SIM1000 FXA, SIM1000 FXG

Sensor Integration Machine

SICK
Sensor Intelligence.

Described product

SIM1000 FXA (1097816), SIM1000 FXG (1097817)

Manufacturer

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Germany

Legal information

Original document

This document is an original document of SICK AG.

Contents

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1 About this document

1.1 Information on the operating instructions

These operating instructions provide important information on how to use devices from SICK AG.

Prerequisites for safe work are:

- Compliance with all safety notes and handling instructions supplied.
- Compliance with local work safety regulations and general safety regulations for device applications

The operating instructions are intended to be used by qualified personnel and electrical specialists.

NOTE
Read these operating instructions carefully to familiarize yourself with the device and its functions before commencing any work.

The operating instructions are an integral part of the product. Store the instructions in the immediate vicinity of the device so they remain accessible to staff at all times. Should the device be passed on to a third party, these operating instructions should be handed over with it.

These operating instructions do not provide information on the handling and safe operation of the machine or system in which the device is integrated. Information on this can be found in the operating instructions for the machine or system.

1.2 Explanation of symbols

Warnings and important information in this document are labeled with symbols. Signal words introduce the instructions and indicate the extent of the hazard. To avoid accidents, damage, and personal injury, always comply with the instructions and act carefully.

DANGER
… indicates a situation of imminent danger, which will lead to a fatality or serious injuries if not prevented.

WARNING
… indicates a potentially dangerous situation, which may lead to a fatality or serious injuries if not prevented.

CAUTION
… indicates a potentially dangerous situation, which may lead to minor/slight injuries if not prevented.

NOTICE
… indicates a potentially harmful situation, which may lead to material damage if not prevented.

NOTE
… highlights useful tips and recommendations as well as information for efficient and trouble-free operation.

1.3   Further information

More information can be found on the product page.

The page can be accessed via the **SICK Product ID: pid.sick.com/{P/N}/{S/N}**

{P/N} corresponds to the part number of the product, see type label.

{S/N} corresponds to the serial number of the product, see type label (if indicated).

The following information is available depending on the product:
- Data sheets
- This document in all available language versions
- CAD files and dimensional drawings
- Certificates (e.g., declaration of conformity)
- Other publications
- Software
- Accessories

1.4   SICK service

If you require any technical information, our SICK Service will be happy to help. To find your agency, see the final page of this document.

NOTE
To help us to resolve the matter quickly, please note down the details on the type label.

2 Safety information

2.1 General safety notes

The following safety notes must always be observed regardless of specific application conditions:

- The device must only be mounted, commissioned, operated, and maintained by professionally qualified safety personnel.
- Electrical connections with peripheral devices must only be made when the voltage supply is disconnected.
- The device is only to be operated when mounted in a fixed position.
- The device voltage supply must be protected in accordance with the specifications.
- The specified ambient conditions must be observed at all times.
- The electrical connections to peripheral devices must be screwed on correctly.
- The pin assignment of pre-assembled cables must be checked and adjusted if necessary.
- These operating instructions must be made available to the operating personnel and kept ready to hand.

2.2 Intended use

The device is a programmable control and evaluation unit for sensors. The device also acts as a link between system and plant controls, and the connected terminal devices. The device is mainly used in an industrial environment in production, testing, and control. Other applications are possible depending on the device-specific properties. When using the device in a mobile application, make sure the floor is flat and smooth and avoid door sills.

The device is programmed on a PC by using the development environment software SICK AppSpace. Depending on the application, a browser-based, graphical user interface (HMI) can be created, which provides opportunities defined by the application developer to influence an application at operator level. The device is connected to peripherals via Ethernet interfaces and other interfaces.

The device offers various interfaces for controlling, programming, and operating purposes, which can be activated as necessary via development environments, control systems (programmable logic controllers), or applications. However, configuration, programming, and control requires various technical skills, depending on how the device is connected and used.

The SIM1000 FXG - unlike the SIM1000 FXA - can only be operated in conjunction with a Flexi Soft system. The Flexi Soft Designer software is used to configure the device. For more information, see the "SIM1000 FXG in the Flexi Soft Designer" operating instructions (part number 8025561).

2.3 Improper use

Any use outside of the stated areas, in particular use outside of the technical specifications and the requirements for intended use, will be deemed to be incorrect use.

- The device does not constitute a safety component in accordance with the respective applicable safety standards for machines.
- The device must not be used in explosion-hazardous areas, in corrosive environments or under extreme environmental conditions.
- Any use of accessories not specifically approved by SICK AG is at your own risk.

⚠️ **WARNING**
Danger due to improper use!

Any improper use can result in dangerous situations.

Therefore, observe the following information:

- Product should be used only in accordance with its intended use.
- All information in these operating instructions must be strictly observed.
- Shut down the product immediately in case of damage.

2.4 Cybersecurity

Overview

To protect against cybersecurity threats, it is necessary to continuously monitor and maintain a comprehensive cybersecurity concept. A suitable concept consists of organizational, technical, procedural, electronic, and physical levels of defense and considers suitable measures for different types of risks. The measures implemented in this product can only support protection against cybersecurity threats if the product is used as part of such a concept.

