OPERATING INSTRUCTIONS

CLV62x

Fixed mount barcode scanner

SICK
Sensor Intelligence.

Described product

CLV62x

Manufacturer

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Legal information

Original document

This document is an original document of SICK AG.

UL certification type-dependent, only for devices in IP65 standard housing

BIS certification type-dependent

KC certification type-dependent

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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 Related applicable documents

Related applicable documents from SICK

Document	Title	Part number	Source
Technical information	CLV62x, CLV63x and CLV64x in IP69K protective housing	8021479	www.sick.com/8021479

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

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

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

The following information is available depending on the product:

- Data sheets
- This document in all available language versions
- CAD files and dimensional drawings
- Certificates (e.g., declaration of conformity)
- Other publications
- Software
- Accessories

2 Safety information

2.1 Intended use

The device is an intelligent, opto-electronic ID sensor and is used for automatic, fixed identification and decoding of bar codes on moving or stationary objects.

The device transmits the data content of the decoded bar codes to a higher-level control (PLC) for coordinating further processing.

The device is primarily designed for use in industrial and logistics areas. The device meets the applicable requirements for industrial robustness, interfaces and data processing.

The barcodes being read must conform to at least quality level C in accordance with ISO/IEC 15416.

SICK AG assumes no liability for losses or damage arising from the use of the product, either directly or indirectly. This applies to use of the product that does not conform to its intended purpose and is not described in this documentation.

2.2 Improper use

Any use that goes beyond the areas specified below is considered improper use. This applies to use outside the technical specifications and the specifications for intended use.

- The device does not constitute a safety component in accordance with the respective applicable safety standards for machines.

Devices in IP65 standard housing:

- The device must not be used in explosion-hazardous or corrosive areas or under extreme ambient conditions.
- The device must not be operated in the ambient temperature range below 0 °C.

Devices in IP69K protective housing:

- The device must not be used in explosion-hazardous areas.
- The device must not be operated in the ambient temperature range below 0 °C.
- The protective housing of the factory-installed bar code scanner must not be opened.

Accessories:

- The use of accessories not 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 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)

2.3.1 Configuration with profile programming

NOTE

The device can be configured for the specific application using the convenient "Profile programming" function. This involves presenting the device with a set of printed configuration bar codes. The bar codes can be created using the SOPAS ET configuration software.

The “Profile programming” function is activated in the default factory settings. After successfully configuring the device, deactivate this function using SOPAS ET to avoid any undesired configuration changes and exclude the resultant risks.

The configuration of this function and further documentation can be found on the Internet after logging on at: support.sick.com

2.4 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

2.5 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.

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

2.7 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.

CAUTION
Optical radiation: Class 2 Laser Product

The human eye is not at risk when briefly exposed to the radiation for up to 0.25 seconds. Exposure to the laser beam for longer periods of time may cause damage to the retina. The laser radiation is harmless to human skin.

- Do not look into the laser beam intentionally.
- Never point the laser beam at people's eyes.
- If it is not possible to avoid looking directly into the laser beam, e.g., during commissioning and maintenance work, suitable eye protection must be worn.
- Avoid laser beam reflections caused by reflective surfaces. Be particularly careful during mounting and alignment work.
- 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.

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.

2.7.1 Laser radiation

Laser class

The device corresponds to laser class 2.

NOTE
No maintenance is required to ensure compliance with Laser Class 2.

Wavelength

The device works with a red light laser diode in the wavelength 655 nm.

Laser activity display

Devices in IP65 standard housing:

When the laser diode is switched on, the “Laser” LED on the device lights up.

Devices in IP69K protective housing:

NOTE
Optical displays as well as control elements (pushbuttons) are not accessible on the device.

Laser output aperture

The entire viewing window is a laser output aperture.

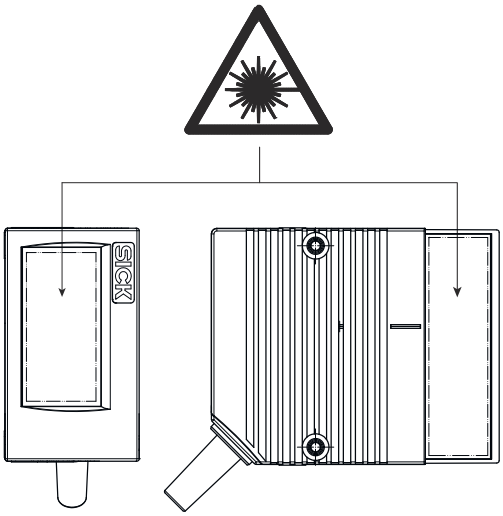

Figure 1: IP65 standard housing: Laser output aperture for the two designs of the device

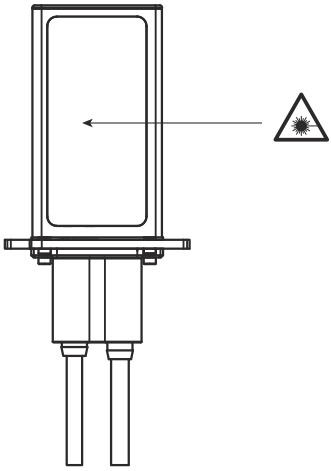

Figure 2: IP69K protective housing: Laser output aperture of the device

Warning symbol on the device

Devices in IP65 standard housing:

The colored laser warning label is affixed to the rear of the device combined with the type label.

Devices in IP69K protective housing:

The laser warning label is lasered onto the protective housing. The type label is glued to the underside of the housing of the connections.

Laser output data

In addition to other information, the type label of the device in use also contains the laser output data.

The laser power data consists of:

- Laser output power (maximum and average)
- Wavelength or wavelength range
- Pulse duration

The laser power data is located in the lower part of the type label, as an example see "Type label", page 14.

If the device is installed inaccessibly, see "Features", page 74 in the technical data.

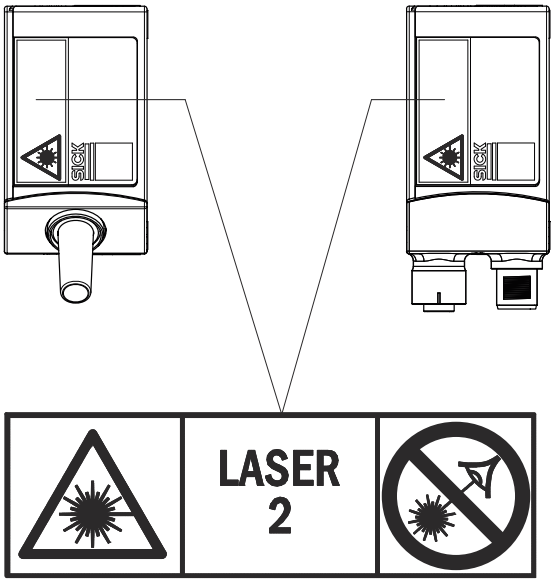

Figure 3: IP65 standard housing: Position and content of the laser warning label on the device

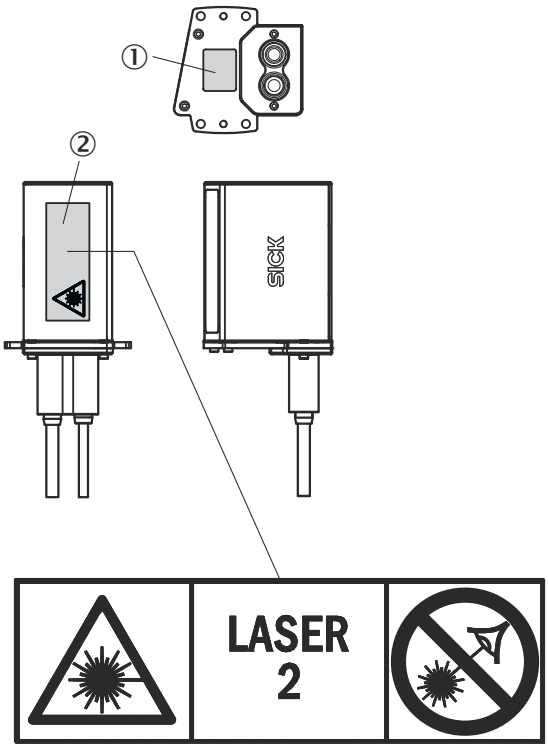

Figure 4: IP69K protective housing: Position and content of the laser warning label on the device

① Type label

② Laserwarnschild

Meaning of the laser warning label: Laser radiation. Do not look into the light beam. Laser class 2.

NOTE
Additional laser warning label

If the laser warning label applied to the device is concealed when installed into a machine or paneling, the laser beam output aperture must be suitably labeled. For this purpose, an additional warning label of the same type must be applied next to the output aperture.

Controlling the laser diode

During operational use, the device only switches the laser diode on if there is an object in the reading area, or if a reading is required (cyclic reading operation).

A laser timeout can automatically switch off the laser diode in this type of object trigger control if **the pulse has been active for too long**, e.g. when the conveyor system is at a standstill. In this case, the current internal reading interval of the device remains open.

Depending on the selected parameterization type, the laser timeout can be set as follows:

- Using the SOPAS ET configuration software, on the **Illumination Control** device page
- During GSD parameterization with the “10_Object Trigger Ctrl” module (PROFINET or PROFIBUS)

In the default setting, the laser timeout is deactivated.

The laser diode is permanently or repeatedly switched on in the following device statuses:

- In reading operation in the PSDI types “Auto pulse” (adjustable duty cycle) or “Free”
- In the operating modes “Percentage evaluation” and “Auto setup”. Use these operating modes only temporarily for configuration or diagnostics.

If the timeout is activated, it will have no effect in this case.

2.8 Switching off the device

When the device is switched off, a maximum of the following data is lost in the device:

- A modified, application-specific parameter set that is only temporarily located in the working memory of the device and is not yet permanently stored in the device as a new valid configuration data set.
- Last reading result
- State of the daily operating hours counter

2.9 Protection of the environment

During construction of the device, attention was paid to achieving the smallest environmental impact possible. Apart from the housing, the device contains no materials using silicon.

3 Product description

3.1 Product ID

3.1.1 Type label

The type label is combined with the laser warning label on the device. The type label contains information for identifying the device as well as conformity marks and test marks. If necessary, information is moved to an additional label for space reasons.

If the device in the standard housing has been UL certified, this can be found on the type label.

Devices in IP65 standard housing:

Figure 5: CLV62x: Example for type label of CLV620-0000 (serial variant). For devices in IP65 standard housing, figure can differ.

① Laser warning label
② Type designation according to type code
③ Conformity mark and certification mark
④ Supply voltage, power consumption, maximum current consumption
⑤ Manufacturer, production date and production location
⑥ MAC address, only for Ethernet variants
⑦ Serial number
⑧ Part number
⑨ QR code, leads to SICK product ID
⑩ Laser power data: Maximum power, average power, wavelength, pulse duration
⑪ Complies with 21 CFR 1040.10/11 except for conformance with IEC 60825-1 Ed. 3., see Laser Notice No. 56, May 8, 2019

Devices in IP69K protective housing:

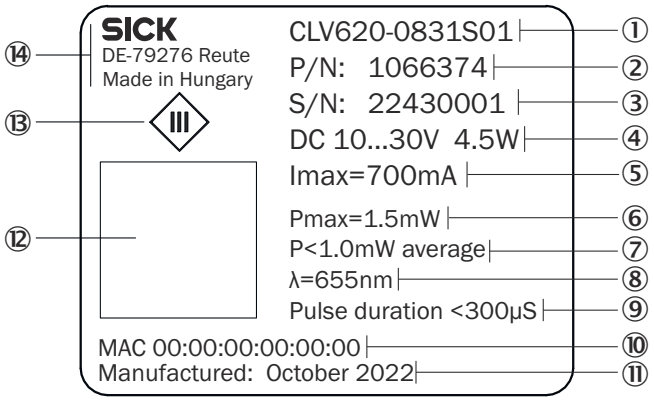

Figure 6: CLV62x: Example for type label of CLV620-083S01 (Ethernet variant). For devices in IP69K protective housing. Figure may differ.

① Type designation according to type code
② Part number
③ Serial number
④ Supply voltage and power consumption
⑤ Maximum current consumption
⑥ Maximum laser output
⑦ Average laser output
⑧ Laser wavelength
⑨ Laser pulse duration
⑩ MAC address (only for Ethernet variant)
⑪ Production date
⑫ Data Matrix code with product data: Part number, production date, serial number, MAC address for device, MAC address for Ethernet port (not shown on type label)
⑬ Symbol for protection class III
⑭ Manufacturer and production location

Position of the type label on the device:

- IP65 standard housing: The combination type label with laser warning label is located on the rear of the device.
- IP69K protective housing: The type label is located on the underside of the device near the connections. The laser warning label is lasered on the rear of the device.

Additional label

In addition to the type label, the additional label also displays other conformity marks and test marks.

Figure 7: Device in standard housing: Additional label

Figure 8: Device in protective housing: Additional label

Position of the additional label on the device:

- IP65 standard housing: The additional label is attached to the right side of the device (device viewed from the rear).
- IP69K protective housing: The additional label is located on the underside of the device next to the type label.

3.1.2 Type code

The devices of the CLV62x product family are arranged according to the following type code:

CLVxyz-abcde

CLV	x	y	z	–	a	b	c	d	e
1	2	3	4		5	6	7	8	9

Table 2: Type code

Position	Description	Characteristic
1	Code reader	V-principle
2 – 3	Product family	62: CLV62x
4	Working range	0: Mid range 1: Long range 2: Short range
5	Reading method, orientation of viewing window [1]	0: Line scanner, viewing window on front side 1: Raster scanner, viewing window on front side 2: Line scanner, viewing window on the side 3: Raster scanner, viewing window on the side
6	Electrical connections (design)	**Serial variant:** 0: Cable 0.9 m with male connector, D-Sub-HD, 15-pin 3: Cable 2 m with male connector, D-Sub-HD, 15-pin **Ethernet variant:** 1: Swivel connector, 12-pin, with 2 M12 plug connections [2] 8: Swivel connector, 17-pin, with 2 M12 plug connections [3]
7	Interfaces	**Serial variant:** 0: RS-232, RS422/485, CAN, 2 digital inputs, 2 digital outputs **Ethernet variant:** 2: Ethernet, RS-232, RS-422/485, CAN, 1 digital input 3: Ethernet, RS-232, RS-422/485, CAN, 2 digital inputs, 2 digital outputs
8	Window material of the viewing window	0: Glass 1: Plastic
9	Enclosure rating	Without label: IP65 standard housing S01: IP69K protective housing
Ambient operating temperature: Standard(0 °C ... +40 °C)		

1) Refers to the longitudinal axis of the device.
2) 1 male connector, M12, 12-pin, A-coded and 1 female connector, M12, 4-pin, D-coded.
3) 1 male connector, M12, 17-pin, A-coded and 1 female connector, M12, 4-pin, D-coded.

3.2 Product characteristics

3.2.1 Device view

Ethernet variant in IP65 standard housing

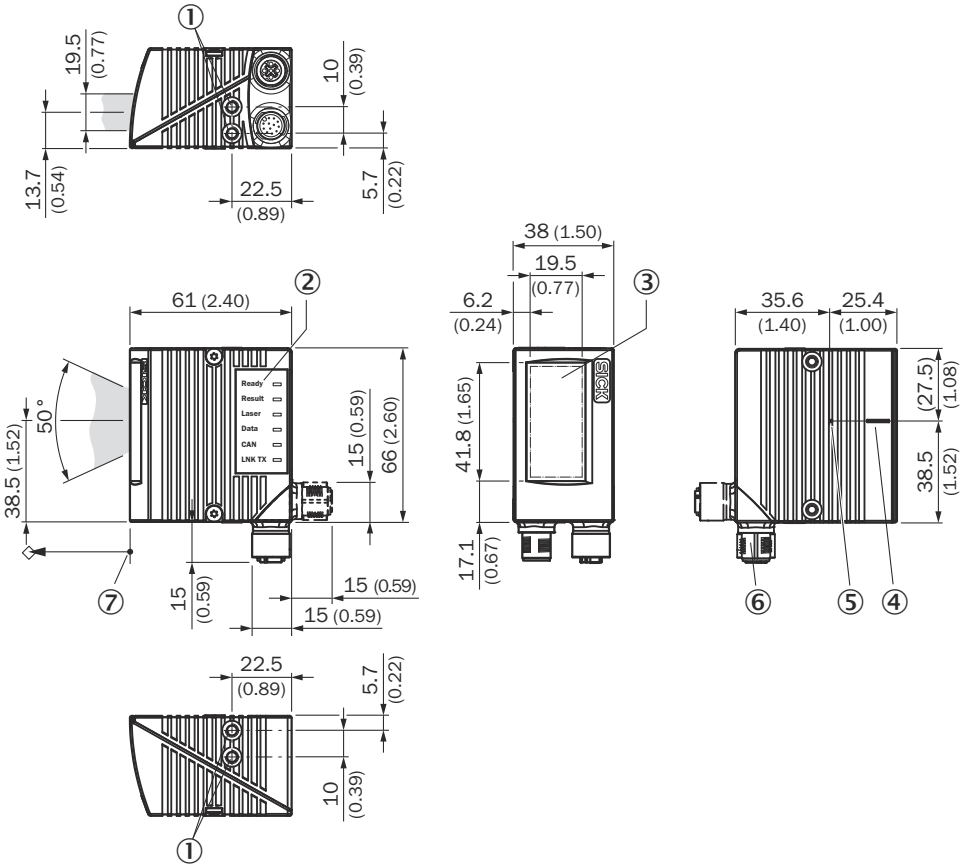

Figure 9: CLV62x in IP65 standard housing with front viewing window and connector unit: Structure and device dimensions, unit of measurement: mm (inch), decimal separator: Period

① Tapped blind hole M5, 5 mm deep (2 x), for mounting the device

② LED (6 x), status indicator

③ Viewing window, front orientation

④ Central position of the deflected laser beam in the V-shaped aperture angle

⑤ Internal impact point: Rotation point of the variable direction laser beam

⑥ Swivel connector (male connector, M12, type-dependent 12- or 17-pin, A-coded and female connector, M12, 4-pin, D-coded)

⑦ Reference point of the reading distance (from housing edge to object)

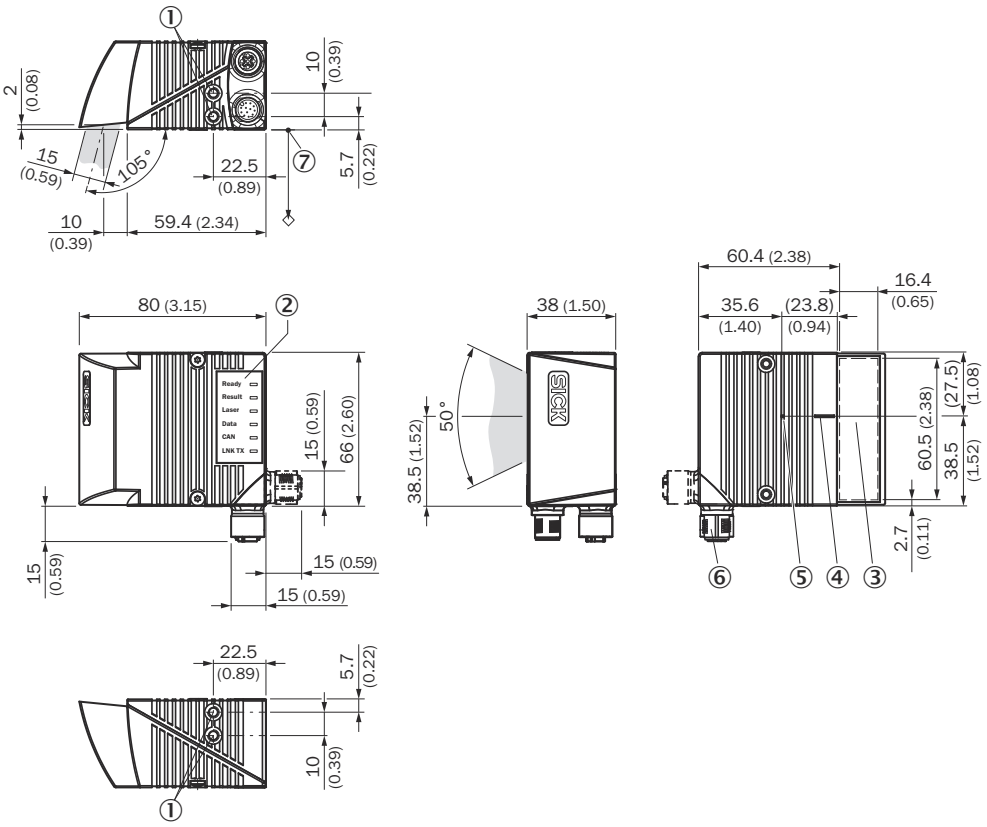

Figure 10: CLV62x in IP65 standard housing with side viewing window and connector unit: Structure and device dimensions, unit of measurement: mm (inch), decimal separator: Period

① Tapped blind hole M5, 5 mm deep (2 x), for mounting the device

② LED (6 x), status indicator

③ Viewing window, side orientation

④ Central position of the deflected laser beam in the V-shaped aperture angle

⑤ Internal impact point: Rotation point of the variable direction laser beam

⑥ Swivel connector (male connector, M12, type-dependent 12- or 17-pin, A-coded and female connector, M12, 4-pin, D-coded)

⑦ Reference point of the reading distance (from housing edge to object)

Serial variants in IP65 standard housing

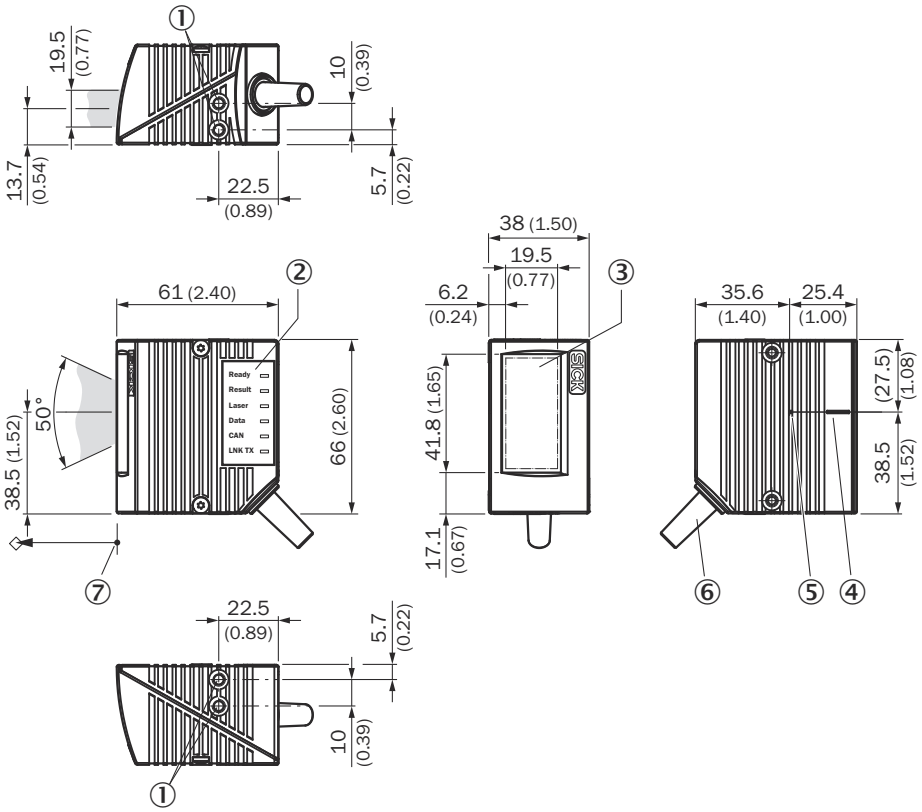

Figure 11: CLV62x in IP65 standard housing with front viewing window and connecting cable: Structure and device dimensions, unit of measurement: mm (inch), decimal separator: Period

① Tapped blind hole M5, 5 mm deep (2 x), for mounting the device
② LED (6 x), status indicator
③ Viewing window, front orientation
④ Central position of the deflected laser beam in the V-shaped aperture angle
⑤ Internal impact point: Rotation point of the variable direction laser beam
⑥ Cable outlet, standard cable 0.9 m (+10 %) with male connector, D-Sub-HD, 15-pin
⑦ Reference point of the reading distance (from housing edge to object)

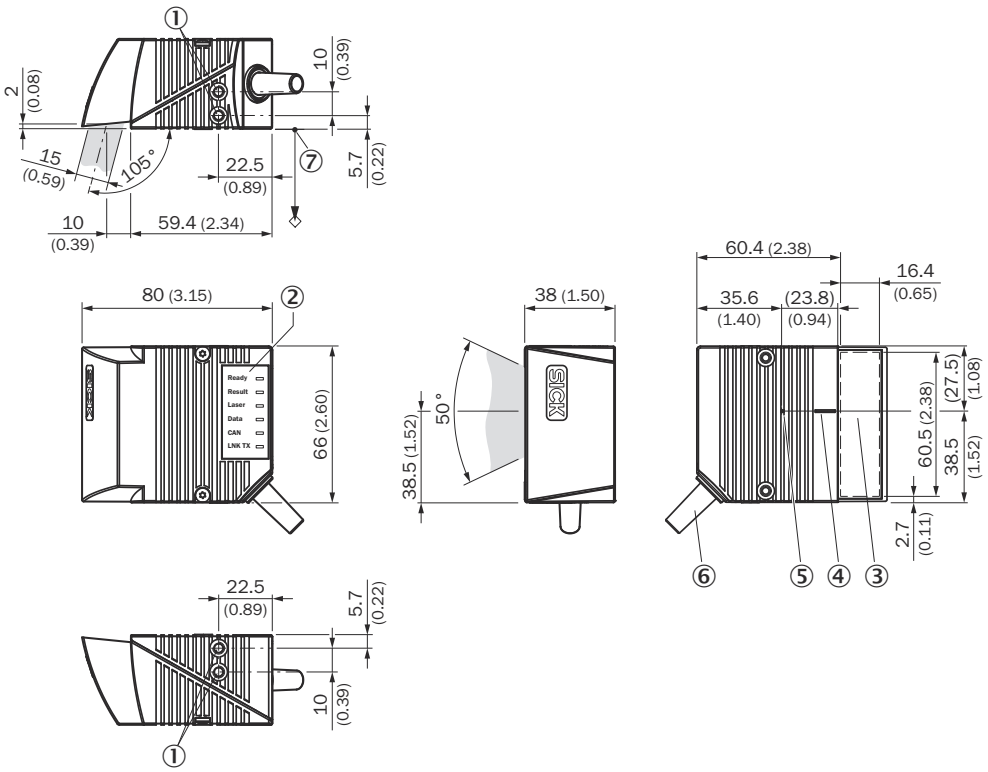

Figure 12: CLV62x in IP65 standard housing with side viewing window and connecting cable: Structure and device dimensions, unit of measurement: mm (inch), decimal separator: Period

① Tapped blind hole M5, 5 mm deep (2 x), for mounting the device
② LED (6 x), status indicator
③ Viewing window, side orientation
④ Central position of the deflected laser beam in the V-shaped aperture angle
⑤ Internal impact point: Rotation point of the variable direction laser beam
⑥ Cable outlet, standard cable 0.9 m (+10 %) with male connector, D-Sub-HD, 15-pin
⑦ Reference point of the reading distance (from housing edge to object)

Ethernet variant in IP69K protective housing

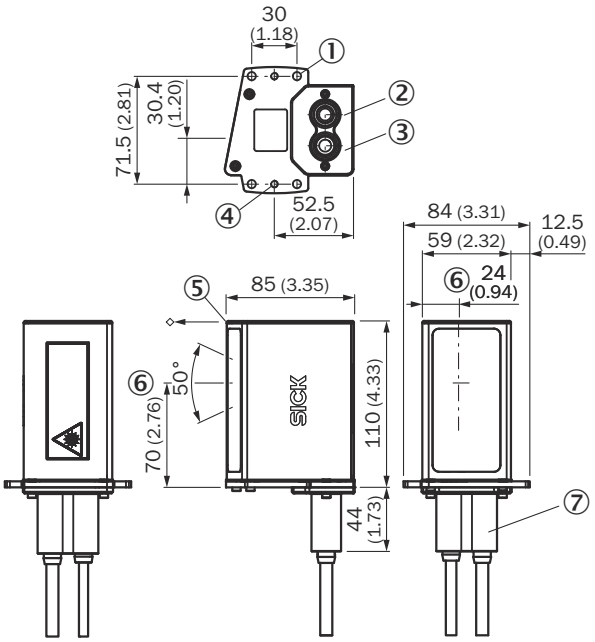

Figure 13: CLV620 (Ethernet variant) in IP69K protective housing, with front viewing window and two M12 connections. structure and device dimensions, unit: mm (inch), decimal separator: period

① Fixing holes, Ø 5.5 mm (4 x)
② "Ethernet" connection (female connector, M12, 4-pin, D-coded)
③ "Power / Serial Data / CAN / I/O" connection (male connector, M12, 17-pin, A-coded)
④ Threaded hole, M5 (2 x)
⑤ Reference point of the reading distance (from housing edge to object)
⑥ Position of the light emission (center position of the deflected laser beam)
⑦ Protective double bushing for the electrical connections

3.2.2 Device variants

The CLV62x product family consists of 4 series:

- Ethernet variant, 12-pin, IP65 standard housing
- Ethernet variant, 17-pin, IP65 standard housing
- Serial variant, 15-pin, IP65 standard housing
- Ethernet variant, 17-pin, IP69K protective housing

The series differ, amongst other things, in regard to the following housing features:

Table 3: Differences between the device series

Feature	**Ethernet variant**		**Serial variant**
Housing	**Standard housing** [1]	**Protective housing, stainless steel**	**Standard housing** [1]
Purpose	Data output via Ethernet to host		Data output via RS-232 / RS422/485 to host
Enclosure rating	IP65	IP69K	IP65
Scanning methods	Line scanning or raster scanning, depending on type		
Sensor type	Line scanner or grid scanner		

Feature	Ethernet variant			Serial variant
Housing	**Standard housing** [1]		**Protective housing, stainless steel**	**Standard housing** [1]
Orientation of the viewing window	• front or • On the side		• front	• front or • On the side
Window material of the viewing window	• Glass or • Plastic		• Plastic	• Glass or • Plastic
Reading ranges (working range) and resolution	• Short Range (CLV622) • Mid Range (CLV620) • Long Range (CLV621)			
Reading fields	• For glass: 100% • For plastic: depth of field reduced by 10%		Depth of field reduced by 10%	• For glass: 100% • For plastic: depth of field reduced by 10%
Optical displays	6	6	Not accessible	6
Connection type	Swivel connector		1 male connector, 1 female connector	Cable with D-Sub HD male connector
Electrical Interfaces	• Power • Ethernet (Host, AUX) • RS-232 (Host, AUX) • RS-422/845 (host) • CAN • 1 digital input	• Power • RS-232 (Host, AUX) • RS-422/845 (host) • CAN • 2 digital inputs • 2 digital outputs	• Power • RS-232 (Host, AUX) • RS-422/845 (host) • CAN • 2 digital inputs • 2 digital outputs	• Power • RS-232 (Host, AUX) • RS-422/845 (host) • CAN • 2 digital inputs • 2 digital outputs
Type of electrical connections	• 1 male connector, M12, 12-pin, A-coded • 1 female connector, M12, 4-pin, D-coded	• 1 male connector, M12, 17-pin [2] , A-coded • 1 female connector, M12, 4-pin, D-coded	• 1 male connector, M12, 17-pin, A-coded • 1 female connector, M12, 4-pin, D-coded	1 male connector, D-Sub HD, 15-pin
Supply voltage	10 V DC ... 30 V DC			
Power consumption	Max. 4.5 W [3]	Max. 4,5 W [4]		
Laser warning label	Stuck on		Lasered on	Stuck on
Ambient operating temperature	0 °C ... +40 °C			
Storage temperature	–20 °C ... +70 °C			
Dimensions for device with front viewing window [5]	61 mm x 66 mm x 38 mm		85 mm x 84 mm x 154 mm	61 mm x 66 mm x 38 mm
Dimensions for device with side viewing window [5]	80 mm x 66 mm x 38 mm		-	80 mm x 66 mm x 38 mm

1) Aluminum
2) Available on request.
3) With digital output loaded.
4) With both digital outputs loaded.
5) Ethernet variant: without protruding connections on the connector.

3.2.3 Scope of delivery

Devices in IP65 standard housing

The delivery of the device includes the following components:

Table 4: CLV62x: scope of delivery

No. of units	Component	Notes
1	Device in the version ordered	**Delivery state:** a) Ethernet variant: • The M12 female connector is closed with a tightly screwed-on protective element, e.g. a protective cap • Without connecting cables b) Serial variant: • Device with permanently connected connecting cable All devices: • Without bracket • Without fixing screws
1	Printed Safety Notes (safety information), multilingual	The document contains: • Information on safe handling of the device • Note for online access to the operating instructions and other documentation

Not included with delivery of the device and must be ordered separately:

Ethernet variant in IP65 standard housing:

- Suitable cables for the connection of the supply voltage/Serial Data/I/O as well as for the access to Ethernet

Devices in IP69K protective housing

The Ethernet variant of the CLV620 is available as a device in a protective housing.

NOTE

For scope of delivery, see "Technical Information CLV62x, CLV63x and CLV64x with IP69K Protective Housing", part no. 8021479

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

3.2.4 Product features and functions (overview)

Table 5: Overview of product features and functions of the device

Product feature/function	Characteristic
Safety and ease of use	• Rugged, compact IP65 metal housing, CE marking (Europe) • Laser Class 2, laser switches off if the output power is exceeded • Automatic self-test on system start • Diagnostic tools for system setup and (remote) system monitoring • Configurable output of reading diagnostic data in two reading results formats • Activatable test string function (heartbeat) to signal that the device is ready for operation • Password-protected configuration mode via SOPAS ET • Future-oriented SOPAS ET configuration software • Low power consumption • Optional parameter cloning using an external CMC600 parameter cloning module in the CDB/CDM connection module

Product feature/function	Characteristic
Convenient operation and configuration	• Configuration via SOPAS ET configuration software (online/offline) or commands • Type-dependent configuration via GSD parameterization (via CDF600-2xxxx or using Ethernet variant) • LED status indicators • Auto setup of the optical reading properties • Profile programming with bar codes, generated and printed via SOPAS ET • Deactivatable acoustic signaling device for confirming device functioning
Reading Operation Mode	• Start/stop operation (one bar-code bearing object per reading pulse)
Read cycle	• Pulse sources for start: Digital inputs, data interface (command), auto pulse, free-running, CAN • Pulse sources for stop: Read cycle source, digital inputs, data interface (command), timer, condition
Bar code evaluation	• All current 1D bar code types • Max. number of bar codes: 50 per reading interval • Separation of identical codes of the same code type by read angle
Data processing	• Output of read data configurable through event-dependent evaluation conditions • Influencing the output string by filtering and output sorting
Data communication	• Host interface: Two data output formats can be configured for the reading result, can be switched to various physical interfaces, parallel operation possible • AUX interface: Fixed data output format that can be switched for various physical interfaces

3.2.5 Operating principle

The device consists of a laser scanner (laser diode and optics), an electronics unit with integrated decoder and various data interfaces (type-dependent) to industrial bus systems. The use of various focusing settings, resolutions, scan processes, bus systems, mounting options and optics enables use in most industrial applications. Interfaces to external timers, such as photoelectric sensors or incremental encoders, enable reading pulses independent of the control. The device makes the read results available for further processing via its data interfaces.

The device basically detects the codes on any side on an object (single side reading). The objects can be at rest or moved in a conveyor system.

By combining several devices , multiple sides of an object can be recorded in one passage (multi-side reading).

To capture the codes, the device generates a scan line (line scanner).

In the raster scanner version, the device generates eight scan lines. The lines are offset parallel to each other.

The length of the scan line which can be used for evaluation (reading field height) depends on the reading distance as a result of the V-shaped light emission.

The device picks up the light patterns reflected from the bar code. In the process, the device converts the patterns into electrical signals that are processed and decoded. External sensors deliver information about the read cycle and conveyor speed (increment) to control this process. The device outputs the read results to its data interfaces, for forwarding to a coordinating host or computer.

For the detailed wiring of the device and the connections to the host or computer and to the external sensors, see see "Electrical installation", page 37.

Block diagrams

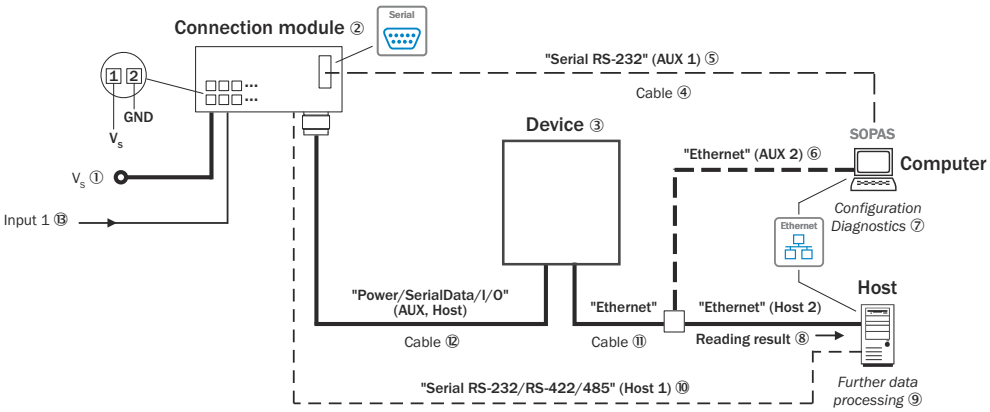

Figure 14: Connection options for CLV62x, Ethernet variant (male connector, M12, 12-pin, A-coded)

① Supply voltage V_S

② Connection module (optional, CDB620 here as example)

③ Device

④ Null modem cable (female connector, D-Sub, 9-pin/female connector, D-Sub, 9-pin), crossed TxD and RxD

⑤ Alternative to Ethernet AUX port

⑥ Alternative to serial AUX

⑦ Configuration or diagnostics

⑧ Read result

⑨ Data further processing

⑩ Alternative to Ethernet host port

⑪ Adapter cable (male connector, M12, 4-pin, D-coded/male connector, RJ-45, 8-pin)

⑫ Adapter cable (female connector, M12, 12-pin, A-coded/male connector, D-Sub-HD, 15-pin)

⑬ Digital input 1, e.g. for connecting a read cycle sensor

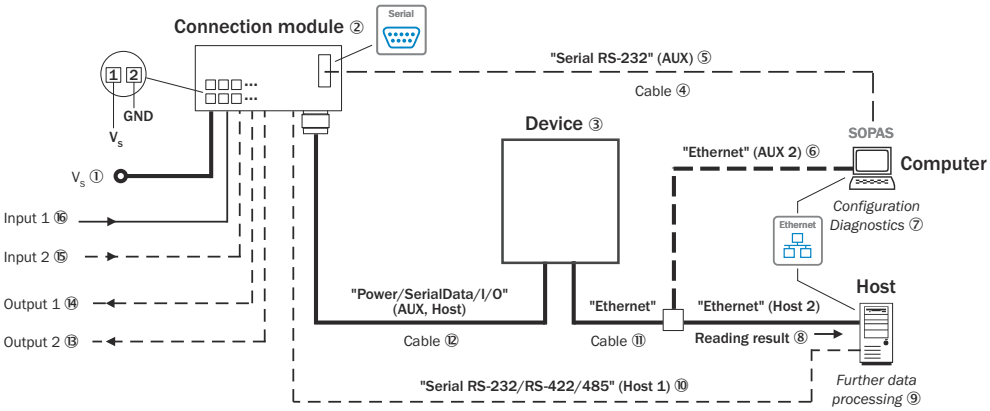

Figure 15: Connection options for CLV62x, Ethernet variant (male connector, M12, 17-pin, A-coded)

① Supply voltage V_S

② Connection module (optional, CDB650-204 required here)

③ Device

④ Null modem cable (female connector, D-Sub, 9-pin/female connector, D-Sub, 9-pin), crossed TxD and RxD

⑤ Alternative to Ethernet AUX port

⑥ Alternative to serial AUX

⑦ Configuration or diagnostics

⑧ Read result

⑨ Data further processing

⑩ Alternative to Ethernet host port

⑪ Adapter cable (male connector, M12, 4-pin, D-coded/male connector, RJ-45, 8-pin)

⑫ Connection cable 1:1 (female connector, M12, 17-pin, A-coded/male connector, M12, 17-pin, A-coded)

⑬ Digital output 2, e.g. for connecting an LED

⑭ Digital output 1, e.g. for connecting an LED

⑮ Digital input 2, e.g. for connecting an incremental encoder

⑯ Digital input 1, e.g. for connecting a read cycle sensor

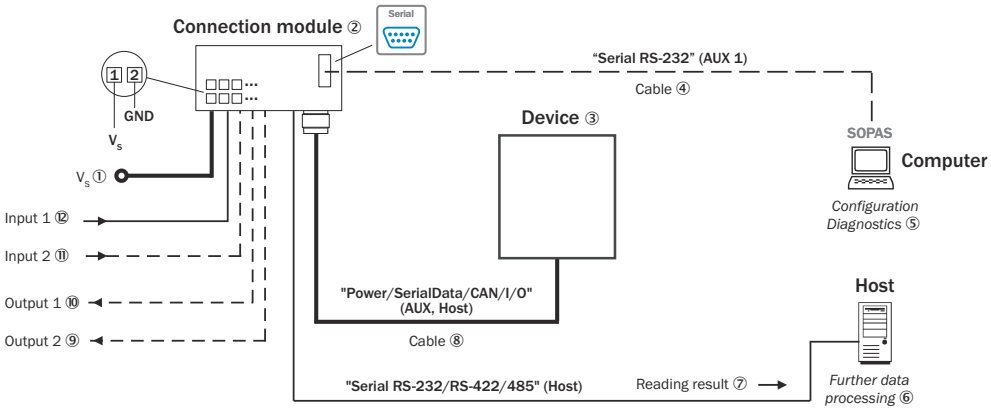

Figure 16: CLV62x facilities for connecting, serial variant

① Supply voltage V_S
② Connection module (optional, CDB620 here as example)
③ Device
④ Null modem cable (female connector, D-Sub, 9-pin/female connector, D-Sub, 9-pin), crossed TxD and RxD
⑤ Configuration or diagnostics
⑥ Data further processing
⑦ Read result
⑧ Serial variant: Device cable with male connector, D-Sub-HD, 15-pin
⑨ Digital output 2, e.g. for connecting an LED
⑩ Digital output 1, e.g. for connecting an LED
⑪ Digital input 2, e.g. for connecting an incremental encoder
⑫ Digital input 1, e.g. for connecting a read cycle sensor

3.2.5.1 Object trigger control

To start an object-related read operation, the device requires a suitable signal (trigger source) for reporting an object in the reading field. The start signal is provided by an external read cycle sensor (e.g. photoelectric sensor) as standard. As soon as an object has passed the read cycle sensor, the device opens a time window (“reading interval") for the reading process.

Alternatively, a command via a data interface or the SICK SENSOR network starts the reading process. In Auto pulse mode, the device internally generates the reading interval itself with an adjustable clock ratio.

The read cycle can be ended in several ways. For example, external triggering by the read cycle source or a command, or internally by a timer or a evaluation condition to be fulfilled.

NOTE
The SOPAS ET configuration software can be used to configure the trigger source.

3.2.5.2 Reading operation mode

In start/stop mode, there is always only one object in the reading field during the reading process. This allows all read codes to be uniquely assigned to the object. As standard, starting and stopping of the reading process are controlled by one or two read cycle sensors at the start and end of the reading field.

The distance between the read cycle sensors determines the size of the reading field. The reading process can alternatively be controlled with command strings via the data interface.

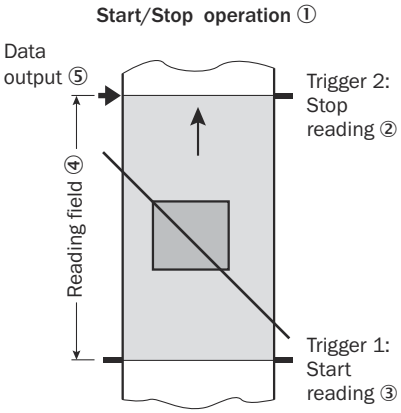

Figure 17: Start/Stop operating mode of the device in stand-alone operation

① Start/stop operation
② Trigger 2: Stop reading
③ Trigger 1: Start reading
④ Reading field
⑤ Data output

NOTE
The SOPAS ET configuration software can be used to configure the reading operation mode.

Alternatively, the configuration can also be done via GSD file (Ethernet variant/PROFINET).

Support Portal

NOTE
In the SICK Support Portal (**support.sick.com**) you will find, besides useful service and support information for your product, further detailed information on the available accessories and their use.

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 74.
- Relative humidity: see "Technical data", page 74.
- For storage periods of longer than 3 months, check the general condition of all components and packaging on a regular basis.

5 Mounting

5.1 Overview of mounting procedure

- Selecting and preparing the mounting location.
- Mounting the device.
- Connect serial variant to combined data and supply cable. Connect Ethernet variant to isolated data cable and supply cable.
- Align the device towards object with bar code.
- Adjust the device.

NOTICE

Danger due to damage to the device

For reasons of safety, if a device shows visible signs of damage do not put it into operation. Immediately take a device that is in operation out of operation.

Damage includes, depending on the type of device, for example the following:

- Viewing window pane: Cracked or broken
- Housing: Cracked or broken
- Violation of the cable outlet on the housing or the cable itself
- Overtightening of the male connector unit, tearing or breakage of the housing
- Moisture penetration in the device

5.2 Preparing for mounting

5.2.1 Mounting requirements

Space requirements

- For typical space requirements for the device: See type-specific dimensional drawing and reading field diagram.
- The device requires a direct, unimpeded line of sight to the codes being read.
- Make sure path between the bar code and the viewing window of the device is of sufficient size. The light reflected from the bar code must be able to reach the viewing window without interference. This means that there must be a free corridor along the entire light path. The height of the corridor must be at least equal to the height of the viewing window.

Environmental influences

- Comply with technical data, e.g. permissible ambient conditions for operating the device (temperature range, EMC interference emission, ground potential), see "Technical data", page 74.
- To prevent the formation of condensation, avoid exposing the device to rapid changes in temperature.
- To avoid additional external heating of the device during operation or optical device dazzle, protect the device from direct or indirect sunlight.

Mounting

IP65 standard housing:

- The device must only be mounted using the pairs of blind tapped holes provided for this purpose.

IP69K protective housing:

- The device must be mounted using the two blind tapped holes provided or with at least two of the four fixing holes.

NOTE
For more detailed information on mounting and electrical installation of the devices, see “Technical Information CLV62x, CLV63x and CLV64x with IP69K Protective Housing”, part no. 8021479.

General:

- Mount the device in a shock and vibration insulated manner.

Equipment required

- Mounting device (bracket) with sufficient load-bearing capacity and suitable dimensions for the device.
- IP65 standard housing: 2 M5 screws – the maximum screw-in depth in the device is 5 mm from the housing surface.
- Tool and tape measure

The screws are for mounting the device on mounting equipment (bracket) supplied by the user. The screw length required depends on the mounting base (wall thickness of the bracket).

NOTE
The scope of delivery of a SICK bracket already includes the right screws for mounting the device to the bracket.

5.2.2 Mounting device

The device is mounted as follows, depending on the type of housing:

IP65 standard housing:

- The device is mounted to the bracket via at least two M5 tapped blind holes. The blind tapped holes are located in pairs on both of the narrow sides of the device, see "Device view", page 17.

IP69K protective housing:

- The device is attached to the bracket via M5 tapped blind holes or fixing holes. The two tapped blind holes and four fixing holes are located in the base plate of the device, symmetrically divided on the two narrow sides, see "Device view", page 17.

SICK brackets

The device can be installed using optional SICK brackets or customer-specific brackets.

SICK offers prefabricated brackets that are suited for mounting the device in various applications. Information can be found on the product page.

Example: The design of the bracket with adapter plate supports many different installation variants, for example, as well as the alignment of the device in two axes.

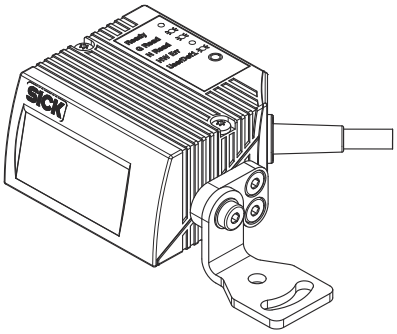

Figure 18: Mounting example of a device (IP65 standard housing) with mounting bracket with adapter plate

User-supplied brackets

Bracket requirements:

- Stable mounting device
  - Orientation of the device changeable in the x- and y-axis
  - The mounting device must be able to bear the weight of the device and connecting cables without shock.
- Depending on the device, at least two M5 screws for mounting the device
  - The screw length depends on the wall thickness of the mounting device.
  - The maximum screw in-depth in the device is 5 mm from the housing surface.

5.3 Mounting location

Observe the following aspects when selecting the installation location:

- Basic assignment of the scan line to the bar code
- Reading distance to bar code and aperture angle α
- Angular orientation of the device to the bar code
- Avoidance of surface reflections
- Counting direction of the reading angle (position of the bar code within the scan line)

5.3.1 Basic assignment of the scan line to the bar code

The principle assignment of the scan line to the bar code on the object depends on the sensor type of the device: Line scanner with line scanning or raster scanner with raster scanning

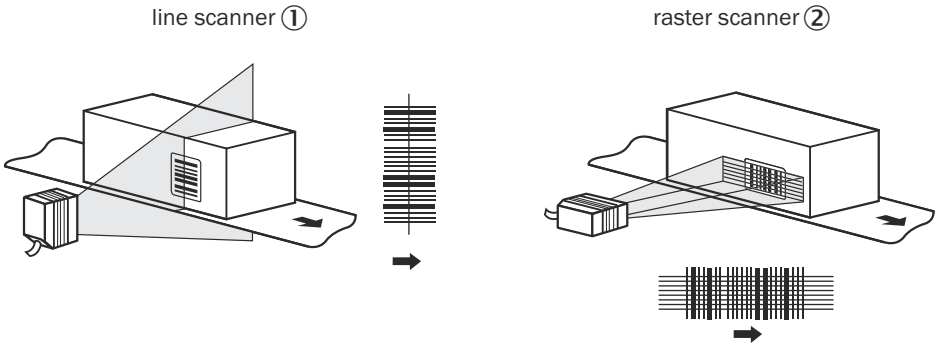

Figure 19: Allocation of scan line(s) to bar code and conveyor direction

① Line scanner

② Grid scanner

5.3.2 Reading distance to the bar code and aperture angle α

The maximum distance from the viewing window of the device to the bar code may not exceed the limit values for the device. Because of the V-shaped deflection of the beams, the usable length of the scan line for evaluation (reading field height) depends on the reading distance.

