

InspectorP62x

2D machine vision

SICK
Sensor Intelligence.



Described product

InspectorP62x

Manufacturer

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Original document

This document is an original document of SICK AG.



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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 Scope

The operating instructions are valid for all available product types. To obtain more detailed information on identifying your product type, see "Type code", page 12.

Available product types are listed on the online product page:

- www.sick.com/InspectorP62x

A number of product types are used as examples for commissioning and based on the default parameter settings for the relevant device.

1.3 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.

1.4 Further information

More information can be found on the product page.

The call is made 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

2 Safety information

2.1 Intended use

The InspectorP6xx is a programmable vision sensor for industrial use for tasks which require high-resolution images at long distances.

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 (GUI) can be created, which provides opportunities defined by the application developer to influence an application at operator level. 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 devices are primarily designed for use in industrial and logistics areas, and they meet the requirements for industrial ruggedness, interfaces and data processing. They are not safety components as per the Machinery Directive 2006/42/EC. They are not intended and not permitted to be used in areas with explosive atmospheres, in corrosive environments, or in extreme ambient conditions.

2.1.1 Operating restrictions

**NOTE**

Radio interference may occur when the device is used in residential areas!

- Only use the device in industrial environments (EN 61000-6-4).

2.1.2 Conditions for specified enclosure rating

To ensure compliance with the specified enclosure rating of the device during operation, the following requirements must be met: If these requirements are not met, the device does not fulfill any specified enclosure rating.

- The cables plugged into the electrical connections must be screwed tight.
- Any electrical connections that are not being used must be sealed with a tightly-fastened protective cap (as in the delivery condition).
- The foldable cover must be flush with the device and screwed tight.

2.1.3 Cover on the device

**NOTICE**

Risk of product damage if cover is open!

In open state, the device does not conform to a specified enclosure rating.

If necessary, only operate the device for a short time with an open cover for the activities listed in the following: During this time, protect the device against moisture and dust.

Briefly open the cover for the following activities:

- Inserting or removing the optional memory card

For further warranty provisions, see the General Terms and Conditions of SICK AG, e.g., on the delivery note of the device.

2.2 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.
- The device must not be operated in the temperature range below 0 °C.
- 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.
-

2.3 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

2.3.1 Programmable product

For programmable products, the respective programmer is responsible for his/her programming performance and the resulting working principle of the product.

The liability and warranty of SICK AG is limited to the product specification (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.

2.4 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.

2.5 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)

2.6 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.

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 ■ Knowledge of the programming of image-processing systems and network components
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

2.7 Operational safety and specific hazards

Please observe the safety notes and the warnings listed here and in other sections 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.

The product is fitted with LEDs of risk group 0 or 1 for object illumination, depending on type.



CAUTION

Optical radiation: LED risk group 1, visible radiation, 400 nm to 780 nm

The LEDs may pose a danger to the eyes in the event of incorrect use.

- Do not look into the light source intentionally.
 - Do not open the housing. Opening the housing will not switch off the light source. Opening the housing may increase the level of risk.
 - Comply with the current national regulations on photobiological security of lamps and lamp systems.
-

If the product is operated in conjunction with external illumination systems, the risks described here may be exceeded. This must be taken into consideration by users on a case-by-case basis.

Laser alignment aid



CAUTION

Optical radiation: Class 1 Laser Product

The accessible radiation does not pose a danger when viewed directly for up to 100 seconds. It may pose a danger to the eyes and skin in the event of incorrect use.

- Do not open the housing. Opening the housing may increase the level of risk.
 - Current national regulations regarding laser protection must be observed.
-

Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

For both radiation types:

It is not possible to entirely rule out temporary disorienting optical effects, particularly in conditions of dim lighting. Disorienting optical effects may come in the form of dazzle, flash blindness, afterimages, photosensitive epilepsy, or impairment of color vision, for example.



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 Scope of delivery

Scope of delivery

No. of units	Component	Note
1	Device in the version ordered	M12 female connector for Ethernet sealed with tightly-fastened protective cap Without bracket and optional connecting cables
2	Sliding nut, 5.5 mm deep, with M5 threaded fixing hole	Alternative mounting option for the device instead of the threaded mounting hole Use in pairs
1	Printed safety notes, multilingual	Brief information and general safety notes
	Quality Inspection SensorApp	Pre-installed on the device

Associated components not contained in the delivery:

Table 2: Other components

Component	Remarks
SOPAS ET configuration software	Available online at: <ul style="list-style-type: none"> www.sick.com/SOPAS_ET
SICK AppStudio software	Available online at: <ul style="list-style-type: none"> www.sick.com/SICK_AppStudio
SICK AppManager software	Available online at: <ul style="list-style-type: none"> www.sick.com/SICK_AppManager
This documentation, available in English and German, and in other languages if necessary	Available online at: <ul style="list-style-type: none"> www.sick.com/InspectorP62x

3.2 Product ID

3.2.1 Type label

The type label gives information for identification of the device.

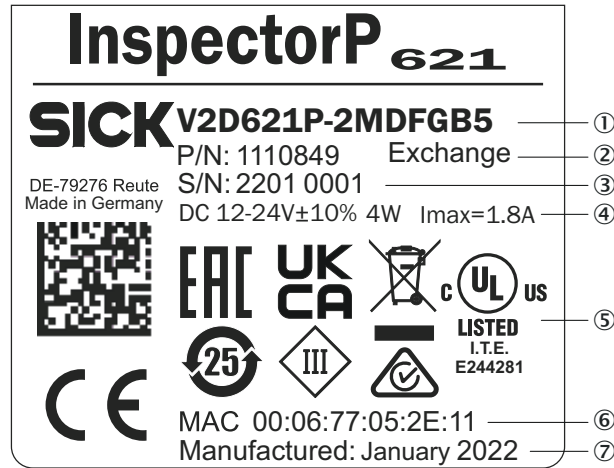


Figure 1: Structure of the type label

- ① Type designation according to type code
- ② Part number
- ③ Serial number
- ④ Supply voltage, power consumption and maximum current consumption
- ⑤ Certifications and symbols
- ⑥ MAC address (placeholder)
- ⑦ Production date

3.2.2 Type code

The devices of the InspectorP621 product family are arranged according to the following type code:

V2D6xyz-abcdefg

V	2	D	6	x	y	z	-	a	b	c	d	e	f	g
1	2	3	4	5	6	7		8	9	10	11	12	13	14

Position	Description
1 ... 5	Product family V2D62 InspectorP62x
4 ... 6	Image sensor resolution 1: 1.3 Mpx (1280 px x 1024 px)
7	Function P: Programmable
8	Generation 2: 2nd generation
9	Image sensor type M: Monochrome
10	Integrated illumination unit ¹⁾ / aiming laser S: red left, blue right / aiming laser D: left IR ²⁾ , right IR ²⁾ / aiming laser
11	Parameter set F: Full Feature Set for variant InspectorP621

Position	Description
12	Focal length B: 9.6 mm F: 17, 1 mm G: 17, 1 mm with visible block filter
13	Connectivity package B: Ethernet, serial, CAN, I/O, USB, memory card slot
14	IP Protection class 5: IP 65

- 1) Front view
- 2) IR = Infrared light



NOTE

Not all combinations are possible according to the type code. The available device variants can be found online at:

- www.sick.com/InspectorP62x

3.3 Product characteristics

3.3.1 Device view

Important information



NOTICE

Damage to the swivel connector from over-rotation

- The swivel connector may be moved up to a maximum of 180° from end point to end point. Do not exceed the respective limit position.
- Carry out the rotational movement slowly.

Device view

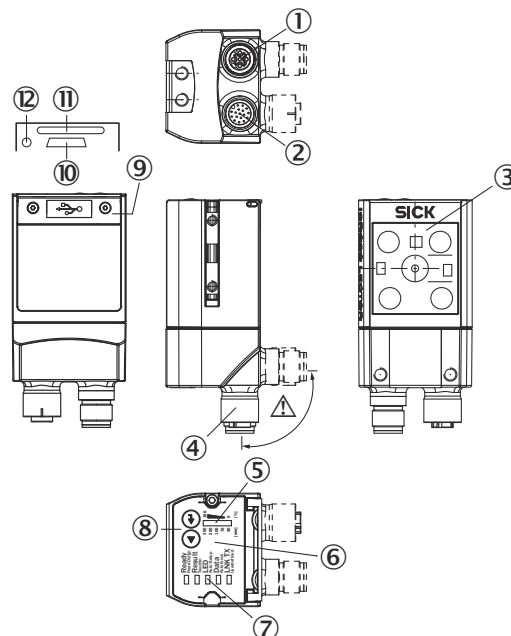


Figure 2: Device view

- ① Ethernet connection (female connector, M12, 4-pin, D-coded)
- ② Power/Serial Data/CAN/I/O connection (male connector, M12, 17-pin, A-coded)
- ③ Viewing window with four LEDs, integrated illumination unit
- ④ Swivel connector (swivel range 180°)
- ⑤ Bar graph
- ⑥ beeper (under housing cover)
- ⑦ 5 status LEDs (2 levels)
- ⑧ 2 function keys
- ⑨ Cover (flap) with two fixing screws (TX6 key, captive)
- ⑩ USB port (female connector, type Micro-B, 5-pin)
- ⑪ Card slot for microSD memory card
- ⑫ Status LED, status indicator for the microSD memory card

3.3.1.1 Illumination unit

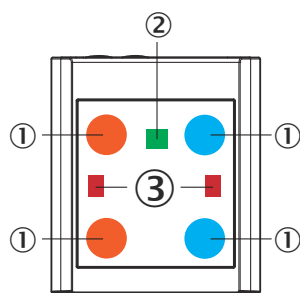


Figure 3: Illumination unit (integrated illumination unit)

- ① 4 LEDs (color: visible red light, visible blue light; position: 2 on the left, 2 on the right)
- ② Feedback LED (color: visible green light)
- ③ Laser alignment aid (color: visible red light)



NOTE

To avoid being dazzled by the integrated illumination unit, do not look into the viewing window of the device.

3.3.2 Display and operating elements

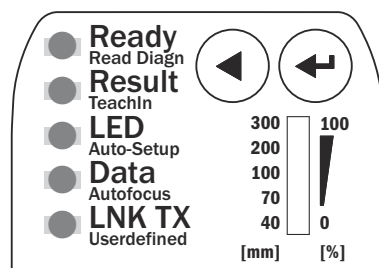


Figure 4: LED status displays, bar graph display and function keys on the top of the device

- ① Status LEDs and device functions
- ② Function buttons
- ③ Bar graph
- ④ Status LED of the microSD memory card

Status displays

Display	LED	API name ¹	Color	Status
Ready	Steady	-	green	Device is ready
	Steady	-	red	Hardware or software error
	Steady	-	yellow	Firmware or SensorApps are being installed on the device. Do not disconnect the power to the device.
	Flashing (about 1 Hz)	-	green/yellow	Profinet is configured, but no successful connection to a PLC is established. If there are additional errors related to the SensorApp, the LED flashes with red color.
Result	Programmable	RESULT_LED	red, green, blue, fuchsia, yellow, aqua, white	Function defined by user
Light (LED)	Programmable	LIGHT_LED	red, green, blue, fuchsia, yellow, aqua, white	Function defined by user
Function (Data)	Programmable	FUNCTION_LED	red, green, blue, fuchsia, yellow, aqua, white	Function defined by user
LNK TX	Flashing	-	green	The device is connected to a network
LED bar (0..9)	Programmable	BAR0_LED BAR1_LED BAR2_LED BAR3_LED BAR4_LED BAR5_LED BAR6_LED BAR7_LED BAR8_LED BAR9_LED	green	Function for each LED defined by user

¹ For programmable LEDs only

Status display of the microSD memory card

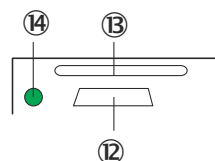


Figure 5: Display under flap on rear of device

- ⑫ USB interface
- ⑬ Slot for microSD memory card
- ⑭ Display for microSD memory card

Table 3: Status display of the microSD memory card

Display	LED	Color	Status
MicroSD	Lights up	Green	The device writes data to the correctly installed memory card. Read access to the card is not signaled.

3.3.3 Acoustic status indicator

The beeper (buzzer) is located under the cover on the top of the device, see "Device view", page 13. The API contains functionality for setting the beep duration, the pitch, the tone sequence and the volume level.

3.3.4 Memory card

The device has a card slot integrated in the housing. The card slot accommodates a memory card in microSD format.



NOTE

The microSD memory card is optional and not included in the scope of delivery of the device. The device supports memory cards up to max. 32 GB.

Only use types (industrial standard) approved by SICK to ensure reliable function of the memory card. You can find these as accessories online at:

- www.sick.com/InspectorP62x

The memory card has no write protection that can be activated.

Inserting the memory card in the device:



DANGER

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 lost heat transfer from the device.



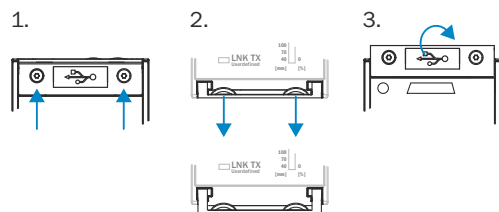
NOTICE

Risk of damage to the memory card!

- ▶ To avoid damaging the microSD memory card, make sure the device is **de-energized** when you insert or remove the card. For this purpose, disconnect the device from the supply voltage.

Access to the card slot

The card slot for the memory card is located under the hinged cover on the rear side of the device.



1. Switch off the supply voltage to the device.
2. Undo the screws (Torx TX6, captive) on the hinged cover and open the cover as follows:
 - Carefully pull the upper edge of the cover away from the housing a little at the level of the hinges on the side. Use both of the recesses on the inside of the cover to do this.
 - Fold the cover upwards starting from the bottom edge.
3. Making sure it is in the correct position, insert the memory card into the slot until it locks into place. When doing this, position the contacts so that they are facing to the rear and upwards, see the card symbol on the device.
4. Close the hinged cover. Make sure that the cover is completely flush with the housing.
5. Tighten the screws on the hinged cover again.
6. Switch on the supply voltage for the device.

Removing the memory card from the device:



NOTICE

Risk of damage to the memory card!

- ▶ To avoid damaging the microSD memory card, make sure the device is **de-energized** when you insert or remove the card. For this purpose, disconnect the device from the supply voltage.

1. Switch off the supply voltage to the device.
2. Undo the screws on the hinged cover.
3. Making sure it is in the correct position, push the memory card into the slot until it is released. When doing this, position the contacts so that they are facing to the rear and upwards, see the card symbol on the device.
4. Remove the memory card.
5. Close the hinged cover. Make sure that the cover is completely flush with the housing.
6. Tighten the screws on the hinged cover.
7. Switch on the supply voltage for the device.

3.4 SICK AppSpace

The InspectorP6xx product family is part of the SICK AppSpace ecosystem, which consists of software tools and programmable sensors or devices. See [figure 6](#) for an overview of SICK AppSpace.

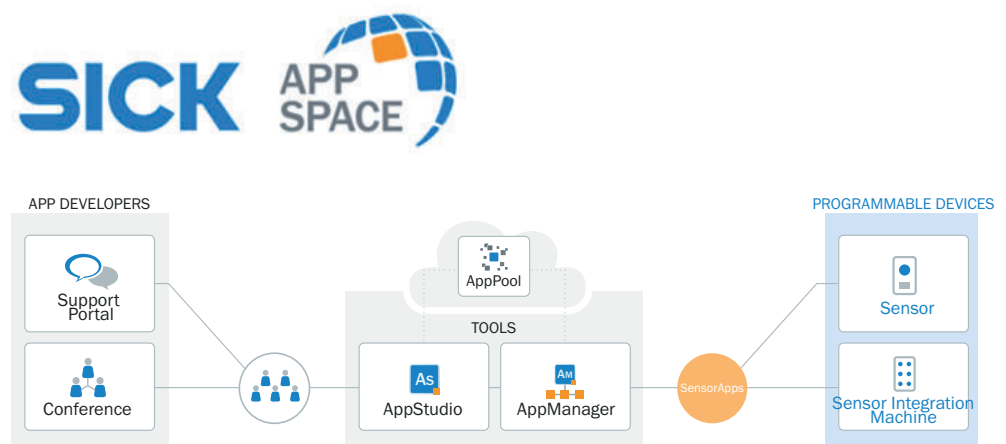


Figure 6: SICK AppSpace

SICK AppSpace includes the following components and resources:

- SICK AppManager: A software tool used for the installation and management of SensorApps and device firmware updates.
- SICK AppPool: A cloud-based repository for storing and sharing SensorApps. SICK AppPool can be accessed directly from SICK AppManager, SICK AppStudio, and from the web.
- SICK AppStudio: A Software Development Kit (SDK) for developing SensorApps on programmable SICK devices. Its user interface for machine operators can be created individually as a web GUI.
- The SICK Support Portal (supportportal.sick.com) contains tutorials and instructions for programming the InspectorP6xx in SICK AppStudio.

For more information about downloading SensorApps and programming the device, see "[Commissioning](#)", page 37.

For more information about SICK AppSpace, see www.sick.com/SICK_AppSpace.

4 Transport and storage

4.1 Transport

**NOTICE****Damage due to improper transport!**

- The product must be packaged with protection against shock and damp.
- Recommendation: Use the original packaging.
- Note the symbols on the packaging.
- Do not remove packaging until immediately before you start mounting.