You will find further information at www.sick.com/psirt, e.g.:
- General information on cybersecurity
- Contact option for reporting vulnerabilities
- Information on known vulnerabilities (security advisories)

An overview of cybersecurity concepts for the SICK AppSpace Eco-System is available in the SICK Support Portal: supportportal.sick.com, under the search term: **SICK AppSpace Security Concepts**

2.5 Limitation of liability

Relevant standards and regulations, the latest technological developments, and our many years of knowledge and experience have all been taken into account when compiling the data and information contained in these operating instructions. The manufacturer accepts no liability for damage caused by:

- Non-adherence to the product documentation (e.g., operating instructions)
- Incorrect use
- Use of untrained staff
- Unauthorized conversions or repair
- Technical modifications
- Use of unauthorized spare parts, consumables, and accessories

ℹ️ **NOTE**
The product is a programmable device. The respective programmer is therefore responsible for his/her programming work and the resultant operation of the device. The liability and warranty of SICK AG is limited to the device specification (hardware functionality and any programming interfaces) according to the agreed conditions. SICK AG will therefore not be liable, among other things, for any damages resulting from the programming of the product by the customer or third parties.

2.6 Modifications and conversions

! **NOTICE**
Modifications and conversions to the device may result in unforeseeable dangers.

Interrupting or modifying the device or SICK software will invalidate any warranty claims against SICK AG. This applies in particular to opening the housing, even as part of mounting and electrical installation.

2.7 Requirements for skilled persons and operating personnel

> ⚠️ **WARNING**
> **Risk of injury due to insufficient training.**
> Improper handling of the device may result in considerable personal injury and material damage.
>
> ▪ All work must only ever be carried out by the stipulated persons.

This product documentation refers to the following qualification requirements for the various activities associated with the device:

- **Instructed personnel** have been briefed by the operator about the tasks assigned to them and about potential dangers arising from improper action.
- **Skilled personnel** have the specialist training, skills, and experience, as well as knowledge of the relevant regulations, to be able to perform tasks delegated to them and to detect and avoid any potential dangers independently.
- **Electricians** have the specialist training, skills, and experience, as well as knowledge of the relevant standards and provisions, to be able to carry out work on electrical systems and to detect and avoid any potential dangers independently. The electrician must comply with the provisions of the locally applicable work safety regulation.

The following qualifications are required for various activities:

Table 1: Activities and technical requirements

Activities	Qualification
Mounting, maintenance	▪ Basic practical technical training ▪ Knowledge of the current safety regulations in the workplace
Electrical installation, device replacement	▪ Practical electrical training ▪ Knowledge of current electrical safety regulations ▪ Knowledge of the operation and control of the devices in their particular application
Commissioning, configuration	▪ Basic knowledge of the computer operating system used ▪ Basic knowledge of the design and setup of the described connections and interfaces ▪ Basic knowledge of data transmission
Operation of the device for the particular application	▪ Knowledge of the operation and control of the devices in their particular application ▪ Knowledge of the software and hardware environment for the particular application

2.8 Operational safety and particular hazards

Please observe the safety notes and the warnings listed here and in other chapters of this product documentation to reduce the possibility of risks to health and avoid dangerous situations.

The product is fitted with LEDs in risk group 0. The accessible radiation from these LEDs does not pose a danger to the eyes or skin.

> **WARNING**
> **Electrical voltage!**
>
> Electrical voltage can cause severe injury or death.
>
> - Work on electrical systems must only be performed by qualified electricians.
> - The power supply must be disconnected when attaching and detaching electrical connections.
> - The product must only be connected to a voltage supply as set out in the requirements in the operating instructions.
> - National and regional regulations must be complied with.
> - Safety requirements relating to work on electrical systems must be complied with.

> **WARNING**
> **Risk of injury and damage caused by potential equalization currents!**
>
> Improper grounding can lead to dangerous equipotential bonding currents, which may in turn lead to dangerous voltages on metallic surfaces, such as the housing. Electrical voltage can cause severe injury or death.
>
> - Work on electrical systems must only be performed by qualified electricians.
> - Follow the notes in the operating instructions.
> - Install the grounding for the product and the system in accordance with national and regional regulations.

3 Product description

3.1 Device view

Figure 1: SIM1000 FXA

① Connections for switching input/output, IO-Link, CAN, and voltage supply
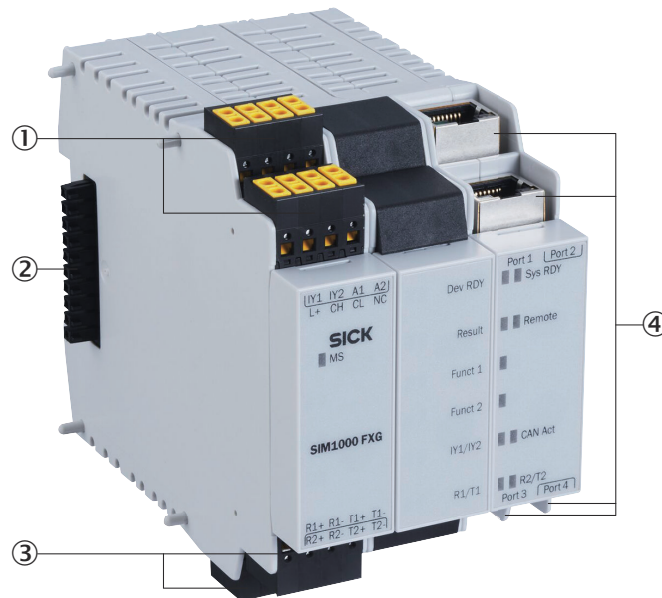② Serial connections or encoder connection
③ Ethernet connections

Figure 2: SIM1000 FXG

① Connections for switching input/output, IO-Link and CAN
② FLEXBUS+ connection (includes voltage supply)
③ Serial connections or encoder connection
④ Ethernet connections

> **i** NOTE
> The SIM1000 FXA does not include the FLEXBUS+ plug connector, which is integrated into the housing.

