

SIM1012

Sensor Integration Machine



Described product

SIM1012

Manufacturer

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Original document

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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 cooling fins or fan - if present - must not be covered or restricted in their functionality.
- 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 and image processing devices. 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.

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 connection to the peripherals is established by means of a range of industrial 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.

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



NOTE

Programmable device

The Sensor Integration Machine (SIM) is a programmable device.

Therefore, the respective programmer is responsible for his/her programming performance and the resulting operating principle 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.

Therefore, SICK AG is not liable, among other things, for damages that are caused by programming of 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	<ul style="list-style-type: none"> ■ Basic practical technical training ■ Knowledge of the current safety regulations in the workplace
Electrical installation, device replacement	<ul style="list-style-type: none"> ■ Practical electrical training ■ Knowledge of current electrical safety regulations ■ Knowledge of the operation and control of the devices in their particular application
Commissioning, configuration	<ul style="list-style-type: none"> ■ 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	<ul style="list-style-type: none"> ■ 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.

**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.
-

2.8.1 LED RGO

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.

3 Product description

3.1 Device view

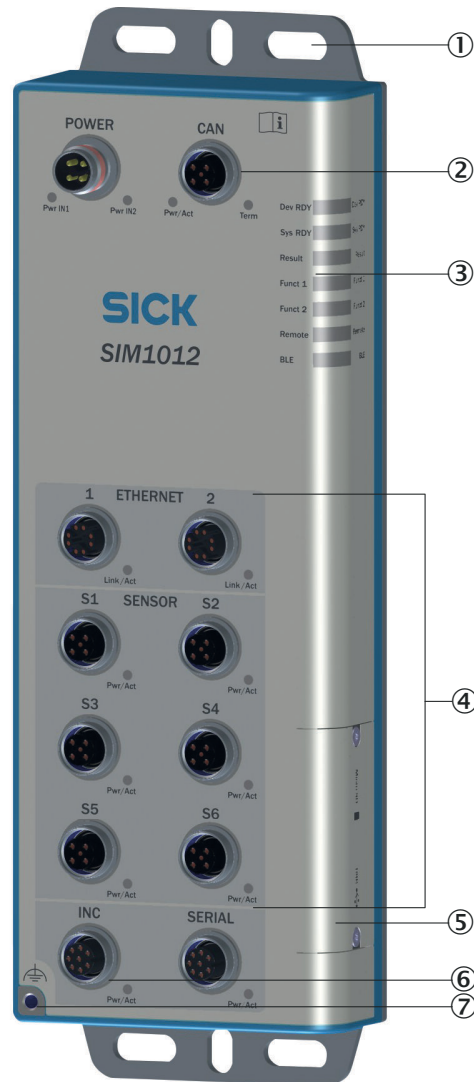


Figure 1: SIM1012 device view

- ① Elongated drill holes for mounting
- ② Connections for power and CAN
- ③ Status indicators
- ④ Connections for Ethernet and sensors
- ⑤ Servicing panel
- ⑥ Connections for increment and serial
- ⑦ Functional ground connection

3.2 Functionality

The SIM1012 Sensor Integration Machine – part of the SICK AppSpace ecosystem – is opening up new possibilities for application solutions.

Data from SICK sensors such as laser scanners or cameras can be evaluated, archived, and transmitted.

Sensors can be integrated via IO Link, for example for distance or height measurement.

Ethernet interfaces with OPC UA and MQTT provide pre-processed data (edge computing) for cloud computing. In addition, the SIM can be integrated into a SICK CAN sensor network.

The open SICK AppSpace software platform makes it possible to develop customized application programs for demanding applications.

The HMI and data visualization features can be provided on any browser-enabled notebook, PC, or tablet. The app is created via the 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 Preset Ethernet interfaces



NOTE

Preset IP addresses of the ETHERNET interfaces:

- ETHERNET 1: 192.168.0.1
 - ETHERNET 2: 192.168.1.1
-

When expanding the 1 GigE interfaces with one or more Ethernet switches, it is essential to use only jumbo-frame compatible 1 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 “WelcomeAPP” pre-installed in the device or via the SICK “SOPAS ET” PC tool. It is recommended to remove the WelcomeApp from the device using the AppManager after completing the device configuration.

