OPERATING INSTRUCTIONS

Lector621

Image-based code reader

SICK
Sensor Intelligence.

Described product

Lector621

Lector621 ECO

Manufacturer

SICK AG
Erwin-Sick-Str. 1
79183 Waldkirch
Germany

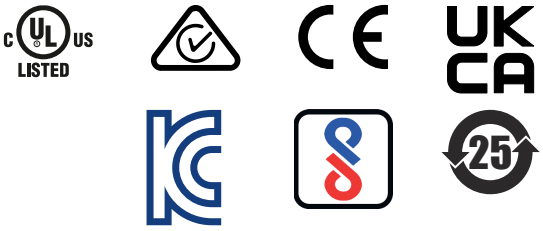
Legal information

EtherCAT®

EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

Original document

This document is an original document of SICK AG.



Contents

1 About this document

1.1 Information on the operating instructions

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

Prerequisites for safe work are:

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

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

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

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

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

1.2 Explanation of symbols

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

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

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

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

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

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

1.3 Related applicable documents

Related applicable documents from SICK

Document	Title	Part number	Source
Addendum to operating instructions	InspectorP621, Lector621: V2D621x-xxxxxx6x	8027368	www.sick.com/8027368

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 image-based code reader Lector621 is an intelligent SICK-4Dpro sensor. The product is suited for automatic, stationary identification and decoding of codes on moving or stationary objects. The product reads all commonly used 1D codes and 2D codes. In read mode, the product transmits the read results via a host interface to a higher-level computer (e.g. PLC) for further centralized processing.

The product is suited for industrial and logistics applications in its two variant lines **Lector621** and **Lector621 ECO**. The product meets the applicable requirements for industrial robustness, interfaces and data processing.

Different operating conditions from the standard product apply for product type V2D621x-xxxxxx6x (cold storage usage). The operating conditions must be adhered to at all times. Information on the operating conditions is included in the addendum to operating instructions for the “InspectorP621, Lector621: V2D621x-xxxxxx6x”.

SICK AG assumes no liability for losses or damage arising from the use of the product, either directly or indirectly. This applies in particular 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 outside of the stated areas, in particular use outside of the technical specifications and the requirements for intended use, will be deemed to be incorrect use.

- The device does not constitute a safety component in accordance with the respective applicable safety standards for machines.
- The device must not be used in explosion-hazardous areas, in corrosive environments or under extreme environmental conditions.
- The device must not be operated in the temperature range below 0 °C.
- Any use of accessories not specifically approved by SICK AG is at your own risk.

WARNING
Danger due to improper use!

Any improper use can result in dangerous situations.

Therefore, observe the following information:

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

2.3 Cybersecurity

Overview

To protect against cybersecurity threats, the operator must have a comprehensive cybersecurity concept, which must be continuously monitored and maintained. 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)

2.4 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 1D technology (bar code) or 2D technology (matrix code)
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.

Danger due to visible radiation is product-specific. See the technical data for more information.

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

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

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

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

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

CAUTION
Optical radiation: Class 1 Laser Product

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

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

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

For both radiation types:

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

CAUTION
Risk of injury due to hot device surface!

The surface of the product can become hot.

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

WARNING
Electrical voltage!

Electrical voltage can cause severe injury or death.

- Work on electrical systems must only be performed by qualified electricians.
- The power supply must be disconnected when attaching and detaching electrical connections.
- The product must only be connected to a voltage supply as set out in the requirements in the operating instructions.
- National and regional regulations must be complied with.
- Safety requirements relating to work on electrical systems must be complied with.

WARNING
Risk of injury and damage caused by potential equalization currents!

Improper grounding can lead to dangerous equipotential bonding currents, which may in turn lead to dangerous voltages on metallic surfaces, such as the housing. Electrical voltage can cause severe injury or death.

- Work on electrical systems must only be performed by qualified electricians.
- Follow the notes in the operating instructions.
- Install the grounding for the product and the system in accordance with national and regional regulations.

2.8 UL conformity

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

NFPA79 applications only. Adapters including field wiring cables are available.

More information can be found on the product page:

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

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

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

3 Product description

3.1 Scope of delivery

Table 2: Scope of delivery

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

[1] Only Lector621 variant

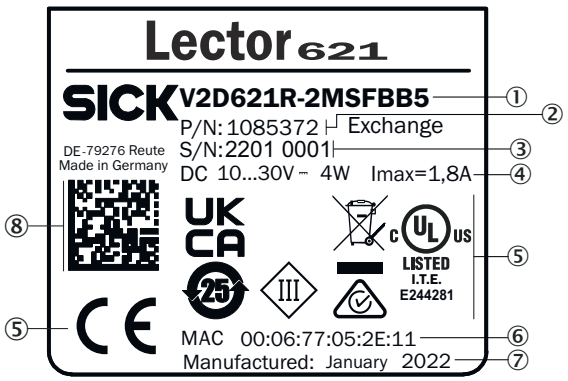
The actual scope of delivery may differ for special designs, additional orders or due to the latest technical changes.

3.2 Product ID

3.2.1 Type label

The type label contains information for identifying the product.

The UL certification is dependent on the type. Any existing UL certification can be found on the type label. The corresponding UL logo is then printed on the label.



① Type designation according to type code
② Part number
③ Serial number
④ Supply voltage, power consumption and maximum current consumption
⑤ Certificates and symbols
⑥ MAC address (placeholder)
⑦ Date of manufacture
⑧ Data Matrix code with product data and link to product page

3.2.2 Type code

Type code structure

V2D aaa b – c d e f g h i

Table 3: Type code

Position	Description	Characteristic
a	Product family	621: Lector621, image sensor resolution 1.3 Mpx (1280 px x 1024 px)
b	Function	R: Reading D: Reading with DPM and OCR
c	Generation	2: 2nd generation
d	Image sensor, color	CMOS matrix sensor M: Monochrome (black-and-white)
e	Integrated illumination unit ; laser alignment aid	S: red left, blue right; laser alignment aid D: left IR , right IR ; laser alignment aid R: red left; no laser alignment aid
f	Parameter set	L: Limited set for variant Lector621 ECO F: Full set for variant Lector621
g	Focal length	B: 9.6 mm F: 17, 1 mm G: 17, 1 mm with visible block filter
h	Connection package	B: Ethernet, serial, CAN, I/O, USB, memory card slot C: Ethernet, serial, CAN, I/O, USB D: Serial, CAN, I/O, USB, memory card slot E: Serial, CAN, I/O, USB
i	Protection class	5: IP 65 6: IP 65, passive cold storage applications

1) Front view
2) IR = infrared light

3.3 Product overview

Important information

NOTICE
Damage to the swivel connector from over-rotation

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

Product overview

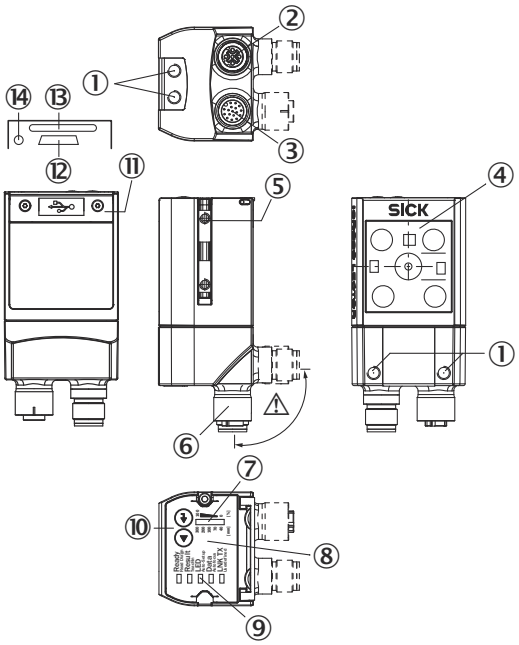


Figure 1: Lector621:

① 4 threaded mounting holes, M5: blind tapped hole; 5 mm deep; max. depth of thread 5 mm
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 Viewing window with four LEDs, integrated illumination unit
⑤ 2 sliding nuts, M5; 5.5 mm deep; as an alternative method of mounting the product
⑥ Swivel connector (swivel range 180°)
⑦ Bar graph
⑧ beeper (under housing cover)
⑨ 5 status LEDs (2 levels)
⑩ 2 function keys
⑪ Cover with 2 fixing screws (TX6 key, captive)
⑫ USB connection (female connector, Micro-B type, 5-pin, for temporary use as service interface)
⑬ Card slot for microSD memory card
⑭ Status LED, status indicator for the microSD memory card

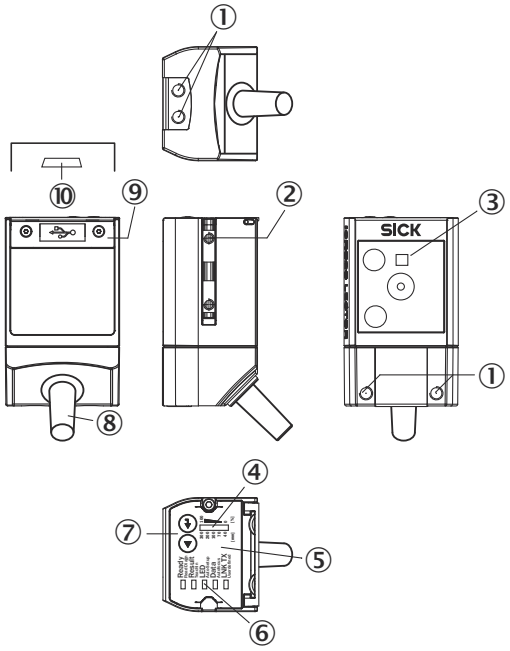


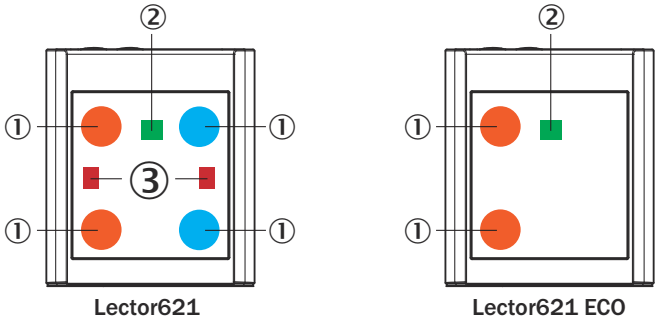
Figure 2: Lector621 ECO: Device view

① 4 threaded mounting holes, M5: blind tapped hole; 5 mm deep; max. depth of thread 5 mm
② 2 sliding nuts, M5; 5 mm deep; as an alternative method of mounting the product
③ Viewing window with two LEDs, integrated illumination unit
④ Bar graph
⑤ beeper (under housing cover)
⑥ 5 status LEDs (2 levels)
⑦ 2 function keys
⑧ Cable (0.9 m) permanently attached to product with male connector, D-Sub-HD, 15-pin (Power/Serial Data/CAN/I/O connection)
⑦ Cover (flap) with two fixing screws (TX6 key, captive)
⑩ USB connection (female connector, Micro-B type, 5-pin, for temporary use as service interface)

Further topics

- Dimensional drawing

3.4 Integrated illumination unit



① Lector621: 4 integrated illumination LEDs (color is type-dependent; position: 2 on the left, 2 on the right)

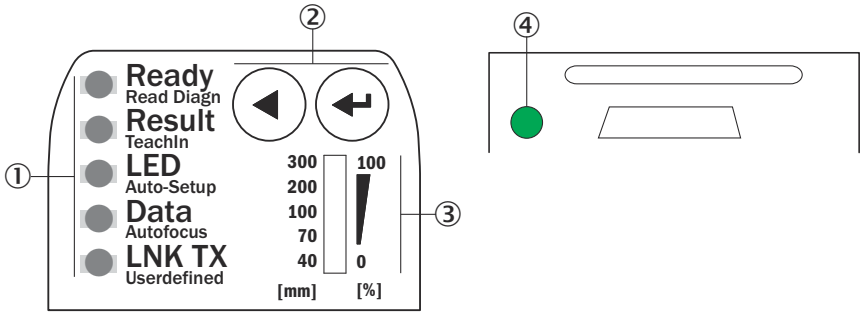
Lector621 ECO: 2 integrated illumination LEDs (color: visible red light; position: on the left)

② 1 feedback-LED (color: visible green light, e.g. for Good Read)

③ Laser alignment aid, can be deactivated (color: visible red light)

3.5 Display and operating elements

Overview



① Status LEDs and product functions

② Function buttons

③ Bar graph

④ Status LED of the microSD memory card

Status LEDs

Table 4: Status LEDs

Display	LED	Color	Status
Ready	●	Green	The product is ready for operation
	●	Red	Hardware or software error
Result	●	Green	Read operation successful
	●	Red	Read operation unsuccessful
LED	●	Green	Read mode: illumination on, internal reading interval open
Data	●	Yellow	Data output via host interface
LNK TX	✳	Green	Data traffic via Ethernet

Display	LED	Color	Status
MicroSD	●	Green	The product does not directly signal access (read, write) to the memory card. The **MicroSD** status LED shows when the saving process is finished when permanently saving the parameter set. • When the device starts saving, the **MicroSD** status LED goes out. • When the product has finished saving, the **MicroSD** status LED lights up green again.

● = illuminated; ✳ = flashing

PROFINET operation (single port)

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

Table 5: LEDs in PROFINET operation (single port)

Ready LED		Product status	Remarks
Green components	Red components		
●	○	The product is ready for operation.	
●	✳ Flashes every 7 seconds.	Network detection in the product is active.	The duration of network detection can be configured in SOPAS ET (default: 3 minutes).
●	✳ Flashes every 0.5 seconds.	PROFINET is activated in the product. The product is not connected to the PROFINET IO controller (PLC) or the product is not configured.	To not use PROFINET, deactivate PROFINET. In the default configuration of the product, automatic PROFINET network detection is activated. This detects during startup whether the product is in a PROFINET environment and activates PROFINET automatically. To prevent this, deactivate PROFINET network detection or set the product name or IP address different from the default. To apply the changed settings, permanently save the changes and restart the product.
✳	✳	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 product.

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

Product functions

Table 6: Product functions

Function	Description
Read Diagn (read diagnosis)	Percentage evaluation: the product records images. The product uses the current settings of the read properties to decode them. With the 0 to 100% bar graph, the product shows the read rate of the last 10% (90% to 100%). The bar graph display is activated in standard read mode.

Function	Description
TeachIn	Teaching in a match code: the product reads the presented code. The product saves the code permanently as a target code for future code comparisons during read mode. The **TeachIn** function is not supported for OCR detection (Lector621 variant only). For Pharmacodes, the **Code type & code length** function must first be defined in SOPAS ET.
Auto-Setup	The product adjusts itself automatically to suit the lighting conditions and the quality of the code presented. The Lector621 variant also adjusts to the working distance. The product permanently stores the acquired values. The **Auto-Setup** function is not supported for OCR detection (Lector621 variant only) or Pharmacodes.
Autofocus	The product adjusts to the working distance. The product permanently stores this working distance.

1) Only Lector621 variant

Table 7: Product functions for action with function buttons

Display	LED	Color	Status
Read Diagn	●	Blue	Test (reading diagnostics) selected
	✳	Blue	Test started
TeachIn	●	Blue	Teach-in selected Default: match code
	✳	Blue	Teach-in started
	●	Green	Teach-in successful
	●	Red	Teach-in unsuccessful Default: match code The product cannot teach in a code.
Auto-Setup	●	Blue	Auto-Setup selected
	✳	Blue	Auto-Setup started
	●	Green	Auto-Setup successfully quit
	●	Yellow	Auto-Setup was partially successful
	●	Red	Auto-Setup was unsuccessful
Autofocus 1)	●	Green	Function can be defined by user
	●	Yellow	Function can be defined by user
	●	Blue	Function can be defined by user
	●	Red	Function can be defined by user

● = illuminated; ✳ = flashing

1) Omitted with the Lector621 ECO.

Further topics

- Calling up product functions

3.6 Acoustic status indicator

The beeper (buzzer) is located under the cover on the top of the product. The beeper can be switched off.

In read mode, the beeper indicates a selectable event with a signal tone (default: event = Good Read).

The beeper also accompanies user operations with different tone sequences. For example, calling up and starting a function with the two function keys.

3.7 Working distance and field of view size

Working distance and field of view size

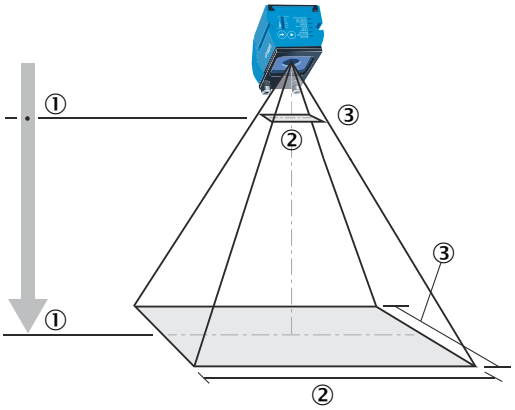


Figure 3: Working distance and field of view size

① Working distance in mm

② Perceived field of view area: horizontal (mm)

③ Perceived field of view area: vertical (mm)

The working distance is measured starting from the housing edge.

The field of view size is determined by the focus position, the focal length of the lens, and the working distance. The necessary working distance can be determined from the field of view diagram.

Further topics

- Field of view

3.8 Focus setting

- Lector621: The device uses the **Auto Setup** function to automatically set the focus position to the working distance. To execute the function, use SOPAS ET or the function keys on the device.
- Lector621 ECO: To set the focus position, enter the working distance manually in SOPAS ET.

The focus position is valid for one working distance. The device does not perform automatic tracking (auto focus) if, for example, the working distance changes significantly.

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.
- To avoid ingress of dust and water, only remove the protective elements, e.g. protective caps of the electrical connections just before attaching the connecting cable.

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 58.
- Relative humidity: see "Technical data", page 58.
- For storage periods of longer than 3 months, check the general condition of all components and packaging on a regular basis.

5 Mounting

5.1 Mounting instructions

- Observe the technical data.
- Protect the sensor from direct and indirect sunlight.
- To prevent condensation, avoid exposing the device to rapid changes in temperature.
- The mounting site has to be designed for the weight of the device.
- Mount the product in a shock and vibration insulated manner.
- Ensure a good dissipation of excess heat from the device to the surroundings, in particular at higher ambient temperatures. Good heat transfer from the device can be achieved, for example, by using a bracket on the mounting base or by ensuring that the back of the device is located at a sufficient distance from the wall of an enclosure.
- Make sure the device has a clear view of the codes.

5.2 Mounting location

5.2.1 Alignment

Vertical mounting

For highest transport speed

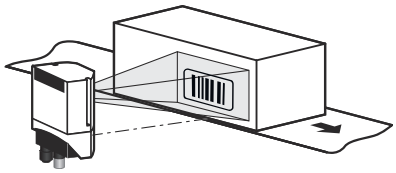


Figure 4: Vertical mounting

Horizontal mounting

For maximum reading field width

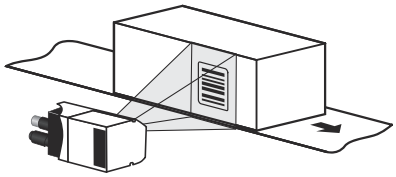


Figure 5: Horizontal mounting

5.2.2 Mounting angle and reflection prevention

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

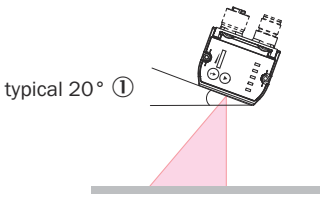


Figure 6: Mounting angle to use, depending on the application

① Typical angle 20°

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

5.3 Assembling the product

Important information

NOTICE

Different operating conditions from the standard product apply for product type V2D621x-xxxxxx6x (cold storage usage). The operating conditions must be adhered to at all times.

Information on the operating conditions is included in the addendum to operating instructions for the “InspectorP621, Lector621: V2D621x-xxxxxx6x” (part number: 8027368, www.sick.com/8027368).

Carefully read the addendum to operating instructions before using the product.

Prerequisites

- 4 or 2 M5 screws for mounting the product on mounting equipment

Approach

1. Mount the product on suitably prepared mounting equipment using M5 screws and by means of the provided threaded mounting holes or sliding nuts.
   - Screw the screws no more than 5 mm into the threaded mounting holes or sliding nuts.
   - Use the threaded mounting holes in pairs on the front or bottom of the product or the two sliding nuts on the side of the product.
   - Attach the optional SICK mounting equipment ordered separately using the sliding nuts on the product.
2. Align the product taking into consideration the field of view and the application circumstances.
3. Connect the product to interfaces and supply voltage when disconnected from voltage.
4. Start the product.

✓ The **Ready** status LED lights up green.

5. Perform fine tuning.

Further topics

- Field of view
- Mounting systems are available as accessories: Accessories
- Connecting

5.4 Mounting the read cycle sensor (optional)

Prerequisites

- The product is triggered via an external trigger sensor.

Approach

► Mount the trigger sensor near the product. The mounting location of the product depends on distance **a** of the codes from the front object edge. Depending on the application, mount the product so that codes on objects of different sizes can be read completely during the reading interval.

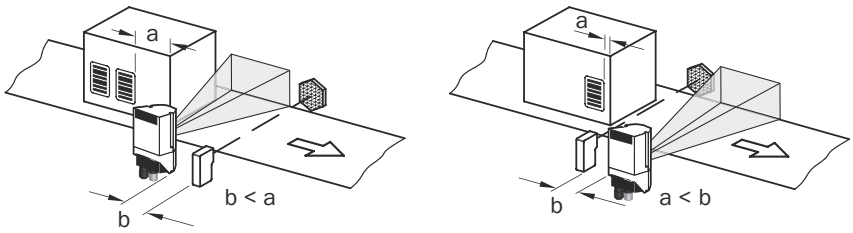


Figure 7: Positioning an external trigger sensor for the read cycle (mounting example)

6 Electrical installation

6.1 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 71.

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

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

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

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

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

The supply voltage must be as specified in the technical data, see "Technical data", page 58.

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

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

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

6.1.1 Data cables

Important information

NOTE
Layout of data cables

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

Length of cable and data transmission rate

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

Further topics

- For information on data transmission rates and lengths of cable: Wiring the data interface

6.2 Prerequisites for safe operation of the device

WARNING
Risk of injury and damage caused by electrical current!

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

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

Remedial measures

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

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

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

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

This is achieved by complying with the following conditions:

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

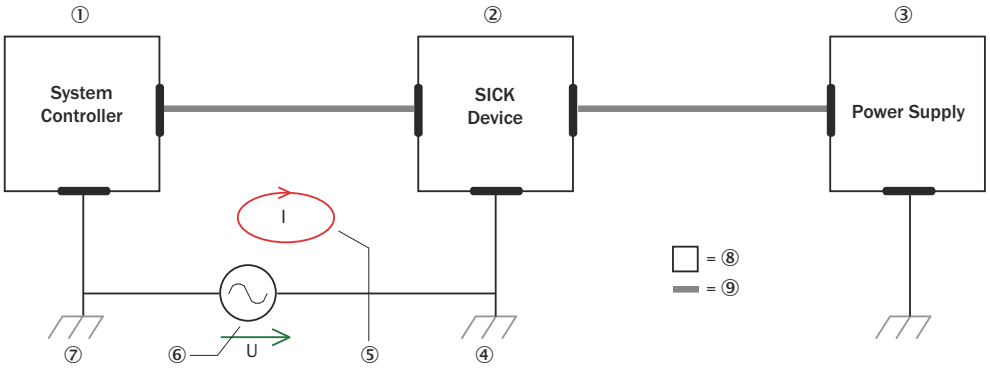


Figure 8: Example: Occurrence of equipotential bonding currents in the system configuration

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.

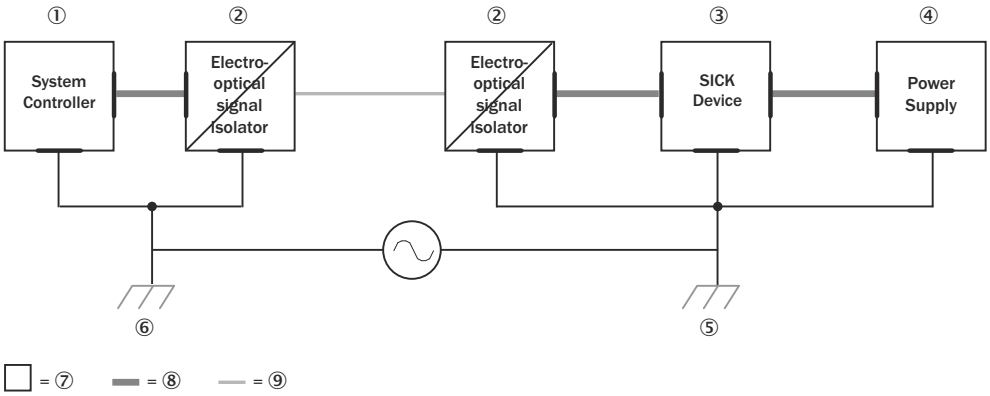


Figure 9: Example: Prevention of equipotential bonding currents in the system configuration by the use of electro-optical signal isolators

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.

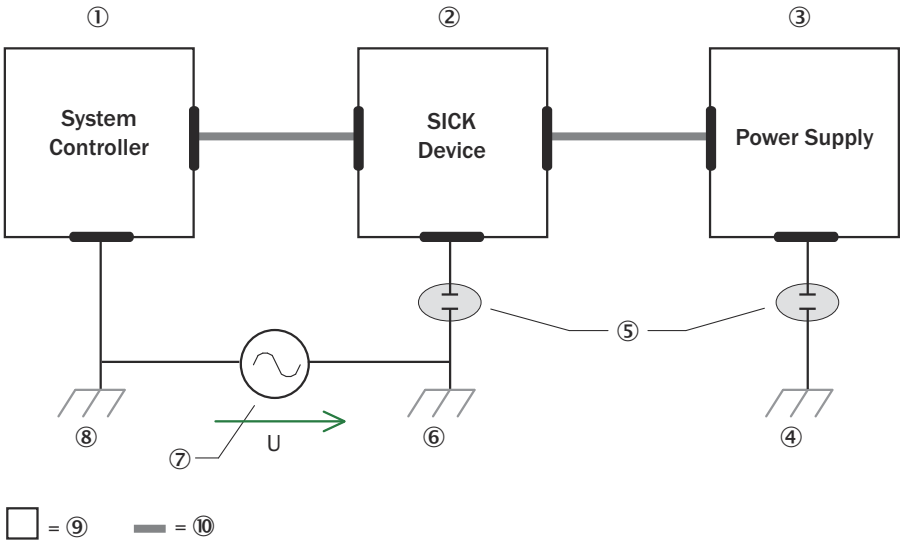


Figure 10: Example: Prevention of equipotential bonding currents in the system configuration by the insulated mounting of the device

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 Connection diagrams

6.3.1 Service mode connection schematic

This operating mode is recommended for initial commissioning of the product.

NOTE
The USB interface is used in industrial environments only as a service interface for temporary use (e.g. for configuration, troubleshooting). Use as a data interface (host) while the system is in operation is not supported.