4.2 Unpacking

- To protect the device against condensation, allow it to equilibrate with the ambient temperature before unpacking if necessary.
- Handle the device with care and protect it from mechanical damage.

4.3 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.

4.4 Storage

- Electrical connections are provided with a protective cap.
- Do not store outdoors.
- Store in a place protected from moisture and dust.
- Recommendation: Use the original packaging.
- To allow any residual dampness to evaporate, do not package in airtight containers.
- Do not expose to any aggressive substances.
- Protect from sunlight.
- Avoid mechanical shocks.
- Storage temperature: see "Technical data", page 45.
- Relative humidity: see "Technical data", page 45.
- 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 Mounting instructions

- Observe the technical data.
- To prevent condensation, avoid exposing the device to rapid changes in temperature.
- The mounting site has to be designed for the weight of the device.
- Ensure a good dissipation of excess heat from the device to the surroundings, in particular at higher ambient temperatures. Good heat transfer from the device can be achieved, for example, by using a bracket on the mounting base or by ensuring that the back of the device is located at a sufficient distance from the wall of an enclosure.

5.2 Preparation for mounting

5.2.1 Installation requirements

Mounting requirements

- Typical space requirement: see ["Field of view diagrams", page 21](#) and type-specific dimensional drawing
- Comply with the technical data, such as the permitted ambient conditions for operation, see ["Technical data", page 45](#).
- Only mount the device using the threaded mounting holes provided or the movable sliding nuts.
- Mount the device in a shock and vibration insulated manner.
- Make sure the device has a clear view of the objects to be scanned.

Auxiliary equipment required

- Mounting system with sufficient load-bearing capacity and suitable dimensions
- 4 or 2 M5 screws for mounting the device on a mounting system supplied by the customer

The screw length depends on the mounting base (wall thickness of the bracket). When using an optional SICK mounting system, the screws for mounting the device are included with delivery.

5.2.2 Mounting systems

Mount the device to the mounting systems using at least 2 threaded mounting holes (M5) or sliding nuts.

The threaded mounting holes are located on the top and bottom of the device.

The sliding nuts can each be inserted into a slot on the side of the housing.

SICK offers prefabricated mounting systems that are optimally suited for mounting the device, see ["Accessories", page 48](#).

Customer-supplied mounting system

A customer-supplied mounting system must meet the following requirements:

- The device can be aligned in the X- and Y-axes.
- The mounting system must be able to bear the weight of the device and connecting cables without shock.
- Mounting options for the device using the threaded mounting holes or sliding nuts must be available.

5.3 Mounting location

5.3.1 Working distance

The possible working distance is 70 mm to 2,000 mm, depending on the application and the device type. The working distance is measured starting from the housing edge.

The field of view is determined by the focus position, focal distance of the lens, and the working distance. The necessary working distance can be determined based on the field of view diagram (see "Field of view diagrams", page 21).

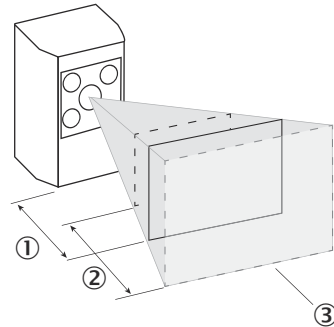


Figure 7: Field of view geometry

- ① Workspace
- ② Depth of field
- ③ Field of view

5.3.2 Mounting bracket and reflection prevention

In order to avoid reflections from the surfaces to be scanned, mount the device so that it is tilted from the perpendicular to the surface.

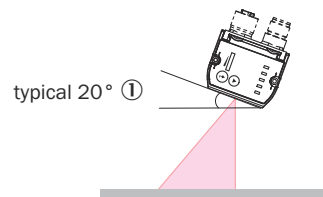


Figure 8: Mounting angle to use, depending on the application

- ① Typical angle 20°

Depending on the application, an angle of 0° (brightfield illumination) or up to 45° (darkfield illumination) is appropriate.

5.3.3 Field of view diagrams

Take into account the following aspects in application design:

- Field of view geometry of the device and position of the field of view in the space in front of the device
- Possible angles at which the objects can occur with respect to the device
- For the planned working distance: resultant field of view length and width and approximate resolution

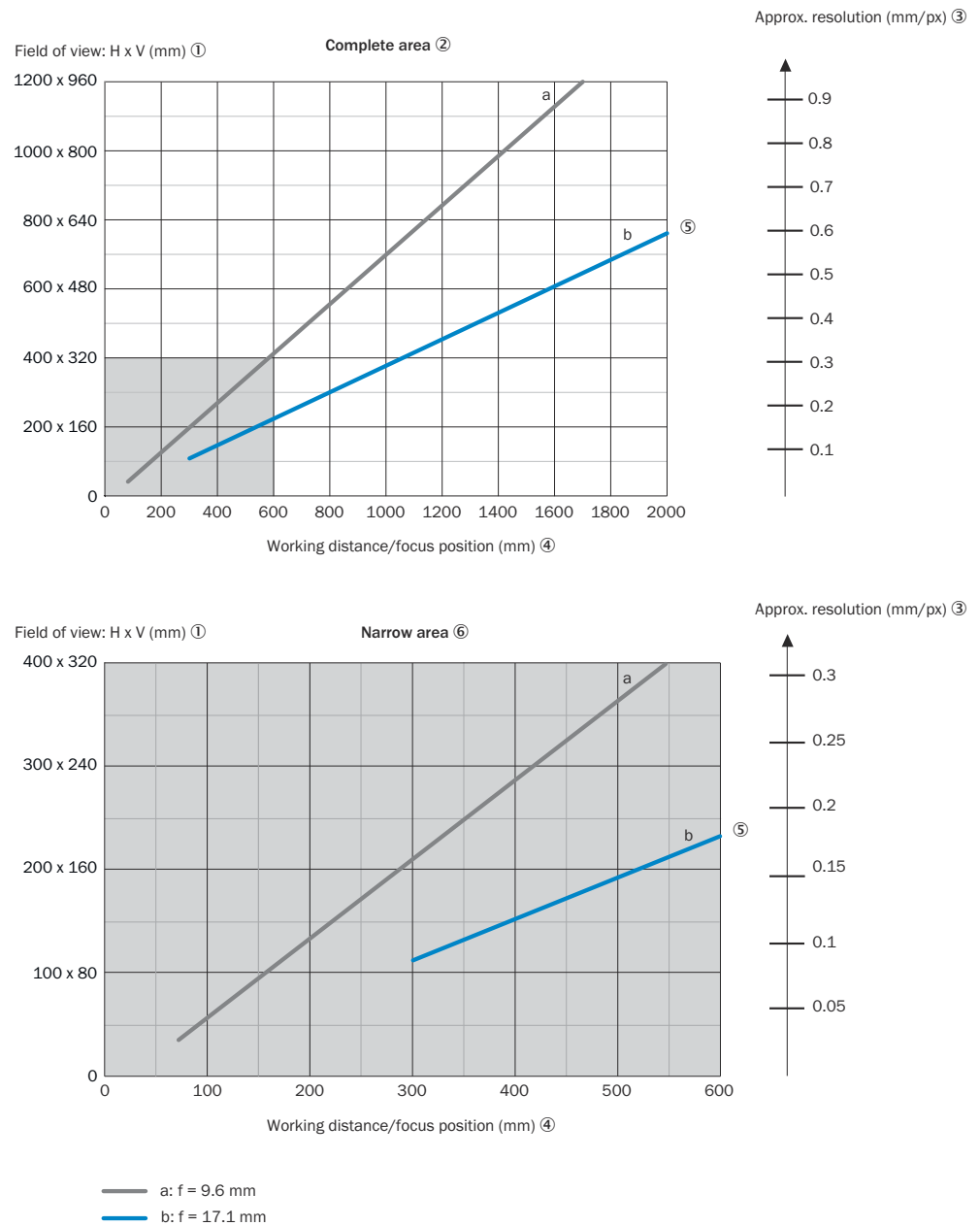


Figure 9: Field of view diagram for InspectorP621

- ① Field of view: horizontal x vertical in mm
- ② Complete area
- ③ Approximate resolution in mm/px
- ④ Working distance/Focus position in mm
- ⑤ Focal length of lens, here example for f = 17.1 mm
- ⑥ Narrow area

Interpretation aid for the field of view diagram

Using the diagram, you can determine the following data for each device type:

- The maximum working distance for a selected resolution
- The dimensions of the field of view that is available for this distance

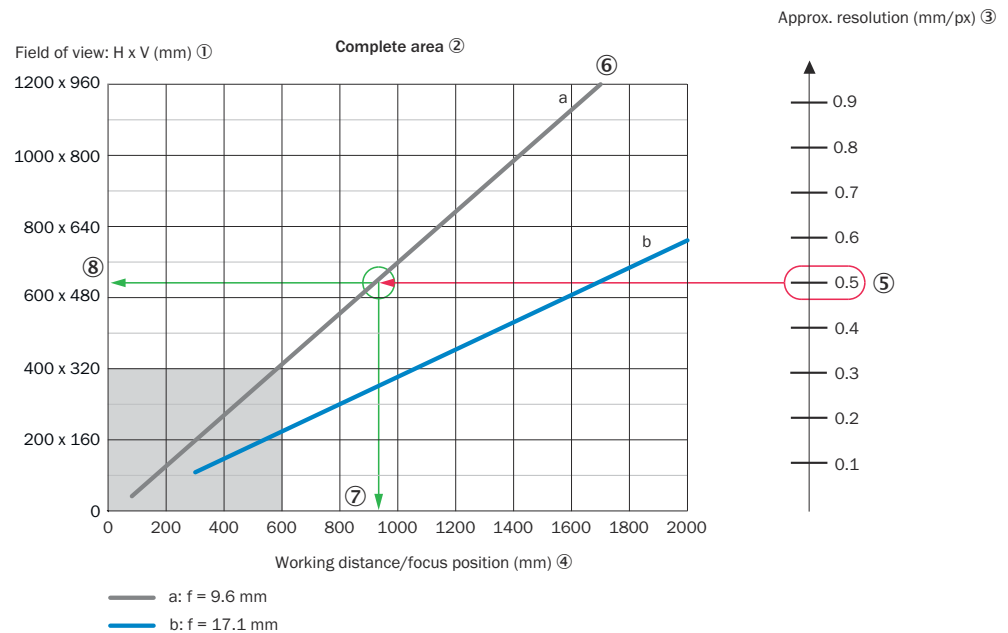


Figure 10: Example of field of view diagram

- ① Field of view: horizontal x vertical in mm
- ② Complete area
- ③ Approximate resolution in mm/px
- ④ Working distance/Focus position in mm
- ⑤ Selected resolution
- ⑥ Focal length of lens, here example for $f = 9.6$ mm
- ⑦ Reading off: resultant maximum working distance
- ⑧ Reading off: resultant field of view (mm x mm)

Given (in red):

- Resolution ⑤: approx. 0.5 mm/px
- Focal length of lens ⑥: 9.6 mm

Read off (in green):

- Maximum working distance ⑦: approx. 930 mm
- Field of view ⑧: approx. 640 mm x approx. 510 mm

Both axes of the diagrams must be interpreted linearly.

5.4 Mounting the device

1. Mount the device in a suitably prepared mounting system with M5 screws using the threaded mounting holes or sliding nuts provided.
 - Screw the screws no more than 5 mm into the threaded mounting holes or sliding nuts.
 - Use the threaded mounting holes in pairs on the top or bottom of the device or the two sliding nuts on the side of the device.
 - Attach the separately-ordered, optional SICK mounting system using the sliding nuts on the device. Mounting systems are available as accessories, see "Accessories", page 48.
2. Align the device taking into consideration the field of view (see "Field of view diagrams", page 21) and the application circumstances (see "Installation requirements", page 20).
3. Connect the device to interfaces and supply voltage when disconnected from voltage, see "Connecting the device", page 32.

- ✓ The Ready status LED lights up green.
- 4. Perform fine adjustment.

5.5 Mounting an external trigger sensor (optional)

If the device is triggered by an external trigger sensor, it is recommended to place the trigger sensor beyond the device (see left image).

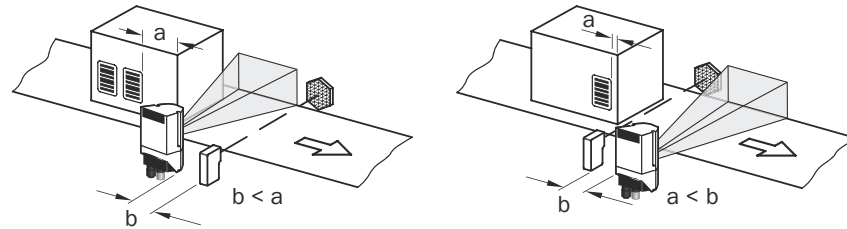


Figure 11: Mounting example for positioning an external trigger sensor for the read cycle

Place the trigger sensor so that the distance b between the trigger sensor and the device is smaller than the distance a between the device and the part of the object to be inspected. Adjust the mounting location of the external trigger sensor so that the correct part of the object is inspected when the object activates the trigger sensor (see left image).

The API contains functionality for delaying the external trigger signal. For SensorApps where this functionality is implemented, the sensor can delay the external trigger signal so that the mounting of the external trigger is more flexible (see right image).

6 Electrical installation

6.1 Wiring instructions

**NOTE**

Pre-assembled cables can be found on the product page.

The call is made 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).

**NOTE**

Pre-assembled cables with open cable end at one end:

Information about pin, signal and wire color assignments can be found in the appendix, see "[Signal assignment of cables with open cable end at one end](#)", page 49.

**NOTICE****Faults during operation and defects in the device or the system**

Incorrect wiring may result in operational faults and defects.

- Follow the wiring notes precisely.

The enclosure rating stated in the technical data is achieved only with screwed plug connectors or protective caps.

Configure the circuits connected to the device as ES1 circuits or as SELV circuits (SELV = Safety Extra Low Voltage). The voltage source must meet the requirements of ES1 and PS2 (EN 62368-1) or SELV and LPS (EN 60950-1).

Protect the device with an external slow-blow fuse at the beginning of the supply cable.

Connect the connecting cables in a de-energized state. Do not switch on the supply voltage until installation is complete and all connecting cables are connected to the device and control.

Perform all connection work only at ambient temperatures above 0 °C.

The supply voltage must be as specified in the technical data, see "[Technical data](#)", page 45.

Wire cross-sections in the supply cable from the customer's power system must be implemented in accordance with the applicable standards.

In the case of open end cables, make sure that bare wire ends do not touch. Wires must be appropriately insulated from each other.

Wire cross-sections of the data and switching signal cables have to also be designed in accordance with the applicable national standards.

6.1.1 Data cables

Important information



NOTE

Layout of data cables

- Use screened data cables with twisted-pair wires.
 - Implement the screening design correctly and completely.
 - To avoid interference, always use EMC-compliant cables and layouts. This applies, for example, to cables for switched-mode power supplies, motors, clocked drives, and contactors.
 - Do not lay cables over long distances in parallel with power supply cables and motor cables in cable channels.
-

Length of cable and data transmission rate

The maximum length of cable between device and host computer depends on the interface type and the data transmission rate.

Further topics

- For information on data transmission rates and lengths of cable: [Wiring the data interface](#)

6.2 Prerequisites for safe operation of the device



WARNING

Risk of injury and damage caused by electrical current!

As a result of equipotential bonding currents between the device and other grounded devices in the system, faulty grounding of the device can give rise to the following dangers and faults:

- Dangerous voltages are applied to the metal housings.
- Devices will behave incorrectly or be destroyed.
- Cable shielding will be damaged by overheating and cause cable fires.

Remedial measures

- Only skilled electricians should be permitted to carry out work on the electrical system.
 - If the cable insulation is damaged, disconnect the voltage supply immediately and have the damage repaired.
 - Ensure that the ground potential is the same at all grounding points.
 - Where local conditions do not meet the requirements for a safe earthing method, take appropriate measures. For example, ensure low-impedance and current-carrying equipotential bonding.
-

The device is connected to the peripheral devices (any local trigger sensor(s), system controller) via shielded cables. The cable shield – for the data cable, for example – rests against the metal housing of the device.

The device can be grounded through the cable shield or through a blind tapped hole in the housing, for example.

If the peripheral devices have metal housings and the cable shields are also in contact with their housings, it is assumed that all devices involved in the installation have the **same ground potential**.