The specification diagrams show the height of the reading field as a function of the reading distance at different resolutions (module widths), see "Technical data", page 74.

5.3.3 Angular orientation of the device

When the scan line sweeps across the bar code at nearly a right angle, the optimal alignment of the device has been achieved (azimuth and tilt). Possible reading angles that may occur between the scan line and the bar code must be taken into account. This applies to all three levels in the room.

To avoid surface reflections, select a rotation angle of approx. 15° from the perpendicular to the bar code, see "Avoiding surface reflections", page 33.

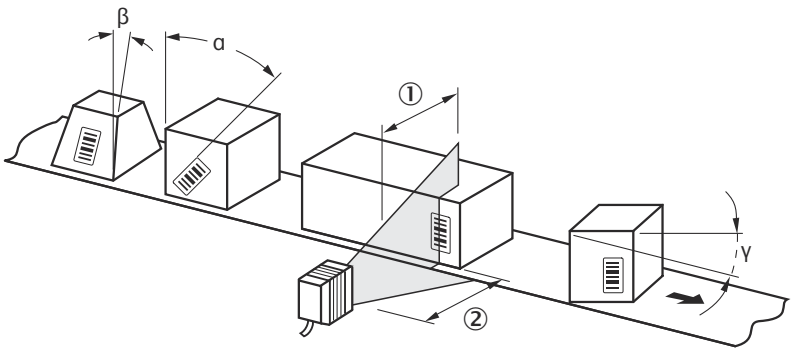

Figure 20: Line scanner: Occurring reading angle between scan line and bar code

① Depth of field

② Reading distance

Table 6: Permitted read angle between scan line and bar code

Angle	Limit Value
Tilt α	Max. 30°
Pitch β	Max. 45°
Skew γ	Max. 45°

NOTE

The specified maximum values can only be achieved if conditions are optimal. The actual maximum depends on module width, code type, print contrast, ambient light, distance and scanning frequency.

5.3.4 Avoiding surface reflections

If the light of the scan line(s) hits the surface of the bar code exactly perpendicular, disturbing reflections may occur.

To avoid this effect when receiving the backscattered light, mount the device so that the outgoing light is tilted relative to the perpendicular.

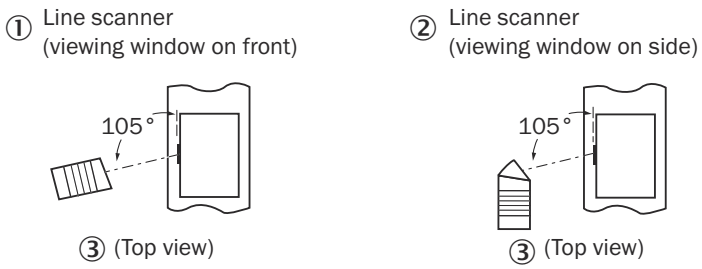

Figure 21: Avoiding surface reflections on the example line scanner: Angle between light emitted and bar code (tilting away from vertical)

① Line scanner (front viewing window)
② Line scanner (side viewing window)
③ Supervision

NOTE
When the scan line is tilted approx. 15° from the perpendicular, optimum results are obtained.

5.3.5 Counting direction of the reading angle

The device can scan and decode several bar codes at each reading.

The device determines the location-specific read diagnostics data per bar code and optionally outputs these data in the read result:

Reading angle (RA value)

- This value specifies the angle at which the deflected scanning beam detects the bar code center with the red scan line in the scan plane. This value is within the aperture angle of the device.

By determining the respective RA value, identical bar codes (code type, code length, and data content) can be separated, and the bar code data can be assigned based on its position on the object.

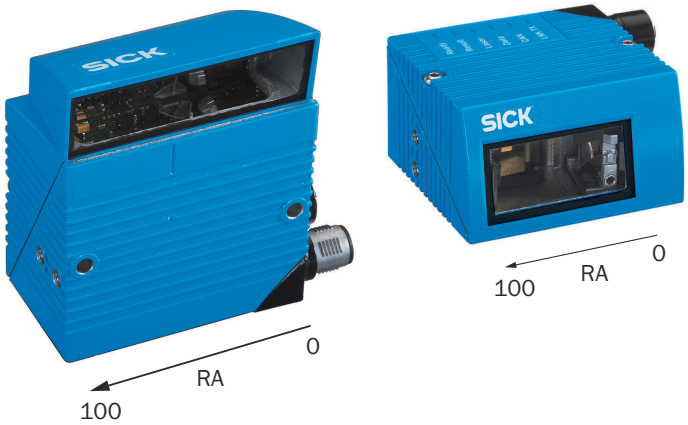

Figure 22: Counting direction of the reading angle RA in the scan plane: For devices in the IP65 standard housing with side viewing window (left) and front viewing window (right)

- Reading angle α (aperture angle) in the scan plane: 1° = 2 RA (50° = 100 RA)

5.4 Mounting device

Devices in IP65 standard housing

NOTICE
Risk of damage to the device

the device will be damaged if the tightening torque of the mounting screws is too high or if the maximum screw-in depth of the blind hole threads is exceeded.

- ► Observe maximum tightening torque.
- ► Use suitable mounting screws for the blind hole threads of the device. Observe the maximum screw-in depth.

Maximum tightening torque: 2.5 Nm

Screw-in depth of the blind tapped holes see "Mechanics/Electronics", page 77 in the technical data.

1. Prepare the base for mounting the bracket of the device, see "Preparing for mounting", page 30.
2. Place the object with bar code at the intended reading point of the device in the viewing range of the device (no conveying movement).
3. Align device with the bar code by eye. When doing so, be aware of the following:
   - For devices with a front viewing window: The rear of the device with the laser warning label faces the viewer and is aligned approximately parallel to the bar code surface.
   - For devices with a side viewing window: The side panel with the LEDs faces the viewer and is aligned almost parallel to the bar code surface.
   - During reading, note the reading angle that occurs see "Angular orientation of the device", page 33.
   - If the position of the bar code within the scan line is relevant for the evaluation, observe the counting direction of the code position, see "Counting direction of the reading angle", page 34.
4. Mount the device bracket onto the base.
5. Screw suitable screws through the bracket into the blind tapped hole of the device. Tighten the screws lightly for the time being.
6. Align device, see "Aligning the device for operational use", page 62.
7. After alignment, tighten the screws. Do not exceed the maximum tightening torque.

Devices in IP69K protective housing

NOTE

For more detailed information on mounting and electrical installation of the devices, see “Technical Information CLV62x, CLV63x and CLV64x with IP69K Protective Housing”, part no. 8021479.

5.5 Mounting external components

5.5.1 Mounting the connection module

If a connection module is used for device control, mount the connection module close to the device.

NOTE

Observe the maximum cable length when connecting to the serial AUX interface.

If the computer with the SOPAS ET configuration software accesses the AUX interface (RS-232; 57.6 kBd) of the device via the connection module, do not mount the connection module further than a 3 m cable length from the device.

1. Mount the connection module in the vicinity of the device.
2. Mount the connection module in such a way that the open module can be accessed at all times.

NOTE

For detailed information on mounting and electrical installation, please refer to the respective operating instructions for the connection module.

5.5.2 Mounting external read cycle sensor

If an external read cycle sensor (e.g. photoelectric sensor) triggers the device, mount the sensor close to the device.

NOTE

A large selection of photoelectric sensors and accessories (brackets, connecting cables) can be found at www.sick.com.

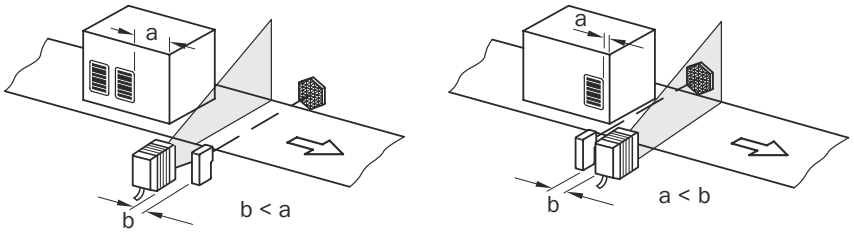

Figure 23: Bar code at the end or start of the piece goods

The mounting location of the device depends on distance “a” of the bar codes from the front object edge. Depending on the application, mount the device so that bar codes on objects of different sizes can be read completely during the evaluation time window (reading interval).

6 Electrical installation

6.1 Safety

6.1.1 Notes on the electrical installation

Devices in IP69K protective housing

NOTE
For more detailed information on mounting and electrical installation of the devices, see “Technical Information CLV62x, CLV63x and CLV64x with IP69K Protective Housing”, part no. 8021479.

All devices:

NOTICE
Equipment damage due to incorrect supply voltage!
An incorrect supply voltage may result in damage to the equipment.

- Only operate the device using a protected low voltage and safe electrical insulation as per protection class III.

NOTICE
Equipment damage or unpredictable operation due to working with live parts.
Working with live parts may result in unpredictable operation.

- Only carry out wiring work when the power is off.
- Only connect and disconnect electrical connections when the power is off.

- **The electrical installation must only be performed by electrically qualified personnel.**
- **Standard safety requirements must be observed when working on electrical systems!**
- Only switch on the supply voltage for the device when the connection tasks have been completed and the wiring has been thoroughly checked.
- When using an extension cable with an open end, make sure that bare wire ends are not touching (risk of short-circuit when the supply voltage is switched on). Wires must be properly insulated from each other.
- Wire cross-sections in the supply cable from the user’s power system must be selected in accordance with the applicable standards. When this is done in Germany, observe the following standards: DIN VDE 0100 (Part 430) and DIN VDE 0298 (Part 4) or DIN VDE 0891 (Part 1).
- All circuits connected to the device must be designed as SELV circuits (EN 60950-1) or ES1 circuits (EN 62368-1).
- Protect the device with a separate fuse of max. 2 A at the start of the supply circuit.

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.

6.1.2 Note on the swivel connector

NOTE
The swivel connector is type-dependent. The unit is not available on all models of the device.

NOTICE
Damage to the male connector unit due to overtightening
The connector unit on the device has two opposite end positions.

- Do not rotate the connector unit from either of the two end positions by more than 180°.
- Always rotate the connector unit in the direction of the display LEDs.

Figure 24: Swivel connector unit, rotation direction from end position to end position

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 designed and tested for electrical safety in accordance with EN 62368-1.

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

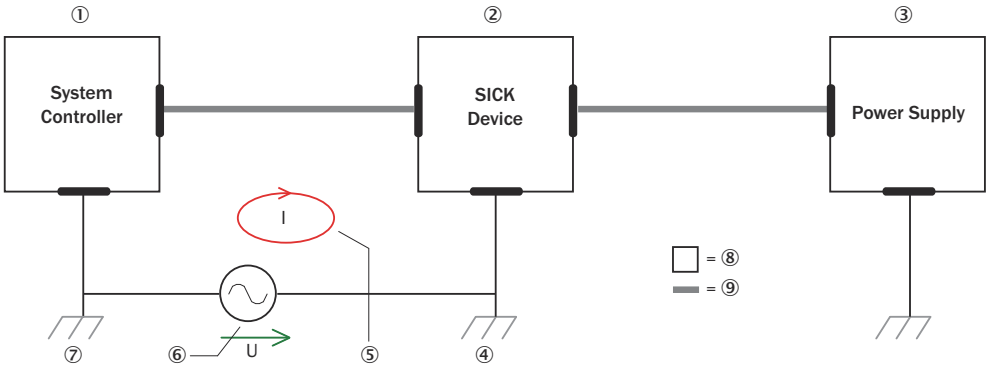

Figure 25: Example: Occurrence of equipotential bonding currents in the system configuration

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.

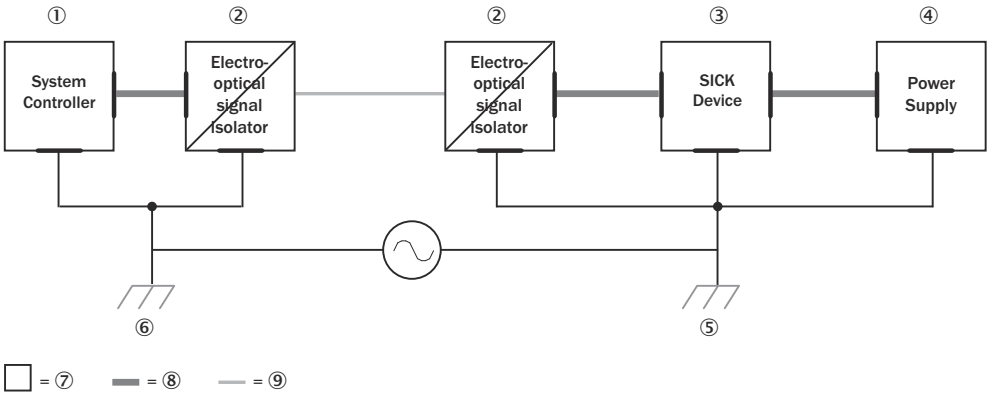

Figure 26: Example: Prevention of equipotential bonding currents in the system configuration by the use of electro-optical signal isolators

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.

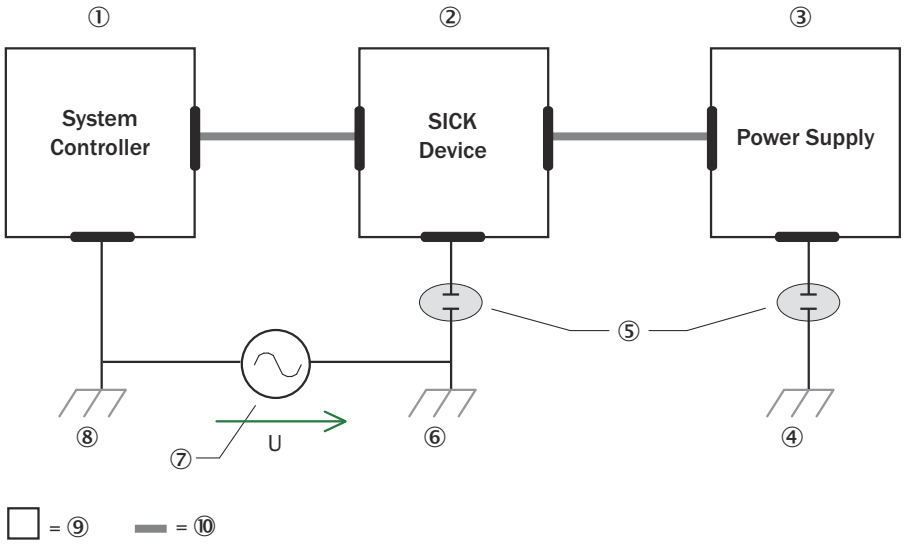

Figure 27: Example: Prevention of equipotential bonding currents in the system configuration by the insulated mounting of the device

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 Wiring instructions

NOTE

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

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

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

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

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.

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 87.

All electrical connections of the device are configured as M12 round connectors or as a cable with D-Sub male connector, depending on the type.

The enclosure rating stated in the technical data is achieved only with screwed plug connectors and protective elements on any unused M12 connections.

Shielding requirements

- To ensure a fault-free data transmission, an effective and comprehensive shielding solution must be implemented.
- Apply a cable shield at each end, i.e. in the control cabinet and at the device.
- The cable shield of the pre-assembled cables is routed via the knurled nut (M12 plug connector) or the housing (D-Sub plug connector) of the cable heads, depending on the device.
- After plugging in and fixing the cable heads, the screen is connected to the device housing over a large area.
- The cable shield in the control cabinet must be connected over a large surface to the ground potential on the potential equalization conductor.
- Take appropriate measures (e.g. earthing method) to prevent equipotential bonding currents from flowing through the cable shield.
- During installation, pay attention to the different cable groups. The cables are grouped into the following four groups according to their sensitivity to interference or radiated emissions:
  - Group 1: cables very sensitive to interference, such as analog measuring cables
  - Group 2: cables sensitive to interference, such as device cables, communication signals, bus signals
  - Group 3: cables that are a source of interference, such as control cables for inductive loads and motor brakes
  - Group 4: cables that are a powerful source of interference, such as output cables from frequency inverters, welding system power supplies, power cables
  - ► Cables in groups 1, 2 and 3, 4 must be crossed at right angles (see figure 28).
  - ► Route the cables in groups 1, 2 and 3, 4 in different cable channels or use metallic separators (see figure 29 and see figure 30). This applies particularly if cables of devices with a high level of radiated emission, such as frequency converters, are laid parallel to device cables.

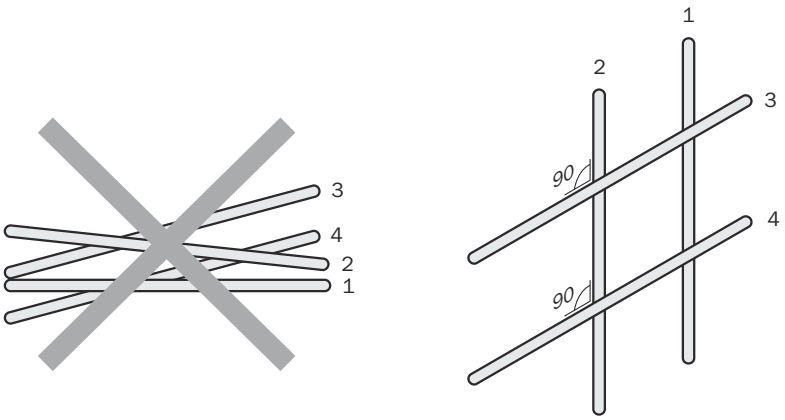

Figure 28: Cross cables at right angles

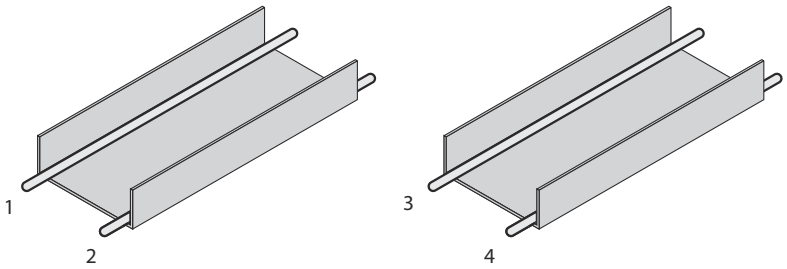

Figure 29: Ideal laying – Place cables in different cable channels

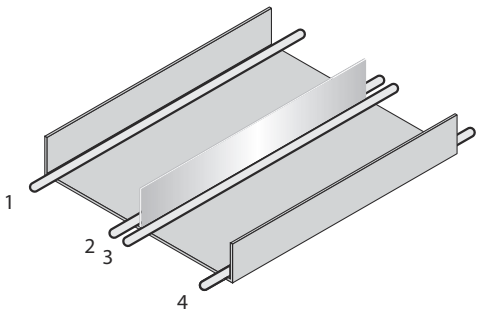

Figure 30: Alternative laying – Separate cables with metallic separators

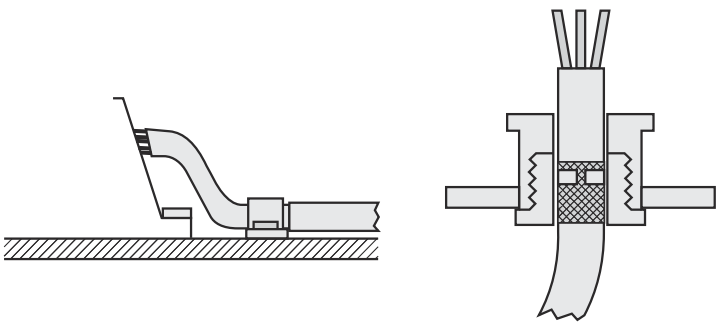

Figure 31: Shield connection in plastic housings

6.4 Pin assignments for electrical connections

6.4.1 Ethernet variant: Connections of the device with connector unit

Ethernet

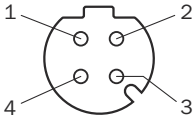

Figure 32: M12 female connector, 4-pin, D-coded

Table 7: Ethernet: Pin assignment of the female connector, M12, 4-pin, D-coded

Pin	Signal	Function
1	TD+	Sender+
2	RD+	Receiver+
3	TD–	Sender–
4	RD–	Receiver–

Serial/CAN/I/O/Power: 12-pin connection variant

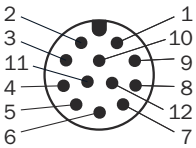

Figure 33: Male connector, M12, 12-pin, A-coded

Table 8: Ethernet variant: Pin assignment of the male connector, M12, 12-pin, A-coded

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 interface (sender+)
6	TD- (RS-422/485) or TxD (RS-232)	Host interface (sender-)
7	TxD (RS-232)	AUX interface (sender)
8	RxD (RS-232)	AUX interface (receiver)
9	SensGND	Common ground of the digital inputs
10	Sensor 1	Digital input 1 (external read cycle)
11	RD+ (RS-422/485)	Host interface (receiver+)
12	RD- (RS-422/485) or RxD (RS-232)	Host interface (receiver–)
-	–	Shielding

The “Sensor 2” digital input and “Result 1” and “Result 2” digital outputs are only available via the CDB620 / CDM connection module, in combination with the CMC600 parameter cloning module.

Serial/CAN/I/O/Power: 17-pin connection variant

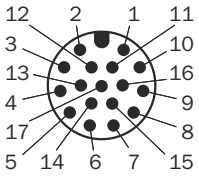

Figure 34: Male connector, M12, 17-pin, A-coded

Table 9: Ethernet variant: Pin assignment of the male connector, M12, 17-pin, A-coded

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 interface (sender+)
6	TD- (RS-422/485) or TxD (RS-232)	Host interface (sender-)
7	TxD (RS-232)	AUX interface (sender)
8	RxD (RS-232)	AUX interface (receiver)
9	SensGND	Common ground of the digital inputs
10	Sensor 1	Digital input 1 (configurable function, e.g. start external read cycle)
11	RD+ (RS-422/485)	Host interface (receiver+)
12	RD- (RS-422/485) or RxD (RS-232)	Host interface (receiver–)
13	Result 1	Digital output 1, configurable function
14	Result 2	Digital output 2, configurable function
15	Sensor 2	Digital input 2 (configurable function, e.g. stop external read cycle)
16	–	–
17	–	–

6.4.2 Serial variant: Connections of the device with cable

Device with cable and D-Sub male connector

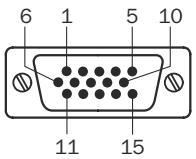

Figure 35: Male connector, D-Sub-HD, 15-pin

Table 10: Serial variant: Pin assignment of the male connector, D-Sub-HD, 15-pin

Pin	Signal	Function
1	V_S	Supply voltage
2	RxD (RS-232)	AUX interface (receiver)
3	TxD (RS-232)	AUX interface (sender)

Pin	Signal	Function
4	Sensor 2	Digital input 2 (configurable function, e.g. start external read cycle)
5	GND	Ground
6	RD+ (RS-422/485)	Host interface (receiver+)
7	RD- (RS-422/485) or RxD (RS-232)	Host interface (receiver–)
8	TD+ (RS-422/485)	Host interface (sender+)
9	TD- (RS-422/485) or TxD (RS-232)	Host interface (sender-)
10	CAN H	CAN bus (IN/OUT)
11	CAN L	CAN bus (IN/OUT)
12	Result 1	Digital output 1, configurable function
13	Result 2	Digital output 2, configurable function
14	Sensor 1	Digital input 1 (configurable function, e.g. stop external read cycle)
15	SensGND	Common ground of the digital inputs
–	–	Shielding

6.5 Connection diagrams

Ethernet variant (male connector, M12, 12-pin, A-coded)

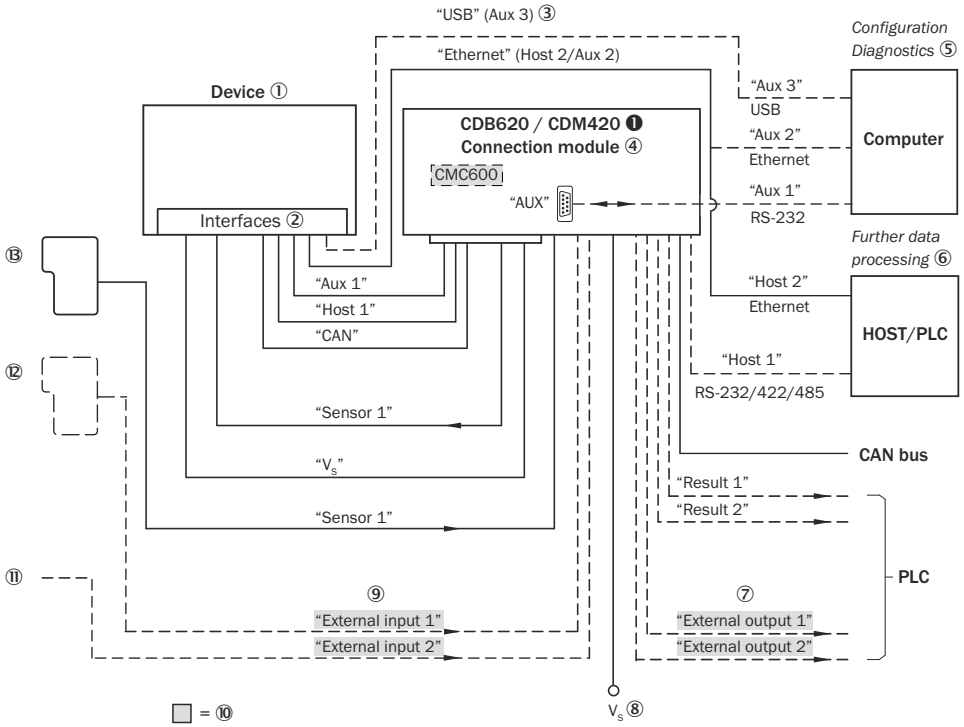

Figure 36: Ethernet variant: Electrical connections on the device with connector (male connector, M12, 12-pin, A-coded)

❶ Here CDM420-0001 or CDM420-0006
① Device
② Interfaces
③ USB not required for CLV62x
④ Connection module
⑤ Configuration or diagnostics
⑥ Further data processing
⑦ External digital outputs
⑧ Supply voltage V_S
⑨ External digital inputs
⑩ The optional CMC600 parameter cloning module is required in order to be able to use the additional external digital inputs and outputs of the device (highlighted in gray)
⑪ Other functions
⑫ Application-dependent alternative stop reading cycle (e.g., photoelectric sensor) or travel increment (incremental encoder)
⑬ Start/Stop reading sensor (e.g., photoelectric sensor)

Ethernet variant (male connector, M12, 17-pin, A-coded)

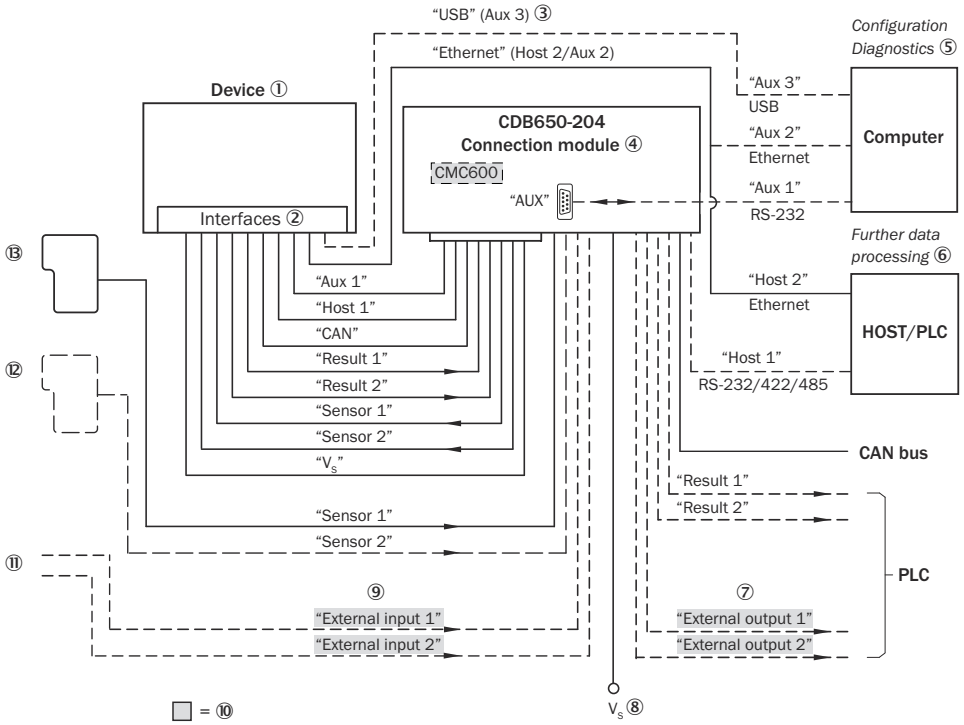

Figure 37: Ethernet variant: Electrical connections on the device with connector (male connector, M12, 17-pin, A-coded)

① Device
② Interfaces
③ USB not required for CLV62x
④ Connection module
⑤ Configuration or diagnostics
⑥ Further data processing
⑦ External digital outputs
⑧ Supply voltage V_S
⑨ External digital inputs
⑩ The optional CMC600 parameter cloning module is required in order to be able to use the additional external digital inputs and outputs of the device (highlighted in gray)
⑪ Other functions
⑫ Application-dependent alternative stop reading cycle (e.g., photoelectric sensor) or travel increment (incremental encoder)
⑬ Start/Stop reading sensor (e.g., photoelectric sensor)

Serial variant (male connector, D-Sub-HD, 15-pin)

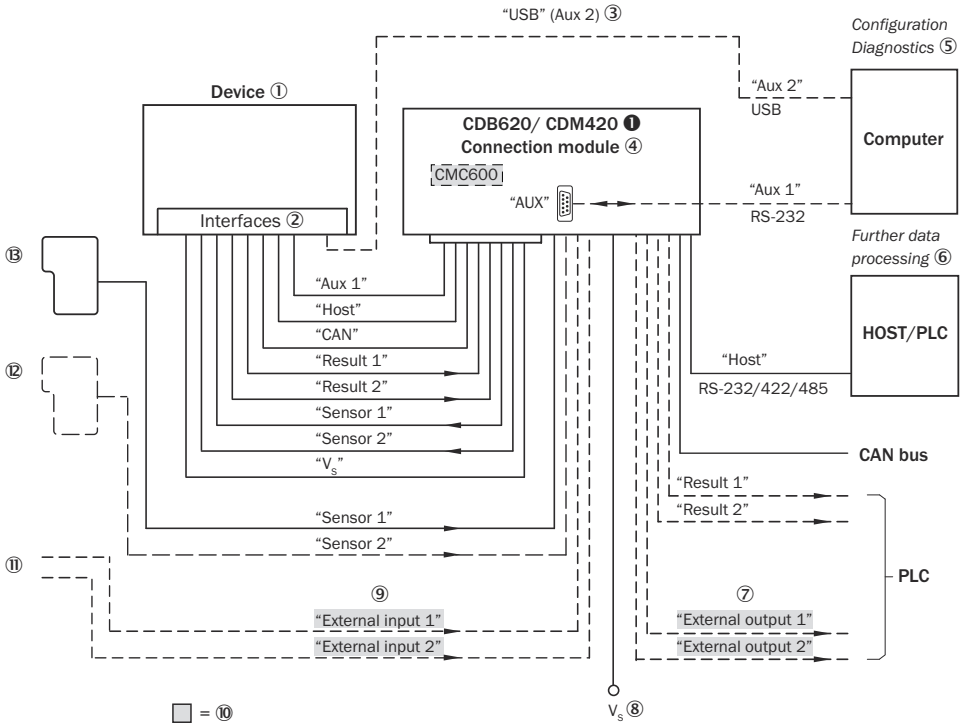

Figure 38: Serial variant: Electrical connections on the device with connecting cable (male connector, D-Sub-HD, 15-pin)

❶ Here CDM420-0001 or CDM420-0006
① Device
② Interfaces
③ USB not included for serial variant and CLV62x
④ Connection module
⑤ Configuration or diagnostics
⑥ Further data processing
⑦ External digital outputs
⑧ Supply voltage V_S
⑨ External digital inputs
⑩ The optional CMC600 parameter cloning module is required in order to be able to use the additional external digital inputs and outputs of the device (highlighted in gray)
⑪ Other functions
⑫ Application-dependent alternative stop reading cycle (e.g., photoelectric sensor) or travel increment (incremental encoder)
⑬ Start/Stop reading sensor (e.g., photoelectric sensor)

6.6 Wiring interfaces

6.6.1 Connecting the supply voltage

Connect the device only to a power supply unit that has the following properties:

- Stabilized safety extra-low voltage SELV according to currently valid standards
- The voltage supply must meet the requirements of ES1 (EN 62368-1).
- Supply voltage 10 V DC ... 30 V DC

- Electricity source with at least 10 W power
- When using the optional CMC600 parameter cloning module in the connection module: Additional output power 0.5 W

Wiring with SICK connection module

Feeding supply voltage for the device via a connection module:

Connection modules	Interface	Reference
CDB620-001	Supply voltage	see "Connecting supply voltage for the device in CDB620-001", page 98
CDB650-204 [1]	Supply voltage	see "Connecting supply voltage for the device in CDB650-204", page 118
CDM420-0001	Supply voltage	see "Connecting supply voltage for the device in CDM420-0001", page 132
CDM420-0006	Supply voltage	see "Connecting supply voltage for the device in CDM420-0006", page 152

[1] For CLV62x with male connector, M12, 17-pin on the swivel connector.

NOTE

For further connection modules see

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

If the supply voltage is connected via a connection module, observe the respective operating instructions of the module.

Protecting the supply cables

To ensure protection against short-circuits/overload in the user's supply cable, appropriately choose and protect the wire cross-sections used and at the beginning of the supply cable.

Observe the following standards in Germany:

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

Supply voltage directly via a SICK connection module or via a user voltage supply.

6.6.2 Wiring the data interface

Wiring the Ethernet interface (Ethernet variant)

1. Connect the device to the Ethernet port of the computer via an adapter cable.
2. Set up communication via SOPAS ET configuration 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 (serial variant)

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

Table 11: Data transmission rates

Interface type	Data transmission rate	Distance to the target computer (host)
RS-232 (Host)	Up to 19.2 kBd 38.4 kBd ... 57.6 kBd 115.2 kBd ... 500 kBd	Max. 10 m Max. 3 m Max. 2 m
RS-232 (AUX)	57.6 kBd	Max. 3 m
RS-422/485 (Host) [1]	Up to 38.4 kBd 38.4 kBd ... 57.6 kBd	Max. 1,200 m Max. 500 m

1) For RS-422/485-suitable cable and corresponding cable termination as per specification.

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.

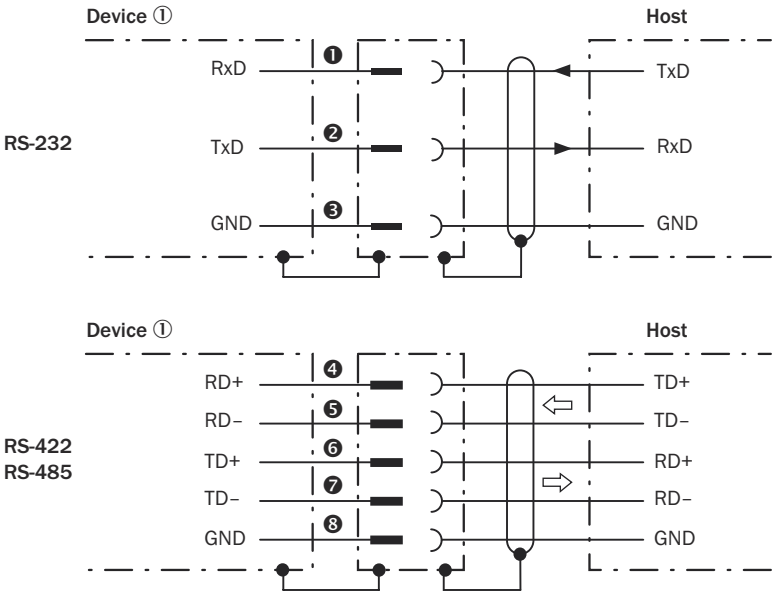

Figure 39: Internal circuitry for data interfaces: RS-232 and RS-422/485

① Device

❶...❸ Pin assignment: see RS-232 pin assignment for the respective device

❹...❽ Pin assignment: See RS-422/485 pin assignment for the respective device

Termination of the RS-422/485 data interface

The data interface can be terminated in the connection module via switches.

Additional information on this, specific to the connection module type, can be found in the appendix of this operating manual.

NOTE

Activate the serial data interface type in the device using a configuration software, e.g., SOPAS ET.

Wiring the serial data interface of the device (host interface) via a connection module:

Connection modules	Data interface	Reference
CDB620-001	RS-232	see "Wiring serial host interface RS-232 of the device in the CDB620-001", page 99
	RS-422	see "Wiring serial host interface RS-422 of the device in the CDB620-001", page 100
	RS-485	see "Wiring the RS-485 serial host interface of the device in the CDB620-001", page 102
CDB650-204 [1]	RS-232	see "Wiring serial host interface RS-232 of the device in CDB650-204", page 118
	RS-422	see "Wiring serial host interface RS-422 of the device in CDB650-204", page 119
	RS-485	see "Wiring serial host interface RS-485 of the device in CDB650-204", page 120
CDM420-0001	RS-232	see "Wiring serial host interface RS-232 of the device in the CDM420-0001", page 133
	RS-422	see "Wiring serial host interface RS-422 of the device in the CDM420-0001", page 135
	RS-485	see "Wiring serial host interface RS-485 of the device in the CDM420-0001", page 137
CDM420-0006	RS-232	see "Wiring serial host interface RS-232 of the device in the CDM420-0006", page 153
	RS-422	see "Wiring serial host interface RS-422 of the device in the CDM420-0006", page 155
	RS-485	see "Wiring serial host interface RS-485 of the device in the CDM420-0006", page 157

1) For CLV62x with male connector, M12, 17-pin, A-coded on the swivel connector.

NOTE

For further connection modules see

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

If the data interface is wired via a connection module, observe the respective operating instructions of the module.

6.6.3 Wiring the CAN interface

NOTE

Activate the CAN data interface in the device using a configuration software, e.g., SOPAS ET.

Configure further settings in the device according to the function of the device in the system configuration.

Wiring the CAN interface of the device via a connection module:

Connection modules	Interface	Reference
CDB620-001	CAN	see "Wiring the CAN interface in the CDB620-001", page 104
CDM420-0001	CAN	see "Wiring the CAN interface of the device in the CDM420-0001", page 138
CDB650-204 [1]	CAN	see "Wiring the CAN interface of the device in the CDB650-204", page 121
CDM420-0006	CAN	see "Wiring the CAN interface of the device in the CDM420-0006", page 158

1) For CLV62x with male connector, M12, 17-pin, A-coded on the swivel connector.

NOTE

For further connection modules see

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

If the CAN interface is wired via a connection module, observe the respective operating instructions of the module.

6.6.4 Wiring the digital inputs

Digital inputs can be used, for example, to start and end the reading pulse or to feed in an increment signal.

Physical digital inputs on the device:

Physical digital inputs are available at the connections. The number of them varies depending on the device, see "Pin assignments for electrical connections", page 45.

Table 12: Characteristic data of the digital inputs

Type	Switching
Switching behavior	Power to the input starts the assigned function, e.g., start of the internal reading interval of the device. (Default: active high, debounce time 10 ms)
Properties	• Opto-decoupled, reverse polarity protected • Can be wired with PNP output of a trigger sensor • Adjustable debounce time
Electrical values	The electrical values are identical for all digital inputs. Low: $\lvert V_{in}$ [1] $\rvert \leq 2$ V; $\lvert I_{in}$ [2] $\rvert \leq 0.3$ mA High: 6 V $\leq \lvert V_{in} \rvert \leq 32$ V; 0.7 mA $\leq \lvert I_{in} \rvert \leq 5$ mA

1) Input voltage.
2) Input current.

The SOPAS ET configuration software can be used to configure the debounce time.

- Minimum: 0 ms
- Maximum: 10,000 ms
- Default: 10 ms

NOTE

Avoidance of uncontrolled state changes of the digital inputs

In environments with high electromagnetic pollution, insufficient debounce times can cause undesirable changes in the state of the digital inputs of the device. E.g.: Example of uncontrolled start of a read process with debounce times < 10 ms.

The following measures are recommended to prevent uncontrolled changes in condition:

- Keep the length of cables from the signal source to the device as short as possible.
- Reduce coupling to neighboring cables.
- Shield any affected lines.

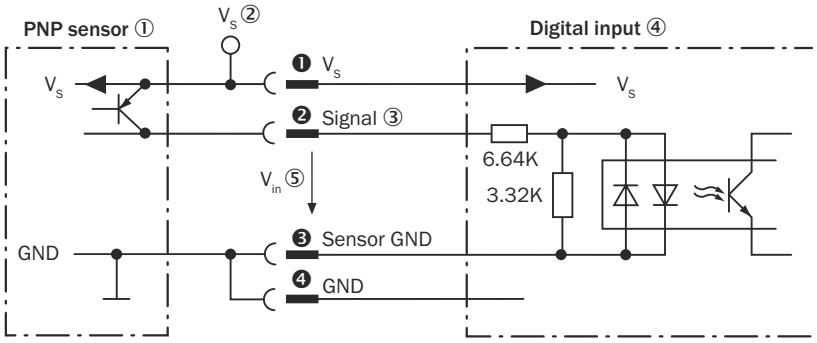

Figure 40: Wiring of a digital input on the device with external PNP sensor

① PNP sensor
② Supply voltage V_S
③ Input signal
④ Digital input
⑤ Input voltage V_{in}
❶...❹ For pin assignment, see respective device

External digital inputs in the CDB/CDM connection module (optional):

The optional CMC600 parameter cloning module provides two additional external digital inputs at the corresponding terminals in the connection module.

NOTE

The external digital inputs are not suitable for time-critical applications.

For the electrical characteristic data of the external digital inputs, see the connection diagrams for the connection modules in these operating instructions.

Function assignment

NOTE

Allocate the functions for the digital inputs in the device using a configuration software, e.g., SOPAS ET.

Wiring the digital inputs via a connection module:

Connection modules	Digital inputs	Reference
CDB620-001	“Sens 1” “Sens 2”	see "Wiring digital inputs of the device in the CDB620-001", page 106
	External input 1 (“In 1”) External input 2 (“In 2”)	see "Wiring the external digital inputs of the device in the CDB620-001", page 109
CDB650-204 [1]	“SENS/IN 1” “SENS/IN 2”	see "Wiring digital inputs of the device in the CDB650-204", page 123
	External input 1 (“EXT. IN 1”) External input 2 (“EXT. IN 2”	see "Wiring the external digital inputs of the device in the CDB650-204", page 125
CMD420-0001	“Sensor 1” “Sensor 2“	see "Wiring digital inputs of the device in the CDM420-0001", page 140
	External input 1 (“Aux In 1”) External input 2 (“Aux In 2”)	see "Wiring the external digital inputs of the device in the CDM420-0001", page 143
CMD420-0006	“Sensor 1” “Sensor 2“	see "Wiring digital inputs of the device in the CDM420-0006", page 160
	External input 1 (“Aux In 1”) External input 2 (“Aux In 2”)	see "Wiring the external digital inputs of the device in the CDM420-0006", page 163

1) For CLV62x with male connector, M12, 17-pin, A-coded on the swivel connector.

NOTE

For further connection modules see

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

If the digital inputs are wired via a connection module, observe the respective operating instructions of the module.

6.6.5 Wiring the digital outputs

The digital outputs can be assigned, independently of each other, various functions for event status indication. If the allocated event occurs in the read process, then the corresponding digital output is live after the end of the reading pulse for the selected pulse duration.

Physical digital outputs on the device:

Physical digital outputs are available at the connections. The number of them varies depending on the device, see "Pin assignments for electrical connections", page 45.

Table 13: Characteristic data of the digital outputs

Type	Switching
Switching behavior	PNP switching against supply voltage V_S
Properties	Short-circuit protected Temperature protected Not electrically isolated from V_S

Electrical values	The electrical values are identical for all digital outputs. 0 V ≤ V_{out} [1] ≤ V_S (V_S [2] −1.5 V) ≤ V_{out} ≤ V_S at I_{out} [3] ≤ 100 mA

1) Output voltage.
2) Supply voltage.
3) Output current.

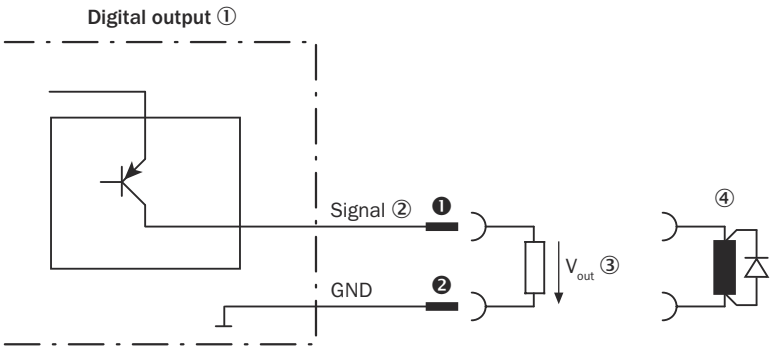

Figure 41: Wiring a digital output on the device

① Digital output
② Output signal
③ Output voltage V_{out}
④ With inductive load: see note
❶...❷ For pin assignment, see respective device

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. The limit value is a maximum capacitance of 100 nF.

NOTE
The digital outputs are not suitable for time-critical applications.

1. Connect the digital outputs according to the application.
2. For the thorough check of the switching functions, use a high resistance digital voltmeter and wire the digital outputs with a load.
   This prevents the display of incorrect voltage values/output states.

External digital outputs in the CDB/CDM connection module (optional):

The optional CMC600 parameter cloning module provides two additional external digital outputs at the corresponding terminals in the connection module.

NOTE
The digital outputs are not suitable for time-critical applications.

For the electrical characteristic data of the two external digital outputs, see the respective connection diagrams for the connection modules in these operating instructions.

Function assignment

NOTE
Allocate the functions for the digital outputs in the device using a configuration software, e.g., SOPAS ET.

Wiring the digital outputs via a connection module:

Connection modules	Digital outputs	Reference
CDB620-001	“Result 1” “Result 2”	see "Wiring digital outputs of the device in the CDB620-001", page 111
	External output 1 (“ Out 1”) External output 2 ("Out 2")	see "Wiring the external digital outputs of the device in the CDB620-001", page 114
CDB650-204 [1]	“RES/OUT 1” ”RES/OUT 2”	see "Wiring digital outputs of the device in the CDB650-204", page 127
	External output 1 (“EXT. OUT 1”) External output 2 (“EXT. OUT 2")	see "Wiring the external digital outputs of the device in the CDB650-204", page 128
CMD420-0001	“Result 1” “Result 2”	see "Wiring digital outputs of the device in the CDM420-0001", page 145
	External output 1 (“Aux Out 1”) External output 2 (“Aux Out 2”)	see "Wiring the external digital outputs of the device in the CDM420-0001", page 148
CMD420-0006	“Result 1” “Result 2”	see "Wiring digital outputs of the device in the CDM420-0006", page 165
	External output 1 (“Aux In 1”) External output 2 (“Aux In 2”)	see "Wiring the external digital outputs of the device in the CDM420-0006", page 167

1) For CLV62x with male connector, M12, 17-pin, A-coded on the swivel connector

NOTE
For further connection modules see
- www.sick.com/CDB
- www.sick.com/CDM

If the digital outputs are wired via a connection module, observe the respective operating instructions of the module.

7 Commissioning

7.1 Overview of the commissioning steps

- Commissioning of the device with factory default
- Installing the SOPAS ET configuration software
- Connecting the device to a computer using the SOPAS ETconfiguration software
- Alignment and configuration of the device to optimize the functionality
- Test of the device for correct functionality in read operation

7.2 SOPAS ET configuration software

The SOPAS-ET configuration software can be used to adapt the device to the reading situation on site. The configuration data is stored and archived as a parameter set (project file) on the computer.

7.2.1 Functions of the SOPAS ET configuration software for the device (overview)

The general functions of the software and its operation are described in the online help in the SOPAS ETconfiguration software:

- Choice of the menu language (German, English)
- Setting up communication with the device
- Password-protected configuration for different operating levels
- Recording of the data in continuous operation (recording and analyzing data of certain memory areas of the device with the data recorder)
- Diagnostics for the system

7.2.2 Installing SOPAS ET

NOTE

The SOPAS ETconfiguration software, the current system prerequisites for the computer, and the instructions for downloading can be found online at:

- www.sick.com/SOPAS_ET

1. Start computer. Download the latest version of the configuration software.
2. If the installation does not start automatically, run setup.exe from the download folder.
3. Follow the operating instructions to complete the installation.

7.2.3 Connecting SOPAS ET to the device

Administrator rights may be required on the computer to install the software.

1. Start the “SOPAS ET” program after completing the installation. Path: C:\Program Files (x86)\SICK\SOPAS ET\SopasET.exe or using the Windows search.
2. Install the device driver (SDD) in the device catalog using the wizard (gear symbol). The *.jar file can be obtained from the online repository if an Internet connection is present.
3. In the device search list, establish a connection between SOPAS ET and the device using the search settings. To do this, select the CLV6xx family of devices and select the default IP address 192.168.0.1 when connecting for the first time.

✓ The device is detected and can now be integrated into a project for configuration purposes.

7.2.4 Activate password protection

Overview

Reading and adjusting the parameter settings is possible ex works without a password. Password protection should be activated to protect the product against unauthorized changes to the settings.

