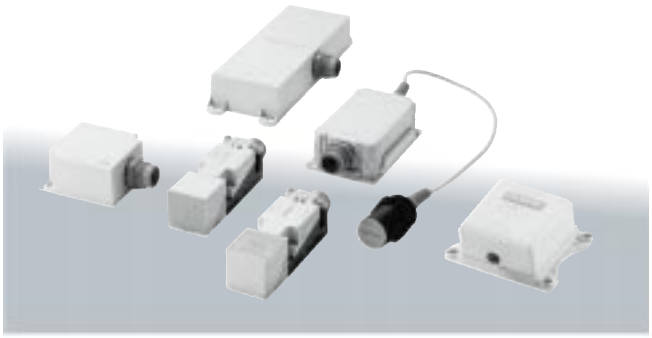
Support for MDS 439 E data memory





Assembly

SLG read/write units



Application

The SLG provides the inductive communication to the mobile data memories (MDS) and for the serial interface to the interface modules (ASM).

Various SLGs are available for small, medium and large distances from the MDS in line with customer requirements.

SLG 40 S	SLG with separate antenna (18 mm diam. x 30 mm) for e.g. assembly lines with small workpiece carriers ▪ Max. read/write distance 8 mm ▪ Degree of protection IP 65 ▪ Max. temperature +70 °C
SLG 40	SLG with separate antenna (30 mm diam. x 54 mm) for e.g. assembly lines with small workpiece carriers ▪ Max. read/write distance 10 mm ▪ Degree of protection IP 65 ▪ Max. temperature +70 °C
SLG 41	Compact SLG for universal use, with pivoted antenna head (BERO housing) ▪ Max. read/write distance 30 mm ▪ Housing dimensions 120 mm x 40 mm x 40 mm ▪ Degree of protection IP 65 ▪ Max. temperature +70 °C
SLG 41 S	Same as SLG 41, but antenna rotated by 90°
SLG 41 C	Compact SLG for universal use, with 3 m cable ▪ Max. read/write distance 30 mm ▪ Housing dimensions 55 mm x 75 mm x 30 mm ▪ Degree of protection IP 67 ▪ Max. temperature +70 °C
SLG 41 CC	Same as SLG 41 C, with 2 m cable and double M12 plug
SLG 42	SLG for universal use ▪ Max. read/write distance 70 mm ▪ Housing dimensions 75 mm x 75 mm x 40 mm ▪ Degree of protection IP 65 ▪ Max. temperature +70 °C
SLG 43	SLG for universal use ▪ Max. read/write distance 150 mm ▪ Housing dimensions 75 mm x 75 mm x 40 mm ▪ Degree of protection IP 65 ▪ Max. temperature +70 °C
SIM 41/42/43	SLG for universal use, with serial connection to PC/PLC ▪ Max. read/write distance 40 mm ▪ Housing dimensions 75 mm x 75 mm x 40 mm ▪ Degree of protection IP 54 ▪ Max. temperature +70 °C

Design and functions

The SLG converts the commands received from the interface modules. These commands as well as the data to be written or read are converted by a corresponding modulator/demodulator circuit.

Communication between MDS and SLG takes place via inductive alternating fields.

The amount of data which can be transmitted between SLG and MDS depends on:

- The speed at which the MDS moves through the spectral window of the SLG
- The length of the spectral window
- The type of MDS (FRAM, EEPROM).

Field data in mm

SLG type	Minimum distance from SLG to SLG
SLG 40 S	> 50
SLG 40	> 50
SLG 41, SLG 41 S, SLG 41 C	200
SLG 42	800
SLG 43	2000
SIM 41/42/43	700

Ordering data

	Order No.
Read/write units for connection to ASM	
SLG 40 S	**6GT2 001-0EB00**
SLG 40	**6GT2 001-0EA10**
SLG 41	**6GT2 001-0AA00**
SLG 41 S	**6GT2 001-0AA00-Z** The order code **A23** is essential for SLG 41 S
SLG 41 C	**6GT2 001-0AC00**
SLG 41 CC	**6GT2 001-0AC00-0AX0**
SLG 42	**6GT2 001-0BA00**
SLG 43	**6GT2 001-0CA10**
Read/write units for direct connection to PC or PLC	
SIM 41 with V.24 (RS 232) interface	**6GT2 005-0AA10**
SIM 42 with RS 422 (RS 485, V.11) interface	**6GT2 005-0BA10**
SIM 43 with TTY (20-mA current loop) interface	**6GT2 005-0CA10**
MOBY software CD, FB/FC for SIMATIC, 3964R driver for DOS/WINDOWS 95/NT, C libraries, PC demonstration program, MOBY documentation (German + English)	**6GT2 080-2AA10**

See Section 9 for SLG cables and documentation.

Application

The SLG 40/SLG 40 S can be used to advantage in small assembly lines. A particular feature is the small mounting distance between several SLG 40/SLG 40 S antennae.

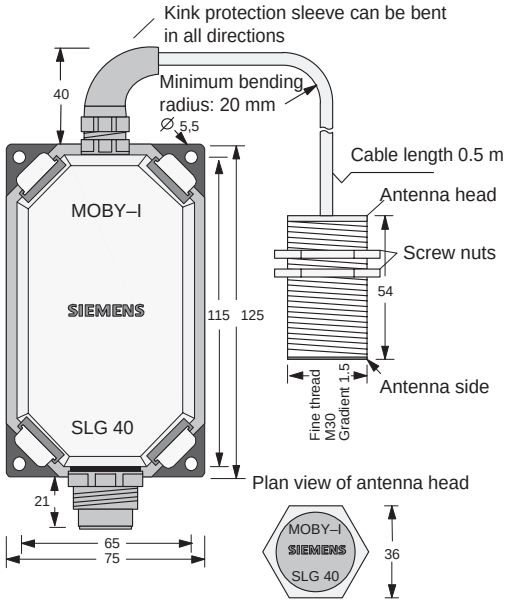
The antenna head can be positioned very exactly for every application using the 2 screw nuts.

Technical specifications

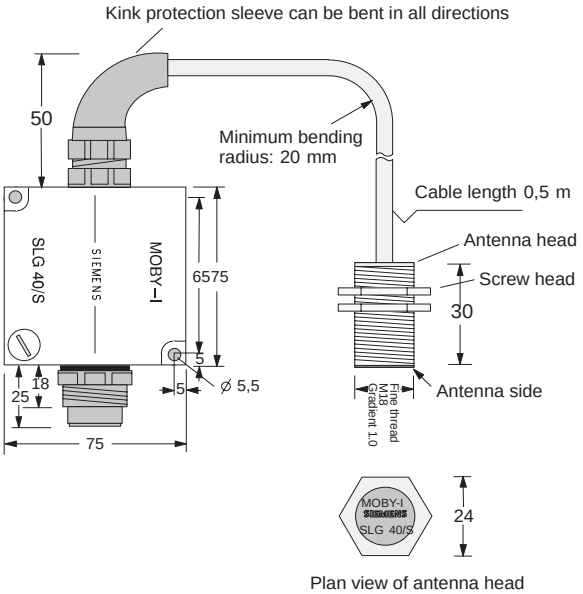
	SLG 40	SLG 40 S
Read/write distance	Max. 8 mm, see MDS field data	Max. 10 mm, see MDS field data
Transmission frequency (power/data)	1.81 MHz/134 kHz	
Distance SLG-SLG	Min. 50 mm	
Special features	Only one transmission field centrally above the antenna head	
Serial interface to ASM	RS-422, 6-pin SLG plug to DIN 43651	
Cable length (ASM-SLG) with 24 V DC	Max. 360 m	
MTBF (at +40 °C)	2×10^6 hours	
Supply voltage		
▪ Rated value	24 V DC	
▪ Permissible range	20 V to 30 V DC	
Current input		
▪ Idle	25 mA	
▪ Operating	90 mA	
Housing		
▪ Dimensions in mm		
– Antenna head	M18 × 1.0 × 30	M130 × 1.5 × 54
– Electronics without connector	75 × 75 × 40	125 × 40 × 75
▪ Color		
– Antenna/SLG housing	Anthracite with orange head/ergo gray	
▪ Material		
– Antenna/SLG housing	Krastin/polyamide 12	
Degree of protection to EN 40050	IP 65	
Shock (DIN IEC 60068-2-29)	50 *g*	
Vibration (DIN IEC 60068-2-6)	20 *g*	
Mounting of SLG	4 screws	
Ambient temperature		
▪ Operation	–25 to +70 °C	
Approx. weight	0.2 kg	0.21 kg

Dimensions in mm

SLG 40



SLG 40 S



SLG 41/41 S read/write units

Application

The SLG 41 is a read/write unit in the low-performance range. It can be favorably used where the MDS support system (e.g. workpiece support) can be mechanically positioned relatively accurately. The pivot head (BERO housing) means that the SLG 41 can be exactly adapted to the transport system.

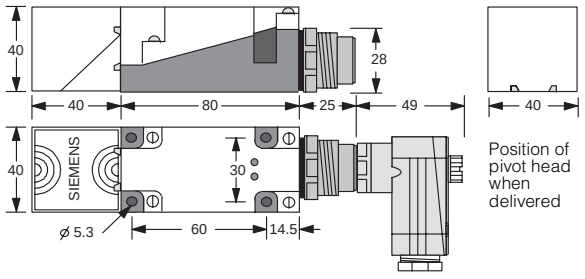
The antenna in the pivot head of the SLG 41 S is rotated by 90° compared to the SLG 41. All positions of the spectral window can then be implemented.

Technical specifications

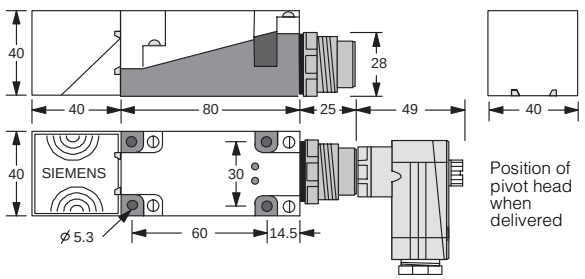
Inductive interface to MDS		
Read/write distance		Max. 25 mm, see MDS field data
Transmission frequency (data/power)		1.81 MHz/134 kHz
Distance SLG-SLG		Min. 200 mm
Special features		BERO housing, pivoted antenna head
Serial interface to ASM		RS-422, 6-pin SLG plug to DIN 43651
Cable length (ASM-SLG) with 24 V DC		Max. 360 m
MTBF (at +40 °C)		2 × 10^6 hours
Supply voltage	Rated value Permissible range	24 V DC 20 to 30 V DC
Current input	Idle Operating	20 mA 90 mA
Housing ▪ Dimensions in mm ▪ Color ▪ Material		120 × 40 × 40 Ergo gray Polyamide 12
Degree of protection to DIN 40050		IP 65
Shock to DIN IEC 60068-2-29		50 *g*
Vibration to DIN IEC 60068-2-6		20 *g*
Mounting		4 screws
Ambient temperature ▪ Operation		 –25 to +70 °C
Approx. weight		0.21 kg

Dimensions in mm

SLG 41:



SLG 41-S:



SLG 41 C/41 CC read/write units

Application

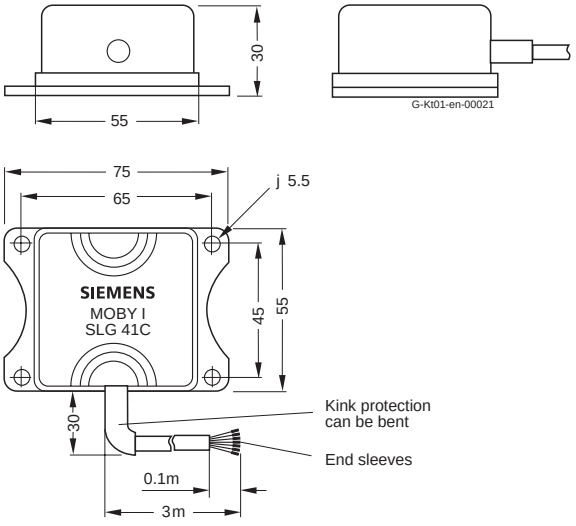
The SLG 41 C is a read/write unit in the low-performance range and can be used to advantage in assembly lines as a result of its small, compact design.

The high degree of protection together with the application of high-quality materials means that the SLG 41 C can even be used in harsh industrial environments without problem. A 3-m long cable provided with end sleeves is used for the connection. With the SLG 41 CC, the end of the 2-m long cable is fitted with a double M12 plug for connection to the ASM 450/452.

Technical specifications

Inductive interface to MDS		
Transfer rate from MDS to SLG		Typ. 0.8 ms/byte
Read/write distance		Max. 25 mm, see MDS field data
Transmission frequency (data/power)		1.81 MHz/134 kHz
Distance SLG-SLG		Min. 200 mm
Serial interface to ASM ▪ SLG 41 C ▪ SLG 41 CC		RS-422, with 3-m cable Without SLG plug With double M12 plug
Cable length (ASM-SLG) with 24 V DC		Max. 360 m
MTBF (at +40 °C)		2 × 10^6 hours
Supply voltage ▪ Rated value ▪ Permissible range		 24 V DC 20 to 30 V DC
Current input ▪ Idle /operating		 20 mA/70 mA
Housing ▪ Dimensions in mm ▪ Color ▪ Material		55 × 75 × 30 Ergo gray Polyamide 12
Degree of protection to DIN 40050		IP 67
Shock to DIN IEC 60068-2-29		50 *g*
Vibration to DIN IEC 60068-2-6		20 *g*
Mounting		4 screws
Ambient temperature ▪ Operation		 –25 to +70 °C
Approx. weight		0.21 kg

Dimensions in mm



SLG 42 read/write units

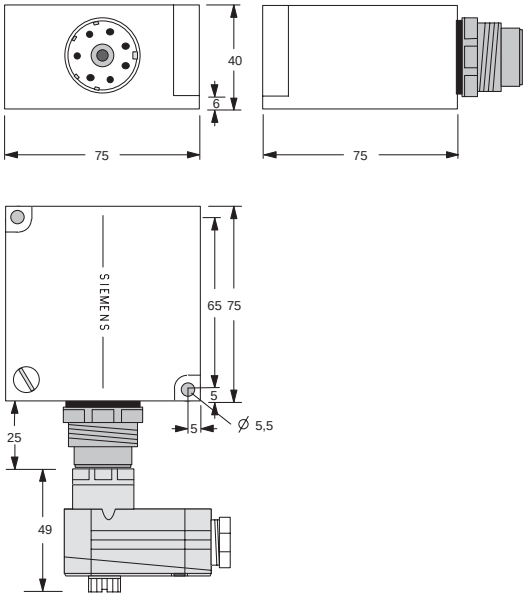
Application

The SLG 42 is a read/write unit in the medium-performance range. The larger antenna dimension means that the SLG 42 generates a far greater field than the SLG 41. Thus a larger range can be achieved with the same data memories. Larger quantities of data can be read/written by the MDS in dynamic mode.