This is achieved by complying with the following conditions:

- Mounting the devices on conductive metal surfaces
- Correctly grounding the devices and metal surfaces in the system
- If necessary: low-impedance and current-carrying equipotential bonding between areas with different ground potentials

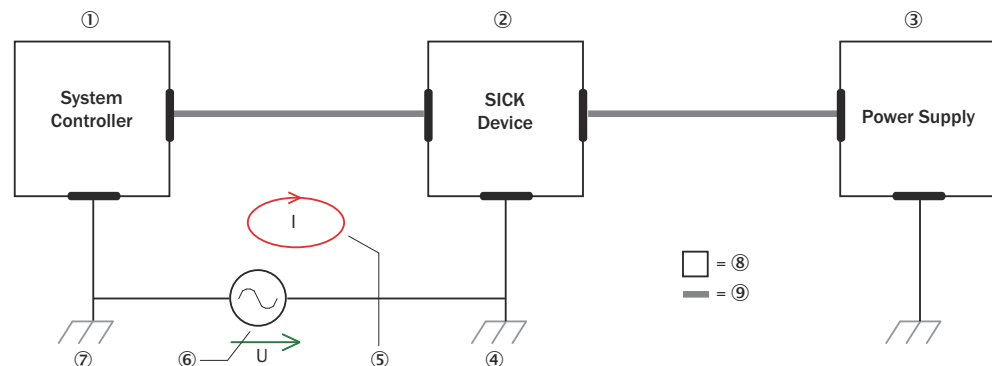


Figure 12: Example: Occurrence of equipotential bonding currents in the system configuration

- ① System controller
- ② Device
- ③ Voltage supply
- ④ Grounding point 2
- ⑤ Closed current loop with equalizing currents via cable shield
- ⑥ Ground potential difference
- ⑦ Grounding point 1
- ⑧ Metal housing
- ⑨ Shielded electrical cable

If these conditions are not fulfilled, equipotential bonding currents can flow along the cable shielding between the devices due to differing ground potentials and cause the hazards specified. This is, for example, possible in cases where there are devices within a widely distributed system covering several buildings.

Remedial measures

The most common solution to prevent equipotential bonding currents on cable shields is to ensure low-impedance and current-carrying equipotential bonding. If this equipotential bonding is not possible, the following solution approaches serve as a suggestion.



NOTICE

We expressly advise against opening up the cable shields. This would mean that the EMC limit values can no longer be complied with and that the safe operation of the device data interfaces can no longer be guaranteed.

Measures for widely distributed system installations

On widely distributed system installations with correspondingly large potential differences, the setting up of local islands and connecting them using commercially available **electro-optical signal isolators** is recommended. This measure achieves a high degree of resistance to electromagnetic interference.

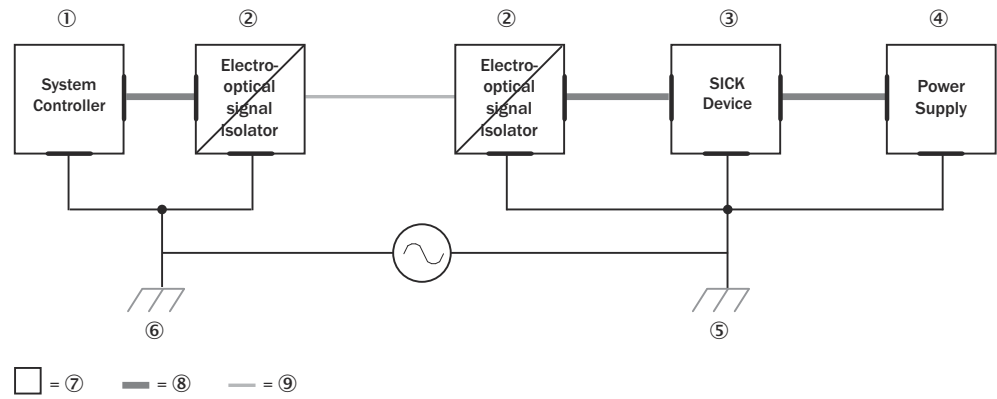


Figure 13: Example: Prevention of equipotential bonding currents in the system configuration by the use of electro-optical signal isolators

- ① System controller
- ② Electro-optical signal isolator
- ③ Device
- ④ Voltage supply
- ⑤ Grounding point 2
- ⑥ Grounding point 1
- ⑦ Metal housing
- ⑧ Shielded electrical cable
- ⑨ Optical fiber

The use of electro-optical signal isolators between the islands isolates the ground loop. Within the islands, a stable equipotential bonding prevents equalizing currents on the cable shields.

Measures for small system installations

For smaller installations with only slight potential differences, insulated mounting of the device and peripheral devices may be an adequate solution.

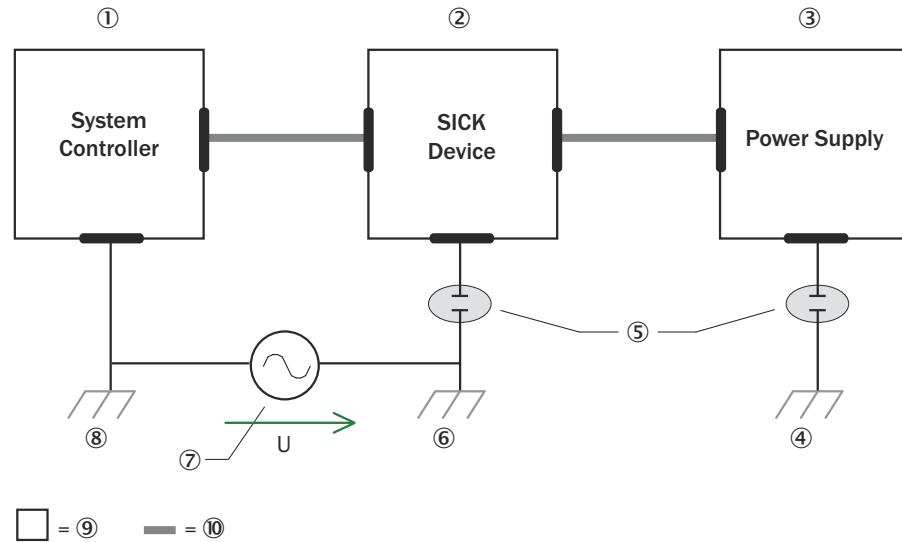


Figure 14: Example: Prevention of equipotential bonding currents in the system configuration by the insulated mounting of the device

- ① System controller
- ② Device
- ③ Voltage supply

- ④ Grounding point 3
- ⑤ Insulated mounting
- ⑥ Grounding point 2
- ⑦ Ground potential difference
- ⑧ Grounding point 1
- ⑨ Metal housing
- ⑩ Shielded electrical cable

Even in the event of large differences in the ground potential, ground loops are effectively prevented. As a result, equalizing currents can no longer flow via the cable shields and metal housing.



NOTICE

The voltage supply for the device and the connected peripheral devices must also guarantee the required level of insulation.

Under certain circumstances, a tangible potential can develop between the insulated metal housings and the local ground potential.

6.3 Note on the swivel connector



NOTICE

Damage to the swivel connector from over-rotation

- The swivel connector may be moved up to a maximum of 180° from end point to end point. Do not exceed the respective limit position.
- Carry out the rotational movement slowly.

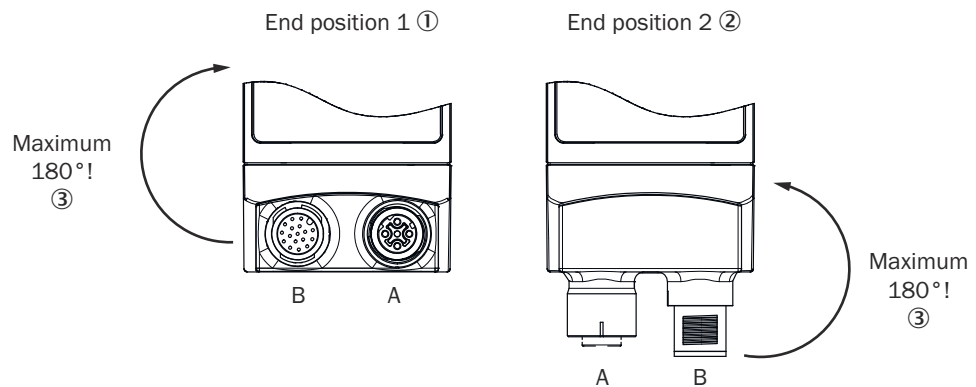


Figure 15: End positions of the swivel connector

- ① End position 1
- ② End position 2
- ③ Maximum 180°

6.4 Connection diagrams

6.4.1 Connection principle for operation mode

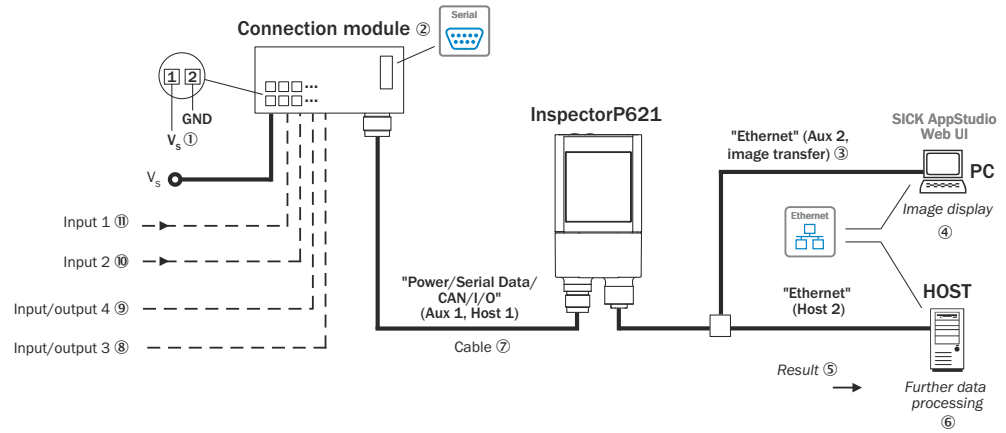


Figure 16: Connection block diagram

- ① Supply voltage V_s
- ② Connection module CDB650-204 or CDM420-0006
- ③ Ethernet-Aux port (image transmission)
- ④ Image display
- ⑤ Result
- ⑥ Further data processing
- ⑦ For CDB650-204: Connection cable 1:1 (female connector, M12, 17-pin, A-coded/male connector, M12, 17-pin, A-coded)
For CDM420-0006: Adapter cable (female connector, M12, 17-pin, A-coded/male connector, D-Sub-HD, 15-pin)
- ⑧ Digital input/output 3
- ⑨ Digital input/output 4
- ⑩ Digital input 2
- ⑪ Digital input 1, e.g., for connecting a trigger sensor

6.4.2 Example applications

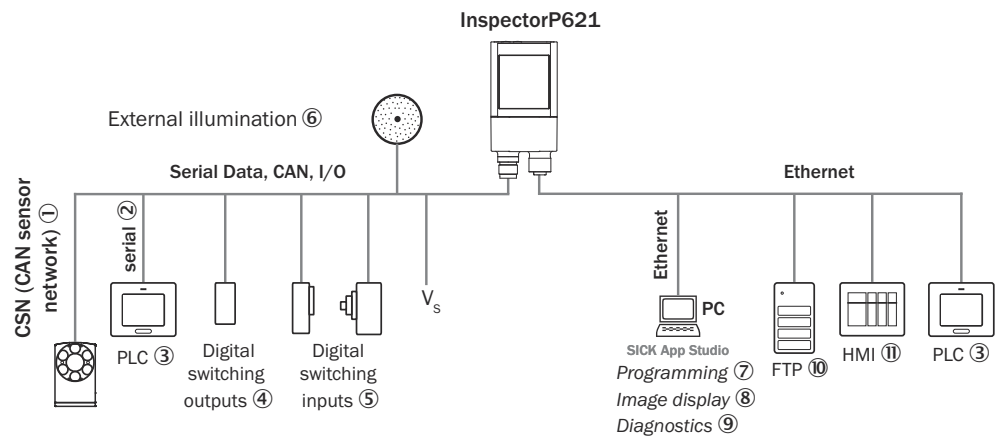


Figure 17: InspectorP621: connection options

- ① CSN (CAN sensor network)
- ② Serial
- ③ PLC (programmable logic controller)

- ④ Digital outputs, e.g. for signal lamps
- ⑤ Digital inputs e.g. for encoders, photoelectric sensors (trigger sensor)
- ⑥ External illumination unit, e. g. ICL
- ⑦ Programming
- ⑧ Image display
- ⑨ Diagnostics
- ⑩ FTP server (image storage)
- ⑪ HMI interface

6.5 Pin assignments of electrical connections

“Power/Serial data/CAN/I/O” connection

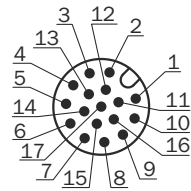


Figure 18: Male connector, M12, 17-pin, A-coded

Table 4: Pin assignment of the “Power/Serial data/CAN/I/O” connection

Pin	Signal	Function
1	GND	Ground
2	V _s	Supply voltage
3	CAN L	CAN bus (IN/OUT)
4	CAN H	CAN bus (IN/OUT)
5	TD+ (RS-422/485), host	Host interface (sender+)
6	TD- (RS-422/485), host TxD (RS-232), host	Host interface (sender-)
7	TxD (RS-232), Aux	AUX interface (sender)
8	RxD (RS-232), Aux	AUX interface (receiver)
9	SensGND	Digital input ground
10	Sensor 1	Digital input 1
11	RD+ (RS-422/485), host	Host interface (receiver+)
12	RD- (RS-422/485), host RxD (RS-232), host	Host interface (receiver-)
13	IN/OUT 3	Digital input/Digital output 3 (configurable)
14	IN/OUT 4	Digital input/Digital output 4 (configurable)
15	Sensor 2	Digital input 2
16	IN/OUT 5	Digital input/Digital output 5 (configurable)
17	IN/OUT 6	Digital input/Digital output 6 (configurable)
-	-	Shield

“Ethernet” connection

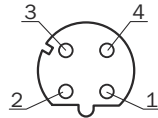


Figure 19: M12 female connector, 4-pin, D-coded

Female contact	Signal	Function
1	TD+	Sender+
2	RD+	Receiver+
3	TD-	Sender-
4	RD-	Receiver-

6.6 Connecting the device

6.6.1 Using CDB and CDM connection modules

Table 5: Possible combinations of device and connection modules

Connection on the device	Connection modules	Connection cable
Male connector, M12, 17-pin, A-coded	CDB650-204	Cable 1:1 ¹⁾
	CDM420-0006 ²⁾	Adapter cable ³⁾

¹⁾ Connection cable 1:1 (female connector, M12, 17-pin, A-coded / male connector, M12, 17-pin, A-coded).

²⁾ CDM420-0007: for connecting 2 devices.

³⁾ Adapter cable (female connector, M12, 17-pin, A-coded / male connector, D-Sub-HD, 15-pin).

Connecting device with connection module

Connection modules	Reference
CDB650-204	see "Connection of the device to CDB650-204", page 51
CDM420-0006	see "Connection of the device to CDM420-0006", page 59



NOTE

The operating instructions of the connection modules contains detailed information on mounting and electrical installation. The operating instructions are available as a download on the product page of the connection module.

Connection module product page

- www.sick.com/CDB
- www.sick.com/CDM

6.6.2 Connecting the supply voltage

The voltage source meets the requirements of ES1 and PS2 (EN 62368-1) or SELV and LPS (EN 60950-1).

Table 6: Required supply voltage V_S and power output

Supply voltage V_S	Power source: required power output ¹⁾
DC 12 V ... 24 V \pm 10%	Maximum 25 W

¹⁾ Valid for device with 4 loaded digital outputs (each 100 mA).

Table 7: Typical current consumption depending on supply voltage

Designation		Supply voltage (V_S) in [DC V]			
		10.8 (12 V -10%)	12	24	26.4 (24 V +10%)
Current consumption, digital outputs unloaded	$I_{B\text{ RMS}}$ [A]	0.36	0.32	0.17	0.15
Power loss, digital outputs unloaded	P_{RMS} [W]	3.84	3.84	4.08	4.05
Maximum current consumption, digital outputs unloaded	$I_{B\text{ Peak}}^{1)}$ [A]	0.97	0.90	0.45	0.4
Typical, all 4 digital outputs loaded (0.1 A per output)	$I_{B\text{ RMS }40\text{out}}$ [A]	0.76	0.72	0.57	0.56
Power loss, all 4 digital outputs loaded (0.1 A per output)	$P_{\text{Peak }40\text{out}}$ [W]	8.12	8.64	13.68	14.6

¹⁾ Valid for the power supply unit rating, supply cable and fuse protection at the start of the cable.

Protecting the supply cables

To ensure protection against short-circuits/overload in the customer's supply cables, appropriately choose and protect the wire cross-sections used.

The following standards must be observed in Germany:

Observe applicable standards (Germany):

- DIN VDE 0100 (part 430)
- DIN VDE 0298 (part 4) and DIN VDE 0891 (part 1)

Connecting device without connection module

For a supply voltage of DC 12 V to 24 V \pm 10%, protect the device with a separate 2 A fuse.

- Install the fuse in the supply circuit at the start of the supply cable.

Connecting device with connection module

The supply voltage for the device is protected in the connection modules in the circuit after switch S1.

Table 8: Protection of the supply voltage in the connection module

Connection modules	Supply voltage fuse protection	Reference
CDB650-204	2 A (slow-blow)	see "Connecting supply voltage for the device in CDB650-204", page 54
CDM420-0006	2 A (slow-blow)	see "Connecting supply voltage for the device in CDM420-0006", page 62

6.6.3 Wiring the data interface

Wiring the Internet interface

1. Connect the device to the Ethernet connection of the computer via the adapter cable.
2. Set up communication via the SICK AppManager software.



NOTE

The Ethernet interface of the device has an Auto-MDIX function. This automatically adjusts the transmission speed as well as any necessary crossover connections.

Wiring the serial data interface

The maximum data transmission rate for the serial interface depends on the length of cable and on the type of interface.

Table 9: Data transmission rates and recommended maximum lengths of cable

Interface	Data transmission rate	Distance to the target computer (host)
-----------	------------------------	--



NOTICE

Risk of damage to the internal interface modules!

If the serial data interfaces are wired incorrectly, then electronic components in the device could get damaged.