3.2 Functionality

The Sensor Integration Machine – part of the SICK AppSpace ecosystem – is opening up new possibilities for application solutions.

It can read, evaluate, archive, and transmit data from a number of different sensors.

The Ethernet interfaces with OPC UA and MQTT provide preprocessed data (edge computing) for cloud computing.

The HMI and data visualization features can be provided on any browser-enabled notebook, PC, or tablet. The app is developed in SICK AppStudio .

3.3 SICK AppSpace

Detailed instructions on the SICK AppStudio as well as programming the device can be found at supportportal.sick.com.

3.4 Flexi Soft Designer

For information on integrating the device into the Flexi Soft Designer, see the "SIM1000 FXG in the Flexi Soft Designer" operating instructions (part number 8025561).

3.5 Preset ETHERNET interfaces

> **i** NOTE
> Preset IP addresses of the ETHERNET interfaces:
>
> - Port 1: 192.168.0.1
> - Port 2: 192.168.1.1
> - Port 3: 192.168.2.1
> - Port 4: 192.168.3.1

When expanding the GigE interfaces with one or more Ethernet switches, it is essential to use only jumbo-frame compatible GigE switches. Switches limited to just 100 MB/s do not support the data packet mode used by cameras and can cause transmission errors.

Changing the IP addresses

The individual IP addresses can be changed using the SICK SOPAS ET PC tool.

4 Transport and storage

4.1 Transport

For your own safety, please read and observe the following notes:

> ⚠ **NOTICE**
> **Damage to the product due to improper transport.**
>
> - The device must be packaged for transport with protection against shock and damp.
> - Recommendation: Use the original packaging as it provides the best protection.
> - Transport should be performed by trained specialist staff only.
> - The utmost care and attention is required at all times during unloading and transportation on company premises.
> - Note the symbols on the packaging.
> - Do not remove packaging until immediately before you start mounting.

4.2 Transport inspection

Immediately upon receipt in Goods-in, check the delivery for completeness and for any damage that may have occurred in transit. In the case of transit damage that is visible externally, proceed as follows:

- Do not accept the delivery or only do so conditionally.
- Note the scope of damage on the transport documents or on the transport company's delivery note.
- File a complaint.

> ℹ **NOTE**
> Complaints regarding defects should be filed as soon as these are detected. Damage claims are only valid before the applicable complaint deadlines.

4.3 Storage

Store the device under the following conditions:

- Do not store outdoors.
- Store in a dry area that is protected from dust.
- Do not expose to any aggressive substances.
- Protect from sunlight.
- Avoid mechanical shocks.
- Storage temperature: see "Technical data", page 29.
- For storage periods of longer than 3 months, check the general condition of all components and packaging on a regular basis.

5   Mounting

5.1   Overview of mounting procedure

> ! **NOTICE**
> Damage to device through improper mounting.
>
> Mount the device in an environment corresponding to enclosure rating IP54 (EN 60529), e.g., inside a control cabinet with enclosure rating IP54.

> **i** **NOTE**
> The mounting procedure described here for the device meets the requirements for use in the target system.
>
> Additional or different requirements may become necessary in the laboratory and during preparation, and should be taken into account as necessary, see "Commissioning", page 24. If you have any questions or anything remains unclear in this regard, please contact our service team.

- Mounting the device.
- Connect the cables.
- Connecting peripheral devices.
- Connecting the voltage supply.

5.2   Scope of delivery

- SIM in the version ordered
- Safety note
- Optional: ordered accessories

The actual scope of delivery may differ for special designs, additional orders or due to the latest technical changes.

5.3   Mounting the device

- Mount the device in accordance with EN 50274.
- Ensure suitable ESD protective measures during mounting.
- Implement suitable measures to prevent any foreign bodies from entering the connector openings or ventilation slots.
- The module is housed in a 67.5 mm wide housing for standard 35 mm rails in accordance with EN 60715 (mounting rail).
- Due to the FLEXBUS+ plug connector integrated into the housing, the total width of the SIM1000 FXG is 73.5 mm.
- Install the module in the control cabinet in such a way that the minimum distance to the control cabinet is adhered to. This distance is 50 mm above and below the module, and25 mm to the front and back.
- Mount the module vertically. The ventilation slots must be positioned at the top and bottom.
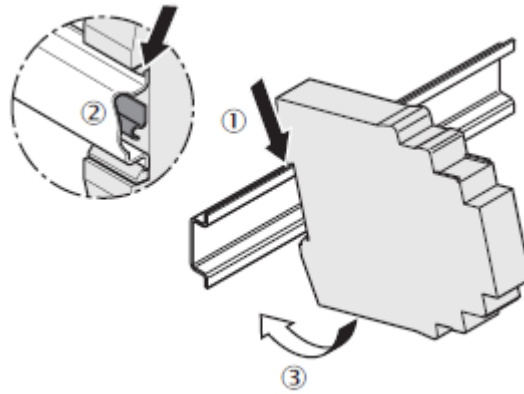- Mount the module in such a way as to allow vertical air circulation.