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.



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

**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 22. 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

- SIM1012
- 1x grounding screw
- 1x toothed lock washer
- Safety note
- Optional: ordered accessories

**NOTE**

For a list of cables suitable for use with the device, see: supportportal.sick.com.

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

5.3 Preparing for mounting

Installation requirements

- Select the mounting site: Plan space requirements and sufficient distance from other devices. Be aware of the possibility of heat dissipation.
- Unpack the device and allow to acclimatize to avoid formation of condensation.

Preparing for mounting

1. Place the device at the mounting site.
2. Mark the mounting holes.
3. Proceed to drill the mounting holes.

5.4 Mounting the device

1. Place device at mounting site.
2. Fasten the device with at least two M6 screws (max. 6 Nm) and corresponding washers on opposite sides of the device.

**NOTICE**

Use self-locking or lock nuts on mounting sites that are exposed to vibrations to prevent the holding plates from loosening.

6 Electrical installation

6.1 Important information

**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.
- Ground the equipotential bonding via the functional ground connection with a low impedance.

**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) as specified in EN 61010. The external voltage supply of the device must bridge a short-term power interruption of 20 ms in order to meet the requirements of EN 60204-1.
- Only devices that are also supplied with safety extra-low voltage must be connected.

**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.

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)

For a list of cables suitable for use with the device, see the document “SIMxxx_Cable-Overview” available from: supportportal.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 2: SIM1012 overview of connections

- ① **POWER:** Voltage supply input
- ② **CAN:** Connection for SICK CAN sensor network (receiver/transceiver)
- ③ **ETHERNET:** 2 x 1 Gigabit Ethernet
- ④ **SENSOR S1 - S6:** Connections with digital inputs/outputs and voltage supply. Can be alternatively used as IO-Link master connections.
- ⑤ **INC:** 1 x incremental encoder In/Out or 1 x RS-422
- ⑥ **SERIAL:** 1 x RS-232 / RS-422 / RS-485 or 1 x incremental encoder In/Out
- ⑦ For e functional ground connection, see electrical installation/notes chapter.
- ⑧ **USB connection** (Micro-B, for configuration/diagnostics/firmware update)
- ⑨ **microSD card slot**

6.4.1 Functional earth connection



Figure 3: Alternative FE connection

The functional earth (FE) is connected either via the housing/mounting rail or via an FE connection with cable lug.

Alternative FE connection

Screw connection of the alternative functional earth connection

- Screw: M4 x 15

Suitable cable lugs

- Forked cable lug or ring cable lug
- Width ≤ 10 mm
- Hole diameter for screw: typically 4.1 mm

The functional earth must be connected in a low-inductance manner and with an adequate cross-section while keeping the cable length as short as possible.

6.5 Pin allocation of the connections

6.5.1 POWER

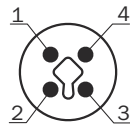


Table 2: POWER pin assignment, M12 - 4-pin T-coded, male

Pin	Signal	Function
1	24 V IN1	IN1 supply voltage (except CAN)
2	GND IN2	Ground
3	GND IN1	Ground
4	24 V IN2	IN2 supply voltage (CAN)
Housing	-	Screen

Additional notes:

- Max. 7.5 A (IN1), max. 4 A (IN2)
- Observe the requirements for the design of overcurrent protective devices according to EN 61010.

6.5.2 SERIAL

Serial connections, can also be used as an incremental connection.

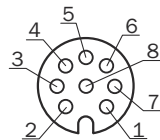


Table 3: SERIAL pin assignment, M12 - 8-pin A-coded, female

Pin	Mode			
	RS-422	RS-232*	RS-485	INC
1	-	-	-	A- (in/out)
2	-	-	-	A+ (in/out)
3	T-	-	Rx/Tx- (B)	B- (in/out)
4	T+	TxD	Rx/Tx+ (A)	B+ (in/out)
5	R-	-		
6	R+	RxD		
7	GND (ground)			
8	24 V (supply voltage for peripherals, configurable, deactivated with factory settings)			
Housing	Screen			

* Standard configuration

Additional notes:

- Max. 1 A output for supply voltage connections (compliant with LPS)
- Data transmission rates:
 - RS-232: 115.2 kBaud
 - RS-422: 2 MBaud
 - RS-485: 2 MBaud
- TTL encoders use RS-422 and can be connected via the SERIAL interface.