- Observe the information on wiring.
- Carefully check the wiring prior to switching on the device.



NOTE

Control the serial data interface in the device with the API functions. In order to activate the serial data interface, use an installed SensorApp which contains this function.

Wiring data interfaces via a connection module

Connection modules	Data interface	Reference
--------------------	----------------	-----------

6.6.4 Wiring the CAN interface



NOTE

Control the CAN data interface in the device with the API functions. In order to activate the CAN data interface, use an installed SensorApp which contains this function.

Wiring CAN interfaces via a connection module

Connection modules	Interface	Reference
CDB650-204	CAN	see "Wiring the CAN interface of the device in the CDB650-204", page 56
CDM420-0006	CAN	see "Wiring the CAN interface of the device in the CDM420-0006", page 64

6.6.5 Wiring the digital inputs

Position of digital inputs

- Male connector of the device (M12, 17-pin, A-coded)
- Adapter cable (female connector, M12, 17-pin, A-coded/male connector, D-Sub-HD, 15-pin)
- Open end of the adapter cable (female connector, M12, 17-pin, A-coded/open end)

All digital inputs are available at the individual positions.

Function assignment



NOTE

Control the digital inputs in the device with the API functions. In order to assign the digital inputs functions, use an installed SensorApp which contains this function.

6.6.6 Wiring the digital outputs

Position of digital outputs

- Male connector of the device (M12, 17-pin, A-coded)
- Open end of the adapter cable (female connector, M12, 17-pin, A-coded/open end)
- CDB650-204 connection module

All digital outputs are each available at the individual positions.

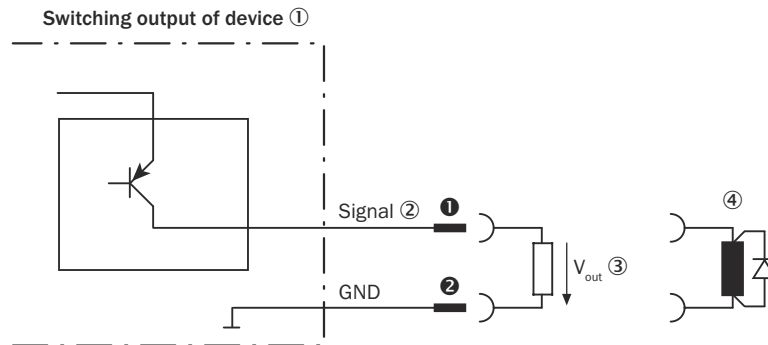


Figure 20: Wiring a digital output

- ① Digital output of the device via a configurable digital input/output
- ② Output signal
- ③ Output voltage V_{out}
- ④ With inductive load: see note
- ①... ② For pin assignment, see respective device

Table 10: Characteristic data of the digital outputs

Switching behavior	PNP switching to supply voltage V_S Default: No function Logic: not inverted (active high)
Features	<ul style="list-style-type: none"> • Short-circuit protected • Not electrically isolated from V_S ¹⁾
Electrical values	$0\text{ V} \leq V_{out} \text{ } ^{2)} \leq V_S$

¹⁾ Supply voltage.

²⁾ Output voltage.



NOTE

Provide an arc-suppression switch at the digital output if inductive load is present.

- Attach a freewheeling diode directly to the load for this purpose.



NOTE

Capacitive loads on the digital outputs have an effect on the switch-on and switch-off behavior. A maximum capacitance of 100 nF is the limit value.

Function assignment



NOTE

Control the digital outputs in the device with the API functions. In order to assign the digital output functions, use an installed SensorApp which contains this function.

7 Commissioning



NOTE

Update the device firmware version before you start using the device. Always use the latest version, unless there is a specific need to use an older version. Download the latest version of the firmware from the SICK Support Portal (supportportal.sick.com) and install it using SICK AppManager.

InspectorP6xx is a programmable device. To use it, the following options are available:

- Using the default SensorApp Quality Inspection (see "[Default SensorApp: Quality Inspection](#)", page 38).
- Using other SensorApps that are available for the device (see "[Installing SensorApps](#)", page 38).
- Programming SensorApps for the device (see "[Programming the device](#)", page 39).

7.1 Computer software

SICK AppManager

The SICK AppManager software can be used for the following actions:

- Installing a SensorApp on a device.
- Reading and changing the device's IP address.
- Starting, stopping or deleting an installed SensorApp.
- Installing firmware updates.

Download SICK AppManager from www.sick.com/SICK_AppManager. To install SICK AppManager on the computer, open the installation (.exe) file and follow the instructions on the screen.

SICK AppStudio

The SICK AppStudio development environment is used to program the device and to perform diagnostics in case of faults.

The use of SICK AppStudio requires a valid license. A one-year license (art no 1610199) is available from www.sick.com/SICK_AppStudio. After purchasing the license, download the SICK AppStudio software from the SICK Support Portal, supportportal.sick.com.

After downloading SICK AppStudio, follow the on-screen instructions to complete the installation.

7.2 Network communication settings

To connect to the device from a computer, make sure that the network communication settings are correctly set up:

- The device must be connected to the computer via Ethernet.
- The computer must be on the same network as the device.
- The computer must not use the same IP address as the device. The device's default IP is 192.168.0.1.

Editing the device's IP address

To change the device's IP address using SICK AppManager:

1. Open SICK AppManager.
- ✓ All connected devices on the network are listed on the **Device search** tab.

2. Select the correct device in the list.
3. Click **Edit IP address**.
4. Enter the new IP address for the device.

7.3 Default SensorApp: Quality Inspection

The Quality Inspection SensorApp is pre-installed on the InspectorP6xx devices and is also available for download from SICK AppPool. The Quality Inspection SensorApp uses vision-based quality inspection to ensure that produced items have the exact qualities required regarding presence and measurements of details.

Opening the user interface

Quality Inspection is configured through a web-based graphical user interface. To open the user interface from a web browser:

1. Open a web browser window.
2. Type the IP address of the device. The default IP address is 192.168.0.1.

Using tools

Quality Inspection contains a selection of software tools for image analysis, result output, and communication. A help text for each tool is accessible directly from the GUI. The tools are also listed and described in the Quality Inspection Operating Instructions, art no 8025687.

Quality Inspection is based on SICK Nova, which allows the user to create and import additional tools. For a description of how to import a tool through SICK AppManager, see the Quality Inspection Operating Instructions. Information on SICK Nova tool development is available from the SICK Support Portal, supportportal.sick.com.

7.4 Installing SensorApps

7.4.1 Available SensorApps

The available SensorApps for the device can be downloaded from SICK AppPool (<http://apppool.cloud.sick.com/>). The use of SICK AppPool requires a SICK ID, which can be obtained at the login page at the link above.

The **Apps** tab on each device page on www.sick.com contains a list of available SensorApps for the device.

7.4.2 Installing or updating a SensorApp on the device

A SensorApp must be downloaded to the computer before installing it on the device. There are two different options for downloading a SensorApp:

- Online option: If the computer has Internet access when connected to the device, the SensorApp can be downloaded and installed directly from SICK AppPool as part of the installation procedure described below.
- Offline option: If the computer does not have Internet access when connected to the device, the SensorApp must be downloaded from the SICK AppPool to the computer via a web browser prior to the installation.

To install or update a SensorApp using SICK AppManager:

1. Connect the device to the PC via Ethernet.
2. On the computer, open SICK AppManager.
3. Under the **Device Search** tab in SICK AppManager, click **Scan** to search for available devices on the network.
4. In the list of available devices, select the device where you want to install the SensorApp.

5. If the device tab (lower left pane) contains any active applications, right-click the applications and delete them.
 6. Online option: To download and install the SensorApp directly from the AppPool:
 - a) Click **Login to SICK ID** (below the **Utils** menu in SICK AppManager) to log in to SICK AppPool.
 - b) Click the **AppPool** tab.
 - c) Select a SensorApp in the list of available SensorApps.
 - d) Click **Download and install** to download the selected SensorApp to the computer and install it on the device.
- Or:
- Offline option: To install a downloaded SensorApp from the PC to the device:
- a) Click the **Local Packages** tab in SICK AppManager.
 - b) Drag and drop the **SensorApp** into the file list.
 - c) Click **Install** to install the SensorApp on the device.
- ✓ The SensorApp is now installed and running on the device.

7.4.3 Opening the web user interface

To access the user interface for an installed SensorApp:

1. Open a Google Chrome web browser window.
2. Type the IP address of the device. The default IP address is 192.168.0.1.

7.5 Programming the device

7.5.1 Starting SICK AppStudio

Before starting SICK AppStudio:

- Make sure that the network communication settings are correct (see "[Network communication settings](#)", page 37).
- When starting SICK AppStudio for the first time, a license dialog opens. To be able to use the software, make sure to have a valid license available (see "[Computer software](#)", page 37).

7.5.2 Lua scripting

The embeddable scripting language Lua is used to create scripts in SICK AppStudio. See www.lua.org for more information about Lua.

7.5.3 Programming API

SICK AppSpace has a large application programming interface (API) which includes algorithms and functionality for hardware configuration, result processing, and result communication. The API consists of functional groups called crowns, where each crown contains functions and events related to a specific topic.

The complete API documentation for each InspectorP6xx firmware release is available in the SICK Support Portal, supportportal.sick.com.



NOTE

The API is directly accessible from SICK AppStudio. To access it, click a free place in a lua file and press Ctrl+Space to display a list of all accessible functions and commands for the device.

7.5.4 Tutorials and code samples

Tutorials and code samples for general and device-specific topics are available to help the user get started with the programming of the device:

- Tutorials are available from the SICK Support Portal: supportportal.sick.com/pages/appspace/documentation-and-more.
- Code samples are available from Gitlab: gitlab.com/sick-appspace/samples.

The above pages can be accessed directly from the **Help** menu in SICK AppStudio.

8 Maintenance

8.1 Maintenance plan

During operation, the device works maintenance-free.



NOTE

No maintenance is required to ensure compliance with the laser class.



NOTE

No maintenance is required to ensure compliance with the LED risk group.

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

Table 11: 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 and viewing window.	Depends on ambient conditions and climate.	Specialist
Check the screw connections and plug connectors.	Depends on the place of use, ambient conditions or operating requirements. 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

8.2 Cleaning

Cleaning includes the viewing window and the housing of the device.



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. Use a dry cloth or an industrial vacuum cleaner for cleaning. Do not use cleaning agents.

Cleaning the viewing window

Check the viewing window of the device for accumulated dirt at regular intervals. This is especially important in harsh operating environments (dust, abrasion, damp, fingerprints, etc.).

The viewing window lens must be kept clean and dry during operation.



NOTE

Static charging may cause dust particles to stick to the viewing window. This effect can be reduced by using an anti-static cleaning agent in combination with the SICK lens cloth (part number 4003353).

The viewing window is made of plastic, see "Technical data", page 45.

Cleaning procedure:



CAUTION

Optical radiation: LED risk group 1, visible radiation, 400 nm to 780 nm

The LEDs may pose a danger to the eyes in the event of incorrect use.

- Do not look into the light source intentionally.
 - Do not open the housing. Opening the housing will not switch off the light source. Opening the housing may increase the level of risk.
 - Comply with the current national regulations on photobiological security of lamps and lamp systems.
-

If the product is operated in conjunction with external illumination systems, the risks described here may be exceeded. This must be taken into consideration by users on a case-by-case basis.



CAUTION

Optical radiation: Class 1 Laser Product

The accessible radiation does not pose a danger when viewed directly for up to 100 seconds. It may pose a danger to the eyes and skin in the event of incorrect use.

- Do not open the housing. Opening the housing may increase the level of risk.
 - Current national regulations regarding laser protection must be observed.
-

For both radiation types:

It is not possible to entirely rule out temporary disorienting optical effects, particularly in conditions of dim lighting. Disorienting optical effects may come in the form of dazzle, flash blindness, afterimages, photosensitive epilepsy, or impairment of color vision, for example.

- ▶ Switch off the device for the duration of the cleaning operation. If this is not possible, use suitable laser protection goggles. These must absorb radiation of the device's wavelength effectively.
 - ▶ Clean the viewing window only with a clean, damp, lint-free cloth, and a mild anti-static lens cleaning fluid.
-



NOTICE

If the inspection window is scratched or damaged (cracked or broken), the lens must be replaced. Contact SICK Support to arrange this.

- If the inspection window is cracked or broken, take the device out of operation immediately for safety reasons and have it repaired by SICK.
-

Cleaning the housing

In order to ensure that heat is adequately dissipated from the device, the housing surface must be kept clean.

- ▶ Clear the build up of dust on the housing with a soft brush.

9 Troubleshooting

9.1 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**

Before calling, make a note of all type label data such as type code, serial number, etc., to ensure faster processing.

9.2 Repairs

Repair work on the device may only be performed by qualified and authorized personnel from SICK AG. Interruptions or modifications to the device by the customer will invalidate any warranty claims against SICK AG.

9.3 Returns

- ▶ Only send in devices after consulting with SICK Service.
- ▶ The device must be sent in the original packaging or an equivalent padded packaging.

**NOTE**

To enable efficient processing and allow us to determine the cause quickly, please include the following when making a return:

- Details of the contact person
 - Description of the application
 - Description of the fault that occurred
-

10 Decommissioning

10.1 Disposal

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 call is made 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

Type	Value
Task	Quality inspection Position determination Measuring, 2D Code reading ¹
Technology	2D snapshot, image analysis
Shutter technology	Global shutter
Product category	Programmable, configurable
Pre-installed SensorApp	Quality Inspection, based on SensorApp framework SICK Nova that enables functional extensions via tool plug-ins and custom development
Toolkit	HALCON
Sensor	CMOS matrix sensor, grayscale values
Focus	Adjustable focus (electric) ²
Working distance	300 mm ... 1.500 mm ³
Integrated illumination unit	4 LEDs (2 on the left, 2 on the right) Light color combination, type-dependent, identifier see "Type code", page 12: <ul style="list-style-type: none"> • Visible blue light ($\lambda = 470 \text{ nm} \pm 15 \text{ nm}$) • Visible red light ($\lambda = 617 \text{ nm} \pm 15 \text{ nm}$) • Invisible infrared light ($\lambda = 850 \text{ nm} \pm 25 \text{ nm}$)
Feedback LED (spot in field of view)	1 LED: Visible green light ($\lambda = 525 \text{ nm} \pm 15 \text{ nm}$)
Laser alignment aid (2 points in the field of view)	2 LEDs, can be deactivated: Visible red light ($\lambda = 630 \text{ nm} \dots 680 \text{ nm}$)
Light source	Illumination LEDs: visible red light ($\lambda = 617 \pm 15 \text{ nm}$), visible blue light ($\lambda = 470 \pm 15 \text{ nm}$) Feedback spot: visible green light ($\lambda = 525 \pm 15 \text{ nm}$) Aiming laser: visible red light ($\lambda = 630 \dots 680 \text{ nm}$)
LED class	Risk group 1 (IEC 62471:2006-07, EN 62471:2008-09)
Laser class	Class 1 Laser Product, according to EN/IEC 60825-1:2014. Complies with 21 CFR 1040.10/11 except for conformance with IEC 60825-1 Ed.3., as described in Laser Notice No.56, dated May 8, 2019.
Spectral range	Approx. 400 nm ... 900 nm

Type	Value
Lens	Integrated

- 1 Not yet available in pre-installed Quality Inspection SensorApp.
- 2 The focusing engine allows an app to control the image focus distance in an auto-focus manner. The focusing engine should only be used for teach-style or batch change autofocus, and not as part of a frequent measurement cycle.
- 3 For details, see ["Field of view diagrams", page 21](#).

11.2 Mechanics and electronics

Type	Value
Electrical connection	1 x M12, 17-pin male connector (serial, I/Os, voltage supply) 1 x M12, 4-pin female connector (Ethernet)
Supply voltage	DC 12 V ... 24 V, ± 10% Voltage source as per ES1 and PS2 or lower (EN62368-1), or as per SELV (EN60950-1)
Power consumption	Typ. 4 W
Enclosure rating	IP65
Weight	170 g
Housing material	Aluminum die cast
Window material	Glass

11.3 Performance

Type	Value
Image sensor resolution	see "Type code", page 12
Scan/frame rate	50 Hz

11.4 Interfaces

Type	Value
Serial ¹	RS-232, RS-422 Data transmission rate: 300 Baud ... 115.2 kBaud
Ethernet	TCP/IP Function: FTP ¹ , HTTP Data transmission rate: 10/100 MBit/s
CAN ¹	Function: SICK CAN sensor network (master/slave)
EtherNet/IP	Data transmission rate: 10/100 MBit/s
EtherCAT ^{®1}	Type of fieldbus integration: Optional over external fieldbus module CDF600
PROFINET	Built-in, additionally available (optional) via external fieldbus module CDF600-2200
PROFIBUS DP ¹	Type of fieldbus integration: Optional over external fieldbus module CDF600-2
Operator interfaces	Web server
Configuration software	Web GUI (SensorApp configuration), SICK AppStudio (programming)
Data storage and retrieval	Image and data logging via microSD memory card Image and data logging via external FTP ¹
Output current	≤ 100 mA

Type	Value
Maximum encoder frequency	300 Hz
Operating elements	2 buttons ¹
Optical indicators	16 LEDs (5 x status display, 10 x LED bar graph, 1 green/red feedback spot)
Acoustic indicators	Beeper ¹

¹ Not yet available in pre-installed Quality Inspection SensorApp

11.5 Ambient data

Type	Value
Shock load	EN 60068-2-27: 2009-05
Vibration load	EN 60068-2-6: 2008-02
Ambient operating temperature	0 °C ... +50 °C ¹
Storage temperature	-20 °C ... +70 °C ¹

¹ Permissible relative humidity: 0% ... 90%, non-condensing

12 Accessories



NOTE

On the product page you will find accessories and, if applicable, related installation information for your product.