Figure 3: Mounting the device, illustration only

①   Mounting rail

②   Grounding clip

③   Direction of engagement with the mounting rail

1. Make sure that the voltage supply is switched off.
2. Hook the device onto the DIN mounting rail.
3. The grounding clip must sit flush against the mounting rail so that it is secure and can conduct electricity effectively.
4. Snap the module into place on the mounting rail by applying a slight pressure in the direction of the arrow.
5. Mount the end pieces on the left and right side of the module.

5.4   Special instructions for mounting the SIM1000 FXG

> **!** **NOTICE**
> Improper mounting
> The device may be damaged in the event of non-compliance.
>
> - The SIM1000 FXG is supplied with voltage via the FLEXBUS+ connection.
> - Ensure suitable ESD protective measures during mounting.

Assignment of the modules:

- In a Flexi Soft system, the FX3-CPUx main module is always located on the far left.
- Up to two SIM1000 FXG or one SIM1000 FXG and one Flexi Soft gateway can be used per system. The SIM1000 FXG and the optional Flexi Soft gateway must be mounted directly to the right of the main module of the Flexi Soft system.
- All other Flexi Soft expansion modules (z. B. FX3-XTIO, FX3-XTDI or FX3-MOCx) must be mounted to the right of the SIM1000 FXG and the Flexi Soft gateway. The expansion modules can be mounted in any order.
- Any additional relay modules (the UE410-2RO or UE410-4RO) must be mounted to the right of the expansion modules.

Details on mounting the SIM1000 FXG

ⓘ **NOTE**

The modules are interconnected via a FLEXBUS+ plug connector, which is integrated into the housing.

Procedure see "Mounting the device", page 14, item 1-4

- Slide the modules together one by one until the side-mounted plug connector engages
- Mount the end pieces on the left- and right-hand sides

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6 Electrical installation

6.1 Important notes

> ⚠️ **DANGER**
> **Danger from electrical voltage.**
>
> **Danger posed by the machine starting up unexpectedly.**
>
> - Disconnect the power for the entire system/machine.
> - Prevent the system from starting unexpectedly while you are connecting the devices!

> ⚠️ **WARNING**
> **Risk of injury and damage caused by electrical current!**
>
> Due to equipotential bonding currents, incorrect earthing can lead to the following dangers and faults: Voltage is applied to the metal housing, cable fires due to cable shields heating up, the product and other devices become damaged.
>
> - Generate the same ground potential at all grounding points.

> ⚠️ **WARNING**
> **Ineffectiveness of the protective device due to non-compliance with safety standards**
>
> The intended safety level may not be achieved in the event of non-compliance.
>
> - Observe the relevant safety standards (e.g., EN 62061 or EN ISO 13849-1) for all the safety-related parts of the plant (wiring, connected sensors and control devices, configuration, external device monitoring).

> ❗ **NOTICE**
> **Device damage due to improper supply voltage!**
>
> - Only operate the device with the specified supply voltage.
> - The voltage supply and all connected signals must meet the requirements for extra-low voltages with safe separation (SELV, PELV) as specified in EN 60664 and EN 50178 (Electronic equipment for use in power installations).

- Carry out the electrical installation work in conformity with EN 60204-1.
- The external voltage supply for the devices must be capable, amongst other things, of bridging short-term power outages of 20 ms as specified in EN 60204-1.
- Make sure the device and the voltage supplies are all connected to the same ground.
- Connect the shielding of all data lines (Ethernet, CAN, serial, switching input/output) directly to the functional earth (FE) at the control cabinet entry point.
- In addition for the SIM1000 FXG: Make sure that all the Flexi Soft system modules, the connected protective devices (e.g., the EFI-enabled devices), and the voltage supplies are all connected to the same ground.

NOTE

Layout of data cables

- Use screened data cables with twisted-pair wires.
- Implement the screening design correctly and completely.
- To avoid interference, e.g. from switching power supplies, motors, clocked drives, and contactors, always use cables and layouts that are suitable for EMC.
- Do not lay cables over long distances in parallel with power supply cables and motor cables in cable channels.

EMC measures

Electromagnetic influences can interfere with signal transmissions and interrupt communications. To minimize electromagnetic influences, it is necessary to implement the following measures:

- Connect the mounting rail to functional earth (FE).
- Ensure sufficient equipotential bonding of the connection points for the shielding. Ensure compliance with the applicable standards and directives.
- Connect all inactive metal parts (doors and housing of the control cabinet, DIN mounting rails, etc.) to the ground potential.
- Always connect the cable shielding to the ground connection across a large area at both ends.
- Use suitable cable clamps to connect the shielding of the shielded cables to the ground potential directly at the access to the system (control cabinet, frame, DIN mounting rail). The cable clamps must reach all the way around the cable shielding.
- Use suitable cable clamps to connect the cable shielding to the ground potential, once again as close as possible to the main module (e.g., on the DIN mounting rail). The cable clamps must reach all the way around the cable shielding.
- Keep the cable ends from which the insulation has been stripped as short as possible.
- Insulate the end of the shielding braid, for example using a suitable heat-shrinkable sleeve.
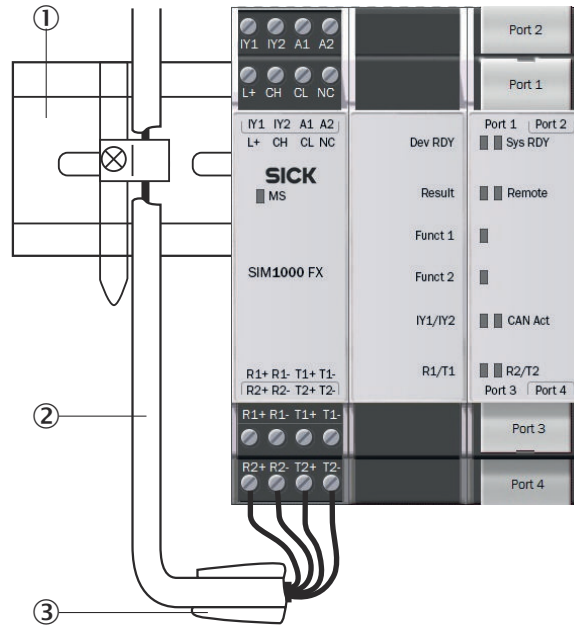
Figure 4: Connecting the cable shielding to the mounting rail, example