Technical specifications

Inductive interface to MDS	
Transfer rate from MDS to SLG	Typ. 0.8 ms/byte
Read/write distance	Max. 70 mm, see MDS field data
Transmission frequency (data/power)	1.81 MHz/134 kHz
Distance SLG-SLG	Min. 800 mm
Serial interface to ASM	RS-422, 6-pin SLG plug to DIN 43651
Cable length (ASM-SLG) with 24 V DC	Max. 120 m
MTBF (at +40 °C)	2 × 10^6 hours
Supply voltage ▪ Rated value ▪ Permissible range	 24 V DC 20 to 30 V DC
Current input ▪ Idle ▪ Operating	 60 mA 180 mA
Housing ▪ Dimensions in mm ▪ Color ▪ Material	 75 × 75 × 40 Gray Polyamide 12
Degree of protection to DIN 40050	IP 65
Shock to DIN IEC 60068-2-29	50 *g*
Vibration to DIN IEC 60068-2-6	20 *g*
Mounting Tightening torque (at room temperature)	2 x M5 screws ≤ 2 Nm
Ambient temperature ▪ Operation	 –25 to +70 °C
Approx. weight	0.25 kg

Dimensions in mm



SLG 43 read/write units

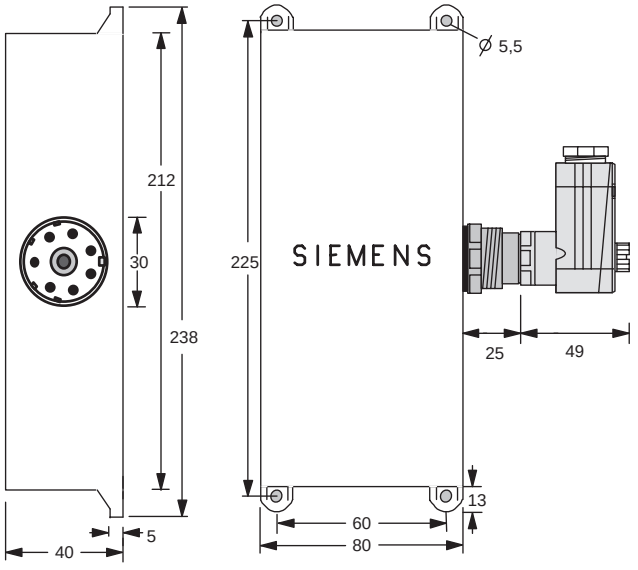
Application

The SLG 43 is a high-performance read/write unit. It can be used to advantage with large MDS types (MDS 506/MDS 439 E). A particular feature is the size of the spectral window which permits good compensation of mechanical tolerances in the transport system. The large spectral window means that a large data quantity can be read or written in dynamic mode.

Technical specifications

Inductive interface to MDS	
Transfer rate from MDS to SLG	Typ. 0.8 ms/byte
Read/write distance	Max. 150 mm, see MDS field data
Transmission frequency (data/power)	1.81 MHz/134 kHz
Distance SLG – SLG	> 2000 mm
Serial interface to ASM	RS-422, 6-pin SLG plug to DIN 43651
Cable length (ASM-SLG) with 24 V DC	Max. 85 m
MTBF (at +40 °C)	2 × 10^6 hours
Supply voltage ▪ Rated value ▪ Permissible range	 24 V DC 20 to 30 V DC
Current input ▪ Idle ▪ Operating	 60 mA 250 mA
Housing ▪ Dimensions in mm ▪ Color ▪ Material	 238 × 40 × 80 Ergo gray Polyamide 12
Degree of protection to DIN 40050	IP 65
Shock to DIN IEC 60068-2-29	50 *g*
Vibration to DIN IEC 60068-2-6	20 *g*
Mounting	4 screws
Ambient temperature ▪ Operation	 –25 to +70 °C
Approx. weight	0.8 kg

Dimensions in mm



SIM 41/42/43 serial interface module

Application

The SIM module is a read/write unit with integral antenna and serial interface for connection to the following systems:

- Computers
- PCs
- PLCs.

A rugged housing enables it to be used in harsh industrial environments and renders it insensitive to many chemical substances.

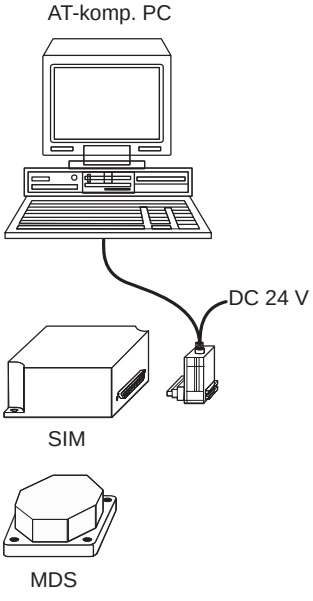
Design and functions

The SIM combines an ASM interface module and an SLG read/write unit in one housing and is available with 3 different interfaces: RS-422 (SIM 42), TTY (SIM 43) and V.24 (SIM 41).

All SIM versions can be operated via different procedures (3964R, Lauf, SINEC L1 and SINUMERIK protocols).

The C library MOBY API (included in the MOBY software CD) with the basic MOBY functions (read, write, etc.) is available for simple, fast integration into the application (PC with Windows 98/NT). The SIM has 2 digital inputs and 2 digital outputs for sequential control.

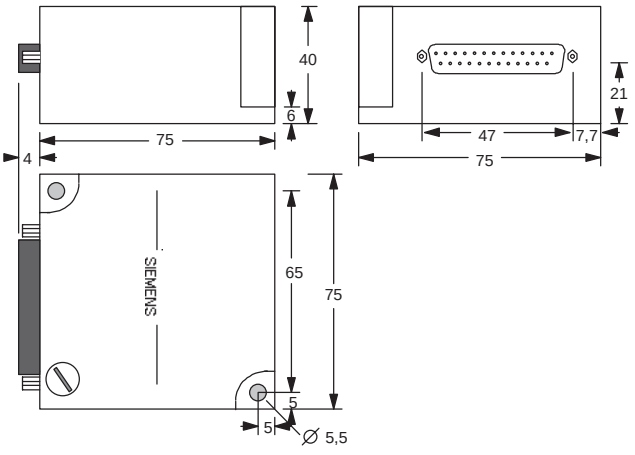
Configuration



Technical specifications

Inductive interface to MDS	
Read/write distance	40 mm, see MDS field data
Max. transmission frequency (data/power)	1.81 MHz/134 kHz
Serial interface	25-pin sub-D plug with screw fasteners
Transfer rate	2400 to 9600 baud
Max. cable length	TTY: 1000 m (shielded) RS-422: 1000 m (shielded) V.24: 30 m (shielded)
Software functions	Read, write, initialize MDS, set MDS type, …
Programming	Dependent on computer, PC
Available software (included in MOBY software CD)	MOBY API for Windows 98/NT 4.0, 3964R driver for DOS
Digital inputs	
Number	2
Electrical isolation	No
Input voltage ▪ For logical "0" ▪ For logical "1"	 –2 V to +5 V +12 V to +33 V (Ri = 10 kV)
Delay time	<10 ms
Digital outputs	
Number	2
Electrical isolation	No (internal power supply) Short-circuit-proof I_{max} = 200 mA (per DO, or for 2 DO)
Supply voltage ▪ Rated value ▪ Permissible range	 24 V DC 20 to 30 V DC
Current input	Max. 220 mA (DO unloaded)
Shock to DIN IEC 60068-2-29	30 *g*
Degree of protection to DIN 40050	IP 54
Ambient temperature ▪ Operation	 0° C to +60 °C
Dimensions	75 × 75 × 40
Approx. weight	0.3 kg

Dimensions in mm



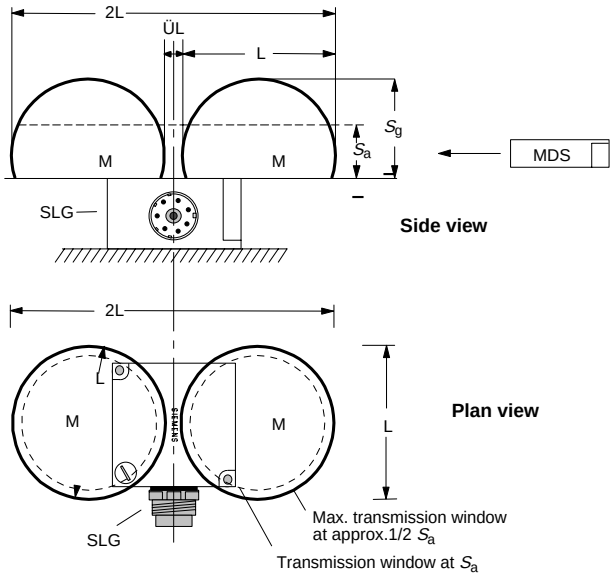
Detailed data (distance from metal, distance SLG–SLG, ...) can be found in the "MOBY-I Configuring, Installation and Service Manual". See Section 9 for ordering information.

Spectral window

The SLG generates an inductive alternating field. The field is largest in the vicinity of the SLG, and is greatly reduced as the distance from the SLG increases. The field distribution depends on the design and geometry of the antennae in the SLG and MDS.

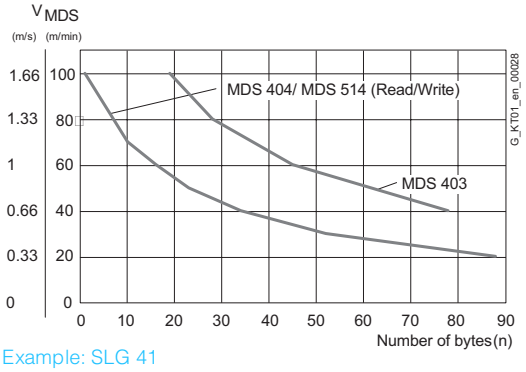
A requirement for functioning of the MDS is a minimum field strength on the MDS which is achieved at a distance S_g from the SLG. The following Fig. shows the spectral window between the MDS and SLG.

M: Center point of spectral window
S_a: Operating distance
S_g: Limit distance (the maximum distance between the surfaces of the SLG and the MDS at which the transmission just still functions under normal conditions)
L: Length of a spectral window with vertical movement direction of MDS
2L: Length of a spectral window with horizontal movement direction of MDS
ÜL: The transmission hole between the two spectral windows. The MDS cannot be used in this area. The transmission hole has a length of a few millimeters. The ÜL is not taken into account in any of the other considerations (ÜL = 0 mm)

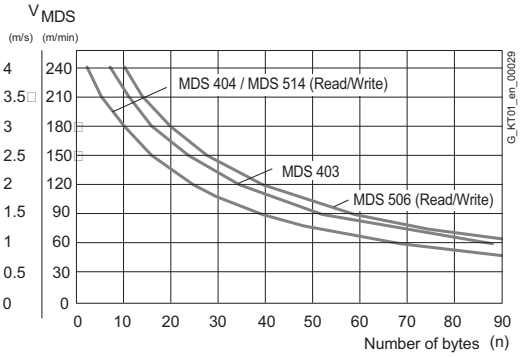


Relationship between speed and data quantity

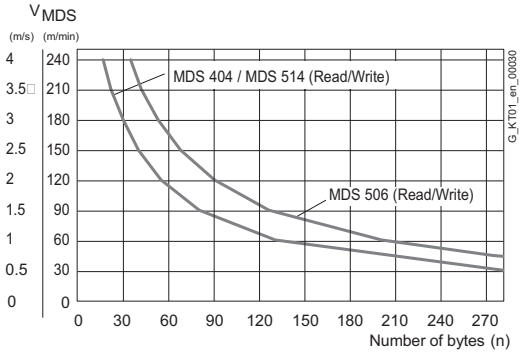
The curves displayed here facilitate preselection of the MOBY I components MDS and SLG for dynamic use. The curves apply to vertical operation with the single length of the spectral window (L) and the operating distance (S_a).



Example: SLG 41



Example: SLG 42 (vertical operation)

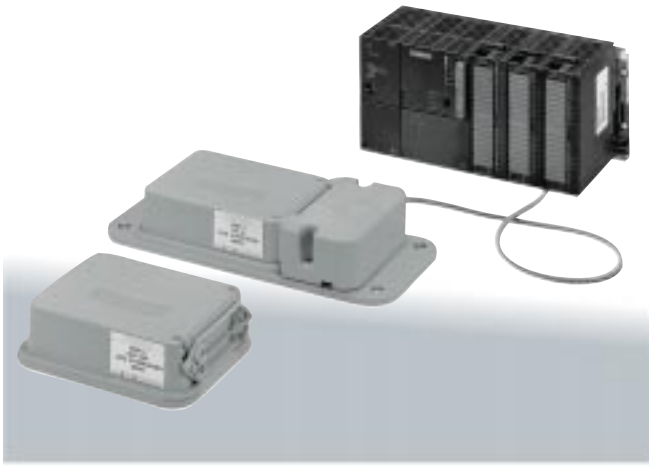


Example: SLG 43 (vertical operation)

Notes

Radio-based identification system MOBY V

MOBY V



Application

MOBY V is a radio-based identification system specially designed for applications in independent railway systems, e.g. underground or suburban trains, where high demands are placed on reliability, interference resistance, reading/writing in dynamic mode, high degree of protection etc.

Just like the other MOBY identification systems, MOBY V consists of three basic components:

- Mobile data memories (MDS)
- Read/write units (SLG)
- Interface modules (ASM).

Design

The standard MOBY V components enable fast and reliable design of application-specific identification systems, freeing capacity for the production of the application software.