The call is made 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).

13 Annex

13.1 Declarations of conformity and certificates

You can download declarations of conformity and certificates via the product page.

The call is made 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).

13.2 Signal assignment of cables with open cable end at one end

13.2.1 “Power/SerialData/CAN/I/O” connection to customer-specific connection equipment or control cabinet

Adapter cable suitable for drag chain

Part no. 2070425 (3 m), part no. 2070426 (5 m), part no. 2070427 (10 m), shielded, suitable for drag chain, suitable for 2 A

Ambient temperature range:

For mobile installation: -25 °C to +80 °C, for fixed installation: -40 °C to +80 °C

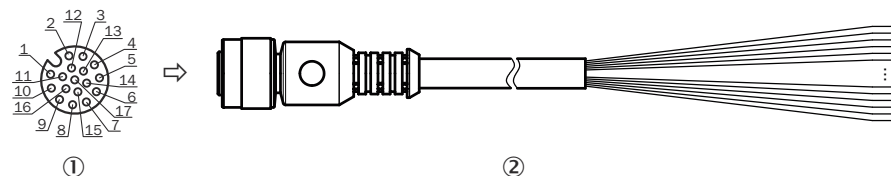


Figure 21: Adapter cable, e.g. part no. 2070425 (3 m)

- ① Female connector, M12, 17-pin, A-coded (view from front)
- ② Illustration may differ

Table 12: Signal assignment of adapter cable with open end

Pin	Signal	Function	Wire color
1	GND	Ground	Blue
2	V _S	Supply voltage	Brown
3	CAN L	CAN bus (IN/OUT)	Green
4	CAN H	CAN bus (IN/OUT)	White
5	TD+ (RS-422/485), host	Host interface (sender+)	Pink
6	TD- (RS-422/485), host TxD (RS-232), host	Host interface (sender-)	Yellow
7	TxD (RS-232), Aux	AUX interface (sender)	Black
8	RxD (RS-232), Aux	AUX interface (receiver)	Gray
9	SensGND	Digital input ground	White-black
10	Sensor 1	Digital input 1	Violet
11	RD+ (RS-422/485), host	Host interface (receiver+)	Gray-pink
12	RD- (RS-422/485), host RxD (RS-232), host	Host interface (receiver-)	Red-blue
13	Result 1	Digital output 1	White-green

Pin	Signal	Function	Wire color
14	Result 2	Digital output 2	Brown-green
15	Sensor 2	Digital input 2	White-yellow
16	N. c.	-	Yellow-brown
17	N. c.	-	White-gray

13.2.2 “Power/SerialData/CAN/I/O” connection to customer-specific connection equipment or control cabinet

Adapter cable, straight female connector, open

Part no. 2075220 (5 m), shielded, suitable for 2 A, suitable for drag chain, deep-freeze compatible

Permitted currents for ambient temperature +40 °C:

- Contact 1 (blue) and contact 2 (brown): 2 A
- All other contacts: 1.5 A

Ambient temperature range:

For mobile installation: -25 °C to +40 °C, for fixed installation: -35 °C to +40 °C

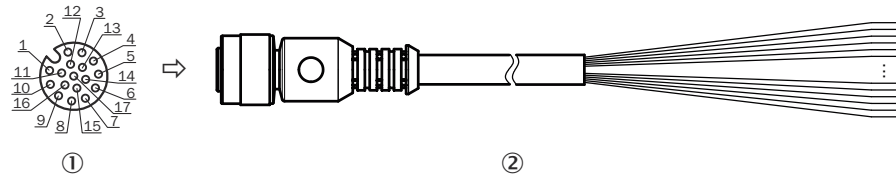


Figure 22: Adapter cable, part no. 2075220

- ① Female connector, M12, 17-pin, A-coded (view from front)
- ② Illustration may differ
- ③ Illustration may differ

Table 13: Signal assignment of adapter cable with open end

Pin	Signal	Function	Wire color
1	GND	Ground	Brown
2	V _S	Supply voltage	Blue
3	CAN L	CAN bus (IN/OUT)	White
4	CAN H	CAN bus (IN/OUT)	Green
5	-	-	Pink
6	TxD (RS-232), host	Host interface (sender)	Yellow
7	-	-	Black
8	-	-	Gray
9	SensGND	Digital input ground	Red
10	Sensor 1	Digital input 1	Violet
11	-	-	Gray-pink
12	RxD (RS-232), host	Host interface (receiver)	Red-blue
13	Result 1	Digital output 1	White-green
14	Result 2	Digital output 2	Brown-green
15	Sensor 2	Digital input 2	White-yellow
16	Result 3	Digital input 3	Yellow-brown

Pin	Signal	Function	Wire color
17	N. c.	-	White-gray

13.2.3 Host interface RS-232 via connection module CDB/CDM to host (computer)

Adapter cable, straight female connector, open end

Part no. 2020319 (3 m), unshielded

Ambient temperature range:

For fixed installation: -25 °C to +40 °C

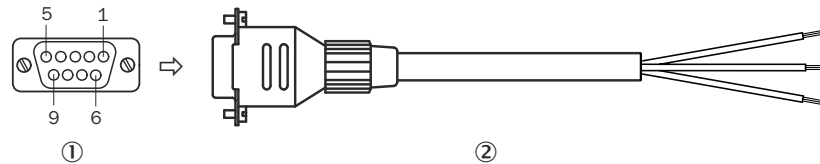


Figure 23: Adapter cable, part no. 2020319

- ① Female connector, D-Sub, 9-pin (front view)
- ② Illustration may differ
- ② Illustration may differ

Table 14: Signal assignment of adapter cable with open end

Pin	Signal at computer	Function	Wire color
1	-	-	-
2	RxD (RS-232), host	Host interface (receiver)	Brown ¹⁾
3	TxD (RS-232), host	Host interface (sender)	Blue ²⁾
4	-	-	-
5	GND	Ground	Black
6 ... 9	-	-	-

¹⁾ Connect to the "TxD Host" terminal in the CDB/CDM connection module

²⁾ Connect to the "RxD Host" terminal in the CDB/CDM connection module

13.3 Connection diagrams of connection module CDB650-204

13.3.1 Connection of the device to CDB650-204

Device = InspectorP621 = V2D621P-xxxxBx

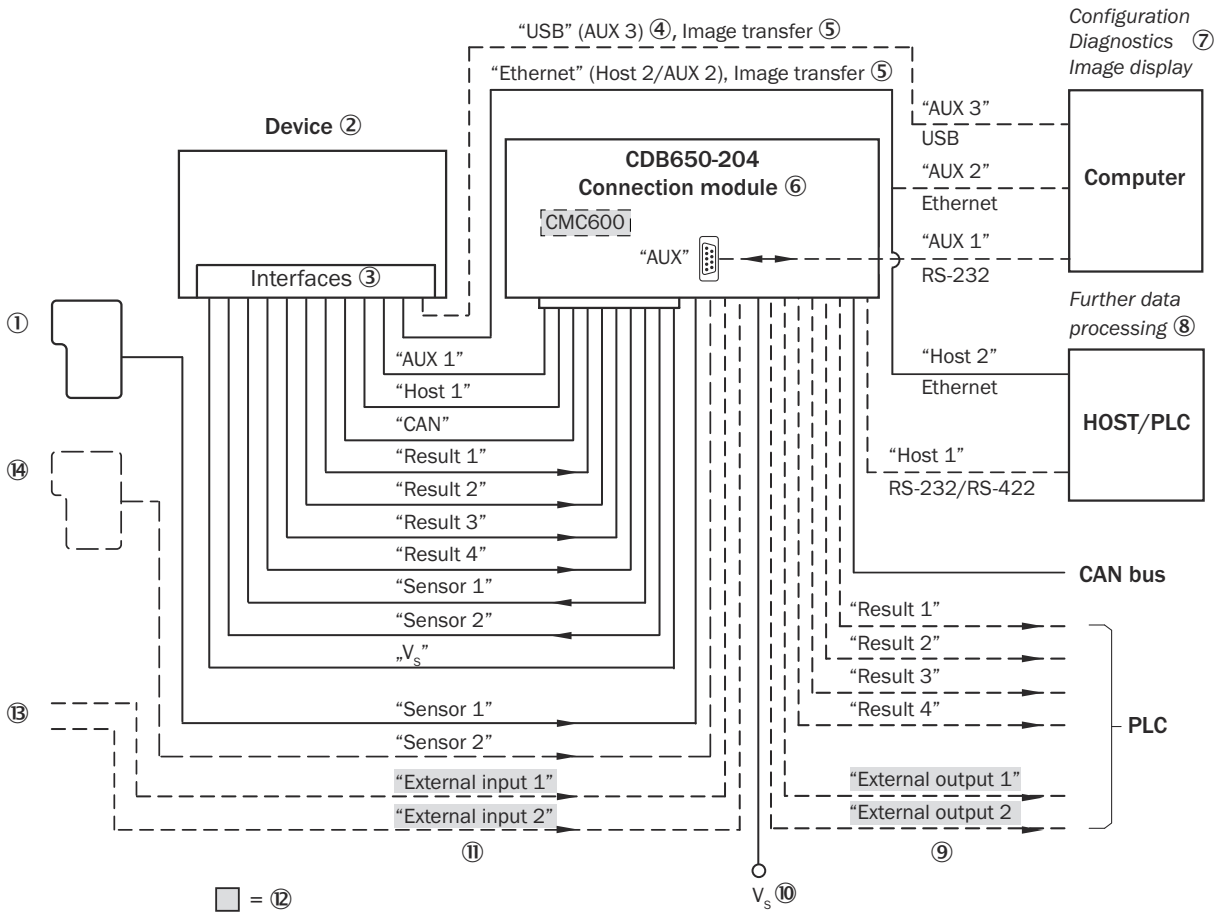


Figure 24: Connection of the device (Ethernet variant) to peripherals via CDB650-204 (overview).

- ① External trigger sensor
- ② Device
- ③ Interfaces
- ④ USB interface (not supported)
- ⑤ Image transmission
- ⑥ Connection modules
- ⑦ Configuration, diagnostics or image display
- ⑧ Data further processing
- ⑨ External digital outputs (not supported)
- ⑩ Supply voltage V_s
- ⑪ External digital inputs (not supported)
- ⑫ Optional CMC600 parameter cloning module to enable the external digital inputs and digital outputs of the device to be used (not supported).
- ⑬ Other functions
- ⑭ Can also be used as an alternative stop trigger (e.g., photoelectric sensor) or travel increment (incremental encoder), depending on the application

13.3.2 Wiring overview of the CDB650-204

Device = InspectorP621 = V2D621P-xxxxBx, 1 digital input used

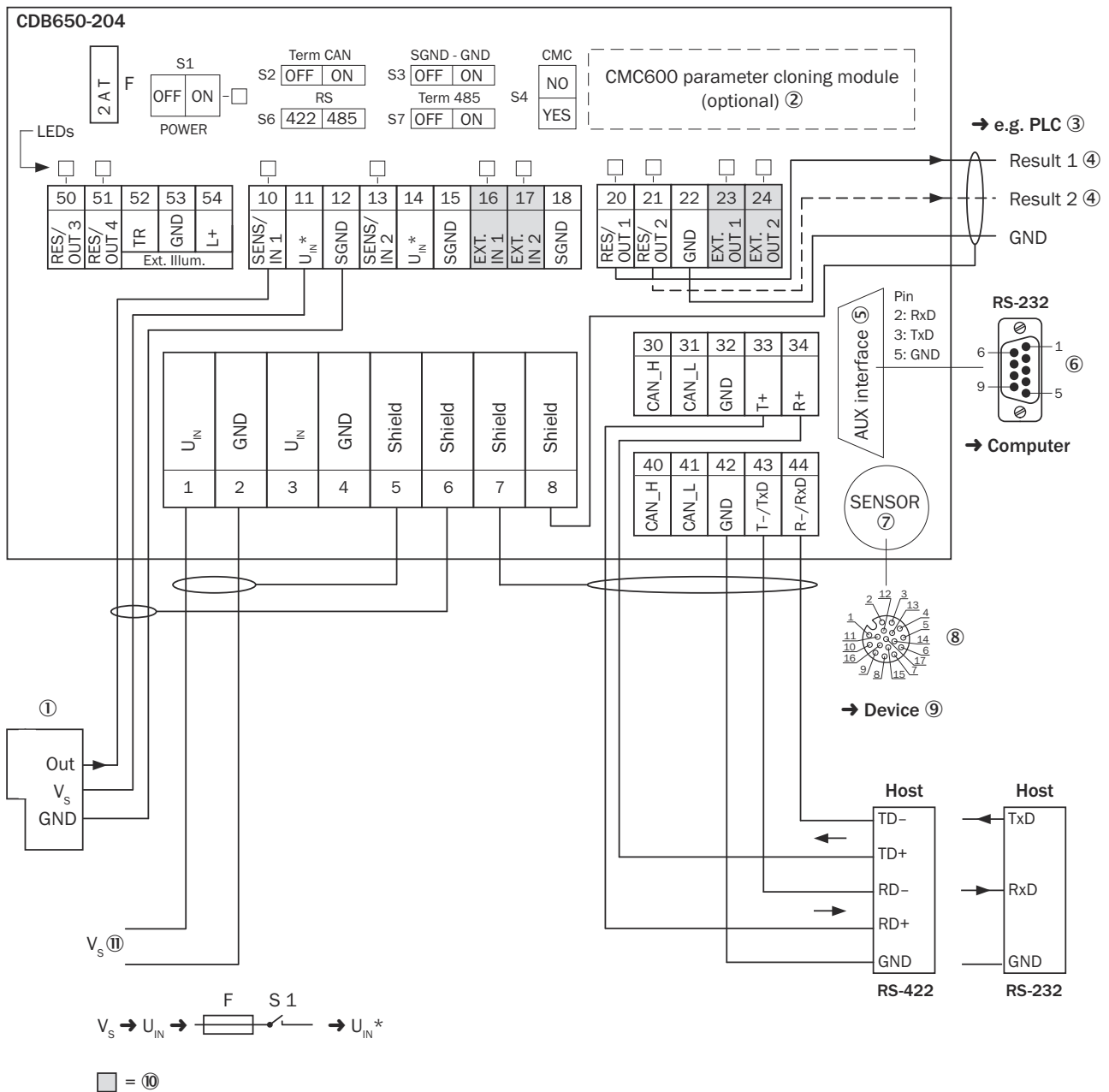


Figure 25: Connection of device and peripherals to the CDB650-204 connection module (overview).

- ① External trigger sensor
- ② Parameter cloning module CMC600 (optional), not supported
- ③ E.g., PLC (programmable logic controller)
- ④ Name of the digital output
- ⑤ Auxiliary interface "AUX"
- ⑥ Male connector, D-Sub, 9-pin
- ⑦ SENSOR = Device
- ⑧ Female connector, M12, 17-pin, A-coded
- ⑨ Device to be connected
- ⑩ External digital inputs and digital outputs of the device, not supported
- ⑪ Supply voltage V_s

13.3.3 Connecting supply voltage for the device in CDB650-204

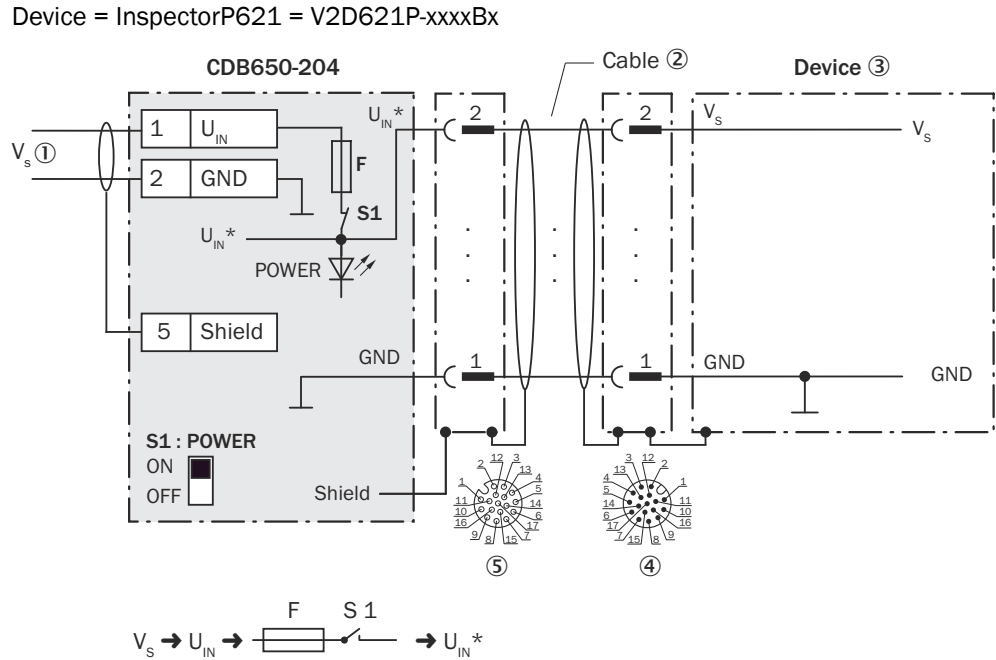


Figure 26: Connecting supply voltage for the device in CDB650-204 connection module.