Procedure

1. Establish a connection between SOPAS ET and the device.
2. Open the device page by double-clicking on the tile of the connected device.
✓ Automatic login with the user level **Authorized Client**.
3. Open the **Parameters** folder in the structure tree.
4. In the **General** window, tick the box for password protection.
5. Click  to permanently save the settings on the device.
✓ Password protection has now been activated.
✓ When you call up the device page again, the **Operator** user level is now used. Adjusting the settings is only possible from the **Authorized Client** user level.

7.2.5 Change password

Overview

Change the passwords during initial commissioning to protect your device.

A higher user level can change the password of a lower user level.

User level	Default password
Operator	–
Maintenance	`main`
Authorized Client (Integrator)	`client`
Service	`servicelevel`

Table 14: User level and authorization

Operator	An **Operator** level user can view the basic device parameters. • No password required • Read only permissions • Not all parameters are visible
Maintenance	**Maintenance** can view the application-related device parameters. • Read only permissions • Not all parameters are visible • Can change the password for this user level
Authorized Client (Integrator)	Device parameters can be set as an **Authorized Client**. • Access to most parameters • Can change the password for this user level and the password for the **Maintenance** user level. • Can create a diagnostic report
Service	A **Service** level user can configure all device parameters. • Access to all parameters • Can change the password for this user level as well as the password for the user levels **Maintenance** and **Authorized Client** • Can create a diagnostic report • Can perform firmware updates

Prerequisites

- Password protection must be activated.
- To change the password, the **Maintenance** user level is required as the minimum.

Procedure

1. Establish a connection between SOPAS ET and the product.
2. Click on **CLV6xx** in the menu bar.
3. Under **Password** > select **Change password**.
4. Change desired password.

7.3 Initial commissioning

Parameterization (configuration)

The user adjusts the device to the reading situation on site. To do so, the device is usually connected directly to the computer (online method). With the help of the SOPAS ET configuration software, the user selects suitable values per parameter from an assigned value range.

The starting point for adjustment during the initial commissioning is a copy of the device's factory default settings in the working memory with predefined parameter values. Each of the parameter values can be changed within the value range to optimize the device. The result using the SOPAS ET configuration software is the creation of an application-specific, new parameter set, initially only in the working memory of the device.

After testing the desired functionality, the user permanently stores in the device the configured parameter set for reading operation. The factory default settings cannot be overwritten. The default settings remain available at all times in case the device needs to be reset (see figure 42, page 62).

The device can permanently save **one** application-specific parameter set.

To test the effect on the reading operation of changing the parameter values, save each different configuration on the computer in a separate file. Then download the parameter sets one after the other to the device for testing, without saving them permanently. Each download overwrites the previously transferred parameter set in the working memory. The "Permanent" option only saves in the device the last parameter set configured for the application.

Manually saving the parameter set

NOTE

As part of a structured data backup concept, it is recommended to save the currently valid parameter set on the computer using a project file (SOPAS file) and thereby archive it. Use a meaningful name when doing so.

Automatically backing up the parameter set

NOTE

External, optional parameter memories allow direct, automated parameter cloning outside the internal parameter memory of the device. In case of defects, it is possible to exchange the device quickly without losing configuration data.

The following components are available as storage media for the device:

Devices in the IP65 standard housing / IP69K protective housing

- CMC600 parameter cloning module for the CDB or CDM connection modules

Memory organization for parameter set

The diagram shows the memory management principle for the involved internal and external components:

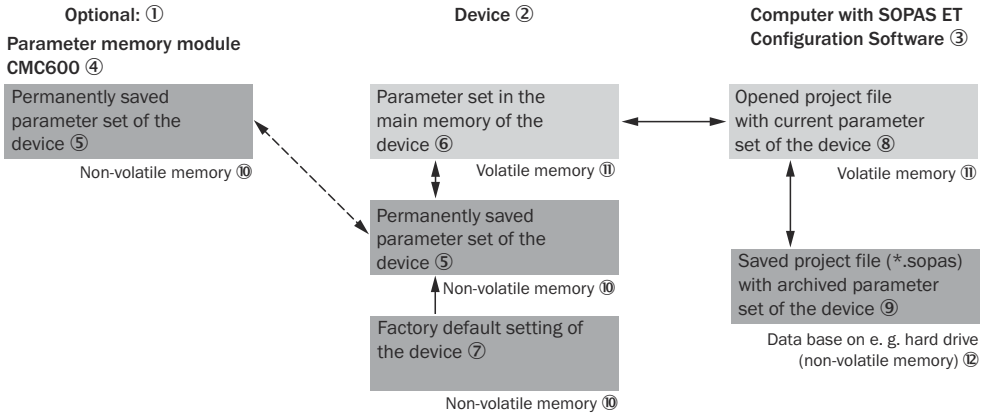

Figure 42: Configuration with SOPAS ET and saving the parameter set

① Optional
② Device
③ Computer with the SOPAS ET configuration software
④ CMC600 parameter cloning module
⑤ Permanently saved device parameter set
⑥ Parameter set in the working memory of the device
⑦ Factory-set defaults for the device
⑧ Opened project file with current device parameter set
⑨ Saved project file with archived device parameter set
⑩ Nonvolatile memory
⑪ Volatile memory
⑫ Database on, for example, a hard drive (non-volatile memory)

Saving behavior using the “Permanent” saving option:

The device is connected to a CDB or CDM connection module. The connection module contains a CMC600 parameter cloning module: When the currently valid parameter set is saved in the device, this is also done externally in the CMC600.

Defective device: Support for replacement with no manual reconfiguration required:

NOTE
The device replacement will only be successful if the defective device is replaced by an exchange unit of the **same type**. The defective device must have been operated with automated parameter cloning before the failure.

To replace a defective device with an exchange unit, a CMC600 with the current parameter set must be present in the connection module connected to the defective device.

For more information, see "Device exchange with transmission of the current configuration data", page 72.

7.4 Aligning the device for operational use

Before the final alignment of the device, complete the electrical installation. Put the device into operation.

1. Loosen the bracket screws so that the device can be aligned.
2. Align the device so that the angle between the scanning line and the bar code stripes is almost 90°.
3. To prevent interference reflections, do not align the device so that it is plane parallel to the object surface.
4. Manually place objects with bar codes one after the other into the reading range of the device, see "Technical data", page 74.
5. Check the reading result with the SOPAS ET configuration software.
6. Place objects at different alignments (angles) in the reading field and ensure that the limit values for the permitted reading angles are not exceeded, see "Angular orientation of the device", page 33.
7. Align the device so that the good read rate is between 70% and 100%.
8. Tighten the screws on the device.

7.5 Fine adjustment and further configuration

NOTE
The additional settings depend on the respective application situation.

User level, downloading parameters to the device

The user is automatically logged on to the device in the **Authorized client** user level. This allows the user to change parameters, which are then immediately transferred to the device (default).

Commissioning via Quickstart

The **Quickstart** tab provides an overview of the most important parameters. The **Quickstart** can be used to quickly evaluate a code content. The **Quickstart** provides access, among other things, to the evaluation window, percentage evaluation, code configuration, and alignment aid functions.

Application wizard

The application wizard (“Magic Wand” icon) assists with configuring the device. Either as standalone device, or as a primary (**master**) and secondary (**slave**) for a primary/master combination (**master/slave**) based on the CAN bus.

Evaluation window

The evaluation window shows the code content, the object index, the code type, the code security, and the device number of the reading device.

Percentage evaluation

Percentage evaluation permanently assesses the quality of the reading. Bar codes are not assessed. Here, the bar codes must not be subjected to any conveying movement. The device performs 100 scans at a time to evaluate the reading quality. The device continuously outputs read results every 2 s via the AUX interface, together with the read diagnostics data. A timer starts when percentage evaluation is called. If no manual abort occurs, the device automatically returns to reading operation after 5 minutes.

Alignment aid

The **Adjustment mode** supports optimal placing of the center of the scan line on the object. To do this, the device hides half of the scan line.

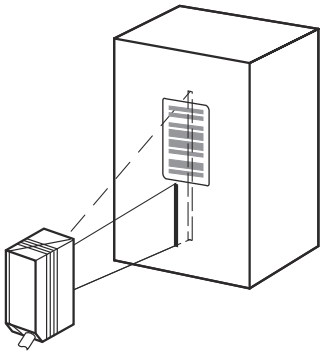

Figure 43: Appearance of the scan line in “Adjusting Mode”

This function is only available under **Analysis** in the **Service** user level.

Code configuration

In the factory default setting, the device decodes the following code types:

- **Code 39**
- **2/5 Interleaved**
- **Code 128 family**

You can activate further code types and configure advanced decoder properties (Device tree > **Parameters** > **Code configuration**).

Scanning frequency

You can set the **scanning frequency** in the range from 400 Hz to 1,200 Hz (Device tree > **Parameters** > **Read configuration**).

Ethernet interface

Use the Ethernet page to adjust the IP address and the subnet mask: Device tree > **Parameters** > **Network/Interfaces/IOs** > **Ethernet**.

Object trigger control

Device with an additionally connected read cycle sensor (for example a photoelectric sensor at the **Sensor 1** digital input): select the **Sensor 1** setting (Device tree > **Parameters** > **Read configuration** > **Object trigger control**).

Test the configured settings during operational use of the system. Modify the settings if necessary.

8 Operation

8.1 Operating and status indicators

8.1.1 Optical displays

Devices in IP65 standard housing

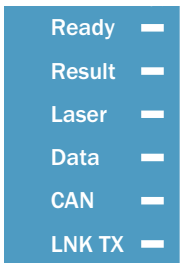

Figure 44: Display LEDs on the CLV62x

Table 15: CLV62x: Display behavior of LEDs

Display	Color	Behavior LED	Device status
Ready	–	○	Device without supply voltage
After switching on supply voltage:			
Ready [1)]	Green	●	• Self-test successful, device ready for operation • After parameter download or upload and successful firmware download: Device again ready for operation
		○	Device not ready
Read operation:			
Laser	Green	●	Laser switched on
Result	Green	●	LED lights up briefly. Reading successful (Good Read)
Data transmission at the serial host interface:			
Data	Yellow	●	Device is sending data (TX)
	Green	●	Device is receiving data (RX)
Data transmission at the CAN interface:			
CAN	Yellow	●	Data transfer via CAN interface
Data transmission at the Ethernet interface (CLV6xx-xYxxx, Y= 1 or 8):			
LNK TX	Yellow	●	Ethernet interface for data communication activated, but no physical connection
	Green	●	Device physically connected to Ethernet
PROFINET operation with single port (CLV6xx-xYxxx, Y= 1 or 8):			
Ready	Green Red	● ☼	Device ready for operation See below for display behavior and device status, section “PROFINET operation (single port)"
Parameter: Download to device or parameter upload from device:			
Ready	–	○	LED goes out. Function is executed.
Firmware update: Download to device			

Display	Color	Behavior LED	Device status
Ready	–	○	LED goes out. Function is executed
Firmware update: Completion			
Ready	Green	●	Firmware download: Successful Device again ready for operation

○ = LED off, ● = LED is lit, ☼ = LED flashes or flickers

1) Ready LED consists of green and red components.

PROFINET operation (single port):

The **Ready** status LED signals the device status in the PROFINET network.

Ready LED		Device status	Remarks
Green components	Red components		
●	○	Device is ready for use.	
●	☼ Flashes every 0.5 seconds.	PROFINET is activated in the device. The device is not connected to the PROFINET IO controller (PLC) or the device is not configured.	To not use PROFINET, deactivate PROFINET. In the default configuration of the device, automatic PROFINET network detection is activated. This detects during startup whether the device is in a PROFINET environment and activates PROFINET automatically. To prevent this, deactivate PROFINET network detection or set the device name or IP address different to the default. To apply the changed settings, permanently save the changes and restart the device.
☼	☼	The **flashing** function is activated via the configuration software.	The red and green components of the LED flash alternately. Prerequisite: PROFINET is activated in the device.

● = lights up; ☼ = flashes; ○ = does not light up

Devices in IP69K protective housing

NOTE

Visual and audible indicators are not accessible on devices in the IP69K protective housing.

8.1.2 Acoustic signaler (beeper)

CLV62x in IP65 standard housing

Depending on the operating mode of the device, the beeper uses different melodies or individual sounds to indicate the following results:

- Fulfillment or non-fulfillment of a configured condition during reading operation (e.g., Good Read)
- The completion of device functions triggered by the user or ended by quitting (confirmation of operation steps)
- Completion of functions (positive or negative confirmation)

Table 16: Beeper behavior

Operating mode	Function/Sound
Switch on device	Successful self-test and start of reading operation: Melody
Read operation	Confirmation of Good Read in default setting: sound. Configurable event condition[1]
Percentage evaluation	Start: melody 100 scans per reading: one tone End: melody
Configuration	Downloading parameters to the device: Start: melody, successful completion: melody Parameter upload from device: No sound
Firmware download	**Firmware:** Start: one tone, successful completion: one tone **Reboot device:** Successful completion: melody **Loading the SDD file into the device:** Successful completion: Melody

1 Assignment e.g., via the SOPAS ET configuration software

Beeper default settings:

Switched on, volume: quiet, reading operation: output condition “Good Read”.

8.2 Operating options

The device can be configured according to application in the following manner:

- Locally at the device with the SOPAS ET configuration software. Backup of the parameter set as a configuration file on the computer using SOPAS ET. Access to the device via AUX interface (RS-232, or Ethernet depending on type).
- As an alternative to the SOPAS ET configuration software, command strings are available, upon which the operator interface of the configuration software is also based. These are also for the triggering of device functions (e.g. reading). Documents on the command strings can be obtained from SICK on request.
- Centrally through the PROFINET controller. This is carried out via PROFINET using GSD parameterization. Backup of the parameter set as a configuration file in the PROFINET controller. Each time PROFINET is restarted, the device is reconfigured.
- Profile programming by reading a set of printed configuration bar codes. The bar codes can be created using the SOPAS ET configuration software.

The SOPAS ET configuration software is used for device diagnostics in case of a fault.

The device operates fully automatically when operational.

9 Maintenance

9.1 Maintenance plan

During operation, the device works maintenance-free.

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

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

Table 17: 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

9.2 Cleaning

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

NOTICE
Damage to the inspection window.
Reduced read performance due to scratches or streaks on the window!

- Clean the window only when wet.
- Use a mild cleaning agent that does not contain powder additives. Do not use aggressive cleaning agents, such as acetone, etc.
- Avoid any movements that could cause scratches or abrasions on the window.
- Only use cleaning agents suitable for the screen material.

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.

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 avoided by using an anti-static cleaning agent in combination with the SICK lens cloth.

The type of material used for the viewing window can be found on the type label (see "Type code", page 16).

Cleaning procedure:

- ► Switch off the device for the duration of the cleaning operation. If this is not possible, wear suitable laser safety goggles. These must absorb radiation of the device's wavelength effectively.
- ► Glass window: remove dust from the viewing window using a soft, clean brush. If necessary, also clean the viewing window with a clean, damp, lint-free cloth, and a mild anti-static lens cleaning fluid.
- ► Plastic window: 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.

Cleaning other optical surfaces

Depending on the equipment of the reading station, additional local sensors with optically effective areas may be installed (e.g. photoelectric sensor for external read cycle). Contamination on these sensors can result in faulty switching behavior.

- ► To avoid faulty switching behavior, remove dirt from the optical surfaces of the external sensors.

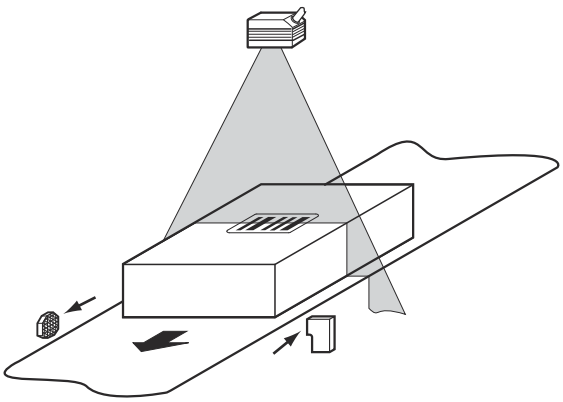

Figure 45: Cleaning the external optical sensors (read pulse encoder)

10 Troubleshooting

10.1 Overview of possible errors and faults

NOTICE

Danger due to damage to the device

For reasons of safety, if a device shows visible signs of damage do not put it into operation. Immediately take a device that is in operation out of operation.

Damage includes, depending on the type of device, for example the following:

- Viewing window pane: Cracked or broken
- Housing: Cracked or broken
- Violation of the cable outlet on the housing or the cable itself
- Overtightening of the male connector unit, tearing or breakage of the housing
- Moisture penetration in the device

Possible faults and corrective actions are described in the table below for troubleshooting.

Table 18: Errors and faults

Situation	Error or fault
Mounting	■ Device poorly aligned to objects with bar codes(e.g., dazzle) ■ Read cycle sensor incorrectly positioned, for example the internal reading interval is opened too early or closed too late.
Electrical installation	■ Data interfaces of the device wired incorrectly ■ Voltage supply not sufficiently dimensioned or cables with too small a cross-section used
Configuration	■ Functions not adapted to local conditions, e.g. parameters for the data interface not set correctly ■ Device limits not observed, e.g. reading distance, aperture angle ■ Trigger source for read cycle not selected correctly
Operation	■ Control of the reading pulse not correct or not suitable for the object ■ Device faults (hardware/ software)

10.2 Detailed fault analysis

10.2.1 LEDs on the device

The following states, among others, can be read off on the device LEDs on the housing (see "Optical displays", page 65):

- Operational readiness
- Hardware fault
- Reading result status (Good Read or No Read) or status of a selected event
- Data traffic via host or CAN interface
- Connection status of the device with PROFINET
- Firmware download status

The LED display can indicate possible errors or faults. Further information on this can be found in the “System Information” section.

10.2.2 System information

The device reports any errors that occur in a number of ways. The error output is staggered. This allows an increasingly detailed level of analysis:

- Communication errors can occur when transmitting telegrams to the device. The device then returns a fault code.
- For errors that occur during reading, the device writes errors codes in the status log.

10.2.2.1 Displaying the status log

Overview

The product saves only the last five entries for each error type. The status log is retained even after switching the product off and on again.

Error types

- Information
- Warning
- Error
- Critical fault

Approach

1. Connect the SOPAS ET configuration software to the product.
2. Opening the product in the project tree: **SERVICE** > **SYSTEM STATUS** > **SYSTEM INFORMATION** tab.

10.3 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.

If an error cannot be rectified, the device may be defective.

However, it is possible to quickly replace a device with a stocked device of the same type, see "Device exchange with transmission of the current configuration data", page 72.

► If a fault cannot be rectified, contact the SICK Service department. To find your agency, see the final page of this document.

NOTE

Before calling, make a note of all type label data as well as the connection technology used to ensure faster assistance.

Type label

- Type designation
- Device serial number

10.4 Disassembly

Dismantling the device

1. Switch off the supply voltage to the device.
2. Disconnect all connecting cables on the device.
3. To replace the device, mark the position and orientation of the device on the bracket or surrounding area.
4. Remove the device from the bracket.

10.5 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

10.6 Device exchange with transmission of the current configuration data

NOTE

Backup concept with computer: If the parameter set of the defective device is saved, the parameter set can be transferred manually to the replacement device. For possible alternatives due to optional equipment, see the following section.

1. Check that the replacement device of the same type (repaired or new device) is de-energized.
2. Mount and align the replacement device (see "Mounting", page 30). When doing so, note the previously applied markings on the bracket or surroundings (see "Disassembly", page 71).
3. Depending on the type, contact the replacement device via its fixed connecting cable, or connect the connecting cables to the replacement device.
4. Switch on the supply voltage for the device. The device starts with its previous settings (new device: defaults).
5. Depending on the selected configuration type, proceed as follows:
   - Local automated configuration via the CMC600 parameter memory module in the CDB/CDM connection module: If a CMC600 is installed, the replacement device transfers the saved parameter set from the CMC600 into its permanent memory.
   - Local, manual configuration via SOPAS ET: Transfer the configuration stored on the computer to the device via download (serially or via Ethernet, depending on the type). Permanently save the configuration in the device.
   - Central configuration via GSD configuration: On restarting the PROFINET, the PROFINET controller configures the device automatically. Directly on the device via PROFINET Single Port or Dual Port via the CDF600-22xx bus connection module.

If automated PN name assignment for the device is configured and activated in the PROFINET controller, the following conditions apply:

- Central configuration: The entire permanently stored parameter set of the new device being installed must be set to **default** (same as the state of a new device upon delivery).
- Local configuration: At least the “PN Name” field in the device’s parameter set must be empty.

The device then automatically obtains the required PN names from the PROFINET controller when the supply voltage is switched on.

11 Decommissioning

11.1 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.

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

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

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

Please note: This documentation may contain further technical data.

12.1 Features

Devices in IP65 standard housing

Table 19: Technical data features

	CLV620	CLV621	CLV622
Work area	Mid range	Long Range	Short Range
Scanning methods	Line scan or raster scan [1], type-dependent		
Sensor type	Line scanner or raster scanner, type-dependent identifier see "Type code", page 16		
Orientation of viewing window	Front or side [2] [3], type-dependent, identifier see "Type code", page 16		
Aperture angle	≤ 50°		
Optical focus	Fixed focus		
Code resolution	0.2 mm ... 1.0 mm	0.35 mm ... 1.0 mm	0.15 mm ... 0.5 mm
Reading ranges	see "Reading field diagrams (working ranges)", page 78		
Scanning frequency	400 Hz ... 1,200 Hz		
Light source	Laser diode, visible red light (λ = 655 nm)		
Light spot	Circular		
MTTF (laser diode)	40,000 hours at 25 °C		
MTBF	100,000 hours		
Laser class	Class 2 according to EN 60825-1:2014 +A11:2021 / IEC 60825-1:2014. Identical laser class for issue EN/IEC 60825-1:2007. Complies with 21 CFR 1040.10/11 except for conformance with IEC 60825-1 Ed. 3., see Laser Notice No. 56, 8 May 2019.		
Laser power	P = 1.5 mW maximum, P < 1.0 mW average	P = 3.2 mW maximum, P < 1.0 mW average	P = 1.5 mW maximum, P < 1.0 mW average
Laser pulse duration	< 300 µs		

1) Front viewing window: 8 lines, grid height approx. 15 mm at reading distance 200 mm.
Side viewing window: 8 lines, grid height approx. 15 mm at reading distance 185 mm.
2) Side viewing window: Light emission at 105° relative to the longitudinal axis of the device.
3) see "Device view", page 17.

Devices in IP69K protective housing

The Ethernet variant of the CLV620 is available as a device in a protective housing.

NOTE
For technical data, see "Technical Information CLV62x, CLV63x and CLV64x with IP69K Protective Housing", part no. 8021479.

12.2 Performance

Devices in IP65 standard housing

Table 20: Technical data for performance

	CLV620	CLV621	CLV622
Readable code structures	1D codes		
Bar code types	Code 39, Code 128, Code 93, Codabar, GS1-128 / EAN 128, UPC/ GTIN/EAN, 2/5 Interleaved, Pharmacode, GS1 DataBar, Telepen, MSI/ Plessey		
Print ratio	2:1 ... 3:1		
No. of codes per scan	1 ... 20 (standard decoder) 1 ... 6 (SMART decoder)		
Number of codes per reading interval [1)]	1 ... 50 (auto-discriminating)		
No. of characters per code/reading interval	Maximum 50 characters. Max. 5,000 characters across all bar codes per reading interval, 500 characters for multiplexer function (CAN)		
Number of multiple readings	1 ... 99		

1) Reading interval: The time window generated internally by the reading cycle for code detection and evaluation

NOTE
The bar codes being read must conform to at least quality level C in accordance with ISO/IEC 15416.

Devices in IP69K protective housing

The Ethernet variant of the CLV620 is available as a device in a protective housing.

NOTE
For technical data, see "Technical Information CLV62x, CLV63x and CLV64x with IP69K Protective Housing", part no. 8021479.

12.3 Interfaces

Devices in IP65 standard housing

Table 21: Technical data: Interfaces

	CLV620	CLV621	CLV622
Ethernet	Only with Ethernet variant **Function:** Host, AUX **Data transmission rate:** 10/100 Mbit/s, half/full duplex **Protocol:** TCP/IP, EtherNet/IP™, PROFINET Single Port		
Serial (RS-232, RS-422/-485)	**Function:** Host, AUX (RS-232 only) **Data transmission rate:** 2.4 kBd ... 115.2 kBd, AUX: 57.6 kBd (RS-232)		
CAN	**Function:** SICK CAN sensor network (master/slave, multiplexer/server) **Data transmission rate:** 20 kbit/s ... 1 Mbit/s **Protocol:** CSN (SICK CAN sensor network), CANopen		

	CLV620	CLV621	CLV622
PROFINET	PROFINET Single Port, PROFINET Dual Port, optional via external fieldbus module CDF600-2		
EtherCAT®	Optional over external fieldbus module CDF600		
PROFIBUS DP	Optional over external fieldbus module CDF600-2		
DeviceNet	Optional over external connection module CDM420 and CMF fieldbus module		
Digital inputs	Ethernet variant: • **M12 male connector, 12-pin:** 1 input (“Sensor 1”), optionally 2 additional, external inputs [1] • **M12 male connector, 17-pin:** 2 inputs (“Sensor 1”, “Sensor 2”), optionally 2 additional, external inputs [2] Serial variant: • 2 inputs, optionally 2 additional, external inputs [1] Opto-decoupled, V_{in} [3] = max. 32 V, reverse polarity protected, can be wired with PNP output, debounce time adjustable (0 ms ... 10,000 ms), default 10 ms		
Digital outputs	Ethernet variant: • **M12 male connector, 12-pin:** No output, optionally 2 external outputs [1] • **M12 male connector, 17-pin:** 2 outputs, optionally 2 additional, external outputs [2] Serial variant: • 2 outputs, optionally 2 additional, external outputs [1] PNP, I_{out} [4] = max. 100 mA, short-circuit protected, pulse duration adjustable (static, 10 ms ... 10,000 ms)		
Reading pulse	**Pulse sources for start:** Digital inputs, Command (data interface), Auto pulse, CAN **Pulse sources for stop:** Read clock source, digital inputs, Command, Timer, Condition (e.g. Good Read)		
Optical displays	6 LEDs		
Acoustic indicator	Beeper, can be switched off, can be allocated function for event status indication		
Control elements	Configuration software		
Service function	Backup of parameterization data (parameter cloning) outside the device memory: Optional CMC600 parameter cloning module in CDB or CDM connection module		
Configuration	SOPAS ET configuration software, profile programming with bar codes (can be deactivated), command language, GSD parameterization		

1) Via the optional CMC600 parameter cloning module in the CDB620 or CDM420 connection module.
2) Via the optional CMC600 parameter cloning module in the CDB650 or CDM420 connection module.
3) Input voltage.
4) Output current.

Devices in IP69K protective housing

The Ethernet variant of the CLV620 is available as a device in a protective housing.

NOTE

For technical data, see "Technical Information CLV62x, CLV63x and CLV64x with IP69K Protective Housing", part no. 8021479.

12.4 Mechanics/Electronics

Devices in IP65 standard housing

Table 22: Technical data mechanics/electrics

	CLV620	CLV621	CLV622
Connection type	**Ethernet variant: Swivel connector unit with 2 round connectors** • Power/Serial/I/O" connection: Male connector, M12, type-dependent 12-pin or 17-pin, A-coded • "Ethernet" connection: Female connector, M12, 4-pin, D-coded **Serial variant:** • 1 standard cable 0.9 m, with male connector, D-Sub-HD, 15-pin		
Supply voltage V_s	10 V DC ... 30 V DC LPS or NEC Class 2 Reverse polarity protected		
Power consumption [1]	Max. 4.5 W		
Housing	Aluminum die cast		
Housing color	Light blue (RAL 5012), black (RAL 9005)		
Window material of the viewing window	Glass or plastic, identifier see "Type code", page 16		
Threaded mounting hole	2 x 2 blind tapped hole M5, 5 mm deep Tightening torque for mounting screws: max. 2.5 Nm		
Laserwarnschild	In combination with the type label, glued on		
Safety	EN 62368-1: 2014-08		
Enclosure rating	IP 65, in accordance with EN 60529: 1991-10; A1: 2002-02 [2]		
Protection class	 (Class 3) For operation in SELV systems (EN 60950-1) or ES1 systems (EN 62368-1)		
Weight [3]	**Ethernet variant:** • Device with front viewing window: 205 g • Device with side viewing window: 230 g **Serial variant:** • Device with front viewing window: 225 g [4] • Device with side viewing window: 250 g [4]		
Dimensions	**Ethernet variant:** • Device with front viewing window: 61 mm x 38 mm x 66 mm [5] • Device with side viewing window: 80 mm x 38 mm x 66 mm [5] **Serial variant:** • Device with front viewing window: 61 mm x 38 mm x 66 mm • Device with side viewing window: 80 mm x 38 mm x 66 mm		

1) With digital outputs loaded.

2) **Prerequisites for complying with enclosure rating IP65 for Ethernet variant:**
- The heads of the attached cables are screwed firmly to the two contacted M12 female connectors.
- When the M12 female connector of the device is not in use, it is closed with a tightly fastened protective element, e.g. a protective cap (as in the delivery state).

Prerequisites for complying with enclosure rating IP65 for serial variant:
- The head of the connecting cable (D-Sub male connector) of the device is tightly fastened to the contacted female connector.
- If an extension cable is used, a corresponding rubber seal must be fitted between the two D-Sub plug connectors. The plug connectors must be screwed together tightly. You can find a suitable IP65 rubber seal as an accessory for the product.

For the conditions for complying with the enclosure rating for devices in the IP69K protective housing, see "Technical Information CLV62x, CLV63x and CLV64x with IP69K Protective Housing", www.sick.com/8021479.

3) Viewing window made of glass.
4) Without connecting cable and male connector.
5) Swivel connector protrudes by 15 mm.

Devices in IP69K protective housing

The Ethernet variant of the CLV620 is available as a device in a protective housing.

NOTE
For technical data, see "Technical Information CLV62x, CLV63x and CLV64x with IP69K Protective Housing", part no. 8021479.

12.5 Ambient data

Devices in IP65 standard housing

Table 23: Technical data for ambient data

	CLV620	CLV621	CLV622
Electromagnetic compatibility (EMC)	Radiated emission: According to EN 61000-6-3: 2007-01 Shock resistance: According to EN 61000-6-2: 2005-08		
Vibration resistance	EN 60068-2-6: 2008-02		
Shock resistance	EN 60068-2-27: 2009-05		
Ambient operating temperature	0 °C ... +40 °C		
Storage temperature	–20 °C ... +70 °C		
Permissible relative humidity	0% ... 90%, non-condensing		
Ambient light immunity	2,000 lx, on bar code		
Bar code print contrast (PCS)	≥ 60 %		

Devices in IP69K protective housing

The Ethernet variant of the CLV620 is available as a device in a protective housing.

NOTE
For technical data, see "Technical Information CLV62x, CLV63x and CLV64x with IP69K Protective Housing", part no. 8021479.

12.6 Dimensional drawings

Dimensions see "Device view", page 17.

12.7 Reading field diagrams (working ranges)

12.7.1 Reading conditions for specification diagrams

Properties	Value
Test code	Code 39 / ITF
Resolution	See reading field diagrams in each case
Scanning frequency	See characteristic curve fields for scanning frequencies
Print ratio	2:1
Print contrast	> 90%

Properties	Value
Tilt	±30°
Ambient light	< 2,000 lx
Good read rate	> 75%
Light spot	Circular
Window material of the viewing window	**IP65 standard housing:** • Glass (CLV62x-xxx**0**) • Optional plastic (CLV62x-xxx**1**), see note in the caption of the reading field diagrams **IP69K protective housing:** • Plastic (CLV62x-x83**1**S01)

NOTE
The reading distances are measured radially from the device.

CLV62x in IP69K protective housing (CLV62x-x831S01):

NOTE
Divergent reading field diagrams
The reading field diagrams of the devices in the IP69K protective housing differ from the devices in the IP65 standard housing as follows:

- In the position of the reading field in front of the device
- In the reduced depth of field of the entire reading field. The reduced depth of field here is not identical to the depth of field of the devices with IP65 standard housing and a **plastic** viewing window.

For further notes on the reading field diagrams, see “Technical Information CLV62x, CLV63x and CLV64x with IP69K Protective Housing”, part no. 8021479.

12.7.2 CLV620: mid range

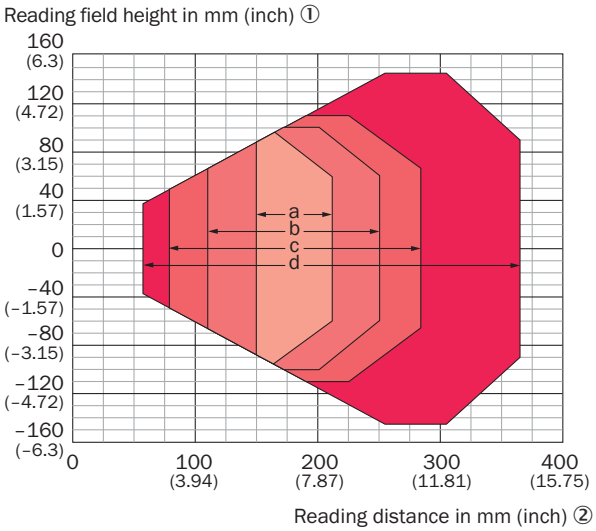

Figure 46: Reading field diagram for CLV620, Mid Range, front viewing window

① Reading field height in mm (inch)

② Reading distance in mm (inch)

③ The depth of field is reduced by approx. 10% for devices with plastic viewing windows.

④ Resolution

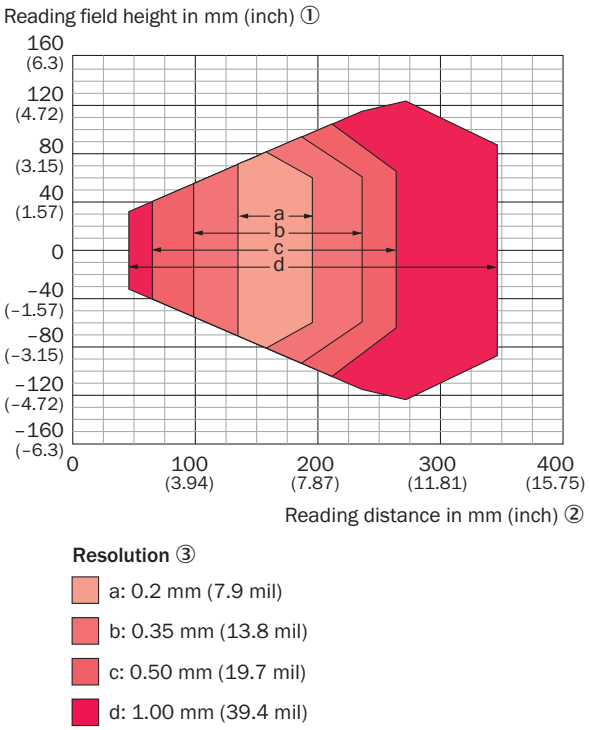

Figure 47: Reading field diagram for CLV620, Mid Range, side viewing window

① Reading field height in mm (inch)

② Reading distance in mm (inch)

③ Resolution

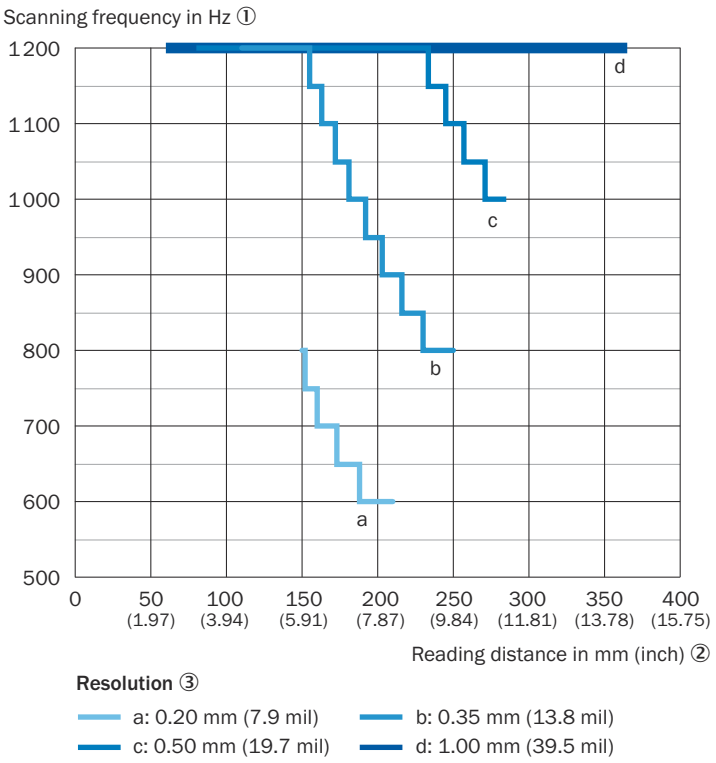

Figure 48: Characteristic curve field Scan frequency for CLV620, Mid Range, front viewing window

① Scanning frequency in Hz

② Reading distance in mm (inch)

③ Resolution

NOTE

Correction of reading distance for devices with side viewing window:

At all scan frequencies, the values for the reading distance shift towards the viewing window in each case by 16 mm (reduction of the reading distance).

12.7.3 CLV621: Long range

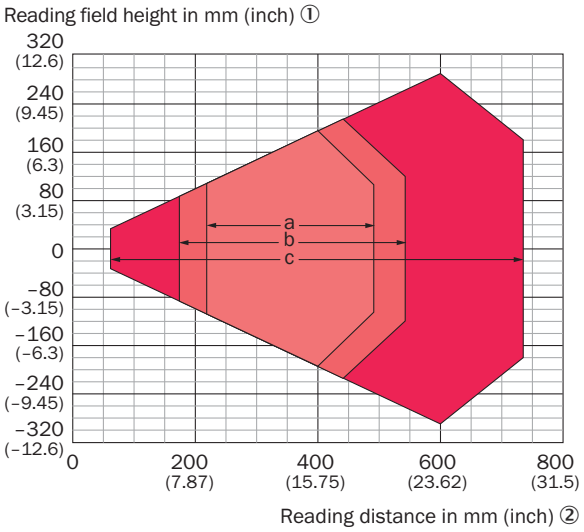

Figure 49: Reading field diagram CLV621, long range, front viewing window

① Reading field height in mm (inch)
② Reading distance in mm (inch)
③ Resolution

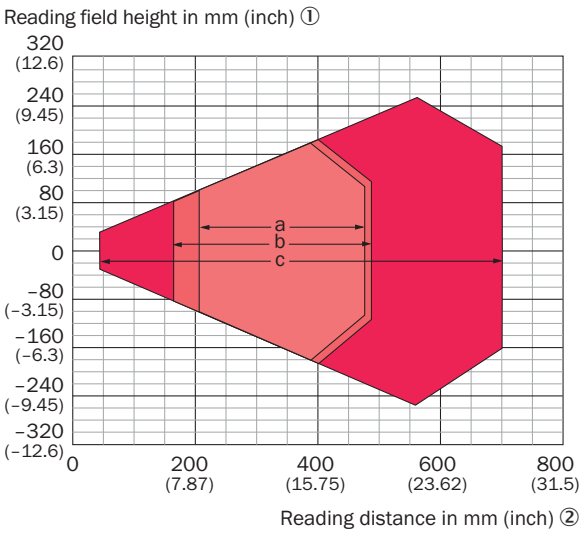

Figure 50: CLV621 reading field diagram, Long Range, side viewing window

① Reading field height in mm (inch)
② Reading distance in mm (inch)
③ Resolution

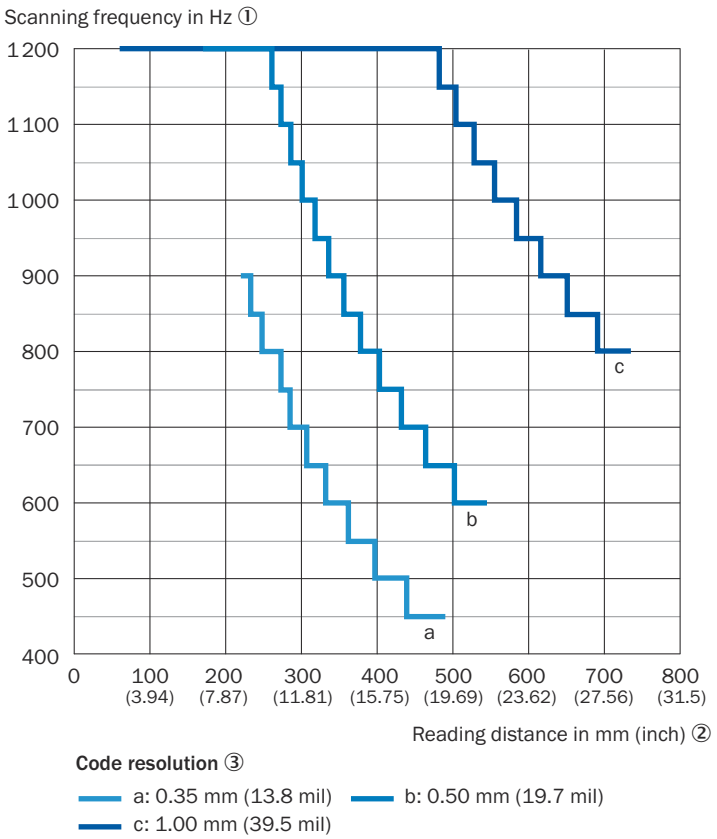

Figure 51: CLV621 characteristic curve field scanning frequency, long range, viewing window on front

① Scanning frequency in Hz

② Reading distance in mm (inch)

③ Resolution

NOTE

Correction of reading distance for devices with side viewing window:

At all scan frequencies, the values for the reading distance shift towards the viewing window in each case by 16 mm (reduction of the reading distance).

12.7.4 CLV622: Short range

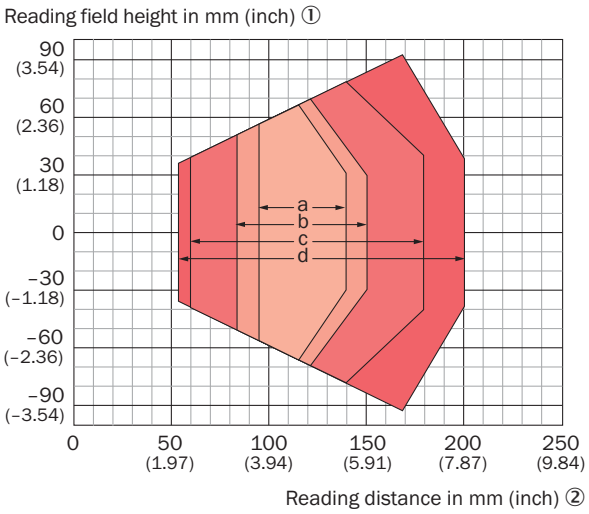

Figure 52: Reading field diagram for CLV622, Short Range, front viewing window

① Reading field height in mm (inch)
② Reading distance in mm (inch)
③ Resolution

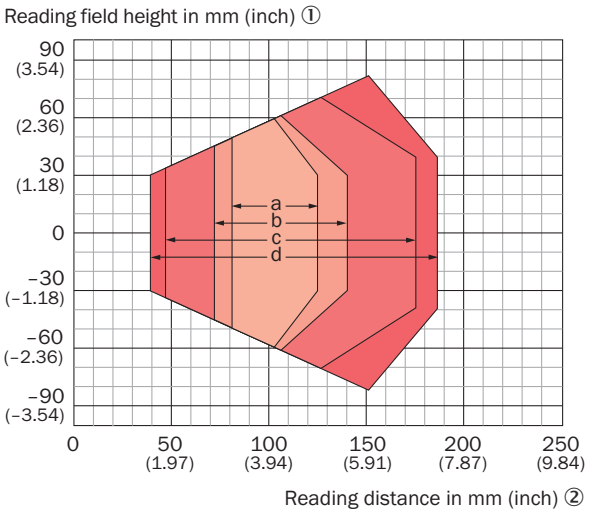

Figure 53: Reading field diagram for CLV622, Short Range, side viewing window

① Reading field height in mm (inch)
② Reading distance in mm (inch)
③ Resolution

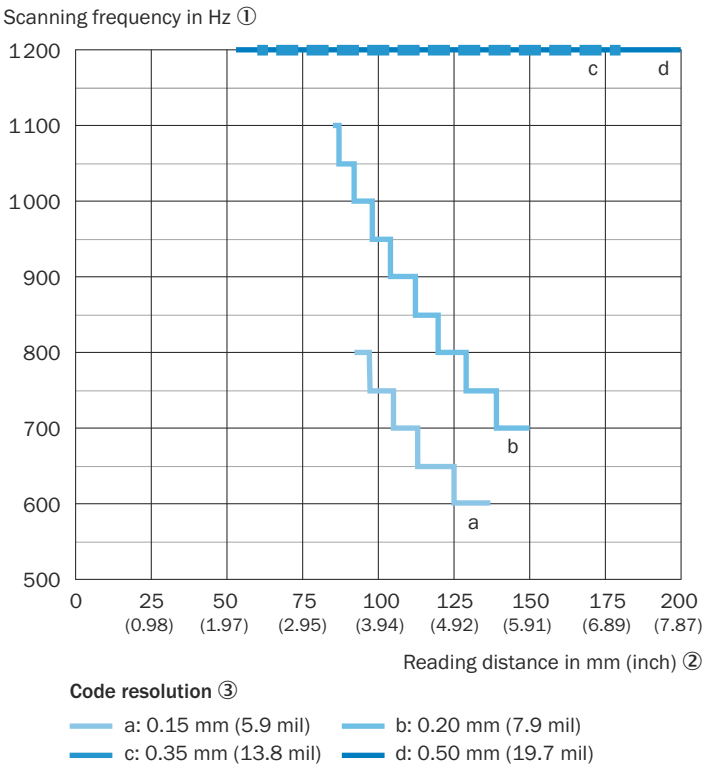

Figure 54: CLV622 characteristic curve field scanning frequency, short range, viewing window on front

① Scanning frequency in Hz

② Reading distance in mm (inch)

③ Resolution

NOTE

Correction of reading distance for devices with side viewing window:

At all scan frequencies, the values for the reading distance shift towards the viewing window in each case by 16 mm (reduction of the reading distance).

13 Accessories

NOTE

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

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

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

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

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

13.1.1 "Power/SerialData/CAN/I/O" connection to customer-specific connection equipment or control cabinet

Adapter cable, straight female connector, open end

Part no. 2075219 (5 m), shielded, suitable for 2 A, suitable for drag chain, deep-freeze compatible

For CLV62x, Ethernet variant, M12, 12-pin, IP65 standard housing

Ambient temperature range:

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

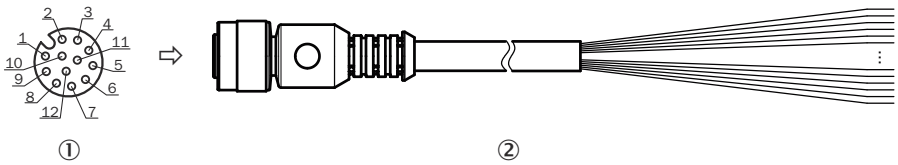

Figure 55: Adapter cable, part no. 2075219

① Female connector, M12, 12-pin, A-coded (front view)

② Illustration may differ

Table 24: 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	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 (AUX)	AUX interface (sender)	Black
8	RxD (AUX)	AUX interface (receiver)	Gray
9	SensGND	Digital input ground	Red
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

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

Adapter cable, straight female connector, open end

Part no. 6034605 (5 m), shielded, UL

For CLV62x, Ethernet variant, M12, 12-pin

Ambient temperature range:

For fixed installation: –30 °C to +90 °C

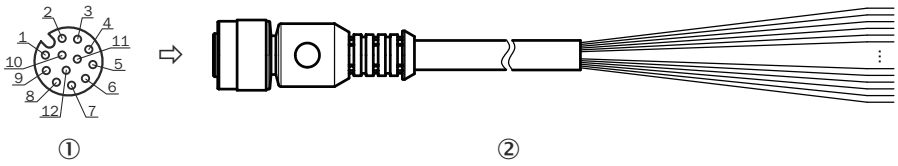

Figure 56: Adapter cable, part no. 6034605

① Female connector, M12, 12-pin, A-coded (front view)

② Illustration may differ

Table 25: 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	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 (AUX)	AUX interface (sender)	Black
8	RxD (AUX)	AUX interface (receiver)	Gray
9	SensGND	Digital input ground	Red
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

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

Adapter cable, straight female connector, open end

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

For CLV62x, Ethernet variant, M12, 17-pin, standard housing IP65 or protective housing IP69K

Ambient temperature range:

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

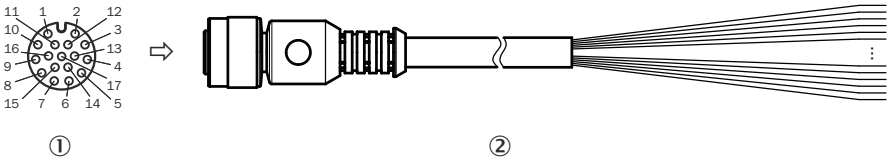

Figure 57: Adapter cable, e.g., part no. 2070425 (3 m)

① Female connector, M12, 17-pin, A-coded (front view)

② Figure may differ.

Table 26: 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	Ground digital inputs	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
14	Result 2	Digital output 2	Brown-green
15	Sensor 2	Digital input 2	White-yellow
16	N. c.	Not connected	Yellow-brown
17	N. c.	Not connected	White-gray

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

Adapter cable, straight female connector, open end

Part no. 2043413 (2 m), shielded

For CLV62x, serial variant, standard housing IP65

Ambient temperature range:

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

The shield braid of the cable has contact with the metal housing of the female connector.