Lector621

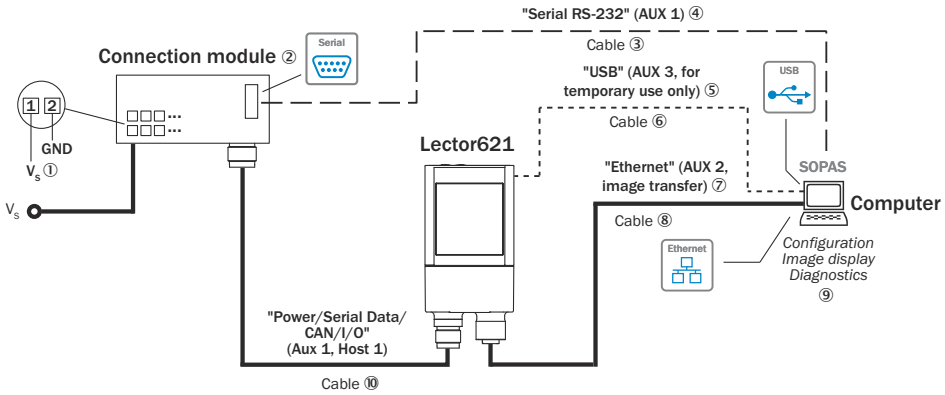


Figure 11: Connection block diagram for commissioning (Lector621)

① Supply voltage V_S, ($V_S = U_V$)

② Connection module CDB650-204 or CDM420-0006

③ Null modem cable (female connector, D-Sub, 9-pin/female connector, D-Sub, 9-pin), crossed TxD and RxD

④ Serial RS-232, alternative to USB or Ethernet AUX port, serial RS-232 without image transmission

⑤ USB, alternative to serial RS-232 or Ethernet AUX port, USB for temporary use only as a servicing interface

⑥ Adapter cable (male connector, USB, Micro-B type/male connector, USB, type A)

⑦ Ethernet, AUX interface (alternative to RS-232 or USB)

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

⑨ Configuration with SOPAS ET, image display or reading diagnostics

⑩ For CDB650-204: Connection cable 1:1 (female connector, M12, 17-pin, A-coded/male connector, M12, 17-pin, A-coded)

For CDM420-0006: Adapter cable (female connector, M12, 17-pin, A-coded/male connector, DSub-HD, 15-pin)

Lector621 ECO

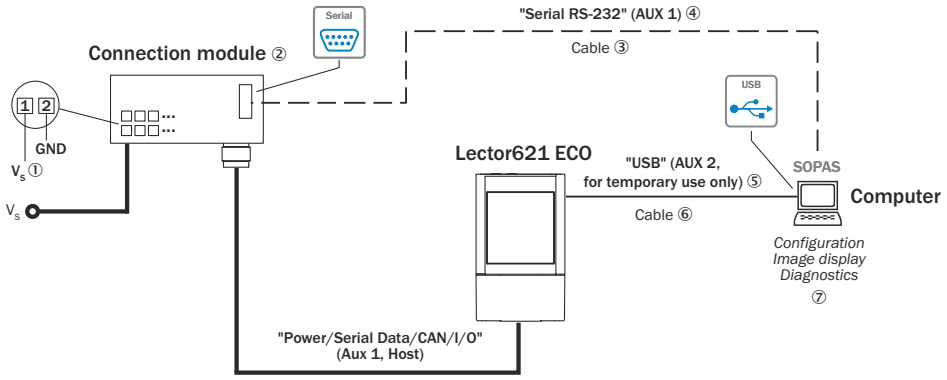


Figure 12: Connection block diagram for commissioning (Lector621 ECO)

① Supply voltage $V_{S,}$(V_S = U_V)

② Connection module CDB620 or CDM420

③ Null modem cable (female connector, D-Sub, 9-pin/female connector, D-Sub, 9-pin), crossed TxD and RxD

④ Serial RS-232, alternative to USB, no image transmission

⑤ USB, alternative to serial RS-232, USB for temporary use only as a servicing interface

⑥ Adapter cable (male connector, USB, Micro-B type/male connector, USB, type A)

⑦ Configuration with SOPAS ET, image display or reading diagnostics

6.3.2 Connection principle for read mode

Lector621

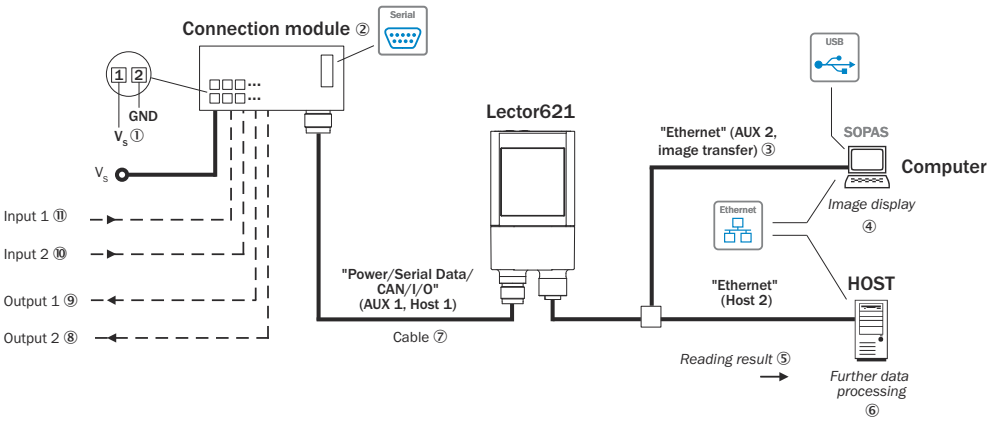


Figure 13: Connection block diagram for read mode (Lector621)

① Supply voltage V_S, ($V_S = U_V$)

② Connection module CDB650-204 or CDM420-0006

③ Ethernet, AUX interface (image transmission)

④ Image display

⑤ Read result

⑥ Data further processing

⑦ For CDB650-204: Connection cable 1:1 (female connector, M12, 17-pin, A-coded/male connector, M12, 17-pin, A-coded)

For CDM420-0006: Adapter cable (female connector, M12, 17-pin, A-coded/male connector, DSub-HD, 15-pin)

⑧ Digital output 2, e.g. for connecting an LED

⑨ Digital output 1, e.g. for connecting an LED

⑩ Digital input 2, e.g. for connecting an incremental encoder

⑪ Digital input 1, e.g. for connecting a trigger sensor for the read cycle

Lector621 ECO

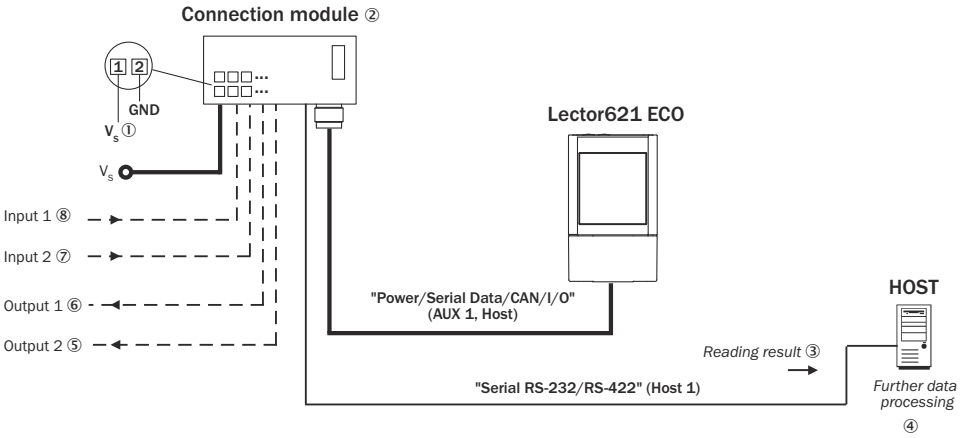


Figure 14: Connection block diagram for read mode (Lector621 ECO)

① Supply voltage V_S = (V_S = V_U)
② Connection module CDB620 or CDM420
③ Read result
④ Data further processing
⑤ Digital output 2, e.g. for connecting an LED
⑥ Digital output 1, e.g. for connecting an LED
⑦ Digital input 2, e.g. for connecting an incremental encoder
⑧ Digital input 1, e.g. for connecting a trigger sensor for the read cycle

6.3.3 Example applications

Lector621

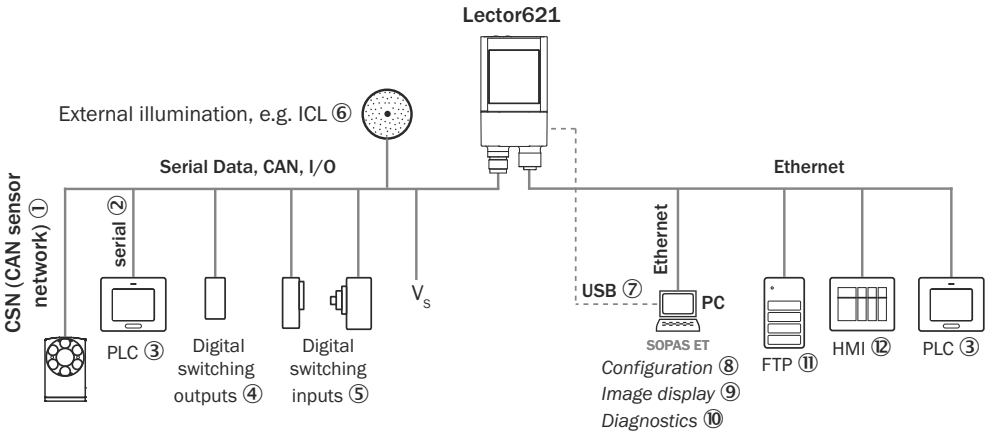


Figure 15: Facility for connecting (Lector621)

① CSN (CAN sensor network)
② Serial
③ PLC (programmable logic controller)
④ Digital outputs, e.g. for signal lamps
⑤ Digital inputs e.g. for encoders, photoelectric sensors (trigger sensor)
⑥ External illumination unit, e.g. ICL
⑦ USB interface, for temporary use as a servicing interface only
⑧ Configuration
⑨ Image display
⑩ Diagnostics
⑪ FTP server (image storage)
⑫ HMI interface

Lector621 ECO

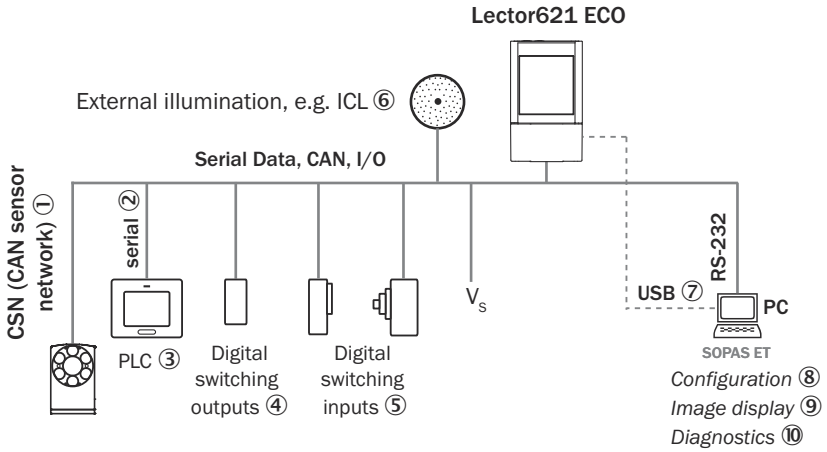


Figure 16: Facility for connecting (Lector621 ECO)

① CSN (CAN sensor network)
② Serial
③ PLC (programmable logic controller)
④ Digital outputs, e.g. for signal lamps
⑤ Digital inputs e.g. for encoders, photoelectric sensors (trigger sensor)
⑥ External illumination unit, e.g. ICL
⑦ USB interface, for temporary use as a servicing interface only
⑧ Configuration
⑨ Image display
⑩ Diagnostics

6.4 Pin assignments

6.4.1 Lector621

Power, Serial Data, CAN, I/O connection

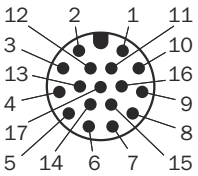


Figure 17: Male connector, M12, 17-pin, A-coded

Table 8: Pin assignment for Power, Serial Data, CAN, I/O

Contact	Signal	Function
1	GND	Zero potential
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	Serial data interface (sender+)
6	TD– (RS-422/485), host TxD (RS-232), host	Serial data interface (sender–)
7	TxD (RS-232), Aux	Serial service interface (sender)
8	RxD (RS-232), Aux	Serial service interface (receiver)

Contact	Signal	Function
9	SensGND	Zero potential digital inputs
10	Sensor 1	Digital input 1
11	RD+ (RS-422/485), host	Serial data interface (receiver+)
12	RD– (RS-422/485), host RxD (RS-232), host	Serial data interface (receiver–)
13	Result 1	Digital output 1
14	Result 2	Digital output 2
15	Sensor 2	Digital input 2
16	Result 3	Digital output 3
17	Result 4	Digital output 4
–	–	Shielding

Ethernet connection

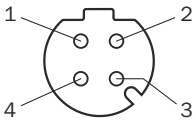


Figure 18: M12 female connector, 4-pin, D-coded

Table 9: Ethernet pin assignment

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

6.4.2 Lector621 ECO

Power, Serial Data, CAN, I/O connection

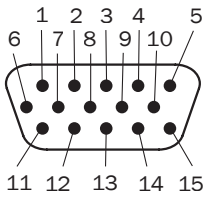


Figure 19: Male connector, D-Sub-HD, 15-pin

Table 10: Pin assignment for Power, Serial Data, CAN, I/O

Pin	Signal	Function
1	V_S	Supply voltage
2	RxD (RS-232), AUX	Serial service interface (receiver)
3	TxD (RS-232), AUX	Serial service interface (sender)
4	Sensor 2	Digital input 2
5	GND	Zero potential
6	RD+ (RS-422/485), host	Serial data interface (receiver+)
7	RD– (RS-422/485), host RxD (RS-232), host	Serial data interface (receiver–)

Pin	Signal	Function
8	TD+ (RS-422/485), host	Serial data interface (sender+)
9	TD– (RS-422/485), host TxD (RS-232), host	Serial data interface (sender–)
10	CAN H	CAN bus (IN/OUT)
11	CAN L	CAN bus (IN/OUT)
12	Result 1	Digital output 1
13	Result 2	Digital output 2
14	Sensor 1	Digital input 1
15	SensGND	Zero potential digital inputs

6.5 Connecting

6.5.1 Using CDB and CDM connection modules

Table 11: Possible combinations of device and connection modules

Device (variant)	Connection on the device	Connection module	Connection cable
Lector621	Male connector, M12, 17-pin, A-coded	CDB650-204	Cable 1:1 [1]
		CDM420-0006 [2]	Adapter cable [3]
Lector621 ECO	Cable with male connector, D-Sub-HD, 15-pin	CDB620 [4]	–
		CDM420 [4][5]	

1) Connection cable 1:1 (female connector, M12, 17-pin, A-coded / male connector, M12, 17-pin, A-coded).
2) CDM420-0007: for connecting 2 devices.
3) Adapter cable (female connector, M12, 17-pin, A-coded / male connector, D-Sub-HD, 15-pin).
4) All variants of the connection module in each case.
5) CDM420-0004 and CDM420-0007: for connecting 2 devices each.

Connecting device with connection module

Connection modules	Reference
CDB650-204	see "Connection of the device to CDB650-204", page 74
CDM420-0006	see "Connection of the device to CDM420-0006", page 88

NOTE

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

Connection module product page

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

6.5.2 Connecting the supply voltage

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

Table 12: Required supply voltage V_S and power output

Device variant	Supply voltage V_S	Power source: required power output [1]
Lector621	DC 12 V ... 24 V ± 20%	Maximum 25 W

Device variant	Supply voltage V_S	Power source: required power output [1]
Lector621 ECO	DC 12 V ... 24 V ± 20%	Maximum 18 W

1) Valid for device with 4 (2) loaded digital outputs (each 100 mA).

When connecting via the optional CDB or CDM connection module: if the CMC600 cloning module is used, an additional output power of 0.5 W is required.

Table 13: Lector621: typical current consumption depending on supply voltage

Designation		Supply voltage (V_S) in [DC V]			
		9.6 (12 V -20%)	12	24	28.8 (24 V +20%)
Current consumption, digital outputs unloaded	$I_{B\ RMS}$ [A]	0.4	0.32	0.17	0.14
Power loss, digital outputs unloaded	P_{RMS} [W]	3.84	3.84	4.08	4.03
Maximum current consumption, digital outputs unloaded	$I_{B\ Peak}$ [1] [A]	1.05	0.90	0.45	0.35
Typical, all 4 digital outputs loaded (0.1 A per output)	$I_{B\ RMS\ 4Out}$ [A]	0.8	0.72	0.57	0.54
Power loss, all 4 digital outputs loaded (0.1 A per output)	$P_{Peak\ 4Out}$ [W]	7.68	8.64	13.68	15.55

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

Table 14: Lector621 ECO: typical current consumption depending on supply voltage

Designation		Supply voltage (V_S) in [DC V]			
		9.6 (12 V -20%)	12	24	28.8 (24 V +20%)
Current consumption, digital outputs unloaded	$I_{B\ RMS}$ [A]	0.39	0.31	0.16	0.14
Power loss, digital outputs unloaded	P_{RMS} [W]	3.74	3.72	3.84	4.03
Maximum current consumption, digital outputs unloaded	$I_{B\ Peak}$ [A]	1.05	0.90	0.45	0.35
Typical, both digital outputs loaded (0.1 A per output)	$I_{B\ RMS\ 2Out}$ [A]	0.59	0.51	0.36	0.34
Power loss, all 2 digital outputs loaded (0.1 A per output)	$P_{Peak\ 2Out}$ [W]	5.66	6.12	8.64	9.79

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

Protecting the supply cables

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

Observe applicable standards (Germany):

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

Connecting device without connection module

For a supply voltage of DC 12 V to 24 V ± 20%, protect the device with a separate fuse.

Current strength of the external fuse:

- Lector621: 2 A
- Lector621 ECO: 0.8 A

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

Connecting device with connection module

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

Table 15: Protection of the supply voltage in the connection module

Device	Connection modules	Supply voltage fuse protection	Reference
Lector621	CDB650-204	2 A (slow-blow)	see "Connecting supply voltage for the device in CDB650-204", page 77
	CDM420-0006	2 A (slow-blow)	see "Connecting supply voltage for the device in CDM420-0006", page 92
Lector621 ECO	CDB620	0.8 A (slow-blow)	see "Connecting supply voltage for the device in CDB620-001", page 107
	CDM420-0001	0.8 A (slow-blow)	see "Connecting supply voltage for the device in CDM420-0001", page 120

6.5.3 Wiring the data interface

Wiring the Internet interface

The Ethernet interface is not available for the Lector621 ECO device variant.

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

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

Table 16: Data transmission rates and recommended maximum lengths of cable

Interface	Data transmission rate	Distance to the target computer (host)
RS-232	Up to 19.2 kBd	Max. 15 m
	38.4 kBd ... 57.6 kBd	Max. 5 m
	115.2 kBd ... 500 kBd	< 2 m
RS-422 [1)]	Up to 38.4 kBd	Max. 1,200 m
	38.4 kBd ... 57.6 kBd	Max. 500 m
	57.6 kBd ... 500 kBd	Max. 10 m

1) For RS-422-compatible 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.

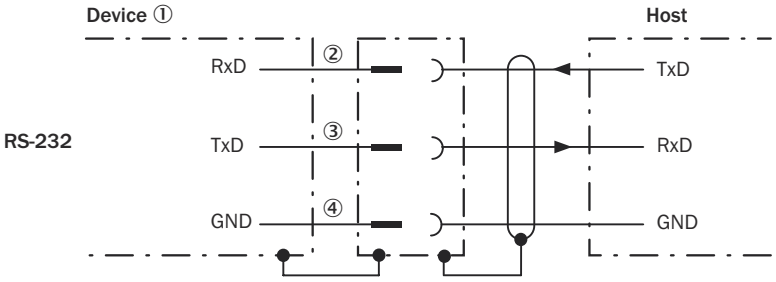


Figure 20: Wiring of the RS-232 serial data interface

① Device

②...④ Pin assignment: see RS-232 pin assignment for the respective device

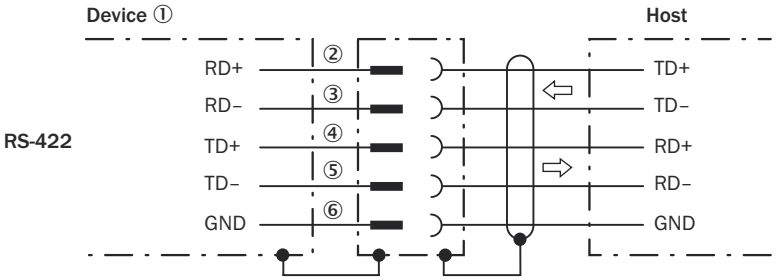


Figure 21: Wiring of the RS-422 serial data interface

① Device

②...⑥ Pin assignment: see RS-422 pin assignment for the respective device

NOTE

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

Wiring data interfaces via a connection module

Table 17: Lector621

Connection modules	Data interface	Reference
CDB650-204	RS-232	see "Wiring serial host interface RS-232 of the device in CDB650-204", page 77
CDB650-204	RS-422	see "Wiring serial host interface RS-422 of the device in CDB650-204", page 78
CDM420-0006	RS-232	see "Wiring serial host interface RS-232 of the device in the CDM420-0006", page 93
CDM420-0006	RS-422	see "Wiring serial host interface RS-422 of the device in the CDM420-0006", page 93

Table 18: Lector621 ECO

Connection modules	Data interface	Reference
CDB620-001	RS-232	see "Wiring serial host interface RS-232 of the device in the CDB620-001", page 107
CDB620-001	RS-422	see "Wiring serial host interface RS-422 of the device in the CDB620-001", page 108
CDM420-0001	RS-232	see "Wiring serial host interface RS-232 of the device in the CDM420-0001", page 121
CDM420-0001	RS-422	see "Wiring serial host interface RS-422 of the device in the CDM420-0001", page 121

Termination of the RS-422 data interface

Termination can be implemented in the connection module via switches.

Additional information on this can be found in the operating instructions for the relevant connection module.

6.5.4 Wiring the CAN interface

NOTE

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

Make further settings in the device corresponding to the function of the device in the system configuration.

Wiring CAN interfaces via a connection module

Device	Connection modules	Interface	Reference
Lector621	CDB650-204	CAN	see "Wiring the CAN interface of the device in the CDB650-204", page 79
	CDM420-0006	CAN	see "Wiring the CAN interface of the device in the CDM420-0006", page 94
Lector621 ECO	CDB620-001	CAN	see "Wiring the CAN interface in the CDB620-001", page 109
	CDM420-0001	CAN	see "Wiring the CAN interface of the device in the CDM420-0001", page 122

6.5.5 Wiring the digital inputs

The device has 2 switching digital inputs (Sensor1, Sensor 2).

Functions (examples)

- Start and end external reading cycle.
- Feed in incremental signal.

Table 19: Position of digital inputs

Device	Position
Lector621	• Male connector of the device (M12, 17-pin, A-coded) • Adapter cable (female connector, M12, 17-pin, A-coded/male connector, D-Sub-HD, 15-pin) • Open end of the adapter cable (female connector, M12, 17-pin, A-coded/open end)
Lector621 ECO	Male connector, D-Sub-HD, 15-pin of the connecting cable

All digital inputs are available at the individual positions.

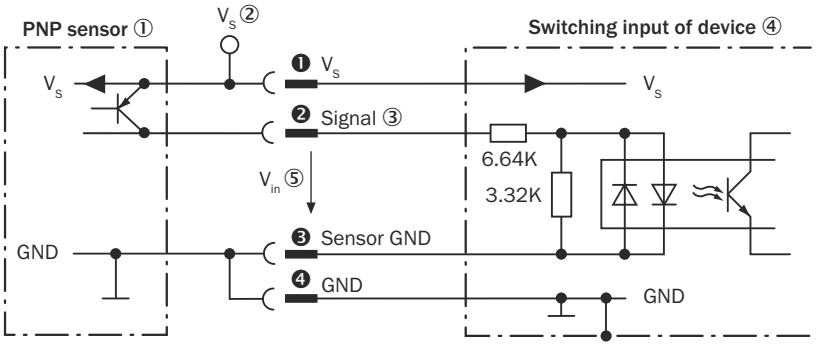


Figure 22: Wiring a digital input

① Trigger sensor (PNP sensor)
② Supply voltage V_S
③ Input signal
④ Digital input of the device (Sensor 1, Sensor 2)
⑤ Input voltage V_{in}
❶ ... ❹ Pin assignment (see respective device)

Table 20: Characteristic data of the digital inputs (Sensor 1, Sensor 2)

Switching behavior	Power to the input starts the assigned function, e.g. start of the internal reading interval of the device. Default: active high Debouncing: 10 ms (standard)
Features	• Opto-decoupled, reverse polarity protected • Can be wired to PNP output of a trigger sensor
Electrical values	The electrical values are identical for all digital inputs of the device. 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 V_{in}.
2) Input current I_{in}.

Function assignment

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

External digital inputs

If the CMC600 cloning module is used in the CDB or CDM connection module, 2 additional external digital inputs (external input 1, external input 2) are available. The external digital inputs are located at the terminals of the connection module.

NOTE
The external digital inputs are software-controlled and therefore do not offer the same timing precision as physical digital inputs. The external digital inputs may not be 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.

Wiring digital inputs via connection module

Device	Connection modules	Digital inputs	Reference
Lector621	CDB650-204	SENS/IN 1 SENS/IN 2	see "Wiring digital inputs of the device in the CDB650-204", page 81
		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 83
	CDM420-0006	Sensor 1 Sensor 2	see "Wiring digital inputs of the device in the CDM420-0006", page 97
		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 99
Lector621 ECO	CDB620-001	Sens 1 Sens 2	see "Wiring digital inputs of the device in the CDB620-001", page 111
		External input 1 (IN 1) External input 2 (IN 2)	see "Wiring the external digital inputs of the device in the CDB620-001", page 113
	CDM420-0001	Sensor 1 Sensor 2	see "Wiring digital inputs of the device in the CDM420-0001", page 124
		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 126

6.5.6 Wiring the digital outputs

The device has 2 (Result 1, Result 2) or 4 (Result 1 to Result 4) switching digital outputs. The digital outputs are used to signal events in the read operation. Different functions can be assigned to the digital outputs independently of each other for this purpose. If the assigned event occurs, then the corresponding digital output becomes live after the end of the read cycle for the selected pulse duration, for example (default).

Table 21: Position of digital outputs

Device	Position
Lector621	• Male connector of the device (M12, 17-pin, A-coded) • Open end of the adapter cable (female connector, M12, 17-pin, A-coded/open end) • CDB650-204 connection module
Lector621 ECO	Male connector, D-Sub-HD, 15-pin of the connecting cable

All digital outputs are each available at the individual positions.

Lector621 device variant: the 4 digital outputs are available reduced to 2 outputs (Result 1, Result 2) in the CDM420-0006 connection module. Connect the device to the CDM420-0006 connection module using an adapter cable (female connector, M12, 17-pin, A-coded / male connector, D-Sub-HD, 15-pin).

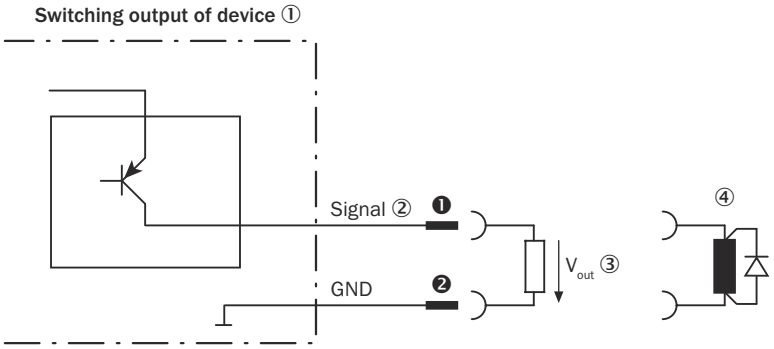


Figure 23: Wiring a digital output

① Lector621: Digital output of the device (Result 1 to Result 4)

Lector621 ECO: Digital output of the device (Result 1 or Result 2)

② Output signal

③ Output voltage V_{out}

④ With inductive load: see note

❶... ❷ For pin assignment, see respective device

Table 22: Characteristic data of the digital outputs

Switching behavior	PNP switching to supply voltage V_S Default: No function Logic: not inverted (active high)
Features	• Short-circuit protected • Not electrically isolated from V_S [1]
Electrical values	0 V ≤ V_{out} [2] ≤ V_S (V_S −1.5 V) ≤ V_{out} ≤ V_S at I_{out} [3] ≤ 100 mA

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

NOTE

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

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

NOTE

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

Function assignment

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

External digital outputs

If the CMC600 cloning module is used in the CDB or CDM connection module, 2 additional external digital outputs (external output 1, external output 2) are available. The external digital outputs are located at the terminals of the connection module.

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

NOTE
The external digital outputs are software-controlled and therefore do not offer the same timing precision as physical digital outputs. The external digital outputs may not be suitable for time-critical applications.

Wiring digital outputs via connection module

Device	Connection modules	Digital outputs	Reference
Lector621	CDB650-204	RES/OUT 1 RES/OUT 2	see "Wiring digital outputs of the device in the CDB650-204", page 85
		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 86
	CDM420-0006	Result 1 Result 2	see "Wiring digital outputs of the device in the CDM420-0006", page 101
		External output 1 (AUX Out 1) External output 2 (AUX OUT 2)	see "Wiring the external digital outputs of the device in the CDM420-0006", page 103
Lector621 ECO	CDB620-001	Res 1 Res 2	see "Wiring digital outputs of the device in the CDB620-001", page 115
		External output 1 (OUT 1) External output 2 (OUT 2)	see "Wiring the external digital outputs of the device in the CDB620-001", page 116
	CDM420-0001	Result 1 Result 2	see "Wiring digital outputs of the device in the CDM420-0001", page 128
		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 129

7 Commissioning

7.1 Start SOPAS ET

Overview

SOPAS ET is used for parameterization and servicing purposes (e.g., diagnostics, data logger, firmware update). If the product has been parameterized with the operating buttons, use SOPAS ET to continue parameterization. The product outputs the recorded images to SOPAS ET for display.

Prerequisites

- Computer with the SOPAS ET software installed
  Use SOPAS ET version 3.0 or above.
  The most up-to-date version of the SOPAS ET software can be downloaded from www.sick.com/SOPAS_ET. The respective system requirements for installing SOPAS ET are also specified there.
- Ethernet connection (recommended) or alternatively a free USB port
- SDD file (device description file)
  You can install the SDD file using the device catalog in SOPAS ET. Use the wizard in SOPAS ET to do this. The SDD file can be installed from the product or the SICK website. To install it from the SICK website, you need an Internet connection.

Approach

1. Install the latest version of the SOPAS ET software and the current device description file (SDD file) for the product variant. In this case, select the “Complete” option as suggested by the installation wizard. Administrator rights may be required on the computer to install the software.
2. Start “SOPAS ET” after completing the installation.
3. Establish a connection between SOPAS ET and the product.

✓ The connection wizard starts automatically.
The following IP addresses are configured by default on the product:
   - IP address P1: 192.168.0.1
   - Subnet mask: 255.255.255.0

4. Double-click on the desired product to add it to the project.
5. To open the product window, double-click the product in the **New Project** window.
6. Select display of the user interface.

✓ SOPAS ET establishes communication with the product and loads the associated device description file for the product.

7. In the **Wizard** window, click on the **Code Reading** button.

✓ The **Initial Setup** window appears.

8. Position the code within the displayed region. Follow the instructions.

✓ The effects of any parameter changes are directly visible.