6.5.3 INC

Incremental connections for encoders, can also be used as serial connections for RS-422.

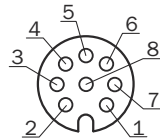


Table 4: INC pin assignment, M12 - 8-pin A-coded, female

Pin	Mode			
	RS-422*	RS-232	RS-485	INC
1	T-	-	-	A- (in/out)
2	T+	-	-	A+ (in/out)
3	R-	-	-	B- (in/out)
4	R+	-	-	B+ (in/out)
5	-	-	-	Z- (not supported)
6	-	-	-	Z+ (not supported)
7	GND (ground)			
8	24 V (supply voltage for peripherals, configurable, deactivated with factory settings)			
Housing	Screen			

* Standard configuration

Additional notes:

- Max. 0.5 A output for supply voltage connections (compliant with LPS)
- Frequency: max. 2 MHz
- TTL encoders use RS-422 and can be connected via the INC interface.

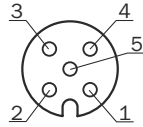
6.5.4 CAN

Table 5: CAN pin assignment, M12 - 5-pin A-coded, female

Pin	Signal	Function	Factory settings
1	-	Screen	-
2	+V24	Supply voltage for peripherals, configurable	Deactivated
3	GND	Ground	-
4	CAN_H	CAN high	Termination deactivated ¹⁾
5	CAN_L	CAN low	
Housing	-	Screen	-

¹⁾ Termination can be controlled via app

Additional notes:

- Max. 3.2 A output for supply voltage connections (compliant with LPS)
- To enable voltage supply to the peripherals, both voltage supply strands of the POWER connection must be connected to 24 V.

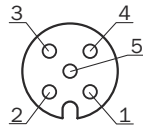
6.5.5 SENSOR 1-6

Table 6: SENSOR 1-6 pin assignment, M12 - 5-pin, A-coded, female

Pin	Signal	Function	Factory settings
1	+24 V	Supply voltage for peripherals, configurable	Deactivated
2	Input 2	Digital input	-
3	GND	Ground	-
4	C/Q or Input 1/Output 1	C/Q IO-Link or configurable digital input/output	All IO connections configured as inputs
5	NC	Not connected	-
Housing	-	Screen	-

Additional notes:

- 6 x IO-Link master (1x master available per connection)
- The digital inputs and outputs are only switchable if the supply voltage is activated on pin1, or +24 V is externally applied to pin1. A ground connection on Pin3 is required in both cases.
- Digital output:
 - Max. output 100 mA
 - Min. high output logic level: VCC – 3 V
 - Max. low output logic level: 3 V
 - Push-pull switch
 - Max. IO-Link output frequency: 230 kHz
 - Max. IO output frequency: 30 kHz
- Digital inputs:
 - Min. high input logic level: 12 V
 - Max. low input logic level: 4 V
 - Max. IO-Link input frequency: 230 kHz
 - Max. IO input frequency: 30 kHz
- Max. 1 A output for supply voltage connections S1 to S6 (compliant with LPS)
- HTL encoders use push-pull switches and can therefore be connected via the digital inputs.

Recommendation when using S1 to S6 for illumination

Short flash times can be achieved by using an illumination unit with signal strobe and by using pin4 as a digital output signal with a constant supply voltage on pin1 (Signal Strobe Mode).

The SIM1012 **does not** support Power Strobe Mode via the "Connector.Power.Gate" API.