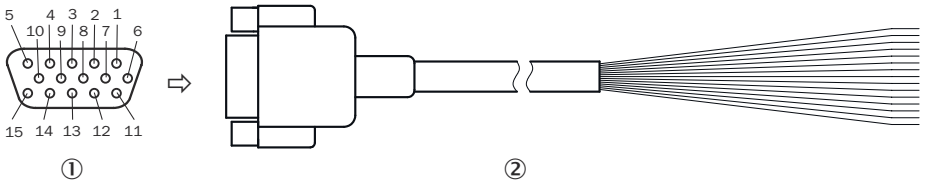

Figure 58: Adapter cable, part no. 2043413

① Female connector, D-Sub-HD, 15-pin (view from front)

② Illustration may differ

② Illustration may differ

Table 27: Signal assignment of adapter cable with open end

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

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

Device	Connection module
CLV62x serial variant	CDB620-001, CDM420-0001, -0004, -0006, -0007
CLV62x Ethernet variant	CDB620-001, CDB650-204, CDM420-0001, -0004, -0006, -0007

Adapter cable, straight female connector, open end

Part no. 2020319 (3 m), unshielded

Ambient temperature range:

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

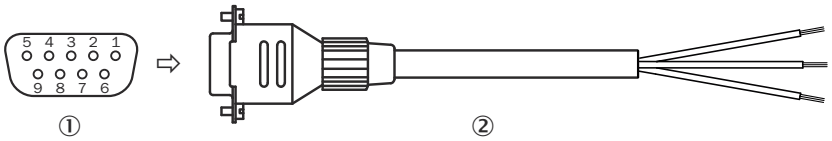

Figure 59: Adapter cable, part no. 2020319

① Female connector, D-Sub, 9-pin (front view)

② Figure may differ.

② Illustration may differ

Table 28: 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

13.1.6 Ethernet connection

Adapter cable, straight male connector, open end

Part no. 2106171 (2 m), part no. 2106172 (5 m), part no. 2106173 (10 m), suitable for drag chain, deep-freeze compatible

For CLV62x, Ethernet variant, M12, standard housing IP65

Ambient temperature range:

For fixed installation: –40 °C to +80 °C

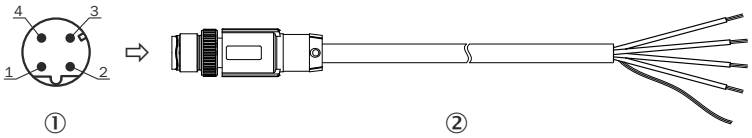

Figure 60: Adapter cable, e.g. part no. 2106171 (2 m)

① Male connector, M12, 4-pin, straight, D-coded (front view)

② Illustration may differ

② Illustration may differ

Table 29: Signal assignment of adapter cable with open end

Pin	Signal	Function	Wire color
1	TD+ (Ethernet)	Sender+	Yellow
2	RD+ (Ethernet)	Receiver+	White
3	TD– (Ethernet)	Sender–	Orange
4	RD– (Ethernet)	Receiver–	Blue

13.1.7 Ethernet connection

Adapter cable, angled male connector, open end

Part no. 2106174 (2 m), part no. 2106175 (5 m), part no. 2106176 (10 m), part no. 2106180 (25 m), shielded

For CLV62x, Ethernet variant, M12, standard housing IP65

Ambient temperature range:

For fixed installation: –40 °C to +80 °C

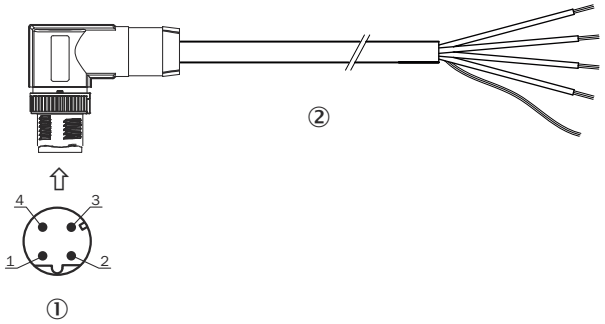

Figure 61: Adapter cable, e.g. part no. 2106174 (2 m)

① Male connector, M12, 4-pin, angled at 90°, D-coded (front view)

② Illustration may differ

Table 30: Signal assignment of adapter cable with open end

Pin	Signal	Function	Wire color
1	TD+ (Ethernet)	Sender+	Yellow
2	RD+ (Ethernet)	Receiver+	White
3	TD– (Ethernet)	Sender–	Orange
4	RD– (Ethernet)	Receiver–	Blue

14 Annex

14.1 Declarations of conformity and certificates

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

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

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

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

14.2 UL conformity

The UL certification is dependent on the type. Any existing UL certification can be found on the type label.

The devices in the CLV62x series in the IP65 standard housing are certified to UL60950-1. The UL file has the designation E244281-A6.

The devices must be supplied by LPS or Class 2 power supply units to ensure proper operation.

UL certification is only valid with corresponding device identification on the type label of the respective device; see see "Type label", page 14.

The IP65 enclosure rating of the devices is not checked by UL.

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).

- Laser warnings and laser power, see "Operational safety and specific hazards", page 9 and see "Laser radiation", page 10

14.3 Notes on PROFINET

14.3.1 Basic information on PROFINET

SICK recommends familiarizing yourself with the basic information described in the planning guidelines and commissioning guidelines of the PI user organization (PROFIBUS & PROFINET International, homepage: www.profinet.com).

These guidelines can be found in the "Downloads" area at:

- www.profibus.com

14.3.2 General notes on PROFINET wiring

The wires of the signal cables must be wrapped in pairs (twisted pairs), and the cables must comply with at least CAT5 according to ISO/IEC 11801 Edition 2.0. Class D. The signal lines must also be shielded and grounded.

SICK recommends using components certified by PROFINET.

More detailed information can be found in the “PROFINET Cabling and Interconnection Technology” Installation Guide.

You can find the document in the “Downloads” area at:

- www.profibus.com

14.3.3 PROFINET Conformance Class

The device complies with PROFINET Conformance Class B (CC-B) and supports the properties defined within.

Further information on the PROFINET Conformance Classes can be found in the document of the PI user organization (PROFIBUS and PROFINET International).

You can find the document in the “Downloads” area at:

- www.profibus.com

14.3.4 General requirements on a switch suitable for PROFINET applications

For PROFINET Conformance Class B and C (CC-B / CC-C), use only a PROFINET-certified switch that can be configured as a PROFINET device.

For further information, refer to the commissioning guidelines of the PI “Installation Guideline PROFINET Part 2: Network Components”.

You can find the document in the “Downloads” area under:

- www.profibus.com

14.3.5 Notes on installing the SICK bar code scanner into a PROFINET network

For 1-port devices, these include:

- LLDP (neighborhood detection) [1)]
- I&M 0-4 (device identification) [1)]
- Device exchange by topology check [1)]
- 16 bit digital “status word” for reading gate result
- 16 bit digital “control word” for controlling the device via PLC
- Heartbeat (for checking communication)
- GSD file for configuring the device using modules via the PLC [1)]

For 2-port devices, these include:

- LLDP (neighborhood detection) [1)]
- I&M 0-4 (device identification) [1)]
- Device exchange by topology check [1)]
- MRP (ring redundancy) [1)]
- 16 bit digital “status word” for reading gate result
- 16 bit digital “control word” for controlling the sensor via PLC
- Heartbeat (for checking communication)
- GSD file for configuring the sensor using modules via the PLC [1)]

14.3.6 Behavior of the digital outputs of the bar code scanner with “Fieldbus input” reading cycle source

The digital outputs can be configured so that the outputs show information from other network nodes (e.g., external output 1=fieldbus input).

If the fieldbus is interrupted, these outputs are no longer updated. The outputs will then each retain the last value before the interruption.

1) Properties of the CC-B

After switching on the fieldbus (power-up), all digital outputs are set to their “passive” values.

Status of digital outputs with	output value behavior
IOPS = Bad	Retain the last value before cancellation
Connection lost	Retain the last value before cancellation
Switching on the PROFINET network	Values are initialized to “passive”

The reading cycle input can also be controlled by the fieldbus. When the fieldbus is interrupted, the reading cycle input is no longer updated. Reading results may then get lost since the reading cycle input retains its last value before the interruption.

After switching on the fieldbus (power-up), the reading cycle input is set to its “passive” value.

14.4 Dimensional drawings electronic formats

Current dimensional drawings and CAD data for your device in various electronic formats can be downloaded online:

- www.sick.com/CLV62x

14.5 Connection diagrams of connection module CDB620-001

14.5.1 Connection of the device to CDB620-001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

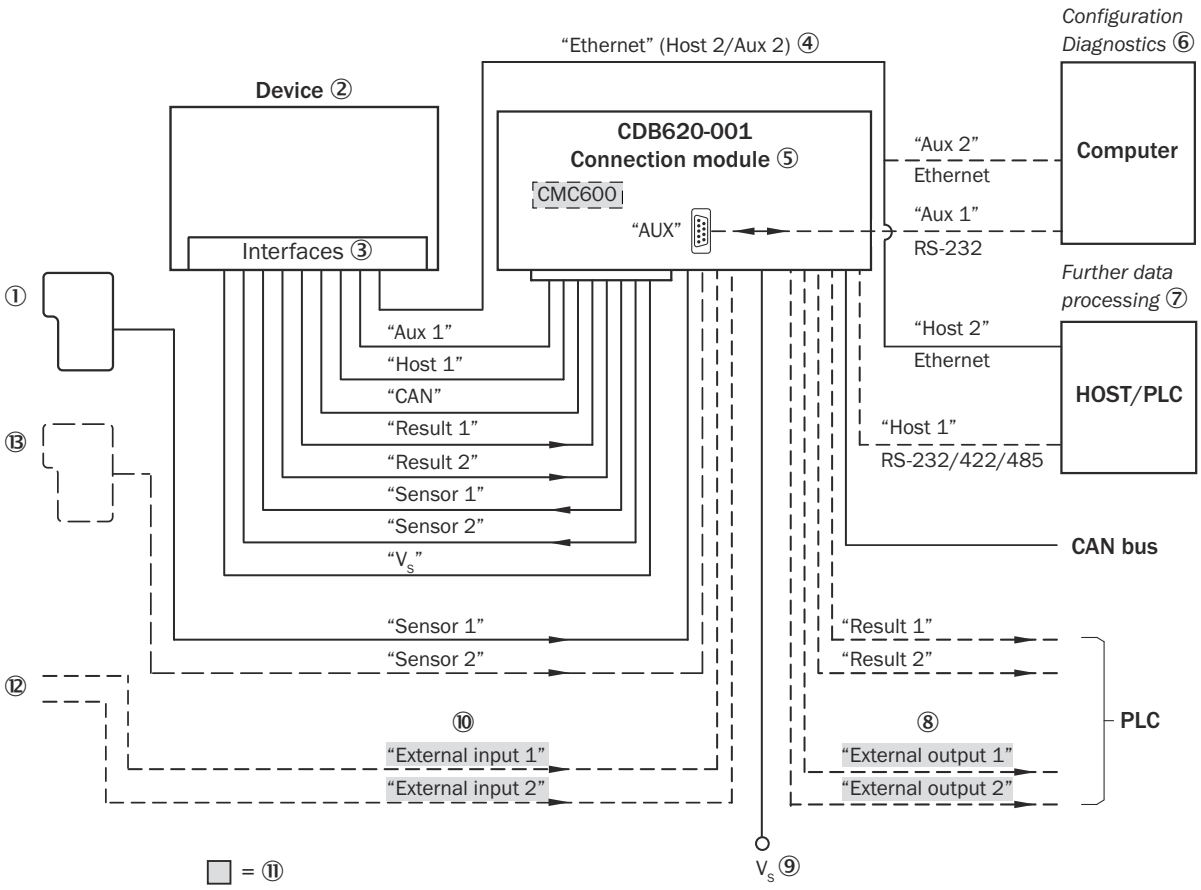

Figure 62: Connection of the device to peripherals via CDB620-001 (overview)

① External trigger sensor, e.g., for read cycle generation
② Device
③ Interfaces
④ Ethernet: not supported for CLV62x-x0xxx (serial variant).
⑤ Connection modules
⑥ Configuration or diagnostics
⑦ Data further processing
⑧ External digital outputs
⑨ Supply voltage V_S
⑩ External digital inputs
⑪ The optional CMC600 parameter cloning module is required in the connection module in order to use the additional external digital inputs and outputs of the device (highlighted in gray).
⑫ Other functions
⑬ Application-dependent alternative stop reading cycle (e.g. photoelectric sensor) or travel increment (incremental encoder)

14.5.2 Wiring overview of the CDB620-001

Device = CLV62x-x0xx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8), 1 digital input used

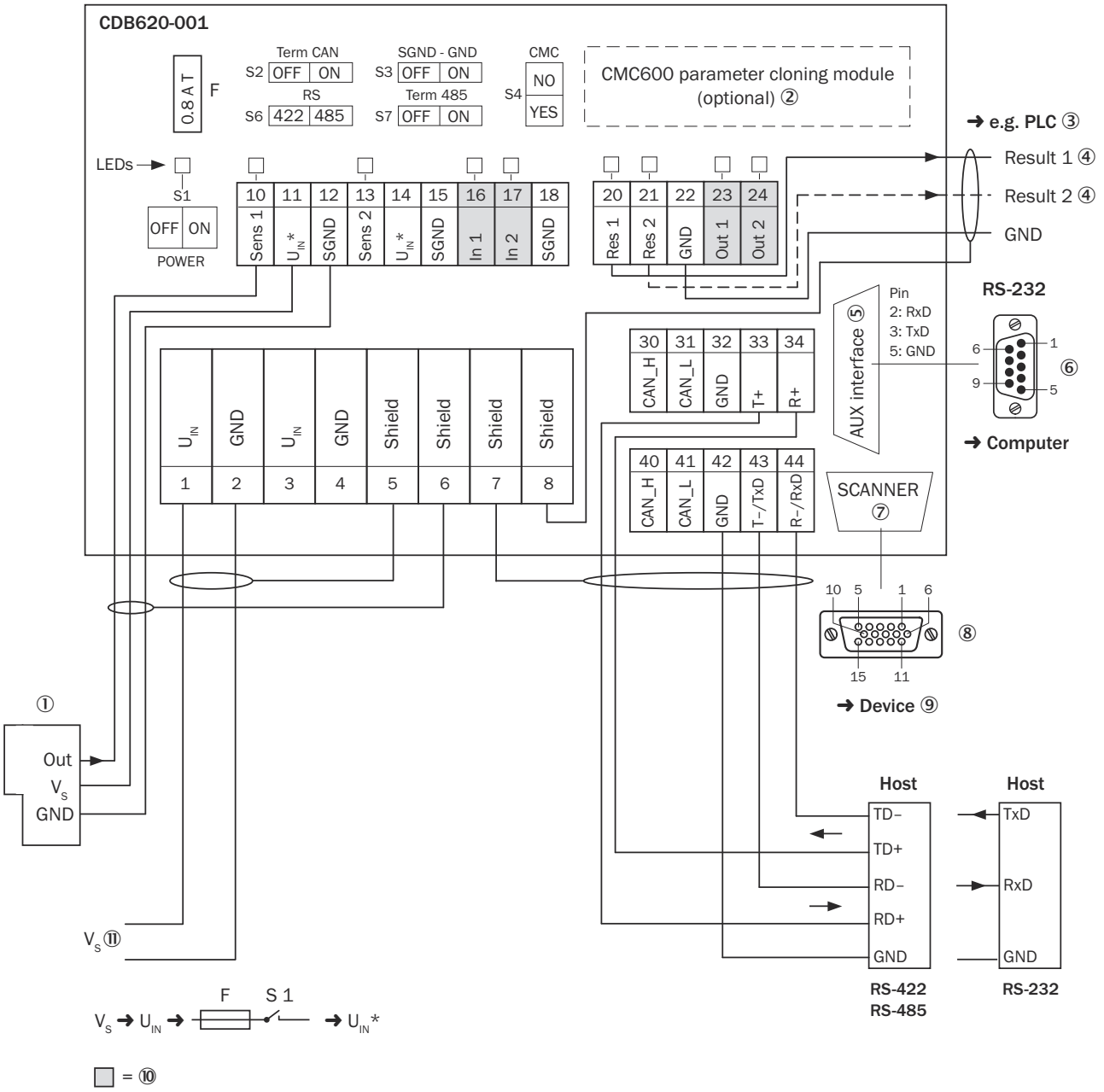

Figure 63: Overview: connection of device (without heating) and peripherals to the CDB620-001 connection module.

① External trigger sensor, e.g. for read cycle generation
② CMC600 parameter cloning module (optional)
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 SCANNER = Device
⑧ Female connector, D-Sub-HD, 15-pin
⑨ Device to be connected
⑩ The optional CMC600 parameter cloning module is required in the connection module in order to use the additional external digital inputs and outputs of the device (highlighted in gray).
⑪ Supply voltage V_S

14.5.3 Connecting supply voltage for the device in CDB620-001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

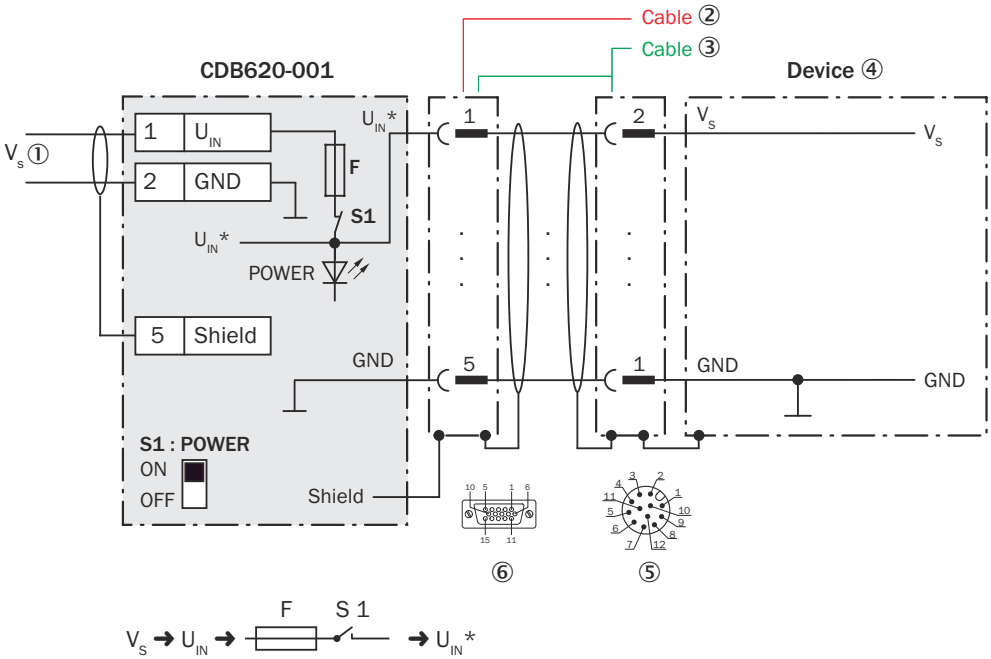

Figure 64: Connecting supply voltage for the device in the CDB620-001 connection module, Ethernet variant with male connector, M12, 12-pin, A-coded

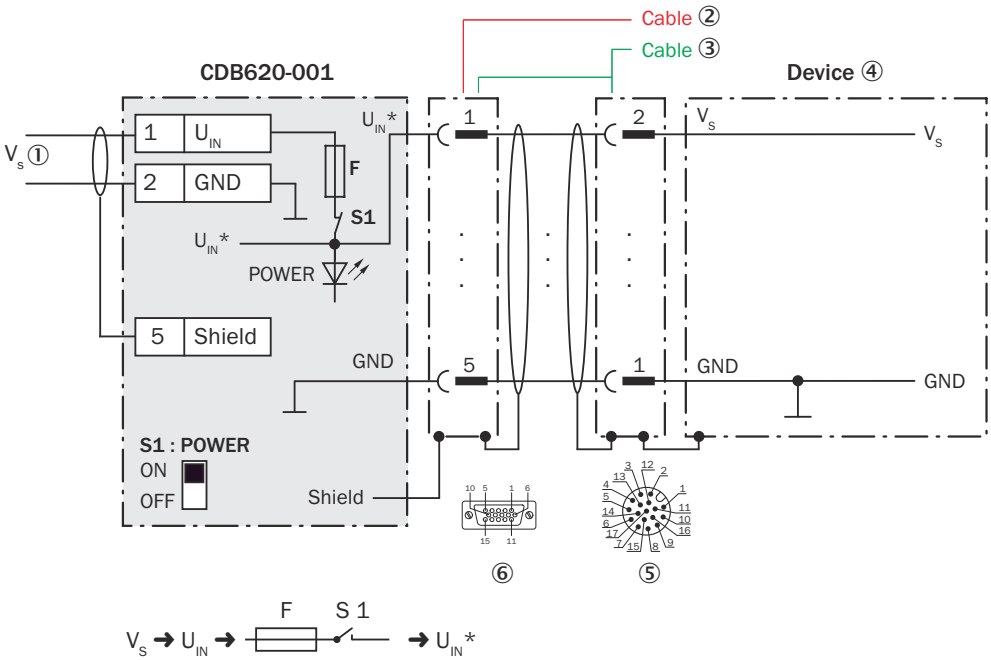

Figure 65: Connecting supply voltage for the device in the CDB620-001 connection module, Ethernet variant with male connector, M12, 17-pin, A-coded

① Supply voltage V_S

② CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)

③ CLV62x-x1xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 12-pin, A-coded)

CLV62x-x8xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 17-pin, A-coded)

④ Device

⑤ CLV62x-x1xx (Ethernet variant): male connector, M12, 12-pin, A-coded

CLV62x-x8xx (Ethernet variant): male connector, M12, 17-pin, A-coded

⑥ Connection module: female connector, D-Sub-HD, 15-pin

Function of switch S1

Table 31: Switch S1: Power

Switch setting	Function
ON	Supply voltage U_{IN} connected to CDB620-001 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	CDB620-001 and device disconnected from supply voltage Recommended setting for all connection work

14.5.4 Wiring serial host interface RS-232 of the device in the CDB620-001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

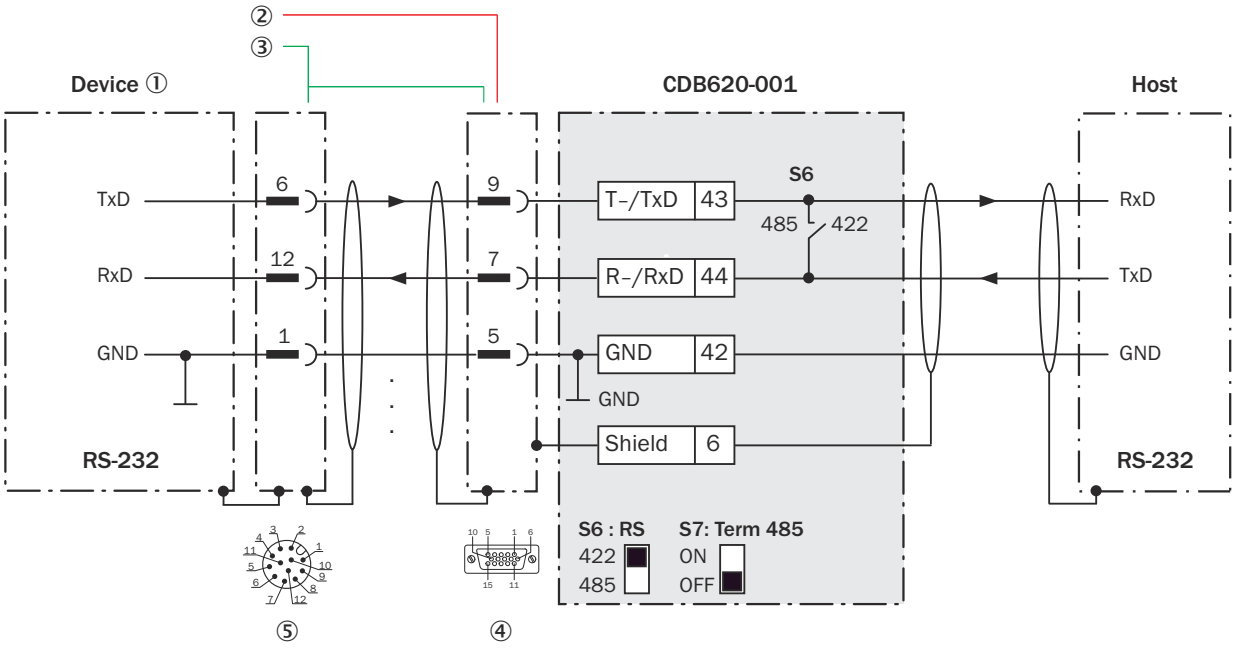

Figure 66: Wiring data interface RS-232 of the device in the CDB620-001 connection module, Ethernet variant with male connector, M12, 12-pin, A-coded

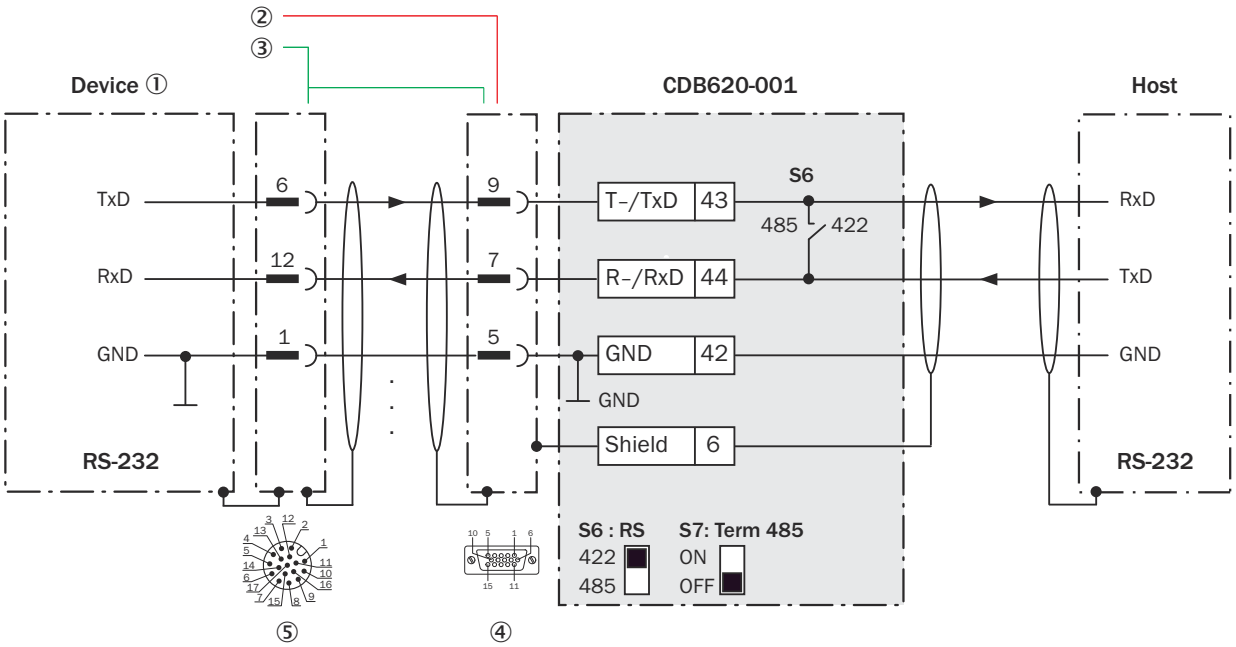

Figure 67: Wiring data interface RS-232 of the device in the CDB620-001 connection module, Ethernet variant with male connector, M12, 17-pin, A-coded

① Device

② CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)

③ CLV62x-x1xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 12-pin, A-coded)

CLV62x-x8xx (Ethernet variant): 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 CLV62x-x1xx (Ethernet variant): male connector, M12, 12-pin, A-coded

CLV62x-x8xx (Ethernet variant): male connector, M12, 17-pin, A-coded

NOTE

Activate the RS-232 data interface in the device using a configuration software, e.g., SOPAS ET.

14.5.5 Wiring serial host interface RS-422 of the device in the CDB620-001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

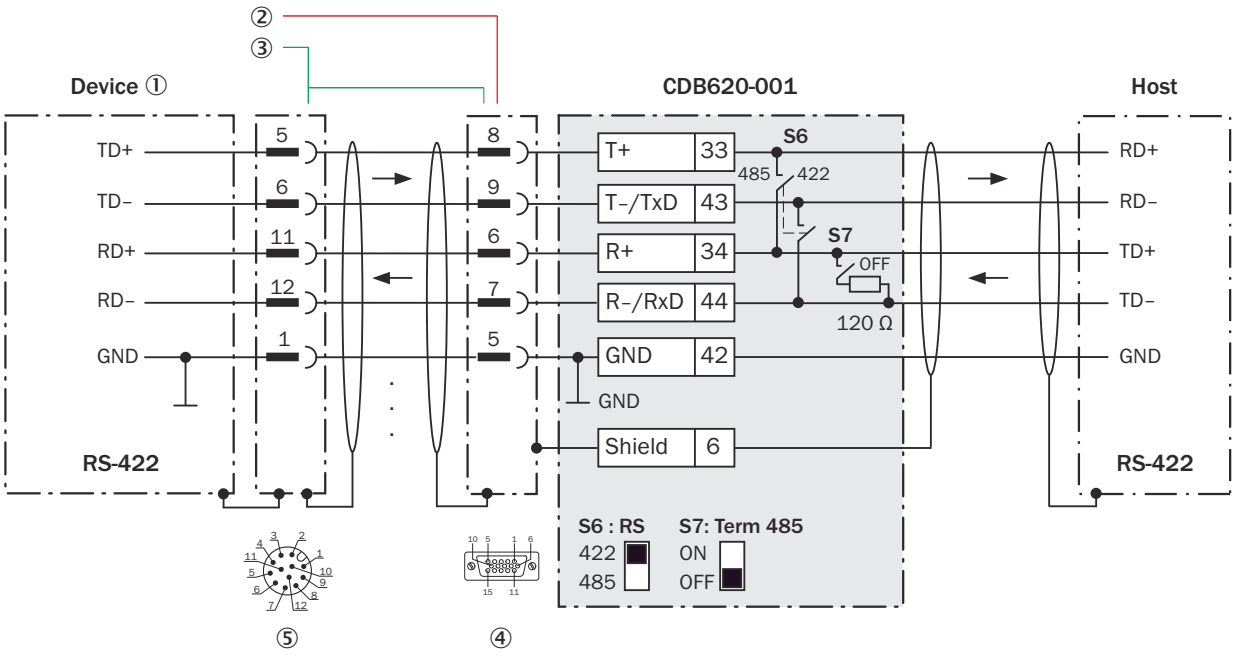

Figure 68: Wiring data interface RS-422 of the device in the CDB620-001 connection module, Ethernet variant with male connector, M12, 12-pin, A-coded

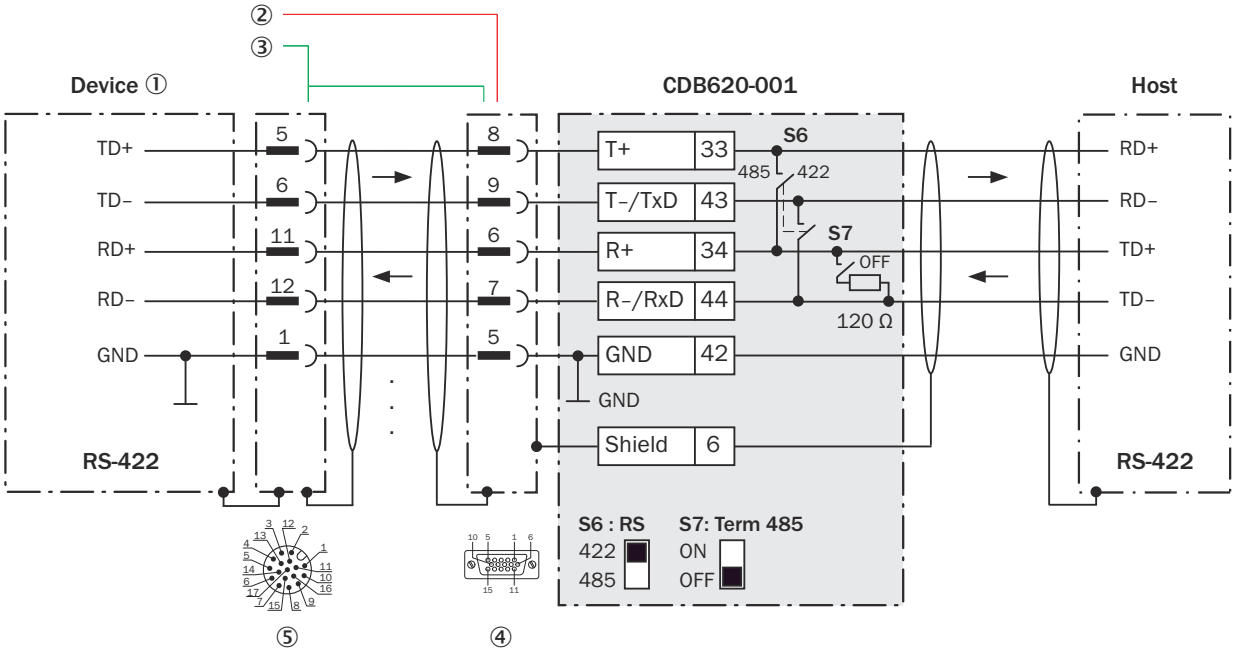

Figure 69: Wiring data interface RS-422 of the device in the CDB620-001 connection module, Ethernet variant with male connector, M12, 17-pin, A-coded

① Device

② CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)

③ CLV62x-x1xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 12-pin, A-coded)

CLV62x-x8xx (Ethernet variant): 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 CLV62x-x1xx (Ethernet variant): male connector, M12, 12-pin, A-coded

CLV62x-x8xx (Ethernet variant): male connector, M12, 17-pin, A-coded

Function of switch S7

Table 32: Switch S7: Term 485

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

NOTE

Activate the RS-422 data interface (“Point-to-Point” option) in the device using a configuration software, e.g., SOPAS ET.

The following requirements or 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 and RS-485.
- The connection shown above is configured for operation of the host with permanently activated drivers (often described as “RS-422 operation”), i.e. not RS-485 operation.

14.5.6 Wiring the RS-485 serial host interface of the device in the CDB620-001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

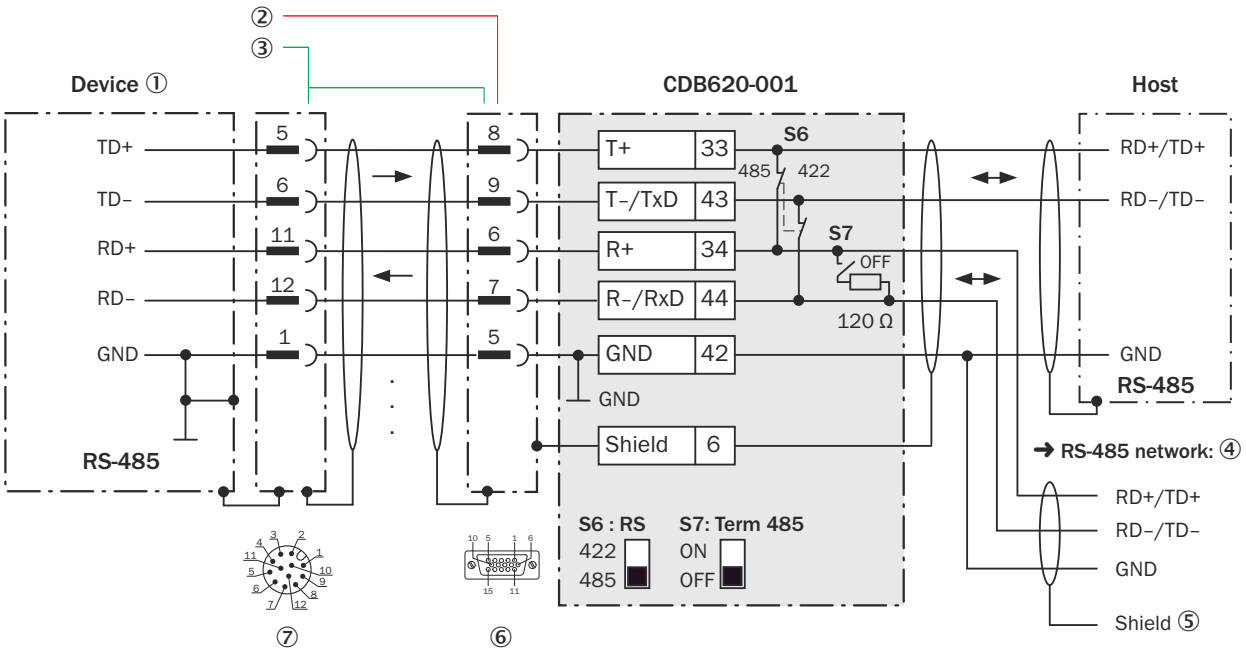

Figure 70: Wiring data interface RS-485 of the device in the CDB620-001 connection module, Ethernet variant with male connector, M12, 12-pin, A-coded

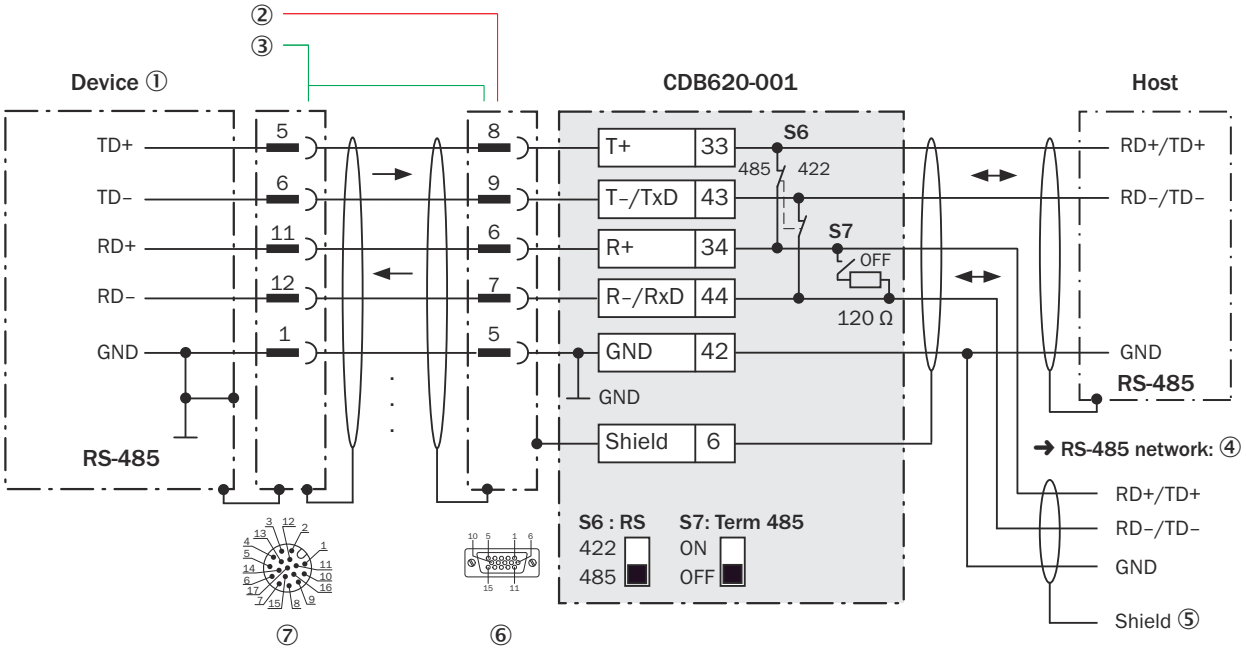

Figure 71: Wiring the RS-485 data interface of the device in the CDB620-001 connection module, Ethernet variant with male connector, M12, 17-pin, A-coded

① Device
② CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
③ CLV62x-x1xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 12-pin, A-coded)

CLV62x-x8xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 17-pin, A-coded)

④ RS-485 network
⑤ Shielding
⑥ Connection module: female connector, D-Sub-HD, 15-pin
⑦ CLV62x-x1xx (Ethernet variant): male connector, M12, 12-pin, A-coded

CLV62x-x8xx (Ethernet variant): male connector, M12, 17-pin, A-coded

Function of switch S7

Table 33: Switch S7: Term 485

Switch setting	Function
ON	Terminates the device. Required if the device is located at the end of the RS-485 bus cable.
OFF	No termination

NOTE
Activate the RS-485 data interface (“Bus” option) in the device using a configuration software, e.g., SOPAS ET.

The following requirements or restrictions apply when using the RS-485 data interface:

- The relevant interface drivers for the device comply with the RS-422 and RS-485standard.
- This operating mode is only permitted if all connected devices use a corresponding RS-485 protocol.
- This configuration is not permitted when using the standard data output and protocol of the device. In case of doubt, contact SICK Service.

14.5.7 Wiring the CAN interface in the CDB620-001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

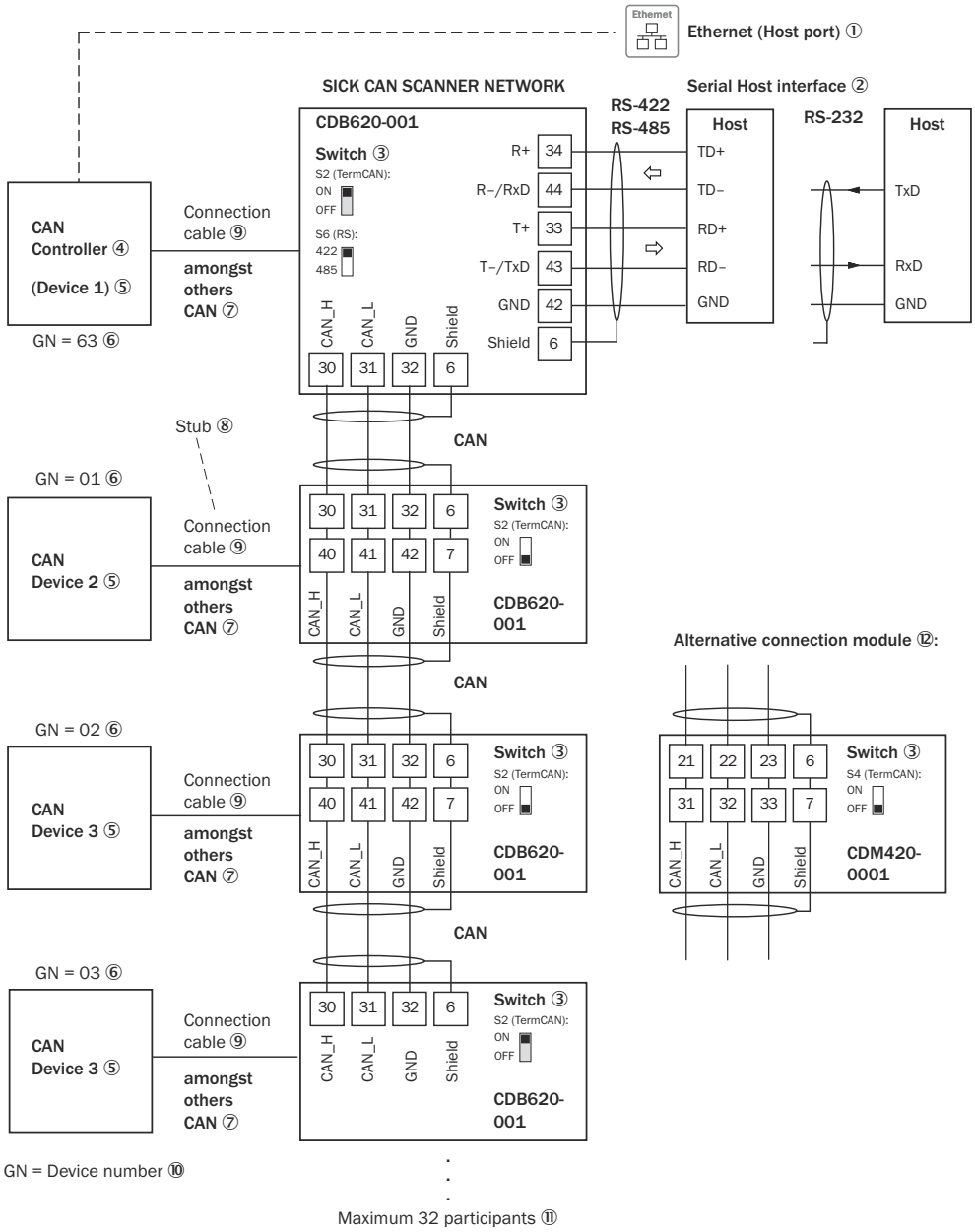

Figure 72: Wire the CAN interface of the device in the CDB620-001 connection module. Connection and looping through of the supply voltage and connection of a trigger sensor for read cycle generation at the CAN controller, for example, are disregarded here.

① Ethernet (host port): CLV62x-xYxxx (Ethernet variant, Y = 1 or 8) only
② Serial host interface
③ Switch
④ CAN controller
⑤ CAN device
⑥ Device number
⑦ CAN etc.
⑧ Branch line
⑨ CLV62x-x0xxx (serial variant): connecting cable permanently connected to the device with male connector, D-Sub-HD, 15-pin

CLV62x-xYxxx (Ethernet variant, Y = 1): adapter cable with female connector, M12, 12-pin, A-coded and male connector, D-Sub-HD, 15-pin

CLV62x-xYxxx (Ethernet variant, Y = 8): adapter cable with female connector, M12, 17-pin, A-coded and male connector, D-Sub-HD, 15-pin

⑩ Device number (GN)
⑪ Maximum 32 users
⑫ Example of alternative connection module:

Alternative connection module for CLV62x-x0xxx (serial variant): CDM420-0001 or CDM420-0006.

Alternative connection module for CLV62x-xYxxx (Ethernet variant, Y = 1 or 8): CDM420-0001 or CDM420-0006. CDB650-204 only for CLV62x-xYxxx (Ethernet variant, Y = 8)

CDM420-0001 or CDM420-0006: An adapter cable with female connector, M12, 12-pin, A-coded and male connector, D-Sub-HD, 15-pin is required to connect the CLV62x-xYxxx (Ethernet variant, Y = 1).

CDM420-0001 or CDM420-0006: An adapter cable with female connector, M12, 17-pin, A-coded and male connector, D-Sub-HD, 15-pin is required to connect the CLV62x-xYxxx (Ethernet variant, Y = 8).

CDB650-204: A connection cable 1:1 with female connector, M12, 17-pin, A-coded and male connector, M12, 17-pin, A-coded is required to connect the CLV62x-xYxxx (Ethernet variant, Y = 8).

NOTE

Activate the CAN data interface in the device using a configuration software, e.g., SOPAS ET.

Configure further settings in the device according to the function of the device in the system configuration.

14.5.8 Wiring digital inputs of the device in the CDB620-001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

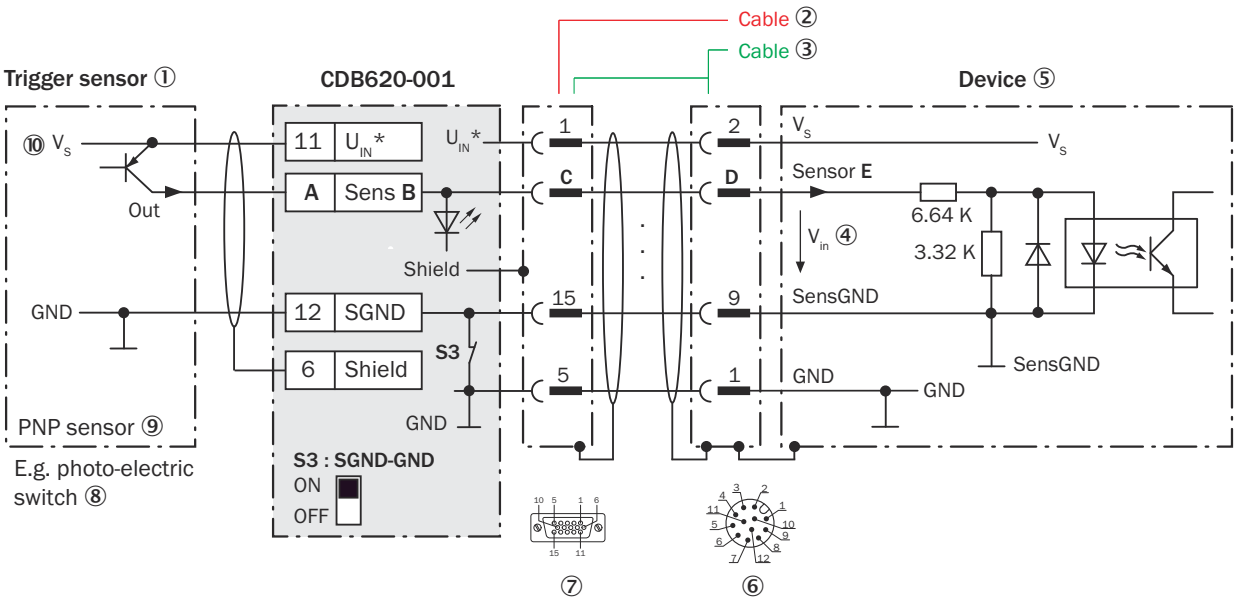

Figure 73: Trigger sensor supplied with power by connection module CDB620-001, Ethernet variant with male connector, M12, 12-pin, A-coded

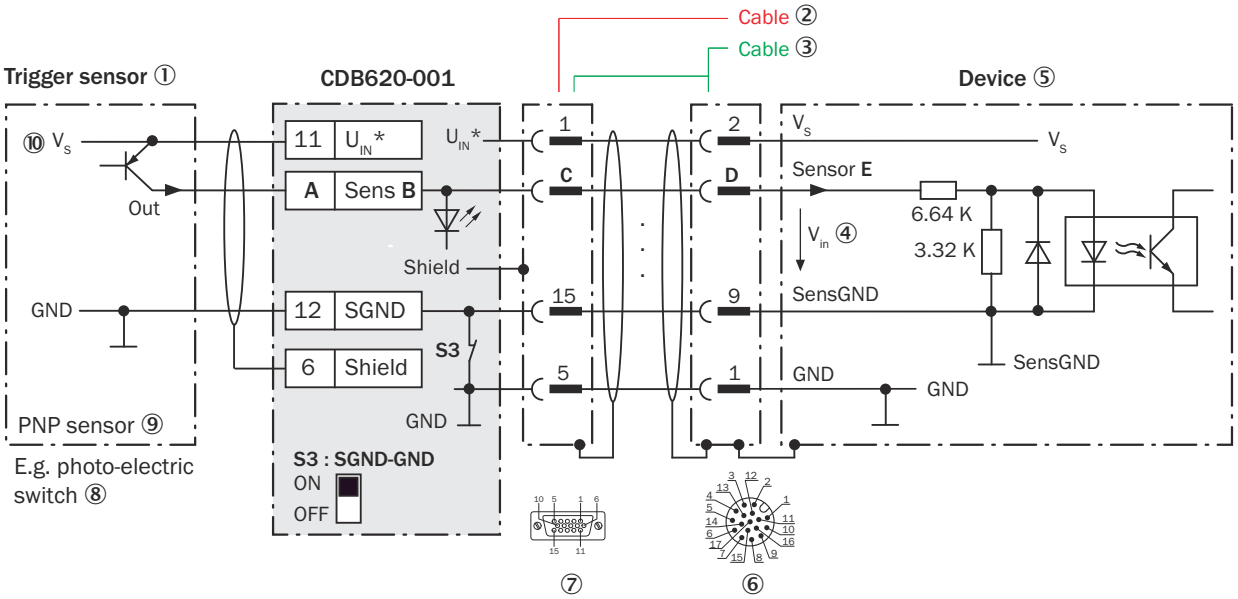

Figure 74: Trigger sensor supplied with power by connection module CDB620-001, Ethernet variant with male connector, M12, 17-pin, A-coded

① Trigger sensor, e.g., for read cycle generation
② CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
③ CLV62x-x1xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 12-pin, A-coded)
CLV62x-x8xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 17-pin, A-coded)
④ Input voltage V_{in}
⑤ Device
⑥ CLV62x-x1xx (Ethernet variant): male connector, M12, 12-pin, A-coded
CLV62x-x8xx (Ethernet variant): 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

NOTE
Reduction of digital inputs due to limited number of contacts in the connector plug of the device

CLV62x-xYxxx (Ethernet variant, Y = 1) with male connector, M12, 12-pin, A-coded: The “Sensor 2” digital input is not available.