✓ The product will continuously record images and automatically attempt to find the appropriate settings for the image and the decoder. If the read is successful, these settings can be saved directly.

7.2 Configuration with SOPAS ET

7.2.1 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.

7.2.2 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 23: 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 **Lector6xx** in the menu bar.

3. Under **Password** > select **Change password**.
4. Change desired password.

7.2.3 Configuring the product manually

1. In the **Online Image** window, click the **Live** button.

✓ In the **Live** mode, the product starts recording images consecutively. The product uses the current settings to decode them. The effects of any parameter changes are thus directly visible.

NOTE

Deactivated in Live mode

- Digital inputs and outputs
- Data output via the host interface

2. Align the product in the desired depth of field range with a medium-height object with a test code.
3. Click the **Camera & Illumination** configuration bar. Use the **Shutter timer** and **Brightness** sliders to adjust the image brightness so that the code is easy to see.
4. Only available in **Extended** mode: activate the sharpness diagnostic bar. To do this, go to the **Camera & Illumination** area and click the **Display sharpness** checkbox.

7.2.4 Continuing the configuration

1. Make additional settings (e.g. codes, triggers, data processing, data interface).
2. In the **Online Image** window, click the **Operation** button.
3. Test the settings during operational use.

7.2.5 Complete the configuration

1. To permanently save the parameter set in the product: Click the button.
2. To permanently save the parameter set on the PC: Click the button.

7.3 Configuration with operating buttons

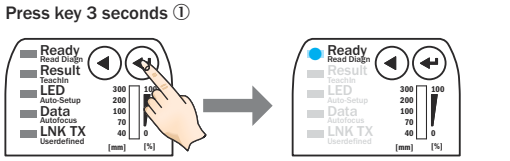
7.3.1 Performing Auto Setup

The two function buttons, the second display level of the status LEDs and the bar graph product are used to manually adjust the reading characteristics of the device with **Auto Setup**.

NOTE

Auto Setup is not possible with a Pharmacode.

1. Start **Setup** mode.

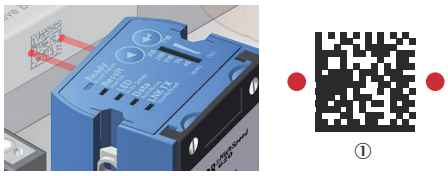


① Press the ↵ function button for 3 seconds

2. Align the product with the code.

NOTE

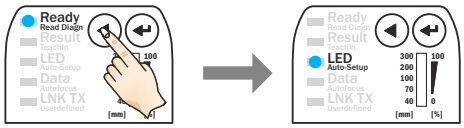
The Lector621 ECO does not have a laser alignment aid.



① Test code

3. Select **Auto Setup**.

Press key 2 x shortly ①

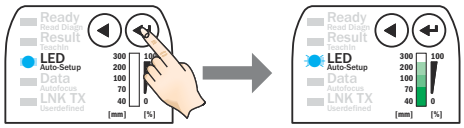


① Press the ◀ function button twice briefly.

✓ The **Auto Setup** LED lights up blue.

4. Start **Auto Setup**.

Press key 1 x shortly ①



① Press the ◀↵ function button once briefly.

✓ The **Auto Setup** LED flashes blue.
- Lector621: the product adjusts itself automatically to the lighting conditions, the code quality, and the working distance.
- Lector621 ECO: the product adjusts itself automatically to suit the lighting conditions and the quality of the code.

NOTE

If the **Auto Setup** LED lights up yellow or red, the read result is inadequate. If this is the case, check the alignment and distance of the product in relation to the code. Repeat the process.

5. Wait until **Auto Setup** has finished. The bar graph display shows the progress of the **Auto Setup** function in percent. 100% means **Auto Setup** has finished.

✓ The **Auto-Setup** LED indicates the result see "Display and operating elements", page 15.

6. Exit **Live** mode. Save parameters.

✓ The existing configuration in the product is overwritten.

Alternatively, the product saves the parameters automatically if 5 minutes elapse without a pushbutton being pressed, and it returns to read mode.

7.3.2 Calling up product functions

Overview

The two function buttons are used for manually calling up product functions without using a computer. On the second display level, the status LEDs indicate the selectable product functions and the execution of a product function.

Important information

NOTE
With the **Auto-Setup** function, make sure that a medium-high object is in the reading field.

Calling up product functions

1. Start **Setup** mode: press the return key (↵) for approx. 3 seconds.
✓ The product interrupts the current read mode, switches off all status LEDs and the bar graph display and switches into button operating mode.
✓ The product now ignores all further external read cycles. The product does not output any read results via the host interface. The beeper confirms this process with an ascending melody.
✓ The **Read Diagn** function is preselected as the first function. The LED lights up.
2. Press the arrow button (◀) repeatedly until the LED of the desired function lights up. The product runs through all possible functions step-by-step without executing them and then starts again from the beginning. The beeper confirms every step with a tone.
3. Press the return key (↵) to confirm the selected function.
✓ The LED of the desired function flashes. The beeper confirms the start with a double tone.
✓ The product executes the function. The product automatically returns to read mode after 5 minutes without pushbutton operation.
✓ The product automatically ends the **TeachIn** (for match code), **Auto Setup** and **Autofocus** (Lector621 variant only) functions when the product has successfully read the presented code. The assigned LED lights up green and the beeper confirms the successful read with an ascending melody.
4. To manually end (cancel) a function, press the return button (↵) again and hold for 3 seconds.
✓ The beeper confirms the change with an ascending melody. The **Ready** LED lights up again.
✓ The product is ready for reading and is waiting for a read cycle.

Further topics

- Display and operating elements

7.4 Saving the parameter set

The product is configured for the application using SOPAS ET. The parameter set is initially adjusted in the working memory of the product. You can permanently save the parameter set in SOPAS ET and then load it into the permanent parameter memory of the product. To be able to restore the setting to a replacement product, for example in the event of a product failure, you should also save the parameter set externally.

Approach

1. Permanently saving the parameter set of the product in SOPAS ET: **Parameters** > **Save permanently**.
✓ The product stores the parameter set internally in the permanent parameter memory.
✓ The product additionally saves the parameter set in the external storage medium.
2. Also save the parameter set manually as a project file (*.sopas) on the computer.

7.5 External data back-up

Manual data backup using project file

The parameter set can be manually saved on the computer as a project file (*.sopas). This is the generally recommended procedure. Using the project file, the parameter set can be transferred to a replacement product via download.

Automatic data backup

An additional storage medium is required to automatically save the parameter set to an external location. The product is permanently connected to the external storage medium.

External storage medium

- MicroSD memory card
- CMC600 cloning module, integrated into the Connection Device Basic or Connection Device Modular connection module
- Connection Device Fieldbus module, continuous operation of the product in proxy mode
  If required, use the microSD memory card in combination with a CMC600 cloning module or a Connection Device Fieldbus fieldbus module.

Once it is switched on, the product automatically detects an external storage medium. The subsequent product behavior depends on the content of the storage medium. The goal is for the internal parameter set and the parameter set saved externally to always be identical.

Content of the storage medium	Behavior
Empty	Once the parameter set is permanently saved, the product also saves the internal parameter set on the storage medium. The prerequisite is that there is enough storage space.
No parameter set possible to interpret	
Parameter set possible to interpret	After being switched on, the product automatically loads the compatible parameter set from the external storage medium into the working memory and internal, permanent parameter memory. The product then starts with its new valid parameter set.

Use in PROFINET

1 After starting, the product loads the last permanently stored internal parameter set to its working memory.
2 The product then searches for a valid parameter set in the optional external memory card slot. If there is a positive search result, the product overwrites the existing parameter set in its working memory with this external parameter set.
3 If the PROFINET controller sends a parameter set, the product again overwrites the parameter set in its working memory. These changes are lost when the product is switched off. The PROFINET controller must then again send the most recently valid parameter values each time the product is restarted (supply voltage is switched on).

7.6 MicroSD memory card

MicroSD memory card

The product has a card slot for a microSD memory card integrated in the housing. The memory card is used as an external storage medium. The microSD memory card can also be ordered as an optional accessory. To ensure that the memory card functions reliably, only use card types (industrial standard) approved by SICK.

Functions

Function	Description
Cloning	Save currently valid save parameter set on an external storage medium. The externally stored parameter set is also updated automatically each time the parameterization is permanently saved. The cloning function provides the means, for example in the event of a product fault, for manual transmission of the parameter set to an replacement product of the same type.
Firmware download (update)	For information, see SICK Support Portal
Image backup (optional)	Image is saved for a failed read (read result: No Read).

Other functions are available upon request.

Complementary information

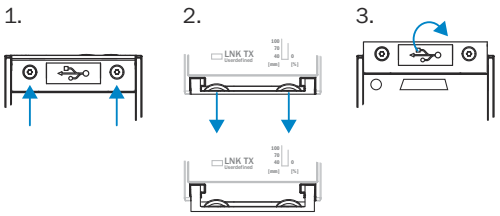
For information on other available functions, see “Overview of SOPAS Parameters” in the online help of the product (part number: 8020322, www.sick.com/8020322).

Further topics

- Inserting and removing memory card
- External data back-up

7.7 Inserting and removing memory card

Overview



Important information

NOTICE

Loss of configuration data

Do not remove the memory card or switch off the supply voltage while the parameter set is being saved. Otherwise all parameters not yet saved permanently will be lost.

Prerequisites

- Product with card slot for a microSD memory card.
- The supply voltage for the product is switched off.
- To remove the memory card during operation, select the **Remove SD card** option under **Analysis/SD card** in SOPAS ET.
- If the cover is open, the product does not fulfill any specified enclosure rating. Only briefly open the cover. Protect the product against moisture and dust during this time.

Approach

Inserting the memory card

1. Undo the screws on the hinged cover.
2. Opening cover:

- Carefully pull the upper edge of the cover away from the housing a little at the level of the hinges on the side. Use both of the recesses on the inside of the cover to do this.
- Fold the cover upwards starting from the bottom edge.

3. Making sure it is in the correct position, insert the memory card into the slot until it locks into place. When doing this, position the contacts so that they are facing to the rear and upwards, see the card symbol on the product.
4. Close the cover again. Make sure that the cover is completely flush with the housing.
5. Re-tighten the screws on the cover.
6. Switch on the supply voltage for the product.

Remove memory card

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

8 Maintenance

8.1 Maintenance plan

During operation, the device works maintenance-free.

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

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

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

Table 24: Maintenance plan

Maintenance work	Interval	To be carried out by
Check device and connecting cables for damage at regular intervals.	Depends on ambient conditions and climate.	Specialist
Clean housing and viewing window.	Depends on ambient conditions and climate.	Specialist
Check the screw connections and plug connectors.	Depends on the place of use, ambient conditions or operating requirements. Recommended: At least every 6 months.	Specialist
Check that all unused connections are sealed with protective caps.	Depends on ambient conditions and climate. Recommended: At least every 6 months.	Specialist

8.2 Cleaning

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

NOTICE
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 viewing window is made of plastic, see "Technical data", page 58.

Cleaning procedure:

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

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

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

Cleaning the housing

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

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

9 Troubleshooting

9.1 General faults, warnings, and errors

Possible faults and corrective actions are described in the table below for troubleshooting. In the case of faults that cannot be rectified using the information below, please contact SICK Service. To find your agency, see the final page of this document.

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

Situation	Error or fault
Mounting	■ Product poorly aligned to objects with codes (e.g. glare) ■ Trigger sensor for reading cycle incorrectly positioned (e.g. internal reading interval is opened too late or closed too early) ■ Incremental encoder (optional) incorrectly positioned
Electrical installation	■ Interfaces of the product incorrectly wired
Configuration	■ Functions not adapted to local conditions, e.g., parameters for the data interface not set correctly ■ Technical limits not observed, e.g., working range, aperture angle ■ Trigger source for read cycle not selected correctly
Operation	■ Start/stop operation: external read cycle missing, more than one object is in the reading field ■ Product faults (hardware, software)

9.2 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.

9.3 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.

9.4 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
Optional memory card

- Check whether there is a memory card in the card slot of the device. If yes, remove the memory card from the faulty device in **de-energized state**.
- Do not send in the memory card!

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

9.5 Replacing the product

Transferring configuration data

The current configuration data of the product to be replaced can be transferred to a replacement product. Data transmission depends on the selected data backup concept when configuring the product to be replaced. The configuration data of the product is combined as a parameter set. The replacement product saves the parameter set to the permanent parameter memory.

Prerequisites:

- Product type identical
- External storage medium with the current configuration data

External storage medium	Prerequisite for configuration back-up	Data transmission
MicroSD memory card	The configuration data is automatically saved on the memory card during the last save operation in the product with the **Permanent** option. The prerequisite is sufficient storage capacity on the microSD memory card.	Connecting a computer to SOPAS ET is not necessary. The product automatically transmits the data.
CMC600 cloning module in the CDB or CDM connection module	The product to be replaced is continuously operated connected to the connection module.	Connecting a computer to SOPAS ET is not necessary. The product automatically transmits the data. If the microSD memory card and CMC600 cloning module are present, the configuration data in the parameter cloning module has higher priority.
CDF600 fieldbus module	The product to be replaced is continuously operated in proxy mode connected to the fieldbus module.	Connecting a computer to SOPAS ET is not necessary. The product automatically transmits the data. If the microSD memory card and fieldbus module are present, the configuration data in the fieldbus module has higher priority.
Project file (*sopas)	The configuration data is saved independently as a project file (*.sopas) on the computer after configuration of the product to be replaced.	Transfer the configuration data independently via download to the replacement product and save it there permanently.

Removing the product to be replaced:

1. Switch off the supply voltage to the product that is to be replaced.
2. Mark the position and alignment of the product on the bracket or surroundings.
3. Disconnect and remove all connecting cables of the product.
4. Remove the product from the bracket.
5. Backed-up configuration data: if an optional microSD memory card is installed in the product, remove the memory card with the backed-up parameter set.

Putting the replacement product into operation:

1. Backed-up configuration data: install the optional microSD memory card from the product that is to be replaced in the replacement product of the same type.
2. Mount and align the replacement product (see "Mounting", page 20). When doing so, note the previously applied markings on the bracket or surroundings.
3. Reconnect the connecting cables of the replacement product (see "Electrical installation", page 23).
4. Switch on the supply voltage for the replacement product.

✓ The product starts with its last permanently saved parameter set. In the case of products that have not been used before, this corresponds to the factory default setting.

✓ The product searches for external storage media with a valid parameter set. Depending on the success of the search, the replacement product proceeds as follows:

- When the replacement product detects an external storage medium, the replacement product automatically transfers the configuration data to the permanent product memory.
- If the replacement product does not detect any external storage media, the replacement product will start with its last permanently stored parameter set. In the case of products that have not been used before, this corresponds to the factory default setting.

5. Establish a connection with the replacement product using the SOPAS ET configuration software.
6. Optional: transfer the configuration data of the product to be replaced by downloading to the replacement product and permanently store this data in the device.

10 Decommissioning

10.1 Disposal

CAUTION

Risk of injury due to hot device surface!

The surface of the product can become hot.

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

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

NOTICE

Danger to the environment due to improper disposal of the device.

Disposing of devices improperly may cause damage to the environment.

Therefore, observe the following information:

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

11 Technical data

NOTE

The relevant online product page for your product, including technical data, dimensional drawing, and connection diagrams, can be downloaded, saved, and printed from the Internet.

The 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.

11.1 Features

Table 25: Technical data: Features

Type	Lector621	Lector621 ECO
Focus	Automatic focus adjustment when teaching in the working distance with SOPAS ET or the function buttons	Adjustable focus (manual) by specifying a distance with SOPAS ET
Sensor	CMOS matrix sensor, monochrome (black/white)	
Sensor resolution	1.3 Mpx (1280 px x 1024 px)	
Integrated illumination unit	4 LEDs (2 on the left, 2 on the right) Light color combination, type-dependent V2D621x–xx**S**xxxx: left red light, right blue light, laser alignment aid V2D621x–xx**D**xxxx: left infrared light, right infrared light, laser alignment aid **Colors:** • Visible blue light (λ = 470 nm ± 15 nm) • Visible red light (λ = 617 nm ± 15 nm) • Invisible infrared light (λ = 850 nm ± 25 nm)	2 LEDs (on the left) V2D621x–xx**R**xxxx: left red light, no laser alignment aid **Colors:** • Visible red light (λ = 617 nm ± 15 nm)

Type	Lector621	Lector621 ECO
LED risk group of illumination unit	**Integrated illumination unit (visible blue light, visible red light)** Risk group 1 (low risk) according to IEC 62471-1: 2006-07/EN 62471-1: 2008-09. Radiance: • L_B [1]: < 10 x 10^3 W/(m^2sr) within 100 seconds; at a distance ≥ 200 mm • L_R [2]: < 3.7 x 10^5 W/(m^2sr) within 10 seconds; at a distance ≥ 200 mm	**Integrated illumination unit (visible red light)** Risk group 1 (low risk) according to IEC 62471-1: 2006-07/EN 62471-1: 2008-09. **Radiance:** L_R: < 3.7 x 10^5 W/(m^2sr) within 10 seconds; at a distance ≥ 200 mm
	Integrated illumination unit (invisible infrared light) Risk group 0 (no risk) according to IEC 62471-1: 2006-07/EN 62471-1: 2008-09. **Radiance**: E_{IR}: < 100 W/m2 within 1,000 seconds; at a distance of ≥ 200 mm	
Feedback LED (spot in field of view)	1 LED: Visible green light (λ = 525 nm ± 15 nm)	
LED risk group of feedback LED	**Feedback LED and status LEDs** Risk group 0 (no risk) according to IEC 62471-1: 2006-07/EN 62471-1: 2008-09	
MTBF of the LEDs (illumination LEDs and feedback LEDs)	75,000 hours, at ambient operating temperature 25 °C	
Laser alignment aid (2 points in the field of view)	2 LEDs, can be deactivated: Visible red light (λ = 630 nm ... 680 nm)	–
Laser class of the laser alignment aid	Class 1 Laser Product according to EN 60825-1:2014+A11:2021; IEC 60825-1:2014. Complies with 21 CFR 1040.10/11 except for conformance with IEC 60825-1 Ed. 3 as described in Laser Notice No. 56, dated May 8, 2019. P < 0.39 mW per laser module	
Scanning frequency	1.3 Mpx: 50 Hz	1.3 Mpx: 25 Hz
Code resolution	≥ 0.05 mm, depending on lens (valid for 1D codes with good print quality)	
Working range	V2D621x–xxxx**B**xx: 70 mm ... 1500 mm [3] V2D621x–xxxx**F**/**G**xx: 300 mm ... 1500 mm [3]	

Type	Lector621	Lector621 ECO
Lens	Integrated **Focal length:** • V2D621x–xxxx**B**xx: 9.6 mm • V2D621x–xxxx**F**xx: 17.1 mm • V2D621x–xxxx**G**xx: 17.1 mm with visible block filter	

1) L_B= Hazard from blue light.
2) L_R= Hazard to the retina of the eye due to heating.
3) For details, see "Field of view", page 65.

11.2 Mechanics/electronics

Table 26: Technical data: Mechanics/electronics

	Lector621	Lector621 ECO
Electrical connection	1 male connector, M12, 17-pin, A-coded [1] 1 female connector, M12, 4-pin, D-coded [1] 1 female connector, USB, 5-pin, Micro-B type 1 microSD card slot	1 cable, length 0.9 m, with male connector, D-Sub-HD, 15-pin 1 female connector, USB, 5-pin, Micro-B type
Supply voltage V_S	DC 12 V ... 24 V, ± 20% Voltage source as per ES1 and PS2 or lower (EN62368-1) and as per SELV (EN60950-1)	
Power consumption	Operation: Typically 4 W [2] Maximum 22 W with typical loading of the 4 digital outputs with 100 mA each and 28.8 V DC supply voltage	Operation: Typically 4 W [2] Maximum 16 W with typical loading of the 2 digital outputs with 100 mA each and 28.8 V DC supply voltage
Current consumption	Max. 1.7 A at 28.8 V DV	Max. 0.6 A at 28.8 V DV
Housing material	Die cast aluminum, plastic	
Housing color	Light blue (RAL 5012), black	
Viewing window material	Plastic (PMMA), 2 mm thick, with scratch-proof coating	
Hinged cover (top side of product)	Material: Plastic Function: for temporary access to the USB interface and memory card slot (Lector621 only) Hinged [3], 2 fixing screws, TX6, captive	
Enclosure rating	IP 65 (EN 60529, EN 60529 / A2) [4]	
Protection class	III	
Electrical safety	EN 62368-1	
Weight	170 g	170 g

	Lector621	Lector621 ECO
Dimensions (L x W x H)	88.5 mm x 43 mm x 35.6 mm	71 mm x 43 mm x 35.6 mm

1) On swivel connector.
2) For digital outputs without load.
3) When the cover is open, the product no longer conforms with the specified IP protection class. Protect the product against moisture and dust when the cover is open temporarily.
4) **Lector621 prerequisites:**
   - The cables plugged into the electrical connections must be screwed tight. Unused electrical connections are sealed off with a protective cap.
   - The foldable cover must be flush with the product and screwed tight.

   Lector621 ECO prerequisites:
   - The D-Sub male connector of the connecting cable must be tightly screwed to the contacted female connector.
   - If an extension cable is used, a rubber seal (SICK accessory) must be fitted between the two D-Sub plug connectors. The plug connectors must be screwed together. You can find a suitable IP65 rubber seal as an accessory on the product page.
   - The foldable cover must be flush with the product and screwed tight.
5) Product without connecting cable.

11.3 Dimensional drawing

Lector621

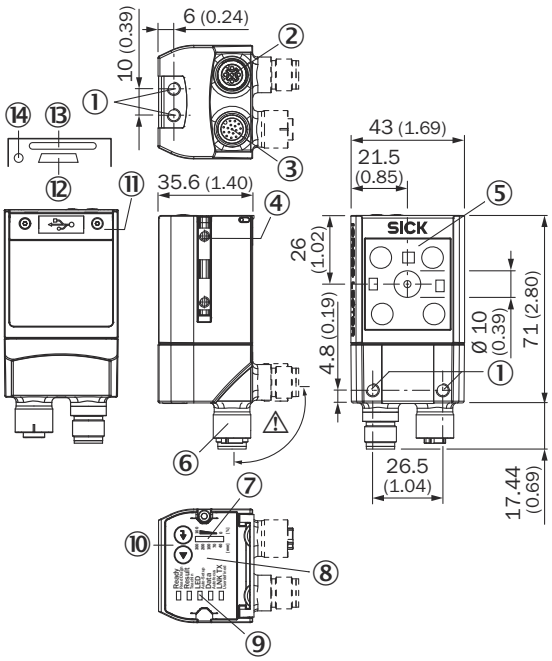


Figure 24: structure and device dimensions, unit: mm (inch), decimal separator: period

① 4 threaded mounting holes, M5: blind tapped hole; 5 mm deep; max. depth of thread 5 mm

② 2 sliding nuts, M5; 5.5 mm deep; as an alternative method of mounting the product

Lector621 ECO

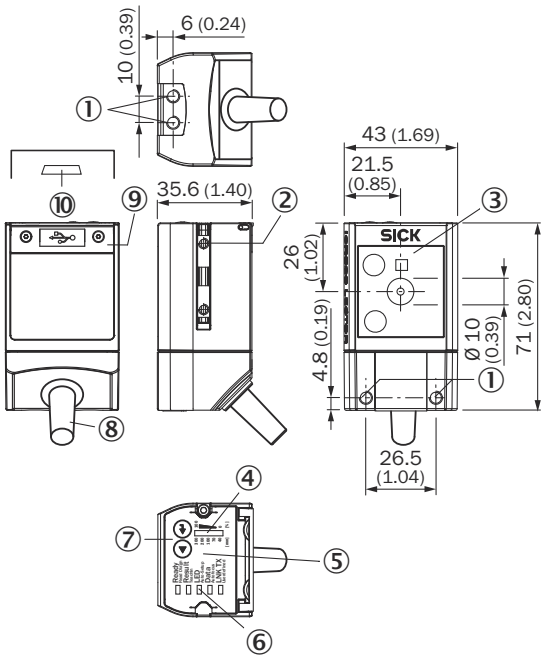


Figure 25: structure and device dimensions, unit: mm (inch), decimal separator: period

① 4 threaded mounting holes, M5: blind tapped hole; 5 mm deep; max. depth of thread 5 mm

② 2 sliding nuts, M5; 5 mm deep; as an alternative method of mounting the product

11.4 Performance

Table 27: Technical data: Performance

Type	Lector621	Lector621 ECO
Readable code structures	1D, 2D, stacked codes Type-dependent: DPM, OCR/OCV	1D, 2D, stacked codes
1D code types (bar code)	GS1-128 / EAN 128, UPC / GTIN / EAN, Interleaved 2 of 5, Pharmacode, GS1 DataBar, Code 39, Code 128, Codabar, Code 32, Code 93, Plessey Code, MSI/Plessey, Telepen	
Postal codes	Postnet, Planet, USPS 4SCB, Australia Post, Post Netherlands, Royal Mail, Post Sweden	
2D code types	Data Matrix ECC200, GS1 Data Matrix, PDF417, PDF417 Truncated, QR-Code, MaxiCode	
Code qualification	On the basis of ISO/IEC 16022, ISO/IEC 15415, ISO/IEC 15416, ISO/IEC 18004	–
No. of codes per reading interval	1 ... 50 (auto-discriminating)	
No. of characters per reading interval	500 (for multiplexer function in CAN network operation)	
Evaluation time	≥ 100 µs	≥ 200 µs
Automatic parameter switching	Integrated	–

11.5 Interfaces

Table 28: Technical data: Interfaces

	Lector621	Lector621 ECO
Serial RS-232 / RS-422	Function: Serial data interface (host) Data transmission rate: 0.3 kBd ... 115.2 kBd	
Serial RS-232	Function: Serial service interface (AUX) [1] Data transmission rate: 57.6 kBd	
USB 2.0 [2]	Function: Serial service interface (AUX) [1]	
CAN	Protocol: • A connection in a CANopen-based environment is possible. For additional support, please contact SICK customer service. • SICK CAN sensor network CSN (primary/secondary, multiplexer/server) Function: Serial data interface (host) Data transmission rate: 20 kBit/s ... 1 Mbit/s Bus length: maximum 30 m	
Ethernet	Protocol: • TCP/IP • EtherNet/IP Function: • Serial data interface • Serial service interface [1] • FTP (image transfer) Data transmission rate: 10/100 Mbit/s MAC address (product-specific), see type label	–
PROFIBUS	Function: Serial data interface (host, RS-232) Type of fieldbus integration: optionally over external CDF600-21xx fieldbus module [3] to bus (RS-485) Function blocks for various PLC manufacturers are available online on the product page.	
PROFINET (line topology)	Function: Serial data interface (host, RS-232), PROFINET Single Port, PROFINET Dual Port Type of fieldbus integration: optionally over external CDF600-2 fieldbus module [3]) Data transmission rate: 10/100 Mbit/s Function blocks for various PLC manufacturers are available online on the product page.	
EtherCAT®	Protocol: EtherCAT® Function: Serial data interface (host, RS-232) Type of fieldbus integration: optionally via external CDF600-0300 fieldbus module [3] (gateway mode) to bus (Ethernet)	
Digital inputs	Type: 2 physical, switching (“Sensor 1”, “Sensor 2”) Optionally 2 additional external logical inputs (software-controlled) via the CMC600 cloning module [3] in the CDB [3] or CDM [3] connection module V_{in} [4] = max. 30 V, I_{in} [5] = max. 5 mA Opto-decoupled, reverse polarity protected, adjustable debounce time [6]	

	Lector621	Lector621 ECO
Digital outputs	Type: 4 physical, switching (“Result1”, “Result2”, “Result3”, “Result4”) When using the CDB420: 2 physical, switching (“Result1”, “Result2”)	Type: 2 physical, switching (“Result1”, “Result2”)
	Optionally 2 additional external logical outputs (software-controlled) via the CMC600 cloning module [3] in the CDB [3] or CDM [3] connection module V_{out} [7] = V_S [8] – 1.5 V, I_{out} [9] ≤ 100 mA (typical) Short-circuit protected, not electrically isolated from the supply voltage	
Reading pulse	Digital inputs, free, serial interface, CAN, auto pulse, presentation mode	
Visual displays	5 status LEDs on the top side of the housing 10 bar graph LED (blue) on the top side of the housing 1 feedback LED (green) as light area on code	
	1 status LED (status indicator for the memory card), under hinged cover	–
Acoustic indicator	Beeper (buzzer), can be switched off [6] Function for event signaling and volume adjustable [6]	
Operating elements	2 function buttons: Select function, start, end.	
Configuration software (parameterization)	SOPAS ET configuration software, web server, CoLa commands (telegrams), fieldbus controller (PLC) with additional support by SICK function blocks, function buttons	
MicroSD memory card	microSD memory card (flash card), max. 32 GB, optional	
Data storage and retrieval	image and data storage via microSD memory card and external FTP	

1) For example: Configuration, diagnosis, transponder access or display of the read result.
2) Data interface only for temporary use (service). Only briefly open the cover to access the USB interface. Protect the product against moisture and dust during this time.
3) Optional accessories.
4) Input voltage.
5) Input current.
6) For example using the SOPAS ET configuration software.
7) Output voltage.
8) Supply voltage.
9) Output current.