Powerful interface modules including software interface are used for connecting to SIMATIC, PROFIBUS-DP or PCs/non-Siemens PLCs.

The MOBY V identification system has the following performance features:

- 433-MHz identification system with read/write distance up to 700 mm
- Very high reliability even with contamination, temperature fluctuations and electromagnetic interferences
- Simple integration into SIMATIC
- Connection possible to any systems, e.g. PC with DOS/Windows 95/NT, via serial interface
- Worldwide configuring and service support

Technical specifications

Transmission frequency (data)	433 MHz
Memory capacity	32 KB
Memory type	RAM
Read/write cycles	Unlimited
Data organization	Address-oriented
Data transfer rate	≥ 0.8 ms/byte
Read/write distance	Up to 700 mm
Operating temperature	–25 to +70 °C
Degree of protection	IP 65
Can be connected to	SIMATIC S5/S7, PC, non-Siemens PLC, PROFIBUS-DP
Special features	MDS V507 and SLG 65 correspond to the specifications of German Rail The SLG 65 can be fitted e.g. directly in the track ballast
Approvals	EN 300 220

Ordering data

	Order No.
Mobile data memories	
MDS V507 32 KB RAM with mounting bracket and battery set	**6GT2 200–0DA01**
SLG 65 read/write unit	**6GT2 201–0AA00**
STG 6 service and test unit for MOBY V, without SLG 65[1)]	**6GT2 003-0AA00-Z** Order code **A07** absolutely essential
Charger unit for STG 4F/6 (220 V AC)	**6GT2 003-1AA00**
Connecting cable between STG 6 and SLG 65 incl. 230 V AC power supply unit	**6GT2091-1AH20**

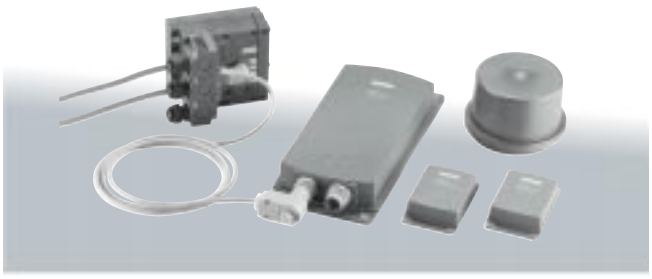
See Section 9 for documentation and cables.

1) A connecting cable 6GT2091-1AH20 and SLG 65 are additionally required for STG operation.

RF identification system MOBY U

MOBY U

Overview



Application

The MOBY U identification system was specially designed for applications which place high demands on interference immunity, a large read/write distance when using mobile data memories, fast and reliable data transmission, simple installation, and functional reliability even in the toughest industrial environments. It uses the internationally approved ISM frequency band of 2.4 GHz, and the radiated emission is far below the recommended limits.

MOBY U covers a range from **only a few centimeters up to three meters**, thus establishing the prerequisite for an integrated identification solution, e.g. in the automobile production industry.

A variety of data memories and read/write units are available for connection to SIMATIC, PROFIBUS or PC/PLC depending on the requirements.

Main applications of MOBY U:

- Main assembly lines in the automotive industry (body-in-white, surface and installation)
- Vehicle identification/access control in haulage companies, car parks, etc.
- Container/freight area identification for transport logistics and distribution
- Traffic control

Features

MOBY U from Siemens is a completely new identification system with outstanding features for use in industry and logistics. It combines the capabilities of innovative RF technologies on the one hand while ensuring continuity thanks to extensive compatibility with the field-tested MOBY I identification system. Rugged housing and power-saving circuitry guarantee years of maintenance-free operation in even the toughest of production environments.

With the MOBY U, disturbances which frequently occur during microwave transmissions, such as echoing, fading and overreach, are eliminated by appropriate technical measures.

Antennae provide a homogeneous transmission field to ensure reliable recognition of the mobile data memories (MDS) even in unfavorable locations.

Special coding procedures ensure that data transmission is problem-free and that data integrity is maintained. To this end, methods and algorithms already well established in mobile radio technology have been put to use for identification engineering.

MOBY U standard components guarantee safe, fast construction of application-specific identification systems, as well as fast substitution/replacement even years later.

The new MOBY U microwave identification system has the following features:

- 2.4-GHz identification system with a read/write distance **up to 3000 mm**
- Innovative technology (cellphone/mobile technology) ensures easy installation/migration and years of maintenance-free operation:
  – Active overreach suppression
  – Automatic frequency hopping to vacant channels
  – Homogeneous transmission field with circular polarization
  – Multitag capability, max. 12 mobile data memories (MDS)
  – Automatic synchronization of up to 3 read/write units
  – Service functions for fast error analysis
  – Call-compatible with MOBY I
- Comprehensive range of rugged data memories for a wide variety of applications
- Special heat-resistant data memory for the automotive industry (paint shops)
- Extremely high reliability even with contamination, temperature fluctuations and electromagnetic interference
- Easily integrated in SIMATIC/PROFIBUS-DP-V1 and Industrial Ethernet (available soon)
- Can be connected to any systems, e.g. PC with Windows 98/NT/2000 via serial interface
- Mobile handheld terminal (available soon)
- Worldwide configuring and service support.

Technical specifications

Transmission frequency	2.4 to 2.4835 GHz in ISM band
Transmitter power	< 10 mW EIRP
Memory capacity (MDS)	
▪ Fixed-code memory	32-bit serial number
▪ Read-only memory	128 bits, can be written once by user
▪ Memory size	Up to 32 KB RAM, prepared for up to 256 KB
Read/write cycles (MDS)	10^7 at +25° C
Data organization (MDS)	Byte or file-oriented access
Bulk capability, multitag capability	Yes, up to 12 MDS
Data transfer rate MDS to SLG (read/write)	Approx. 16/14.4 Kbyte/s when not in bulk (net)
Read/write distance	150 to 3000 mm
Operating temperature (MDS)	–25 to +85 °C/+220 °C cyclic
Degree of protection (MDS)	Up to IP 68
Can be connected to	SIMATIC S7, PROFIBUS-DP-V1, PC, non-Siemens PLC, computer
Special features	Innovative technology ensures simple installation/migration and maintenance-free operation: ▪ Active overreach suppression ▪ Automatic frequency hopping ▪ Call-compatible with MOBY I
Approvals	EMC EN 301 489-3 I-ETS 330 440 (Europe) FCC Part 15 (USA) UL/CSA

MDS mobile data memories

MDS U313	Data memory for universal use (2 KB RAM), chiefly for transport and logistics ▪ Housing dimensions 111 mm x 67 mm x 23.5 mm ▪ Degree of protection IP 67 ▪ Operating temperature –25 to +70 °C
MDS U524	Rugged, mobile data memory for universal use (32 KB RAM) ▪ Housing dimensions 111 mm x 67 mm x 23.5 mm ▪ Degree of protection IP 68 ▪ Operating temperature –25 to +85 °C
MDS U589	Heat-resistant, rugged data memory for use in paint shops (automotive industry, base/covering lacquer) or applications with similar temperature requirements ▪ Memory capacity 32 KB RAM ▪ Temperature range –25 to +220 °C cyclic ▪ Degree of protection IP 68 ▪ Housing dimensions 114 mm diam. x 83 mm Options: ▪ Universal mounting set ▪ Clamp for skid mounting ▪ Cover for clamp ▪ Further clamps on request

Application

Mobile data memories guarantee that detailed data (e.g. production/quality data) accompany a product right from the beginning.

Mobile data memories are therefore fixed to the product or its transport/packaging unit, e.g. container, load bearer or chassis, and written, modified and read without contact. All important information, such as production and material flow control, are thus present directly on the product. A rugged housing permits use in rough environments and makes the MDS resistant to many chemical substances.

Stationary or mobile read/write units (SLG) can be used to read, supplement or modify the required information (production data, transport routes, ...) of mobile data memories without contact and without direct visual contact being necessary.

With MOBY, data are recorded from objects quickly and reliably. MOBY thus provides effective, economical automation.

Field data in mm

	MDS U313 MDS U524 MDS U589
	Operating distance/limit distance
SLG U92	**150 to 2100/3000, adjustable in increments of 0.5 m**

Note:

All field data listed are typical values and apply to a room temperature of +25 °C and a power supply of 24 V DC.

Ordering data

	Order No.
MDS U313 mobile data memory 2 KB RAM	**6GT2 500-3BD10**
MDS U524 mobile data memory 32 KB RAM	**6GT2 500-5CE10**
MDS U589 mobile data memory 32 KB RAM, up to +220 °C cyclic	**6GT2 500-5JK10**
Skid clamp for MDS U589 ▪ Short version ▪ Long version	**6GT2 090-0QA00** **6GT2 090-0QA00-Z** The order code **A31** is essential for the long version
Cover for skid clamp	**6GT2 090-0QB00**
Universal clamp for MDS U589, e.g. for mounting to chassis with customer-specific adapter	**6GT2 590-0QA00**

MDS U313, MDS U524 mobile data memories

Technical specifications

	MDS U313	MDS U524
Memory capacity		
▪ Fixed-code memory	32 bits serial number	
▪ Read-only memory	128 bits, can be written once	
▪ Application memory	2 KB RAM	32 KB RAM
MTBF (at +40° C)	2.5 × 10^6 hours (without consideration of battery)	
Read/write cycles	10^7 at +25 °C	
Read/write distance	150 to 3000 mm	
Bulk and multitag capability	Yes	
Power source	Battery	
Battery life	≥ 5 years[1])	≥ 8 years[1])
Shock/vibration to DIN EN 721-3-7, Class 7 M3	50 *g*/10 *g*	
Free fall to DIN EN 60068-2-32	1 m	
Torsion and bending stress	None	
Mounting	4 x M4 screws	
Recommended distance from metal	Can be mounted directly on metal	
Degree of protection to EN 60529	IP 67	IP 68
Chemical stability	See Configuring Manual	
Housing (L × W × H)		
▪ Dimensions	111 mm × 67 mm × 23.5 mm	
▪ Color/material	Anthracite/PA 12 GF 25 plastic	
Ambient temperature		
▪ Operation	–25 to +70 °C	–25 to +85 °C
Approx. weight	0.1 kg	

Field data in mm

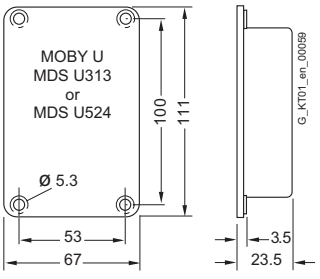
MDS U313/524 to SLG U92

Reach (Sg) of the SLG can be limited in increments of 500 mm

	Minimum	Standard	Maximum
Limit distance (S_g), approx.	500	2000	3000
Operating distance (S_a)	350	1400	2100
Spectral window at S_a Length/width	700	3000	3600

The field data apply to reading and writing of the MDS.

Dimensions in mm



MDS U589 mobile data memories

Technical specifications

Memory capacity	
▪ Fixed-code memory	32 bits serial number
▪ Read-only memory	128 bits, can be written once
▪ Application memory	32 KB RAM
MTBF (at +40° C)	2.5 × 10^6 hours (without consideration of battery)
Read/write cycles	10^7 at +25 °C
Read/write distance	150 to 3000 mm
Multitag capability	Yes
Power source	Battery
Battery life	≥ 5 years[1])
Shock/vibration to DIN EN 721-3-7, Class 7 M3	50 *g*/20 *g*
Free fall to DIN EN 60068-2-32	None
Torsion and bending stress	None
Mounting	See clamps
Recommended distance from metal	Can be mounted directly on metal
Degree of protection to EN 60529	IP 68, for paint shops
Chemical stability	See Configuring Manual
Housing	
▪ Dimensions (diam. × H)	114 mm × 83 mm
▪ Color/material	Brown/PPS
Ambient temperature	
▪ Operation	–25 to +220 °C cyclic (see configuring informations)
Approx. weight	0.6 kg

Field data in mm

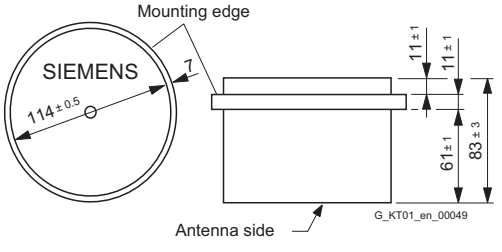
MDS U589 to SLG U92

Reach (Sg) of the SLG can be limited in increments of 500 mm

	Minimum	Standard	Maximum
Limit distance (S_g), approx.	500	2000	3000
Operating distance (S_a)	350	1400	2100
Spectral window at S_a Length/width	700	3000	3600

The field data apply to reading and writing of the MDS.

Dimensions in mm



1) The service life depends on the temperature, the time during which the MDS is within the SLG's antenna field (zones 1 and 2), and the amount of read/written data.

SLG U92 read/write units

Application

The compact and cost-effective SLG U92 is a universal read/write unit (SLG) with integral antenna for applications requiring read/write distances up to 3,000 mm. Since the SLGs are synchronized automatically via cable, as many as three can be installed in very close proximity.

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

- RS 232; serial interface for connection to any system (PC/PLC)
- RS 422; serial interface for connection to PC/PLC or MOBY interface module (ASM 475, ASM 473, ASM 452) for integration in SIMATIC S7 or PROFIBUS

Software tools such as the SIMATIC S7 functions (FC 45/FC 46/FC 56) and the MOBY API library for applications with Windows 98/NT/2000 permit easy implementation in the relevant application.

The integral file management system (compatible with the MOBY I file handler), supplemented by multitag handling commands, provides simple, convenient data management on the mobile data memory.

	Compact, cost-effective read/write unit with integral antenna for universal use, read/write distances up to 3000 mm which can be reduced in increments of 500 mm using the software, incl. file handler, degree of protection IP 65, housing dimensions 290 mm × 135 mm × 42 mm
SLG U92	As above, but with RS 232 interface for connection to PC/PLC
SLG U92	As above, but with RS 422 interface for connection to ASM (e.g. ASM 452, ASM 473, ASM 475) or PC/PLC

Design and function

The SLG U92 works with an ISM band frequency between 2.4 and 2.4835 GHz. This makes it possible to achieve a transmission range between a few centimeters and three meters using a very small output power of < 10 mW EIRP and a high net transmission rate up to 16 Kbyte/s. Selection of the best transmission frequency, a rugged automation procedure, and appropriate check mechanisms make it possible to disregard electromagnetic interferences and guarantee fault-free data transmission and integrity. The MOBY U technology eliminates disturbances common to microwave transmission such as echoing, interferences and overreach. Specially constructed antennae provide a homogeneous transmission field, and ensure 100% recognition of mobile data memories (MDS), making expensive screening measures and antenna adjustment unnecessary.