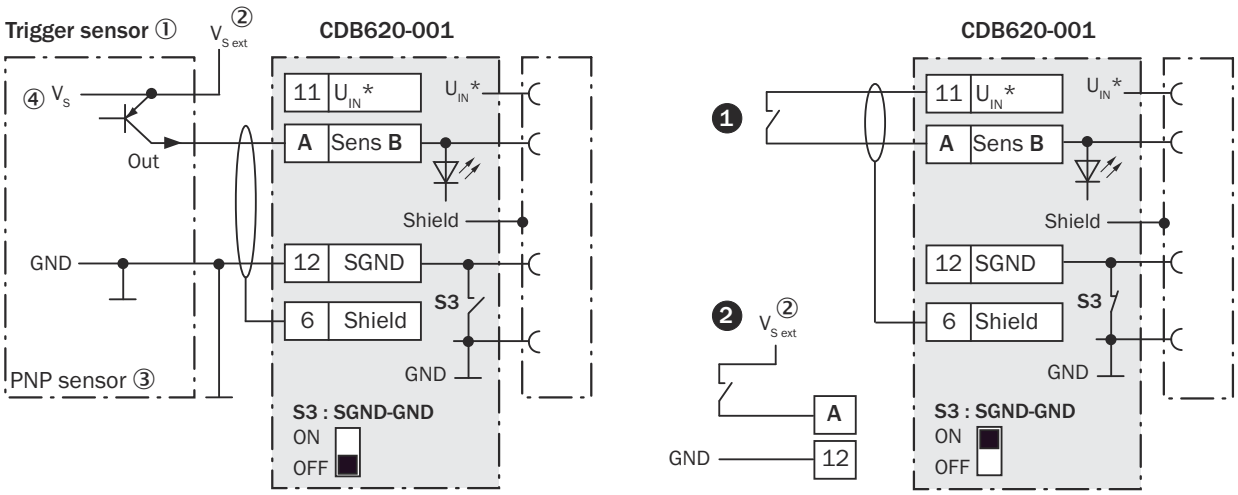

Figure 75: Left: Trigger sensor connected potential-free and supplied with power externally. Right: alternative switch, ❶ supplied with power by connection module CDB620-001 or ❷ connected volt-free and supplied with power externally. Now select switch setting S3 as shown in the left figure.

① Trigger sensor, e.g. for read cycle generation
② External supply voltage $V_{S\ ext}$
③ PNP sensor
④ Supply voltage V_S

Table 34: Assignment of placeholders to the digital inputs

CDB620-001			Device	
Terminal A	**Signal B**	**Pin C**	**Pin D**	**Sensor E**
10	Sens 1	14	10	1
13	Sens 2	4	15	2

Function of switch S3

Table 35: Switch S3: SGND - GND

Switch setting	Function
ON	GND of the trigger sensor is connected with GND of CDB620-001 and GND of the device
OFF	Trigger sensor is connected volt-free at CDB620-001 and the device. Common, isolated reference potential of all digital inputs is SGND.

Characteristic data of the digital inputs

Table 36: 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 read cycle. Default setting in the device: logic not inverted (active high), debounce time 10 ms
Properties	• Opto-decoupled, reverse polarity protected • Can be wired with PNP output of a trigger sensor
Electrical values	Low: V_{in} [1] ≤ 2 V; I_{in} [2] ≤ 0.3 mA High: 6 V ≤ V_{in} ≤ 30 V; 0.7 mA ≤ I_{in} ≤ 5 mA

1) Input Voltage
2) Input current

NOTE
Allocate the functions for the digital inputs in the device using a configuration software, e.g., SOPAS ET.

14.5.9 Wiring the external digital inputs of the device in the CDB620-001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

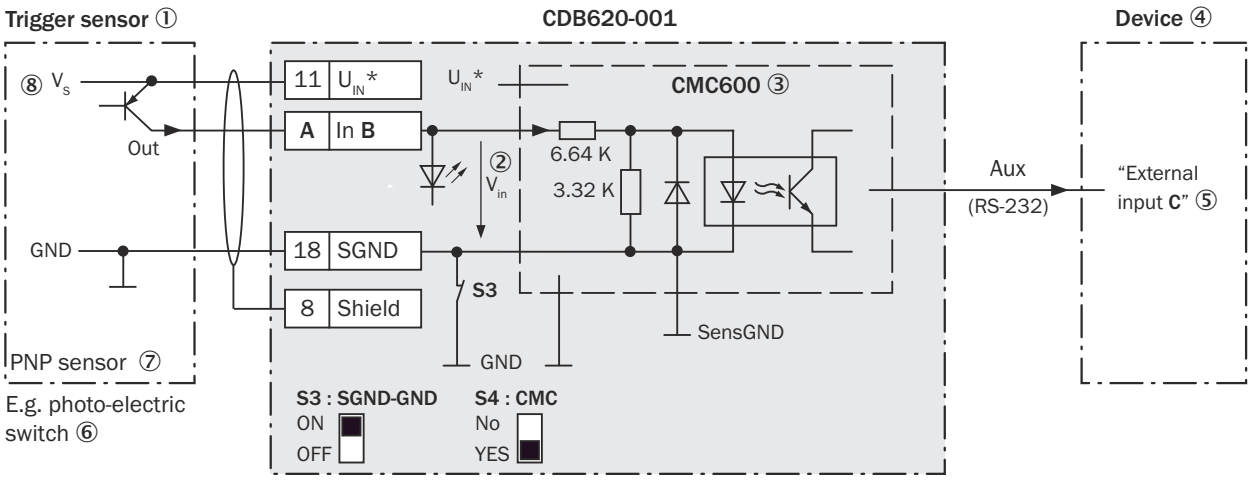

Figure 76: Trigger sensor supplied with power by connection module CDB620-001

① Trigger sensor, e.g., for read cycle generation
② Input voltage V_{in}
③ The optional CMC600 parameter cloning module is required in the connection module in order to use the additional external digital inputs and outputs of the device.
④ Device
⑤ Logical “External input” in the device
⑥ E.g. photoelectric sensor
⑦ PNP sensor
⑧ Supply voltage V_S

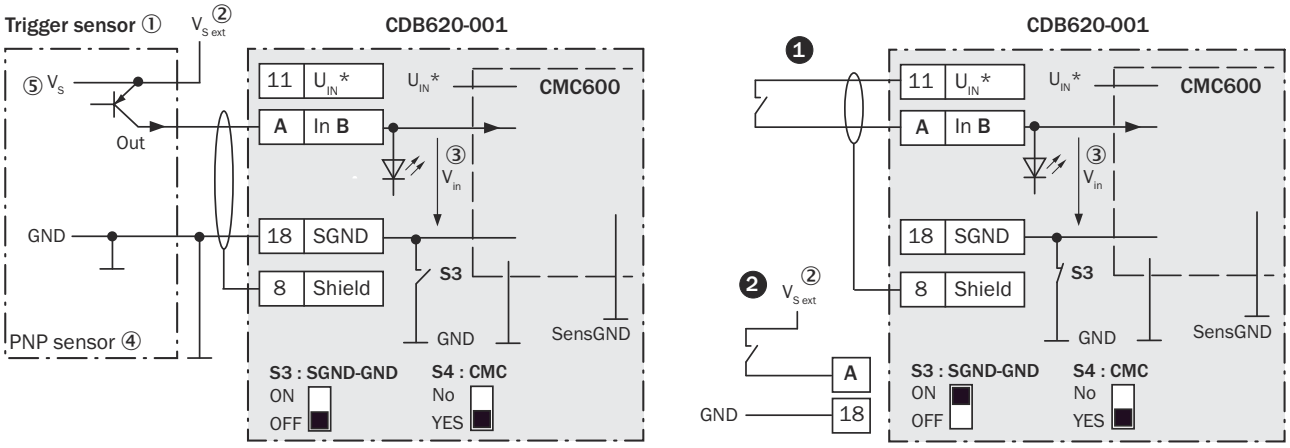

Figure 77: Left: Trigger sensor connected potential-free and supplied with power externally. Right: alternative switch, ❶ supplied with power by connection module CDB620-001 or ❷ connected volt-free and supplied with power externally. Now select switch setting S3 as shown in the left figure.

① Trigger sensor, e.g. for read cycle generation
② External supply voltage $V_{S\ ext}$
③ Input voltage V_{in}
④ PNP sensor
⑤ Supply voltage V_S

Table 37: Assignment of placeholders to the digital inputs

CDB620-001 (physical inputs)		Device (logical inputs)
Terminal A	**Signal B**	**External input C**
16	In 1	1
17	In 2	2

Function of switch S3

Table 38: Switch S3: SGND - GND

Switch setting	Function
ON	GND of the trigger sensor is connected with GND of CDB620-001 and CMC600
OFF	Trigger sensor is connected volt-free at the CDB620-001 and CMC600. Common, isolated reference potential of all digital inputs is SGND.

Functional principle of the external digital inputs

The optional CMC600 parameter cloning module in combination with the CDB or CDM connection module offers two additional physical digital inputs for the device. The inputs are available at the respective terminals of the connection module. To distinguish them from the physical digital inputs directly on the device, these addition inputs via the CMC600 are designated as “external inputs”.

NOTE

The CMC600 transmits the switching signals of the external digital inputs as statuses to the local inputs of the device via its serial data interface.

The digital inputs are not suitable for time-critical applications.

Characteristic data of the digital inputs

Table 39: Characteristic data of the digital inputs “External input 1” and “External input 2”

Type	Switching
Switching behavior	Power to the input starts the assigned function, e.g. start read cycle. Default setting in the device: logic not inverted (active high), debounce time 10 ms
Properties	• Opto-decoupled, reverse polarity protected • Can be wired with PNP output of a trigger sensor
Electrical values	Low: V_{in} [1] ≤ 2 V; I_{in} [2] ≤ 0.3 mA High: 6 V ≤ V_{in} ≤ 30 V; 0.7 mA ≤ I_{in} ≤ 5 mA

1) Input Voltage
2) Input current

NOTE

Allocate the functions for the digital inputs in the device using a configuration software, e.g., SOPAS ET.

14.5.10 Wiring digital outputs of the device in the CDB620-001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

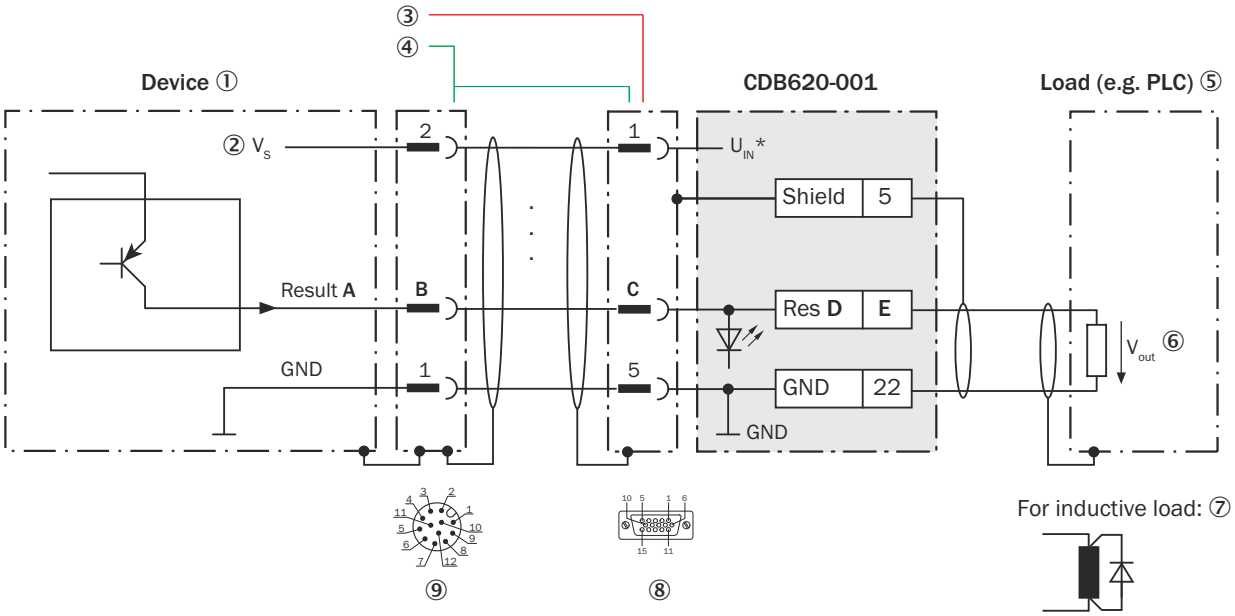

Figure 78: Wiring the digital outputs "Result 1" and "Result 2" of the device in the connection module CDB620-001, Ethernet variant with male connector, M12, 12-pin, A-coded

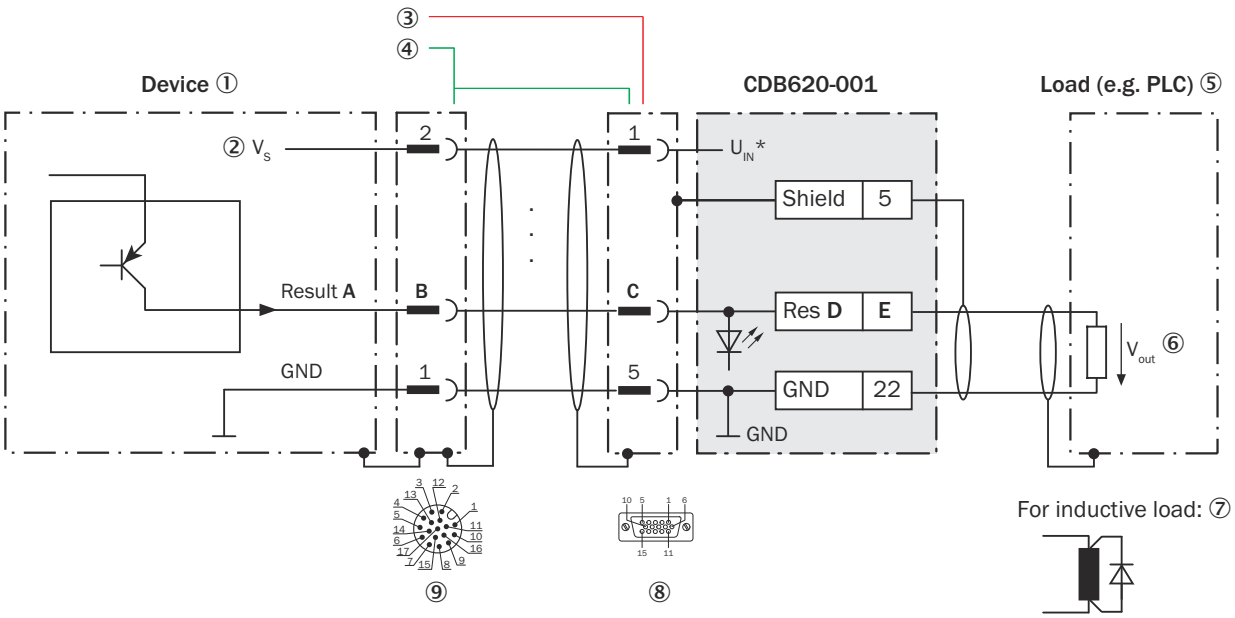

Figure 79: Wiring the "Result 1" and "Result 2" digital outputs of the device in the connection module CDB620-001, Ethernet variant with male connector, M12, 17-pin, A-coded.

① Device
② Supply voltage V_S
③ CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
④ CLV62x-x1xxx (Ethernet variant): adapter cable (female connector, M12, 12-pin, A-coded / male connector, D-Sub-HD, 15-pin)

CLV62x-x8xxx (Ethernet variant): 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 CLV62x-x1xxx (Ethernet variant): male connector, M12, 12-pin, A-coded

CLV62x-x8xxx (Ethernet variant): male connector, M12, 17-pin, A-coded

NOTE
Digital output are omitted due to limited number of contacts in the connector plug of the device.

CLV62x-xYxxx (Ethernet variant, Y =1) with male connector, M12, 12-pin, A-coded: The two “Result 1” and “Result 2” digital outputs are not available.

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 40: Assignment of placeholders to the digital outputs

Device		CDB620-001		
Output A	**Pin B**	**Pin C**	**Signal D**	**Terminal E**
Result 1	13	12	Res 1	20
Result 2	14	13	Res 2	21

Characteristic data of the digital outputs

Table 41: Characteristic data of the digital outputs “Result 1” and “Result 2”

Type	Switching
Switching behavior	PNP switching to supply voltage V_S Default settings in the device: no function, logic: not inverted (active high)
Properties	• Short-circuit protected and temperature protected • Not electrically isolated from the supply voltage V_S
Electrical values	$0\ V \le V_{out}$ [1] $\le V_S$ $(V_S - 1.5\ V) \le V_{out} \le V_S$ bei I_{out} [2] $\le 100\ mA$

1) Output voltage
2) Output current

NOTE
Allocate the functions for the digital outputs in the device using a configuration software, e.g., SOPAS ET.

14.5.11 Wiring the external digital outputs of the device in the CDB620-001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

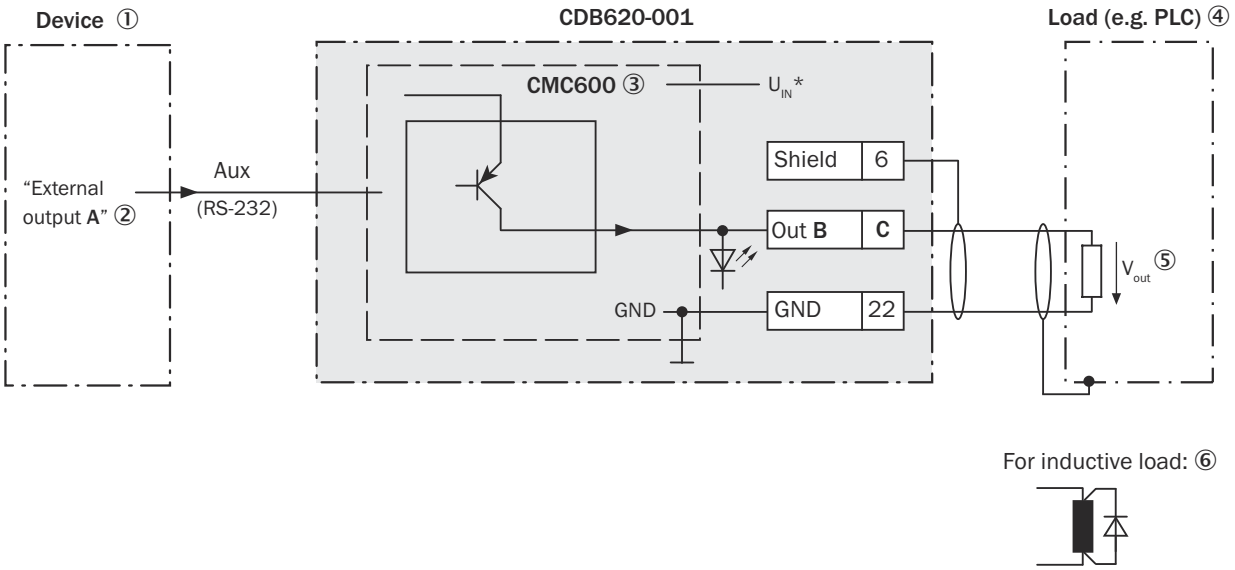

Figure 80: Wiring "Out 1" and "Out 2" external digital outputs of the device in the connection module CDB620-001.

① Device
② Logical "External output" in the device
③ The optional CMC600 parameter cloning module is required in the connection module in order to use the additional external digital inputs and outputs of the device.
④ Load (e.g. PLC)
⑤ Output voltage V_{out}
⑥ With inductive load: see note

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 42: Assignment of placeholders to the digital outputs

Device (logical output)	CDB620-001 (physical output)	
External output A	**Signal B**	**Terminal C**
1	Out 1	23
2	Out 2	24

Functional principle of the external digital outputs

The optional CMC600 parameter cloning module in combination with the CDB or CDM connection module offers two additional digital outputs for the device. The outputs are available at the respective terminals of the connection module. To distinguish them from the physical digital outputs directly on the device, these addition outputs via the CMC600 are designated as "external outputs".

NOTE

The device transmits the statuses of its logical outputs to the CMC600 via its serial data interface. The CMC600 converts the statuses into switching signals on its physical digital outputs.

The digital outputs are not suitable for time-critical applications.

Characteristic data of the digital outputs

Table 43: Characteristic data of the digital outputs "External output 1" and "External output 2"

Type	Switching
Switching behavior	PNP switching to supply voltage V_S Default settings in the device: no function, logic: not inverted (active high)
Properties	• Short-circuit protected and temperature protected • Not electrically isolated from V_S
Electrical values	$0\ V \leq V_{out}$ [1] $\leq V_S$ $(V_S - 1.5\ V) \leq V_{out} \leq V_S$ at I_{out} [2] $\leq 100\ mA$

1) Output voltage
2) Output current

NOTE

Allocate the functions for the digital outputs in the device using a configuration software, e.g., SOPAS ET.

14.6 Connection diagrams of connection module CDB650-204

14.6.1 Connection of the device to CDB650-204

Device = CLV62x-x8xxx (Ethernet variant)

Also devices in protective housing IP69K (CLV62x-x8xxxS01)

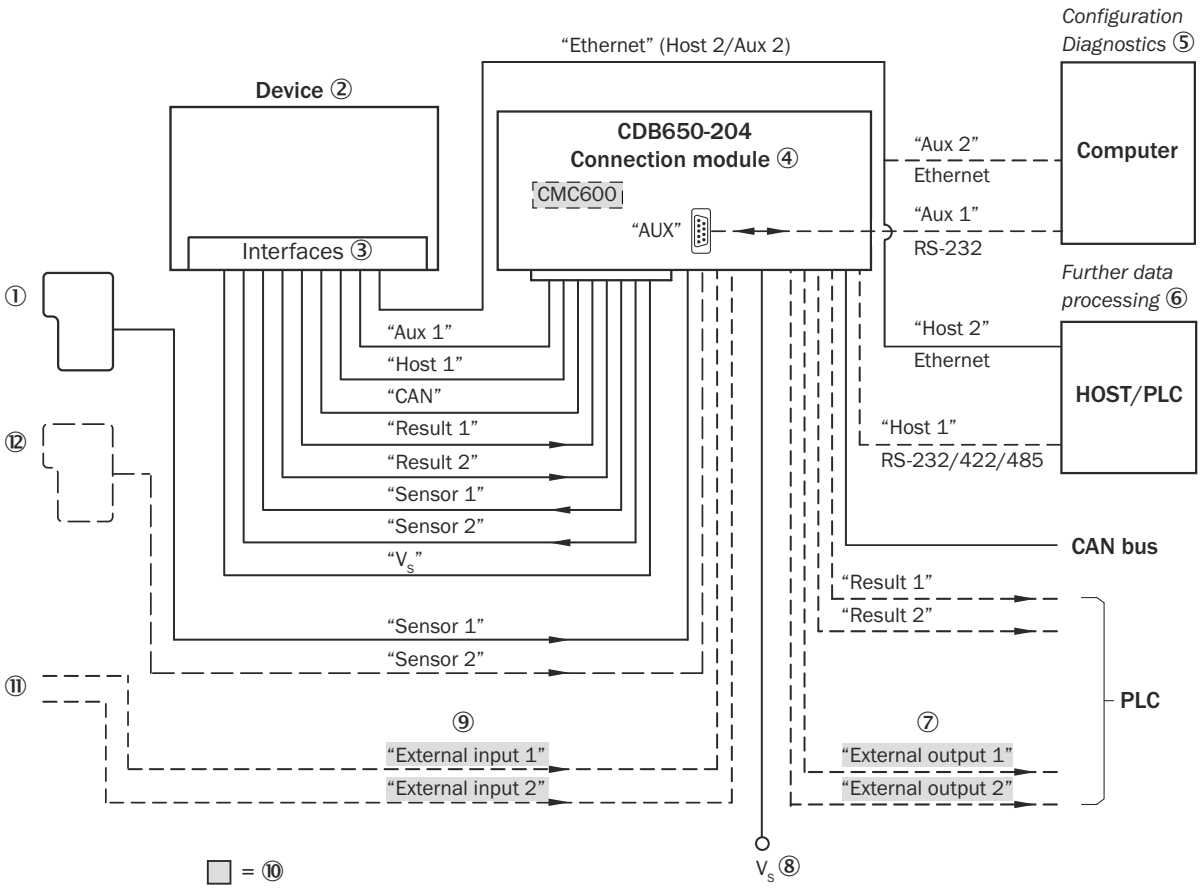

Figure 81: Connection of the device to peripherals via CDB650-204 (overview)

① External trigger sensor, e.g. for read cycle generation
② Device
③ Interfaces
④ Connection module
⑤ Configuration or diagnostics
⑥ Data further processing
⑦ External digital outputs
⑧ Supply voltage V_S
⑨ External digital inputs
⑩ The optional CMC600 parameter cloning module is required in the connection module in order to use the additional external digital inputs and outputs of the device (highlighted in gray).
⑪ Other functions
⑫ Can also be used as an alternative stop reading cycle (e.g., photoelectric sensor) or travel increment (incremental encoder), depending on the application

14.6.2 Wiring overview of the CDB650-204

Device = CLV62x-x8xxx (Ethernet variant), 1 digital input used

Also devices in protective housing IP69K (CLV62x-x8xxxS01), 1 digital input used

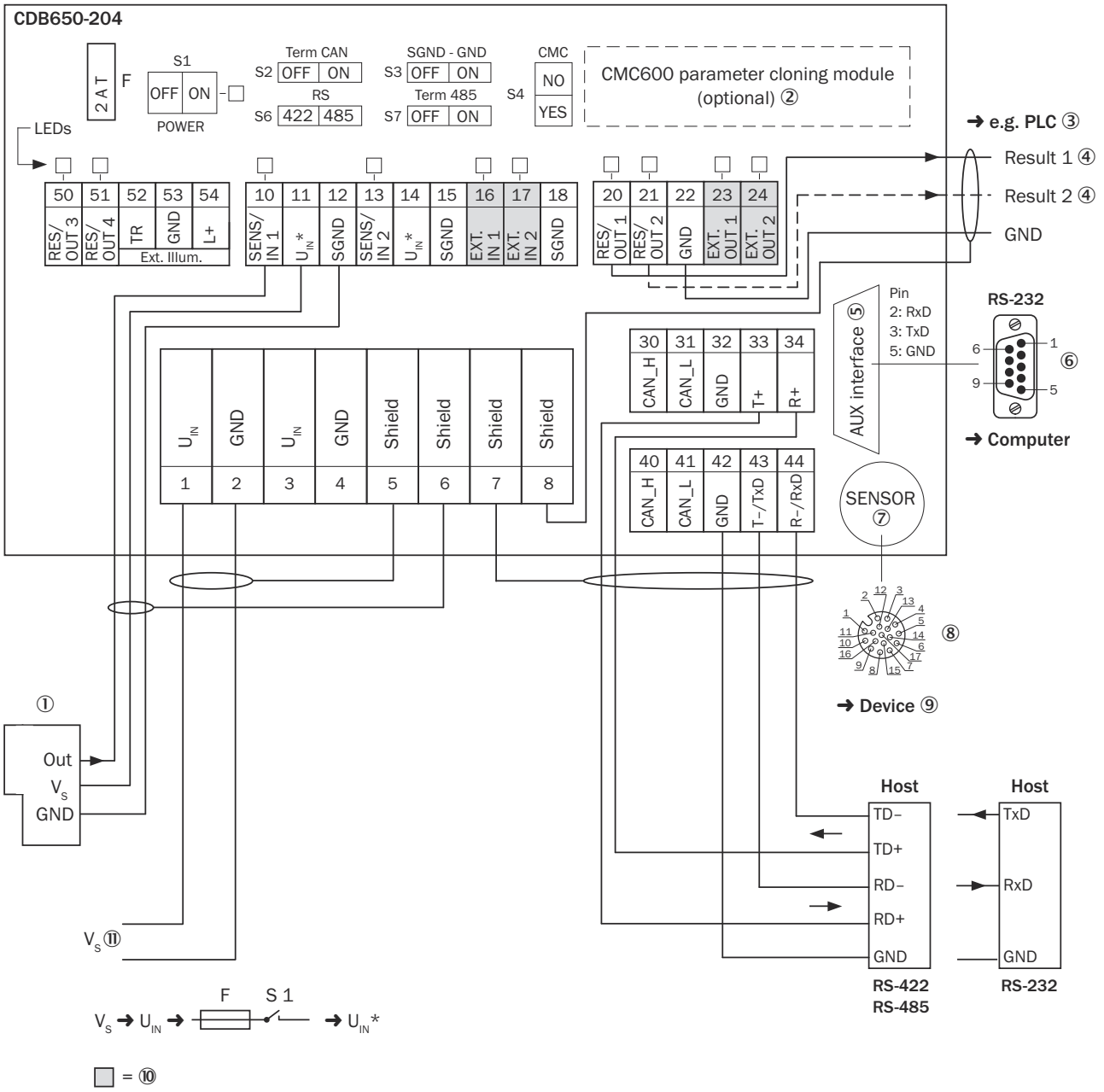

Figure 82: Overview: connection of device and peripherals to the CDB650-204 connection module.

① External trigger sensor, e.g. for read cycle generation
② CMC600 parameter cloning module (optional)
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 The optional CMC600 parameter cloning module is required in the connection module in order to use the additional external digital inputs and outputs of the device (highlighted in gray).
⑪ Supply voltage V_S

14.6.3 Connecting supply voltage for the device in CDB650-204

Device = CLV62x-x8xxx (Ethernet variant)

Also devices in protective housing IP69K (CLV62x-x8xxxS01)

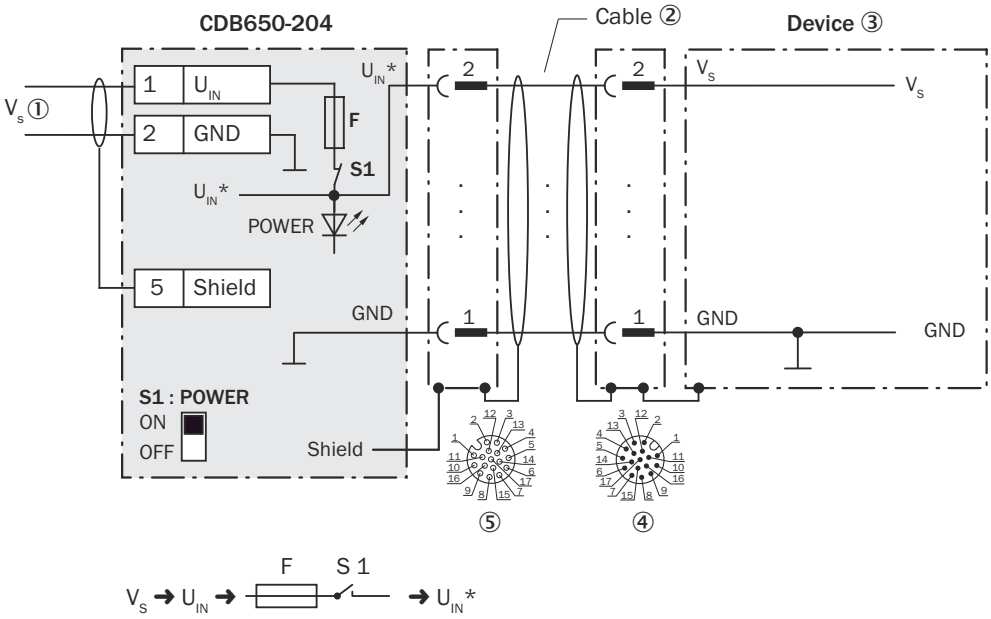

Figure 83: Connecting supply voltage for the device in CDB650-204 connection module.

① Supply voltage V_S
② Connection cable 1:1 with male connector, M12, 17-pin, A-coded and 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 44: 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

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

Device = CLV62x-x8xxx (Ethernet variant)

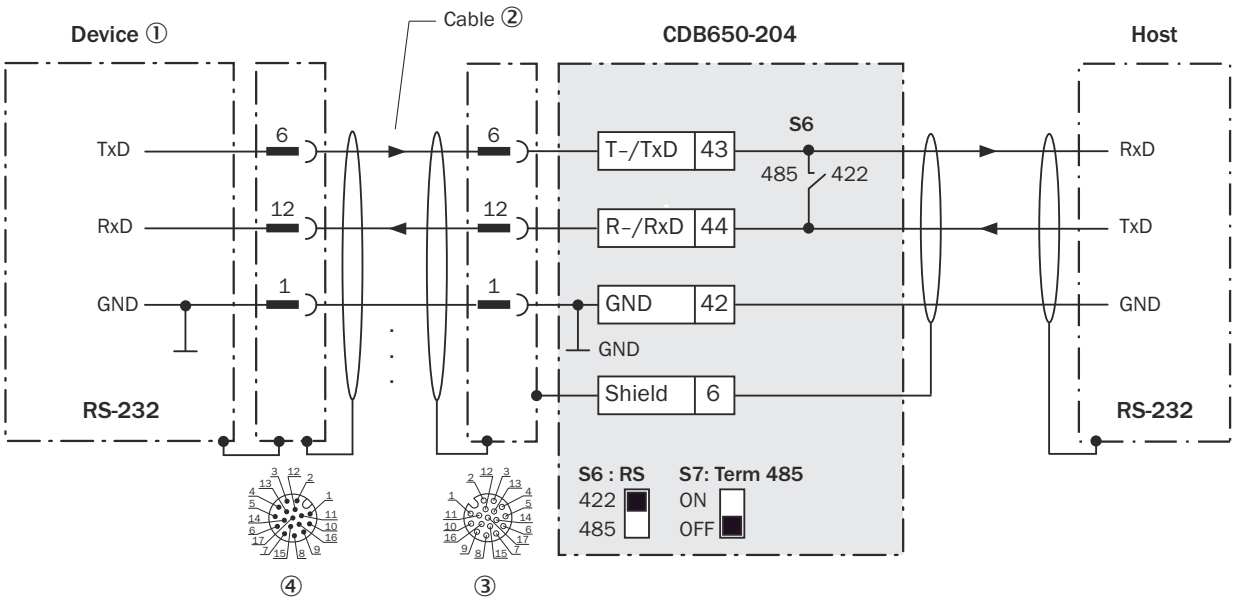

Figure 84: Wiring data interface RS-232 of the device in the connection module CDB650-204

① Device
② Connection cable 1:1 with female connector, M12, 17-pin, A-coded and 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
Activate the RS-232 data interface in the device using a configuration software, e.g., SOPAS ET.

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

Device = CLV62x-x8xxx (Ethernet variant)

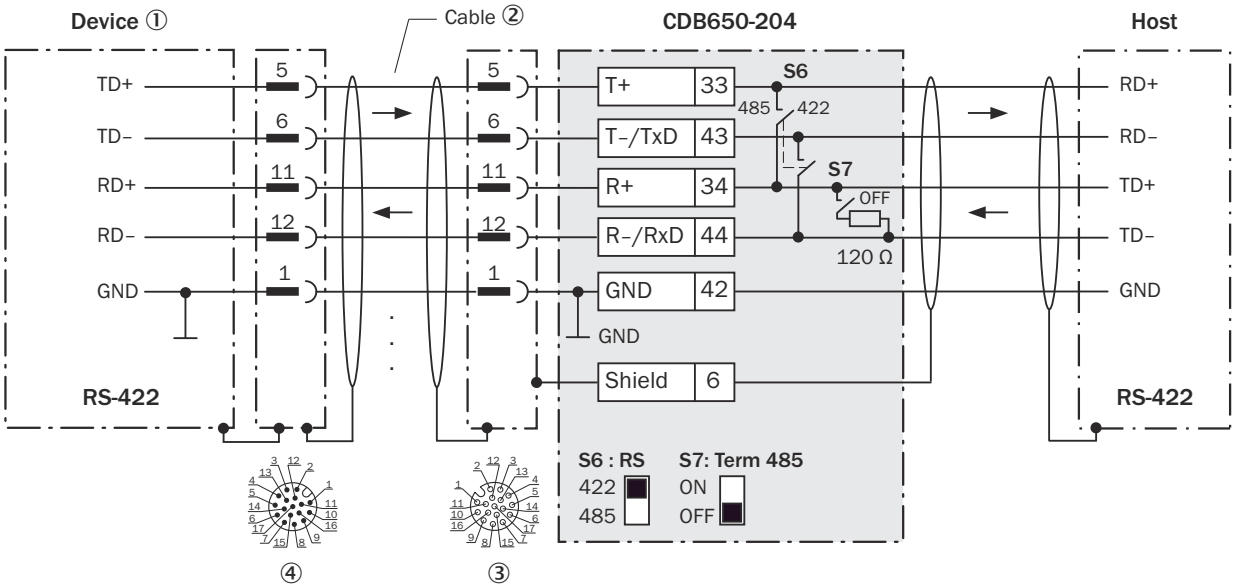

Figure 85: Wiring data interface RS-422 of the device in the connection module CDB650-204

① Device
② Connection cable 1:1 with female connector, M12, 17-pin, A-coded and 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

Function of switch S7

Table 45: Switch S7: Term 485

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

NOTE
User of the RS-422 data interface:

- The relevant interface drivers for the device comply with the standard in accordance with RS-422 and RS-485.
- The connection shown above is configured for operation of the host with permanently activated drivers (often described as “RS-422 operation”), i.e. not RS-485 operation.
- Activate the RS-422 data interface (“Point-to-Point” option) in the device using a configuration software, e.g., SOPAS ET.

14.6.6 Wiring serial host interface RS-485 of the device in CDB650-204

Device = CLV62x-x8xxx (Ethernet variant)

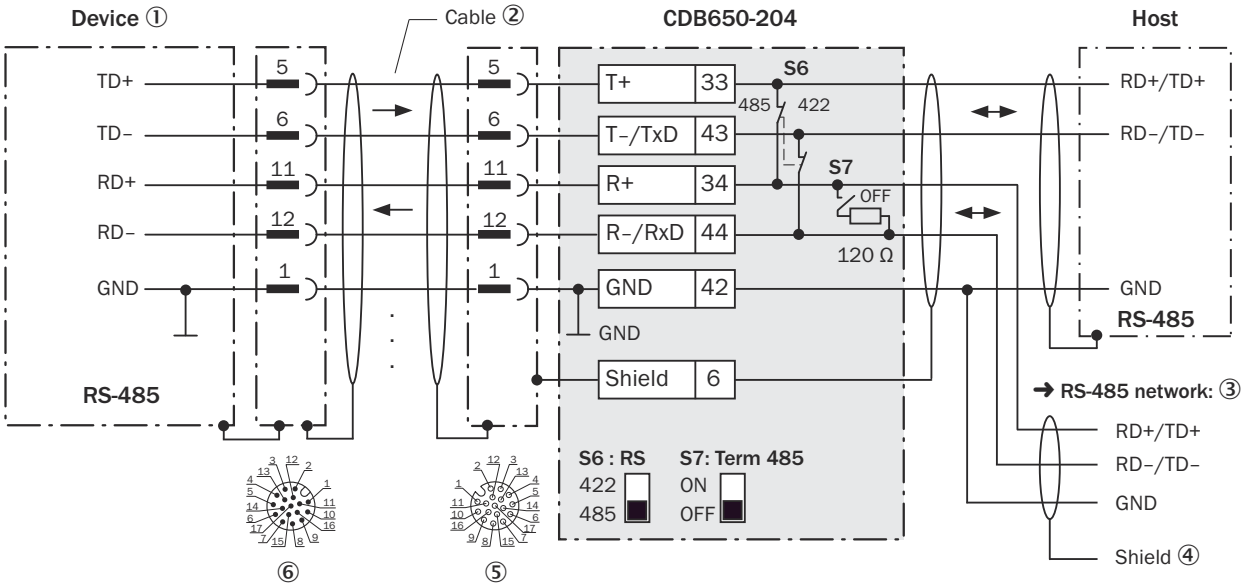

Figure 86: Wiring data interface RS-485 of the device in connection module CDB650-204.

① Device
② Connection cable 1:1 (female connector, M12, 17-pin, A-coded / male connector, M12, 17-pin, A-coded)
③ RS-485 network
④ Shielding
⑤ Connection module: female connector, M12, 17-pin, A-coded
⑥ Device: male connector, M12, 17-pin, A-coded

Function of switch S7

Table 46: Switch S7: Term 485

Switch setting	Function
ON	Terminates the device. Required if the device is located at the end of the RS-485 bus cable.
OFF	No termination

NOTE

User of the RS-485 data interface:

- The relevant interface drivers for the device comply with the standard in accordance with RS-422 and RS-485.
- This operating mode is only permitted if all connected devices use a corresponding RS-485 protocol.
- This configuration is not permitted when using the standard data output and protocol of the device. In case of doubt, contact SICK Service.
- Activate the RS-485 data interface (“Bus” option) in the device using a configuration software, e.g., SOPAS ET.

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

Device = CLV62x-x8xxx (Ethernet variant)

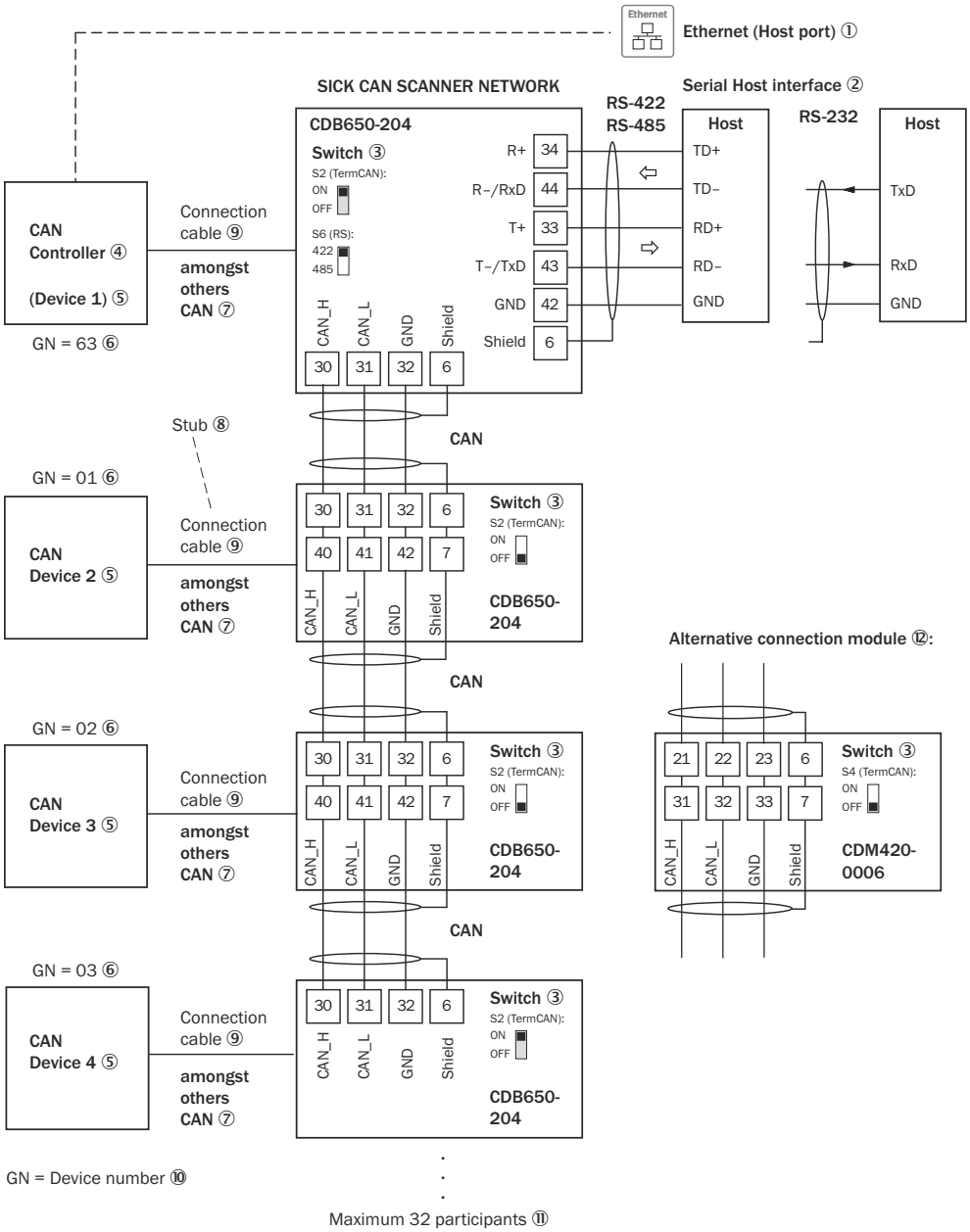

Figure 87: Wire the CAN interface of the device in the CDB650-204 connection module. Connection and looping through of the supply voltage and connection of a trigger sensor for read cycle generation at the CAN controller, for example, are disregarded here.

① Ethernet (host port): CLV62x-x8xxx (Ethernet variant) only
② Serial host interface
③ Switch
④ CAN controller
⑤ CAN device
⑥ Device number
⑦ CAN etc.
⑧ Branch line
⑨ CLV62x-x8xxx (Ethernet variant): connection cable 1:1 with female connector, M12, 17-pin, A-coded and male connector, M12, 17-pin, A-coded
⑩ Device number (GN)
⑪ Maximum 32 users
⑫ Example of alternative connection module

Alternative connection module for CLV62x-x8xxx (Ethernet variant): CDB620, CDM420-0001 or CDM420-0006

An adapter cable with female connector, M12, 17-pin, A-coded and male connector, D-Sub-HD, 15-pin is required to connect the CLV62x-x8xxx (Ethernet variant).

NOTE

Activate the CAN data interface in the device using a configuration software, e.g., SOPAS ET.

Configure further settings in the device according to the function of the device in the system configuration.

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

Device = CLV62x-x8xxx (Ethernet variant)

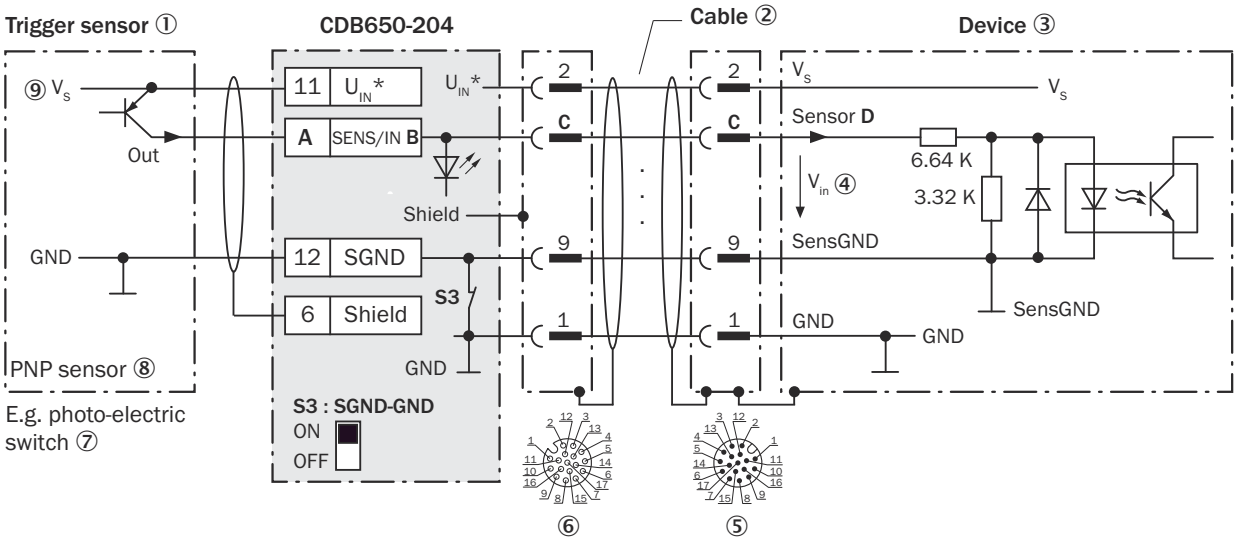

Figure 88: Trigger sensor supplied with power by connection module CDB650-204

① Trigger sensor, e.g. for read cycle generation
② Connection cable 1:1 with female connector, M12, 17-pin, A-coded and 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

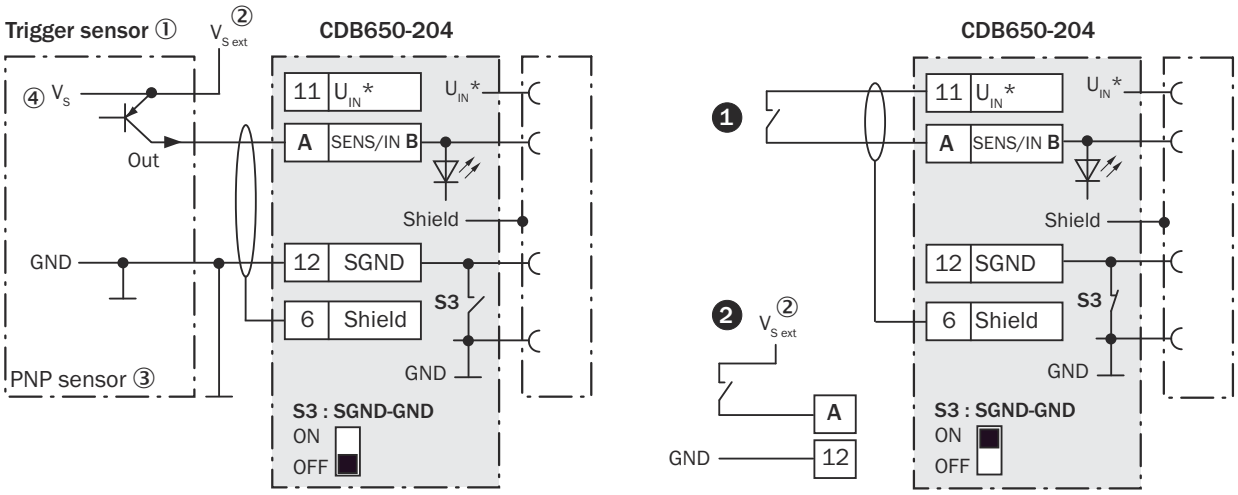

Figure 89: Left: Trigger sensor connected potential-free and supplied with power externally. Right: Alternatively switch, ❶ supplied with power by connection module CDB650-204 or ❷ connected potential-free and supplied with power externally. Now select switch setting S3 as shown in the left figure.