6.5.6 ETH1 – ETH2

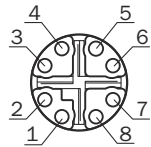


Table 7: ETH1 - ETH2 pin assignment, M12 - 8-pin X-coded, female

Pin	Function
1	D1+
2	D1-
3	D2+
4	D2-
5	D4+
6	D4-
7	D3-
8	D3+

Additional notes:

The Ethernet connections can be used to connect to picoCam and midiCam family cameras and SICK LiDAR sensors as well as a PC or network.

The relevant drivers are implemented in the SIM1012 to enable usage of the SICK picoCam and midiCam camera families.

Important:

- Up to and including SIM1012 firmware version 1.x.x, only first generation picoCam and midiCam cameras are supported.
- For SIM1012 firmware version 2.x.x and above, only picoCam2 and midiCam2 cameras as well as third party GigE Vision compatible cameras are supported.

Jumbo frame support is needed when using Ethernet switches.

Transmission rate: max. 1 Gb/s

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 17.

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.
4. Seal unused connections with dummy plugs.

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 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"](#)) 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"](#).
3. Connect the network connection.
4. Connect the voltage supply.
5. The device requires a certain start-up time. The readiness is indicated by the green "Dev RDY" LED.

8 Operation







8.1 Status LEDs

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

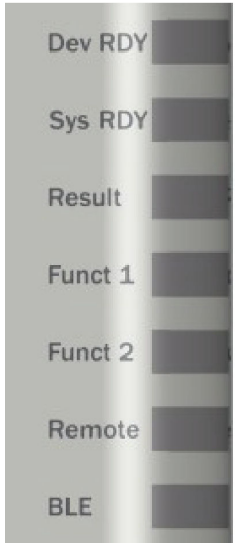









Using these status indicators, the operator can find out quickly and easily whether the device and the peripherals are working properly or whether any faults or errors have occurred.

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 (applies to all colors)




Symbol	Purpose
	LED off
	LED on
	LED flashes
	LED goes out briefly
	LED lights up briefly
	LED flashes bicolored

Device status








Location	Designation	LED behavior	Description
	Dev RDY		Device is booting; power-up time due to boot process (approx. 20 s)
			Runlevel READY, no errors detected*
			Runlevel READY, boot process error
	Sys RDY Result Funct 1 Funct 2 Remote		User-defined, configurable with SICK AppSpace
			
			
			
BLE			
		Currently not supported	

* Time delay before availability due to boot process (about 20 s)








POWER IN

Location	Designation	LED behavior	Description
	POWER IN1 POWER IN2		Voltage not applied to the connection.
			Voltage applied.

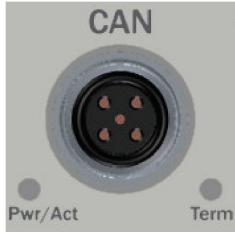








INC

Location	Designation	LED behavior	Description
	PWR/ACT		Voltage not applied to the connection.
			Voltage applied. No signal activity.
			Voltage applied. Signal activity.
			Voltage not applied to the connection. Signal activity.
			Overcurrent or short-circuit detected. No signal activity.
			Overcurrent or short-circuit detected. Signal activity.







SERIAL

Location	Designation	LED behavior	Description
	PWR/ACT		Voltage not applied to the connection.
			Voltage applied. No signal activity.
			Voltage applied. Signal activity.
			Voltage not applied to the connection. Signal activity.
			Overcurrent or short-circuit detected. No signal activity.
			Overcurrent or short-circuit detected. Signal activity.





CAN

Location	Designation	LED behavior	Description
	PWR/ACT		Voltage not applied to the connection.
			Voltage applied. No signal activity.
			Voltage applied at signal activity connection.
			Voltage not applied to the connection. Signal activity.
			Overcurrent or short-circuit detected. No signal activity.
			Overcurrent or short-circuit detected. Signal activity.
	Term		Termination resistor not activated.
			Termination resistor activated.

SENSOR S1 - S6

Location	Designation	LED behavior	Description
	PWR/ACT		Voltage not applied to the connection.
			Voltage applied. No signal activity.
			Voltage applied. Signal activity.
			Voltage not applied to the connection. Signal activity.
			Short-circuit detected.