- ① Supply voltage V_s
- ② Connection cable 1:1 (male connector, M12, 17-pin, A-coded / female connector, M12, 17-pin, A-coded)
- ③ Device
- ④ Device: male connector, M12, 17-pin, A-coded
- ⑤ Connection module: female connector, M12, 17-pin, A-coded

Function of switch S1

Table 15: Switch S1: Power

Switch setting	Function
ON	Supply voltage U_{IN} connected to CDB650-204 and device via fuse and switch S1 as a supply voltage U_{IN}^* Supply voltage U_{IN}^* can be additionally tapped at terminals 11 and 14.
OFF	CDB650-204 and device disconnected from supply voltage Recommended setting for all connection work

13.3.4 Wiring serial host interface RS-232 of the device in CDB650-204

Device = InspectorP621 = V2D621P-xxxxBx

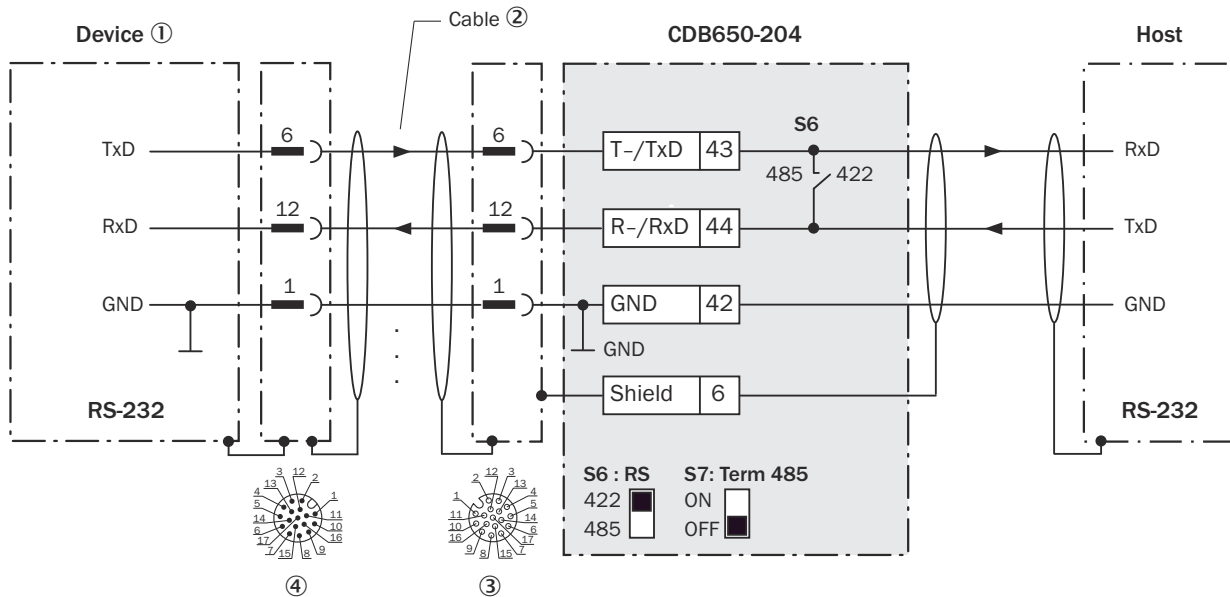


Figure 27: Wiring data interface RS-232 of the device in connection module CDB650-204.

- ① Device
- ② Connection cable 1:1 (female connector, M12, 17-pin, A-coded/male connector, M12, 17-pin, A-coded)
- ③ Connection module: female connector, M12, 17-pin, A-coded
- ④ Device: male connector, M12, 17-pin, A-coded



NOTE

Control the RS-232 data interface in the device with the API functions. In order to activate the RS-232 data interface, use an installed SensorApp which contains this function.

13.3.5 Wiring serial host interface RS-422 of the device in CDB650-204

Device = InspectorP621 = V2D621P-xxxxBx

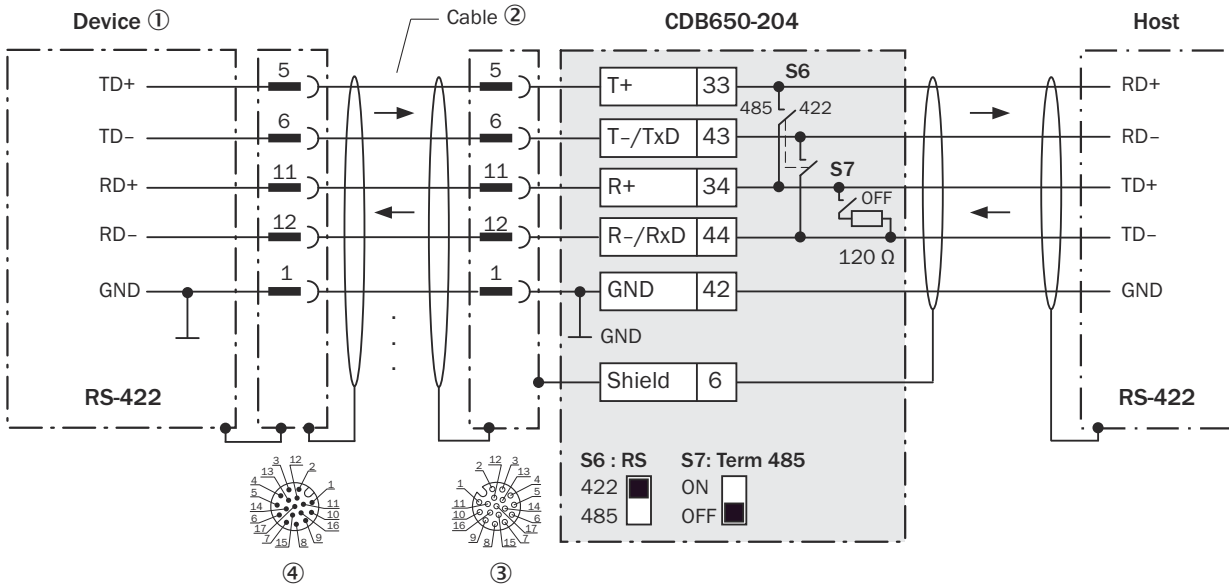


Figure 28: Wiring data interface RS-422 of the device in connection module CDB650-204.

- ① Device
- ② Connection cable 1:1 (female connector, M12, 17-pin, A-coded / male connector, M12, 17-pin, A-coded)
- ③ Connection module: female connector, M12, 17-pin, A-coded
- ④ Device: male connector, M12, 17-pin, A-coded



NOTE

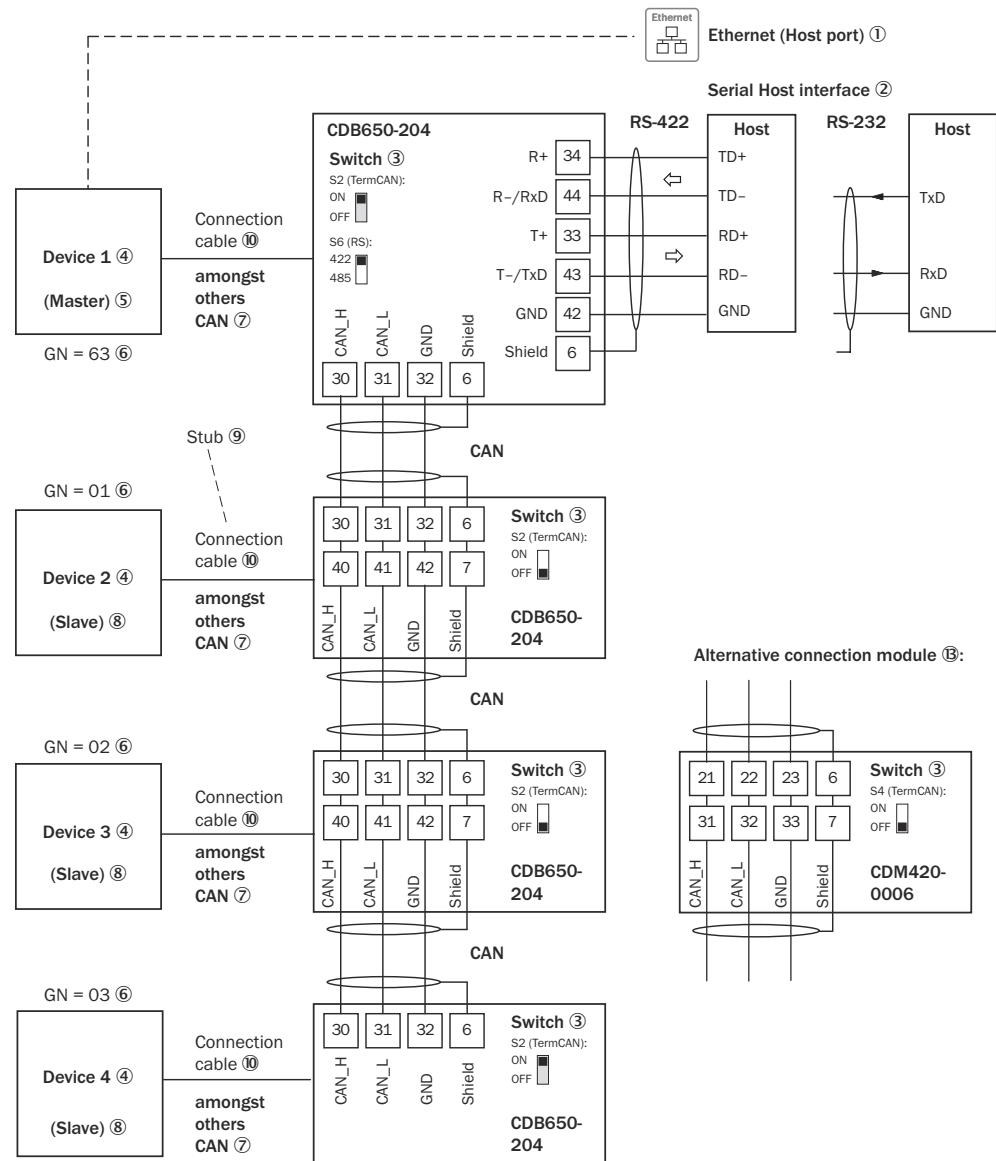
User of the RS-422 data interface:

- The relevant interface drivers for the device comply with the standard in accordance with RS-422.
- Control the RS-422 data interface in the device with the API functions. In order to activate the RS-422 data interface, use an installed SensorApp which contains this function.

13.3.6 Wiring the CAN interface of the device in the CDB650-204

Device = InspectorP621 = V2D621P-xxxxBx

Not considered: connection and looping through of the supply voltage, connection of a trigger sensor for read cycle generation (e.g. at the master)



GN = Device number ⑪
(max. 32 participants) ⑫

Figure 29: Wire the CAN interface of the device in the CDB650-204 connection module.

- ① Ethernet (host port)
- ② Serial host interface
- ③ Switch
- ④ Device
- ⑤ Master
- ⑥ Device number
- ⑦ CAN etc.
- ⑧ Slave
- ⑨ Branch line
- ⑩ Connection cable 1:1 (female connector, M12, 17-pin, A-coded/male connector, M12, 17-pin, A-coded)
- ⑪ Device number (GN)
- ⑫ Maximum 32 users
- ⑬ Example of alternative connection module CDM420-0006

An adapter cable (female connector, M12, 17-pin, A-coded / male connector, D-Sub-HD, 15-pin) is required to connect the device.



NOTE

Control the CAN data interface in the device with the API functions. In order to activate the CAN data interface, use an installed SensorApp which contains this function.

13.3.7 Wiring digital inputs of the device in the CDB650-204

Device = InspectorP621 = V2D621P-xxxxBx

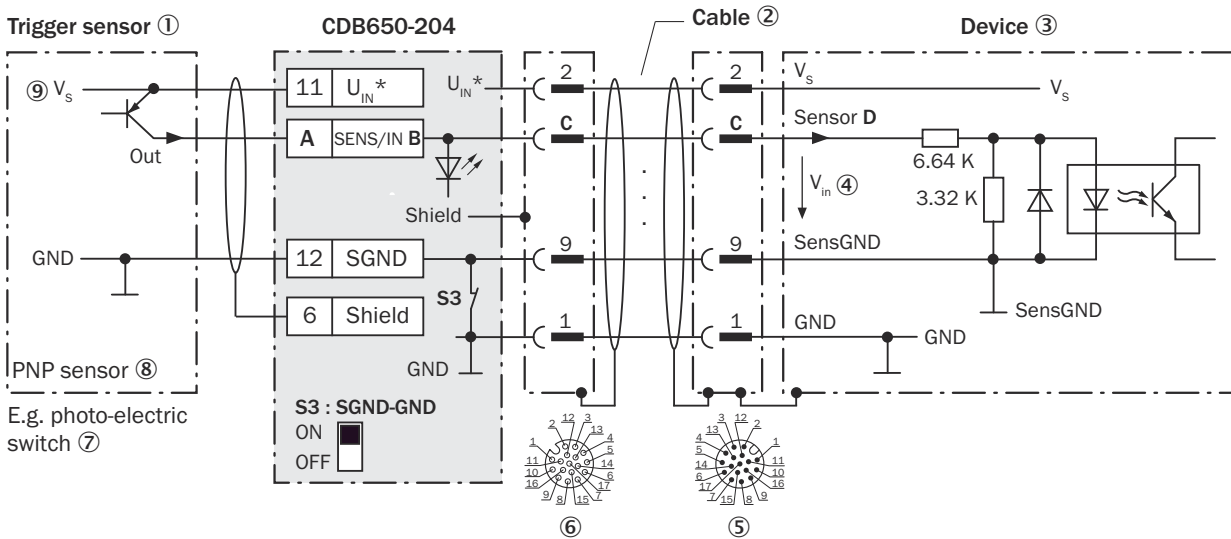


Figure 30: Trigger sensor supplied with power by connection module CDB650-204.

- ① Trigger sensor
- ② Connection cable 1:1 (female connector, M12, 17-pin, A-coded/male connector, M12, 17-pin, A-coded)
- ③ Device
- ④ Input voltage V_{in}
- ⑤ Device: male connector, M12, 17-pin, A-coded
- ⑥ Connection module: female connector, M12, 17-pin, A-coded
- ⑦ E.g. photoelectric sensor
- ⑧ PNP sensor
- ⑨ Supply voltage V_s

13.3.8 Wiring digital outputs of the device in the CDB650-204

Device = InspectorP621 = V2D621P-xxxxBx

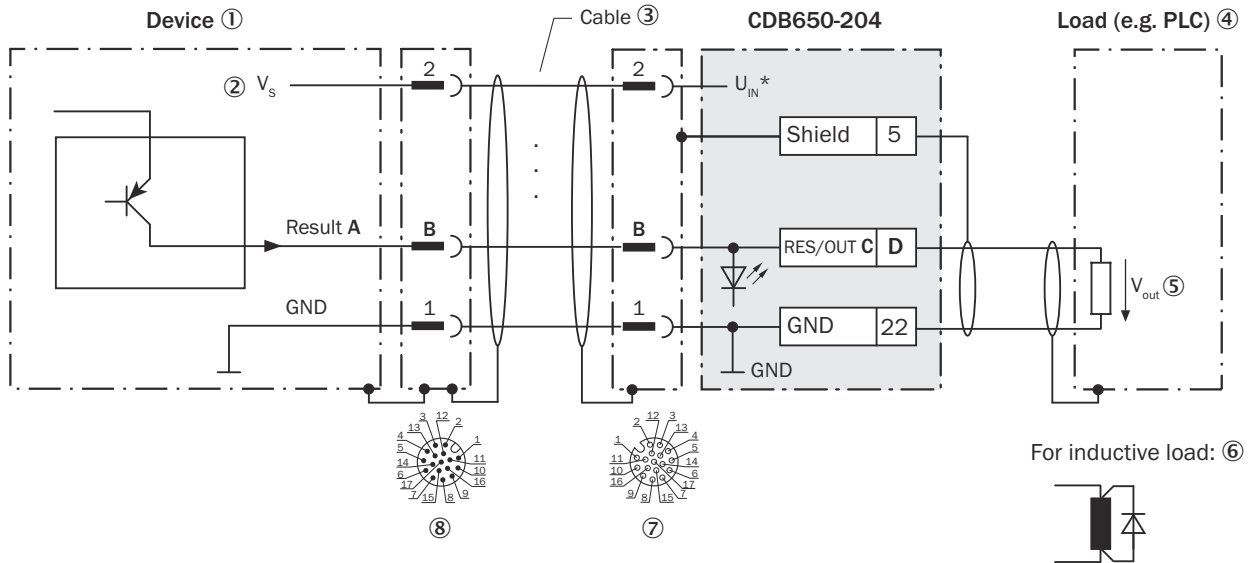


Figure 31: Wire the digital output in the CDB650-204 connection module.