① Trigger sensor, e.g., for read cycle generation
② External supply voltage $V_{S\ ext}$
③ PNP sensor
④ Supply voltage V_S

Table 47: Assignment of placeholders to the digital inputs

CDB650-204			Device
Terminal A	**Signal B**	**Pin C**	**Sensor D**
10	SENS/IN 1	10	1
13	SENS/IN 2	15	2

Function of switch S3

Table 48: Switch S3: SGND-GND

Switch setting	Function
ON	GND of the trigger sensor is connected with GND of CDB650-204 and GND of the device
OFF	Trigger sensor is connected volt-free at CDB650-204 and the device. Common, isolated reference potential of all digital inputs is SGND.

Characteristic data of the digital inputs

Table 49: 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 read cycle. Default setting in the device: logic not inverted (active high), debounce time 10 ms
Properties	• Opto-decoupled, reverse polarity protected • Can be wired with PNP output of a trigger sensor
Electrical values	Low: V_{in} [1] ≤ 2 V; I_{in} [2] ≤ 0.3 mA High: 6 V ≤ V_{in} ≤ 30 V; 0.7 mA ≤ I_{in} ≤ 5 mA

1) Input voltage.
2) Input current.

NOTE
Assign the functions for the digital inputs in the device using a configuration software, e.g., SOPAS ET.

14.6.9 Wiring the external digital inputs of the device in the CDB650-204

Device = CLV62x-x8xxx (Ethernet variant)

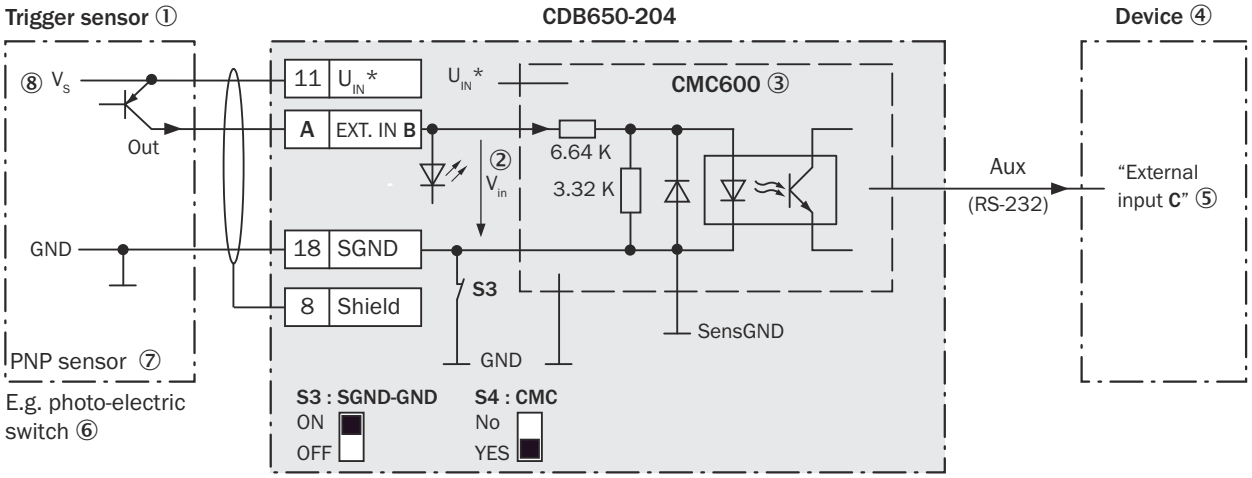

Figure 90: Trigger sensor supplied with power by connection module CDB650-204

① Trigger sensor, e.g. for read cycle generation
② Input voltage V_{in}
③ The optional CMC600 parameter cloning module is required in the connection module in order to use the additional external digital inputs and digital outputs of the device.
④ Device
⑤ Logical "External input" in the device
⑥ E.g. photoelectric sensor
⑦ PNP sensor
⑧ Supply voltage V_S

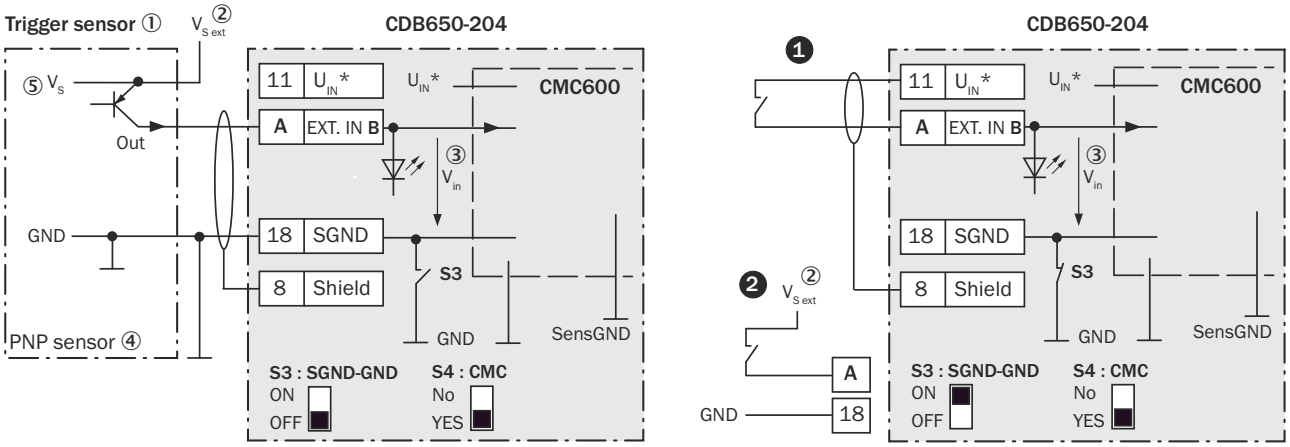

Figure 91: Left: Trigger sensor connected potential-free and supplied with power externally. Right: Alternatively switch, ❶ supplied with power by connection module CDB650-204 or ❷ connected potential-free and supplied with power externally. Switch setting S3 then as in left figure.

① Trigger sensor, e.g. for read cycle generation
② External supply voltage $V_{S\ ext}$
③ Input voltage V_{in}
④ PNP sensor
⑤ Supply voltage V_S

Table 50: Assignment of placeholders to the external digital inputs

CDB650-204 (physical inputs)		Device (logical inputs)
Terminal A	**Signal B**	**External input C**
16	EXT. IN 1	1
17	EXT. IN 2	2

Function of switch S3

Table 51: Switch S3: SGND - GND

Switch setting	Function
ON	GND of the trigger sensor connected with GND of CDB650-204 and CMC600
OFF	Trigger sensor connected volt-free at CDB650-204 and CMC600 Common, isolated reference potential of all digital inputs is SGND.

Functional principle of the external digital inputs

The optional CMC600 parameter cloning module in combination with the CDB or CDM connection module offers two additional physical digital inputs for the device. The inputs are available at the respective terminals of the connection module. To distinguish them from the physical digital inputs directly on the device, these addition inputs via the CMC600 are designated as “external inputs”.

Characteristic data of the digital inputs

Table 52: Characteristic data of the digital inputs “External input 1” and “External input 2”

Type	Switching
Switching behavior	Power to the input starts the assigned function, e.g. start read cycle. Default setting in the device: logic not inverted (active high), debounce time 10 ms

Properties	• Opto-decoupled, reverse polarity protected • Can be wired with PNP output of a trigger sensor
Electrical values	Low: V_{in} [1] ≤ 2 V; I_{in} [2] ≤ 0.3 mA High: 6 V ≤ V_{in} ≤ 30 V; 0.7 mA ≤ I_{in} ≤ 5 mA

1) Input voltage.
2) Input current.

NOTE
Assign the functions for the external digital inputs in the device using a configuration software, e.g., SOPAS ET.

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

Device = CLV62x-x8xxx (Ethernet variant)

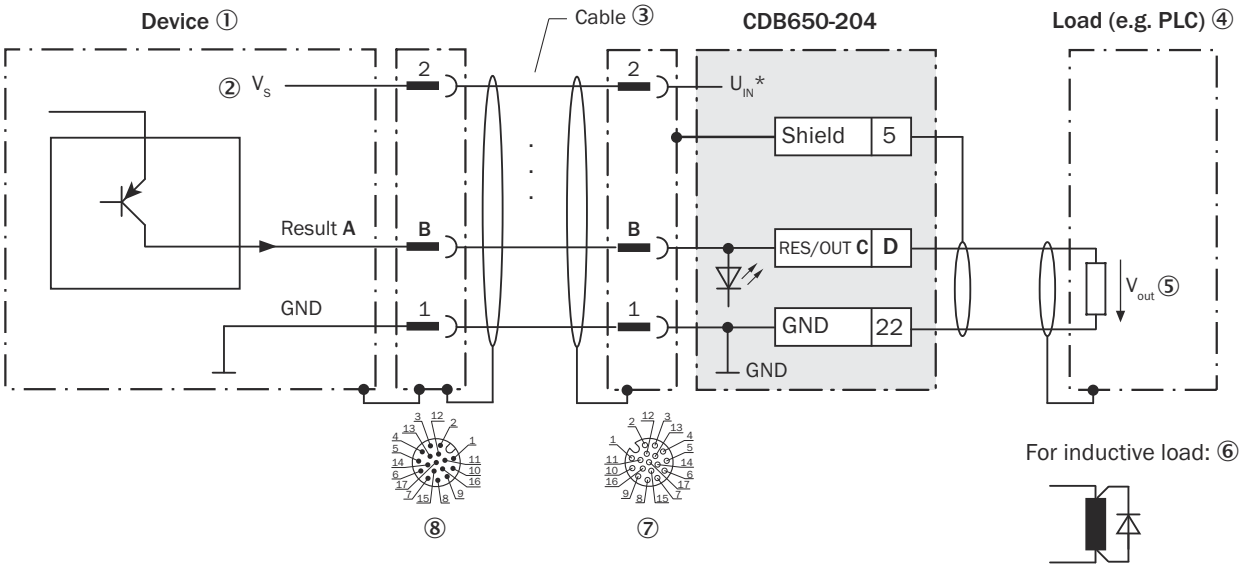

Figure 92: Wiring the digital outputs "Result 1" and "Result 2" of the device in the connection module CDB650-204

① Device
② Supply voltage V_S
③ Connection cable 1:1 with female connector, M12, 17-pin, A-coded and 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

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 53: Assignment of placeholders to the digital outputs

Device		CDB650-204	
Output A	**Pin B**	**Signal C**	**Terminal D**
Result 1	13	RES/OUT 1	20
Result 2	14	RES/OUT 2	21

Characteristic data of the digital outputs

Table 54: Characteristic data of the digital outputs "Result 1" and "Result 2"

Type	Switching
Switching behavior	PNP switching to supply voltage V_S Default settings in the device: no function, logic: not inverted (active high)
Properties	• Short-circuit protected and temperature protected • Not electrically isolated from the supply voltage V_S
Electrical values	$0\ V \leq V_{out}$ [1] $\leq V_S$ $(V_S - 1.5\ V) \leq V_{out} \leq V_S$ at I_{out} [2] $\leq 100\ mA$

1) Output voltage.
2) Output current.

NOTE
Allocate the functions for the digital outputs in the device using a configuration software, e.g., SOPAS ET.

14.6.11 Wiring the external digital outputs of the device in the CDB650-204

Device = CLV62x-x8xxx (Ethernet variant)

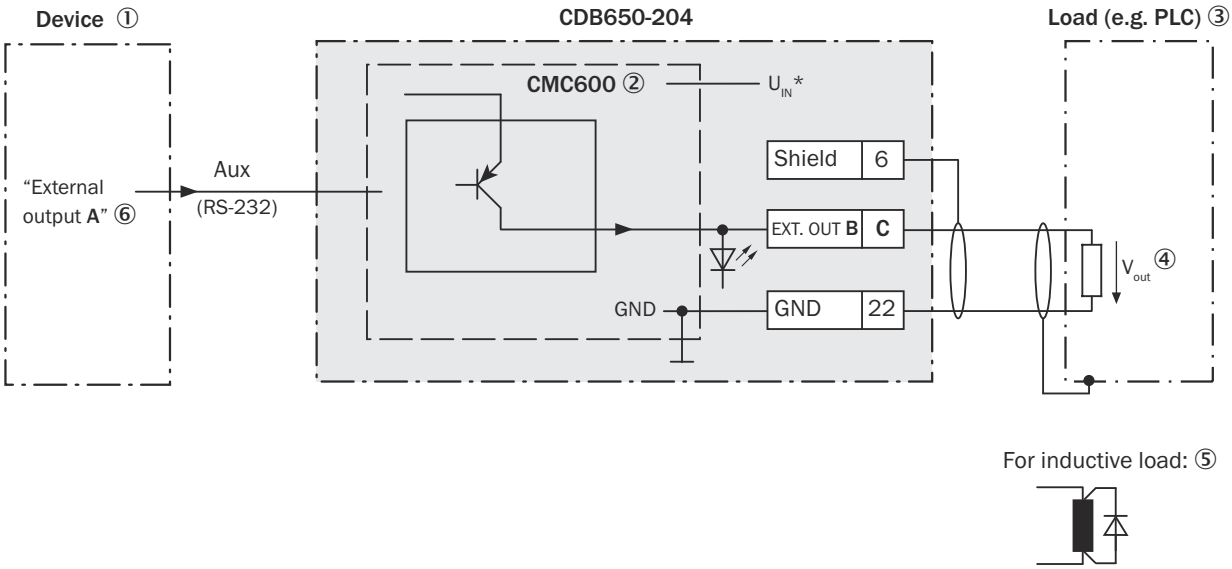

Figure 93: Wiring external "External output 1" and "External output 2" digital outputs of the device in the CDB650-204 connection module.

① Device
② The optional CMC600 parameter cloning module is required in the connection module in order to use the additional external digital inputs and digital outputs of the device.
③ Load (e.g. PLC)
④ Output voltage V_{out}
⑤ With inductive load: see note
⑥ Logical “External output” in the device

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 55: Assignment of placeholders to the digital outputs

Device (logical output)	CDB650-204 (physical output)	
External output A	**Signal B**	**Terminal C**
1	EXT. OUT 1	23
2	EXT. OUT 2	24

Functional principle of the external digital outputs

The optional CMC600 parameter cloning module in combination with the CDB or CDM connection module offers two additional digital outputs for the device. The outputs are available at the respective terminals of the connection module. To distinguish them from the physical digital outputs directly on the device, these addition outputs via the CMC600 are designated as “external outputs”.

NOTE
The device transmits the statuses of its logical outputs to the CMC600 via its serial data interface. The CMC600 converts the statuses into switching signals on its physical digital outputs.

The digital outputs are not suitable for time-critical applications.

Characteristic data of the digital outputs

Table 56: Characteristic data of the digital outputs “External output 1” and “External output 2”

Type	Switching
Switching behavior	PNP switching to supply voltage V_S Default settings in the device: no function, logic: not inverted (active high)
Properties	• Short-circuit protected and temperature protected • Not electrically isolated from the supply voltage V_S
Electrical values	$0\ V \leq V_{out}$ [1] $\leq V_S$ $(V_S - 1.5\ V) \leq V_{out} \leq V_S$ at I_{out} [2] $\leq 100\ mA$

1) Output voltage.
2) Output current.

NOTE
Assign the functions for the external digital outputs in the device using a configuration software, e.g., SOPAS ET.

14.7 Connection diagrams of connection module CDM420-0001

14.7.1 Connection of the device to CDM420-0001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

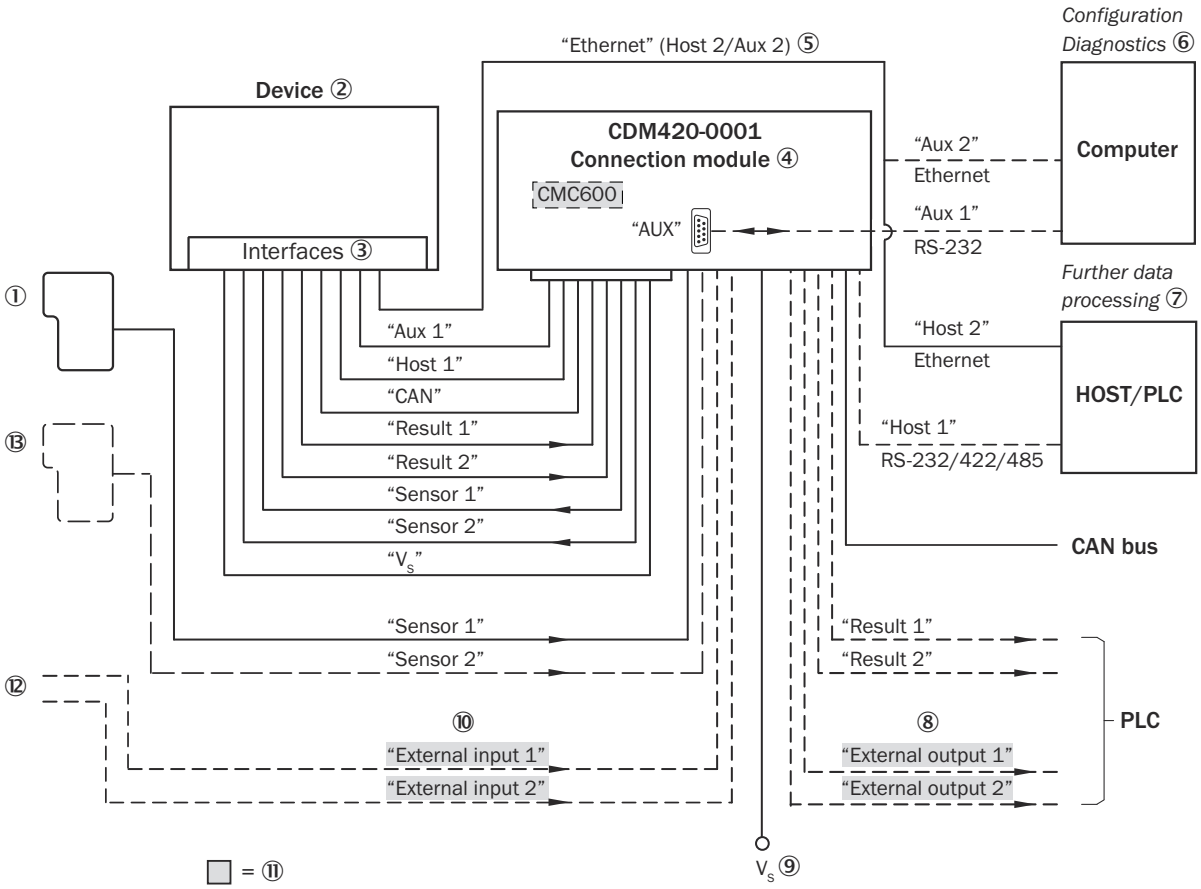

Figure 94: Connection of the device to peripherals via CDM420-0001 (overview)

① External trigger sensor, e.g. for read cycle generation
② Device
③ Interfaces
④ Connection module
⑤ Ethernet: not supported for CLV62x-x0xxx (serial variant).
⑥ Configuration or diagnostics
⑦ Data further processing
⑧ External digital outputs
⑨ Supply voltage V_S
⑩ External digital inputs
⑪ The optional CMC600 parameter cloning module is required in the connection module in order to use the additional external digital inputs and outputs of the device (highlighted in gray).
⑫ Other functions
⑬ Application-dependent alternative stop reading cycle (e.g. photoelectric sensor) or travel increment (incremental encoder)

14.7.2 Wiring overview of the CDM420-0001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8), 1 digital input used

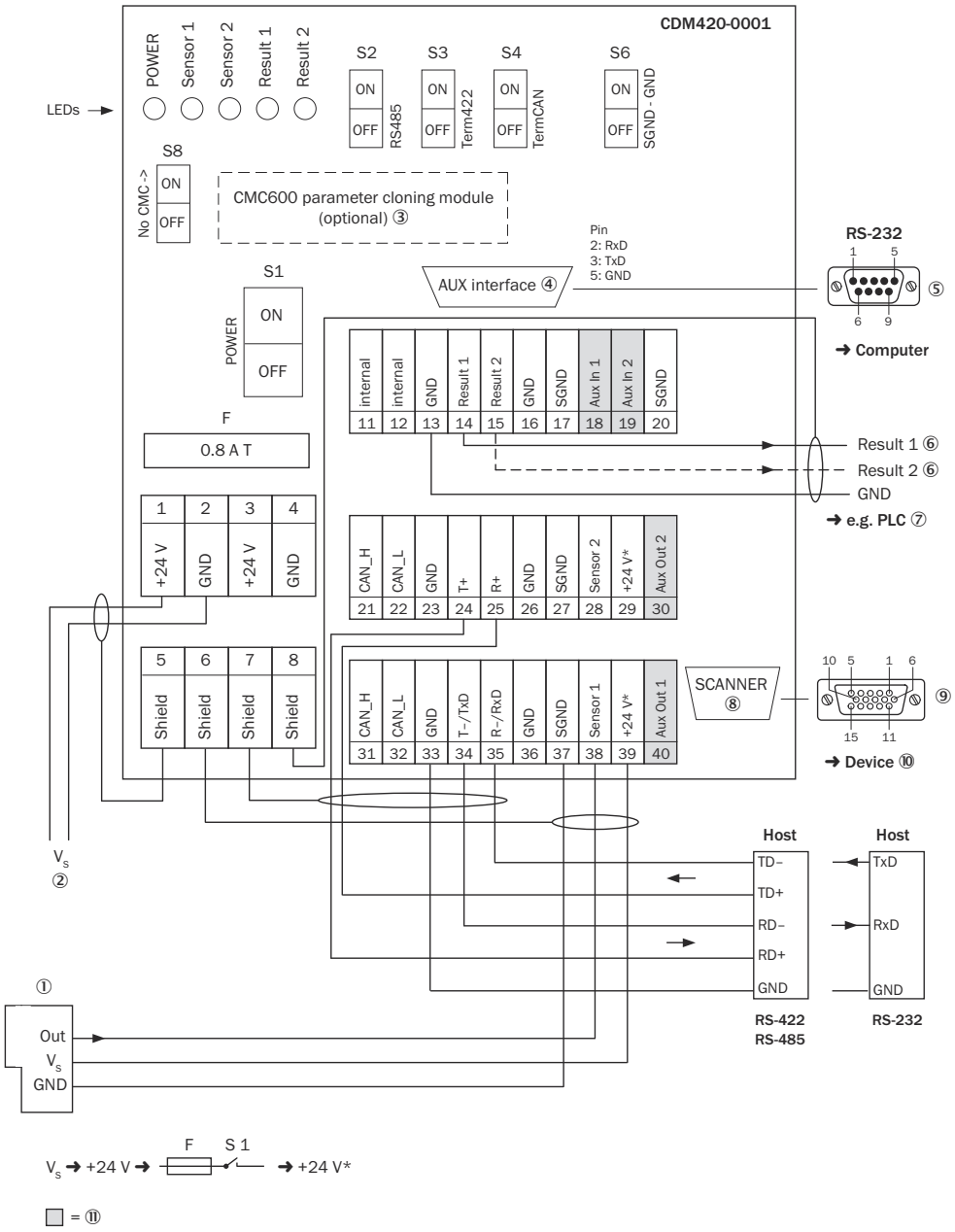

Figure 95: Overview: connection of device (without heating) and peripherals to the CDM420-0001 connection module

① External trigger sensor, e.g. for read cycle generation
② Supply voltage V_S
③ CMC600 parameter cloning module (optional)
④ Auxiliary interface “AUX”
⑤ Male connector, D-Sub, 9-pin
⑥ Name of the digital output
⑦ e.g. PLC (programmable logic controller)
⑧ SCANNER = Device
⑨ Female connector, D-Sub-HD, 15-pin
⑩ Device to be connected
⑪ The optional CMC600 parameter cloning module is required in the connection module in order to use the additional external digital inputs and outputs of the device (highlighted in gray).

14.7.3 Connecting supply voltage for the device in CDM420-0001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

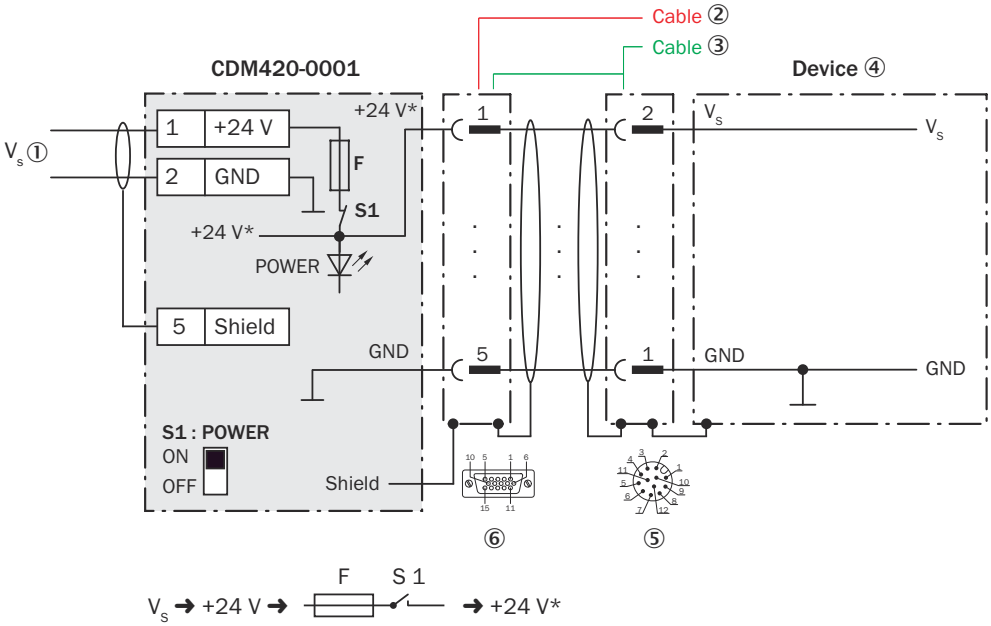

Figure 96: Connecting supply voltage for the device in the CDM420-0001 connection module, Ethernet variant with male connector, M12, 12-pin, A-coded

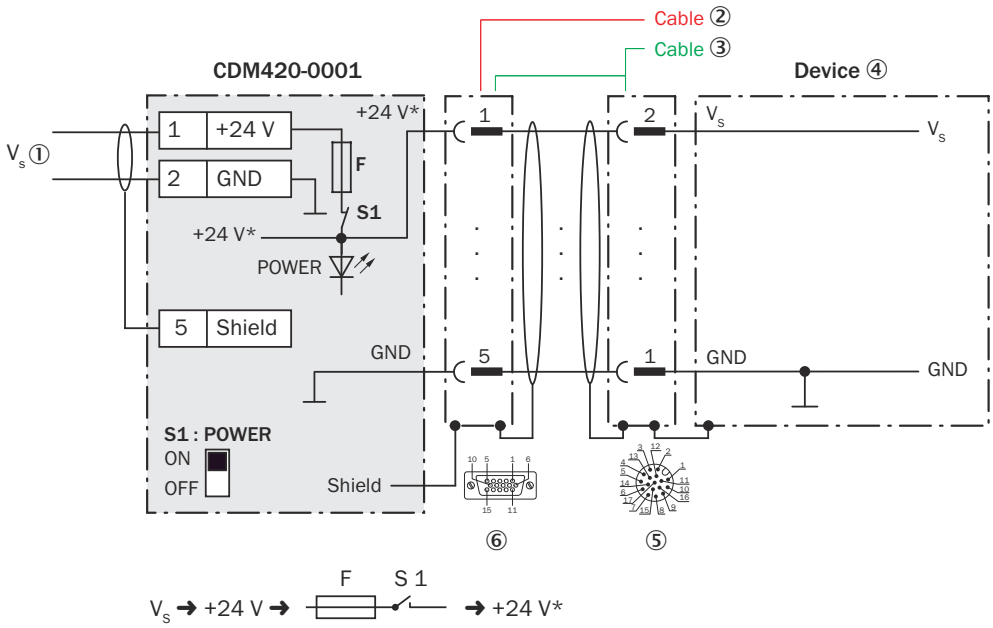

Figure 97: Connecting supply voltage for the device in the CDM420-0001 connection module, Ethernet variant with male connector, M12, 17-pin, A-coded

① Supply voltage V_S

② CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)

③ CLV62x-x1xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 12-pin, A-coded)

CLV62x-x8xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 17-pin, A-coded)

④ Device

⑤ CLV62x-x1xx (Ethernet variant): male connector, M12, 12-pin, A-coded

CLV62x-x8xx (Ethernet variant): male connector, M12, 17-pin, A-coded

⑥ Connection module: female connector, D-Sub-HD, 15-pin

Function of switch S1

Table 57: Switch S1: Power

Switch setting	Function
ON	Supply voltage +24 V connected to CDM420-0001 and device via fuse and switch S1 as supply voltage +24 V* Supply voltage +24 V* can be additionally tapped at terminals 29 and 39
OFF	CDM420-0001 and device disconnected from supply voltage Recommended setting for all connection work

14.7.4 Wiring serial host interface RS-232 of the device in the CDM420-0001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

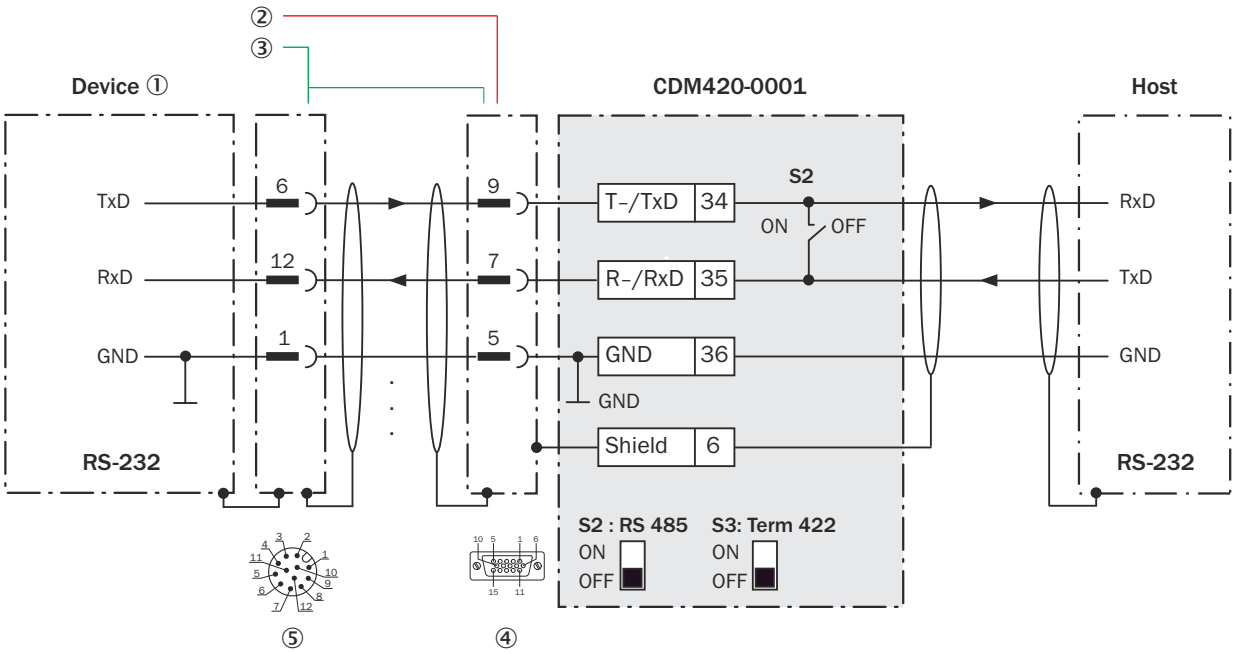

Figure 98: Wiring data interface RS-232 of the device in the CDM420-0001 connection module, Ethernet variant with male connector, M12, 12-pin, A-coded

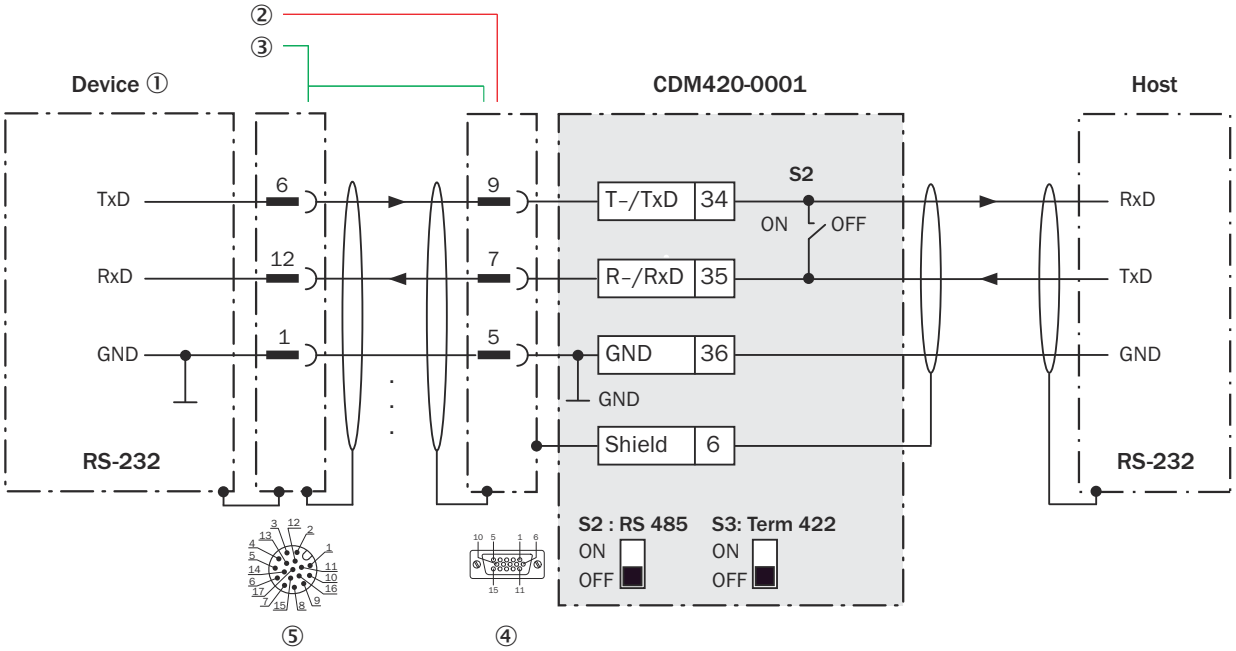

Figure 99: Wiring data interface RS-232 of the device in the CDM420-0001 connection module, Ethernet variant with male connector, M12, 17-pin, A-coded

① Device

② CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)

③ CLV62x-x1xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 12-pin, A-coded)

CLV62x-x8xx (Ethernet variant): 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 CLV62x-x1xx (Ethernet variant): male connector, M12, 12-pin, A-coded

CLV62x-x8xx (Ethernet variant): male connector, M12, 17-pin, A-coded

NOTE

Activate the RS-232 data interface in the device using a configuration software, e.g., SOPAS ET.

14.7.5 Wiring serial host interface RS-422 of the device in the CDM420-0001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

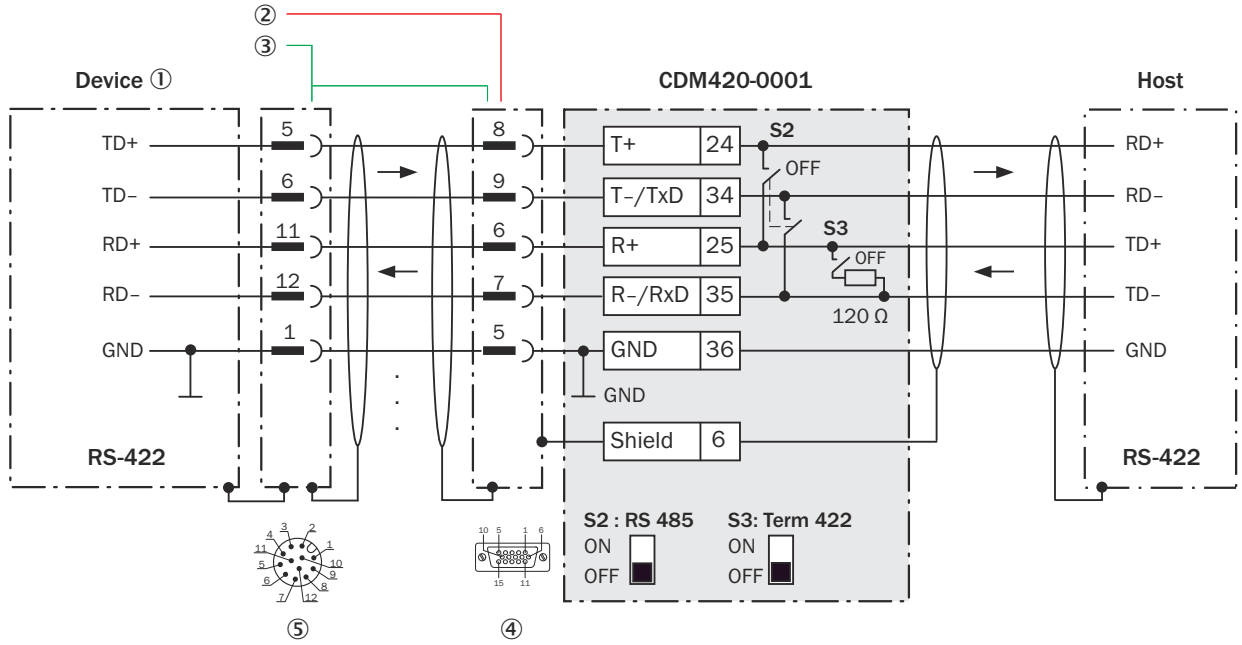

Figure 100: Wiring data interface RS-422 of the device in the CDM420-0001 connection module, Ethernet variant with male connector, M12, 12-pin, A-coded

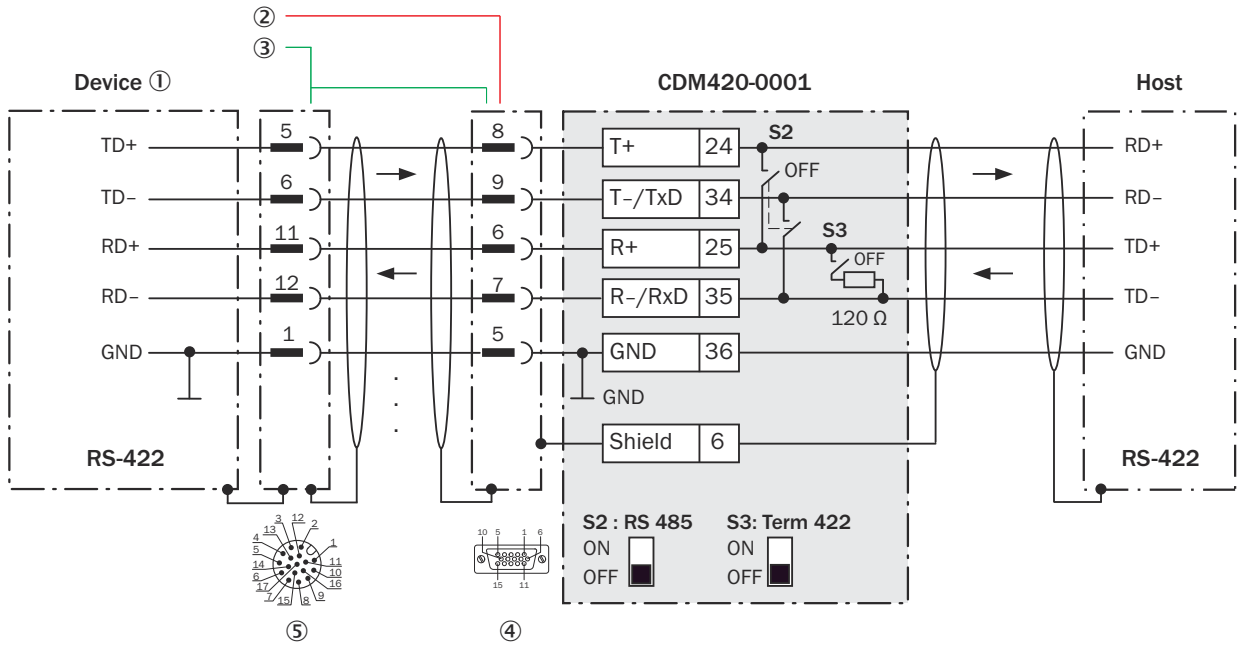

Figure 101: Wiring data interface RS-422 of the device in the CDM420-0001 connection module, Ethernet variant with male connector, M12, 17-pin, A-coded

① Device

② CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)

③ CLV62x-x1xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 12-pin, A-coded)

CLV62x-x8xx (Ethernet variant): 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 CLV62x-x1xx (Ethernet variant): male connector, M12, 12-pin, A-coded

CLV62x-x8xx (Ethernet variant): male connector, M12, 17-pin, A-coded

Function of switch S3

Table 58: 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

Activate the RS-422 data interface (“Point-to-Point” option) in the device using a configuration software, e.g., SOPAS ET.

The following requirements or 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 and RS-485.
- The connection shown above is configured for operation of the host with permanently activated drivers (often described as “RS-422 operation”), i.e. not RS-485 operation.

14.7.6 Wiring serial host interface RS-485 of the device in the CDM420-0001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

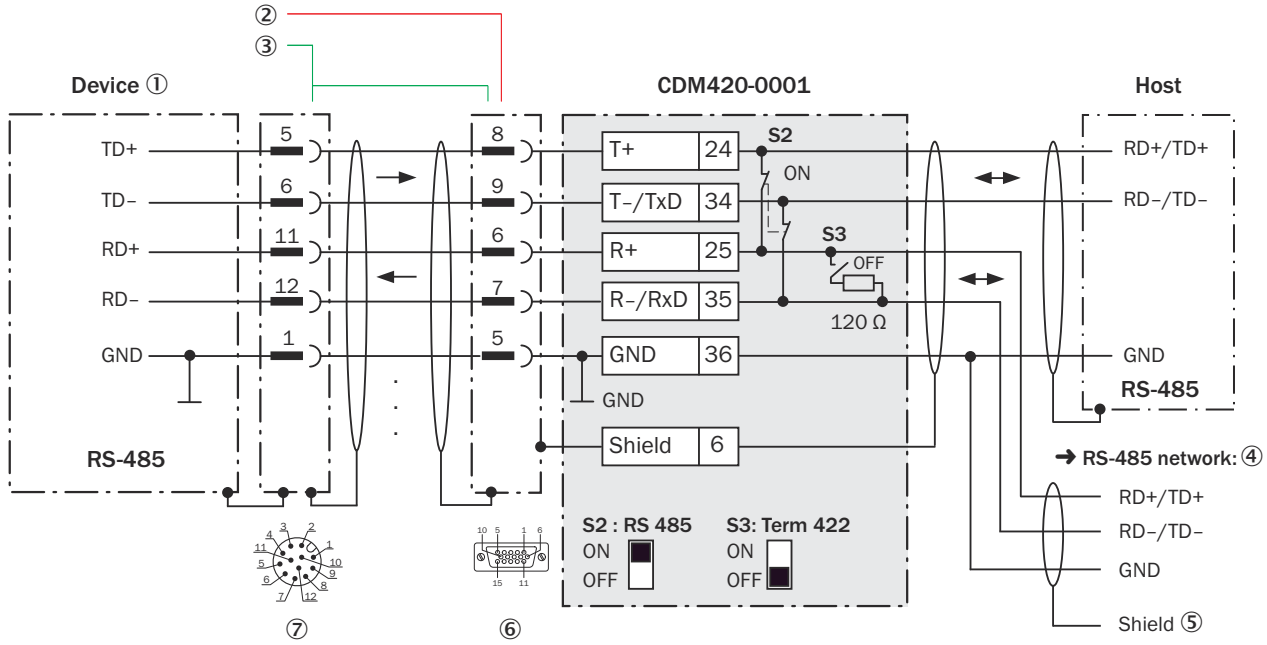

Figure 102: Wiring data interface RS-485 of the device in the CDM420-0001 connection module, Ethernet variant with male connector, M12, 12-pin, A-coded

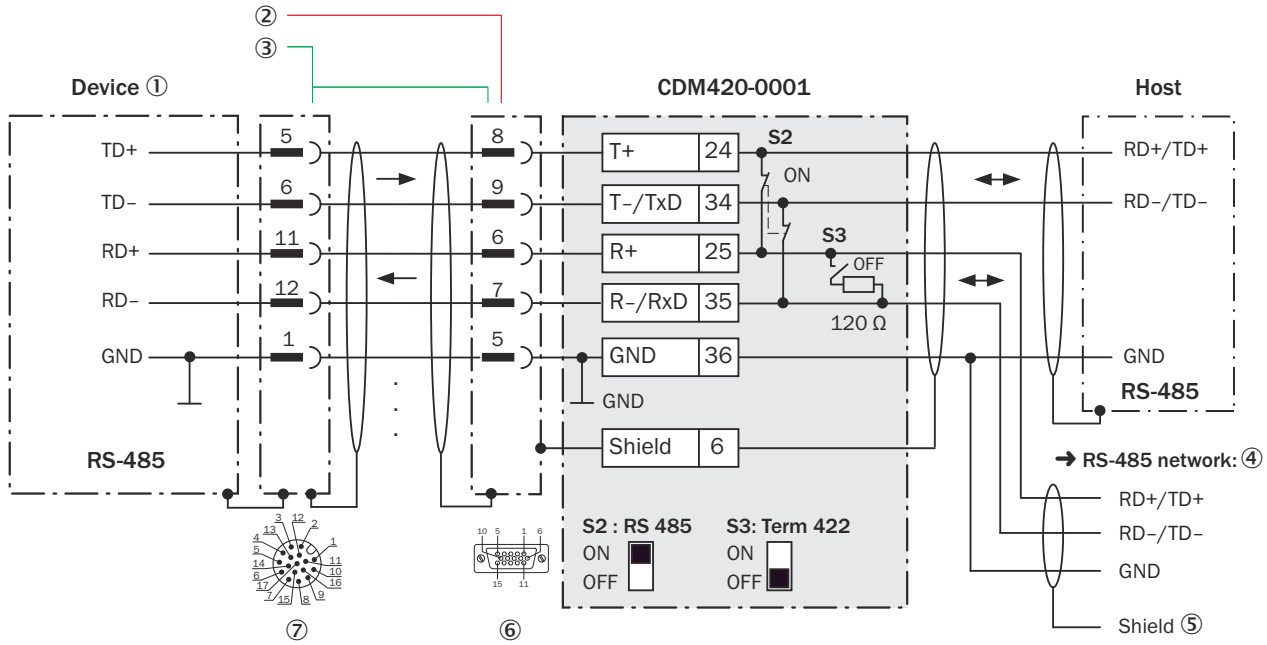

Figure 103: Wiring the RS-485 data interface of the device in the CDM420-0001 connection module, Ethernet variant with male connector, M12, 17-pin, A-coded

① Device
② CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
③ CLV62x-x1xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 12-pin, A-coded)

CLV62x-x8xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 17-pin, A-coded)

④ RS-485 network
⑤ Shielding
⑥ Connection module: female connector, D-Sub-HD, 15-pin
⑦ CLV62x-x1xx (Ethernet variant): male connector, M12, 12-pin, A-coded

CLV62x-x8xx (Ethernet variant): male connector, M12, 17-pin, A-coded

Function of switch S3

Table 59: Switch S3: Term 422

Switch setting	Function
ON	Terminates the device. Required if the device is located at the end of the RS-485 bus cable.
OFF	No termination

NOTE
Activate the RS-485 data interface (“Bus” option) in the device using a configuration software, e.g., SOPAS ET.

The following requirements or restrictions apply when using the RS-485 data interface:

- The relevant interface drivers for the device comply with the RS-422 and RS-485standard.
- This operating mode is only permitted if all connected devices use a corresponding RS-485 protocol.
- This configuration is not permitted when using the standard data output and protocol of the device. In case of doubt, contact SICK Service.