The SLG's antenna field can be activated for the period of communication with an MDS either using a function call or automatically by triggering with BERO.

There are two methods for managing data on the mobile data memory:

- Byte-by-byte addressing using **absolute addresses** (start address, length)
- A user-friendly **file management system** (compatible with the MOBY I file handler).

When the file handler is used, the MOBY U read/write unit always fetches the required file management information directly from the MDS, and can be operated in three stages:

1. For existing system solutions with MOBY I, MOBY U can be operated using default settings and unchanged file handler functions, but without the MOVE and LOAD commands which are no longer required.

2. Only a few additional commands are required to change the standard settings and to request diagnostics data.

3. Utilization of all available features, including multitag processing. In this stage, the commands and/or useful data can also be specifically assigned to the respective MDS number.

Two LEDs indicate the current status (e.g. MDS in the field) and simplify commissioning.

A separate service and diagnostics interface (RS 232) is available for simple commissioning and for real-time diagnostics. Using the service function "Load software into SLG", this interface can also be used to load function extensions into existing applications without exchanging the SLGs.

The system interface (RS 232 or RS 422) can be used as the serial connection to any systems (PC/PLC).

Ordering data

	Order No.
SLG U92 with RS 422 Integral antenna	**6GT2 501-0CA00**
SLG U92 with RS 232 Integral antenna	**6GT2 501-1CA00**
MOBY software CD, FB/FC for SIMATIC, 3964R driver for DOS/WINDOWS 95/NT, C libraries, PC demonstration program, MOBY documentation (German + English)	**6GT2 080-2AA10**

SLG U92 read/write units

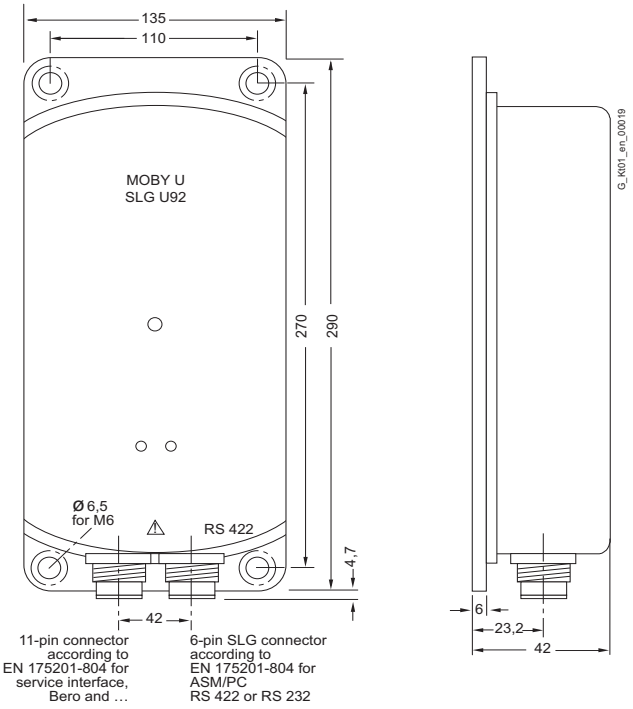
Technical specifications

Air interface to the MDS	Integral antenna
Transmission frequency	2.4 to 2.4835 GHz in ISM band
Bandwidth	2 × 2 MHz within 83 MHz
Check mechanisms	Forward-correction by means of systematic block code (CRC), ARQ procedure
Error rate	< 1 read error every 10^6 transactions
Data transfer rate (read/write) (net)	Approx. 14.4/16 Kbyte/s, without bulk Approx. 7.2/8 Kbyte/s with bulk size 2
Reach (read/write)	150 to 3000 mm, see MDS field data
Resolution	Reach can be limited in increments of 500 mm
Field length/width with L_g = 1500 mm	3000 mm
Radiated energy/radiation density	< 10 mW EIRP/< 0.5 µW/cm^2 (at distance of 1 m)
Acceptance angle	Approx. 90° horizontal/vertical
Polarization	Circular
Multi-ident capability	Up to 12 MDS
MDS acquisition time	< 1 s with 12 MDS
Object speed (MDS)	< 2 m/s with length = 1.5 m and ≤ 2.5 Kbyte data read/write
Synchronization between SLG and SLG	Using semaphore control via 2nd interface; between max. 3 SLGs
Minimum distance between two SLGs	> 6 m; with synchronization: directly next to one another
Serial interface to ASM or PC	RS 232 or RS 422 (SLG U92 version), 6-pin SLG connector to DIN EN 175201-804
▪ Transmission rate	19.2 to 115.2 Kbaud (depends on cable length)
▪ Transmission protocol	3964 R
▪ Cable length SLG-ASM	Max. 1000 m (shielded)
▪ Cable length SLG-PC	Max. 30 m/300 m (shielded)
Software functions	
▪ Commands	MOBY file handler: format data memory, create/delete file, write data to file, define access privileges etc. Direct read/write: read/write data etc.
▪ Programming	FC 45/FC 46/FC 56 (multitag), C library for PCs with Windows 98/NT/2000

Technical specifications (continued)

Service interface	RS 232, 11-pin connector to DIN EN 175201-804
▪ Transmission rate	19.2 Kbaud
▪ Cable length SLG-PC	Max. 30 m
▪ Transmission protocol	Terminal, ASCII characters
▪ 2 DIs for BERO	Triggering of antenna field enabled/ disabled
▪ Cable length SLG-BERO	Max. 50 m
▪ Interface for SLG-SLG synchronization	Max. cable length 30 m
Display elements	2 LEDs (data memory in field, error, etc.)
MTBF (at +40 °C)	5 × 10^6 hours
Supply voltage	24 V DC (rated value) 20 V DC to 30 V DC
Current input	< 300 mA
Housing	
▪ Dimensions (L × W × H) in mm	290 × 135 × 42 (without connector)
▪ Color/material	Anthracite/PA 12 plastic
▪ Mounting	4 x M6 screws
Shock/vibration to DIN EN 712-3-7, Class 7 M3	30 *g*/1.5 *g*
Degree of protection to EN 60529	IP 65
Ambient temperature	
▪ Operation	–25 to +70 °C
Approx. weight	0.9 kg
Special features	▪ Active overreach suppression ▪ Automatic frequency hopping ▪ Service functions for fast error analysis ▪ Call-compatible to MOBY I (FC)

Dimensions in mm



Detailed data (distance from metal, distance between SLGs, etc.) are included in the "MOBY U Configuring, Installation and Service Manual" (see Section 9 for ordering information).

Field characteristic (battery saving mode)

In contrast to inductive RF identification systems, the transmission response of microwave systems is as with electromagnetic waves. The wavelength is approx. 13 cm. Metal surfaces reflect the waves, and cannot be penetrated.

Microwave systems have a relatively large range despite a low radiated power. The radiated field has a directional characteristic which, however, depends on the antenna design. In order to keep the energy requirements of the MDS low and to make the determination of position comprehensible, MOBY U has different function areas which are dependent on the direction and distance. The three different zones of the transmission field are identified by different states and reactions of the affected components.

Put simply, **zone 3** is an area free of SLGs. The MDS is "sleeping" and only listens briefly every 0.5 s for a sign-of-life of an SLG. The current consumption is very low in this case. If other UHF users of the same frequency range are in the vicinity, this has no effect on the MDS since it requires a special code in order to "awaken" it. If the MDS in the vicinity of an active SLG receives this special code, it moves into **zone 2**, see Fig. It then immediately accepts SLG and briefly replies with its own code. However, the SLG ignores every MDS if it is not in zone 1, whose radius can be set in increments in the SLG. The current consumption in zone 2 is insignificantly higher than in zone 3.

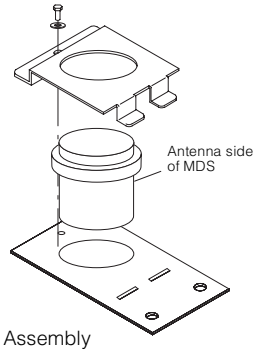
If the MDS enters **zone 1**, it is properly registered by the SLG, and data transfer can commence. All read and write functions can now be carried out. However, since the transmission rate on the air interface is very high (80 Kbit/s), the total communication time is very short. For example, all bytes of the 32 Kbyte memory are read in less than 4 seconds. The battery is therefore hardly loaded by the data transfer.

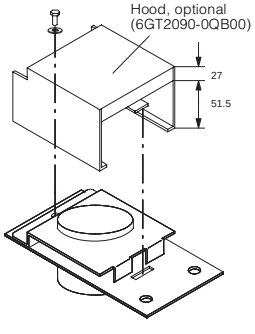
Cyclic operation of the MDS U589 at temperatures > 85 °C

Cyclic operation is unnecessary at temperatures below +85 °C, i.e. the MDS can be operated permanently up to this temperature.

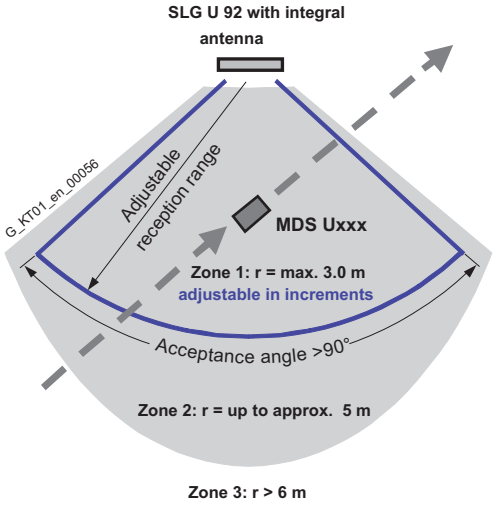
Heating	Cooling		
Temperature	Time	Temperature	Time
220 °C	Short-term	25 °C	< 30 min
200 °C	1 h	25 °C	< 2 h
190 °C	1 h	25 °C	<1 h 45 min

Skid mounting e.g. on a cross-member

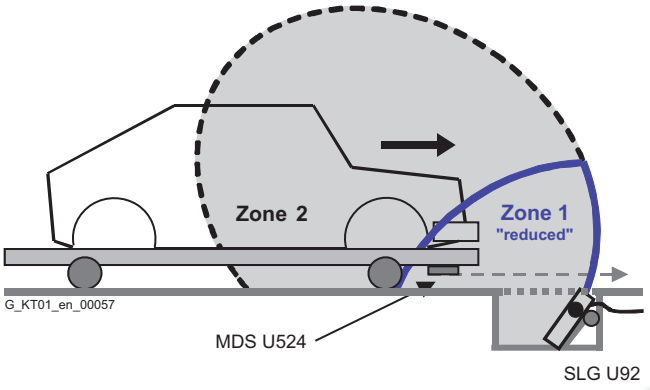




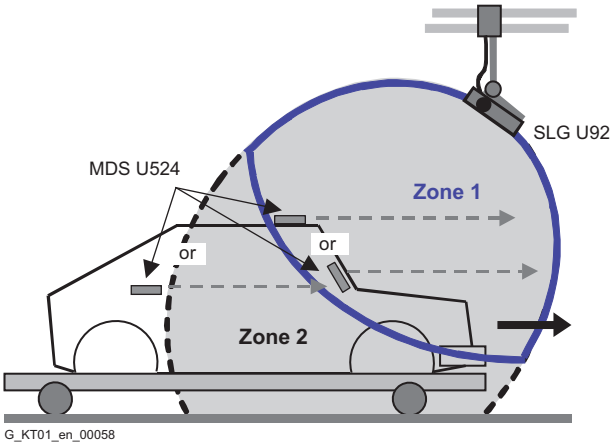
SLG U92 with integral antenna



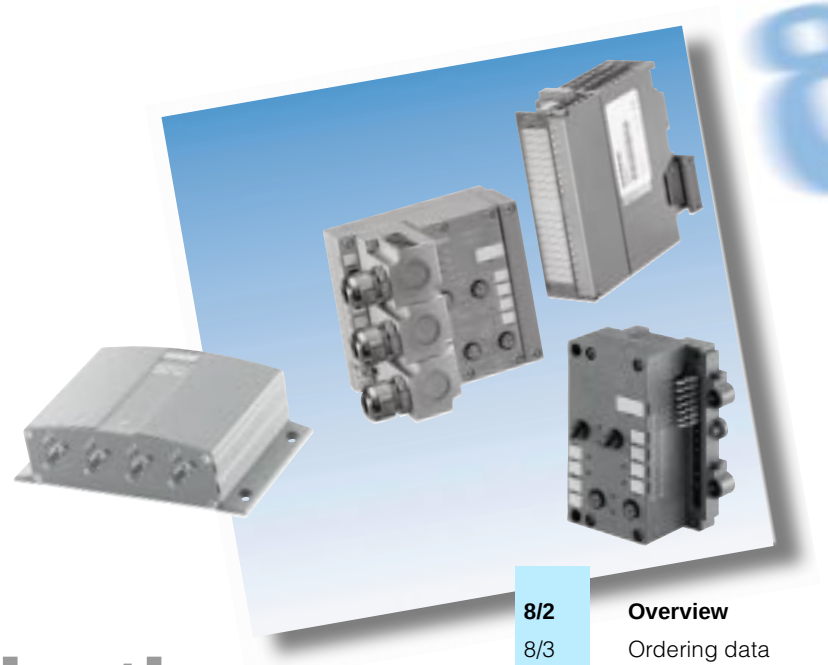
Example of chassis identification



Example of skid identification

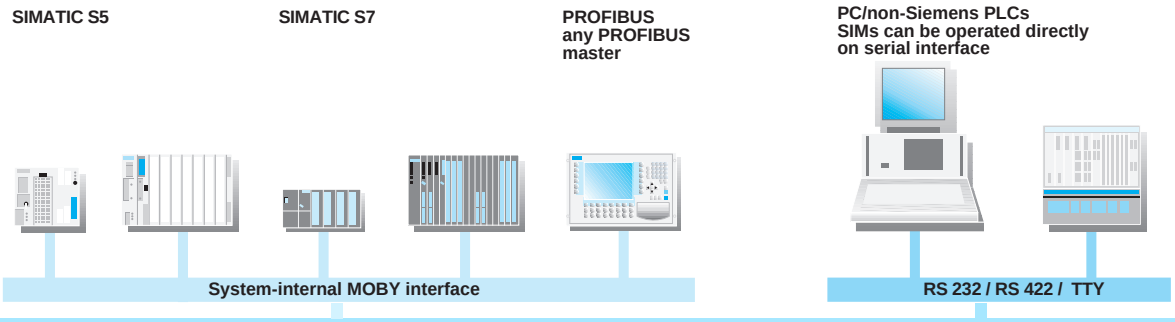


Notes



Identification systems MOBY Interface modules

ASM interface modules



MOBY D/F/E/I/V/U identification systems

Application and function

Various powerful interface modules (ASM) are available for integrating the MOBY identification systems into SIMATIC, SINUMERIK and PROFIBUS-DP. The following possibilities are available for the serial connection of MOBY to any systems (PC, PLC, ...):

- Via an interface module to which the read/write units (SLG) or read/write antennae (SLA) are connected.
- Directly via a read/write unit with serial interface (SIM or SLG Ux)

Up to 4 read/write units can be connected to an ASM (number depends on the ASM), where the connecting cable can be up to 1000 m long (length depends on the SLG, ...). Appropriate software blocks (FB/FC for SIMATIC S5/S7, C libraries for the PC) guarantee simple, fast integration into the application.