ETHERNET 1 - 2

Location	Designation	LED behavior	Description
	Link/Act		Connection not established with Ethernet
			Connection established with Ethernet.
			Data transmission via Ethernet.

9 Maintenance

9.1 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.

9.2 Maintenance plan

During operation, the device works maintenance-free.

Depending on the assignment location, the following preventive maintenance tasks may be required for the device at regular intervals:

Table 8: Maintenance plan

Maintenance work	Interval	To be carried out by
Check device and connecting cables for damage at regular intervals.	Depends on ambient conditions and climate.	Specialist
Clean housing.	Depends on ambient conditions and climate.	Specialist
Clean any fans and check their function	Depends on ambient conditions and climate. Recommended: At least every 6 months.	Specialist
Check that all unused connections are sealed with protective caps.	Depends on ambient conditions and climate. Recommended: At least every 6 months.	Specialist

10 Decommissioning

10.1 Disposal



CAUTION

Risk of injury due to hot device surface.

The surface of the device can become hot during operation.

- Before performing work on the device (e.g. mounting, cleaning, disassembly), switch off the device and allow it to cool down.
 - Ensure good dissipation of excess heat from the device to the surroundings.
-

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

11 Technical data



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 sensors, SICK picoCam and midiCam (note regarding compatible firmware versions: " ETH1 – ETH2 ", page 20)
Technology	Embedded hardware architecture: <ul style="list-style-type: none"> • Dual-core ARM Cortex-A9 CPU • FPGA for I/O handling Software: <ul style="list-style-type: none"> • 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 (optional)	Industrial-grade microSD memory card (flash card) Supported microSD memory cards: <ul style="list-style-type: none"> • max. 32 GB (SDHC, SD); FAT 12/16/32, EXT 2/3/4
Programming software	SICK AppStudio
Sensor data processing	According to SICK Algorithm API

11.2 Interfaces

Feature	Parameter
User interfaces	Web server (GUI), SICK AppStudio (programming), SICK AppManager (app installation, firmware update)
Data storage and retrieval	Image and data logging via microSD memory card, internal RAM, and external FTP
SERIAL (RS-232 / RS-422 / RS-485)	
Number	1, also configurable as an encoder output port
Function	RS-232 / RS-422 / RS-485, incremental encoder (In/Out)
Maximum data transmission rate	RS-232: 115.2 kBaud RS-422: 2 MBaud RS-485: 2 MBaud
INC (incremental)	
Number	1, also configurable as RS-422 interface
Function	Incremental encoder (In/OUT), RS-422

Feature	Parameter
Maximum frequency	2 MHz
Ethernet	
Number	2
Function	Data output, configuration, firmware update
Data transmission rate	10/100/1,000 Mbit/s
Protocol	TCP/IP, FTP (image transfer), OPC-UA, MQTT
CAN	
Number	1
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	6 (SENSOR S1 to S6)
Function	IO-Link master V1.1
Data transmission rate	max. 230 kBaud
Digital inputs/outputs	
S1-S6	Inputs: 1 each, max. frequency: 30 kHz Inputs/outputs: 1 each (configurable), max. frequency: 30 kHz
USB	
Number	1
Function	USB 2.0 (Micro-B) for configuration/diagnostics/firmware update

11.3 Mechanics and electronics

Feature	Parameter
Electrical connection	POWER: 1 x M12, 4-pin male connector, T-coded INC: 1 x M12, 8-pin female connector, A-coded SERIAL: 1 x M12, 8-pin female connector, A-coded CAN: 1 x M12, 5-pin female connector, A-coded SENSOR S1-S6, IO-Link master: 6 x M12, 5-pin female connector, A-coded ETHERNET: 2 x M12, 8-pin female connector, X-coded USB: Micro-B
Supply voltage	24 V DC, $\pm 10\%$ SELV in accordance with EN 61010, also applies to digital inputs
Operating current	Limit to max. 12 A from external power supply unit
Power consumption	15 W max., without connected sensors
Power output	Total 270 W max. (all connections)
Output current	
SENSOR S1-S6, IO	≤ 100 mA, on digital output pins
SENSOR S1-S6, IO	≤ 1 A, on power supply pins
CAN	≤ 3.2 A, on power supply pin
SERIAL	≤ 1 A, on power supply pins
INC	≤ 0.5 A, on power supply pins
Housing material	Aluminum
Housing color	Light blue (RAL 5012), with white-gray front foil (RAL 9002)