14.7.7 Wiring the CAN interface of the device in the CDM420-0001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

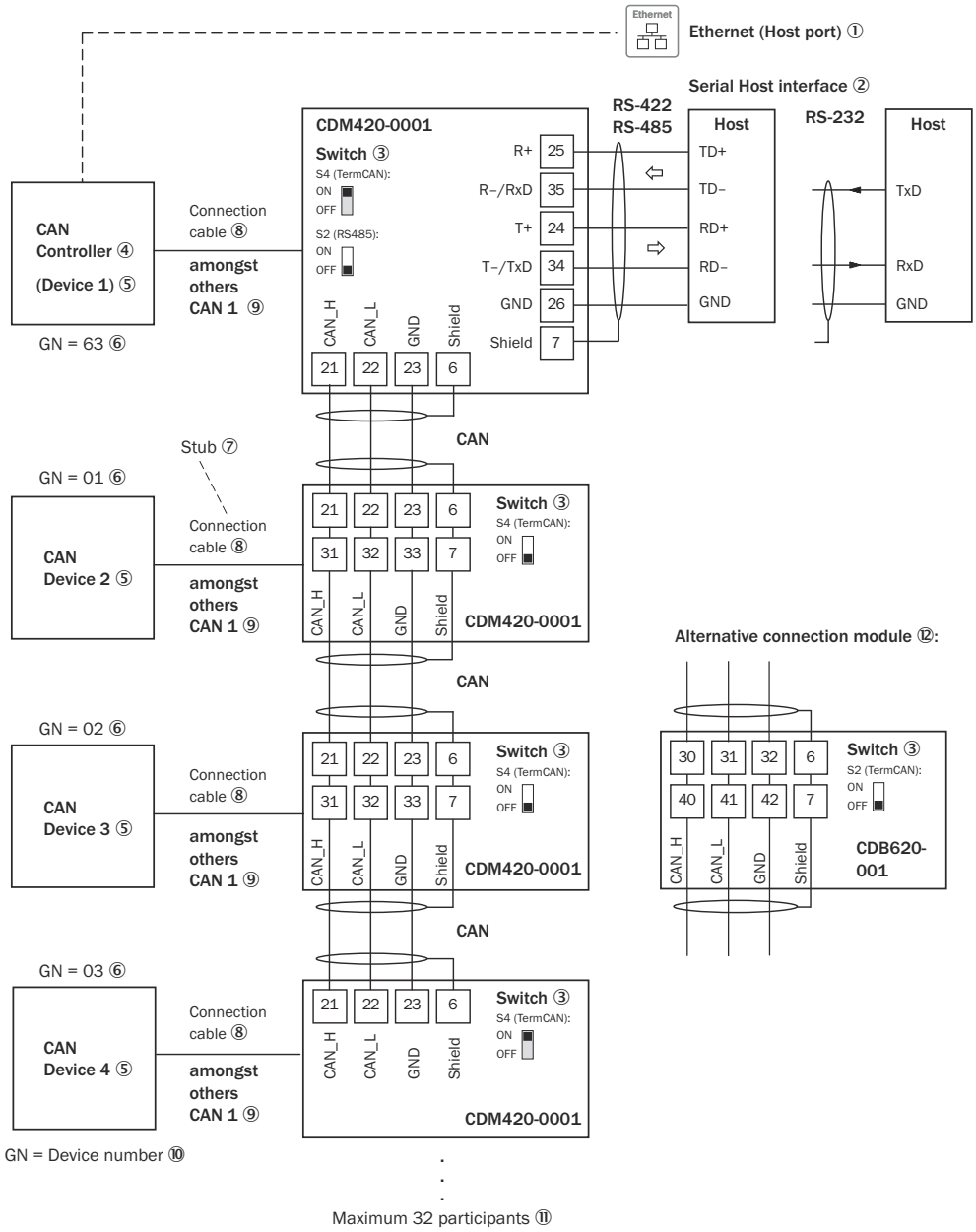

Figure 104: Wire the CAN interface of the device in the CDM420-0001 connection module. Connection and looping through of the supply voltage and connection of a trigger sensor for read cycle generation at the CAN controller, for example, are disregarded here.

① Ethernet (host port): CLV62x-xYxxx (Ethernet variant, Y = 1 or 8) only
② Serial host interface
③ Switch
④ CAN controller
⑤ CAN device
⑥ Device number
⑦ Branch line
⑧ CLV62x-x0xxx (serial variant): connecting cable permanently connected to the device with male connector, D-Sub-HD, 15-pin

CLV62x-xYxxx (Ethernet variant, Y = 1): adapter cable with female connector, M12, 12-pin, A-coded and male connector, D-Sub-HD, 15-pin

CLV62x-xYxxx (Ethernet variant, Y = 8): adapter cable with female connector, M12, 17-pin, A-coded and male connector, D-Sub-HD, 15-pin
⑨ CAN etc.
⑩ Device number (GN)
⑪ Maximum 32 users
⑫ Example of alternative connection module:

Alternative connection module for CLV62x-x0xxx (serial variant): CDB620 or CDM420-0006

Alternative connection module for CLV62x-xYxxx (Ethernet variant, Y = 1 or 8): CDB620 or CDM420-0006. CDB650-204 only for CLV62x-xYxxx (Ethernet variant, Y = 8)

CDB620 or CDM420-0006: An adapter cable with female connector, M12, 12-pin, A-coded and male connector, D-Sub-HD, 15-pin is required to connect the CLV62x-xYxxx (Ethernet variant, Y = 1).

CDB620 or CDM420-0006: an adapter cable with female connector, M12, 17-pin, A-coded and male connector, D-Sub-HD, 15-pin is required to connect the CLV62x-xYxxx (Ethernet variant, Y = 8).

CDB650-204: A connection cable 1:1 with female connector, M12, 17-pin, A-coded and male connector, M12, 17-pin, A-coded is required to connect the CLV62x-xYxxx (Ethernet variant, Y = 8).

NOTE

Activate the CAN data interface in the device using a configuration software, e.g., SOPAS ET.

Configure further settings in the device according to the function of the device in the system configuration.

14.7.8 Wiring digital inputs of the device in the CDM420-0001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

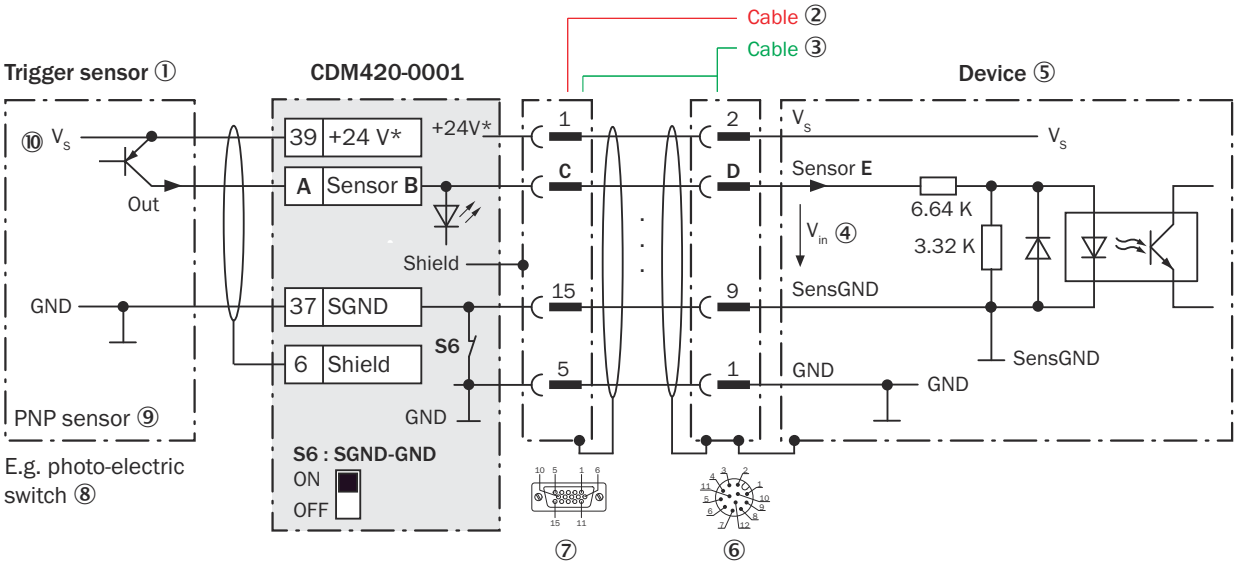

Figure 105: Trigger sensor supplied with power by connection module CDM420-0001, Ethernet variant with male connector, M12, 12-pin, A-coded

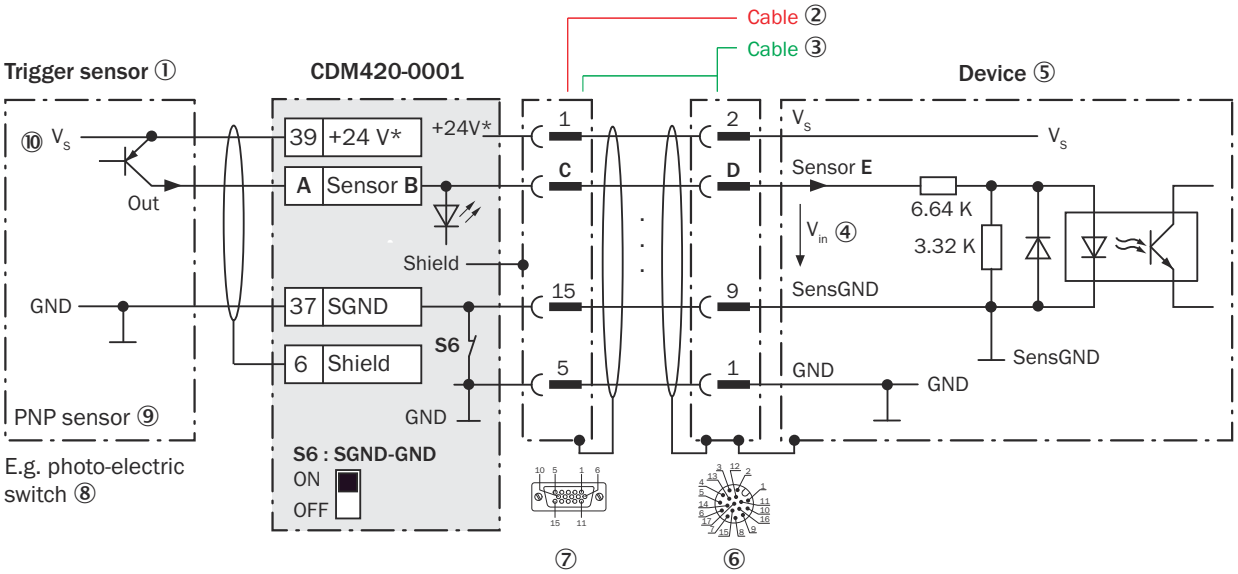

Figure 106: Trigger sensor supplied with power by connection module CDM420-0001, Ethernet variant with male connector, M12, 17-pin, A-coded

① Trigger sensor, e.g. for read cycle generation
② CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
③ CLV62x-x1xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 12-pin, A-coded)
CLV62x-x8xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 17-pin, A-coded)
④ Input voltage V_{in}
⑤ Device
⑥ CLV62x-x1xx (Ethernet variant): male connector, M12, 12-pin, A-coded
CLV62x-x8xx (Ethernet variant): 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

NOTE
Reduction of digital inputs due to limited number of contacts in the connector plug of the device

CLV62x-xYxxx (Ethernet variant, Y = 1) with male connector, M12, 12-pin, A-coded: The “Sensor 2” digital input is not available.

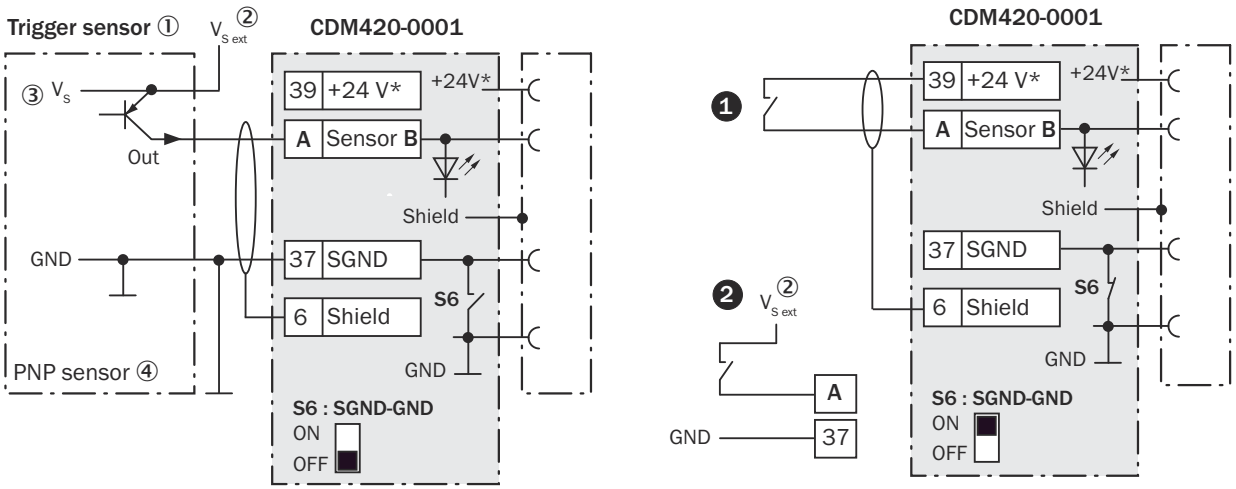

Figure 107: Left: Trigger sensor connected potential-free and supplied with power externally. Right: alternative switch, ❶ supplied with power by connection module CDM420-0001 or ❷ connected volt-free and supplied with power externally. Now select switch setting S6 as shown in the left figure.

① Trigger sensor, e.g. for read cycle generation
② External supply voltage $V_{S\ ext}$
③ PNP sensor
④ Supply voltage V_S

Table 60: Assignment of placeholders to the digital inputs

CDM420-0001			Device	
Terminal A	**Signal B**	**Pin C**	**Pin D**	**Sensor E**
38	Sensor 1	14	10	1
39	Sensor 2	4	15	2

Function of switch S6

Table 61: Switch S6: SGND - GND

Switch setting	Function
ON	GND of the trigger sensor is connected with GND of CDM420-0001 and GND of the device
OFF	Trigger sensor is connected volt-free at CDM420-0001 and the device. Common, isolated reference potential of all digital inputs is SGND.

Characteristic data of the digital inputs

Table 62: 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 read cycle. Default setting in the device: logic not inverted (active high), debounce time 10 ms
Properties	• Opto-decoupled, reverse polarity protected • Can be wired with PNP output of a trigger sensor
Electrical values	Low: V_{in} [1] ≤ 2 V; I_{in} [2] ≤ 0.3 mA High: 6 V ≤ V_{in} ≤ 30 V; 0.7 mA ≤ I_{in} ≤ 5 mA

1) Input Voltage
2) Input current

NOTE
Allocate the functions for the digital inputs in the device using a configuration software, e.g., SOPAS ET.

14.7.9 Wiring the external digital inputs of the device in the CDM420-0001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

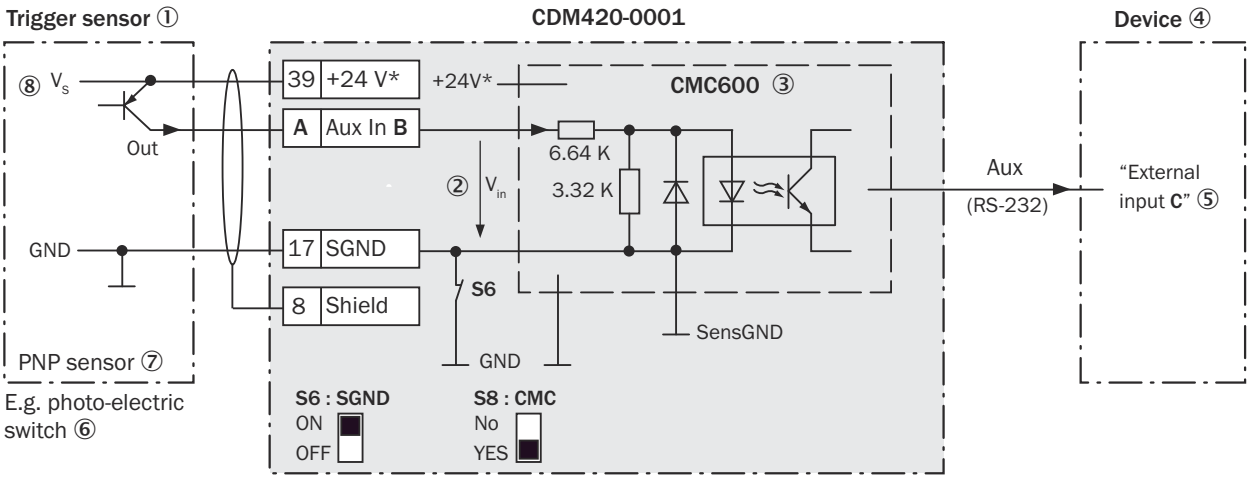

Figure 108: Trigger sensor supplied with power by connection module CDM420-0001

① Trigger sensor, e.g. for read cycle generation
② Input voltage V_{in}
③ The optional CMC600 parameter cloning module is required in the connection module in order to use the additional external digital inputs and outputs of the device.
④ Device
⑤ Logical “External input” in the device
⑥ e.g. photoelectric sensor
⑦ PNP sensor
⑧ Supply voltage V_S

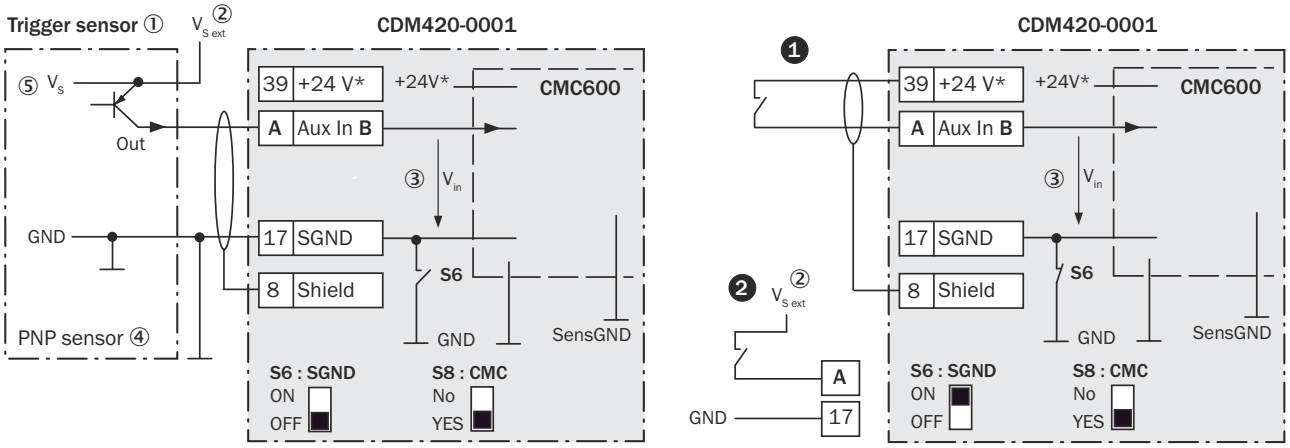

Figure 109: Left: Trigger sensor connected potential-free and supplied with power externally. Right: Alternatively switch, ❶ supplied with power by connection module CDM420-0001 or ❷ connected potential-free and supplied with power externally. Switch setting S3 then as in left figure.

① Trigger sensor, e.g. for read cycle generation
② External supply voltage $V_{S\ ext}$
③ Input voltage V_{in}
④ PNP sensor
⑤ Supply voltage V_S

Table 63: Assignment of placeholders to the digital inputs

CDM420-0001		Device
Terminal A	**Signal B**	**External input C**
18	Aux In 1	1
19	Aux In 2	2

Function of switch S6

Table 64: Switch S6: SGND - GND

Switch setting	Function
ON	GND of the trigger sensor connected with GND of CDM420-0001 and CMC600
OFF	Trigger sensor connected volt-free at CDM420-0001 and CMC600 Common, isolated reference potential of all digital inputs is SGND.

Functional principle of the external digital inputs

The optional CMC600 parameter cloning module in combination with the CDB or CDM connection module offers two additional physical digital inputs for the device. The inputs are available at the respective terminals of the connection module. To distinguish them from the physical digital inputs directly on the device, these addition inputs via the CMC600 are designated as “external inputs”.

NOTE

The CMC600 transmits the switching signals of the external digital inputs as statuses to the local inputs of the device via its serial data interface.

The digital inputs are not suitable for time-critical applications.

Characteristic data of the digital inputs

Table 65: Characteristic data of the digital inputs “External input 1” and “External input 2”

Type	Switching
Switching behavior	Power to the input starts the assigned function, e.g. start read cycle. Default setting in the device: logic not inverted (active high), debounce time 10 ms
Properties	• Opto-decoupled, reverse polarity protected • Can be wired with PNP output of a trigger sensor
Electrical values	Low: V_{in} [1] ≤ 2 V; I_{in} [2] ≤ 0.3 mA High: 6 V ≤ V_{in} ≤ 30 V; 0.7 mA ≤ I_{in} ≤ 5 mA

1) Input Voltage
2) Input current

NOTE

Allocate the functions for the digital inputs in the device using a configuration software, e.g., SOPAS ET.

14.7.10 Wiring digital outputs of the device in the CDM420-0001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

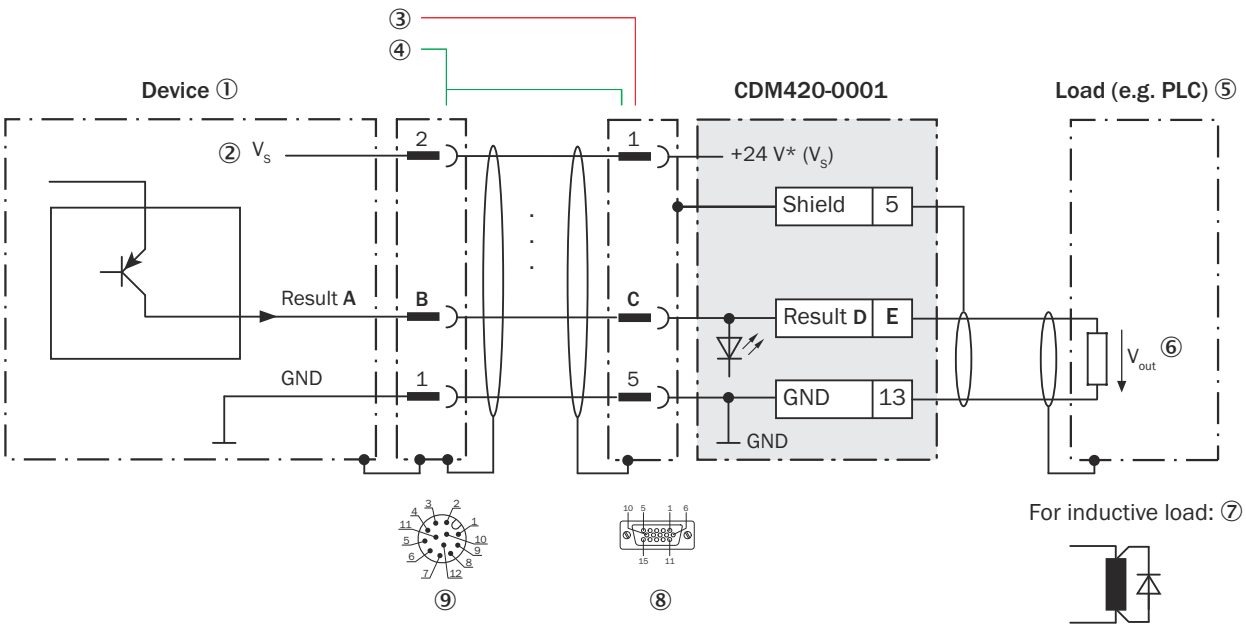

Figure 110: Wiring the digital outputs "Result 1" and "Result 2" of the device in the connection module CDM420-0001, Ethernet variant with male connector, M12, 12-pin, A-coded

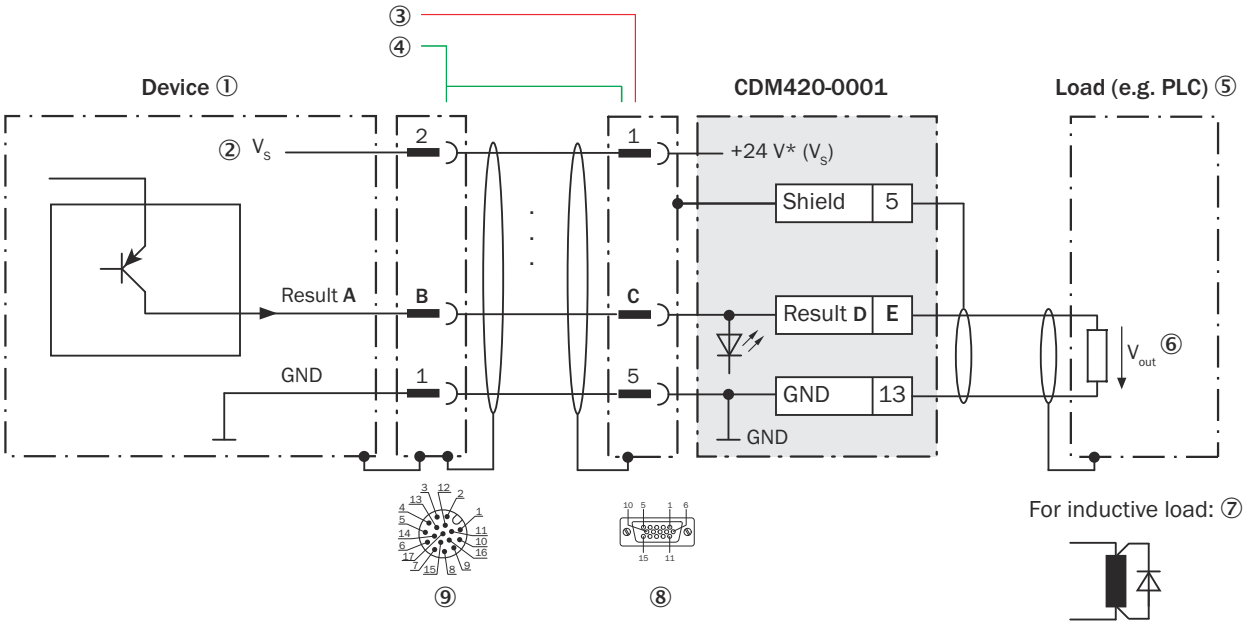

Figure 111: Wiring the "Result 1" and "Result 2" digital outputs of the device in the connection module CDM420-0001, Ethernet variant with male connector, M12, 17-pin, A-coded.

① Device
② Supply voltage V_S
③ CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
④ CLV62x-x1xxx (Ethernet variant): adapter cable (female connector, M12, 12-pin, A-coded / male connector, D-Sub-HD, 15-pin)

CLV62x-x8xxx (Ethernet variant): 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 CLV62x-x1xxx (Ethernet variant): male connector, M12, 12-pin, A-coded

CLV62x-x8xxx (Ethernet variant): male connector, M12, 17-pin, A-coded

NOTE
Digital output are omitted due to limited number of contacts in the connector plug of the device.

CLV62x-xYxxx (Ethernet variant, Y =1) with male connector, M12, 12-pin, A-coded: The two “Result 1” and “Result 2” digital outputs are not available.

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 66: Assignment of placeholders to the digital outputs

Device		CDM420-0001		
Output A	**Pin B**	**Pin C**	**Signal D**	**Terminal E**
Result 1	13	12	Result 1	14
Result 2	14	13	Result 2	15

Characteristic data of the digital outputs

Table 67: Characteristic data of the digital outputs “Result 1” and “Result 2”

Type	Switching
Switching behavior	PNP switching to supply voltage V_S Default settings in the device: no function, logic: not inverted (active high)
Properties	• Short-circuit protected and temperature protected • Not electrically isolated from the supply voltage V_S
Electrical values	$0\ V \le V_{out}$ [1] $\le V_S$ $(V_S - 1.5\ V) \le V_{out} \le V_S$ at I_{out} [2] $\le 100\ mA$

1) Output voltage
2) Output current

NOTE
Allocate the functions for the digital outputs in the device using a configuration software, e.g., SOPAS ET.

14.7.11 Wiring the external digital outputs of the device in the CDM420-0001

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

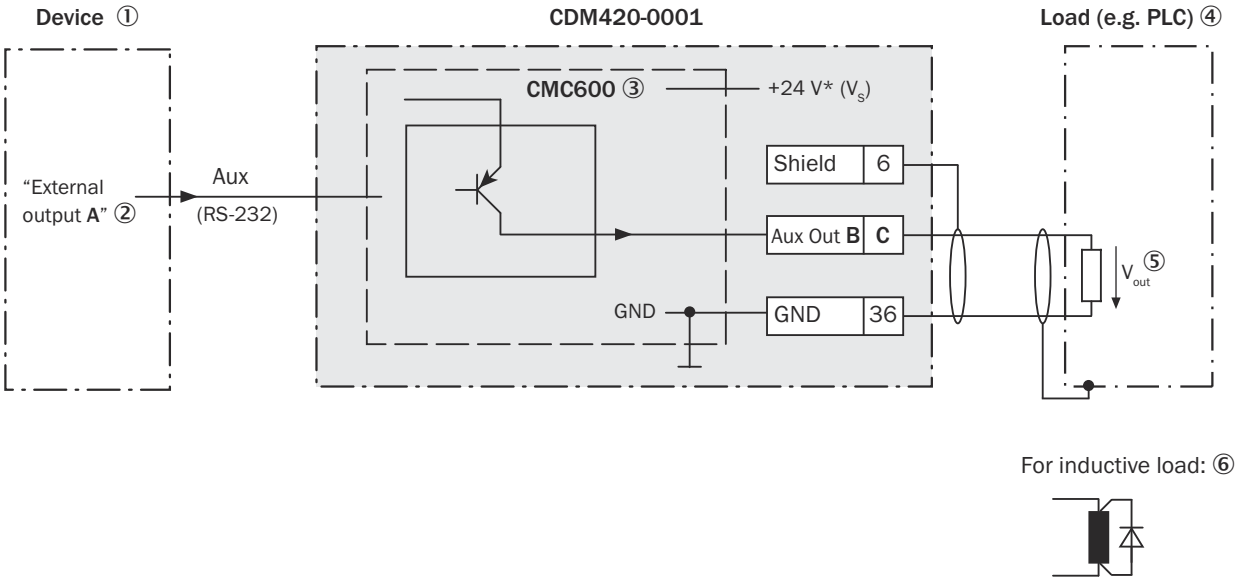

Figure 112: Wiring external digital outputs "Aux Out 1" and "Aux Out 2" of the device in the connection module CDM420-0001.

① Device
② Logical "External output" in the device
③ The optional CMC600 parameter cloning module is required in the connection module in order to use the additional external digital inputs and outputs of the device.
④ Load (e.g. PLC)
⑤ Output voltage V_{out}
⑥ With inductive load: see note

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 68: Assignment of placeholders to the external digital outputs

Device	CDM420-0001	
External output A	**Signal B**	**Terminal C**
1	Aux Out 1	40
2	Aux Out 2	30

Functional principle of the external digital outputs

The optional CMC600 parameter cloning module in combination with the CDB or CDM connection module offers two additional digital outputs for the device. The outputs are available at the respective terminals of the connection module. To distinguish them from the physical digital outputs directly on the device, these addition outputs via the CMC600 are designated as "external outputs".

NOTE

The device transmits the statuses of its logical outputs to the CMC600 via its serial data interface. The CMC600 converts the statuses into switching signals on its physical digital outputs.

The digital outputs are not suitable for time-critical applications.

Characteristic data of the digital outputs

Table 69: Characteristic data of the digital outputs "External output 1" and "External output 2"

Type	Switching
Switching behavior	PNP switching to supply voltage V_S Default settings in the device: no function, logic: not inverted (active high)
Properties	• Short-circuit protected and temperature protected • Not electrically isolated from the supply voltage V_S
Electrical values	$0\ V \leq V_{out}$ [1] $\leq V_S$ $(V_S - 1.5\ V) \leq V_{out} \leq V_S$ at I_{out} [2] $\leq 100\ mA$

1) Output voltage
2) Output current

NOTE

Allocate the functions for the digital outputs in the device using a configuration software, e.g., SOPAS ET.

14.8 Connection diagrams of connection module CDM420-0006

14.8.1 Connection of the device to CDM420-0006

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

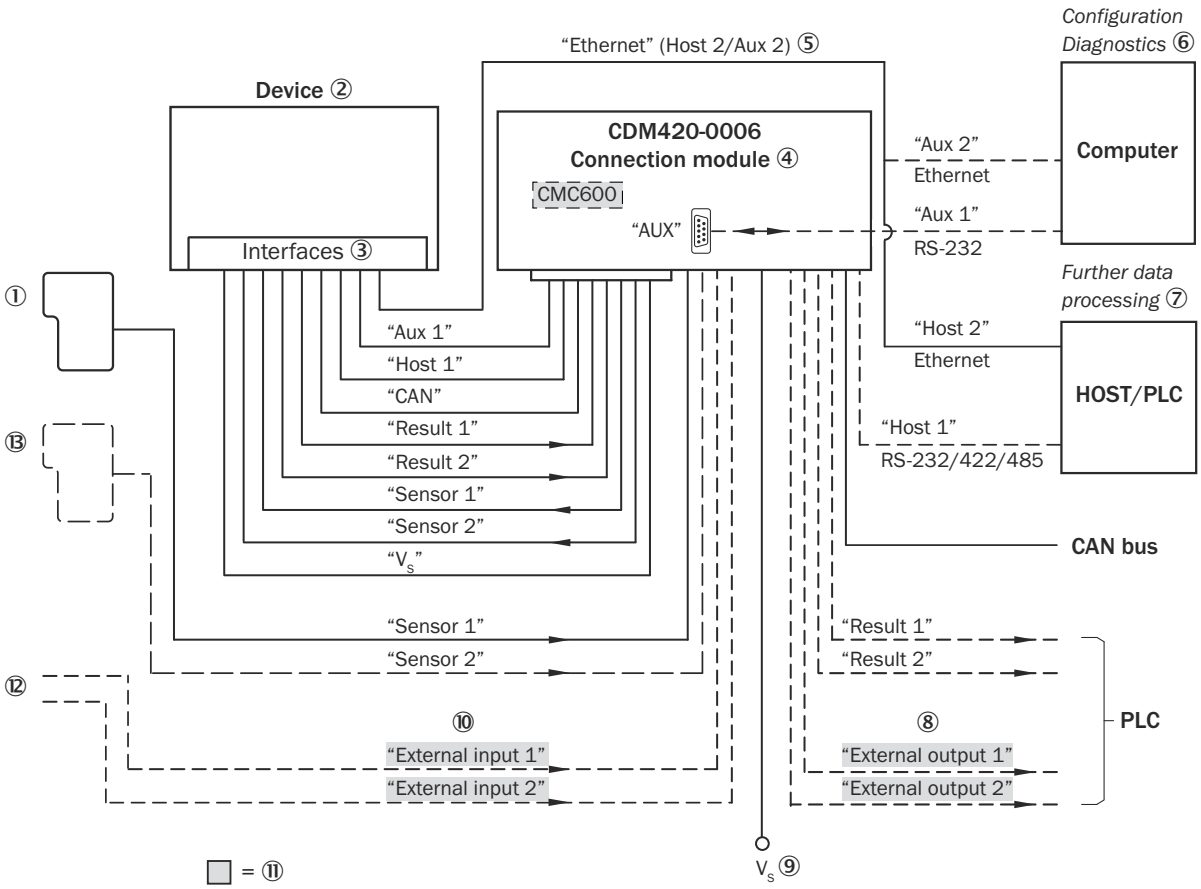

Figure 113: Connection of the device to peripherals via CDM420-0006 (overview)

① External trigger sensor, e.g. for read cycle generation
② Device
③ Interfaces
④ Connection modules
⑤ Ethernet: not supported for CLV62x-x0xxx (serial variant).
⑥ Configuration or diagnostics
⑦ Data further processing
⑧ External digital outputs (switching)
⑨ Supply voltage V_S
⑩ External digital inputs (switching)
⑪ The optional CMC600 parameter cloning module is required in the connection module in order to use the additional external digital inputs and outputs of the device (highlighted in gray).
⑫ Other functions
⑬ Application-dependent alternative stop reading cycle (e.g. photoelectric sensor) or travel increment (incremental encoder)

14.8.2 Wiring overview of the CDM420-0006

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8), 1 digital input used

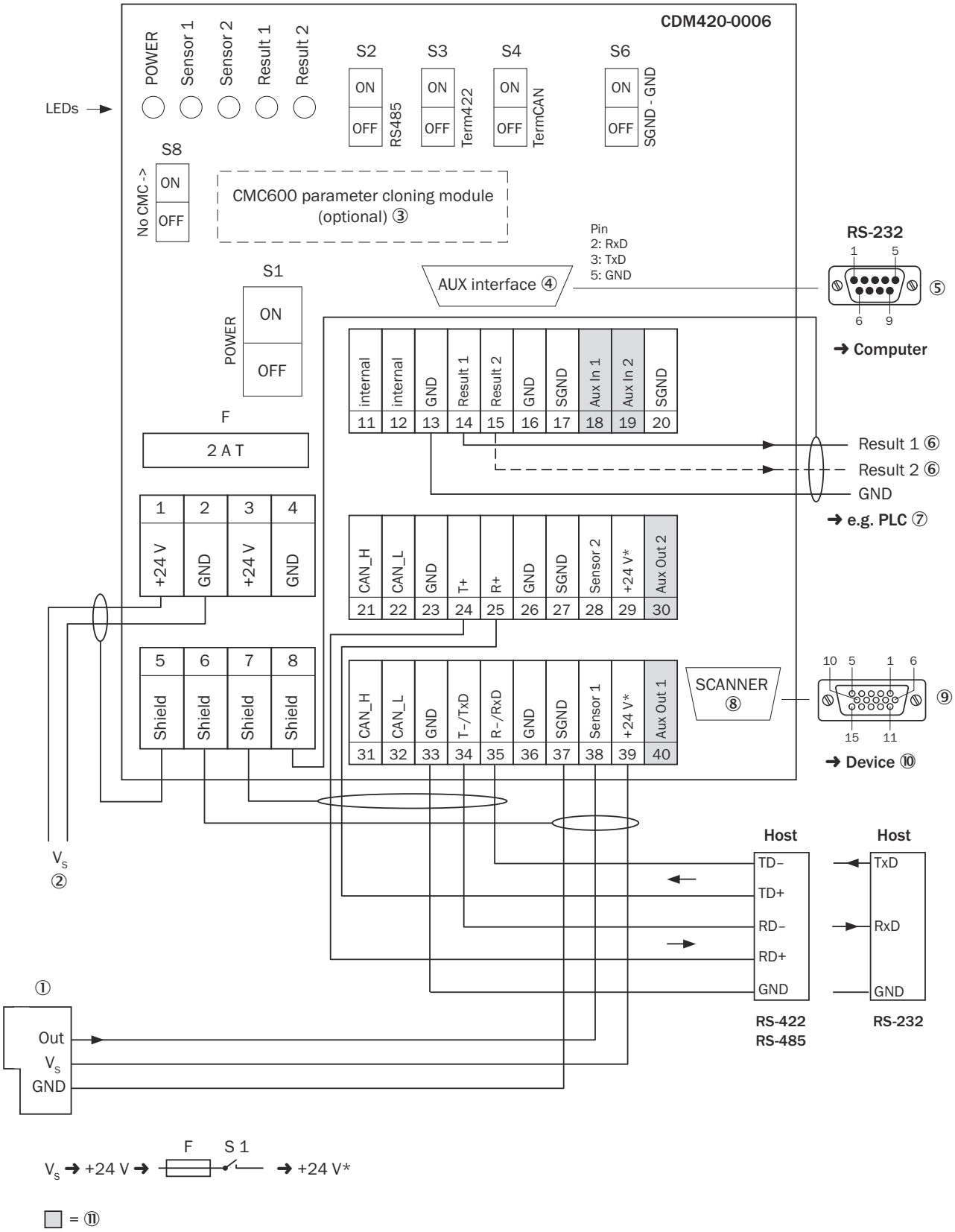

Figure 114: Overview: connection of device (without heating) and peripherals to the CDM420-0006 connection module.

① External trigger sensor, e.g. for read cycle generation
② Supply voltage V_S
③ CMC600 parameter cloning module (optional)
④ Auxiliary interface “AUX”
⑤ Male connector, D-Sub, 9-pin
⑥ Name of the digital output
⑦ E.g., PLC (programmable logic controller)
⑧ SCANNER = Device
⑨ Female connector, D-Sub-HD, 15-pin
⑩ Device to be connected
⑪ The optional CMC600 parameter cloning module is required in the connection module in order to use the additional external digital inputs and outputs of the device (highlighted in gray).

14.8.3 Connecting supply voltage for the device in CDM420-0006

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

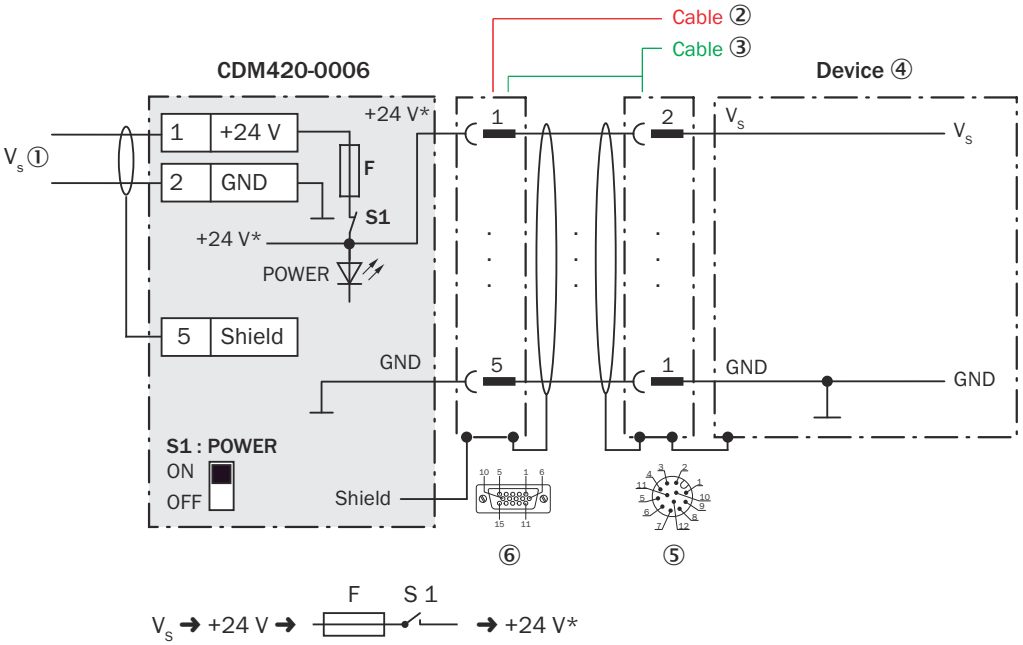

Figure 115: Device (without heater): supply voltage in the CDM420-0006 connection module, Ethernet variant with male connector, M12, 12-pin, A-coded.

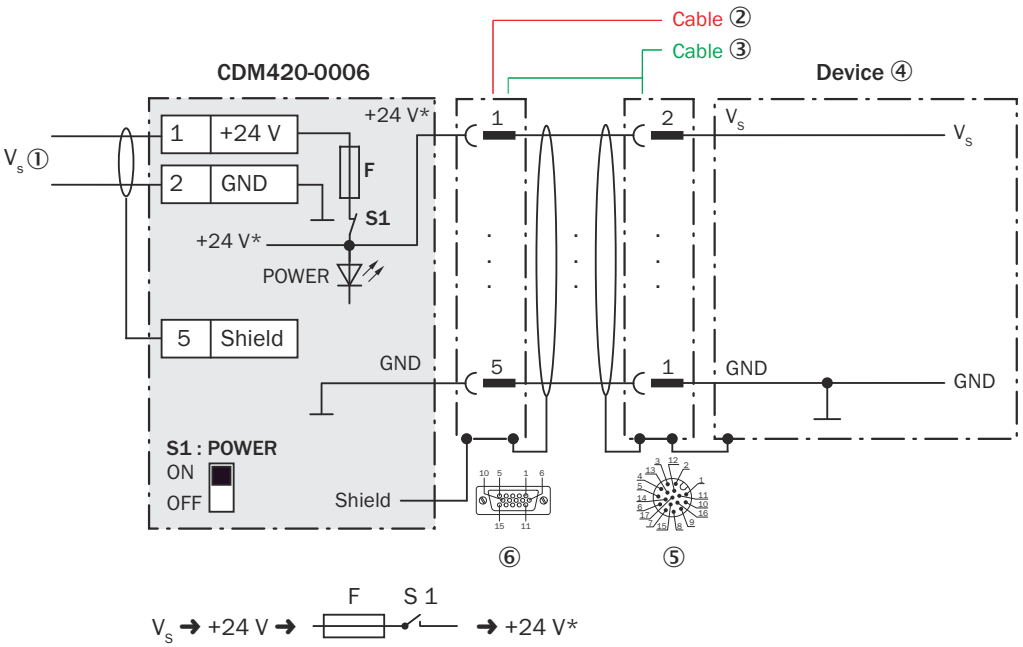

Figure 116: Device (without heater): supply voltage in the CDM420-0006 connection module, Ethernet variant with male connector, M12, 17-pin, A-coded.

① Supply voltage V_S

② CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)

③ CLV62x-x1xx (Ethernet variant): adapter cable with male connector, D-Sub-HD, 15-pin and female connector, M12, 12-pin, A-coded

CLV62x-x8xx (Ethernet variant): adapter cable with male connector, D-Sub-HD, 15-pin and female connector, M12, 17-pin, A-coded

④ Device

⑤ CLV62x-x1xx (Ethernet variant): male connector, M12, 12-pin, A-coded

CLV62x-x8xx (Ethernet variant): male connector, M12, 17-pin, A-coded

⑥ Connection module: female connector, D-Sub-HD, 15-pin

Function of switch S1

Table 70: 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

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

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

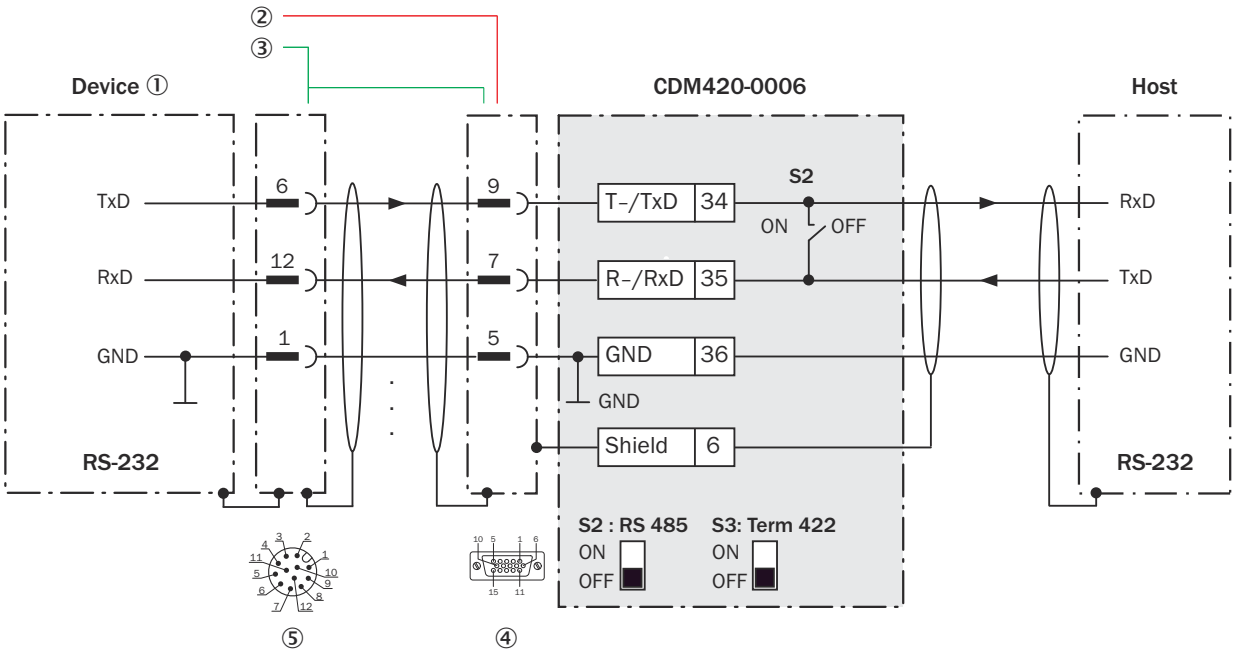

Figure 117: Wiring the RS-232 data interface of the device in the CDM420-0006 connection module, Ethernet variant with male connector, M12, 12-pin, A-coded.