Selection guide for interface modules and software

System	ASM, without file handler	Software available	MOBY system
SIMATIC S5-90U, -95U, -100U/H; ET 200	ASM 410	FB41	F, E, I, V
SIMATIC S5-115U, -135U, -155U/H	ASM 400/CM 422	FB250	F, E, I, V[4]
SIMATIC S5-115U, -135U, -155U, via ET 200M	ASM 470	FB47	F, E, I, V
SIMATIC S7-300 (direct), S7-300/400 via ET 200M, SINUMERIK 840D/810D	ASM 475 ASM 470	FC45 FC47	F, E, I, U[2] F, E, I, V
Serial coupling[1] to PC, PLC, SICOMP, any system	Directly via SIM 4x Directly via SIM 7x Directly via SIM 8x Directly via SLG U92 Directly via SLG Dx ASM 424 ASM 724 ASM 824	MOBY API, C library incl. drivers for Windows 98/NT/2000	I E F U[2] D I E (SLA 7x only) F (SLA 8x only)
PROFIBUS-DP (SIMATIC S5, S7; SICOMP, PC, any system)	ASM 450	FB240, FC44, process image	F, E, I, V
SIMATIC S7-300/-400 via ET 200X	ASM 473 (expansion module for BM 141/142/143/147[2])	FC45	F, E, I, U[3]
PROFIBUS-DP-V1[1] (SIMATIC S7/S5; SICOMP, PC, any system)	ASM 452 ASM 454 ASM 754 ASM 854	FC45 FC45 FC45 FC45	I, E, F, U I (all SLGs) E (SLA 7x only) F (SLA 8x only)

System	ASM, with file handler	Software available	MOBY system
PROFIBUS-DP-V1 (SIMATIC S5/S7; PC, any system)	ASM 451 ASM 452	FB246 for S5-155, FC46 FC46, FC56[2] (incl. multitag)	I I, U[2]
Serial coupling to PC, SICOMP, PLC	SLG U92	3964R driver/C library for Windows 95/98/NT	U[2]/U[3]
SIMATIC S7-300 (direct), S7-400 via ET 200M	ASM 476, ASM 475	FC56	I[2], U[2]
SIMATIC 115U, 135U, 155U/H	ASM 400 with CM 423	FB 230	I

1) The programming interface is described for connection to any systems
2) From approx. 12/2001 3) From approx. 05/2002 4) CM622 required instead of CM422

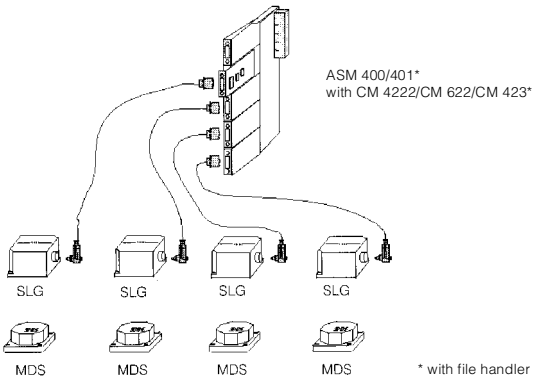
Ordering data[1) 2)]	Order No.
ASM 400/401 interface modules consisting of basic board and CM 422/CM 423/CM 622 channel module	
Basic board without channel module, with slots for 4 channel modules, mixed configuration is not permissible	**6GT2 002-0AA00**
CM 422 channel module for inserting in an ASM 400 with connection for 1 SLG	**6GT2 002-0AB00**
CM 423 channel module for inserting in an ASM 401 with connection for 1 SLG (MOBY I only, file handler)	**6GT2 002-1AB00**
CM 622 channel module for inserting in an ASM 400 with connection for 1 SLG 65 (MOBY V only)	**6GT2 202-0AB00**
S5 adapter casing for ASM 400/401 with 1 cap, single width, for 2 ASM 400 modules	**6ES5 491-0LB11**
ASM 410 interface module for connecting up to 2 SLGs in multiplex mode (without bus unit)	**6GT2 002-0BA00**
Bus unit for ASM 410 with terminal block for ▪ Screw connection ▪ Crimp connection; with crimp contacts	**6ES5 700-8MA11** **6ES5 700-8MA22**
ASM 450 interface module for connecting up to 2 SLGs in multiplex mode, without connector	**6GT2 002-0EB00**
ASM 451 interface module with MOBY file handler, only 1 SLG 4x can be connected, without connector	**6GT2 002-0EB10**
ASM 452 interface module for PROFIBUS-DP-V1, 1 SLG U92 or 2 SLG 4x, 7x, 8x can be connected, without connector	**6GT2 002-0EB20**
Connector for ASM 450/451/452 for PROFIBUS-DP connection and 24 V supply, 3 connectors required per ASM 450/451/452	**6ES7 194-1AA00-0XA0**

Ordering data	Order No.
ASM 473 interface module ET 200X expansion module for BM 141/142/143/147[3)], 1 SLG can be connected per ASM 473	**6GT2 002-0HA00**
ASM 470 interface module suitable for connection of max. 2 SLG (multiplex operation), without front connector	**6GT2 002-0FA10**
ASM 475 interface module suitable for connection of max. 2 SLG (parallel operation), without front connector	**6GT2 002-0GA00**
ASM 476 interface module with MOBY file handler, for MOBY I only, suitable for connection of max. 2 SLG 4x (parallel operation), without front connector	**6GT2 002-0GB00**
20-pin front connector for ASM 470/475/476	**6ES7 392-1AJ00-0AA0**
ASM 454 interface module with PROFIBUS-DP-V interface, suitable for connection of max. 4 SLG 4x	**6GT2 002-2EE00**
ASM 424 interface module with RS 232/RS 422 serial interface, suitable for connection of max. 4 SLG 4x	**6GT2 002-2CE00**
ASM 754 interface module with PROFIBUS-DP-V1 interface, suitable for connection of max. 4 SLA 7x	**6GT2 302-2EE00**
ASM 724 interface module with RS 232/RS 422 serial interface, suitable for connection of max. 4 SLA 7x	**6GT2 302-2CE00**
ASM 850 interface module with PROFIBUS-DP-V1 interface, suitable for connection of only 1 SLA 8x	**6GT2 402-2EA00**
ASM 854 interface module with PROFIBUS-DP-V1 interface, suitable for connection of max. 4 SLA 8x	**6GT2 402-2BB00**
ASM 824 interface module with RS 232/RS 422 serial interface, suitable for connection of max. 4 SLA 8x	**6GT2 402-2CE00**
MOBY software CD, FB/FC for SIMATIC, 3964R driver for DOS/Windows 95/NT, C libraries, PC demonstration program, MOBY documentation (German + English)	**6GT2 080-2AA10**
Connecting cables, documentation and accessories	See Section 9

1) See selection guide for dates and availability for MOBY x.
2) Information on software and licensing:
When purchasing an interface module or SIMx/SLG x, no software or documentation is provided. The CD-ROM "MOBY software" contains all FBs/FCs available for the SIMATIC, C libraries for Windows 95/98/NT, demonstration programs etc., and must be ordered in addition. Furthermore, the CD-ROM contains the complete MOBY documentation (German and English) in PDF format.
A proportional amount of license cost is included by purchasing an interface module or SIM/SLG. And the purchaser is assigned the right to produce copies (copy license) to the extent required for the project.
The contract for use of software products against single payment applies.

ASM 400/401 interface modules

Configurator



Application

The ASM 400/401 interface modules can be directly inserted into and operated in the following SIMATIC S5 programmable controllers:

- SIMATIC S5-115 U/F (all CPUs)
- SIMATIC S5-135 U (all CPUs)
- SIMATIC S5-155 U/H (all CPUs).

Design and functions

The ASM 400/401 interface modules consist of the basic module in double Eurocard format and the channel modules CM 422, CM 423[1] or CM 622[2]. The basic module can be fitted with up to four channel modules. A mixed configuration is not permissible. An adapter casing is required for operation in a SIMATIC 115 U.

ASM 400 (MOBY I/E/F/V)

The ASM 400 interface module with CM 422/CM 622[2] operates in the I/O area of the SIMATIC S5. Together with the FB 250 function block, a maximum of 32 channel modules (corresponding to eight 4-channel interface modules) can be operated in a SIMATIC. When using the FB 252, the maximum number of channel modules is extended from 32 to 96 per SIMATIC S5.

All types of MDS can be processed via the FB 250. Addressing of the data on the MDS is carried out by the user in a command table in the data block.

Users can address their data using absolute addresses.

ASM 401 (only for MOBY I)

The ASM 401 interface module with CM 423 operates in the page area of SIMATIC S5. During configuring, the ASM 401 can be set equal to a communications processor. The ASM 401 operates with the FB 230 function block. Up to 255 basic modules (corresponding to 1020 channel modules) can be addressed in a SIMATIC S5.

The data on the MDS are addressed using files with logical names (file management system similar to DOS).

Technical specifications

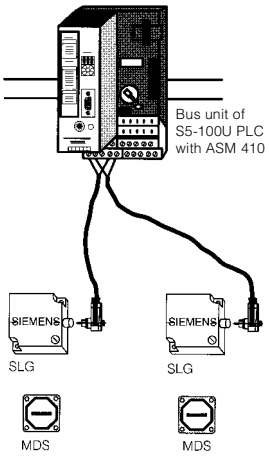
Channel module	CM 422/ CM 622[2])	CM 423[1])
Serial interface to SLG	RS-422	
Connector	9-pint sub-D socket	
Interface/max. cable length	RS 422/1000 m, depending on type of SLG	
Connectable SLGs	1 SLG per CM	
Software functions		
▪ Programming	Using STEP 5 function block	
▪ Commands	FB 250 Read/write data, reset ASM, set MDS type, ... Access takes place directly via addresses	FB 230 Create file, read/ write/delete data, format MDS, ... Access takes place via file handler similar to DOS
▪ Dialog function	Yes[1])	–
Supply voltage	5/24 V DC via internal bus	

Interface modules	ASM 400/401	
Interfaces for CM/SLG		
▪ ASM 400, max.	4 × CM 422 or 4 × CM 622	
▪ ASM 401, max.	4 × CM 423 (mixed configuration not permissible)	
Interface to STG 4F	RS 422, 9-pin sub-D socket	
Interface for 24 V DC	2-pin plug (included in delivery)	
Supply voltage		
▪ Rated value	5/24 V DC	
▪ Permissible range		
Internal (with 5 V)	4.75 to 5.25 V DC	
External (with 24 V)	20 to 30 V DC	
Max. current input		
▪ Internal (with 5 V)	1 channel	370 mA
	2 channels	490 mA
	3 channels	610 mA
	4 channels	730 mA
▪ External (with 24 V)	1 channel	400 mA
	2 channels	800 mA
	3 channels	1200 mA
	4 channels	1600 mA
Ambient temperature		
▪ Operation	0 to +55 °C	
Space requirements	1 slot (1 slot = 15.24 mm)	
Approx. weight		
ASM 400/401	0.44 kg	
CM 422/CM 423	0.1 kg	

1) Only for MOBY I
2) Only for MOBY V

ASM 410 interface module

Configurator



Application

The ASM 410 interface module integrates the MOBY F/E/I/V identification systems into the following systems:

- SIMATIC S5-90 U (max. 2 can be inserted)
- SIMATIC S5-95 U [1]) (max. 8 can be inserted)
- SIMATIC S5-100 U (max. 8 can be inserted)
- ET 100 (max. 2)
- ET 200 (max. 4).

Design and functions

LEDs for status and fault display are present on the front panel. The design is interference-resistant as a result of electrical decoupling of the interface module from the SIMATIC S5 bus. The MOBY commands are started, and data fetched, by setting and scanning a few control bits (STEP 5 programming language) in the process image (PIQ/PII). 2 read/write units can be operated in time-division multiplex mode. The ASM 410 occupies 8 input and output bytes. The MDS data are addressed using absolute addresses.

The STEP 5 function block FB41 (similar to FB250) is available for simple programming of the 95U-100U.

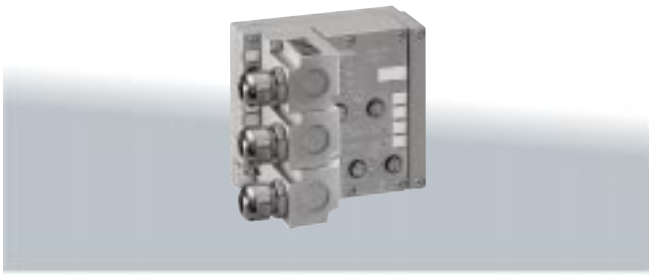
The bus module is not included in the scope of delivery (Order No. 6ES5700-8MA11 or -8MA22).