①   Mounting rail

②   Cable

③   Heat-shrinkable sleeve

6.2   Preparing the electrical installation

To carry out the electrical installation, you will need:

- Connection cables for the peripheral devices, including the corresponding data sheets
- Voltage supply cable
- If customers assemble the cables: crimping tool, ferrules, soldering iron, and other installation material

6.3   Assembling the cables (optional)

> **NOTE**
>
> For a list of cables suitable for use with the device, see: supportportal.sick.com or visit www.sick.com Customer assembly of the cables is only necessary in special cases. Ensure a sufficient length of cable is provided, e.g., for strain-relief clamps.

> **NOTICE**
>
> **Risk of damage/malfunction due to incorrect PIN assignment**
>
> Incorrect wiring of the male connectors/female connectors can lead to damage to or malfunctions in the system.
>
> - Observe data sheets provided by the cable manufacturer.
> - Observe the pin assignment.

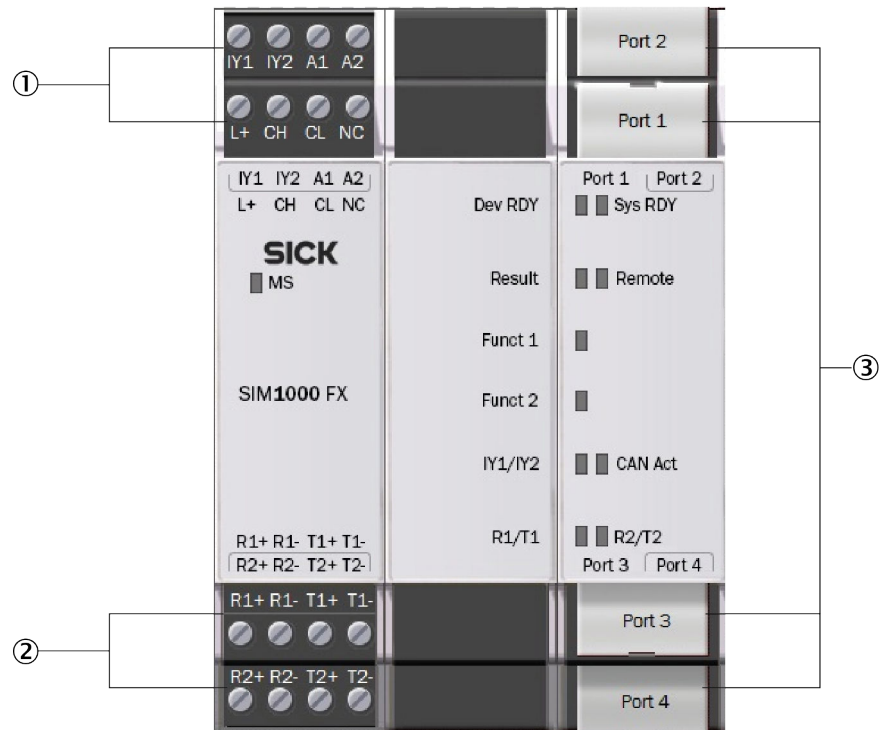## 6.4   Overview of connections

Figure 5: Overview of connections

①   Terminal block 1 and 2
②   Terminal block 3 and 4
③   Ethernet connections

6.5   Pin allocation of the connections

6.5.1   Terminal block 1 and 2

Designation	Signal	Function	Factory settings
IY1	Input 2	Switching input (not isolated)	-
IY2	C/Q or Input 1 / Output 1	C/Q IO-link or configurable switching input/output (not isolated)[1]	Configured as input
A1	+24 V[2]	Supply voltage IN	-
A2	GND[2]	Ground	-
L+	+24 V	Supply voltage for peripherals, configurable	Deactivated

Designation	Signal	Function	Factory settings
CH	CAN_H	CAN high	Termination deactivated[3]
CL	CAN_L	CAN low	
NC	-	Not connected	

[1]   The digital input and output are only switchable if the supply voltage is activated on L+, or +24 V is externally applied. A ground connection on A2 is required in both cases.
IY2 can be addressed from within SICK AppSpace via ENUM "S1DO1" (Output) "S1DI1" (Input). IY1 can be addressed from within SICK AppSpace via ENUM "S1DI2". L+ can be addressed from within SICK AppSpace via ENUM "S1".

[2]   For SIM1000 FXG: not connected

[3]   Termination controllable via app

Additional notes

Switching output

- Max. output current: 100 mA
- Min. high output logic level: VCC – 3 V
- Max. low output logic level: 3 V
- Push/pull, NPN, PNP configurable

Switching inputs

- Min. high input logic level: 12 V
- Max. low input logic level: 4 V

Supply voltage, peripherals L +

- Output current: 200 mA

> **!   NOTICE**
>
> Shielded cables must be used for CAN and the switching input/output. The shielding of the cables must be connected to functional earth.
>
> IO-Link ground and CAN ground of the sensor must be connected to system ground A2.