11.6 Ambient data

Table 29: Technical data: Ambient data

	Lector621	Lector621 ECO
Electromagnetic compatibility (EMC)	Radiated emission: EN 61000-6-3:2007-01 + A1:2011-03 Immunity: 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 [1]	0 °C ... +40 °C 0 °C ... +50 °C, if the product is mounted on a mounting bracket to dissipate the heat.	
Storage temperature	–20 °C ... +70 °C	
Permissible relative humidity	0% ... 90%, non-condensing	

	Lector621	Lector621 ECO
Ambient light immunity	2,000 lx on code	

1) Notes regarding adequate dissipation of heat loss, see "Mounting instructions", page 20.

11.7 Field of view

Overview

The field of view data are typical valuesand do not take into account lens or product tolerances. The values apply to a vertical object.

Focal length: 9.6 mm

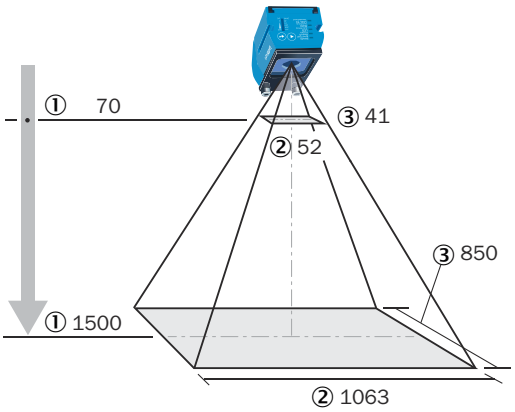


Figure 26: Field of view, focal length: 9.6 mm

① Working distance in mm
② Perceived field of view area: horizontal (mm)
③ Perceived field of view area: vertical (mm)

Table 30: Perceived field of view area

Working distance (mm)	Horizontal (mm)	Vertical (mm)
70	52	41
100	73	58
200	144	115
300	215	172
400	285	228
500	356	285
600	427	342
700	498	398
800	568	455
900	639	511
1000	710	568
1100	780	624
1200	851	681

Working distance (mm)	Horizontal (mm)	Vertical (mm)
1300	922	737
1400	992	794
1500	1063	850

Table 31: Minimum resolution

Working distance (mm)	1D code (mm)	2D code (mm)
70	0.06	0.08
100	0.09	0.11
200	0.17	0.22
300	0.25	0.34
400	0.33	0.45
500	0.42	0.56
600	0.50	0.67
700	0.58	0.78
800	0.67	0.89
900	0.75	1.00
1000	0.83	1.11
1100	0.91	1.22
1200	1.00	1.33
1300	1.08	1.44
1400	1.16	1.55
1500	1.25	1.66

Focal length: 17.1 mm

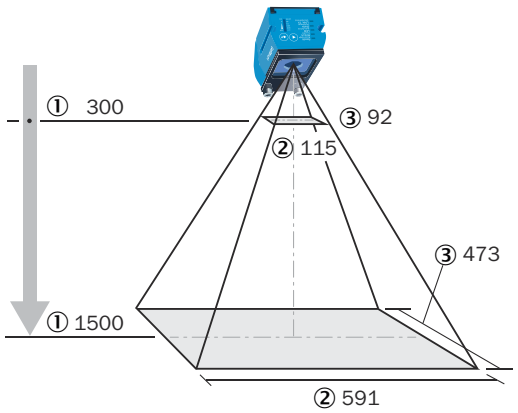


Figure 27: Field of view, focal length: 17.1 mm

① Working distance in mm
② Perceived field of view area: horizontal (mm)
③ Perceived field of view area: vertical (mm)

Table 32: Perceived field of view area

Working distance (mm)	Horizontal (mm)	Vertical (mm)
300	115	92
400	155	124
500	194	155
600	234	187
700	274	219
800	313	251
900	353	282
1000	393	314
1100	432	346
1200	472	378
1300	512	409
1400	551	441
1500	591	473

Table 33: Minimum resolution

Working distance (mm)	1D code (mm)	2D code (mm)
300	0.13	0.18
400	0.18	0.24
500	0.23	0.30
600	0.27	0.37
700	0.32	0.43
800	0.37	0.49
900	0.41	0.55
1000	0.46	0.61
1100	0.51	0.68
1200	0.55	0.74
1300	0.60	0.80
1400	0.65	0.86
1500	0.69	0.92

11.8 Field of view diagrams

Application design

Consider the following aspects:

- Field of view geometry of the device
- Position of the field of view in the space in front of the device.
- Possible reading angles at which the codes can occur with respect to the device.
- For the planned working distance: resultant field of view length and width and minimum possible resolution.

Field of view diagram

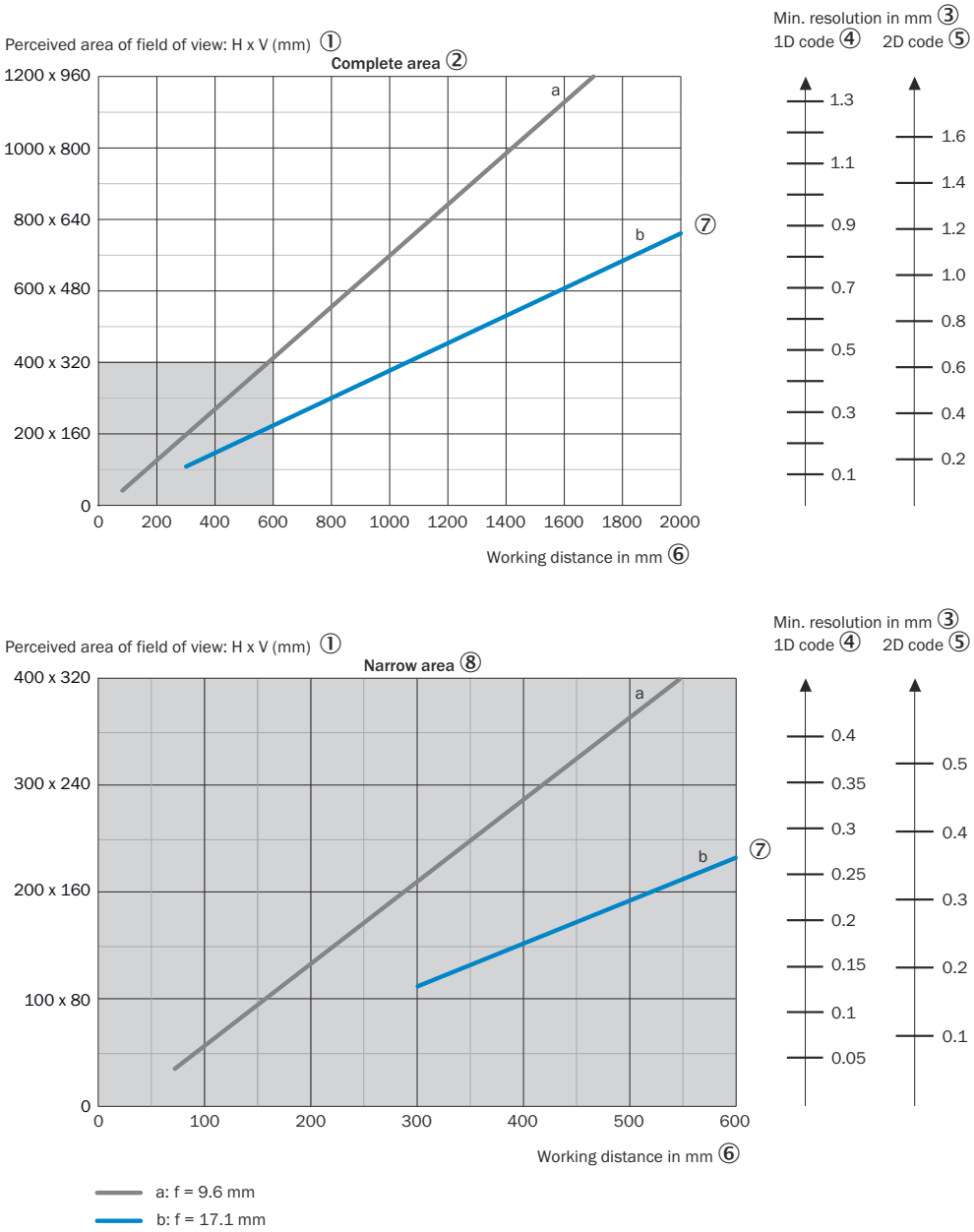


Figure 28: Field of view diagram for Lector621 and Lector621 ECO

① Perceived field of view area: horizontal x vertical (mm)
② Overall range
③ Minimum resolution in mm
④ 1D code
⑤ 2D code
⑥ Working distance in mm
⑦ Focal length of lens, here for example for f = 17.1 mm
⑧ Near range

Interpretation aid for the field of view diagram

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

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

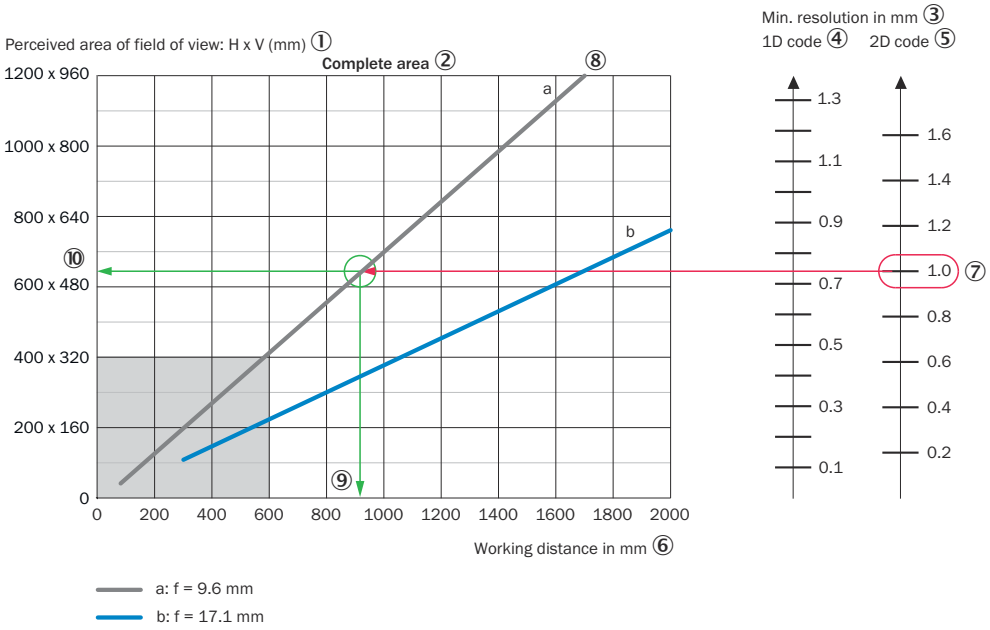


Figure 29: Interpretation aid for the field of view diagram (example)

① Perceived field of view area: horizontal x vertical (mm)
② Overall range
③ Minimum resolution in mm
④ 1D code
⑤ 2D code
⑥ Working distance in mm
⑦ Selected code resolution
⑧ Focal length of lens, here for example for f = 9.6 mm
⑨ Reading off: resultant maximum working distance
⑩ Reading off: Resulting perceived area of the field of view (mm x mm)

Given (in red):

- Code resolution 2D code ⑦: 1.0 mm
- Focal length of lens ⑧: 9.6 mm

Read off (in green):

- Maximum working distance ⑨: approx. 920 mm
- Field of view ⑩: approx. 640 mm x approx. 510 mm

Both axes of the field of view diagrams must be interpreted linearly.

12 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 Annex

13.1 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).

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

NOTICE

For device type V2D621x-xxxxxx6x, use only cables which are listed as accessories for the product. Cables for the standard device are not suitable for device type V2D621x-xxxxxx6x.

13.2.1 "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 variant Lector621, not for variant Lector621 ECO

Ambient temperature range:

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

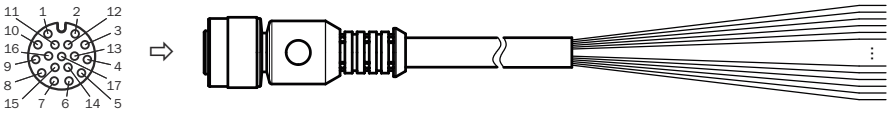


Figure 30: Adapter cable, e.g., part no. 2070425 (3 m)

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

② Figure may differ.

Table 34: 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), Host	Host interface (sender+)	Pink
6	TD– (RS-422), 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

Pin	Signal	Function	Wire color
11	RD+ (RS-422) Host	Host interface (receiver+)	Gray-pink
12	RD– (RS-422), 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	Result 3	Digital output 3	Yellow-brown
17	Result 4	Digital output 4	White-gray

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

Adapter cable, straight female connector, open

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

For variant Lector621, not for variant Lector621 ECO

Permitted currents for ambient temperature +40 °C:

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

Ambient temperature range:

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

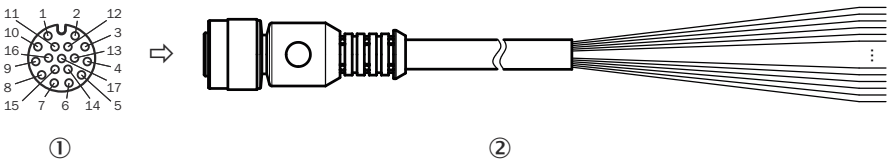


Figure 31: Adapter cable, part no. 2075220

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

② Figure may differ.

Table 35: 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), Host	Host interface (sender+)	Pink
6	TD– (RS-422), 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	Gray-brown
10	Sensor 1	Digital input 1	Violet
11	RD+ (RS-422) Host	Host interface (receiver)	Gray-pink

Pin	Signal	Function	Wire color
12	RD– (RS-422), 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	Result 3	Digital input 3	Yellow-brown
17	Result 4	Digital input 4	White-gray

13.2.3 “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 Lector621 ECO

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.

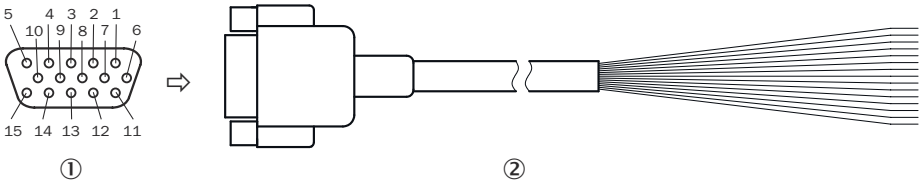


Figure 32: Adapter cable, part no. 2043413

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

② Illustration may differ

② Illustration may differ

Table 36: 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) Host	Host interface (receiver+)	Light blue
7	RD– (RS-422), host RxD (RS-232), host	Host interface (receiver–)	Blue
8	TD+ (RS-422), Host	Host interface (sender+)	Light-gray or turquoise
9	TD– (RS-422), 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

Pin	Signal	Function	Wire color
13	Result 2	Digital output 2	Orange
14	Sensor 1	Digital input 1	White
15	SensGND	Ground digital inputs	White-black

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

Device	Connection module
Lector621	CDB650-204, CDM420-0006, -0007
Lector621 ECO	CDB620-001, 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

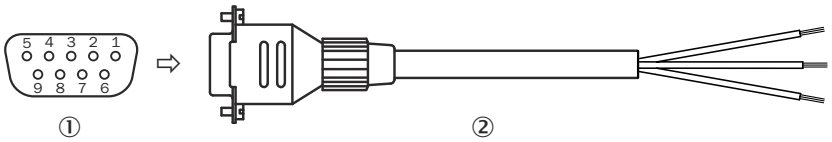


Figure 33: Adapter cable, part no. 2020319

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

② Figure may differ.

② Illustration may differ

Table 37: Signal assignment of adapter cable with open end

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

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

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

13.3 Connection diagrams of connection module CDB650-204

13.3.1 Connection of the device to CDB650-204

Device = Lector621 = V2D621x-xxxxxYx (Ethernet variant, Y = B or C)

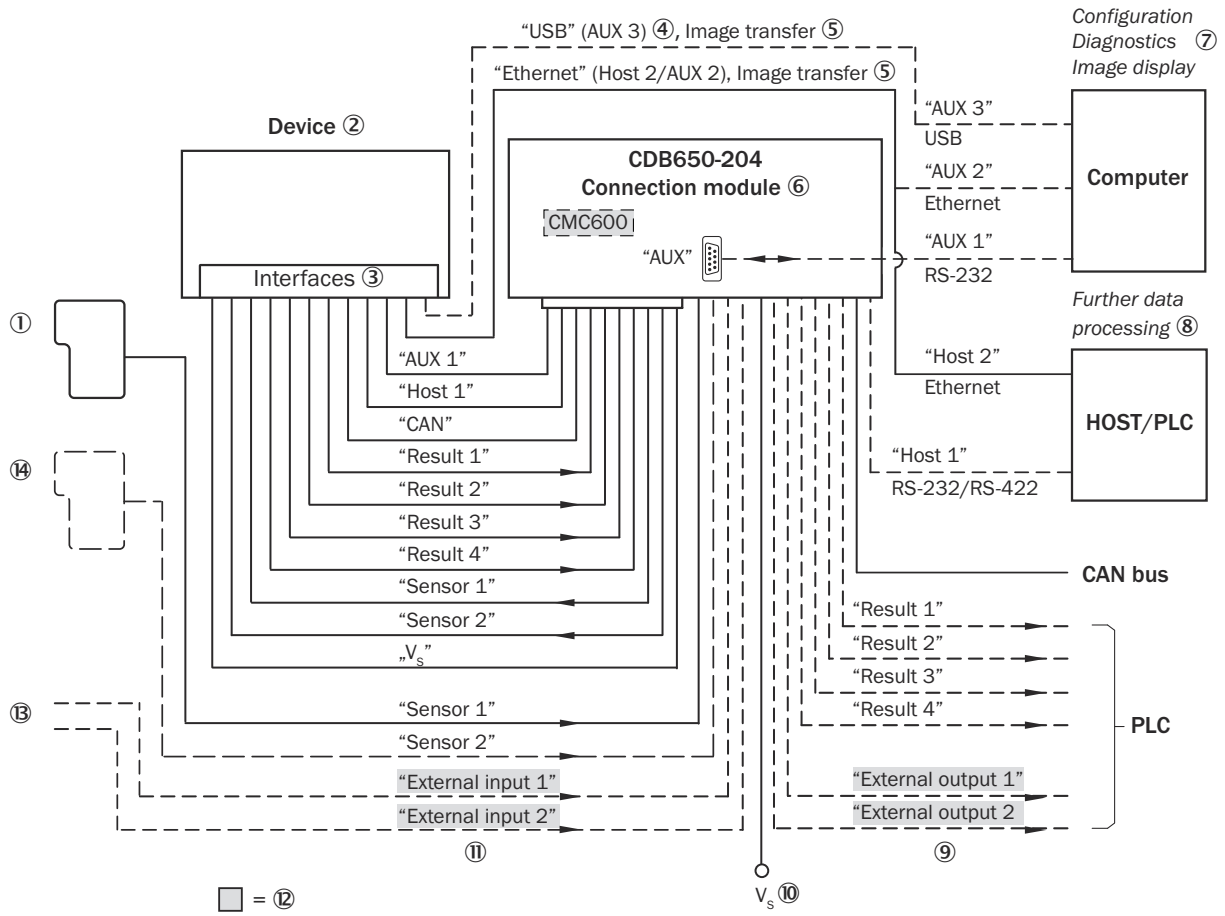


Figure 34: Connection of the device (Ethernet variant) to peripherals via CDB650-204 (overview)

① External trigger sensor
② Device
③ Interfaces
④ USB interface, for temporary use as a servicing interface only
⑤ Image transmission
⑥ Connection modules
⑦ Configuration, diagnostics or image display
⑧ Data further processing
⑨ External digital outputs
⑩ Supply voltage V_S
⑪ External digital inputs
⑫ 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).
⑬ Other functions
⑭ Can also be used as an alternative stop trigger (e.g., photoelectric sensor) or travel increment (incremental encoder), depending on the application

13.3.2 Wiring overview of the CDB650-204

Device = Lector621 = V2D621x-xxxxxYx (Y = B or C), 1 digital input used

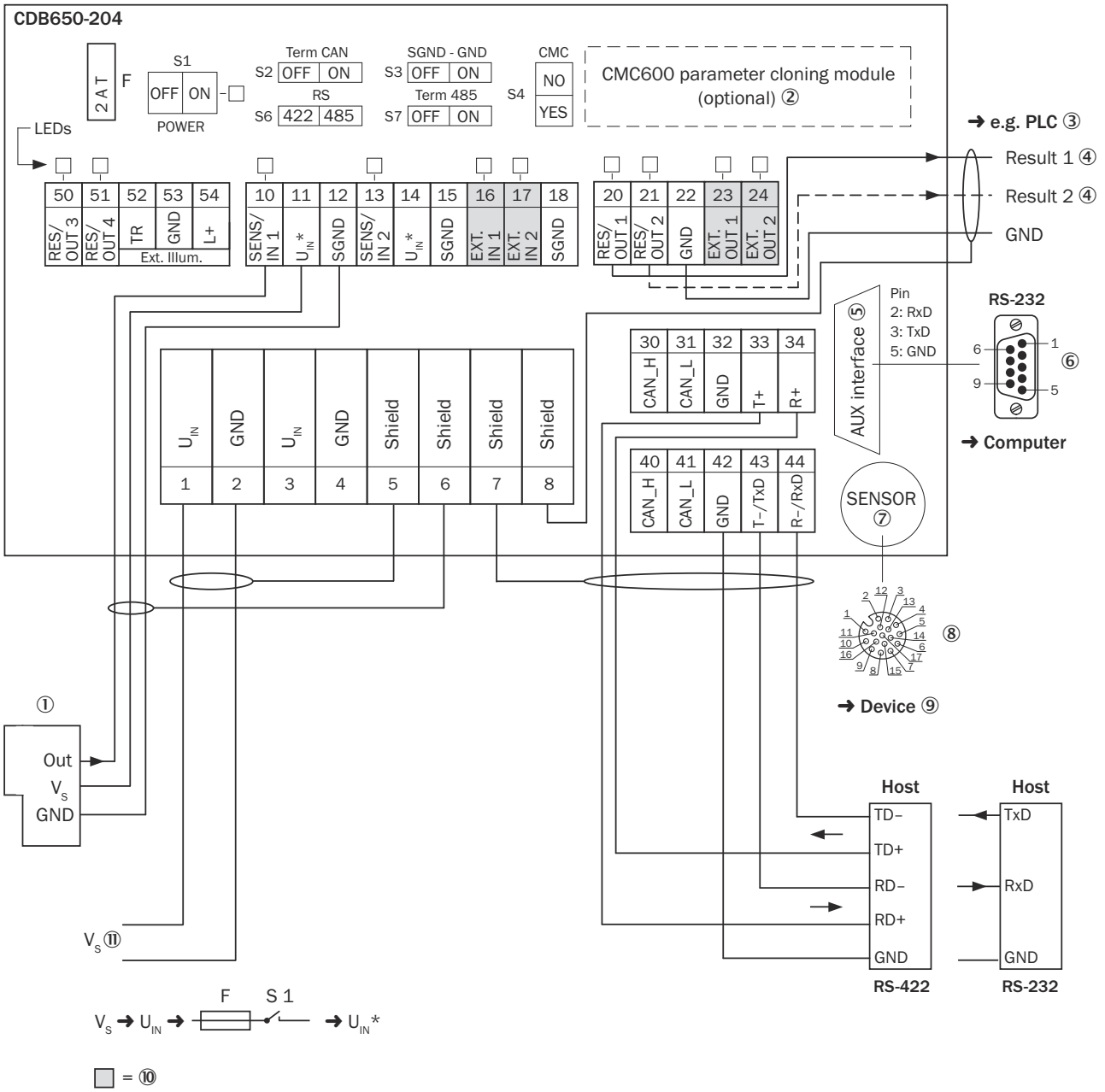


Figure 35: Connection of device and peripherals to the CDB650-204 connection module (overview).

① External trigger sensor
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

13.3.3 Connecting supply voltage for the device in CDB650-204

Device = Lector621 = V2D621x-xxxxxYx (Y = B or C)

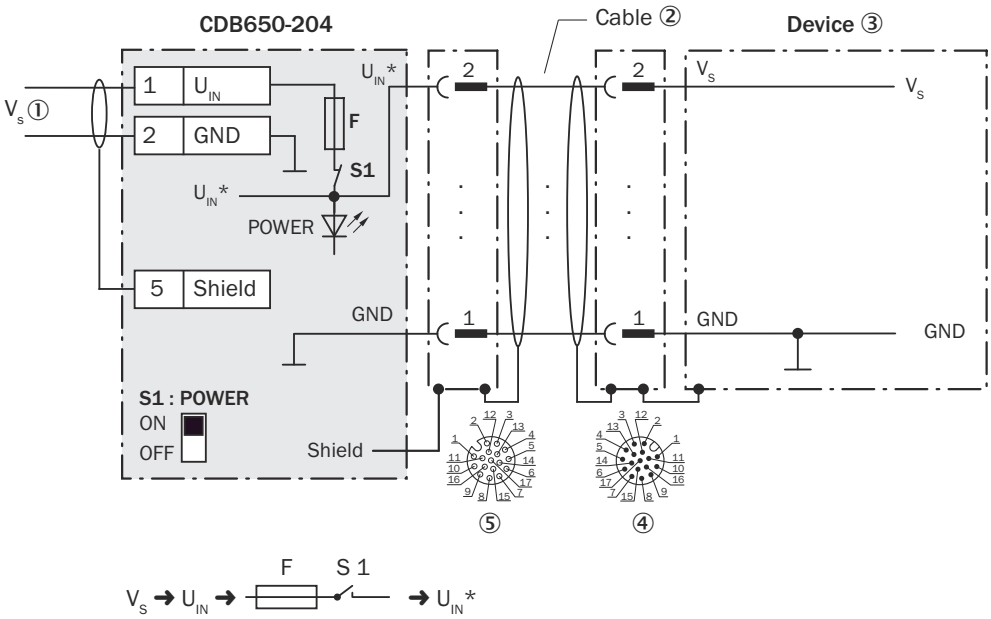


Figure 36: Connecting supply voltage for the device in CDB650-204 connection module.

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 38: Switch S1: Power

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

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

Device = Lector621 = V2D621x-xxxxxYx (Y = B or C)

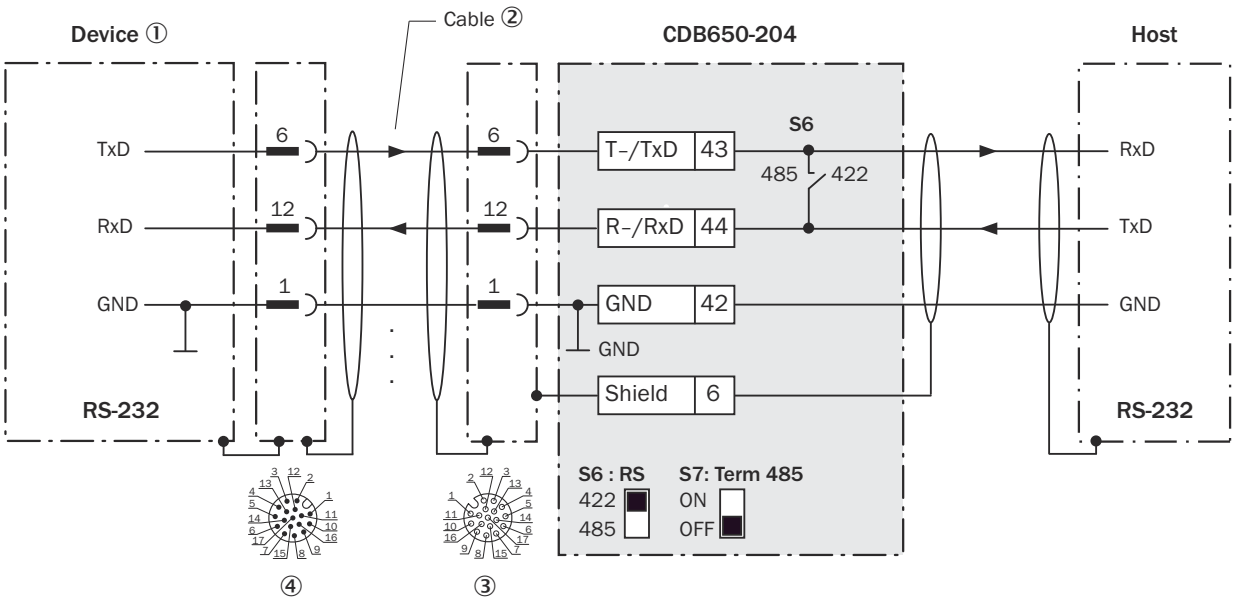


Figure 37: Wiring data interface RS-232 of the device in connection module CDB650-204.