Technical specifications

Serial interface to SLG	RS-422
Connection	Via a separate bus unit
Interface/max. cable length	RS 422/1000 m, depends on SLG and type of cable
Connectable SLGs	Any 2 SLGs of the same type (multiplex mode)
Interface to STG 4F	RS 422, 9-pin sub-D plug
Software functions	
▪ Programming	With STEP 5 directly via process image PIQ/PII FB41 (similar to FB250) for S5-95U/100U 5 bytes are processed per command
▪ Commands	Select channel 1 or 2 Read, write, initialize MDS etc.
Supply voltage	
▪ Rated value	24 V DC (residual ripple max. 10%)
▪ Permissible range	20 to 30 V DC
Current input	
▪ Internal (with 5 V DC), typ.	20 mA to 60 mA (20 mA = long cycle time) (60 mA = short cycle time)
max.	110 mA (PLC at STOP)
▪ External (with 24 V DC), all SLGs switched off	90 mA
Current input, typ. (without SLG)	2.5 W
Cooling	Convection cooling
Insulation group to VDE 0110	C
Degree of protection to IEC 60 529	IP 20
Mechanical stress	IEC 60068-2-27
Ambient temperature	
▪ Operation	
– SIMATIC installed horizontally	0 °C to +60 °C
– SIMATIC installed vertically	0 °C to +40 °C
Dimensions (W x H x D) in mm	45 × 135 × 100
Approx. weight	0.25 kg

1) Max. four up to release version 03/94 of the S5-95U.

ASM 450/451/452 interface modules



Application

The low-cost ASM 450, ASM 451 and ASM 452 interface modules are stand-alone PROFIBUS-DP slaves for operation of MOBY components via the PROFIBUS-DP/DP-V1 on:

- SIMATIC S5/S7 (incl. software FB/FC)
- SINUMERIK
- SICOMP IMC, PCs, PLCs

The high degree of protection and ruggedness mean that the modules are particularly suitable for use close to the machine.

Design and functions

The ASM interface modules are based on the standard ET 200X module. The corresponding configuration and installation guidelines can be found in the ET 200X manual. ET 200X expansion modules cannot be used.

The ASM occupies one station address on the PROFIBUS-DP/DP-V1 bus. The address is set on the basic module. Incorporation of the ASM into the hardware configuration is carried out using a GSD file. The ASM can then be configured using the HW_Config software tool of the SIMATIC Manager or another PROFIBUS tool.

Error messages and operating states (MDS in the field, transmission, etc.) are additionally indicated on LEDs, and facilitate commissioning and servicing.

ASM 450 (for MOBY F/E/I/V)

The ASM 450 has two SLG interfaces. When using both interfaces, the module operates in multiplex mode so that the MDS can only be reliably read in the stop state. The data in the MDS are accessed directly using absolute addresses.

The ASM operates in cyclic mode with the FB 240/FC 44 software functions for the SIMATIC S5/S7, i.e. the data throughput also depends on the size of the address window (max. 208 byte), number of slaves etc.

ASM 451 (only for MOBY I)

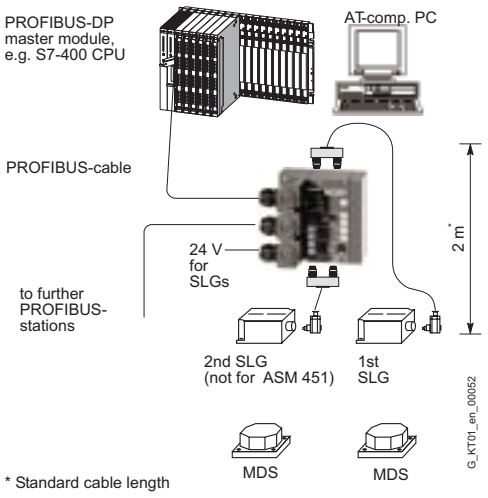
The ASM 451 only has one SLG interface. The data in the MDS can be managed simply using file names by means of the convenient MOBY file handler. The FB 246 and FB 46 software functions are available for the SIMATIC S5/S7.

ASM 452 (MOBY I/E/F/U)

The ASM 452 has two SLG interfaces (only one SLG U9x can be connected with MOBY U). When using two SLG interfaces, the module operates in quasi-parallel mode so that the MDS can only be reliably processed (e.g. read data) in the stop state. The data in the MDS are accessed directly using absolute addresses (FC 45) or in a convenient manner using the MOBY file handler (FC 46, only MOBY U) with file names, where the ASM is operated in acyclic mode via PROFIBUS-DP-V1.

Large amounts of data can be transmitted from/to the ASM in this mode without overloading the PROFIBUS cycle.

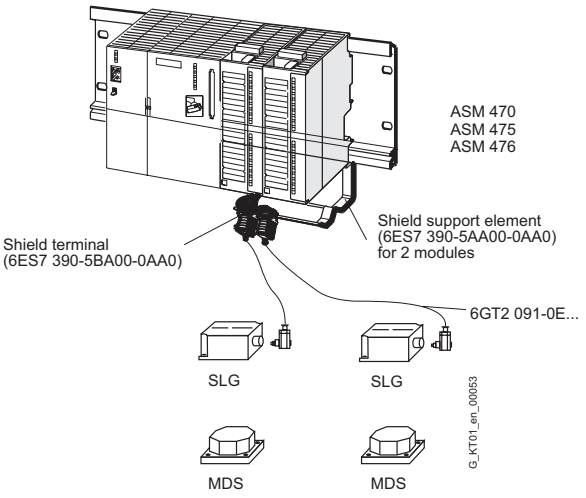
Configurator



Technical specs.	ASM 450	ASM 451	ASM 452
Interface to user	PROFIBUS-DP	PROFIBUS-DP-V1	PROFIBUS-DP-V1
Procedure according to	EN 50170 Vol. 2 PROFIBUS		
PROFIBUS connection	PG 11 screwed gland (3 x 6ES7194-1AA00-0XA0, not in scope of delivery)		
Date transfer rate	9.6 Kbaud to 12 Mbaud		
Max. block length	208 bytes	1 byte cyclic, 240 bytes acyclic	2 words cyclic, 240 bytes acyclic
Serial interface to SLG	M12 coupling plug		
Max. cable length	500 m, depends on SLG (standard length 2 m)		
Connectable SLGs	2 x SLG 8x/7x/4x in multiplex mode	1 x SLG 4x	1 x SLG U9x or 2xSLG 4x, 7x, 8x in quasi-parallel mode
Data transfer rate to SLG	19.2 Kbaud to 57.6 Kbaud (depends on MOBY range)		
Software functions			
Programming	Depends on PROFIBUS-DP/DP-V1 master		
Function blocks			
SIMATIC S5/S7	FB 240/FC 44	FB 246/FC 46	–/FC 46, FC 45
MDS addressing	Direct via addresses	Via file handler	Via file handler (only MOBY U) or directly via addresses
Commands	Initialize MDS, read data, write data, etc.	Format MDS, create/delete file, read data from file, etc.	
Digital inputs/outputs	2/2	–/–	–/–
Electrical isolation	Yes	Yes	Yes
Power supply			
▪ Permissible range	20 to 30 V DC (rated value 24 V DC)		
▪ Current input	Max. 180 mA; typ. 130 mA (without SLG)		
Ambient temperature			
▪ Operation	0 to +55 °C		
Degree of protection	IP 67		
Dimensions (W × H × D) in mm	34 × 110 × 55 (without bus connector)		
Approx. weight	0.5 kg		

ASM 470/475/476 interface modules

Configurator



Application

The ASM 470, ASM 475 and ASM 476 interface modules integrate the MOBY identification systems into the following systems:

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

Max. 2 SLGs can be connected in parallel mode (ASM 470 only multiplex mode).

Design and functions

Up to eight ASM interface modules can be inserted and operated in a SIMATIC S7-300 rack. If several racks are used (not more than four), the ASMs can be inserted and operated in each of them. Thus up to 32 ASMs can be operated in the maximum configuration of a SIMATIC S7-300. The electrical isolation between the SLG and the SIMATIC S7-300 bus provides a design which is insensitive to noise. Error messages and operating states (MDS in the field, command active, etc.) are indicated by means of LEDs.

Communication between the ASM 475/476 and S7 CPU takes place using acyclic telegrams of the P bus so that the useful data (max. 238 byte) can be transmitted very rapidly and effectively. The ASM 475/476 is fully integrated into the diagnostics of the SIMATIC Manager via an Object Manager (OM).

ASM 470 (for MOBY I/E/F/V)

With the ASM 475, the data in the MDS are accessed directly by means of physical addresses. Communication with the ASM is carried out in the process image in blocks of 12 bytes and is slower than with the ASM 475. It can be operated on any external PROFIBUS master via ET 200M.

ASM 475 (for MOBY I/E/F/U[1])

With the ASM 475, the data in the MDS are accessed directly by means of physical addresses. Data transfer between FC 45 and ASM is carried out at a high speed and with low loading of the CPU. In MOBY U mode, the ASM can also be operated with the FC46 (file handler).

ASM 476[1] (only for MOBY I)

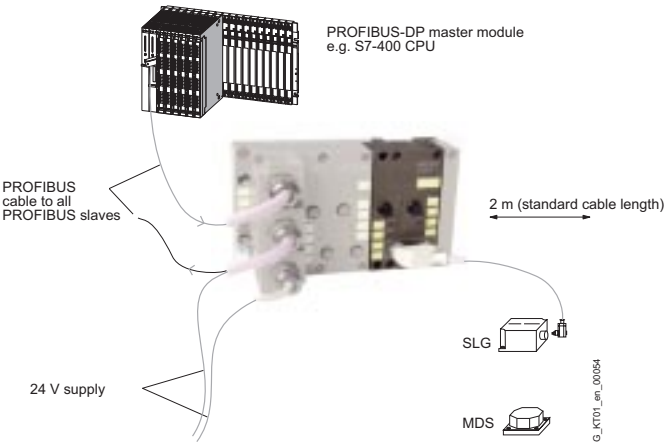
The MOBY I file handler (file management system similar to DOS) has been implemented on the ASM 476.

1) Available soon.

Technical specs.	ASM 470	ASM 475	ASM 476
Serial interface to SLG	RS 422		
SLG connection	Max. 2 SLGs using screw-type terminals in 20-pin front connector (not in scope of delivery, Order No. 6ES7392-1AJ00-0AA0)		
Interface/max. cable length	RS 422/1000 m, depending on SLG and cable type		
Connectable SLGs of same system	MOBY I/E/F/V (multiplex mode)	MOBY I/E/F/U	MOBY I
Interface for 24 V DC	Via screw-type terminals in front connector		
Function blocks SIMATIC S7/S5	FC 47/FB 47	FC 45, FC 46 (MOBY U)/–	FC 46/–
MDS addressing	Direct access by means of addresses		Access via file system similar to DOS
Commands	Initialize MDS, read data from MDS, write to MDS, etc.		Format MDS, read file, write file, etc.
Dialog function	Yes (MOBY I)	No	
Supply voltage			
▪ Rated value	24 V DC		
▪ Permissible range	20 to 30 V DC		
Isolation between S7-300 and MOBY	Yes		
Current input from S7 bus terminal, max.	100 mA		
Power loss, typically	1 W		
Ambient temperature			
Operation			
▪ SIMATIC installed horizontally	0 to +60 °C		
▪ SIMATIC installed vertically	0 to +40 °C		
Dimensions (W x H x D)	40 mm × 125 mm × 120 mm		
Approx. weight	0.2 kg		

ASM 473 interface module

Configurator



Application

The ASM 473 is a low-cost ET 200X expansion module for connecting MOBY F/E/I and U[1)] identification systems to the PROFIBUS-DP-V1.. via the ET 200X.

One SLGx read/write unit can be connected per ASM 473, where max. 7 expansion modules can be inserted on a BM141/142/143/147[1)] basic module in conjunction with e.g. digital input/output modules. The mobile data memories can be reliably operated in dynamic mode on all connected SLGs (see SLG-MDS combination for max. MDS speed).

The following can be used as the PROFIBUS-DP-V1 master:

- SIMATIC S7 (FC 45 available)
- SINUMERIK
- SICOMP IMC and PCs, any PLC[1)]

The high degree of protection and ruggedness mean that the modules are particularly suitable for use close to the machine.

Design and functions

The ASM 473 interface module is an ET 200X expansion module for the BM 141/142 (Order No. 6ES7141-1BF11-0XB0 or 6ES7142-1BD21-0XB0), 143, 147[1)] basic modules. The corresponding configuration and installation guidelines can be found in the ET 200X manual.

The ASM is operated in acyclic mode via PROFIBUS-DP-V1 with the FC 45 software function available for the SIMATIC S7-300/400. Large amounts of data can be transmitted from/to the ASM in this mode without overloading the PROFIBUS cycle. This is advantageous when transmitting large quantities of data. In addition, the ASM can also process chained MDS commands extremely rapidly in this mode. The MDS data are accessed directly using physical addressing.

Error messages and operating states (MDS in the field, transmission, etc.) are additionally indicated by means of LEDs and facilitate commissioning and servicing. The hardware configuration of the ASM 473 is carried out using an Object Manager (OM) which is integrated in the SIMATIC Manager. Depending on the PROFIBUS master, up to 126 ET 200X modules can be operated on one PROFIBUS line.

Technical specifications

Interface to the ET200X basic module (BM141/142/143)	SIMATIC S7 P bus, cyclic and acyclic services
Serial interface to the SLG	
Connector	2 × M12 coupling plugs (not included in scope of delivery)
Max. cable length	20 m; 2 m = standard length (see cable ASM450-SLG and double M12 connector (6GT2 090-0BC00))
Connectable SLGs	1 × SLG 4x, SLG 7x, SLG 8x, SLG U9x [1)]
Software functions	
▪ Programming	Depends on PROFIBUS-DP master
▪ SIMATIC S7 function block	FC 45
▪ MDS addressing	Direct access via addresses
▪ Commands	Initialize MDS, read data from MDS, write data to MDS
▪ MOBY I dialog: standard station/VMDS	Yes/no
▪ PROFIBUS diagnostics	Yes
▪ S7 diagnostics	Yes, can be called using S7 OM
Loadable firmware	Yes, using S7 OM
Supply voltage	
▪ Rated value	24 V DC
▪ Permissible range	20.4 to 28.8 V DC
Current input	
▪ From sensor voltage	Max. 75 mA
▪ From load voltage (SLG power supply)	Max. 500 mA (or see technical specifications of connected SLG)
Module power loss	Typ. 1.6 W
Digital inputs/outputs	Via ET 200X expansion modules
Ambient temperature	
▪ Operation	0 to +55 °C
▪ Transport and storage	–40 to +70 °C
Degree of protection	IP 67
Dimensions (W × H × DT)	87 mm × 110 mm × 55 mm
Mounting	2 x M5 screws
Weight	0.3 kg
Special features	▪ Expansion modules for ET 200X ▪ The ET 200X installation guidelines apply

1) Available soon.