- ① Device
- ② Supply voltage V_s
- ③ Connection cable 1:1 (female connector, M12, 17-pin, A-coded/male connector, M12, 17-pin, A-coded)
- ④ Load (e.g. PLC)
- ⑤ Output voltage V_{out}
- ⑥ With inductive load: see note
- ⑦ Connection module: female connector, M12, 17-pin, A-coded
- ⑧ Device: male connector, M12, 17-pin, A-coded

Table 16: Assignment of placeholders to the digital outputs

Device		CDB650-204	
Output A	Pin B	Signal C	Terminal D
IN/OUT 3	13	RES/OUT 1	20
IN/OUT 4	14	RES/OUT 2	21
IN/OUT 5	16	RES/OUT 3	50
IN/OUT 6	17	RES/OUT 4	51

13.4 Connection diagrams of connection module CDM420-0006

13.4.1 Connection of the device to CDM420-0006

Device = InspectorP621 = V2D621P-xxxxBx

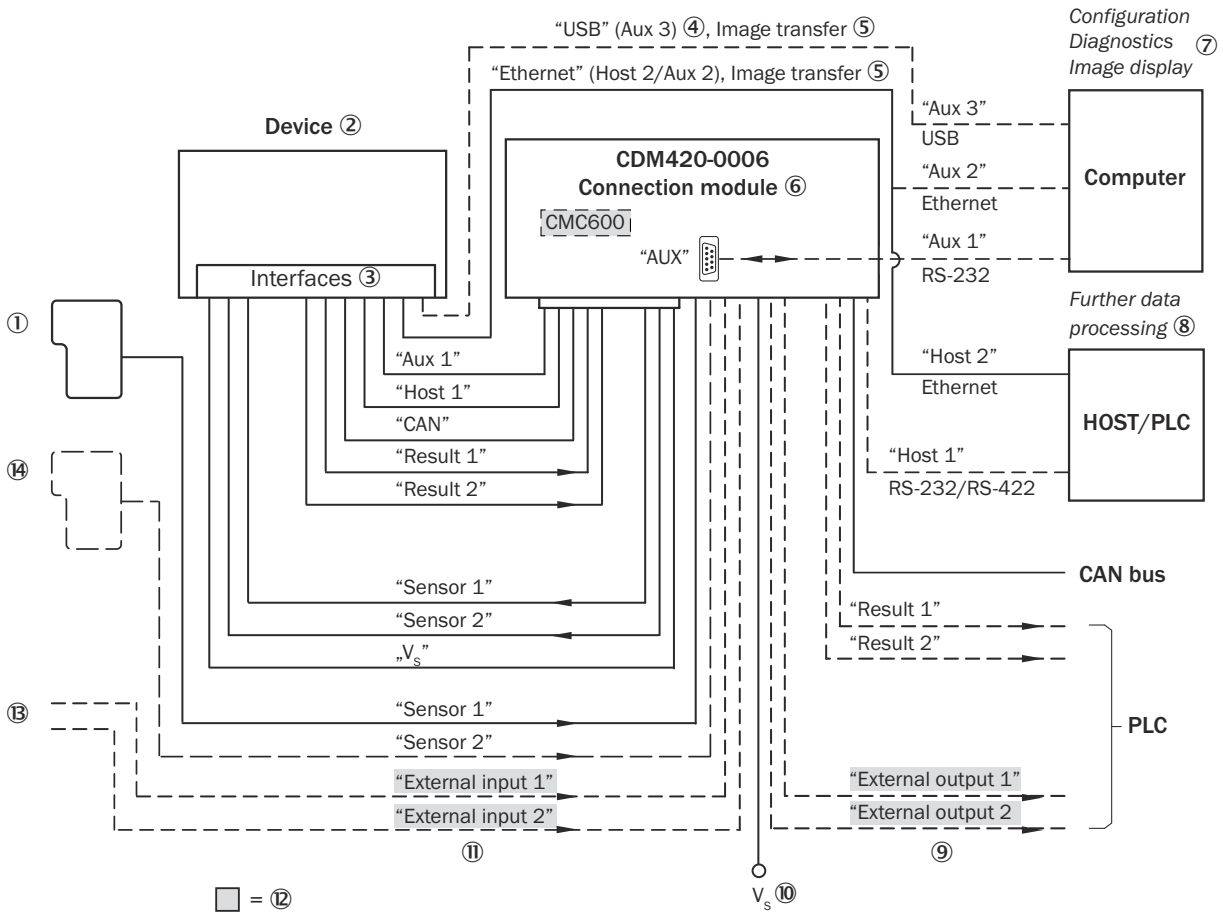


Figure 32: Connection of the device (Ethernet variant) to peripherals via CDM420-0006 (overview).

- ① External trigger sensor
- ② Device
- ③ Interfaces
- ④ USB interface (not supported)
- ⑤ Image transmission
- ⑥ Connection modules
- ⑦ Configuration, diagnostics or image display
- ⑧ Data further processing
- ⑨ External digital outputs (not supported)
- ⑩ Supply voltage V_s
- ⑪ External digital inputs (not supported)
- ⑫ Optional CMC600 parameter cloning module to enable the external digital inputs and digital outputs of the device to be used (not supported).
- ⑬ Other functions
- ⑭ Application-dependent alternative stop trigger (e.g., photoelectric sensor) or travel increment (incremental encoder)

13.4.2 Wiring overview of the CDM420-0006

Device = InspectorP621 = V2D621P-xxxxBx

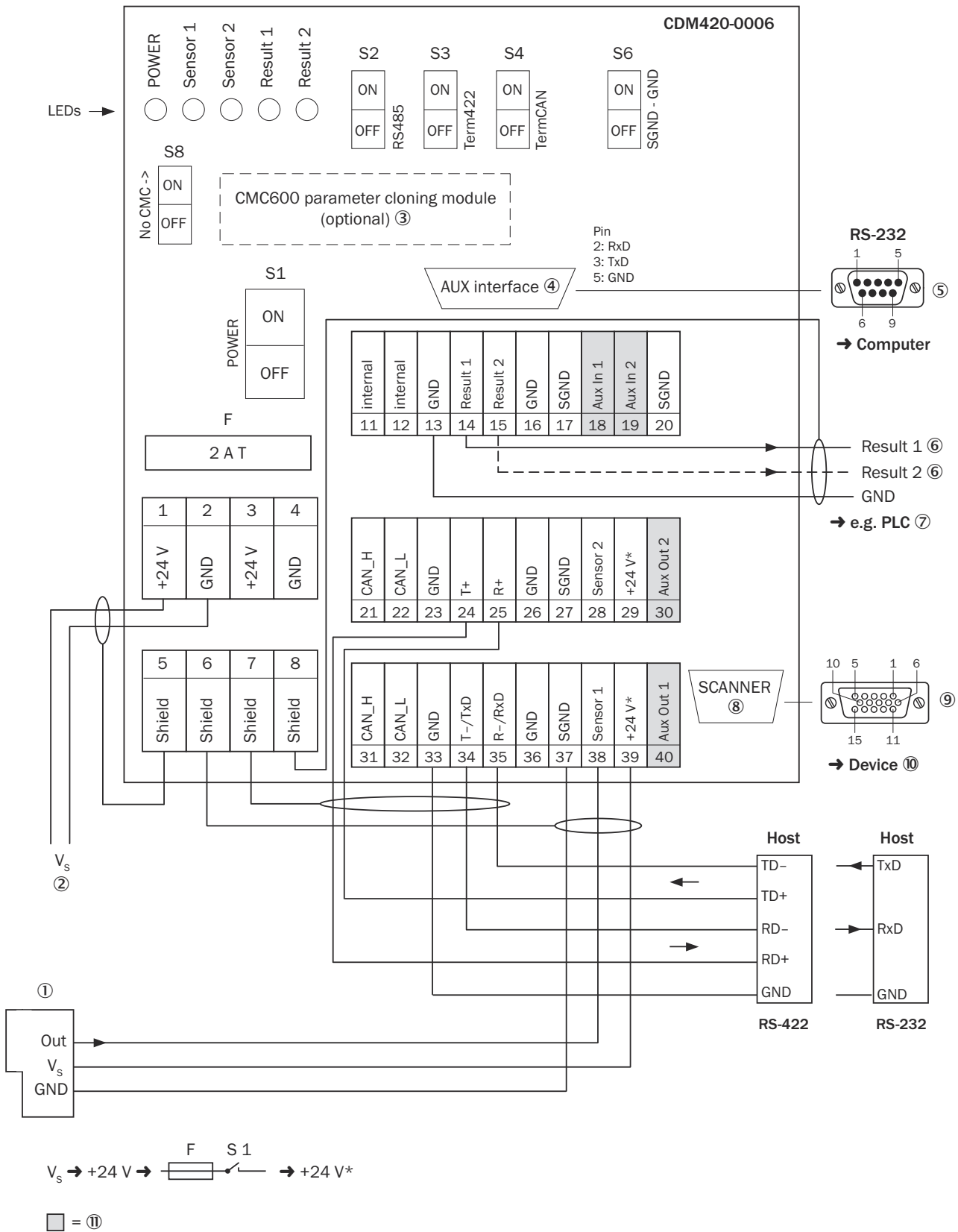


Figure 33: Connection of device and peripherals to the CDM420-0006 connection module (overview).

- ① External trigger sensor
- ② Supply voltage V_s

- ③ Parameter cloning module CMC600 (optional), not supported
- ④ Auxiliary interface “AUX”
- ⑤ Male connector, D-Sub, 9-pin
- ⑥ Name of the digital output or digital input of the device (function selectable in the device)
- ⑦ E.g., PLC (programmable logic controller)
- ⑧ SCANNER = Device
- ⑨ Female connector, D-Sub-HD, 15-pin
- ⑩ Device to be connected
- ⑪ External digital inputs and digital outputs (not supported)

13.4.3 Connecting supply voltage for the device in CDM420-0006

Device = InspectorP621 = V2D621P-xxxxBx, 1 digital input used

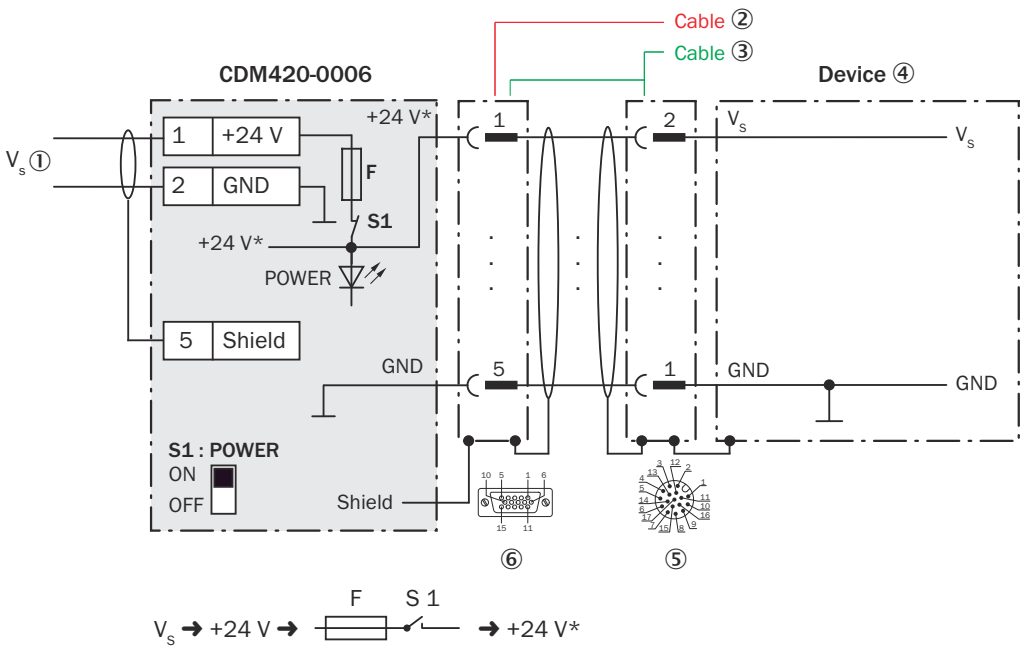


Figure 34: Connecting supply voltage for the device in CDM420-0006 connection module.

- ① Supply voltage V_s
- ② Adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 17-pin, A-coded)
- ③ Adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 17-pin, A-coded)
- ④ Device
- ⑤ Male connector, M12, 17-pin, A-coded
- ⑥ Connection module: female connector, D-Sub-HD, 15-pin

Function of switch S1

Table 17: Switch S1: Power

Switch setting	Function
ON	Supply voltage +24 V connected to CDM420-0006 and device via fuse as +24 V* supply voltage Supply voltage +24 V* can be additionally tapped at terminals 29 and 39
OFF	CDM420-0006 and device disconnected from supply voltage Recommended setting for all connection work

13.4.4 Wiring serial host interface RS-232 of the device in the CDM420-0006

Device = InspectorP621 = V2D621P-xxxxBx

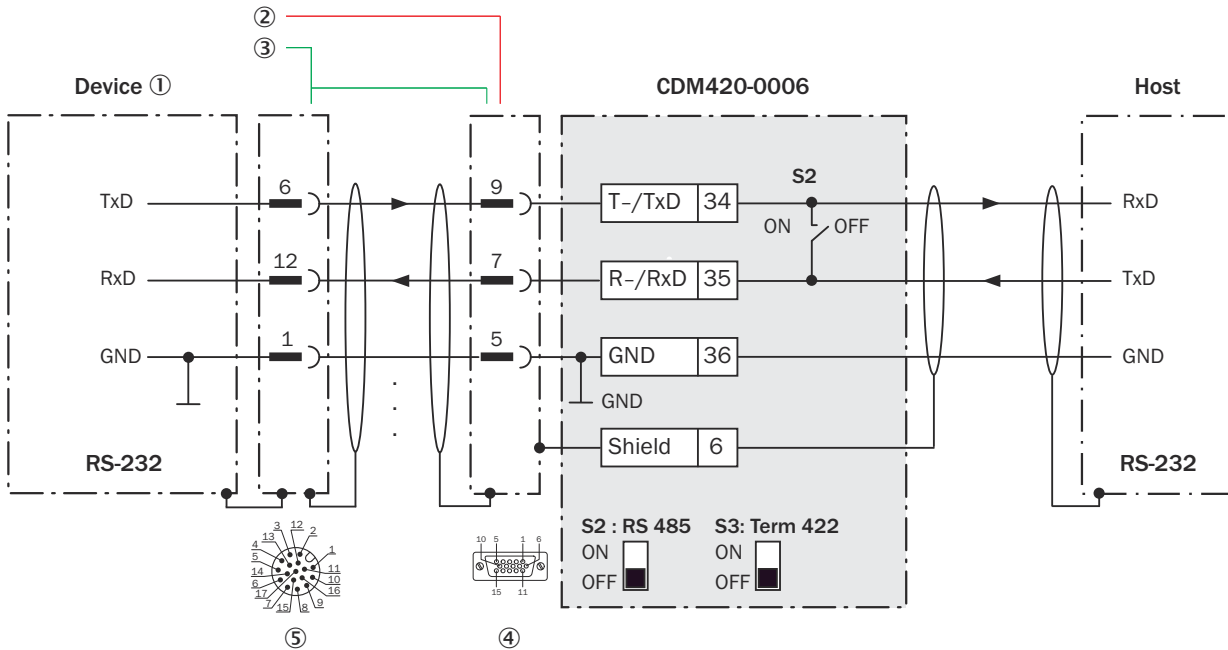


Figure 35: Wiring data interface RS-232 of the device in connection module CDM420-0006.

- ① Device
- ② Connecting cable for 15-pin male connector (not available)
- ③ Adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 17-pin, A-coded)
- ④ Connection module: female connector, D-Sub-HD, 15-pin
- ⑤ Male connector, M12, 17-pin, A-coded



NOTE

Control the RS-232 data interface in the device with the API functions. In order to activate the RS-232 data interface, use an installed SensorApp which contains this function.

13.4.5 Wiring serial host interface RS-422 of the device in the CDM420-0006

Device = InspectorP621 = V2D621P-xxxxBx

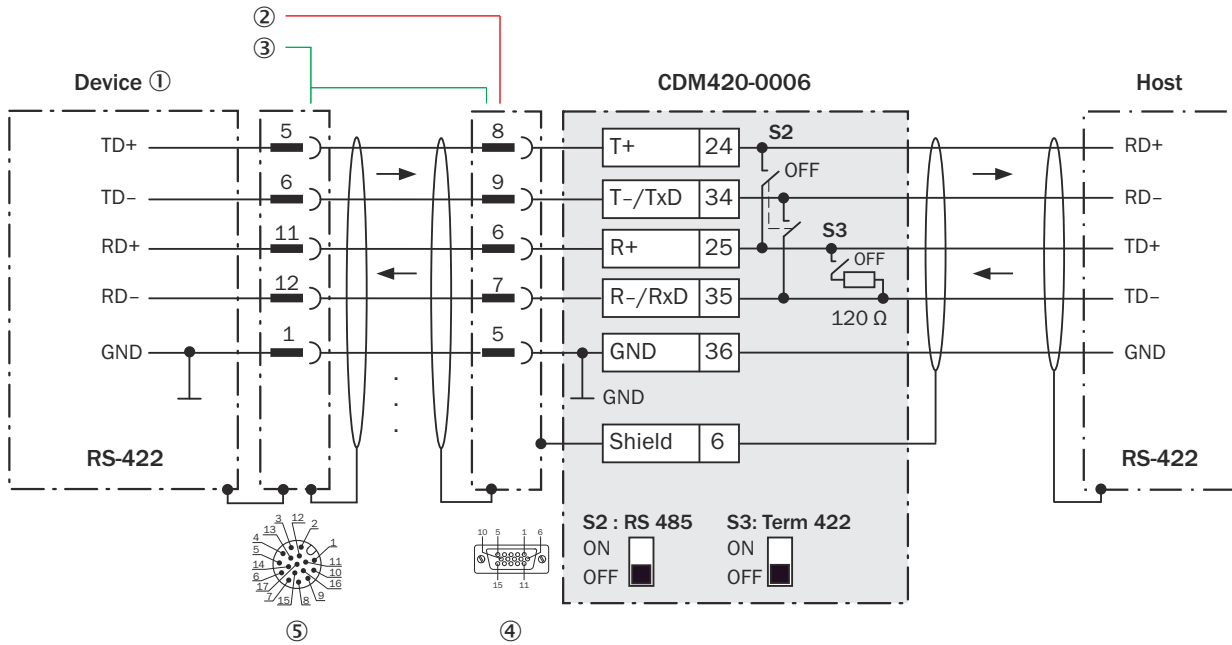


Figure 36: Wiring data interface RS-422 of the device in connection module CDM420-0006.