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

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

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

Device = Lector621 = V2D621x-xxxxxYx (Y = B or C)

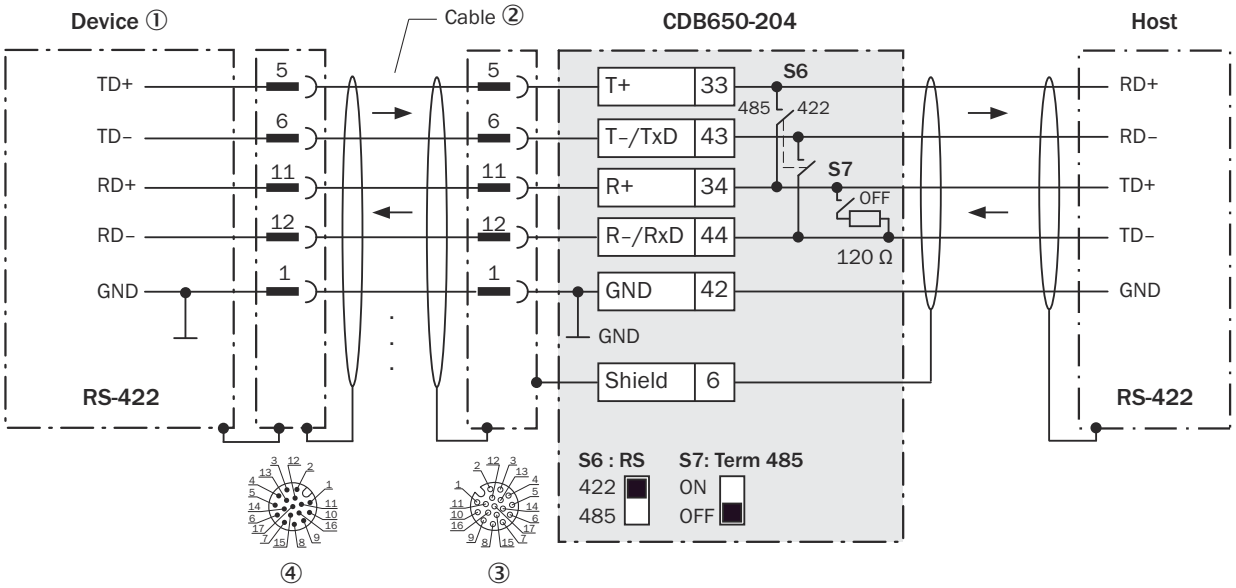


Figure 38: Wiring data interface RS-422 of the device in connection module CDB650-204.

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 39: 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.
- The connection shown above is configured for operation of the host with permanently activated drivers (often described as “RS-422 operation”).
- Activate the RS-422 data interface (“Point-to-Point” option) in the device using a configuration software, e.g., SOPAS ET.

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

Device = Lector621 = V2D621x-xxxxxYx (Y = B or C)

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

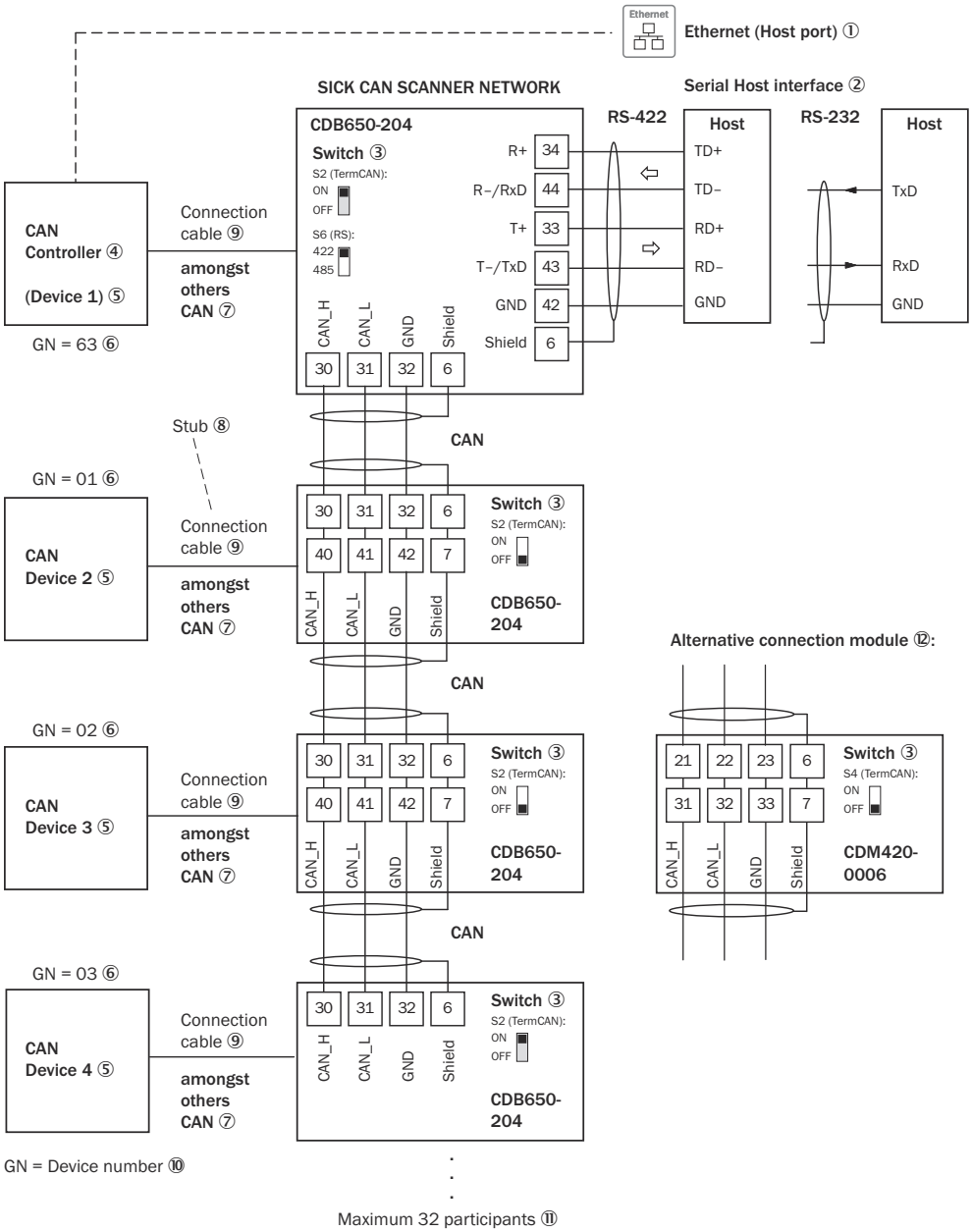


Figure 39: Wire the CAN interface of the device in the CDB650-204 connection module.

① 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 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 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 device.

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.

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

Device = Lector621 = V2D621x-xxxxxYx (Y = B or C)

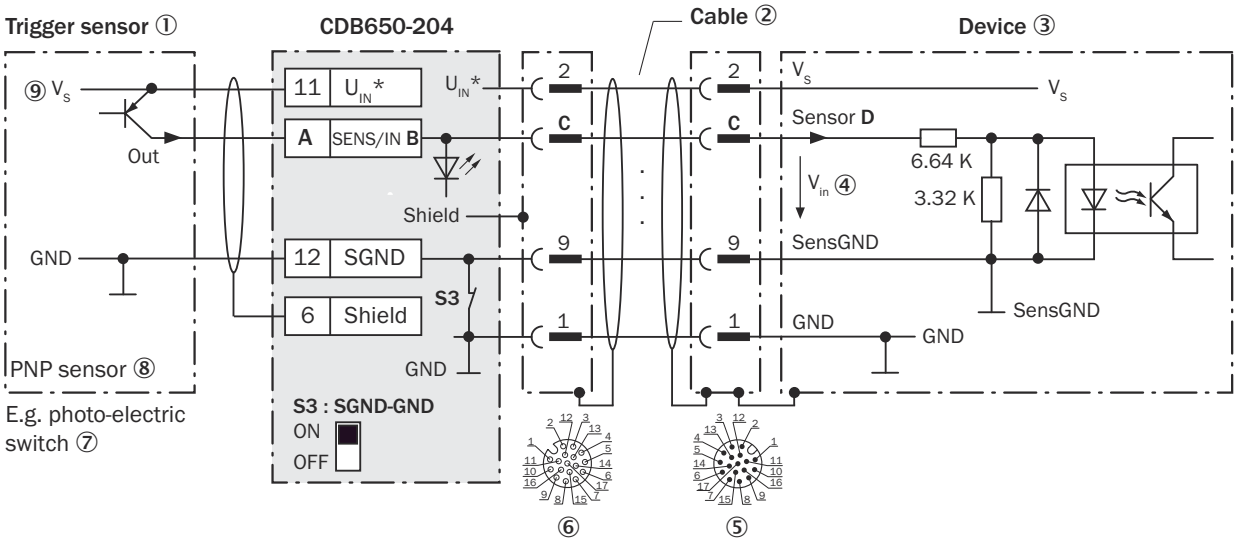


Figure 40: Trigger sensor supplied with power by connection module CDB650-204.

① Trigger sensor
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

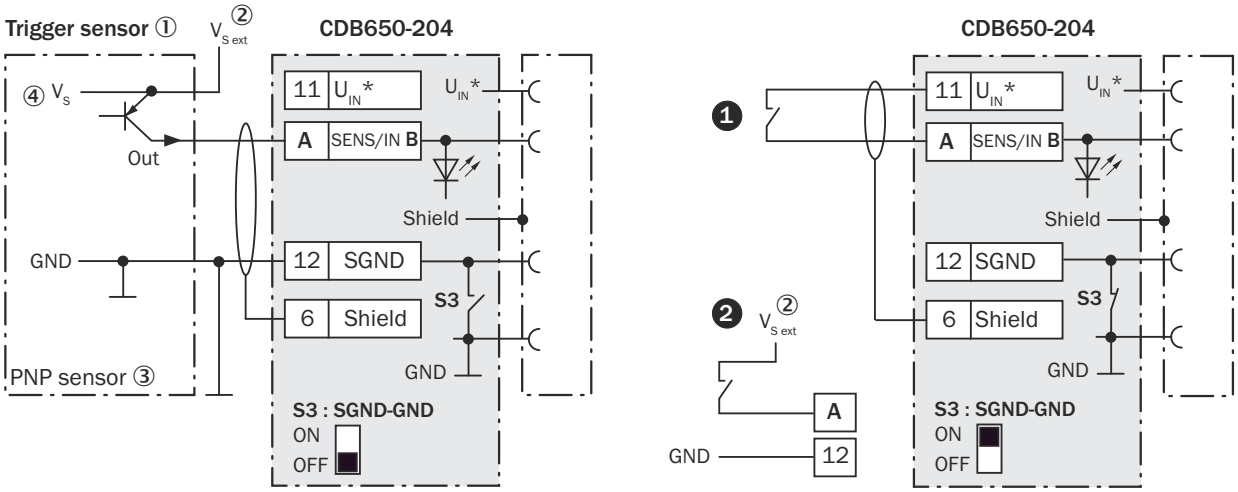


Figure 41: Left: Trigger sensor connected potential-free and supplied with power externally. Right: Alternatively switch, ❶ supplied with power by connection module CDB650-204 or ❷ connected potential-free and supplied with power externally. Now select switch setting S3 as shown in the left figure.

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 40: 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 41: 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 42: 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.

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

Device = Lector621 = V2D621x-xxxxxYx (Ethernet variant, Y = B or C)

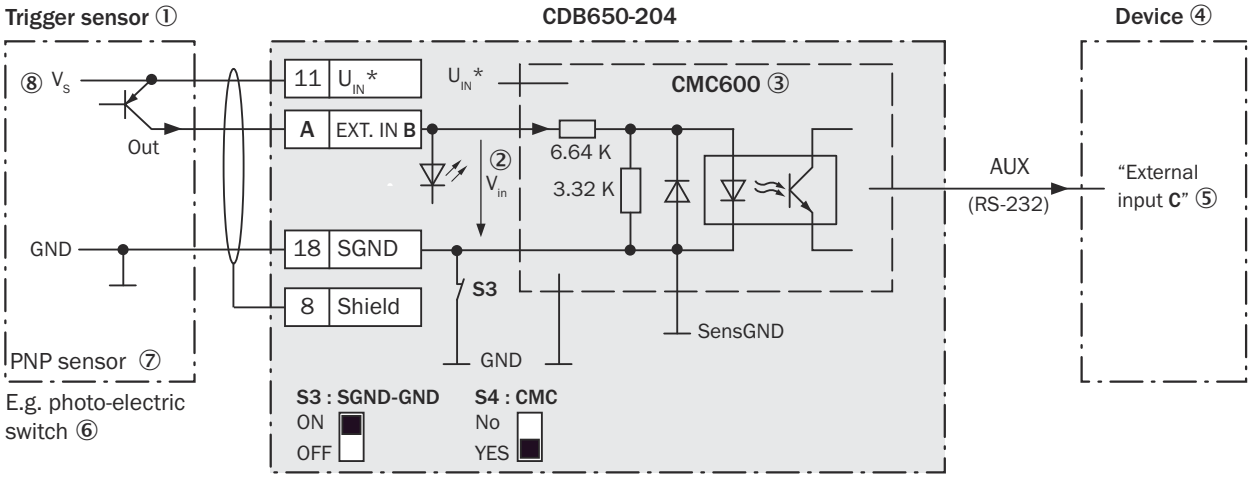


Figure 42: Trigger sensor supplied with power by connection module CDB650-204

① Trigger sensor
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

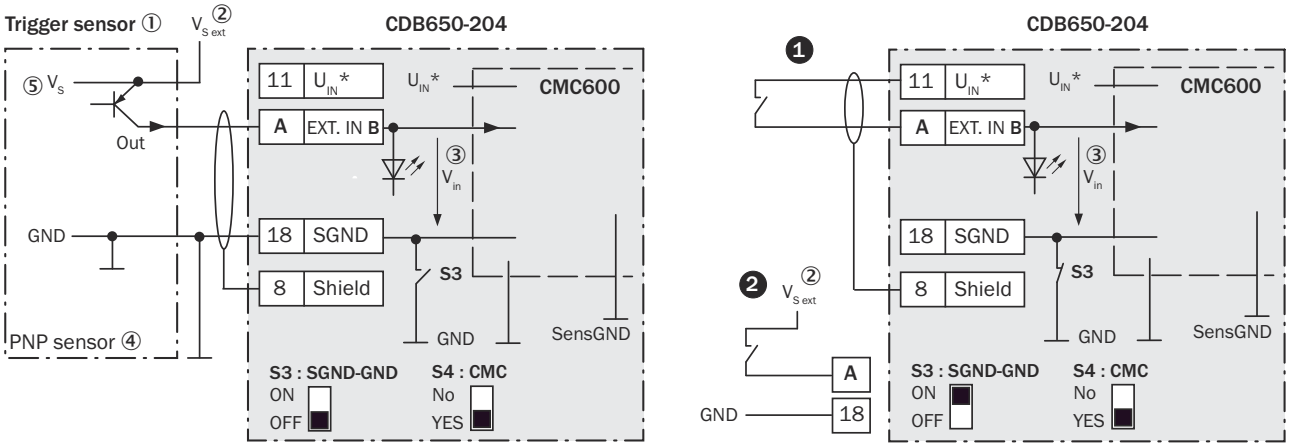


Figure 43: Left: Trigger sensor connected potential-free and supplied with power externally. Right: Alternatively switch, ❶ supplied with power by connection module CDB650-204 or ❷ connected potential-free and supplied with power externally. Switch setting S3 then as in left figure.

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 43: 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 44: 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”.

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 45: 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.

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

Device = Lector621 = V2D621x-xxxxxYx (Y = B or C)

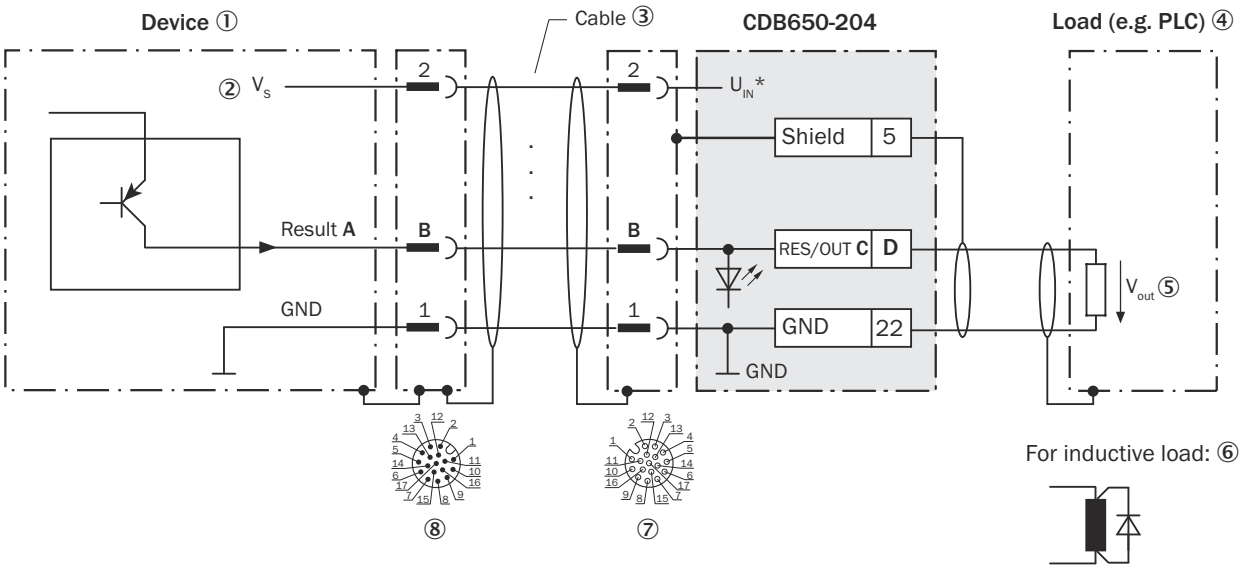


Figure 44: Wire the digital output in the CDB650-204 connection module.

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 46: 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
Result 3	16	RES/OUT 3	50
Result 4	17	RES/OUT 4	51

Characteristic data of the digital outputs

Table 47: Characteristic data of the digital switching 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 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.

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

Device = Lector621 = V2D621x-xxxxxYx (Y = B or C)

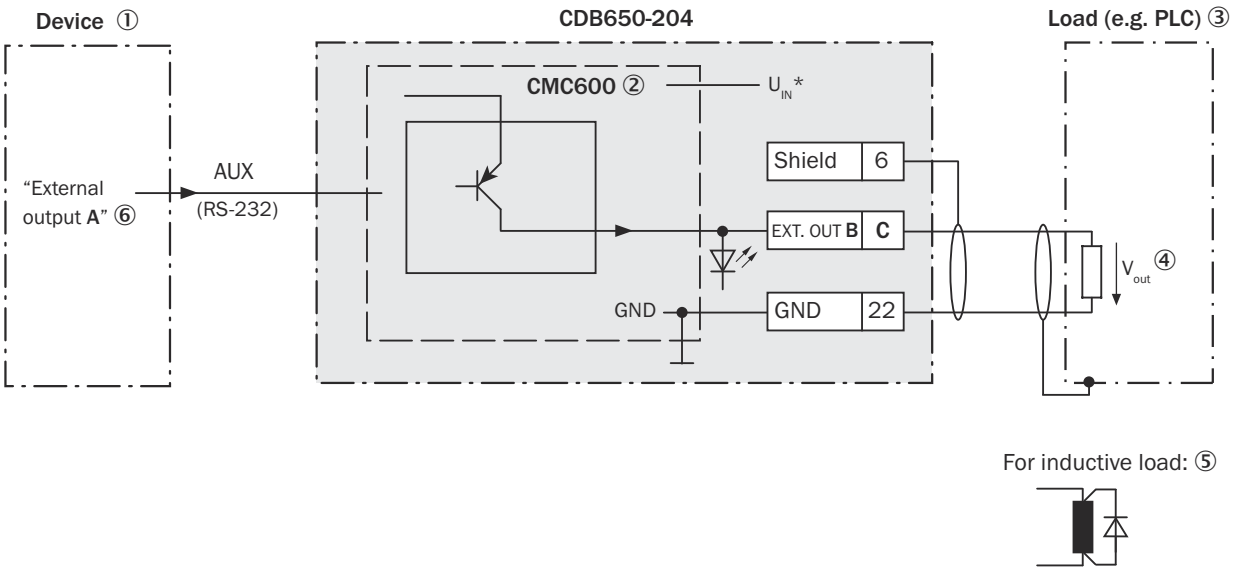


Figure 45: Wiring external "External output 1" and "External output 2" digital outputs of the device in the CDB650-204 connection module.

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 48: 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 49: 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.

13.4 Connection diagrams of connection module CDM420-0006

13.4.1 Connection of the device to CDM420-0006

Device = Lector621 = V2D621x-xxxxxYx (Ethernet variant, Y = B or C)

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

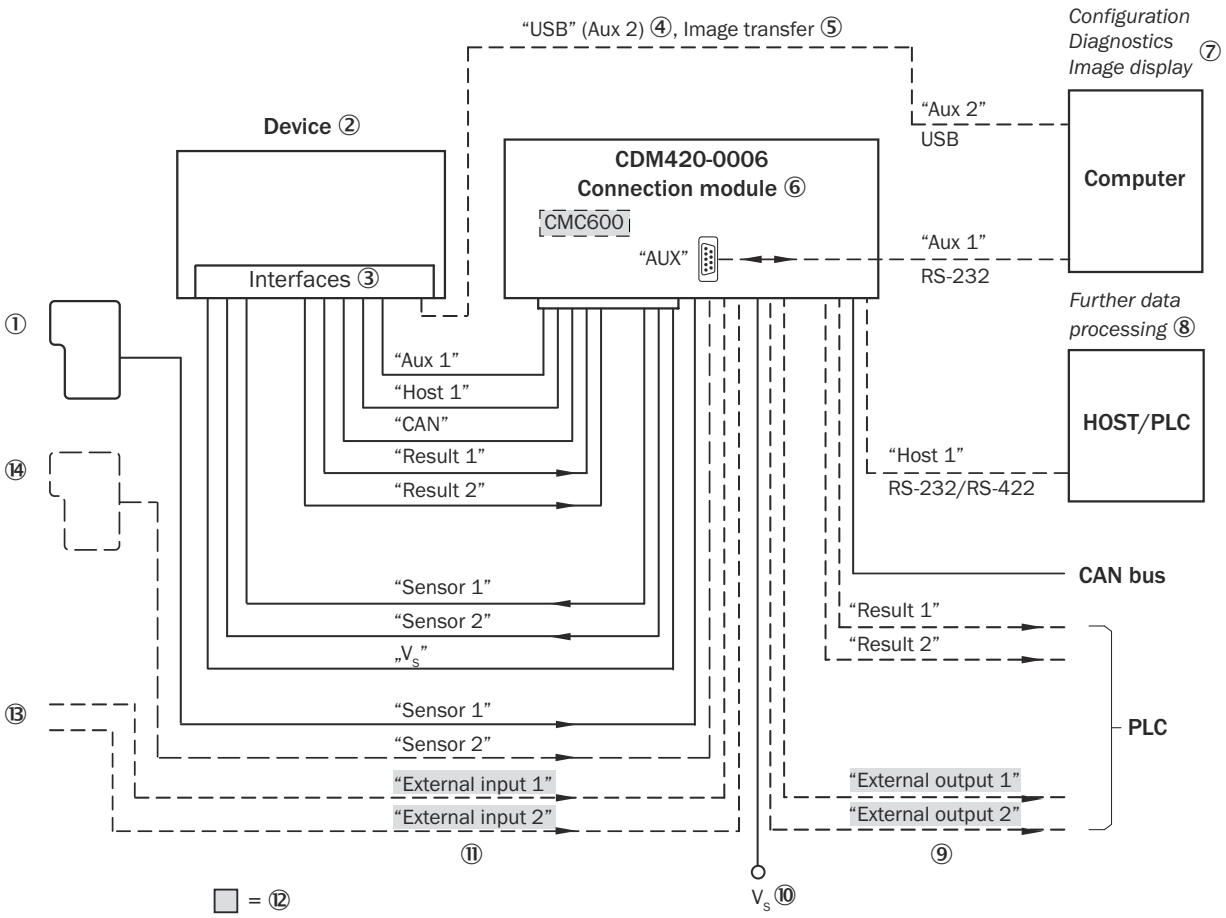


Figure 46: Connection of the device (serial variant) to peripherals via CDM420-0006 (overview)

① External trigger sensor
② Device
③ Interfaces
④ USB interface, for temporary use as a servicing interface only
⑤ Image transmission
⑥ Connection modules
⑦ Configuration, diagnostics or image display
⑧ Data further processing
⑨ External digital outputs (switching)
⑩ Supply voltage V_S
⑪ External digital inputs (switching)
⑫ 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).
⑬ Other functions
⑭ Application-dependent alternative stop trigger (e.g., photoelectric sensor) or travel increment (incremental encoder)

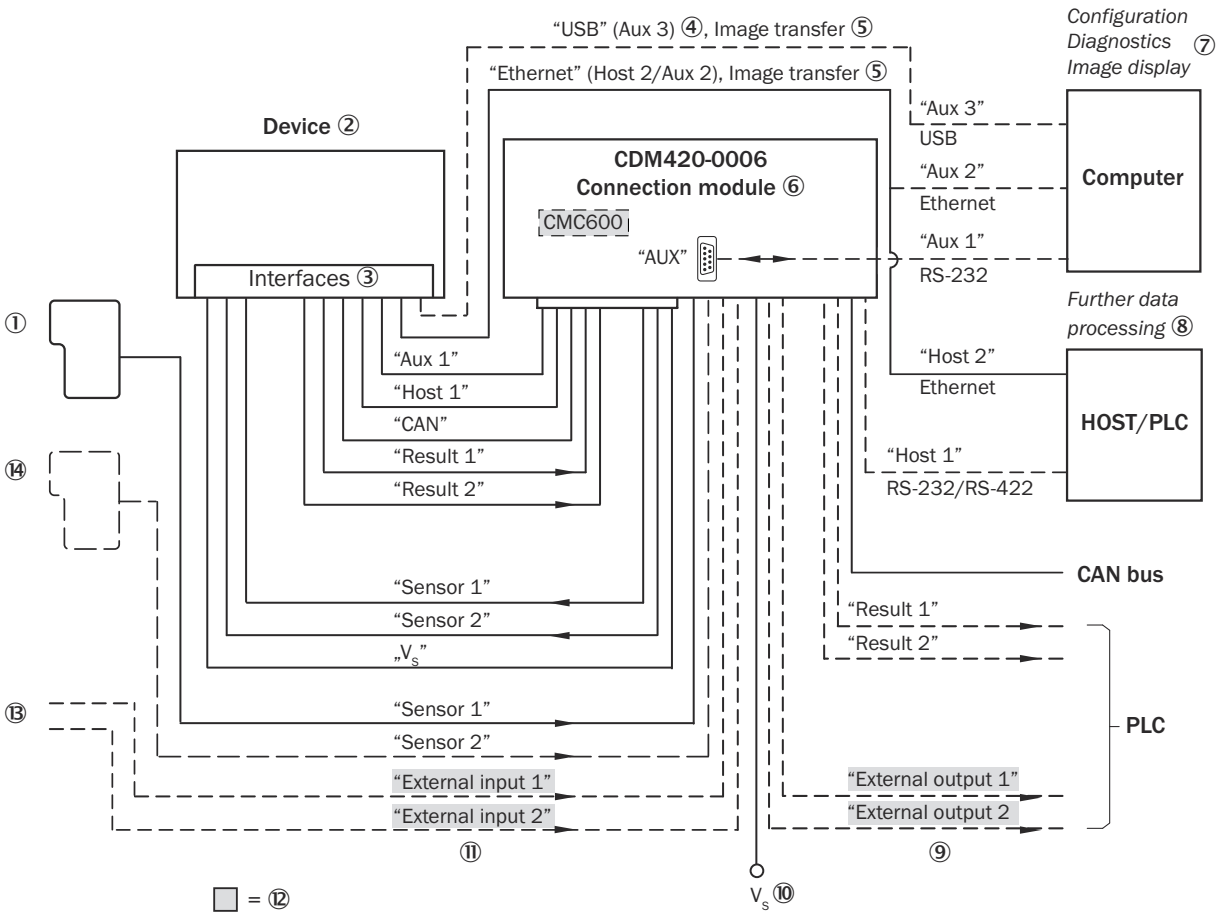


Figure 47: Connection of the device (Ethernet variant) to peripherals via CDM420-0006 (overview)

① External trigger sensor
② Device
③ Interfaces
④ USB interface, for temporary use as a servicing interface only
⑤ Image transmission
⑥ Connection modules
⑦ Configuration, diagnostics or image display
⑧ Data further processing
⑨ External digital outputs
⑩ Supply voltage V_S
⑪ External digital inputs
⑫ 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).
⑬ Other functions
⑭ Application-dependent alternative stop trigger (e.g., photoelectric sensor) or travel increment (incremental encoder)

13.4.2 Wiring overview of the CDM420-0006

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

Device = Lector621 = V2D621x-xxxxxYx (Ethernet variant, Y = B or C)

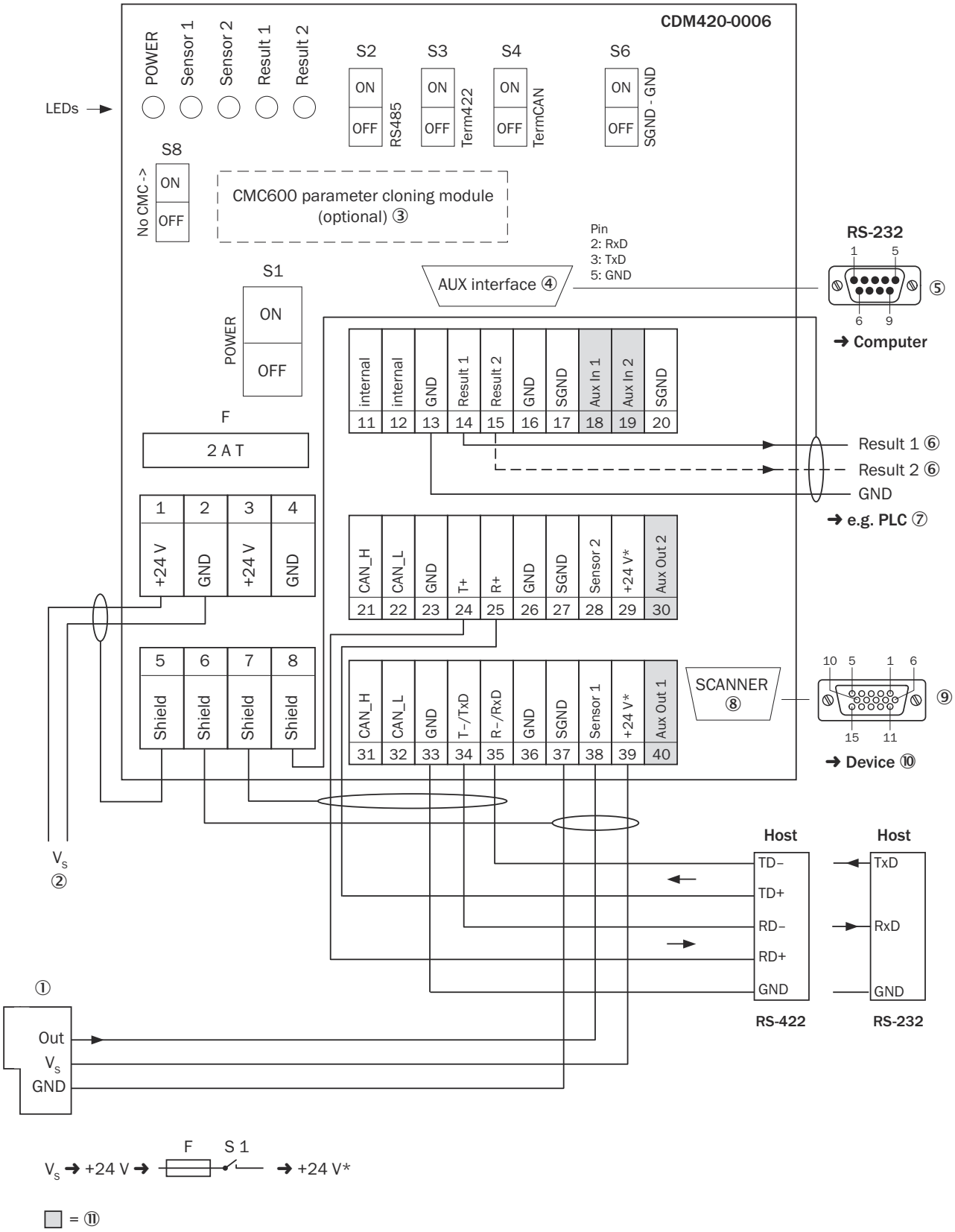


Figure 48: Connection of device and peripherals to the CDM420-0006 connection module (overview).