ASM 454/424, ASM 754/724, ASM 854/850/824 interface modules

Application

Up to 4[1] read/write units or antennae can be connected in parallel to the low-cost interface modules. The user can choose between 2 interfaces:

- PROFIBUS-DP-V1 (ASM 454/754/854/850)
- RS 232/RS 422; serial interface to the PC/PLC (ASM 424/724/824).

An optional adapter is available for simple mounting on a DIN rail.

Design and functions

Up to 4[1] read/write units or antennae from the respective MOBY system can be connected to the rugged housing. The expanded MOBY F/E functions (multitag, access privileges, password, etc.) are not supported.

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

PROFIBUS-DP-V1 interface

Communication with the user is carried out using the acyclic protocols service of PROFIBUS-DP-V1. The station address on the PROFIBUS is directly set on the ASM using DIP switches.

The FC 45 (see also ASM 473) function is available for SIMATIC S7 users to permit simple integration into the application. Incorporation of the ASM into the hardware configuration is carried out using a GSD file. The ASM can then be configured using the HW_Config software tool of the SIMATIC Manager or another PROFIBUS tool.

RS232/RS422 interface

A Windows 98/NT C library (MOBY API, DLL functions) including 3964R drivers with basic functions (open/close channel, read data from data memory, etc.) is available for the applications of PC users.

MOBY F

Up to four SLA 8x (see Section 3) can be connected in parallel to the ASM 850/854/824 and also operated in parallel. When operating with MDS F1xx read-only data memories, the process image mode can be set on the ASM 850/854, where no FC is required.

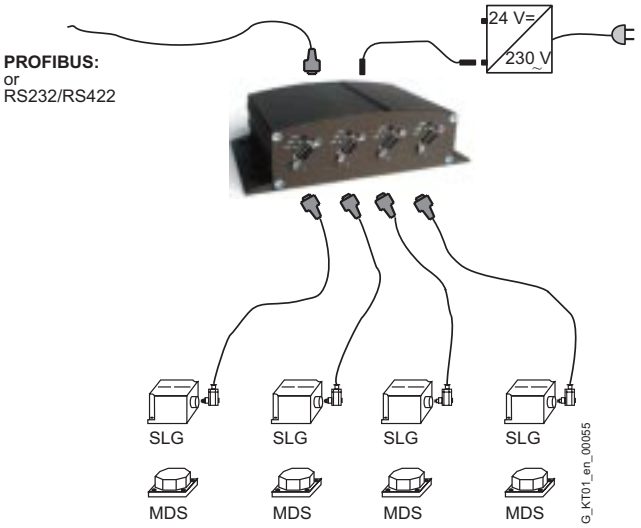
MOBY E

Up to four SLA 7x (see Section 4) can be connected in parallel to the ASM 754/724, but are operated internally in multiplex mode. When connecting more than one SLA 7x, the MOBY E data memories can only be reliably read and written when in the static state.

MOBY I

Up to four SLG 4x (see Section 5) can be connected in parallel to the ASM 454/424, where MOBY I data memories can be read and written simultaneously on all 4 SLGs.

Configurator



Technical specifications

	ASM 454, ASM 754, ASM 850/854	ASM 424, ASM 724, ASM 824
Serial interface to user	PROFIBUS-DP-V1, 9-pin sub-D connector (Order No. 6ES7 972-0BA11-0XA0)	RS 232/RS 422, 9-pin sub-D connector
Max. cable length	See PROFIBUS	30 m with RS232, 500 m with RS422
Procedure/protocol	EN 50170 Vol. 2 PROFIBUS	3964R
Data transfer rate	Up to 12 Mbaud	38.4 Kbaud
Max. block length	4 words cyclically/ 238 bytes acyclically	238 bytes
Serial interface to SLA/SLG	4 × 9-pin sub-D socket	
Max. cable length	55 m to SLA; 1000 m to SLG	
Connectable SLA/SLG	MOBY I: max. 4 × SLG4x (parallel mode) MOBY E: max. 4× SLA 7x (multiplex mode) MOBY F: max. 4 × SLA 8x (parallel mode)	
Software functions		
Programming	Depends on master	Depends on PC/PLC
Software available (CD MOBY software)	FC 45 for SIMATIC S7-300/400	C library MOBY API for PC with Windows 98/NT
MDS addressing	Direct access via addresses	
Commands	Initialize, read, write MDS etc.	
Supply voltage		
▪ Rated value	24 V DC (separate connector)	
Current input	250 mA	
Mounting	4 x M5 screws	
Degree of protection	IP 40 (higher degree of protection on request)	
Housing		
▪ Dimensions (W x H x D)	205 mm × 130 mm × 60 mm (without connector)	
▪ Material/color	Aluminium/anthracite	
Ambient temperature		
▪ Operation	–25 to +55 °C (condensation not permissible)	
Approx. weight	1.3 kg	

1) With the ASM 850, only one SLA 8x can be connected.

Notes

9

MOBY identification systems
Accessories

Accessories, STG E/F/I/D mobile handheld terminals

Application

The STG is a high-performance, mobile handheld terminal with integral read/write antenna for applications relating to logistics, distribution and servicing. In addition, it is an indispensable aid to commissioning and testing.

The following STG versions are available for the various MOBY identification systems:

- STG E: for MOBY E
- STG F: for MOBY F
- STG I: for MOBY I (incl. file handler)
- STG D: for MOBY D (available soon).

Design and functions

The STG mobile handheld terminal consists of a basic unit (PSION Workabout^{mx}) and a plug-in compact read/write head. It has a splash-proof housing (IP 54), an LCD screen with 240 × 100 pixels, alphanumeric keyboard and various interfaces (for an EEPROM card, battery charging, RS-232/TTL for MOBY E/MOBY F read head, battery charge interface including RS 232 for PC connection, etc.). The MOBY software (memory card) supplied with handheld terminals features the following service and test functions:

- Read data from the data memory
- Write data to the data memory
- Read and display the ID number of the data memory
- Display and edit data in hexadecimal and ASCII formats
- Enable/disable password protection.

On the basis of the optional C library, private applications, including a customized interactive screen form can be very easily programmed for reading and writing data from and to data memories. Different optional development tools for a PC and a large selection of accessories are available directly from PSION for this purpose. New potential applications open up in logistics and distribution – for example, order picking data can be acquired and edited offline using the handheld terminal and forwarded to the PC or computer following a time delay.

Optional components

(Take a look at http://www.psion.com/industrial/ on the Internet)

- "3link" connecting cable to a PC for a simple exchange of data between the PC and PSION Workabout^{mx}
- PSION Workabout^{mx} basic unit with large-size function keys and numeric keyboard
- Additional memory card with up to 8 MB
- Docking station incl. high-speed charging unit and software for convenient data transfer between PSION Workabout^{mx} and PC.

Ordering data

	Order No.
STG mobile handheld terminal Basic unit (PSION Workabout^{mx}) with MOBY x read/write head, battery, standard software including STG functions on EEPROM card, operating instructions, without charging unit	
▪ With MOBY E read/write head	**6GT2 303-0AA00**
▪ With MOBY F read/write head	**6GT2 403-0BA00**
▪ With MOBY I read/write head	**6GT2 003-0CA00**
Charging unit for a mobile handheld terminal including 230 V AC plug-type power supply unit	**6GT2 303-1DA00**
MOBY E read/write head for basic unit (PSION Workabout^{mx})	**6GT2 303-1AA00**
MOBY F read/write head for basic unit (PSION Workabout^{mx})	**6GT2 403-1BA00**
MOBY I read/write head for basic unit (PSION Workabout^{mx})	**6GT2 003-1CA00**
STG software for MOBY E, F and I, 256 KB EEPROM card	**6GT2 303-1CA00**
C library for MOBY E, F and F for development of customized interactive screen forms, without development tools, 3½″ floppy disk, C interface description	**6GT2 381-1AB00**

Technical specifications

RAM/ROM	2 MB/2 MB
User program	256 KB (with MOBY service and test program)
Screen	Graphics LCD screen with 240 × 100 pixels; gray tone scale; optional background lighting
Keyboard	Alphanumeric, with 57 keys
Sound	Piezo signal transmitter
Signal transmitter	NiCd battery pack with 2 cells, type AA (850 mAh); fast charging; automatic cut-out; operating time: approx. 20 hours (read head inactive, no background lighting)
Dimensions	260 × 92 × 35 (including read head)
Weight	Approx. 55 g (including batteries and read head)
Temperature ▪ Operation/storage	–20 to +60 °C/–25 to +80 °C
Relative humidity	0 to 90 % (with no condensation)
Degree of protection	IP 54 (splashwater-proof)
Impact resistance	Maximum height of fall onto concrete 0.5 m
EMC	EN 55022
Electrostatic; RF; EFT	IEC 60801-2; IEC 60801-3; IEC 60801-4

Read/write head

Inductive interface to MDS	For MOBY E	For MOBY F	For MOBY I
Read/write distance (depending on MDS)	Up to 30 mm	Up to 80 mm	Up to 20 mm
Transmission frequency (power/data)	13.56 MHz	125 kHz	1.81 MHz/ 134 kHz
Serial interface (to basic unit)	TTL/3964R		
Software functions ▪ Programming	Standard operator interface for reading/writing data memories etc.		
Approvals	EN 300 330, FCC Part 15 (USA) UL/CSA	–	EN 300 330, FCC Part 15 (USA) UL/CSA

Ordering data	Order No.
Connecting cables	
SLG connecting cable, preassembled for MOBY D/E/I/V/U	
▪ Between ASM 400/401/424/454, ES 030-K and SLG	
Angled SLG connector	
Length: **5 m**	**6GT2 091-0AH50**
10 m	**6GT2 091-0AN10**
20 m	**6GT2 091-0AN20**
50 m	**6GT2 091-0AN50**
Straight SLG connector	
Length:**10 m**	**6GT2 091-2AN10**
50 m	**6GT2 091-2AN50**
▪ Between ASM 410 and SLG	
Angled SLG connector	
Length: **5 m**	**6GT2 091-0DH50**
10 m	**6GT2 091-0DN10**
20 m	**6GT2 091-0DN20**
Straight SLG connector	
Length: **5 m**	**6GT2 091-2DH50**
▪ Between ASM 470/475/476 and SLG	
Angled SLG connector	
Length: **2 m**	**6GT2 091-0EH20**
5 m	**6GT2 091-0EH50**
10 m	**6GT2 091-0EN10**
20 m	**6GT2 091-0EN20**
50 m	**6GT2 091-0EN50**
Straight SLG connector	
Length: **2 m**	**6GT2 091-2EH20**
5 m	**6GT2 091-2EH50**
10 m	**6GT2 091-2EN10**
50 m	**6GT2 091-2EN50**
▪ Between ASM 450/451/452/473 and SLG	
Angled SLG connector	
Length: **2 m**	**6GT2 091-1CH20**
5 m	**6GT2 091-1CH50**
20 m	**6GT2 091-1CN20**
50 m	**6GT2 091-1CN50**
Straight SLG connector	
Length: **2 m**	**6GT2 091-2CH20**
SLG connecting cable, preassembled with connector, **for MOBY F,**	
▪ Between ASM 400 and SLG 8x	
Length: **5 m**	**6GT2 491-0AH50**
20 m	**6GT2 491-0AN20**
▪ Between ASM 410 and SLG 8x	
Length: **5 m**	**6GT2 491-0DH50**
20 m	**6GT2 491-0DN20**
▪ Between ASM 470/475 and SLG 8x	
Length: **5 m**	**6GT2 491-0EH50**
20 m	**6GT2 491-0EN20**
50 m	**6GT2 491-0EN50**
▪ Between ASM 450/452/473 and SLG 8x	
Length: **2 m**	**6GT2 491-0CH20**
5 m	**6GT2 491-0CH50**
20 m	**6GT2 491-0CN20**

Ordering data	Order No.
Connecting cables	
Connecting cable, 2-core for 24 V DC supply to ASM 400/401, cable is fitted with plug connectors at both ends	
Length: **2 m**	**6GT2 091-0CH20**
5 m	**6GT2 091-0CH50**
SLG cable, without connectors between ASM and SLG; type 6 × 0.25 mm^2	
Length: **50 m**	**6GT2 090-0AN50**
120 m	**6GT2 090-0AT12**
800 m	**6GT2 090-0AT80**
SLA connecting cable, between SLA 71/81 and ASM 724/754/824/850/854	
Length: **5 m**	**6GT2 391-1AH50**
Extension cable for 6GT2 391-1AH50	
Length: **25 m**	**6GT2 391-1BN25**
Cable for SLG U92 service interface, without connectors	On request
Connecting cable for SLG synchronization, between two SLG U92, preassembled, fitted with angled 11-pin SLG connectors at both ends	On request
RS 232 connecting cable, between PC and **SIM 7x**, with cable for DI/DO and 24 V connector (without power supply unit 6GT2 090-0HB00), length 5 m	**6GT2 391-1DH50**
Wide-range plug-type power supply unit, for SIM 7x - RS 232 connecting cable, 90 – 264 V AC/24 V DC; 1.25 A	**6GT2 090-0HB00**
RS 232 connecting cable, between PC and **SIM 80**, with cable for DI/DO, length 5 m	**6GT2 491-1DH50**
RS 232 connecting cable, between PC and **SLG D1x**	
Length: **5 m**	**6GT2 691-0BH50**
20 m	**6GT2 691-0BN20**
RS 232 connecting cable, between PC and **ASM 424/724/824, SIM 82**	
Length: **5 m**	**6GT2 391-0BH50**
20 m	**6GT2 391-0BN20**
RS 232 connecting cable, between PC and **SLG U92,** with cable for 24 V connector (M12 socket), angled connector	
Length: **5 m**	**6GT2 591-1CH50**
20 m	**6GT2 591-1CN20**