- ① Device
- ② Connecting cable for 15-pin male connector (not available)
- ③ Adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 17-pin, A-coded)
- ④ Connection module: female connector, D-Sub-HD, 15-pin
- ⑤ Male connector, M12, 17-pin, A-coded

Function of switch S3

Table 18: Switch S3: Term 422

Switch setting	Function
ON	Terminates the RS-422 receiver in the device to improve the noise ratio on the line
OFF	No termination



NOTE

Control the RS-422 data interface in the device with the API functions. In order to activate the RS-422 data interface, use an installed SensorApp which contains this function.

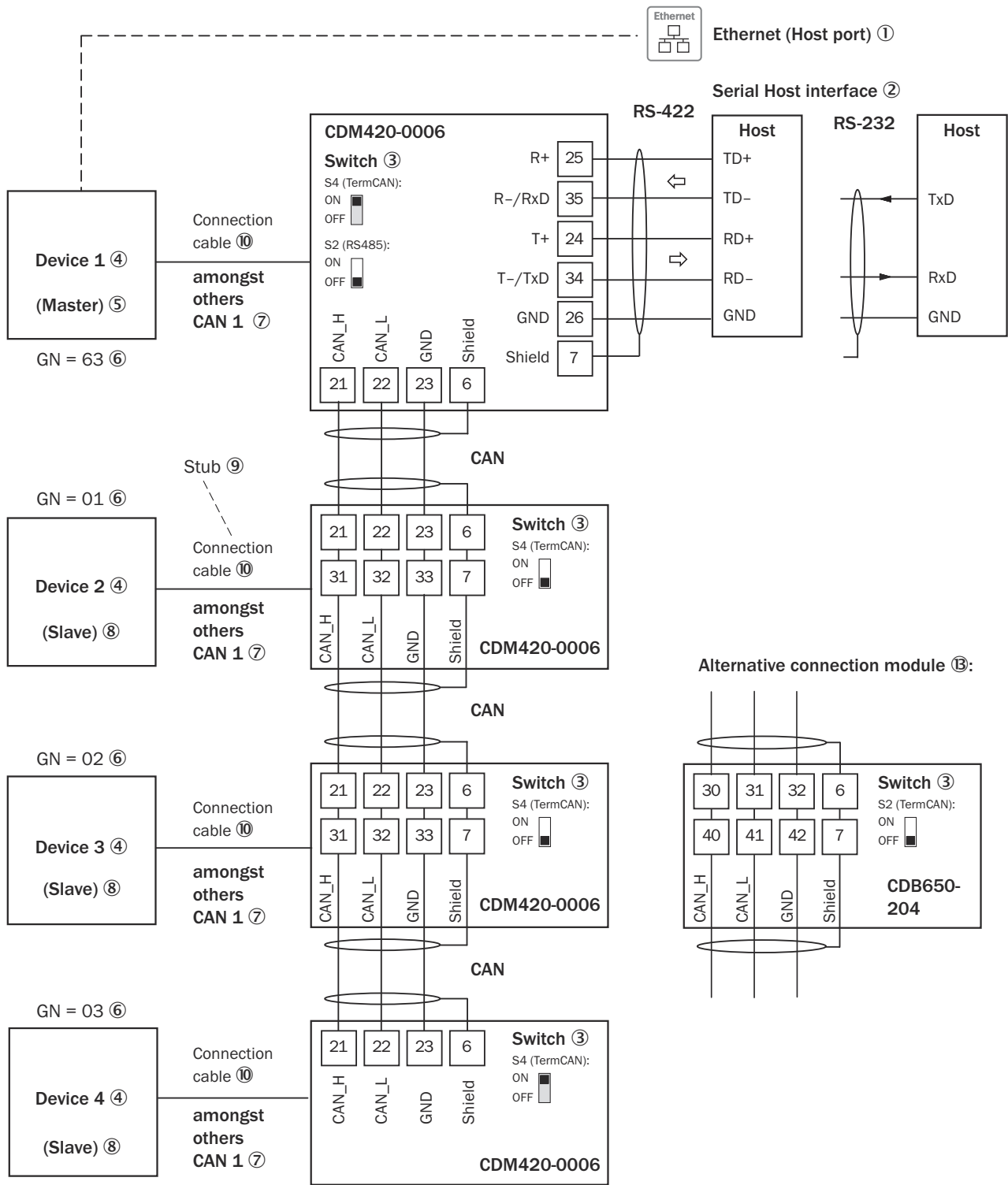
The requirements and restrictions apply when using the RS-422 data interface:

- The relevant interface drivers for the device comply with the standard in accordance with RS-422.
- The connection shown above is configured for operation of the host with permanently activated drivers (often described as “RS-422 operation”).

13.4.6 Wiring the CAN interface of the device in the CDM420-0006

Device = InspectorP621 = V2D621P-xxxxBx

Not considered: connection and looping through of the supply voltage, connection of a trigger sensor for read cycle generation (e.g. at the master)



GN = Device number ⑪
 (max. 32 participants) ⑫

Figure 37: Wire the CAN interface of the device in the CDM420-0006 connection module.

- ① Ethernet (host port)
- ② Serial host interface
- ③ Switch
- ④ Device
- ⑤ Master

- ⑥ Device number
- ⑦ CAN etc.
- ⑧ Slave
- ⑨ Branch line
- ⑩ Adapter cable (female connector, M12, 17-pin, A-coded/male connector, D-Sub-HD, 15-pin)
- ⑪ Device number (GN)
- ⑫ Maximum 32 users
- ⑬ Example of alternative connection module:
CDB650-204

A connection cable 1:1 (female connector, M12, 17-pin, A-coded / male connector, M12, 17-pin, A-coded) is required to connect the device.



NOTE

Control the CAN data interface in the device with the API functions. In order to activate the CAN data interface, use an installed SensorApp which contains this function.

13.4.7 Wiring digital inputs of the device in the CDM420-0006

Device = InspectorP621 = V2D621P-xxxxBx

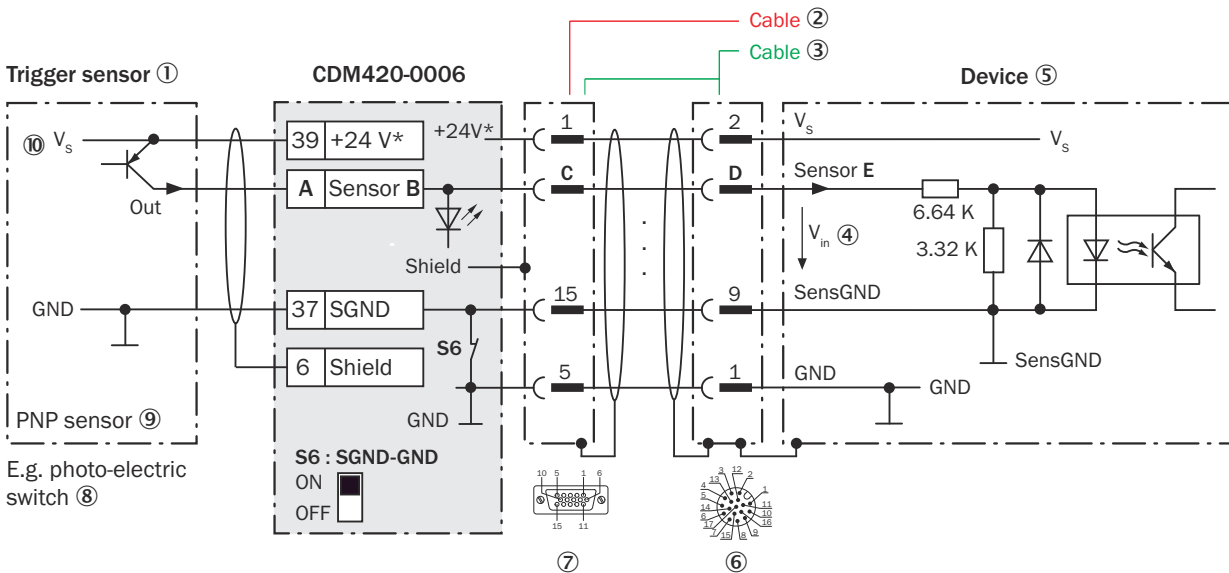


Figure 38: Trigger sensor supplied with power by connection module CDM420-0006.

- ① Trigger sensor
- ② Connecting cable for 15-pin male connector (not available)
- ③ Adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 17-pin, A-coded)
- ④ Input voltage V_{in}
- ⑤ Device
- ⑥ Male connector, M12, 17-pin, A-coded
- ⑦ Connection module: female connector, D-Sub-HD, 15-pin
- ⑧ E.g. photoelectric sensor
- ⑨ PNP sensor
- ⑩ Supply voltage V_s

Table 19: Assignment of placeholders to the digital inputs

CDM420-0006			Device	
Terminal A	Signal B	Pin C	Pin D	Sensor E
38	Sensor 1	14	10	1
28	Sensor 2	4	15	2

Function of switch S6

Table 20: Switch S6: SGND - GND

Switch setting	Function
ON	GND of the trigger sensor is connected with GND of CDM420-0006 and GND of the device
OFF	Trigger sensor is connected volt-free at CDM420-0006 and the device. Common, isolated reference potential of all digital inputs is SGND.

Characteristic data of the digital inputs

Table 21: Characteristic data of the digital inputs "Sensor 1" and "Sensor 2"

Type	Switching
Switching behavior	Power to the input starts the assigned function, e.g. start analysis. Default setting in the device: logic not inverted (active high), debounce time 10 ms
Properties	<ul style="list-style-type: none"> • Opto-decoupled, reverse polarity protected • Can be wired with PNP output of a trigger sensor
Electrical values	Low: $V_{in}^{1)} \leq 2 \text{ V}$; $I_{in}^{2)} \leq 0.3 \text{ mA}$ High: $6 \text{ V} \leq V_{in} \leq 30 \text{ V}$; $0.7 \text{ mA} \leq I_{in} \leq 5 \text{ mA}$

1) Input Voltage

2) Input current



NOTE

Control the digital inputs in the device with the API functions. In order to assign the digital inputs functions, use an installed SensorApp which contains this function.

13.4.8 Wiring digital outputs of the device in the CDM420-0006

Device = InspectorP621 = V2D621P-xxxxBx

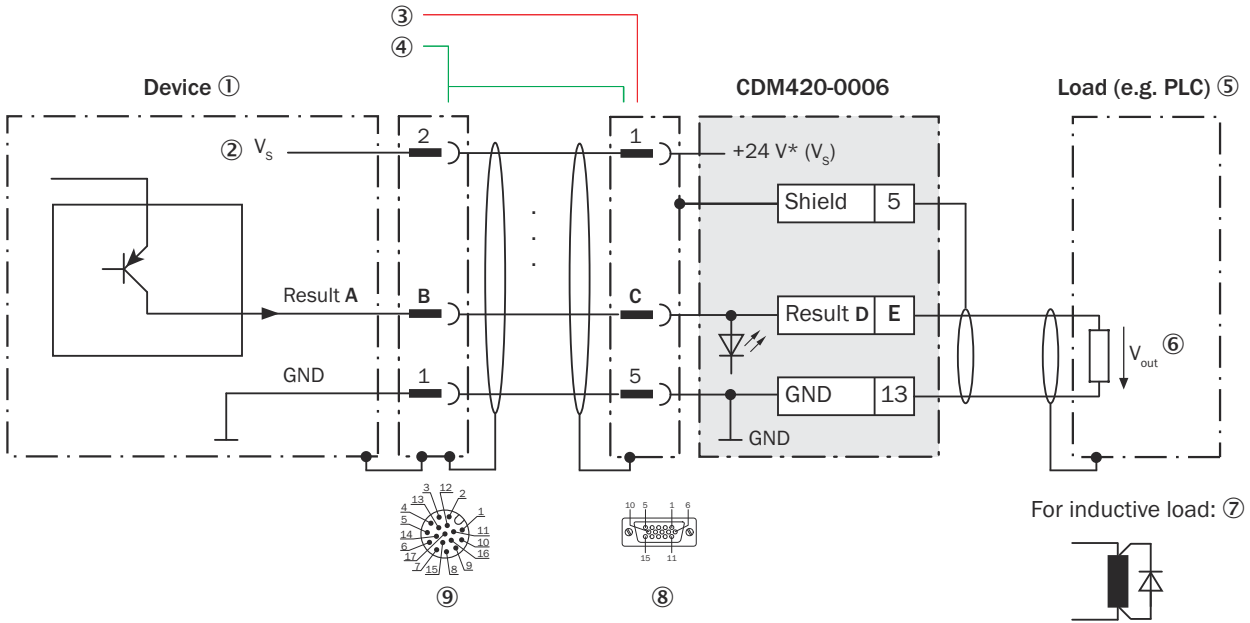


Figure 39: Wire the digital output in the CDM420-0006 connection module.

- ① Device
- ② Supply voltage V_s
- ③ Connecting cable for 15-pin male connector, not available
- ④ Adapter cable (female connector, M12, 17-pin, A-coded/male connector, D-Sub-HD, 15-pin)
- ⑤ Load (e.g. PLC)
- ⑥ Output voltage V_{out}
- ⑦ With inductive load: see note
- ⑧ Connection module: female connector, D-Sub-HD, 15-pin
- ⑨ Male connector, M12, 17-pin, A-coded



NOTE
Digital outputs are omitted due to the 15-pin adapter cable.

Not available in CDM420-0006:

- IN/OUT 5
- IN/OUT 6

Inductive load



NOTE
Provide an arc-suppression switch at the digital output if inductive load is present.
► Attach a freewheeling diode directly to the load for this purpose.

Table 22: Assignment of placeholders to the digital outputs

Device		CDM420-0006		
Output A	Pin B	Pin C	Signal D	Terminal E
IN/OUT 3	13	12	Result 1	14
IN/OUT 4	14	13	Result 2	15

Characteristic data of the digital outputs

Table 23: Characteristic data of the and digital outputs

Type	Switching
Switching behavior	PNP switching to supply voltage V_S Default settings in the device: no function, logic: not inverted (active high)
Properties	<ul style="list-style-type: none"> • Short-circuit protected and temperature protected • Not electrically isolated from the supply voltage V_S
Electrical values	$0 \text{ V} \leq V_{\text{out}}^{1)} \leq V_S$ $(V_S - 1.5 \text{ V}) \leq V_{\text{out}} \leq V_S$ at $I_{\text{out}}^{2)} \leq 100 \text{ mA}$

1) Output voltage.

2) Output current.



NOTE

Control the digital outputs in the device with the API functions. In order to assign the digital output functions, use an installed SensorApp which contains this function.

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14 Abbreviations used

Table 24: Abbreviations used

CAN	Controlled Area Network. Field bus protocol based on the CAN bus
CDB	Connection Device Basic
CDF	Connection Device Fieldbus
CDM	Connection Device Modular
CE	Communauté Européenne. European Community
CMC	Connection Module Cloning
CMD	Connection Module Display
CMF	Connection Module Fieldbus
CMP	Connection Module Power
CoLa-A	Command Language ASCII (SICK-specific protocol)
CSN	CAN Sensor Network (SICK-specific protocol)
DNS	Domain Name Server
ESD	ElectroStatic Discharge Electrostatic discharge
EMC	Electromagnetic Compatibility
GSD	General Station Description (for PROFIBUS/ PROFINET)
HTML	Hyper Text Markup Language
I	Input
I_{in}	Input current
I_{out}	Output current
LED	Light Emitting Diode. Light emitting diode
LPS	Limited Power Supply
MAC	Medium Access Control
MTBF	Mean Time Between Failures
MTTF	Mean Time To Failure
MTTR	Mean Time To Repair
O	Output
OCR	Optical Character Recognition
OCV	Optical Character Verification
PDF	Portable Document Format
SD	Secure Digital
SOPAS ET	SICK Open Portal for Application and Systems Engineering Tool (PC software for Windows for device configuration)
SDD	SOPAS Device Description (device description file)
SELV	Safety Extra Low Voltage
PLC	Programmable Logic Controller
TCP/IP	Transmission Control Protocol/Internet Protocol
UL	Underwriters Laboratories
USB	Universal Serial Bus
V_{in}	Input Voltage
V_{out}	Output voltage
V_S	Supply voltage

$V_{S\ ext}$	External supply voltage
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