① External trigger sensor
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).

13.4.3 Connecting supply voltage for the device in CDM420-0006

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

Device = Lector621 = V2D621x-xxxxxYx (Ethernet variant, Y = B or C)

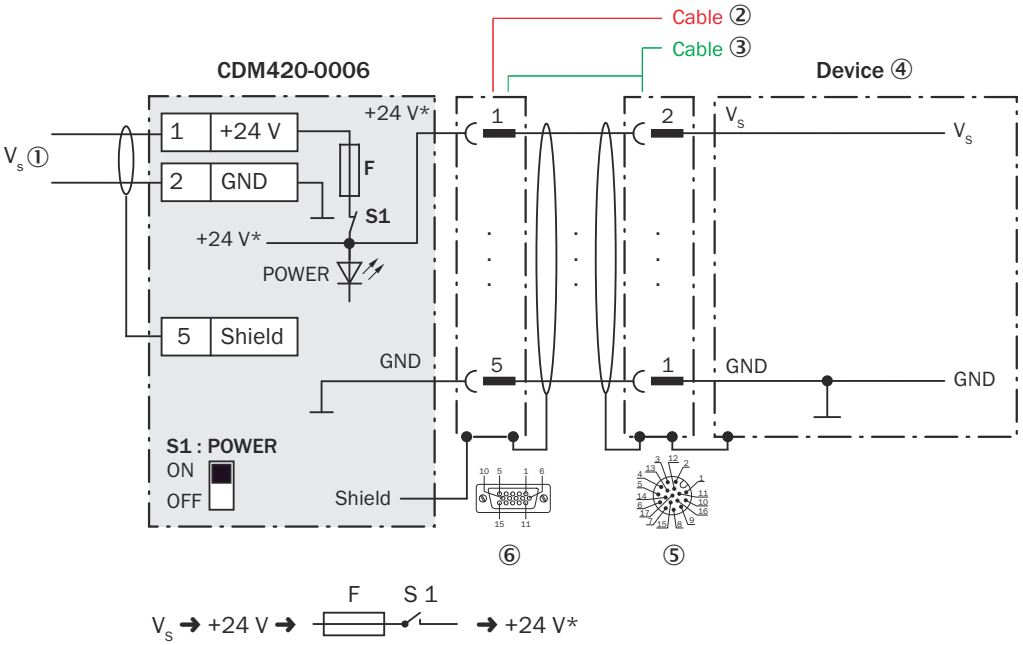


Figure 49: Connecting supply voltage for the device in CDM420-0006 connection module.

① Supply voltage V_S
② Serial variant: connecting cable permanently connected to the device (male connector, D-Sub-HD, 15-pin)
③ Ethernet variant: adapter cable with male connector, D-Sub-HD, 15-pin and female connector, M12, 17-pin, A-coded
④ Device
⑤ Ethernet variant: Male connector, M12, 17-pin, A-coded
⑥ Connection module: female connector, D-Sub-HD, 15-pin

Function of switch S1

Table 50: Switch S1: Power

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

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

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

Device = Lector621 = V2D621x-xxxxxYx (Ethernet variant, Y = B or C)

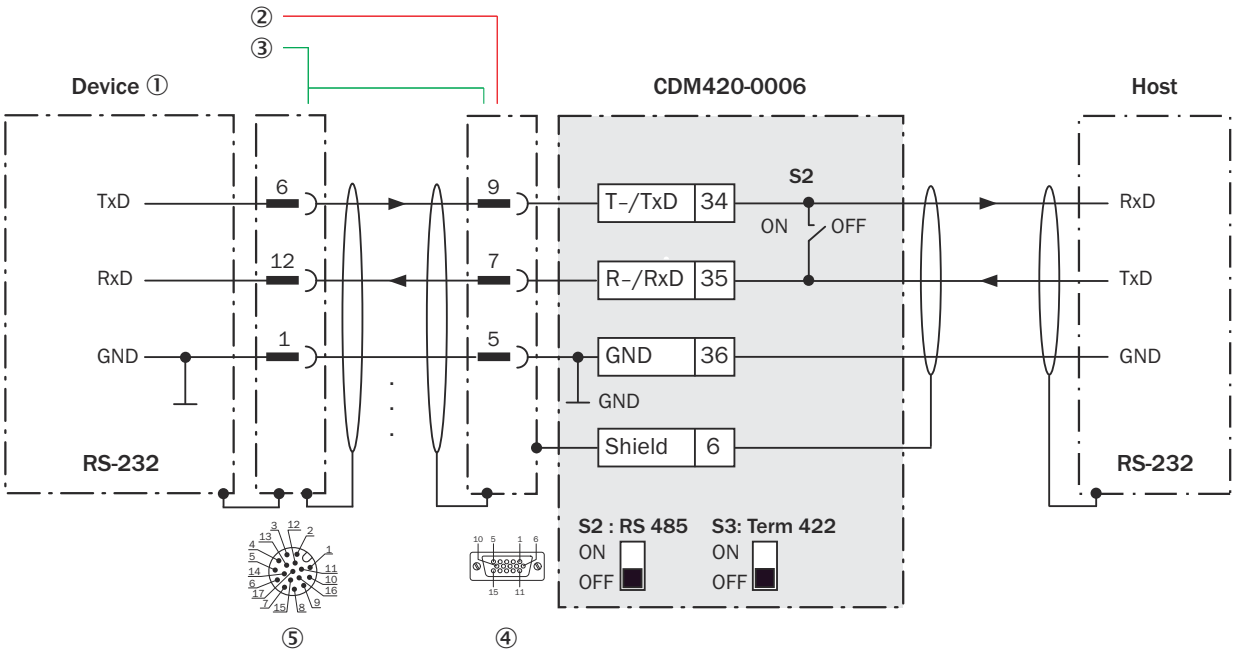


Figure 50: Wiring data interface RS-232 of the device in connection module CDM420-0006.

① Device
② Serial variant: connecting cable permanently connected to the device (male connector, D-Sub-HD, 15-pin)
③ 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 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.

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

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

Device = Lector621 = V2D621x-xxxxxYx (Ethernet variant, Y = B or C)

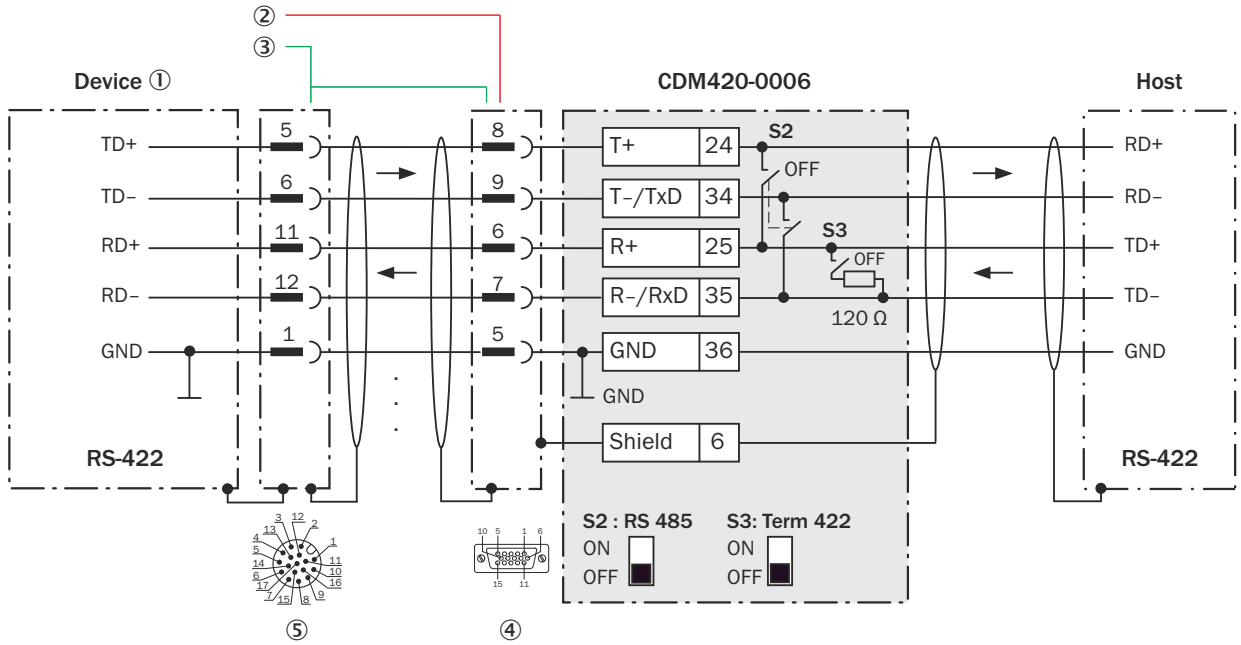


Figure 51: Wiring data interface RS-422 of the device in connection module CDM420-0006.

① Device
② Serial variant: connecting cable permanently connected to the device (male connector, D-Sub-HD, 15-pin)
③ 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 Ethernet variant:

Male connector, M12, 17-pin, A-coded

Function of switch S3

Table 51: 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.
- The connection shown above is configured for operation of the host with permanently activated drivers, often described as “RS-422 operation”.

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

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

Device = Lector621 = V2D621x-xxxxxYx (Ethernet variant, Y = B or C)

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

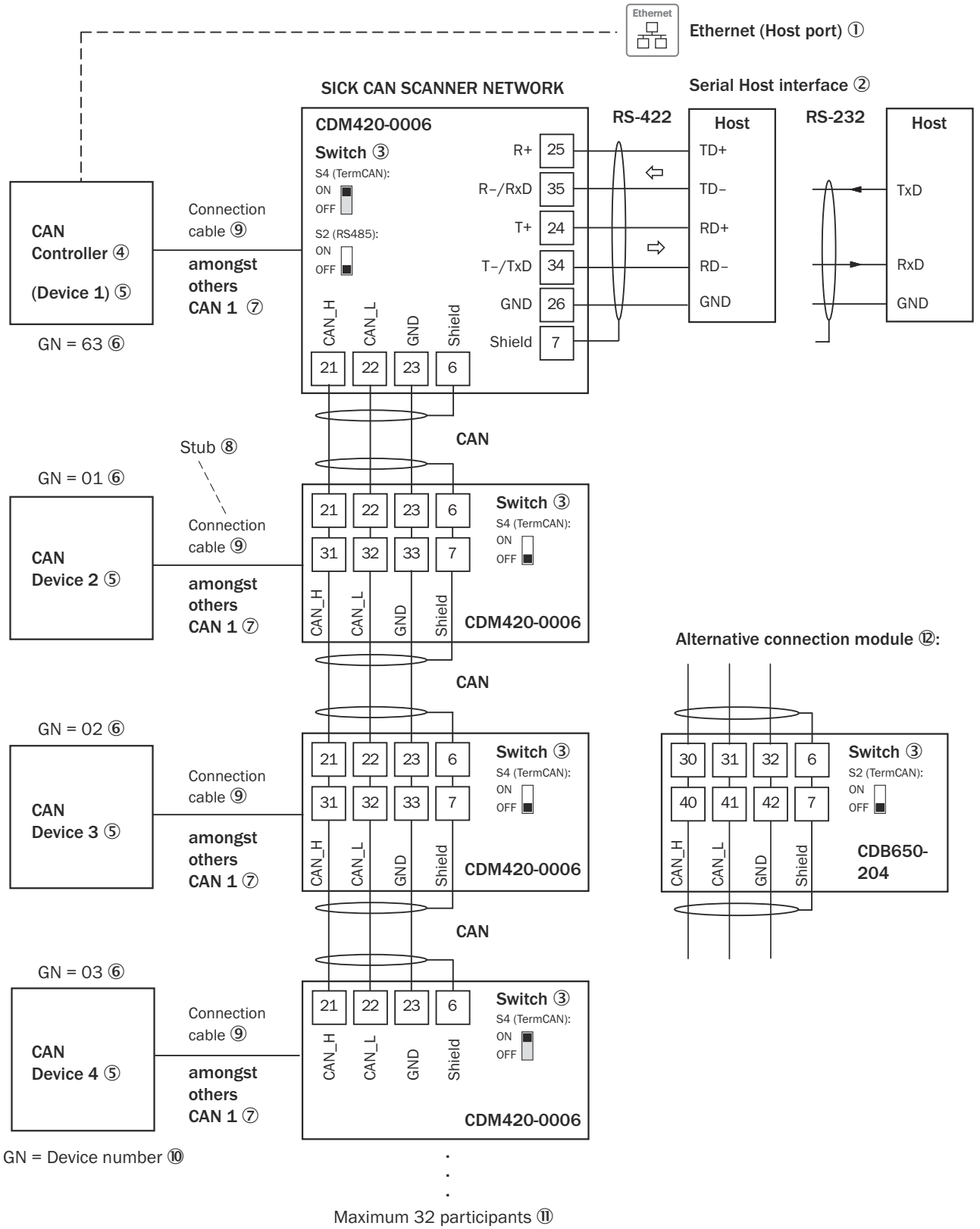


Figure 52: Wire the CAN interface of the device in the CDM420-0006 connection module.

① Ethernet variant:

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 Serial variant: connecting cable permanently connected to the device (male connector, D-Sub-HD, 15-pin)

Ethernet variant:

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:

Serial variant: CDB620 or CDM420-0001

Ethernet variant: CDB650-204

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 Ethernet variant.

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 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.

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

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

Device = Lector621 = V2D621x-xxxxxYx (Ethernet variant, Y = B or C)

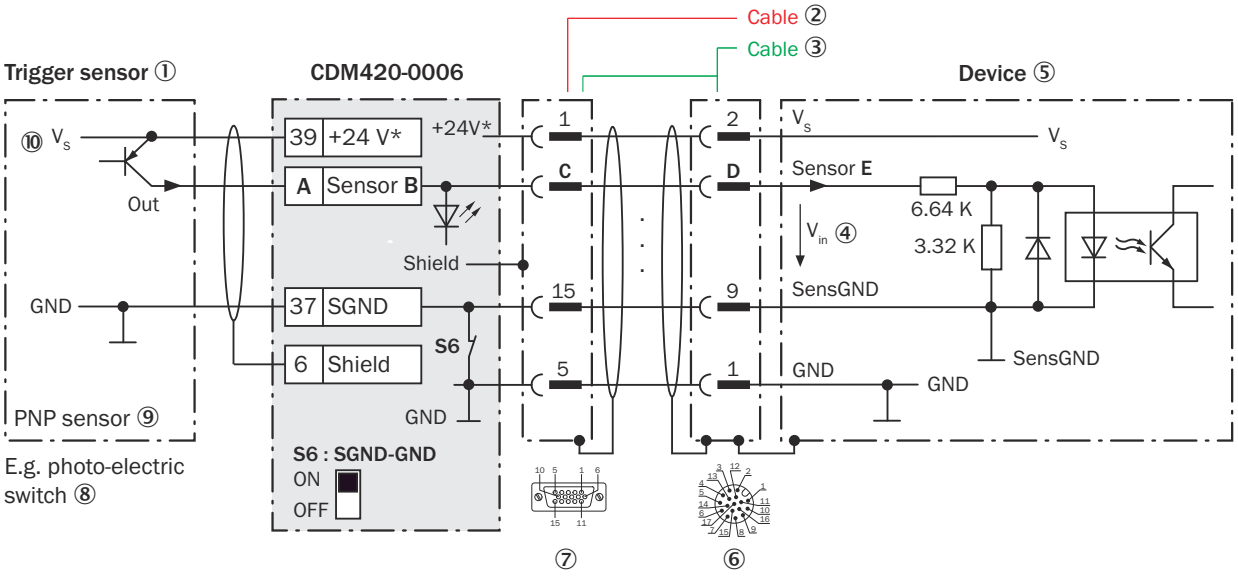


Figure 53: Trigger sensor supplied with power by connection module CDM420-0006

① Trigger sensor
② Serial variant: connecting cable permanently connected to the device (male connector, D-Sub-HD, 15-pin)
③ 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 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

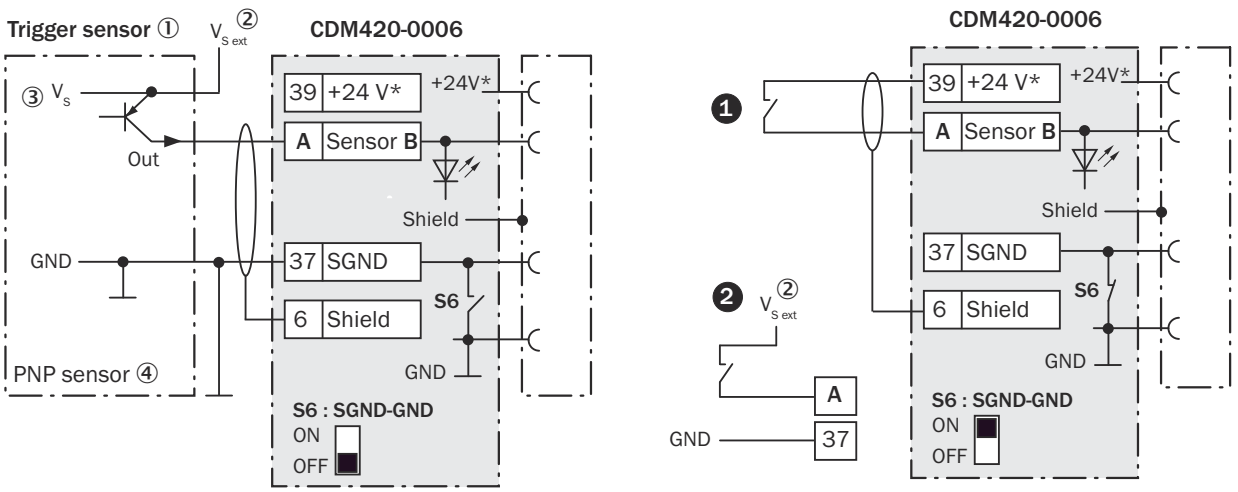


Figure 54: Left: Trigger sensor connected potential-free and supplied with power externally. Right: Alternatively switch, ❶ supplied with power by connection module CDM420-0006 or ❷ connected potential-free and supplied with power externally. Now select switch setting S6 as shown in the left figure.

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 52: 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 53: Switch S6: SGND - GND

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

Characteristic data of the digital inputs

Table 54: 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.

13.4.8 Wiring the external digital inputs of the device in the CDM420-0006

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

Device = Lector621 = V2D621x-xxxxxYx (Ethernet variant, Y = B or C)

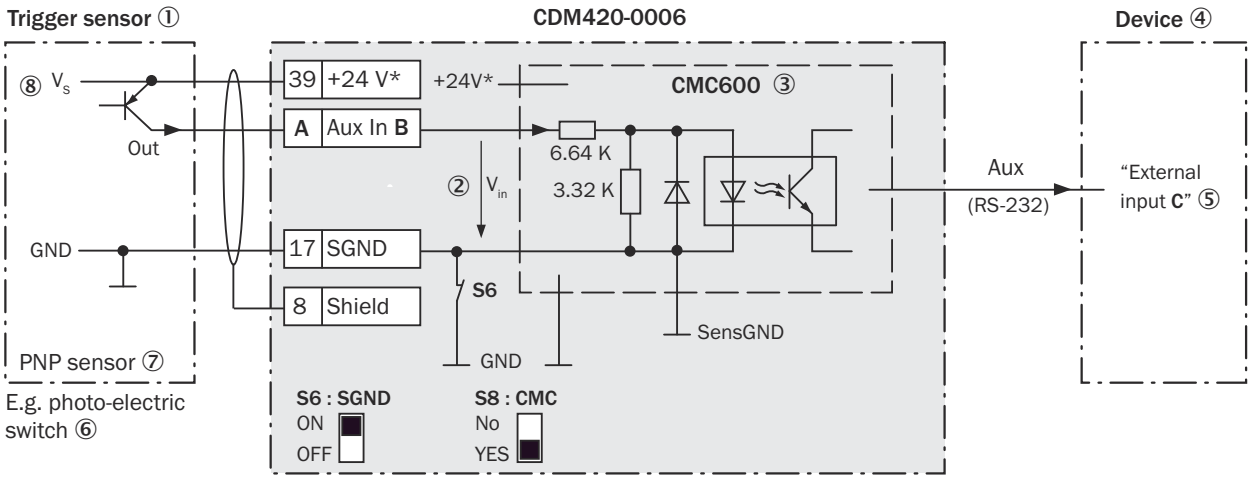


Figure 55: Trigger sensor supplied with power by connection module CDM420-0006

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

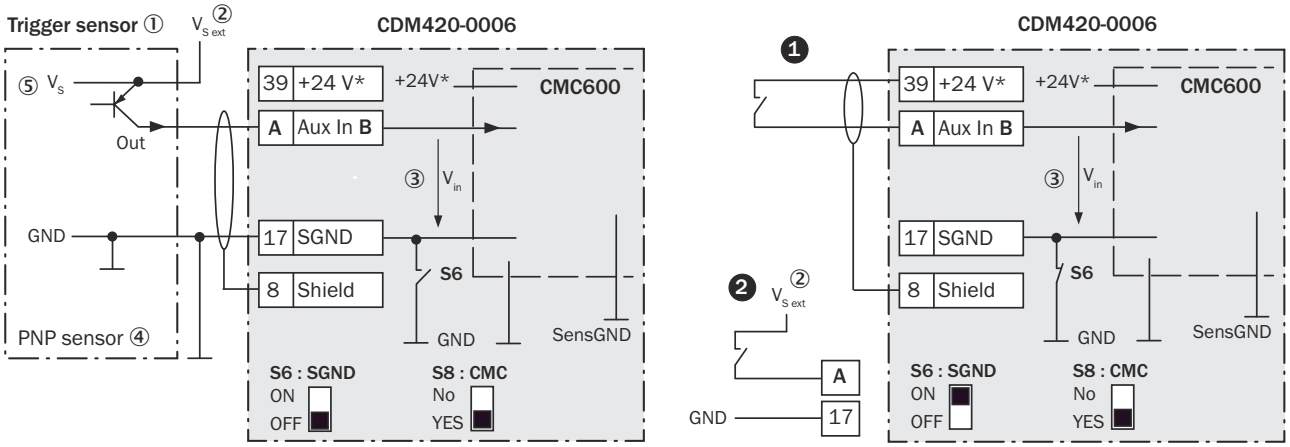


Figure 56: Left: Trigger sensor connected potential-free and supplied with power externally. Right: Alternatively switch, ❶ supplied with power by connection module CDM420-0006 or ❷ connected potential-free and supplied with power externally. Switch setting S3 then as in left figure.

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 55: 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 56: 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 57: 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.

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

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

Device = Lector621 = V2D621x-xxxxxYx (Ethernet variant, Y = B or C)

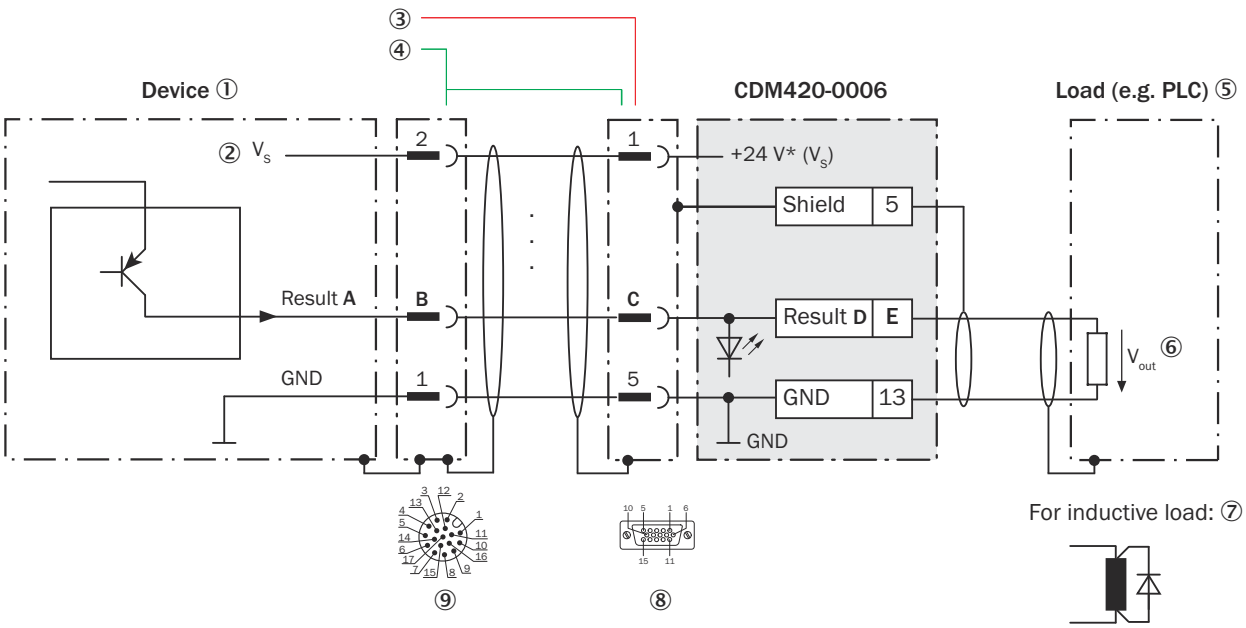


Figure 57: Wire the digital output in the CDM420-0006 connection module.

① Device
② Supply voltage V_S
③ Serial variant: connecting cable permanently connected to the device (male connector, D-Sub-HD, 15-pin)
④ 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 Ethernet variant:

Male connector, M12, 17-pin, A-coded

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

Not available in CDM420-0006:
- Result 3
- Result 4

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 58: 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

Device		CDM420-0006		
Output A	**Pin B**	**Pin C**	**Signal D**	**Terminal E**
Result 2	14	13	Result 2	15

Characteristic data of the digital outputs

Table 59: Characteristic data of the and digital outputs

Type	Switching
Switching behavior	PNP switching to supply voltage V_S Default settings in the device: no function, logic: not inverted (active high)
Properties	• 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.