Feature	Parameter
Protection class	III
Weight	876 g (including connection plugs)
Dimensions (W x D x H)	86.5 x 45.8 x 265.5 mm

11.4 Ambient data

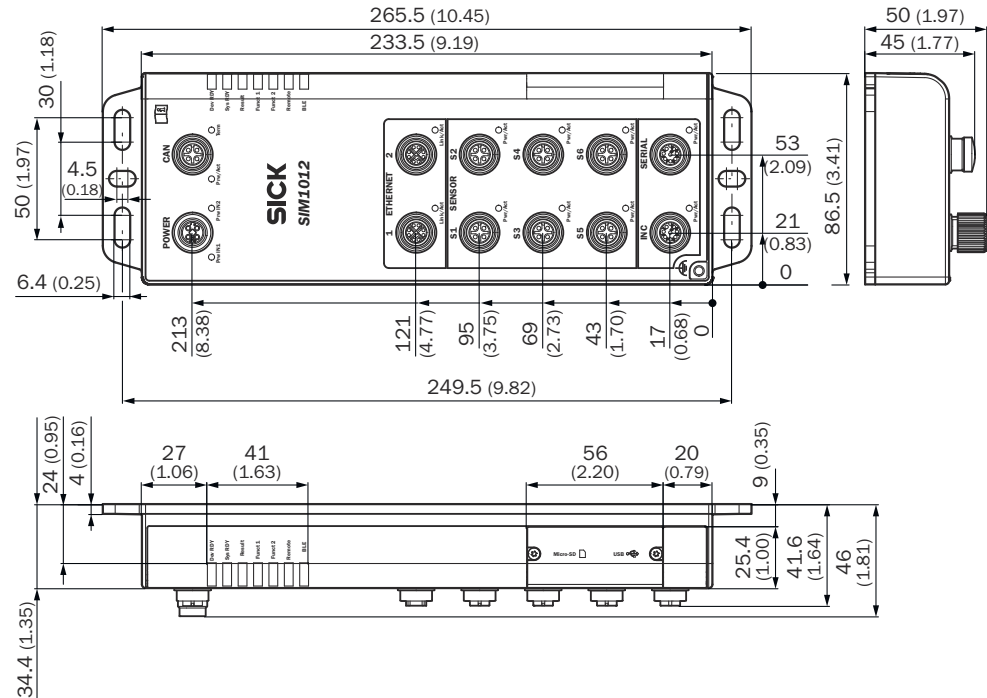
Feature	Parameter
Electromagnetic compatibility (EMC)	EN 61000-6-2:2005-08 EN 61000-6-4:2007 + A1:2011
Vibration resistance	EN 60068-2-6: 2008-02
Shock resistance	EN 60068-2-27:2009-05
Electrical safety	IEC 61010-1:2010 + Cor.: 2011 IEC 61010-2-201:2017
Enclosure rating	IP65 in accordance with EN 60529:1991-10 + A1:2000-02 + A2:2013-10 (requires blind plugs to be inserted into unused connections)
Ambient conditions	
Operation site	Use inside buildings
Height position	max. 2,000 m
Degree of contamination	1
Ambient operating temperature	0 °C ... +50 °C, taking the described mounting requirements into account, see "Mounting the device", page 14
Storage temperature	-20 °C ... +70 °C
Permissible relative humidity	90%, non-condensing

12 Annex

12.1 Dimensional drawings

Dimensions without accessories

All measurements in mm.



12.2 Licenses

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This program is provided for general use without warranty of any kind. This warranty disclaimer also extends to the implicit assurance of marketability or suitability of the program for a particular purpose.

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License texts can be read out from the device using a web browser via the following URL: `<device ip>/license/COPYING`

Printed copies of the license texts are also available on request.

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