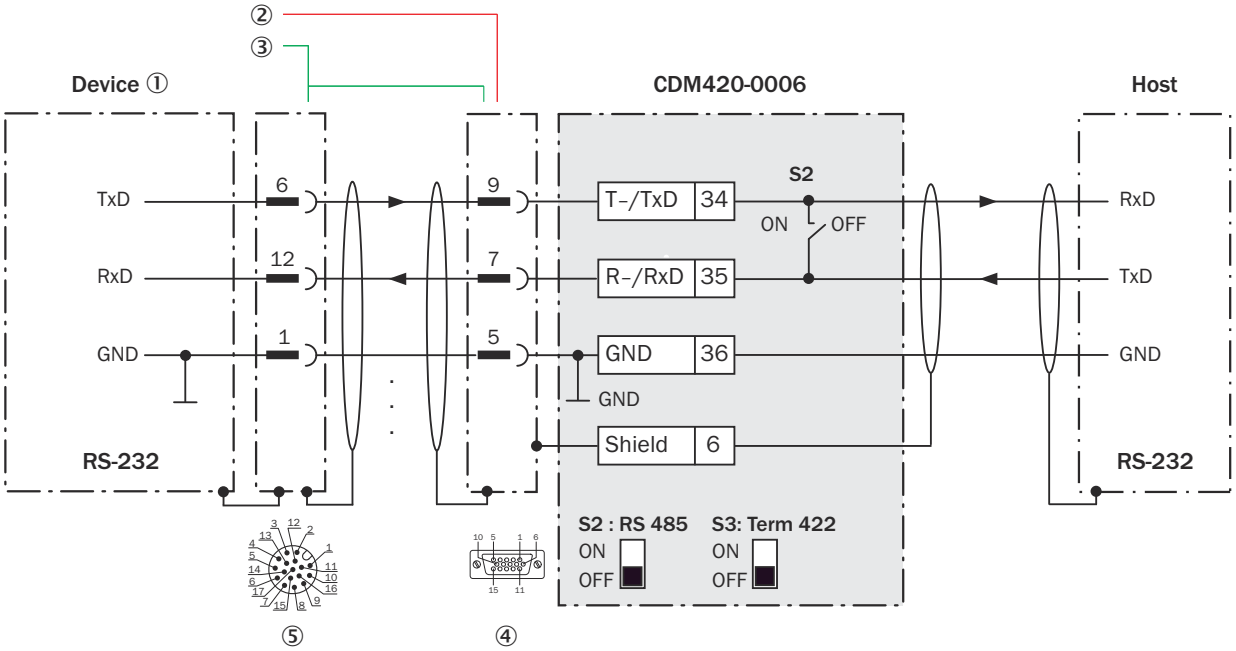

Figure 118: Wiring the RS-232 data interface of the device in the CDM420-0006 connection module, Ethernet variant with male connector, M12, 17-pin, A-coded.

① Device

② CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)

③ CLV62x-x1xx (Ethernet variant): adapter cable with male connector, D-Sub-HD, 15-pin and female connector, M12, 12-pin, A-coded

CLV62x-x8xx (Ethernet variant): adapter cable with male connector, D-Sub-HD, 15-pin and female connector, M12, 17-pin, A-coded

④ Connection module: female connector, D-Sub-HD, 15-pin

⑤ CLV62x-x1xx (Ethernet variant): male connector, M12, 12-pin, A-coded

CLV62x-x8xx (Ethernet variant): male connector, M12, 17-pin, A-coded

NOTE

Activate the RS-232 data interface in the device using a configuration software, e.g., SOPAS ET.

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

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

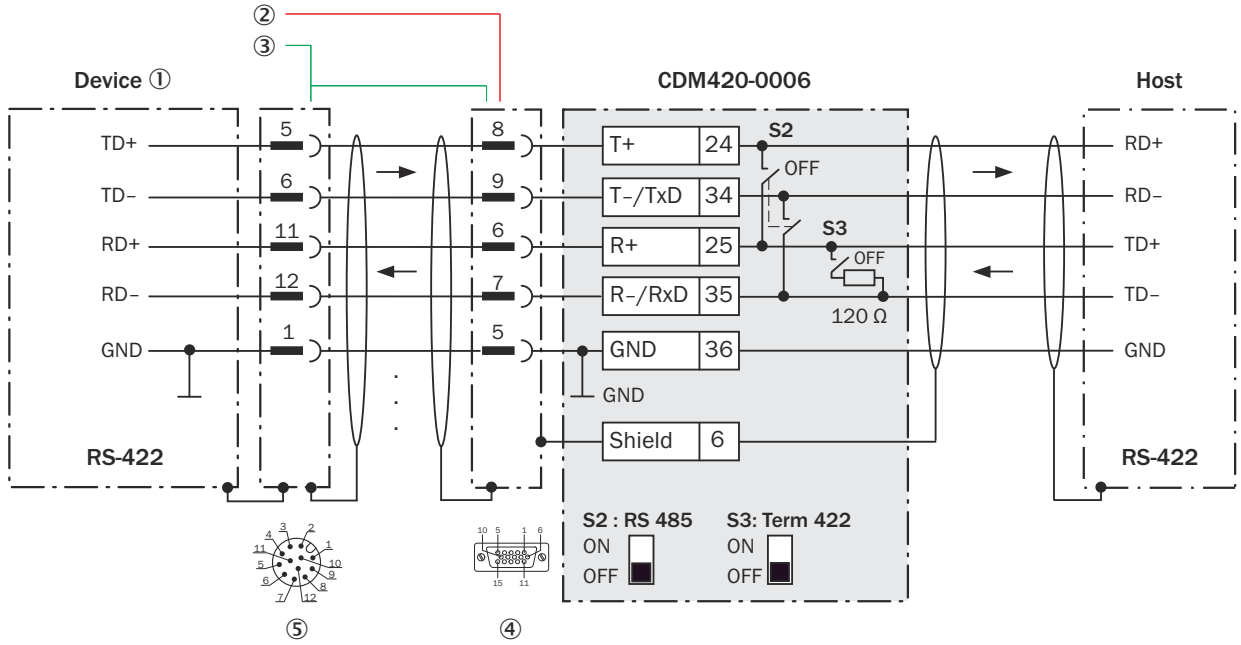

Figure 119: Wiring the RS-422 data interface of the device in the CDM420-0006 connection module, Ethernet variant with male connector, M12, 12-pin, A-coded.

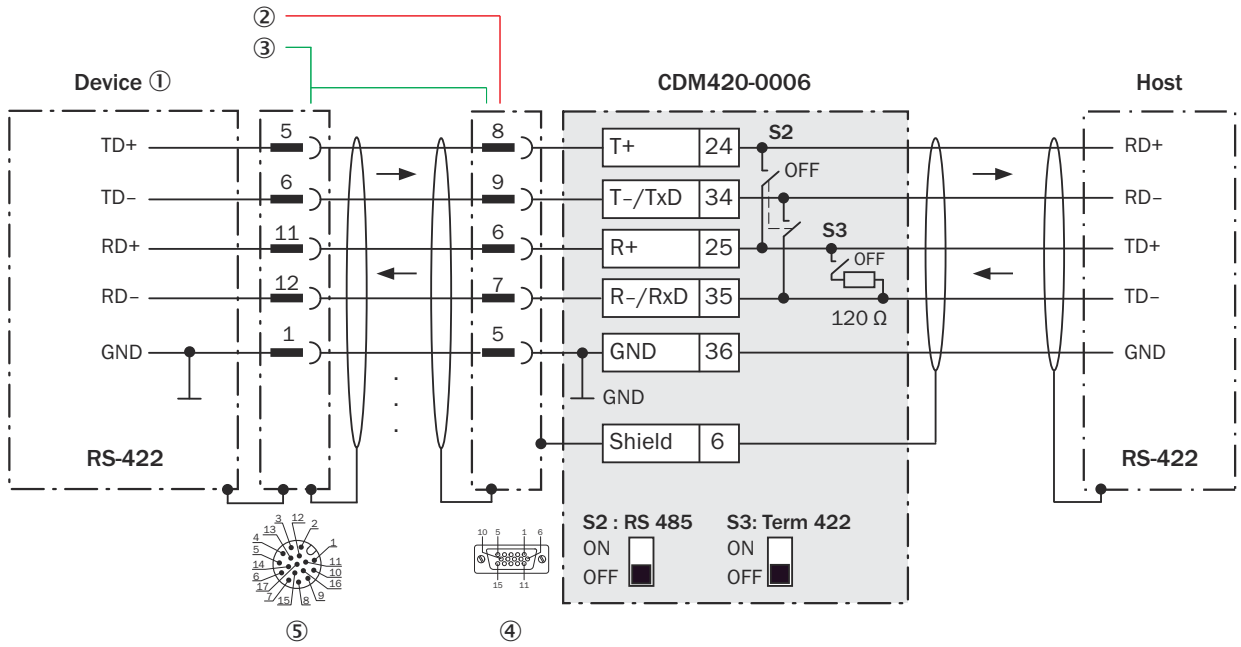

Figure 120: Wiring the RS-422 data interface of the device in the CDM420-0006 connection module, Ethernet variant with male connector, M12, 17-pin, A-coded.

① Device

② CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)

③ CLV62x-x1xx (Ethernet variant): adapter cable with male connector, D-Sub-HD, 15-pin and female connector, M12, 12-pin, A-coded

CLV62x-x8xx (Ethernet variant): adapter cable with male connector, D-Sub-HD, 15-pin and female connector, M12, 17-pin, A-coded

④ Connection module: female connector, D-Sub-HD, 15-pin

⑤ CLV62x-x1xx (Ethernet variant): male connector, M12, 12-pin, A-coded

CLV62x-x8xx (Ethernet variant): male connector, M12, 17-pin, A-coded

Function of switch S3

Table 71: 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

Activate the RS-422 data interface (“Point-to-Point” option) in the device using a configuration software, e.g., SOPAS ET.

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 and RS-485.
- The connection shown above is configured for operation of the host with permanently activated drivers (often described as “RS-422 operation”), i.e. not RS-485 operation.

14.8.6 Wiring serial host interface RS-485 of the device in the CDM420-0006

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

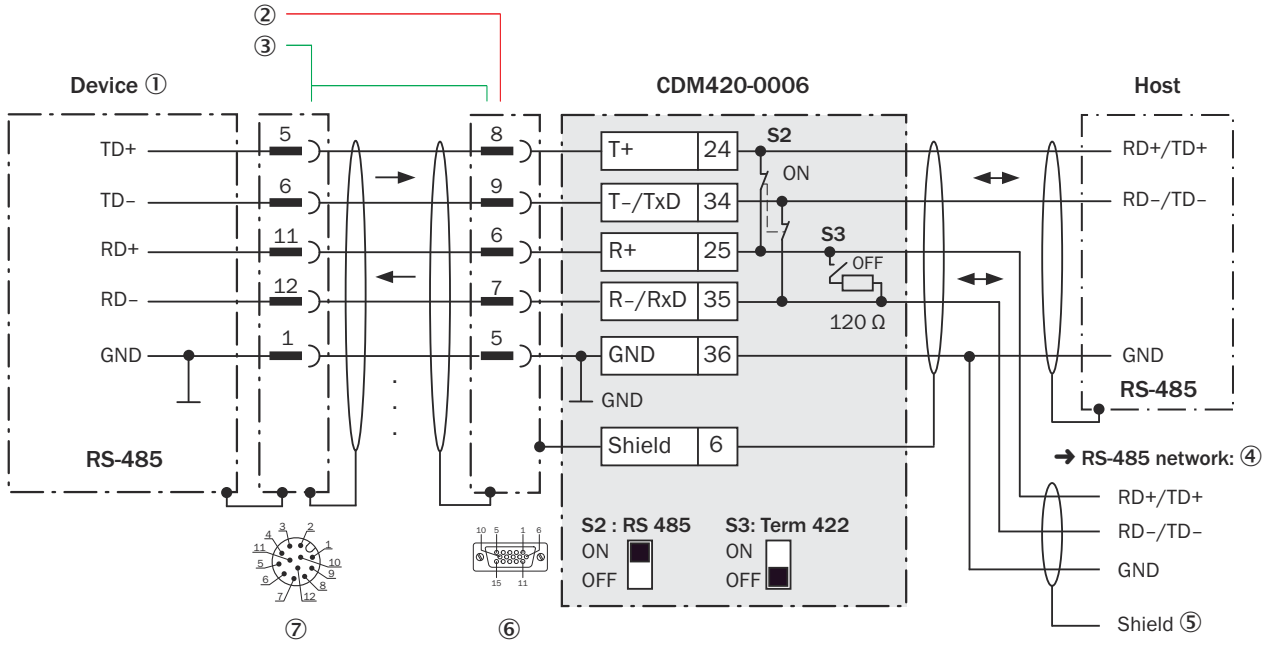

Figure 121: Wiring the RS-485 data interface of the device in the CDM420-0006 connection module, Ethernet variant with male connector, M12, 12-pin, A-coded.

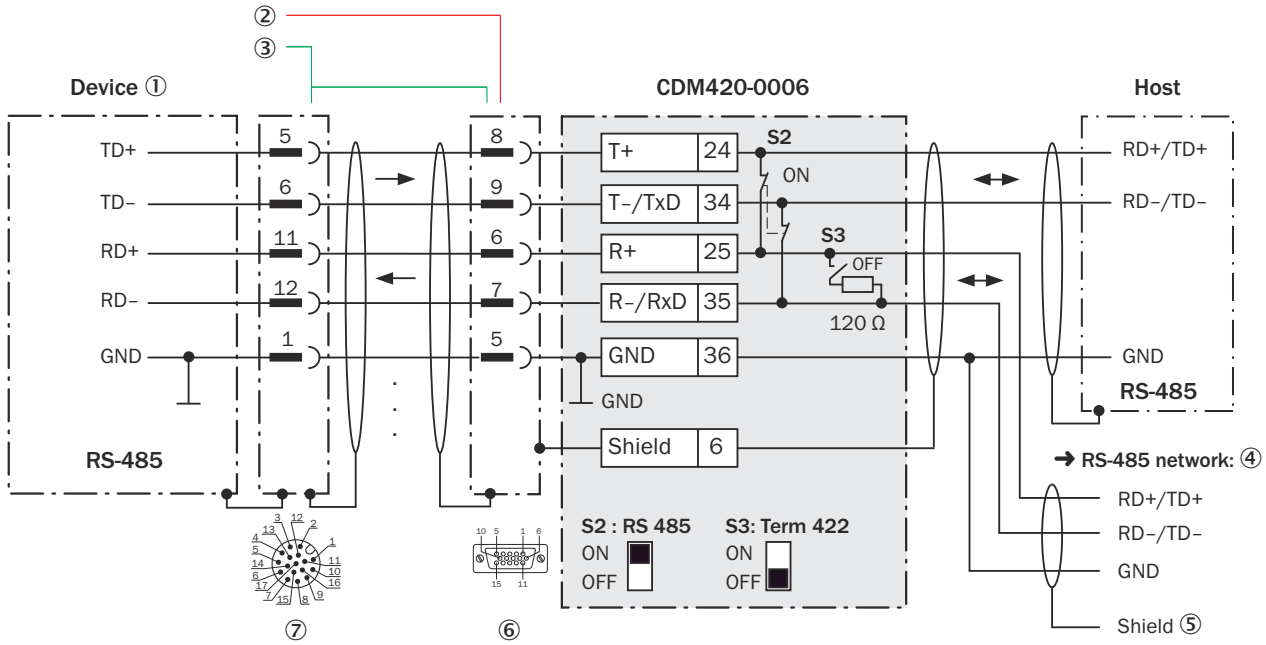

Figure 122: Wiring the RS-485 data interface of the device in the CDM420-0006 connection module, Ethernet variant with male connector, M12, 17-pin, A-coded.

① Device
② CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
③ CLV62x-x1xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 12-pin, A-coded)

CLV62x-x8xx (Ethernet variant): adapter cable (male connector, D-Sub-HD, 15-pin / female connector, M12, 17-pin, A-coded)

④ RS-485 network
⑤ Shielding
⑥ Connection module: female connector, D-Sub-HD, 15-pin
⑦ CLV62x-x1xx (Ethernet variant): male connector, M12, 12-pin, A-coded

CLV62x-x8xx (Ethernet variant): male connector, M12, 17-pin, A-coded

Function of switch S3

Table 72: Switch S3: Term 422

Switch setting	Function
ON	Terminates the device. Required if the device is located at the end of the RS-485 bus cable.
OFF	No termination

NOTE
Activate the RS-485 data interface (“Bus” option) in the device using a configuration software, e.g., SOPAS ET.

The following requirements or restrictions apply when using the RS-485 data interface:

- The relevant interface drivers for the device comply with the RS-422 and RS-485standard.
- This operating mode is only permitted if all connected devices use a corresponding RS-485 protocol.
- This configuration is not permitted when using the standard data output and protocol of the device. In case of doubt, contact SICK Service.

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

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

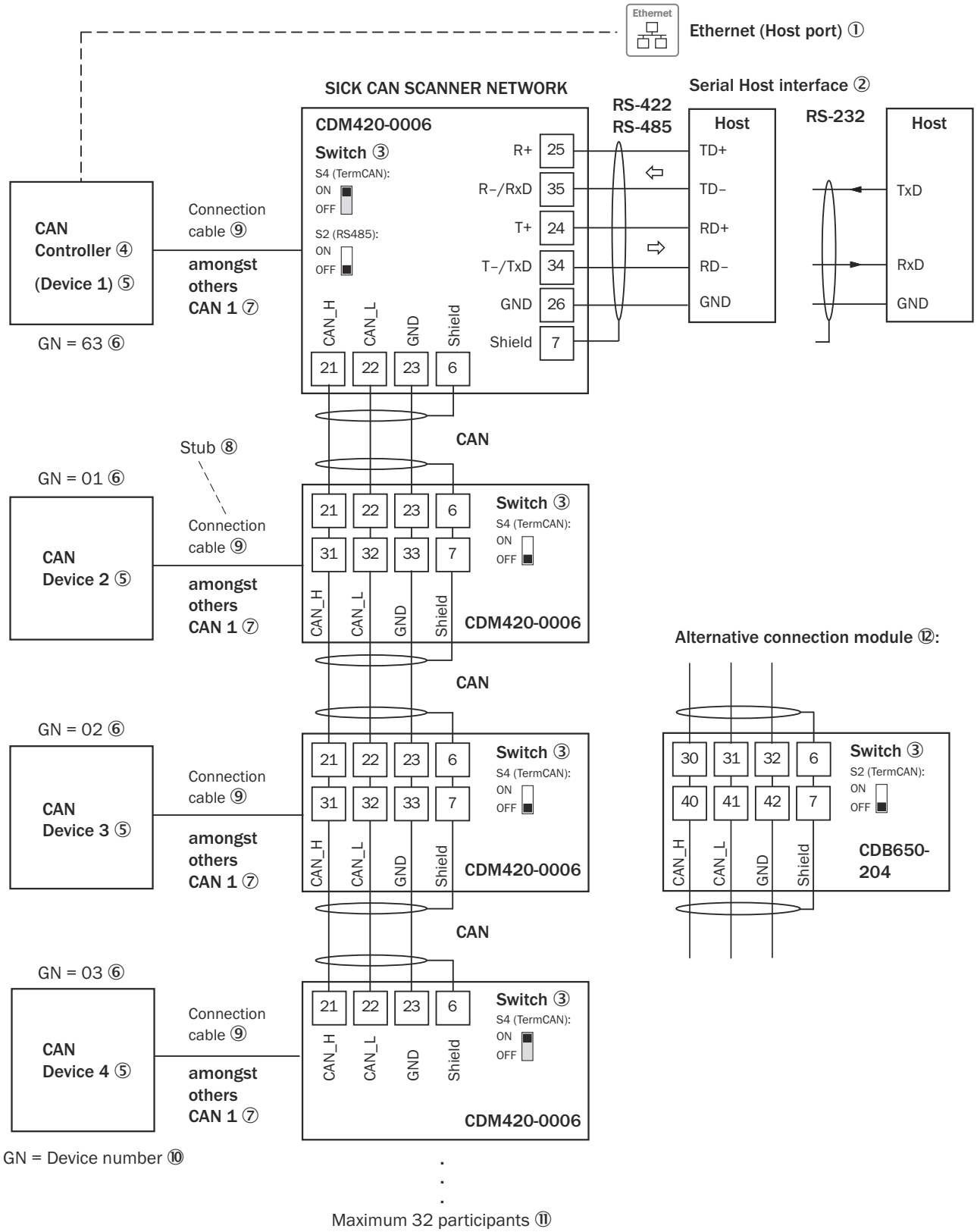

Figure 123: Wire the CAN interface of the device in the CDM420-0006 connection module. Connection and looping through of the supply voltage and connection of a trigger sensor for read cycle generation at the CAN controller, for example, are disregarded here.

① Only CLV62x-xYxxx (Ethernet variant, Y = 1 or 8): Ethernet (host port)
② Serial host interface
③ Switch
④ CAN controller
⑤ CAN device
⑥ Device number
⑦ CAN etc.
⑧ Branch line
⑨ CLV62x-x0xxx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)

CLV62x-xYxxx (Ethernet variant, Y = 1): adapter cable with female connector, M12, 12-pin, A-coded and male connector, D-Sub-HD, 15-pin

CLV62x-xYxxx (Ethernet variant, Y = 8): adapter cable with female connector, M12, 17-pin, A-coded and male connector, D-Sub-HD, 15-pin
⑩ Device number (GN)
⑪ Maximum 32 users
⑫ Example of alternative connection module:

Alternative connection module for CLV62x-x0xxx (serial variant): CDB620 or CDM420-0001

Alternative connection module for CLV62x-xYxxx (Ethernet variant, Y = 1 or 8): CDB620, CDM420-0001 or CDB650-204

CDB620 or CDM420-0001: An adapter cable with female connector, M12, 12-pin, A-coded and male connector, D-Sub-HD, 15-pin is required to connect the CLV62x-xYxxx (Ethernet variant, Y = 1).

CDB620 or CDM420-0001: an adapter cable with female connector, M12, 17-pin, A-coded and male connector, D-Sub-HD, 15-pin is required to connect the CLV62x-xYxxx (Ethernet variant, Y = 8).

CDB650-204: A connection cable 1:1 with female connector, M12, 17-pin, A-coded and male connector, M12, 17-pin, A-coded is required to connect the CLV62x-xYxxx (Ethernet variant, Y = 8).

NOTE
Activate the CAN data interface in the device using a configuration software, e.g., SOPAS ET.

Configure further settings in the device according to the function of the device in the system configuration.

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

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

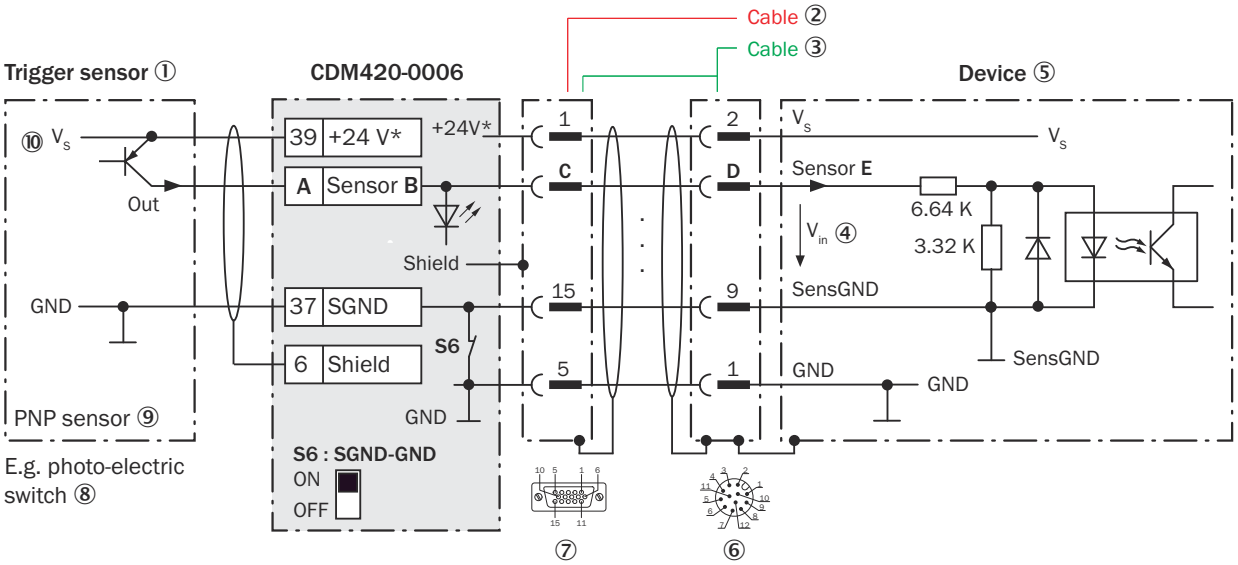

Figure 124: Trigger sensor supplied with power by connection module CDM420-0006, Ethernet variant with male connector, M12, 12-pin, A-coded

NOTE

Reduction of digital inputs due to limited number of contacts in the connector plug of the device

CLV62x-xYxxx (Ethernet variant, Y = 1) with male connector, M12, 12-pin, A-coded: The “Sensor 2” digital input is not available.

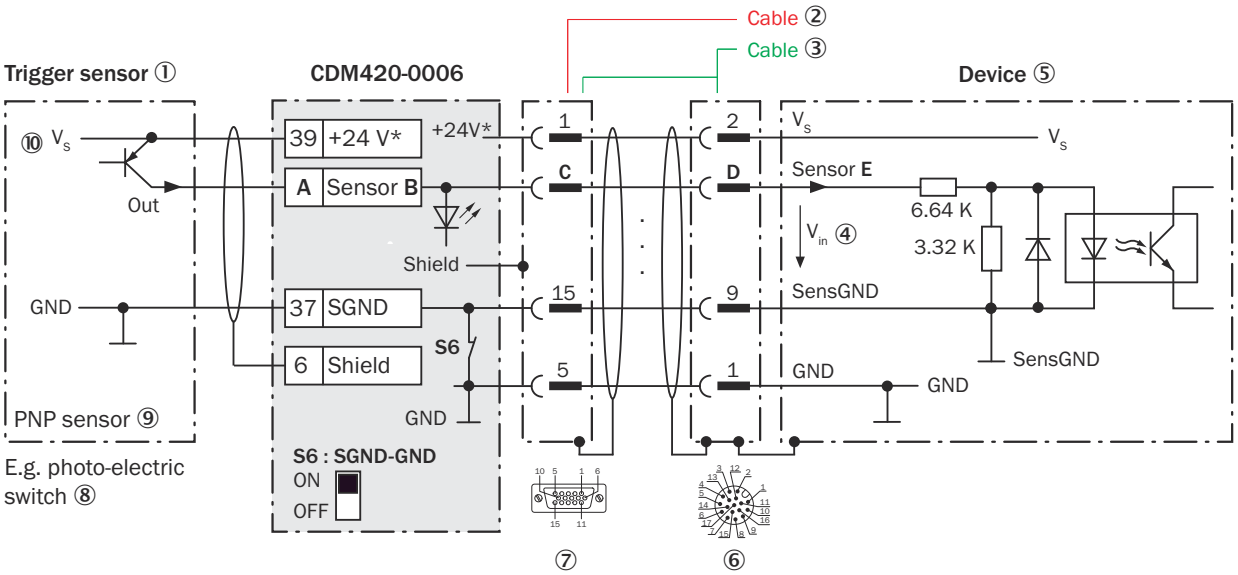

Figure 125: Trigger sensor supplied with power by connection module CDM420-0006, Ethernet variant with male connector, M12, 17-pin, A-coded

① Trigger sensor, e.g. for read cycle generation
② CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
③ CLV62x-x1xx (Ethernet variant): adapter cable with male connector, D-Sub-HD, 15-pin and female connector, M12, 12-pin, A-coded

CLV62x-x8xx (Ethernet variant): adapter cable with male connector, D-Sub-HD, 15-pin and female connector, M12, 17-pin, A-coded
④ Input voltage V_{in}
⑤ Device
⑥ CLV62x-x1xx (Ethernet variant): male connector, M12, 12-pin, A-coded

CLV62x-x8xx (Ethernet variant): 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

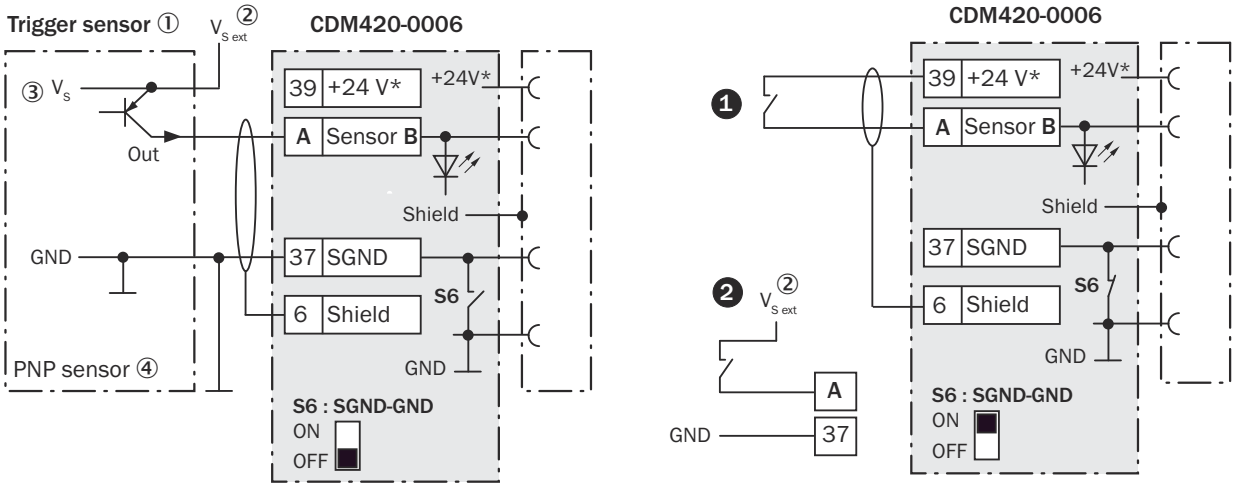

Figure 126: Left: Trigger sensor connected potential-free and supplied with power externally. Right: Alternatively switch, ❶ supplied with power by connection module CDM420-0006 or ❷ connected potential-free and supplied with power externally. Now select switch setting S6 as shown in the left figure.

① Trigger sensor, e.g. for read cycle generation
② External supply voltage $V_{S\ ext}$
③ Supply voltage V_S
④ PNP sensor

Table 73: 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 74: 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

Switch setting	Function
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 75: 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 read cycle. Default setting in the device: logic not inverted (active high), debounce time 10 ms
Properties	• Opto-decoupled, reverse polarity protected • Can be wired with PNP output of a trigger sensor
Electrical values	Low: V_{in} [1] ≤ 2 V; I_{in} [2] ≤ 0.3 mA High: 6 V ≤ V_{in} ≤ 30 V; 0.7 mA ≤ I_{in} ≤ 5 mA

1) Input Voltage
2) Input current

NOTE
Allocate the functions for the digital inputs in the device using a configuration software, e.g., SOPAS ET.

14.8.9 Wiring the external digital inputs of the device in the CDM420-0006

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

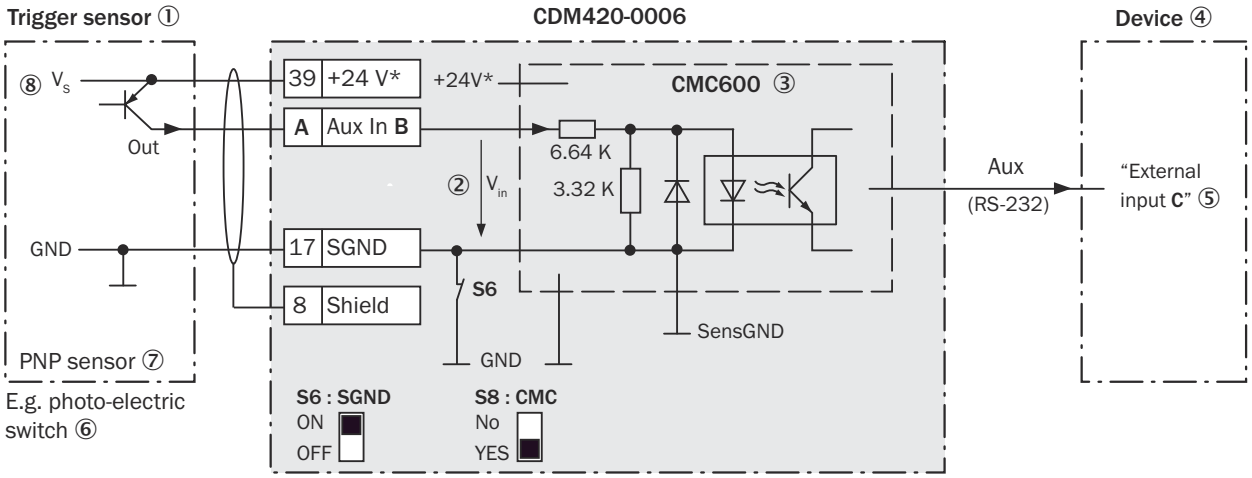

Figure 127: Trigger sensor supplied with power by connection module CDM420-0006

① Trigger sensor, e.g. for read cycle generation
② Input voltage V_{in}
③ The optional CMC600 parameter cloning module is required in the connection module in order to use the additional external digital inputs and outputs of the device.
④ Device
⑤ Logical “External input” in the device
⑥ e.g. photoelectric sensor
⑦ PNP sensor
⑧ Supply voltage V_S

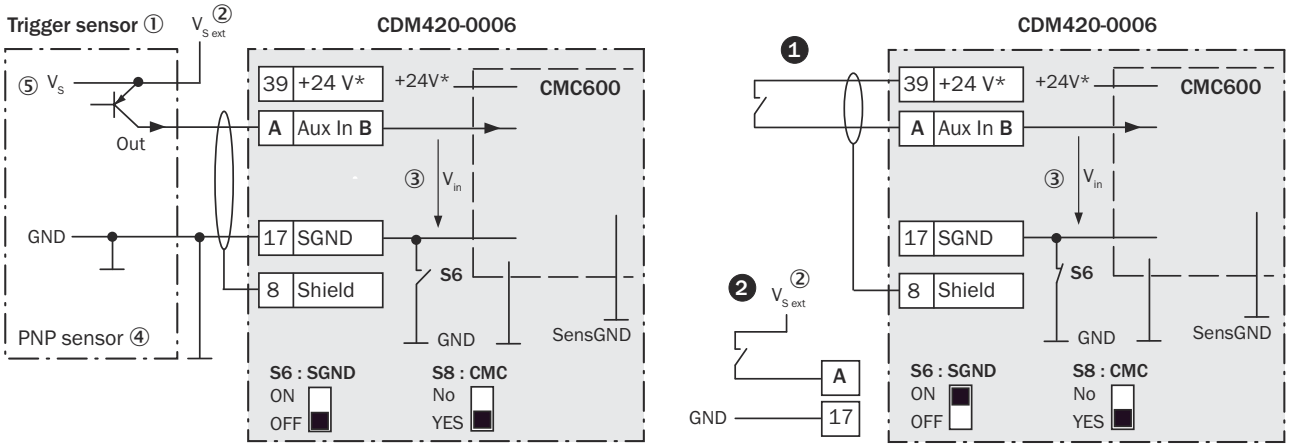

Figure 128: Left: Trigger sensor connected potential-free and supplied with power externally. Right: Alternatively switch, ❶ supplied with power by connection module CDM420-0006 or ❷ connected potential-free and supplied with power externally. Switch setting S3 then as in left figure.

① Trigger sensor, e.g. for read cycle generation
② External supply voltage $V_{S\ ext}$
③ Input voltage V_{in}
④ PNP sensor
⑤ Supply voltage V_S

Table 76: Assignment of placeholders to the digital inputs

CDM420-0006		Device
Terminal A	**Signal B**	**External input C**
18	Aux In 1	1
19	Aux In 2	2

Function of switch S6

Table 77: Switch S6: SGND - GND

Switch setting	Function
ON	GND of the trigger sensor connected with GND of CDM420-0006 and CMC600
OFF	Trigger sensor connected volt-free at CDM420-0006 and CMC600 Common, isolated reference potential of all digital inputs is SGND.

Functional principle of the external digital inputs

The optional CMC600 parameter cloning module in combination with the CDB or CDM connection module offers two additional physical digital inputs for the device. The inputs are available at the respective terminals of the connection module. To distinguish them from the physical digital inputs directly on the device, these addition inputs via the CMC600 are designated as “external inputs”.

NOTE

The CMC600 transmits the switching signals of the external digital inputs as statuses to the local inputs of the device via its serial data interface.

The digital inputs are not suitable for time-critical applications.

Characteristic data of the digital inputs

Table 78: Characteristic data of the digital inputs “External input 1” and “External input 2”

Type	Switching
Switching behavior	Power to the input starts the assigned function, e.g. start read cycle. Default setting in the device: logic not inverted (active high), debounce time 10 ms
Properties	• Opto-decoupled, reverse polarity protected • Can be wired with PNP output of a trigger sensor
Electrical values	Low: V_{in} [1] ≤ 2 V; I_{in} [2] ≤ 0.3 mA High: 6 V ≤ V_{in} ≤ 30 V; 0.7 mA ≤ I_{in} ≤ 5 mA

1) Input voltage.
2) Input current.

NOTE
Allocate the functions for the digital inputs in the device using a configuration software, e.g., SOPAS ET.

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

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

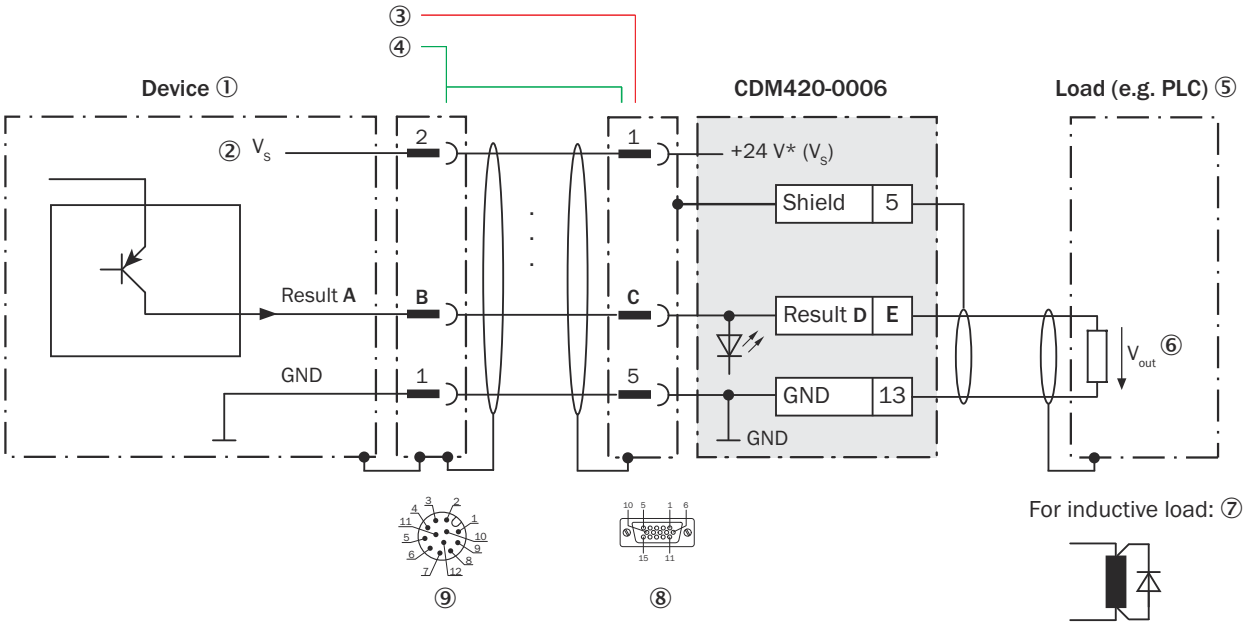

Figure 129: Wiring the “Result 1” and “Result 2” digital outputs of the device in the connection module CDM420-0006, Ethernet variant with male connector, M12, 12-pin, A-coded.

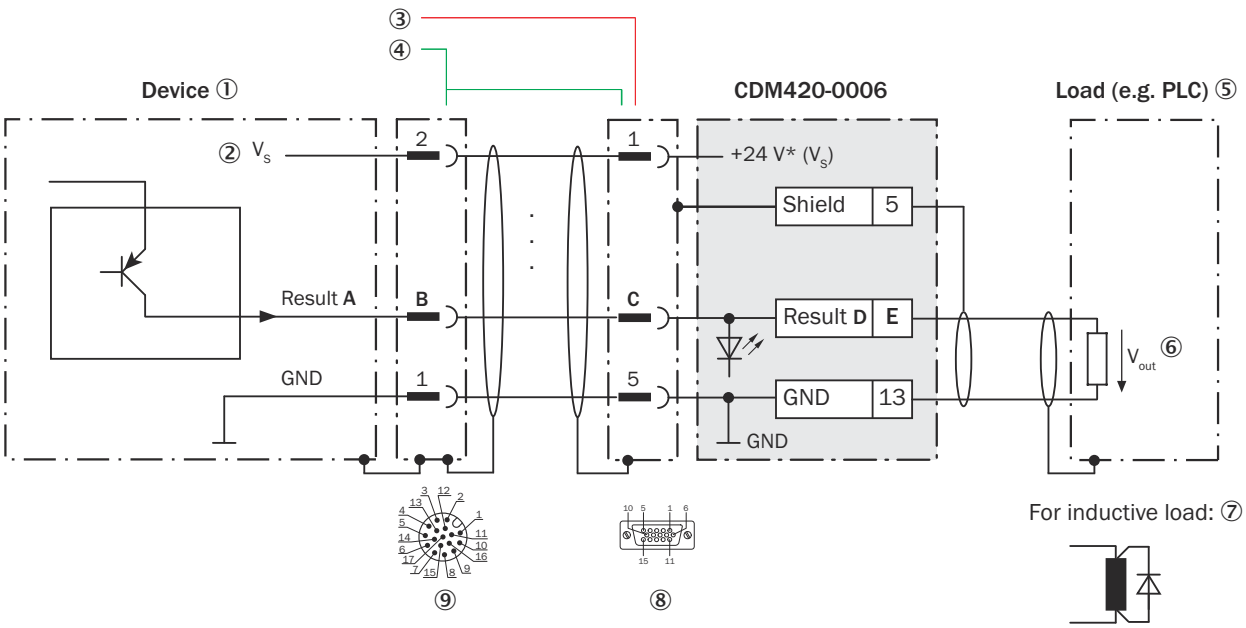

Figure 130: Wiring the "Result 1" and "Result 2" digital outputs of the device in the connection module CDM420-0006, Ethernet variant with male connector, M12, 17-pin, A-coded.

① Device
② Supply voltage V_S
③ CLV62x-x0xx (serial variant): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
④ CLV62x-x1xxx (Ethernet variant): adapter cable with female connector, M12, 12-pin, A-coded and male connector, D-Sub-HD, 15-pin

CLV62x-x8xxx (Ethernet variant): adapter cable with female connector, M12, 17-pin, A-coded and 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 CLV62x-x1xxx (Ethernet variant): male connector, M12, 12-pin, A-coded

CLV62x-x8xxx (Ethernet variant): male connector, M12, 17-pin, A-coded

NOTE
Digital output are omitted due to limited number of contacts in the connector plug of the device.

CLV62x-xYxxx (Ethernet variant, Y =1) with male connector, M12, 12-pin, A-coded: The two "Result 1" and "Result 2" digital outputs are not available.

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 79: Assignment of placeholders to the digital outputs

Device		CDM420-0006		
Output A	**Pin B**	**Pin C**	**Signal D**	**Terminal E**
Result 1	13	12	Result 1	14
Result 2	14	13	Result 2	15

Characteristic data of the digital outputs

Table 80: Characteristic data of the "Result 1" and "Result 2" 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	• Short-circuit protected and temperature protected • Not electrically isolated from the supply voltage V_S
Electrical values	$0\ V \leq V_{out}$ [1] $\leq V_S$ $(V_S - 1.5\ V) \leq V_{out} \leq V_S$ at I_{out} [2] $\leq 100\ mA$

1) Output voltage.
2) Output current.

NOTE
Allocate the functions for the digital outputs in the device using a configuration software, e.g., SOPAS ET.

14.8.11 Wiring the external digital outputs of the device in the CDM420-0006

Device = CLV62x-x0xxx (serial variant), CLV62x-xYxxx (Ethernet variant, Y = 1 or 8)

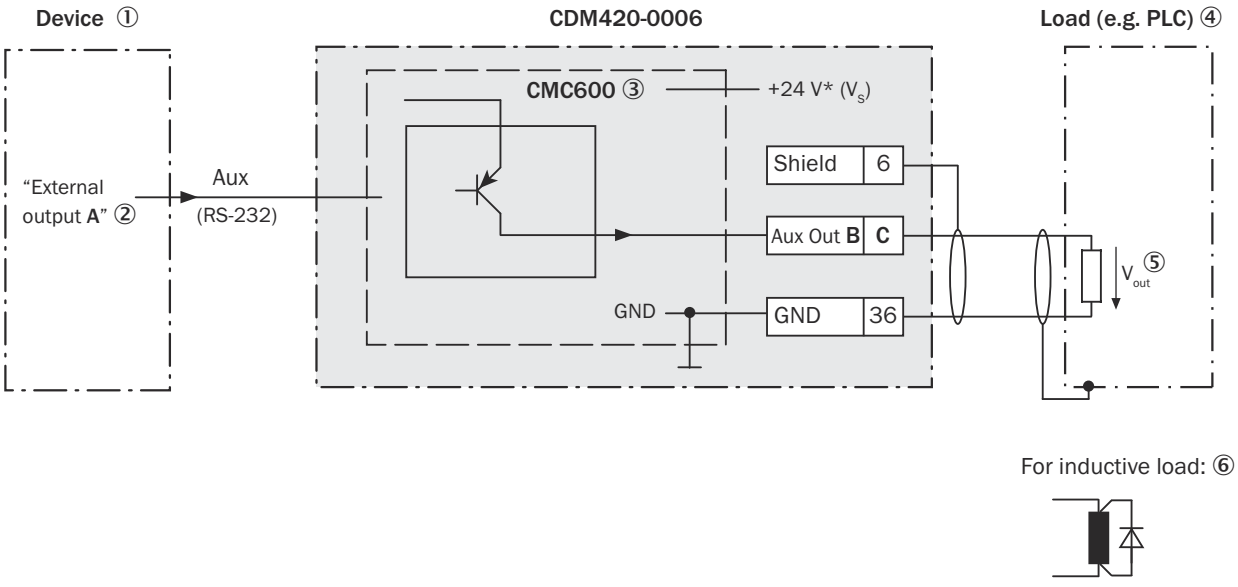

Figure 131: Wiring "Aux Out 1" and "Aux Out 2" external digital outputs of the device in the connection module CDM420-0006.

① Device
② Logical “External output” in the device
③ The optional CMC600 parameter cloning module is required in the connection module in order to use the additional external digital inputs and outputs of the device.
④ Load (e.g. PLC)
⑤ Output voltage V_{out}
⑥ With inductive load: see note

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 81: Assignment of placeholders to the external digital outputs

Device	CDM420-0006	
External output A	**Signal B**	**Terminal C**
1	Aux Out 1	40
2	Aux Out 2	30

Functional principle of the external digital outputs

The optional CMC600 parameter cloning module in combination with the CDB or CDM connection module offers two additional digital outputs for the device. The outputs are available at the respective terminals of the connection module. To distinguish them from the physical digital outputs directly on the device, these addition outputs via the CMC600 are designated as “external outputs”.

NOTE
The device transmits the statuses of its logical outputs to the CMC600 via its serial data interface. The CMC600 converts the statuses into switching signals on its physical digital outputs.

The digital outputs are not suitable for time-critical applications.

Characteristic data of the digital outputs

Table 82: Characteristic data of the digital outputs “External output 1” and “External output 2”

Type	Switching
Switching behavior	PNP switching to supply voltage V_S Default settings in the device: no function, logic: not inverted (active high)
Properties	• Short-circuit protected and temperature protected • Not electrically isolated from V_S
Electrical values	$0\ V \leq V_{out}$ [1] $\leq V_S$ $(V_S - 1.5\ V) \leq V_{out} \leq V_S$ at I_{out} [2] $\leq 100\ mA$

1) Output voltage.
2) Output current.

NOTE
Allocate the functions for the digital outputs in the device using a configuration software, e.g., SOPAS ET.

14.9 Abbreviations used

Table 83: Abbreviations used

CAN	**C**ontrolled **A**rea **N**etwork. Field bus protocol based on the CAN bus
CDB	**C**onnection **D**evice **B**asic
CDF	**C**onnection **D**evice **F**ieldbus
CDM	**C**onnection **D**evice **M**odular
CE	**C**ommunauté **E**uropéenne. European Community
CLV	**C**ode-**L**eser **V**-Prinzip [Code reader V principle]
CMC	**C**onnection **M**odule **C**loning
CMD	**C**onnection **M**odule **D**isplay
CMF	**C**onnection **M**odule **F**ieldbus
CMP	**C**onnection **M**odule **P**ower
DOF	**D**epth **O**f **F**ield. Depth of field
ES	**E**lectrical **s**ource. Electrical power source.
ESD	**E**lectro-**S**tatic **D**ischarge. Electrostatic discharge
GSD	**G**eneral **S**tation **D**escription (generic station description for PROFIBUS/PROFINET)
HTML	**H**yper **T**ext **M**arkup **L**anguage (page description language on the Internet)
I	**I**nput
I_{in}	Input current
I_{out}	Output current
LED	**L**ight **E**mitting **D**iode. Light emitting diode
LPS	**L**imited **P**ower **S**upply
MAC	**M**edium **A**ccess **C**ontrol
MTBF	**M**ean **T**ime **B**etween **F**ailure
MTTF	**M**ean **T**ime **T**o **F**ailure
MTTR	**M**ean **T**ime **T**o **R**epair
O	**O**utput
PCS	**P**rinted **C**ontrast **S**ignal
PLC	**P**rogrammable **L**ogic **C**ontroller
PROM	**P**rogrammable **R**ead **O**nly **M**emory. Programmable non-volatile memory
RA	**R**eading **A**ngle
RAM	**R**andom **A**ccess **M**emory. Direct-access volatile memory
ROM	**R**ead **O**nly **M**emory. Read-only memory (non-volatile)
RTF	**R**ich **T**ext **F**ormat (standardized document format with format description)
SDD	**S**OPAS **D**evice **D**escription (device description file, driver for SICK SOPAS ET software)
SMART	**S**ICK **M**odular **A**dvanced **R**ecognition **T**echnology
SOPAS ET	**S**ICK **O**pen **P**ortal for **A**pplication and **S**ystems **E**ngeneering **T**ool (computer software for Windows for device configuration)
PLC	**P**rogammable **L**ogic **C**ontroller
SELV	Safety Extra Low Voltage
TCP/IP	**T**ransmission **C**ontrol **P**rotocol/**I**nternet **P**rotocol
V_{in}	Input voltage
V_{out}	Output voltage

V_S	Supply voltage
$V_{S\ ext}$	External supply voltage

8011965/1PYS/2024-12-03/en

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