13.4.10 Wiring the external digital outputs of the device in the CDM420-0006

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

Device = Lector621 = V2D621x-xxxxxYx (Ethernet variant, Y = B or C)

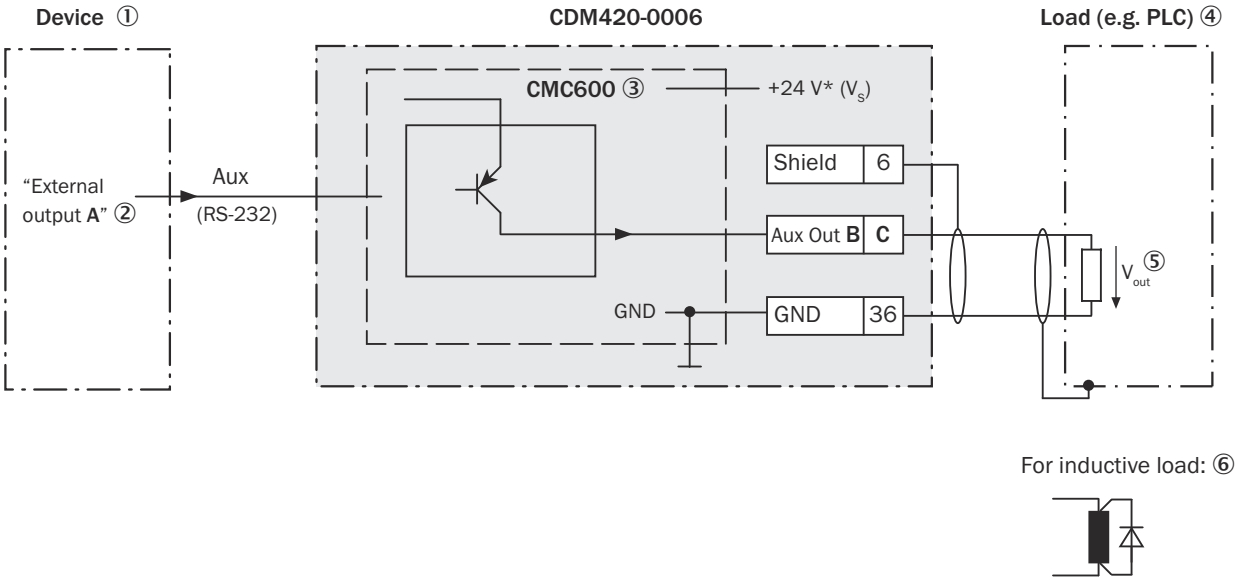


Figure 58: Wiring "Aux Out 1" and "Aux Out 2" external digital outputs of the device in the connection module CDM420-0006.

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 60: 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 61: 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.

13.5 Connection diagrams of connection module CDB620-001

13.5.1 Connection of the device to CDB620-001

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

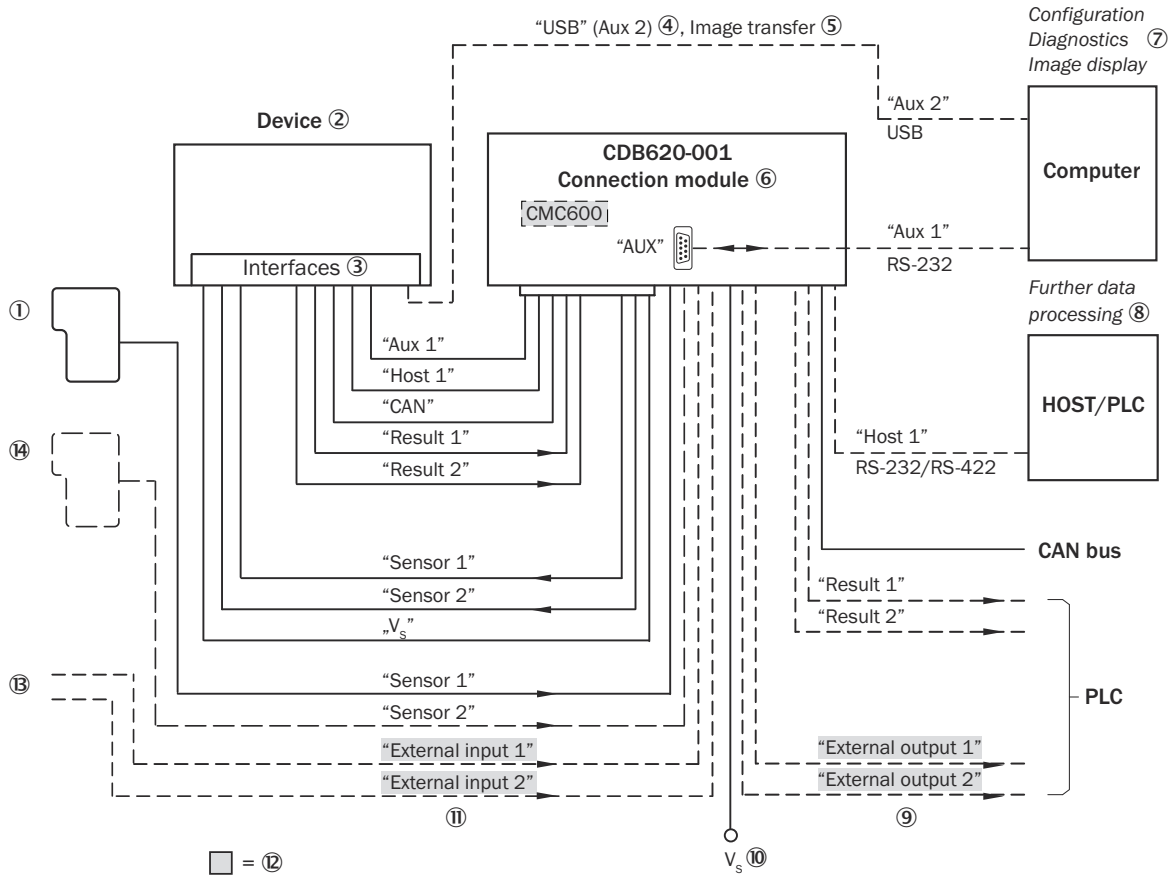


Figure 59: Connection of the device (serial variant) to peripherals via CDB620-001 (overview)

① External trigger sensor, e.g., for read cycle generation
② Device
③ Interfaces
④ USB interface, for temporary use as a servicing interface only
⑤ Image transmission
⑥ Connection modules
⑦ Configuration, diagnostics or image display
⑧ Data further processing
⑨ External digital outputs
⑩ Supply voltage V_S
⑪ External digital inputs
⑫ 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).
⑬ Other functions
⑭ Application-dependent alternative stop reading cycle (e.g. photoelectric sensor) or travel increment (incremental encoder)

13.5.2 Wiring overview of the CDB620-001

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E), 1 digital input used

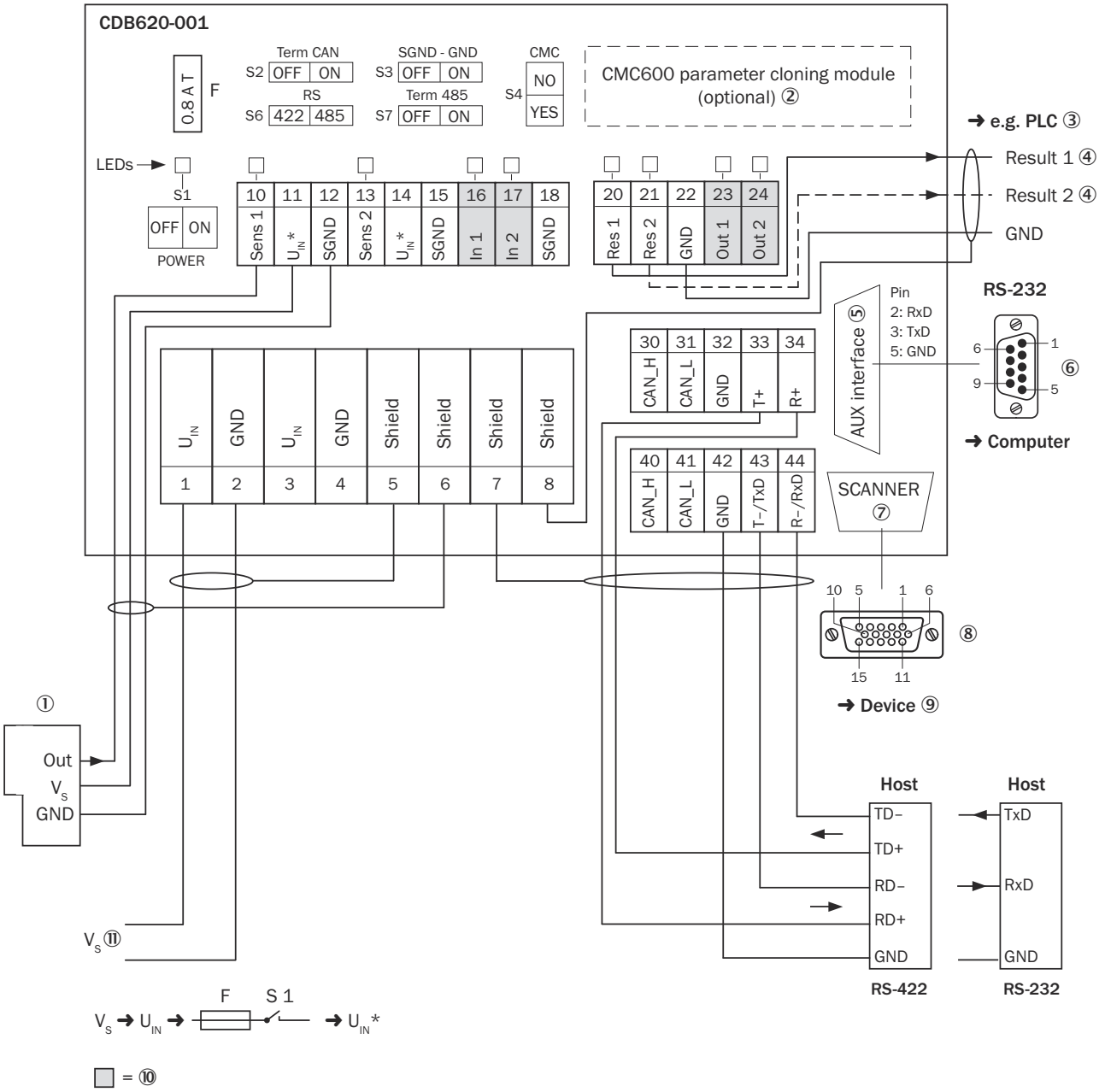


Figure 60: Overview: connection of device and peripherals to the CDB620-001 connection module.

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

13.5.3 Connecting supply voltage for the device in CDB620-001

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

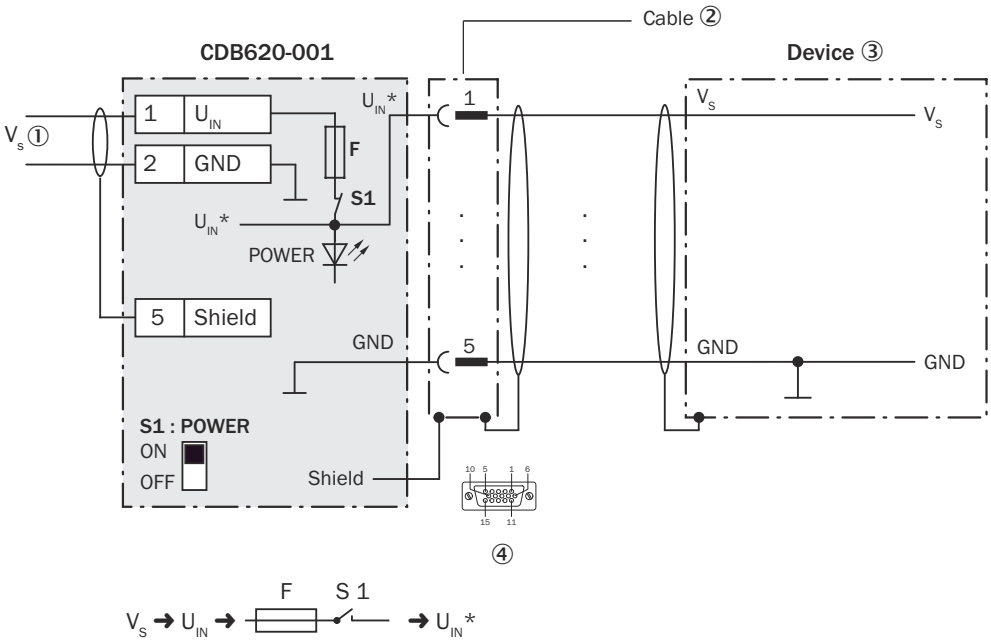


Figure 61: Connecting supply voltage for the device in CDB620-001 connection module

① Supply voltage V_S
② Connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
③ Device
④ Connection module: female connector, D-Sub-HD, 15-pin

Function of switch S1

Table 62: 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

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

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

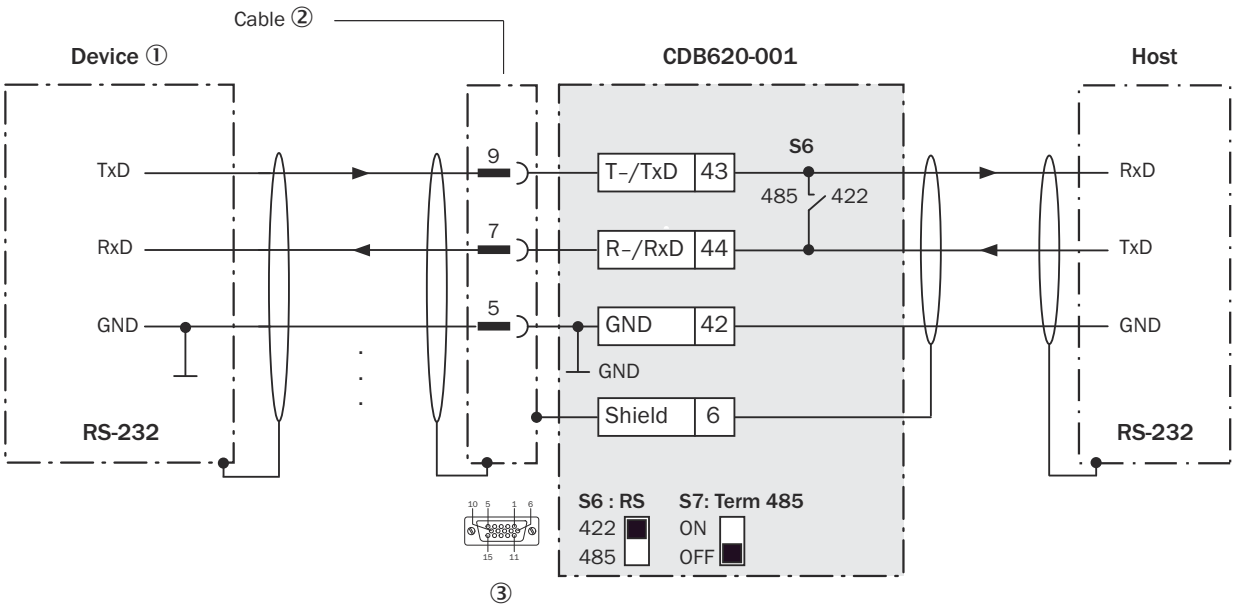


Figure 62: Wiring data interface RS-232 of the device in the connection module CDB620-001

① Device
② Connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
③ Connection module: female connector, D-Sub-HD, 15-pin

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

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

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

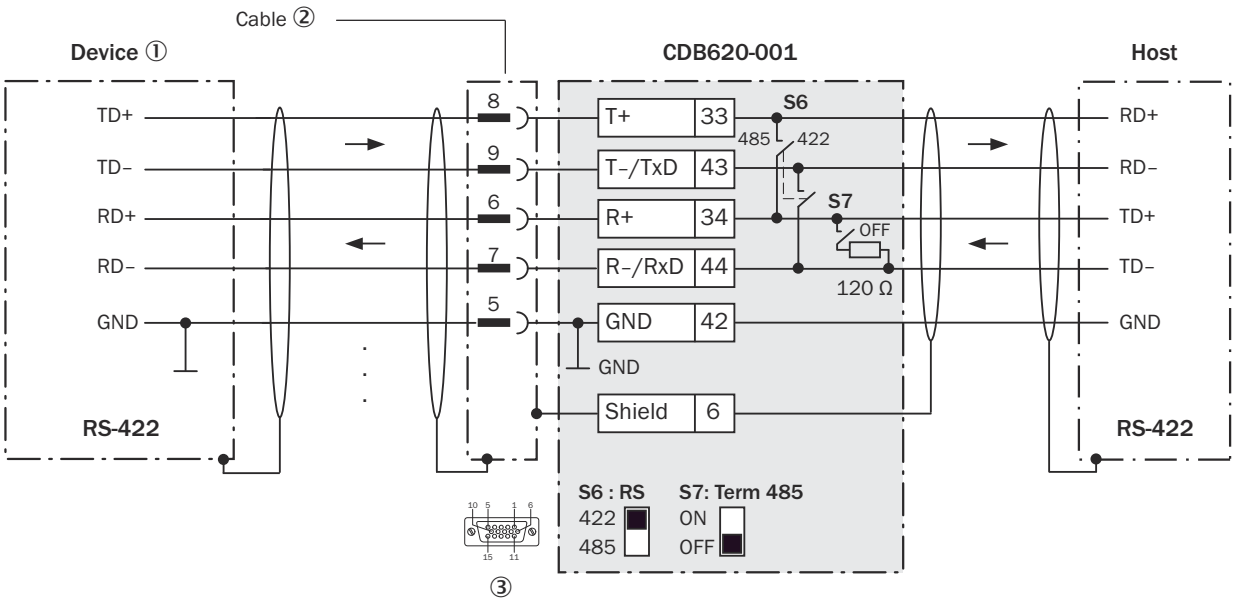


Figure 63: Wiring data interface RS-422 of the device in connection module CDB620-001.

① Device
② V2D621x-xxxxxYx (serial variant, Y = D or E): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
③ Connection module: female connector, D-Sub-HD, 15-pin

Function of switch S7

Table 63: 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.
- The connection shown above is configured for operation of the host with permanently activated drivers (often described as “RS-422 operation”).

13.5.6 Wiring the CAN interface in the CDB620-001

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

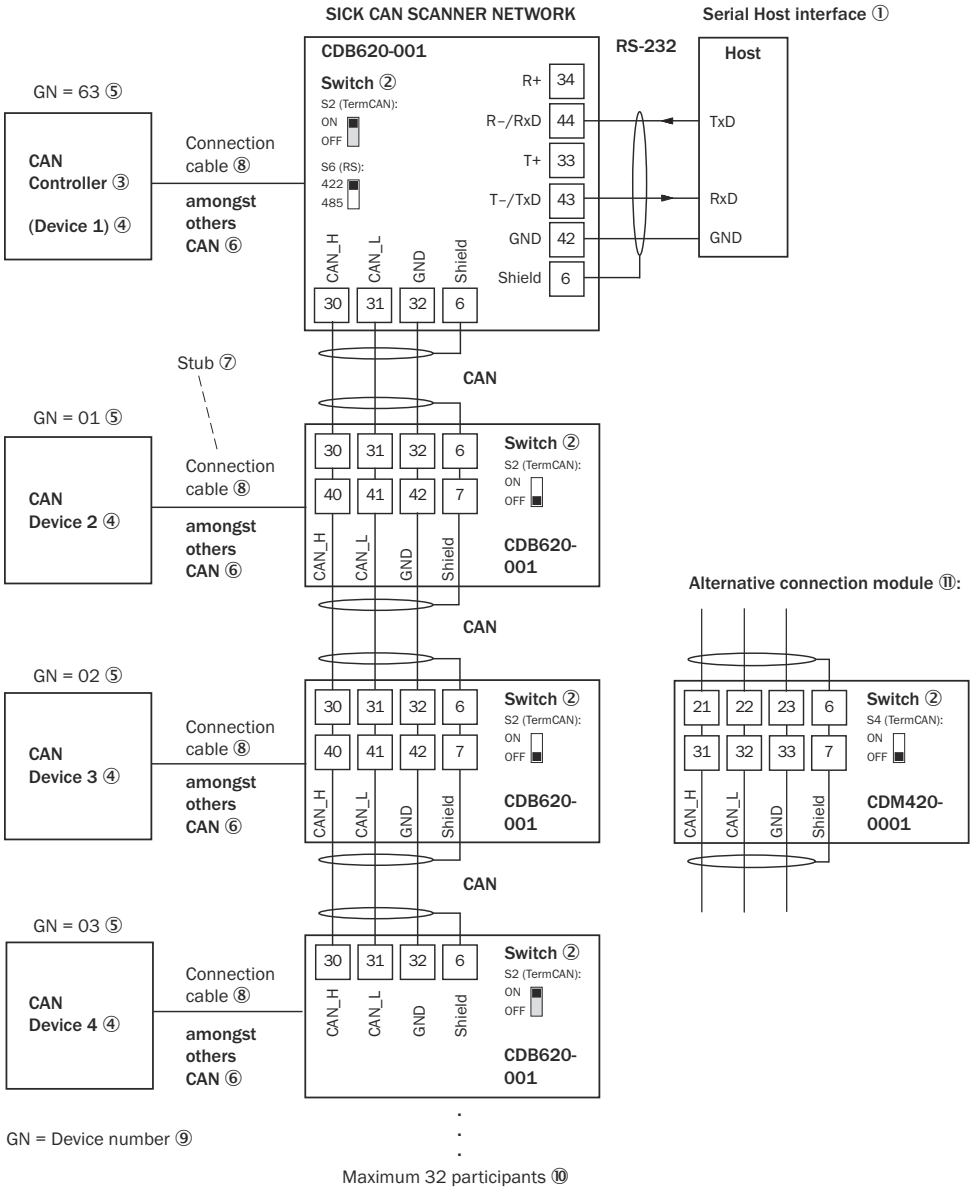


Figure 64: Wire the CAN interface of the device in the CDB620-001 connection module. Connection and looping through of the supply voltage and connection of a trigger sensor for read cycle generation at the CAN controller, for example, are disregarded here.

① Serial host interface
② Switch
③ CAN controller (primary)
④ CAN device (secondary)
⑤ Device number
⑥ CAN etc.
⑦ Branch line
⑧ Connecting cable permanently connected to the device with male connector, D-Sub-HD, 15-pin
⑨ Device number (GN)
⑩ Maximum 32 users
⑪ Example of alternative connection module:

Alternative connection module for V2D621x-xxxxxYx (serial variant, Y = D or E): CDM420-0001 or CDM420-0006

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.

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

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

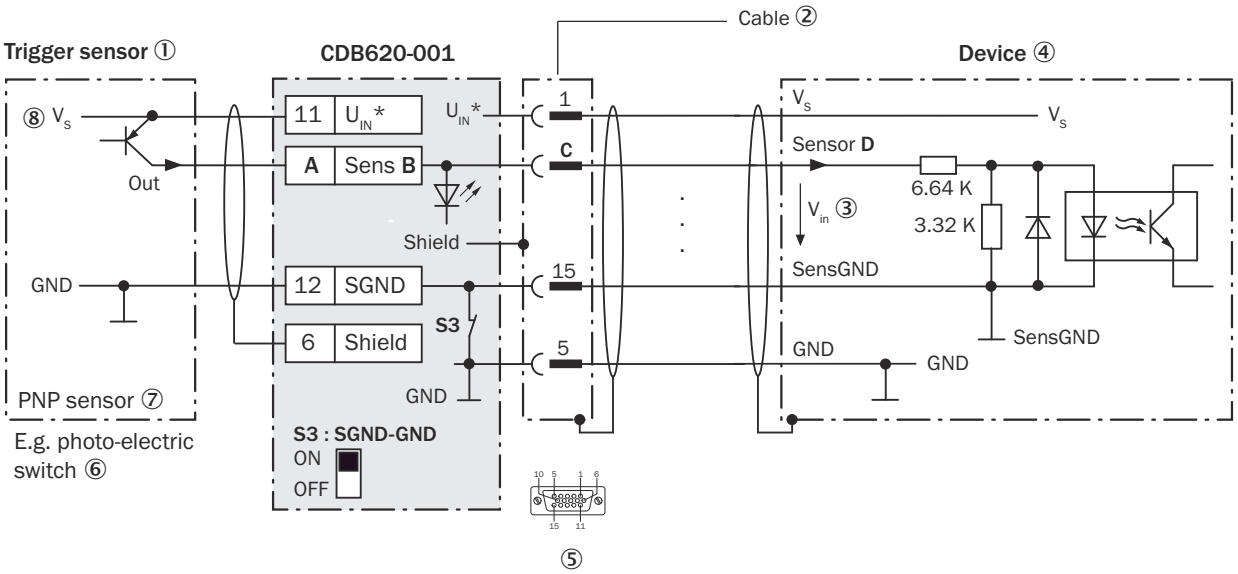


Figure 65: Trigger sensor supplied with power by connection module CDB620-001

① Trigger sensor, e.g., for read cycle generation
② Connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
③ Input voltage V_{in}
④ Device
⑤ Connection module: female connector, D-Sub-HD, 15-pin
⑥ E.g. photoelectric sensor
⑦ PNP sensor
⑧ Supply voltage V_S

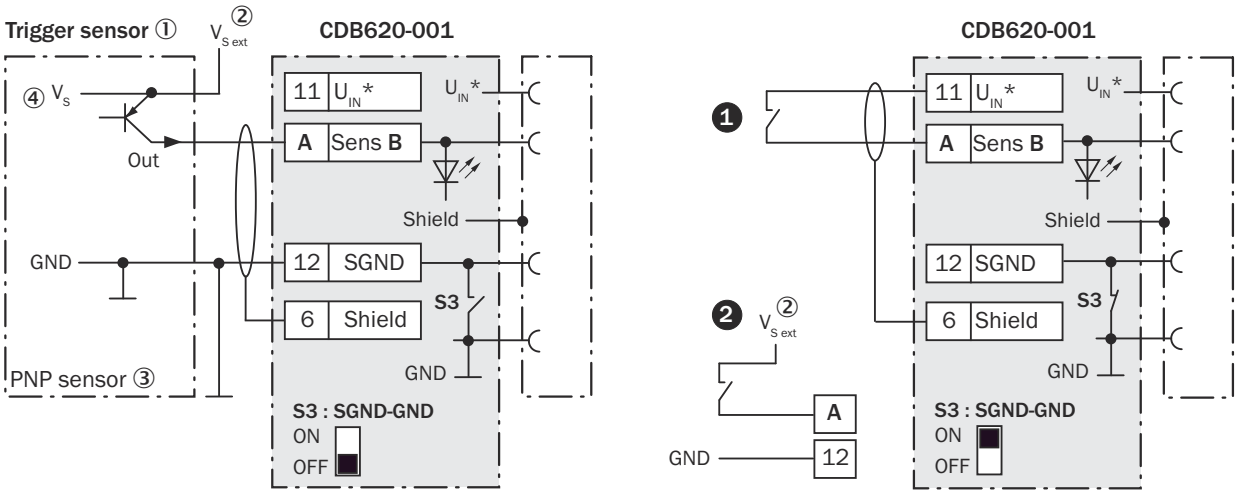


Figure 66: Left: Trigger sensor connected potential-free and supplied with power externally. Right: alternative switch, ❶ supplied with power by connection module CDB620-001 or ❷ connected volt-free and supplied with power externally. Now select switch setting S3 as shown in the left figure.

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 64: Assignment of placeholders to the digital inputs

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

Function of switch S3

Table 65: 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 66: 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.

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

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

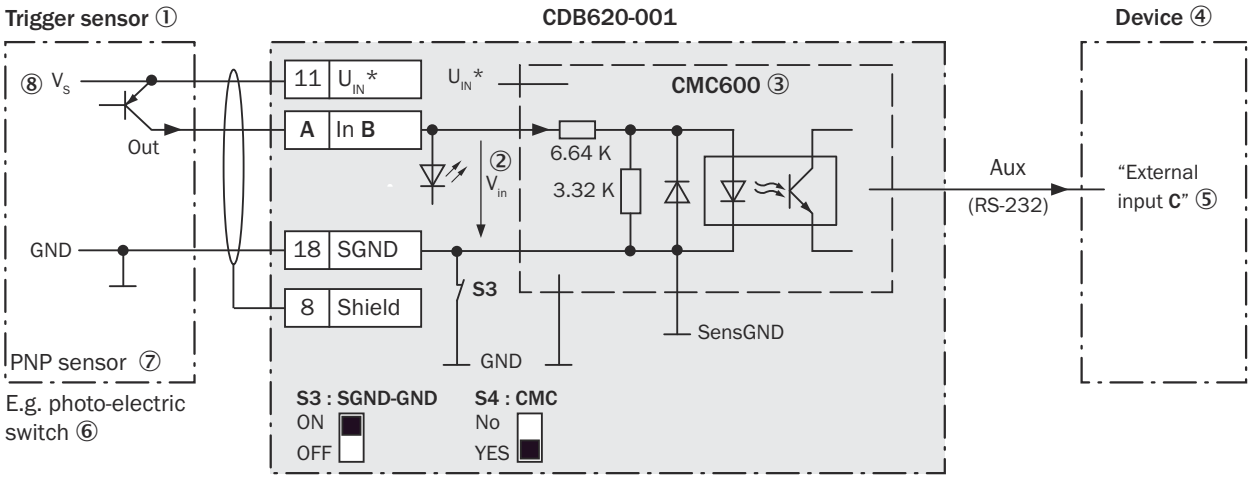


Figure 67: Trigger sensor supplied with power by connection module CDB620-001

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

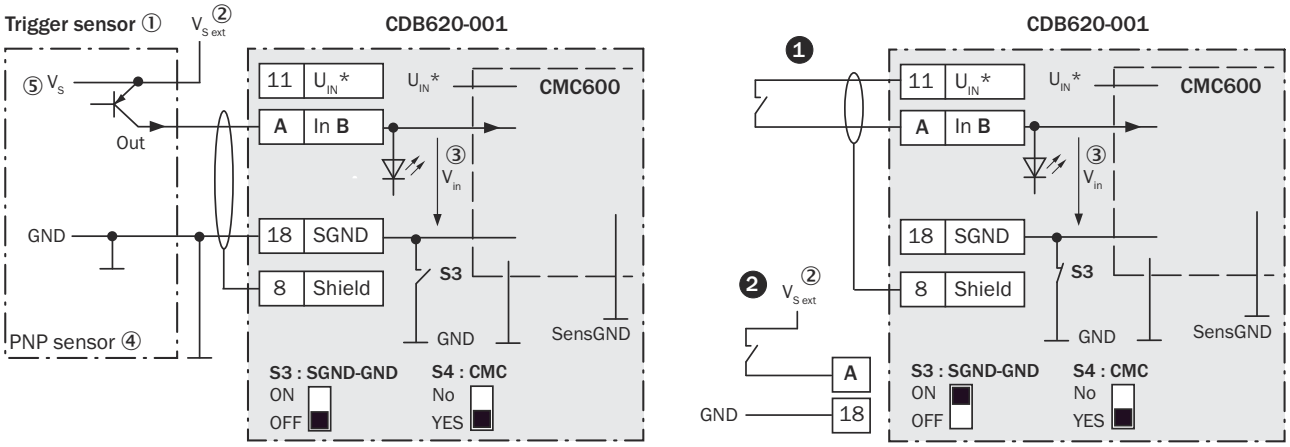


Figure 68: Left: Trigger sensor connected potential-free and supplied with power externally. Right: alternative switch, ❶ supplied with power by connection module CDB620-001 or ❷ connected volt-free and supplied with power externally. Now select switch setting S3 as shown in the left figure.