> **ℹ   NOTE**
>
> The SIM1000 FXA is supplied with power from an external power supply unit via the pins A1 and A2.
>
> The SIM1000 FXG is supplied with voltage via the internal FLEXBUS+ bus.

6.5.2   Terminal block 3 and 4

Designation	Mode		Incremental encoder
	RS-422	**RS-485**	
R1+	R1+	-	A+ (in/out)
R1-	R1-	-	A- (in/out)
T1+	T1+	Rx1+/Tx1+	-
T1-	T1-	Rx1-/Tx1-	-

Designation	Mode		
	RS-422	**RS-485**	**Incremental encoder**
R2+	R2+	-	B+ (in/out)
R2-	R2-	-	B- (in/out)
T2+	T2+	Rx2+/Tx2+	-
T2-	T2-	Rx2-/Tx2-	-

> [!] **NOTICE**
> Shielded cables must be used. The shielding of the cables must be connected to functional earth.

6.5.3 Ethernet connections

Port 1: 100 MBit/s

Port 2: 1 GBit/s

Port 3: 100 MBit/s

Port 4: 1 GBit/s

> [!] **NOTICE**
> Shielded Ethernet cables must be used. The shielding of the Ethernet cables must be connected to functional earth.

6.6 Connecting peripheral devices

The device can be connected to a wide range of sensors and cameras.

The required pin assignments can be found in the data sheets for the peripherals to be connected as well as in the relevant connection descriptions, see "Pin allocation of the connections", page 20.

1. Connect the cables to peripheral devices.
2. Route the cables to the device using installation materials (cable channels, cable ties, etc.). When doing so, pay attention to cable strain relief.
3. Connect cables to the relevant device connections and screw together tightly.

6.7   Connecting voltage supply

> ⚠ **NOTICE**
> **Risk of damage to peripheral devices!**
>
> If peripheral devices are connected when the voltage supply is also applied, these devices can become damaged.
>
> ▪ Only connect peripheral devices when the voltage supply is disconnected.

1. Ensure that the voltage has been disconnected by the user.
2. Connect the voltage supply cable(s) to the device.
3. Lay the cable(s) with strain relief.
4. Have the user connect the voltage supply.
5. Have the user activate the voltage.

7 Commissioning

7.1 Preparatory commissioning

Commissioning for preparatory purposes and under laboratory conditions differs in some respects from commissioning in the target system.

In general, all safety and hazard warnings applicable to mounting (see "Mounting", page 14) and electrical installation see "Important notes", page 17 must also be observed under laboratory conditions. In addition, further notes must be taken into consideration to guarantee the most effective preparation possible:

- Only connect those devices to the product that you want to configure or program.
- Operate the connected device in a controlled and contained network environment for the time being to check network communication if necessary.
- Note the company standards that apply to the use of checking and testing devices.
- For initial programming, use ideal conditions for sensor or camera recognition.
- Use the largest possible deviations from these ideal conditions to check the programming with respect to its error tolerance and reliability, and to determine error limit values.

Procedure

1. Place the device on a non-slip base.
2. Connect the required peripheral devices, see "Connecting peripheral devices", page 22.
3. Connect the network connection.
4. Connect the voltage supply.
5. Switch on the voltage supply.

8 Operation

8.1 Status LEDs

When the device is operating, the operational status of the connections is indicated visually by status LEDs.

Using these status indicators, the operator can find out quickly and easily whether the device and the peripherals are working properly or whether any faults or errors have occurred.

Monitoring the visual indicators is part of the routine inspection carried out on the device and the machine/plant area into which the device is incorporated.

Meaning of symbols

Symbol	Meaning
◯	LED off
●	LED on
☀	LED flashes
☀	LED goes out briefly
☀	LED lights up briefly

8.1.1 Situation and function of the LEDs

Designation	LED behavior	Description
MS*)	●	SIM1000 FXA: Voltage connected. SIM1000 FXG: The Flexi Soft system is in the "Run" state.
	☀	SIM1000 FXG: The Flexi Soft system is in the "Stopped" state.
	☀ (red)	SIM1000 FXG: 1 Hz: Invalid configuration 2 Hz: Serious error on the SIM1000 FXG
	● (red)	SIM1000 FXG: Serious error on another module
	☀ (red/green)	SIM1000 FXG: Recoverable external error
Dev RDY	● (green)	Runlevel READY, no errors detected.*
	● (red)	Runlevel READY, boot process error.

Designation	LED behavior	Description
Sys RDY/ Result/ Funct 1/ Funct 2 Remote	○	User-defined, configurable using SICK AppSpace.
	● (green)	
	● (red)	
IY1 / IY2 CAN Act R1 / T1 R2 / T2	○	Voltage not applied to the connection.
	● (green)	Voltage applied. No signal activity
	☀ (green, flashing)	Voltage applied. Signal activity
	☀ (green, flashing)	Voltage not applied to the connection. Signal activity
Link	○	Connection not established with Ethernet.
	● (green)	Connection established with Ethernet.
Act	○ (yellow)	No activity
	☀ (yellow, flashing)	Data transmission via Ethernet

* Time delay before availability due to boot process (approx. 20 s)
*) Module status

9 Maintenance

9.1 Maintenance schedule

During operation, the device works maintenance-free.