Accessories

Ordering data	Order No.
Connectors	
Connector, on ASM side, 9-pin sub-D connector (male) with screw fasteners between an ASM 400/401/424/454/724/754/824/854 and SLG	
▪ 1 connector ▪ 1 pack (10 connectors)	**6GT2 090-0BB00** **6GT2 090-0BB10**
Connector, 25-pin sub-D connector (female) with screw fasteners for cable between SIM 4x and computer	
▪ 1 connector ▪ 1 pack (10 connectors)	**6AW5 418-4F** **6AW5 418-4FD**
Connector (not MOBY F), on SLG side, 6-pin connector DIN 43 651 with socket contacts for crimping	
With angled output	
▪ 1 connector ▪ 1 pack (10 connectors)	**6GT2 090-0BA00** **6GT2 090-0BA10**
With straight output	
▪ 1 connector	**6GT2 090-0UA00**
Connector for SLG U92 service interface, 11-pin connector with angled output	**6GT2 590-0BA00**
Connector for SIM 7x, degree of protection IP 65, 15-pin sub-D connector	**6GT2 390-1AA00**
Connector for SLG and SIM of MOBY F/D, degree of protection IP 65, 9-pin sub-D connector	**6GT2 490-1AA00**
Double M12 connector for ASM 450/451/452, without SLG cable	**6GT2 090-0BC00**
PROFIBUS connector 9-pin sub-D connector for 2 PROFIBUS cables	**6ES7 972-0BA11-0XA0** (see Catalog IK PI – Industrial communication and Field Devices – for further connectors)

Ordering data	Order No.
Further accessories	
Wide-range power supply unit for ASM 424/454/724/754/824/850/854, SIM 8x, SLG 8x, SLG Ux, SLG D1x; 100 – 230 V AC/24 V DC; 2.2 A, two 24-V outputs, incl. two 24-V connectors (M12 male)	**6GT2 494-0AA00**
24 V DC connecting cable for wide-range power supply unit 6GT2 494-0AA00, length 5 m	**6GT2 491-1HH50**
24 V connector (M12 socket) for ASM 424/454/724/754/824/850/854, SIM 8x, SLG 8x, SLGUx (via PC cable), SLG D1x;	**6GT2 390-1AB00**
Adapter base plate for DIN rail mounting; can be used for ASM 424/454/724/754/824/850/854, SIM 82, SLG 82	**6GT2 390-0BA00**

Documentation

Note:

Since the end of 2000, the CD-ROM "MOBY software" contains the complete MOBY documentation (German and English) in PDF format.

Ordering data	Order No.
Configuring, installation and servicing manual, also includes installation guidelines (e.g. distance from metal) for MDS and SLG, EMC guidelines, pin assignments, ASM adjustment parameters, FB/FC error messages etc.	
For MOBY U	
German	**6GT2 597-4BA00-0EA1**
English	**6GT2 597-4BA00-0EA2**
French	**6GT2 597-4BA00-0EA3**
For MOBY I	
German	**6GT2 097-4BA00-0EA1**
English	**6GT2 097-4BA00-0EA2**
French	**6GT2 097-4BA00-0EA3**
For MOBY E incl. SIM 7x	
German	**6GT2 397-4BA00-0EA1**
English	**6GT2 397-4BA00-0EA2**
French	**6GT2 397-4BA00-0EA3**
For MOBY F incl. SIM 80	
German	**6GT2 497-4BA00-0EA1**
English	**6GT2 497-4BA00-0EA2**
For MOBY D	
German	**6GT2 697-4BA00-0EA1**
English	**6GT2 697-4BA00-0EA2**
For MOBY V	
German	**6GT2 297-4BA00-0EA1**
English	**6GT2 297-4BA00-0EA2**
ES 030-K manual	
German	**6AW5 451-6XX010K**
English	**6AW5 451-6XX011K**
ASM 400/401 description	
German	**6GT2 097-3AB00-0DB1**
English	**6GT2 097-3AB00-0DB2**
ASM 410 description	
German	**6GT2 097-3AC00-0DA1**
English	**6GT2 097-3AC00-0DA2**
ASM 450/FC 44/FB 240 description	
German	**6GT2 097-3AC30-0DA1**
English	**6GT2 097-3AC30-0DA2**
FC 45 description	
German	**6GT2 097-3AM00-0DA1**
English	**6GT2 097-3AM00-0DA2**
ASM 451/FC 46 description	
German	**6GT2 097-3AC40-0DA1**
English	**6GT2 097-3AC40-0DA2**
ASM 451/FB 246 description	
German	**6GT2 097-3AC60-0DA1**
English	**6GT2 097-3AC60-0DA2**
ASM 470/FC 47 description for SIMATIC S7	
German	**6GT2 097-3AL00-0DA1**
English	**6GT2 097-3AL00-0DA2**
ASM 470/FB 47 description for SIMATIC S5	
German	**6GT2 097-3AL10-0DA1**
English	**6GT2 097-3AL10-0DA2**
SIM 4x (MOBY I) description	
German	**6GT2 097-3AD00-0DA1**
English	**6GT2 097-3AD00-0DA2**

Ordering data	Order No.
FB 230 description	
German	**6GT2 097-3AG00-0DA1**
English	**6GT2 097-3AG00-0DA2**
FB 250 description for ASM 400/401	
German	**6GT2 097-3AA00-0DA1**
English	**6GT2 097-3AA00-0DA2**
MDS 439E description	
German	**6GT2 097-3AJ00-1DA1**
English	**6GT2 097-3AJ00-1DA2**
STG F/E/I description German and English	Included in scope of delivery of product
T3964R/DOS description	
German	Included on MOBY software diskette
English	
3964-R driver description for Windows 95/NT 4.0 German	Included on MOBY software diskette
MOBY API description (C library) for PC with Windows 98/NT 4.0	
German	Included on MOBY software diskette
English	
MOBY E SIM 7x programming guide for C library CCT32 for Windows 95/NT 4.0,	
German	**6GT2 397-6AB00-0DA1**
English	**6GT2 397-6AB00-0DA2**
MOBY F SIM 8x programming guide for C library MFWAPI for Windows NT 4.0/Windows 95	
German	**6GT2 497-6AB00-0EA1**
English	**6GT2 497-6AB00-0EA2**

Notes

Appendix

Service & support

Information and Ordering in the Internet and on CD-ROM

A&D 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.

The Siemens Automation and Drives Group (A&D) 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

http://www.siemens.de/automation

you will find everything you need to know about products, systems and services.

Product Selection Using the Interactive Catalogs

Detailed information together with convenient interactive functions:
The interactive catalogs CA 01 and ET 01 cover more than 80,000 products and thus provide a full summary of the Siemens Automation and Drives 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 catalogs can be found in the Internet under

http://www.siemens.de/automation/ca01

or on CD-ROM.

Automation and Drives, CA 01
Order No.:
E86060-D4001-A110-B4-7600

Electrical installation technology, ET 01
Order No.:
E86060-D8200-A107-A2-7600

Easy Shopping with the Siemens Mall

The Siemens 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.

The 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 Siemens Mall on the Internet under:

http://www.siemens.de/automation/mall

Customer Support Automation and Drives

Whether you need a service expert or a spare part, a product specialist for advice, or if you just have a query, then the Customer Support is the address for you – the team that meets all your needs!

Helpline for Service and Support

You need help but do not know who to address. We take care that help is on the way quickly.

The helplines ensure that the right specialist in your vicinity will be of skilled assistance to you. The Helpline e.g. for Germany helps in German and English 24 hours/day, 365 days/year.

Tel.: 0180 50 50 111

Online Support

Our Online Support guarantees quick and efficient assistance – around the clock, worldwide and in five languages.

The Online Support offers all technical information:

- FAQs, tips & tricks, downloads and news
- Free manuals
- Useful programs and software – payment through SIMATIC Card

http://www.siemens.de/automation/service&support

Field Service

Your system is installed and now you need quick on-site help. We have the specialists with the know-how you require, worldwide and at hand.

Thanks to our comprehensive service network, we are able to realize short response times – with competence, reliability, and speed.

You can request an expert in Germany 24 hours/day and 365 days/year.

Tel.: 0180 50 50 444

Of course we offer also service contracts customized to your requirements. Your Siemens Office is always at your disposal.

Spare Parts and Repairs

Our worldwide network of local spare parts stocks and repair centers react with speed and reliable logistics.

For requests about repairs or spare parts please call the following telephone number (in Germany):

Tel.: 0180 50 50 446

Outside the office hours and on weekends, dial this number for our spare parts stand-by service.

Technical Support

Technical advice for implementation of products, systems and solutions in automation and drive technology is provided in german and english.

Competent, qualified and experienced specialists offer teleservice and video conferencing for specific problems.

FreeContact – the way to the free Technical Support.

- in Europe (headquarter)

Tel.: +49 (0)180 50 50 222
Fax: +49 (0)180 50 50 223
E-mail: techsupport@ad.siemens.de

- in the United States

Tel.: +1 423 461-2522
Fax: +1 423 461 2231
E-mail: simatic.hotline@sea.siemens.com

- in Asia

Tel.: +65 740-7000
Fax: +65 740 7001
E-mail: simatic@singnet.com.sg

Our network of dependencies in Germany, the U.S. and Singapore offers support around the clock according to the "follow the sun" principle via FastContact – the fast way to the Technical Support:

- Return call within two hours guaranteed
- around the clock
- payment with SIMATIC card

Tel.: +49 (0)911 895 7777
Fax: +49 (0)911 895 7001

Customer Support

Knowledge base on CD-ROM

A copy of the free-of-charge information sector is available on CD-ROM (Service & Support Knowledge Base) for applications without an online connection to the Internet.
This CD-ROM contains all current product information at the time of production (FAQs, downloads, tips & tricks, updates) as well as general information on service and technical support.

The CD-ROM also contains a full-text search and our Knowledge Manager to permit specific searching for solutions. The CD-ROM is updated every 4 months.

Just like our online offer on the Internet, the CD-ROM with the Service & Support Knowledge Base is completely available in 5 languages (German, English, French, Italian, Spanish).

You can order the CD-ROM **Service and Support Knowledge Base** from your Siemens partner.

Order No.
6ZB5310-0EP30-0BA1

Ordering on the Internet (using SIMATIC Card or credit card) at:

http://www.siemens.de/automation/service&support

in the Shop sector.

SIMATIC Card

You can use the SIMATIC Card to purchase a service credit.
With this credit you are able to use the charged technical support services (FastContact, ServiceLine), or purchase software products and example applications on the Internet.

The SIMATIC Card basically functions like a telephone card.

You can access your credit using the SIMATIC Card number and the SIMATIC Card PIN (both numbers are present on the rear of your SIMATIC Card or are sent to you by e-mail in advance when you purchase the CARD on the Internet).

You can view your SIMATIC Card account statement on the Internet at:

http://www.siemens.de/automation/simatic-card

You can order the **SIMATIC Card** in the following manners:

From your Siemens partner

SIMATIC Card

Units	Order No.
200	**6ES7 997-0AA00-0XA0**
500	**6ES7 997-0AB00-0XA0**
1000	**6ES7 997-0AC00-0XA0**

Valid: 2 years from date of purchase

On the Internet

In conjunction with a credit card, it is possible to use the SIMATIC Card immediately:

http://www.siemens.de/automation/simatic-card

Order No. index

Appendix

Subject index

Appendix
Who to contact

in Germany

Aachen ➜ **Cologne**

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D-95448 Bayreuth
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Berlin
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Mr. Jost
Wernerwerkdamm 5
D-13629 Berlin
Tel +49 (30) 386-32792
Fax +49 (30) 386-32509

Bielefeld ➜ **Hanover**
Braunschweig ➜ **Hanover**
Bremen ➜ **Hamburg**
Chemnitz ➜ **Berlin**
Dresden ➜ **Berlin**
Duesseldorf ➜ **Cologne**
Erfurt ➜ **Berlin**

Essen
Siemens AG
ZN Essen
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Mr. Horath
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D-45117 Essen
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Fax +49 (201) 816-2331

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Mr. Schmidt
Rödelheimer Landstraße 5-9
D-60487 Frankfurt a. M.
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A&D P11
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Lindenplatz 2
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Tel +49 (40) 2889-2721
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Mr. List
Hildesheimer Str. 7
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Fax +49 (511) 877-2113

Heilbronn ➜ **Stuttgart**

Karlsruhe
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Mr. Wagner
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Tel +49 (721) 992-2288
Fax +49 (721) 992-2309

Kassel ➜ **Hanover**

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Mr. Hindelang
Lindauer Straße 112
D-87439 Kempten
Tel +49 (831) 5818-258
Fax +49 (831) 5818-240

Kiel ➜ **Hamburg**
Koblenz ➜ **Cologne**

Cologne
Siemens AG
ZN Köln
A&D B11
Mr. Clermont
Franz-Geuer-Straße 10
D-50823 Köln
Tel +49 (221) 576-2695
Fax +49 (221) 576-3725

Konstanz ➜ **Stuttgart**
Leipzig ➜ **Berlin**
Magdeburg ➜ **Hanover**

Mannheim
Siemens AG
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Mr. Eisele
Dynamostraße 4
D-68165 Mannheim
Tel +49 (621) 456-2658
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Munich
Siemens AG
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Mr. Spindler
Richard-Strauss-Straße 76
D-81679 München
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Muenster ➜ **Essen**

Nuremberg
Siemens AG
ZN Nürnberg
A&D B2
Sales Industrial PC
Von-der-Tann-Straße 30
D-90439 Nürnberg
Tel +49 (911) 654-3800
Fax +49 (911) 654-7386

Osnabrueck ➜ **Essen**

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Fax +49 (941) 4007-236

Rostock ➜ **Hamburg**

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D-70499 Stuttgart
Tel +49 (711) 137-3769
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Ulm ➜ **Stuttgart**
Wetzlar ➜ **Frankfurt a. M.**
Wuppertal ➜ **Essen**

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Mr. Schebler
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Fax +49 (931) 6101-542

ZN Branch Office
GSt Main Office
StP Services and Sales Office

in Austria

Bregenz
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LG Bregenz
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LG Salzburg
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