9.2 Cleaning

> ! **NOTICE**
> **Equipment damage due to improper cleaning.**
> Improper cleaning may result in equipment damage.
>
> - Only use recommended cleaning agents and tools.
> - Never use sharp objects for cleaning.

► The device must be cleaned regularly from the outside to guarantee heat dissipation and therefore operation. Clean using a dry towel or an industrial vacuum cleaner. Do not use cleaning agents.

10   Decommissioning

10.1   Removing the module

- Remove the plug-in terminals along with the wiring and the end pieces.
- When using the SIM1000 FXG: The Flexi Soft modules must be pushed approximately 10 mm apart before a module can be removed from the DIN mounting rail.
- Push the module down at the back (1). With the module still pushed down, move it in the direction of the arrow to remove it from the mounting rail (2).
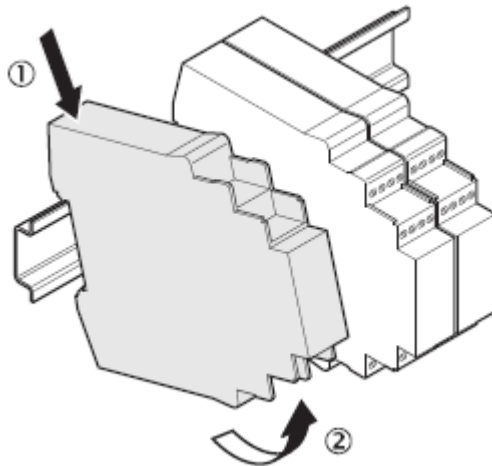
Figure 6: Removing the module, example

10.2   Disposal

⚠ **CAUTION**
Risk of injury due to hot device surface.

The surface of the device can become hot during operation.

- Before commencing disassembly, switch off the device and allow it to cool down as necessary.

If a device can no longer be used, dispose of it in an environmentally friendly manner in accordance with the applicable country-specific waste disposal regulations. Do not dispose of the product along with household waste.

❗ **NOTICE**
Danger to the environment due to improper disposal of the device.

Disposing of devices improperly may cause damage to the environment.

Therefore, observe the following information:

- Always observe the valid regulations on environmental protection.
- Separate the recyclable materials by type and place them in recycling containers.

11 Technical data

> **i** **NOTE**
> The relevant online product page for your product, including technical data, dimensional drawing, and connection diagrams, can be downloaded, saved, and printed from the Internet.
>
> The page can be accessed via the **SICK Product ID: pid.sick.com/{P/N}/{S/N}**
>
> {P/N} corresponds to the part number of the product, see type label.
>
> {S/N} corresponds to the serial number of the product, see type label (if indicated).
>
> Please note: This documentation may contain further technical data.

11.1 Features

Feature	Parameter
Task	Data recording, evaluation, and archiving
Supported devices (excerpt)	Encoders, code readers, RFID read/write devices, SICK LiDAR scanners, SICK picoCam and midiCam
Technology	Embedded hardware architecture: • Dual-core ARM Cortex-A9 CPU with NEON accelerator • FPGA for I/O handling Software: • Can be programmed within the SICK AppSpace environment • SICK Algorithm API
Random Access Memory	1 GB
Flash memory	256 MB in total, 30 MB of which available for applications
Memory card, integrated	Industrial-grade MicroSD memory card, 1 GB
Programming software	SICK AppStudio
Sensor data processing	According to SICK Algorithm API

11.2 Interfaces

Feature	Parameter
Data storage and retrieval	Image and data logging via microSD memory card, internal RAM, and external FTP
SERIAL (RS-422 / RS-485)	
Number	2
Function	RS-422 / RS-485
Maximum data transmission rate	RS-422: 2 MBaud RS-485: 2 MBaud
ETHERNET	
Number	4
Function	Host, image transmission
Data transmission rate	Port 1, 3: max. 100 Mbit/s Port 2, 4: max. 1 Gbit/s
Protocol	TCP/IP, FTP (image transmission)
CAN	
Number	1

Feature	Parameter
Function	SICK CAN sensor network (master/slave, multiplexer/server), termination controllable via app
Data transmission rate	20 kbit/s … 1 Mbit/s
Protocol	CSN (SICK CAN sensor network)
IO-Link	
Number	1
Function	IO-Link Master V1.1
Data transmission rate	max. 230 kBaud
Digital switching inputs/outputs	
IYI:	Switching input, max. frequency: 30 kHz
IY2:	Switching input/output (configurable), max. frequency: 30 kHz
FLEXBUS+ connection (SIM1000 FXG only)	
Quantity	1 male connector on left, 1 female connector on right
Number of pins	10
Function	Internal safety bus

11.3 Mechanics and electronics

Feature	Parameter
Optical indicators	7 x status indicators, front membrane, red/green 4 x status indicators, front membrane, green 4 x status indicators, Ethernet, orange/green
Electrical connection	Terminal block 1 - 4: spring terminals Ethernet connections: RJ - 45 FLEXBUS+ connection: 10-pin male connector
Supply voltage	24 V DC, -30% / +25%
Operating current	Must be limited by external power supply unit to max. 2 A
Power consumption	Max. 10.5 W, without connected sensors
Power output	Max. 9 W total (all connections)
Output current IY2	Max. 100 mA
Output current L+	200 mA (400 mA briefly when switched on)
Housing material	Polycarbonate
Housing color	Light gray (RAL 7035)
Protection class	III (EN 61140:2016-05)
Weight	SIM1000 FXA: 430 g (with spring terminals) SIM1000 FXG: 445 g (with spring terminals)
Dimensions (W x D x H)	SIM1000 FXA: 67.5 mm x 120.6 mm x 106.7 mm SIM1000 FXG: 73.5 mm x 120.6 mm x 106.7 mm

11.4 Ambient data

Feature	Parameter
Electromagnetic compatibility (EMC)	EN 61000-6-2:2005-08 EN 61000-6-4:2007 + A1:2011
Vibration resistance	EN 60068-2-6:2008-02, EN 61131-2:2007-09
Shock resistance	EN 60068-2-27:2009-05, EN 61131-2:2007-09

Feature	Parameter
Electrical safety	IEC 61010-1:2010 + COR:2011
Enclosure rating	IP20 according to EN 60529:1991-10 + A1:2000-02 + A2:2013-10
Ambient conditions	
Operation site Height position Degree of contamination	Use inside buildings max. 2,000 m 1
Ambient operating temperature	-25 °C ... +55 °C
Storage temperature	-25 °C ... +70 °C
Permissible relative humidity	90%, non-condensing

12 Annex

12.1 Dimensional drawings

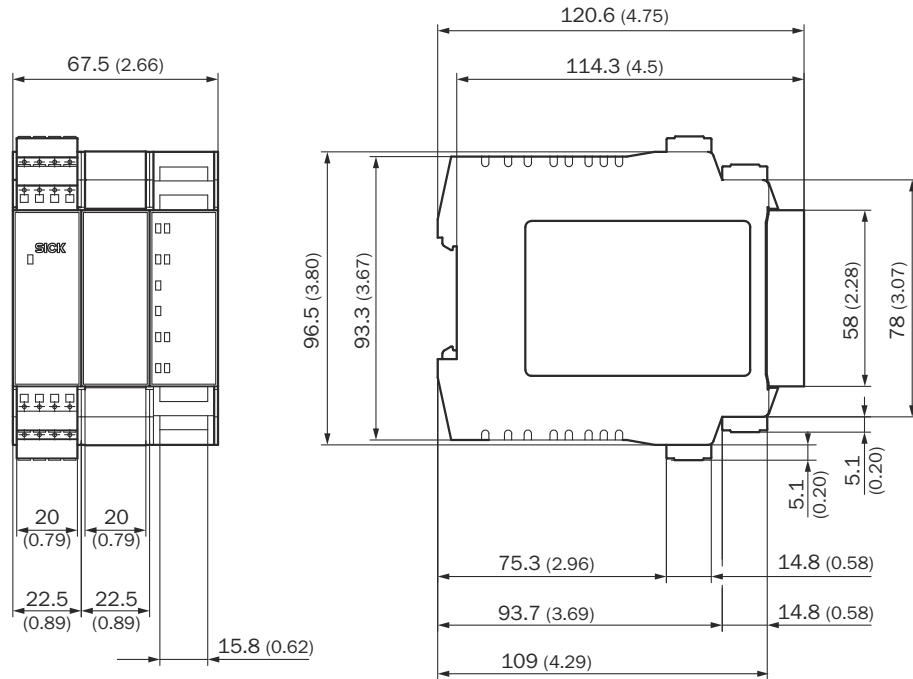**Dimensions without accessories**

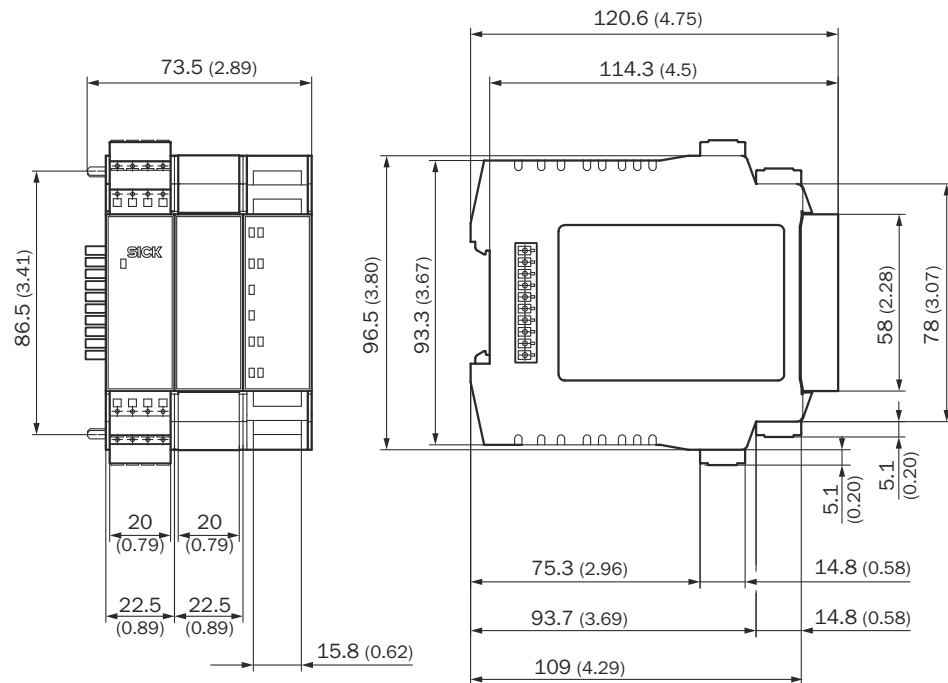All measurements in mm.

Figure 7: SIM1000 FXA

Figure 8: SIM1000 FXG

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