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 67: 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 68: 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 69: 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.

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

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

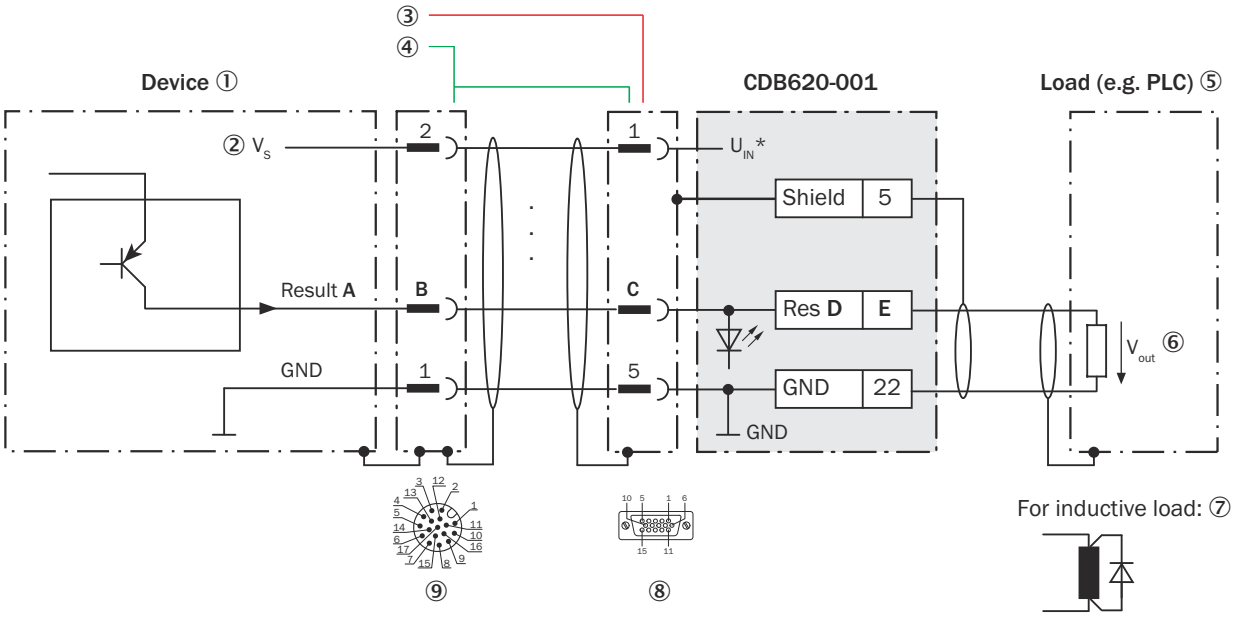


Figure 69: Wiring the "Result 1" and "Result 2" digital outputs of the device in the CDB620-001 connection module.

① Device
② Supply voltage V_S
③ V2D621x-xxxxxYx (serial variant, Y = D or E): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
④ V2D621x-xxxxxYx (serial variant, Y = D or E): omitted
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 V2D621x-xxxxxYx (serial variant, Y = D or E): omitted

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 70: Assignment of placeholders to the digital outputs

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

Table 71: 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 72: 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] $\leq V_S$ $(V_S - 1.5\ V) \leq V_{out} \leq V_S$ bei 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.

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

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

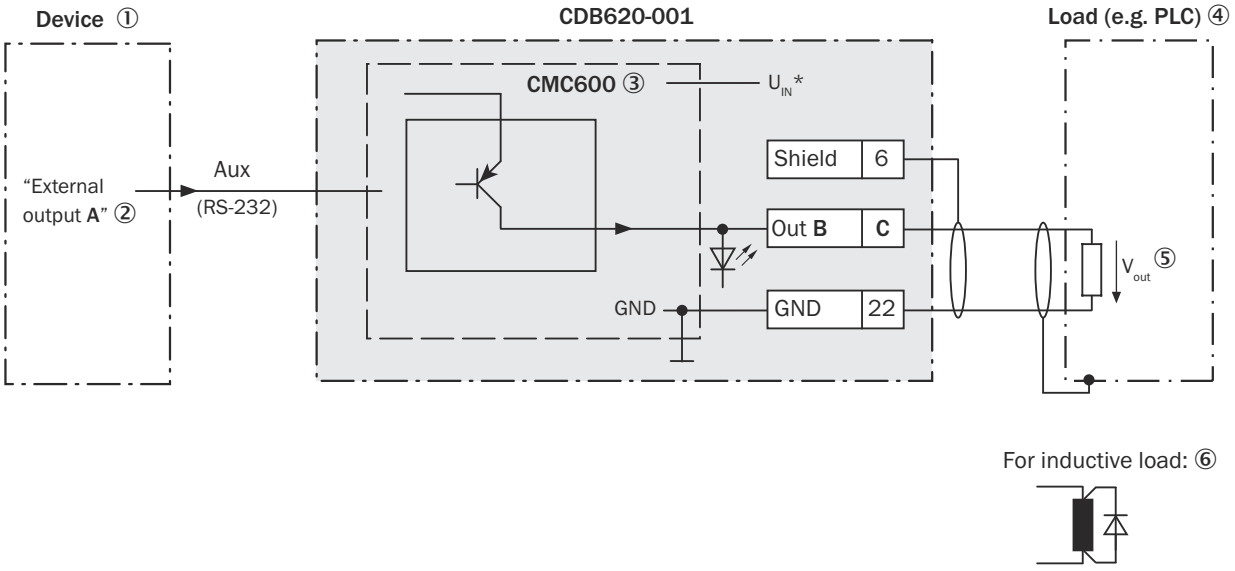


Figure 70: Wiring “Out 1” and “Out 2” external digital outputs of the device in the connection module CDB620-001.

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 73: 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 74: 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.

13.6 Connection diagrams of connection module CDM420-0001

13.6.1 Connection of the device to CDM420-0001

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

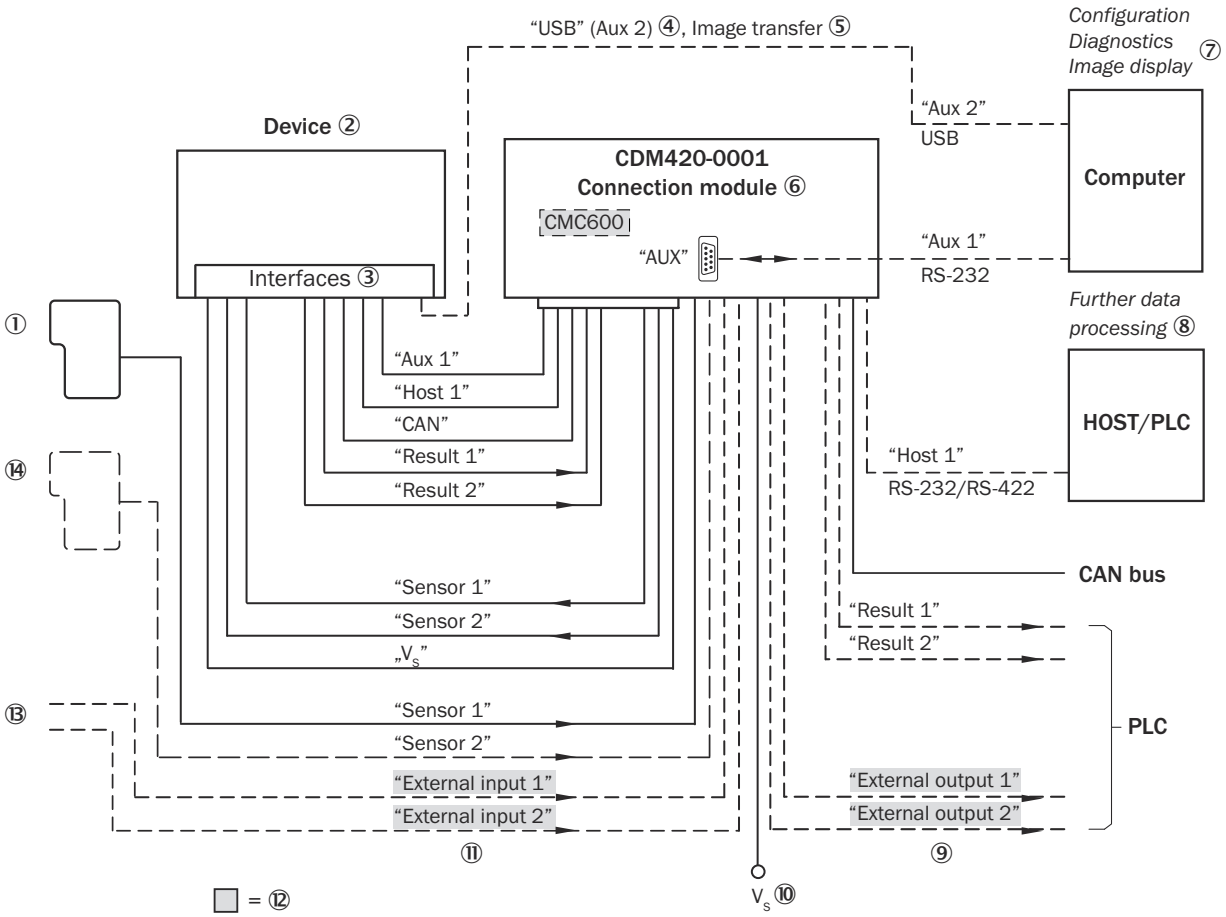


Figure 71: Connection of the device (serial variant) to peripherals via CDM420-0001 (overview)

① External trigger sensor, e.g. for read cycle generation
② Device
③ Interfaces
④ USB interface, for temporary use as a servicing interface only
⑤ Image transmission
⑥ Connection module
⑦ Configuration, diagnostics or image display
⑧ Data further processing
⑨ External digital outputs
⑩ Supply voltage V_S
⑪ External digital inputs
⑫ 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).
⑬ Other functions
⑭ Application-dependent alternative stop trigger (e.g. photoelectric sensor) or travel increment (incremental encoder)

13.6.2 Wiring overview of the CDM420-0001

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

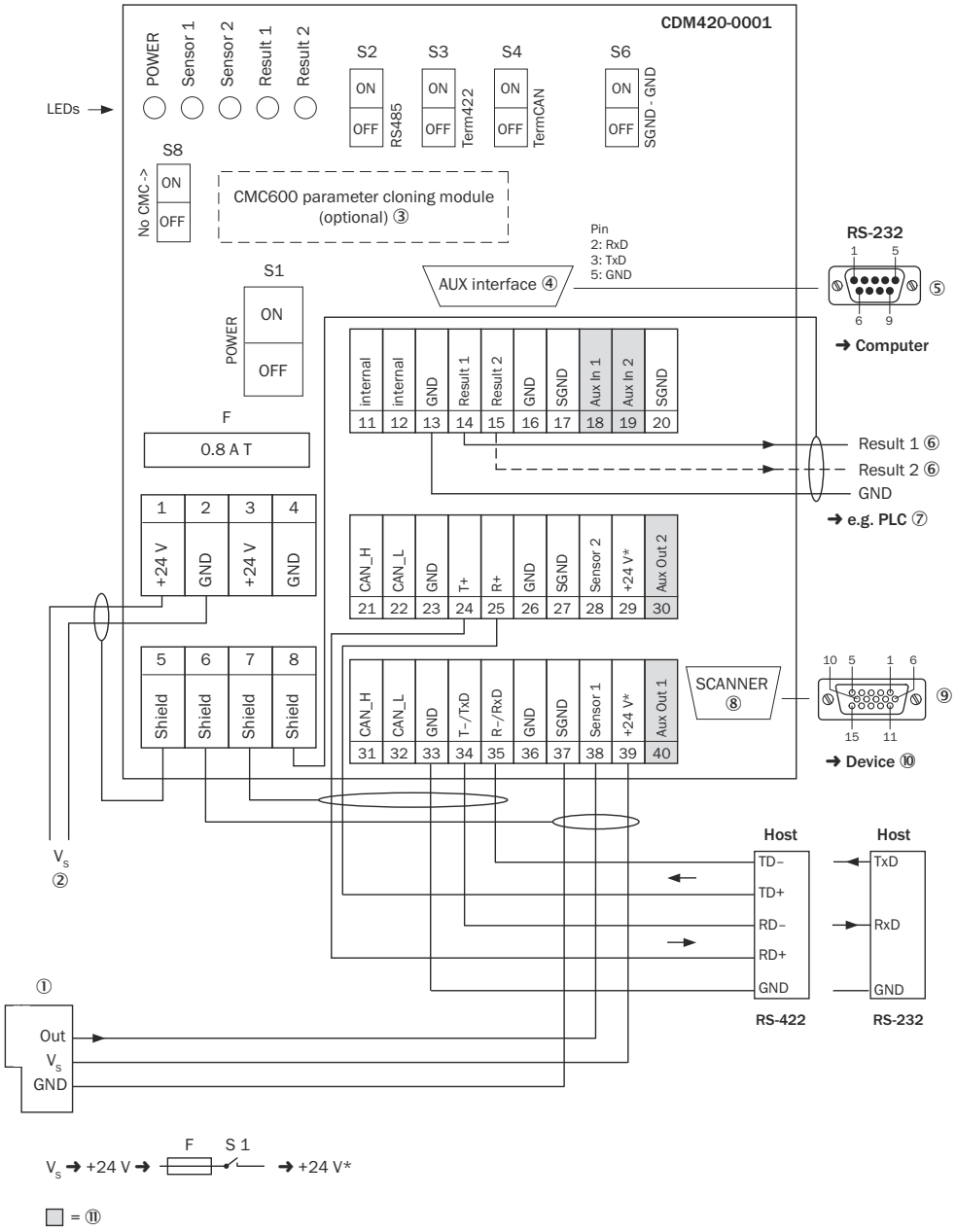


Figure 72: Overview: connection of device and peripherals to the CDM420-0001 connection module

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, 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

13.6.3 Connecting supply voltage for the device in CDM420-0001

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

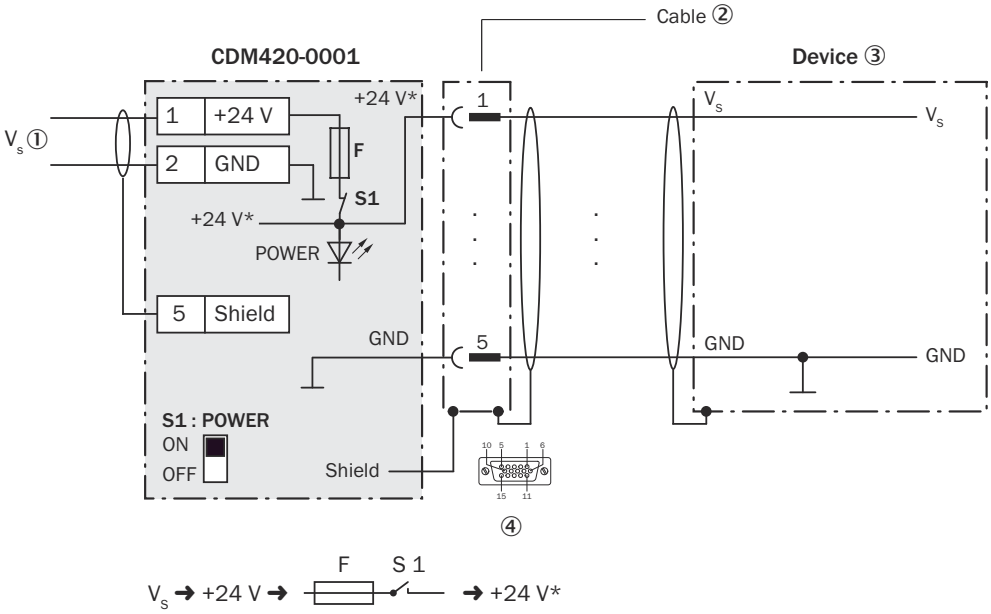


Figure 73: Connecting supply voltage for the device in CDM420-0001 connection module.

① Supply voltage V_S
② Connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
③ Device
④ Connection module: female connector, D-Sub-HD, 15-pin

Function of switch S1

Table 75: 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

Switch setting	Function
OFF	CDM420-0001 and device disconnected from supply voltage Recommended setting for all connection work

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

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

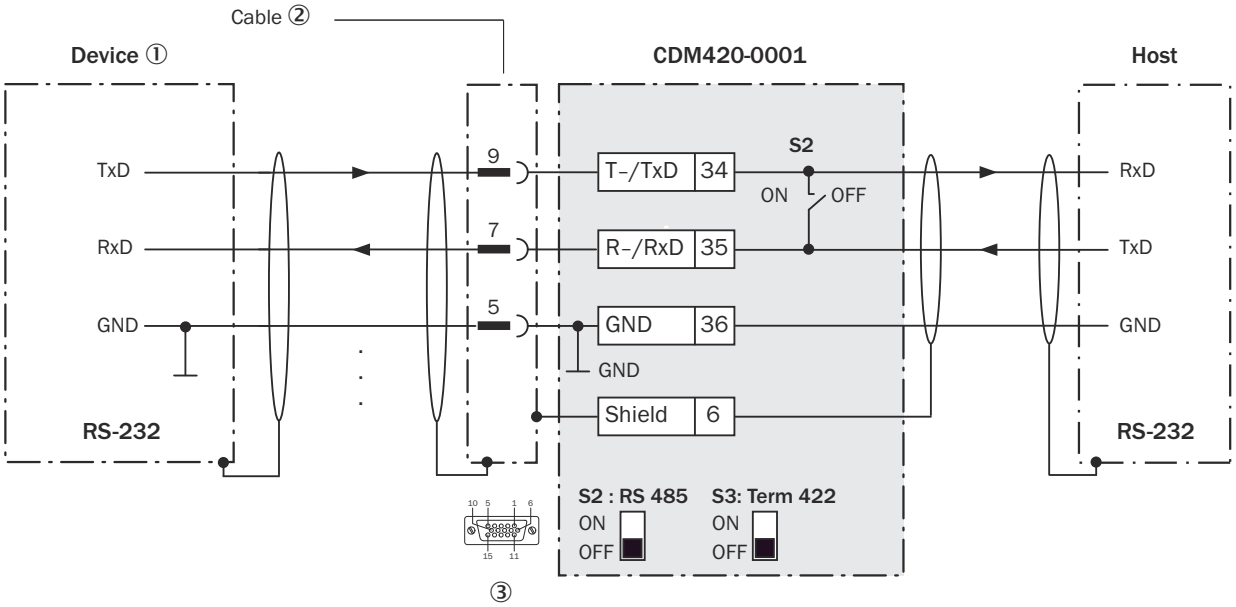


Figure 74: Wiring data interface RS-232 of the device in connection module CDM420-0001.

① Device
② Connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
③ Connection module: female connector, D-Sub-HD, 15-pin

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

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

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

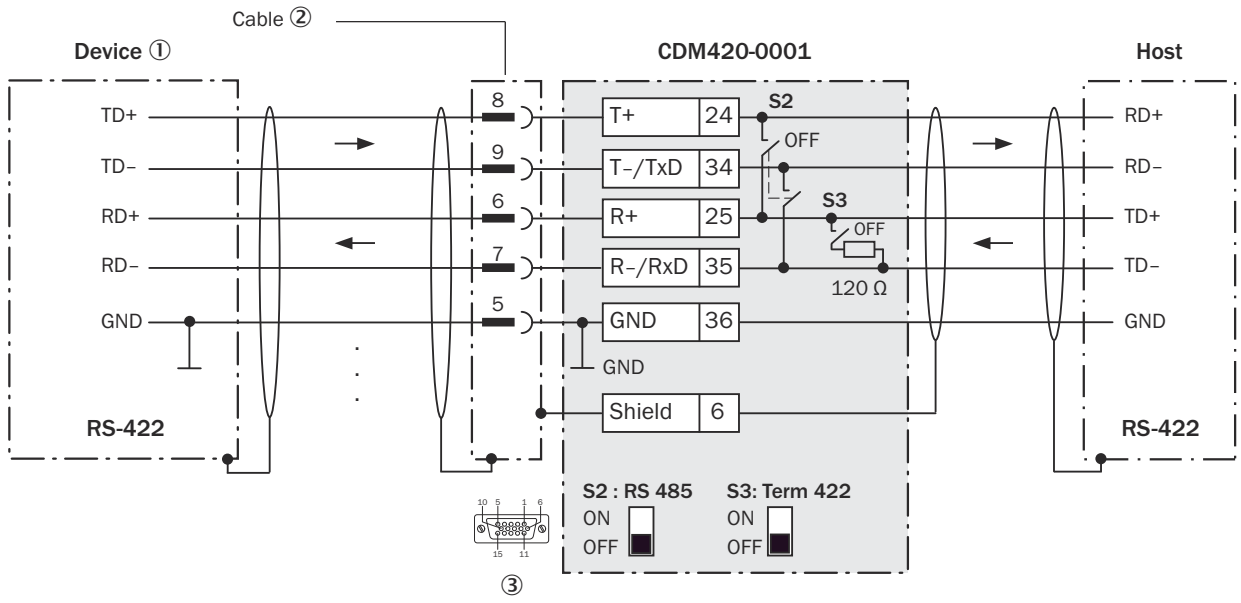


Figure 75: Wiring data interface RS-422 of the device in connection module CDM420-0001.

① Device
② V2D621x-xxxxxYx (serial variant, Y = D or E): connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
③ Connection module: female connector, D-Sub-HD, 15-pin

Function of switch S3

Table 76: 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.
- The connection shown above is configured for operation of the host with permanently activated drivers (often described as “RS-422 operation”).

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

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

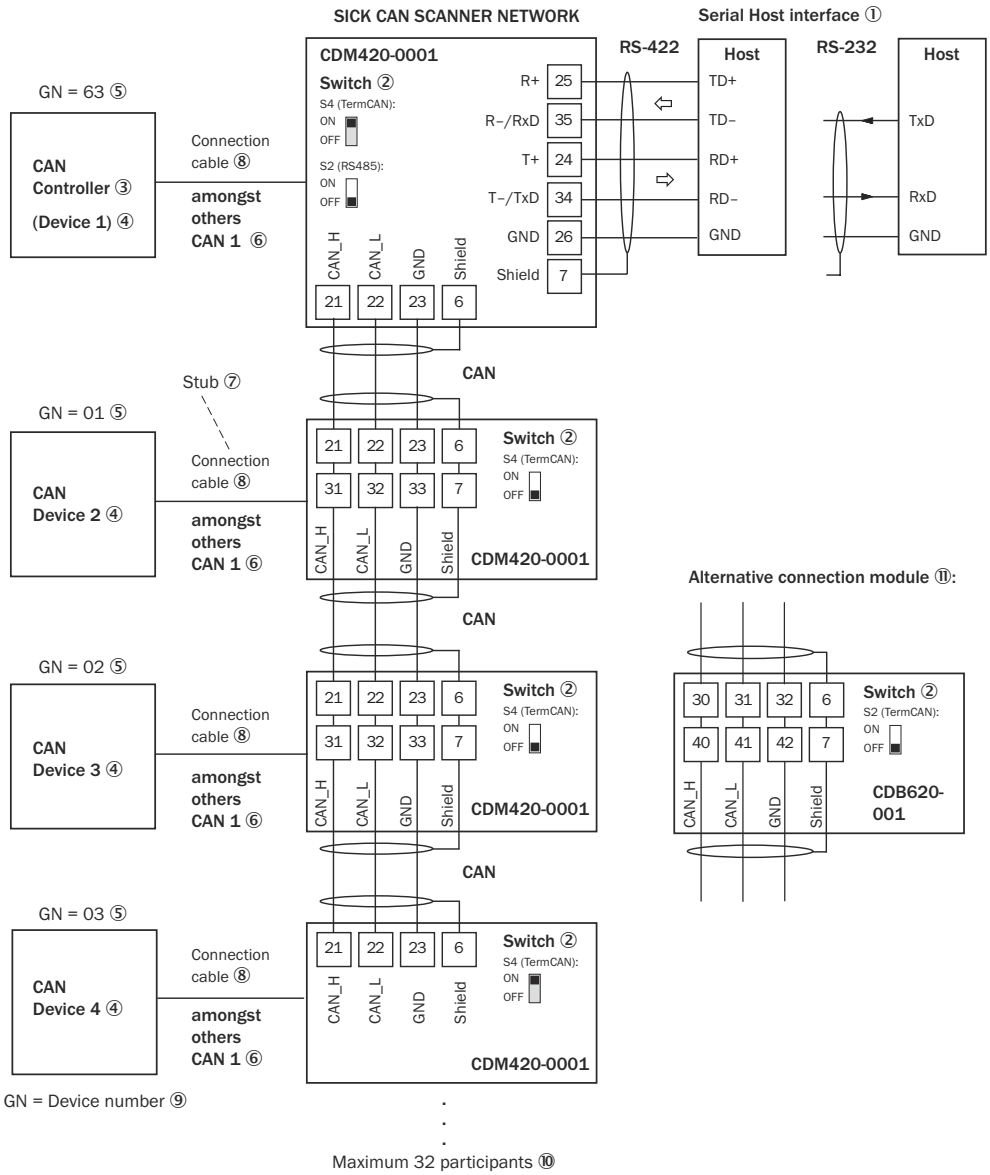


Figure 76: Wire the CAN interface of the device in the CDM420-0001 connection module. Connection and looping through of the supply voltage and connection of a trigger sensor for read cycle generation at the CAN controller, for example, are disregarded here.

① Serial host interface
② Switch
③ CAN controller (primary)
④ CAN device (secondary)
⑤ Device number
⑥ CAN etc.
⑦ Branch line
⑧ Connecting cable permanently connected to the device with male connector, D-Sub-HD, 15-pin
⑨ Device number (GN)
⑩ Maximum 32 users
⑪ Example of alternative connection module:

Alternative connection modules for Lector621 ECO: CDB620 or CDM420-0006

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.

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

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

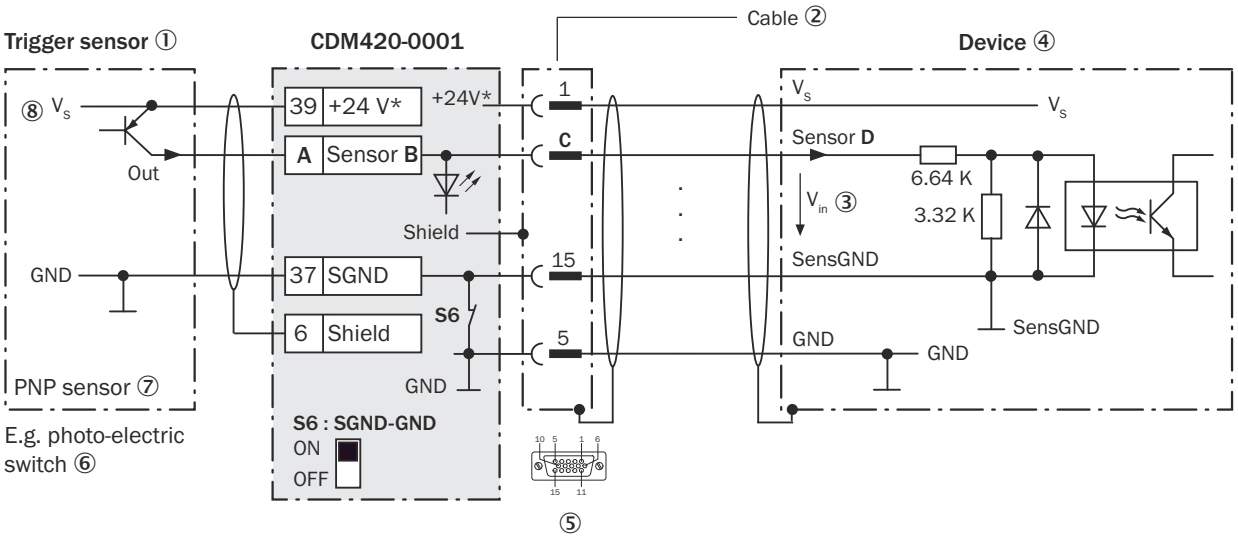


Figure 77: Trigger sensor supplied with power by connection module CDM420-0001

① Trigger sensor, e.g. for read cycle generation
② Connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
③ Input voltage V_{in}
④ Device
⑤ Connection module: female connector, D-Sub-HD, 15-pin
⑥ E.g. photoelectric sensor
⑦ PNP sensor
⑧ Supply voltage V_S

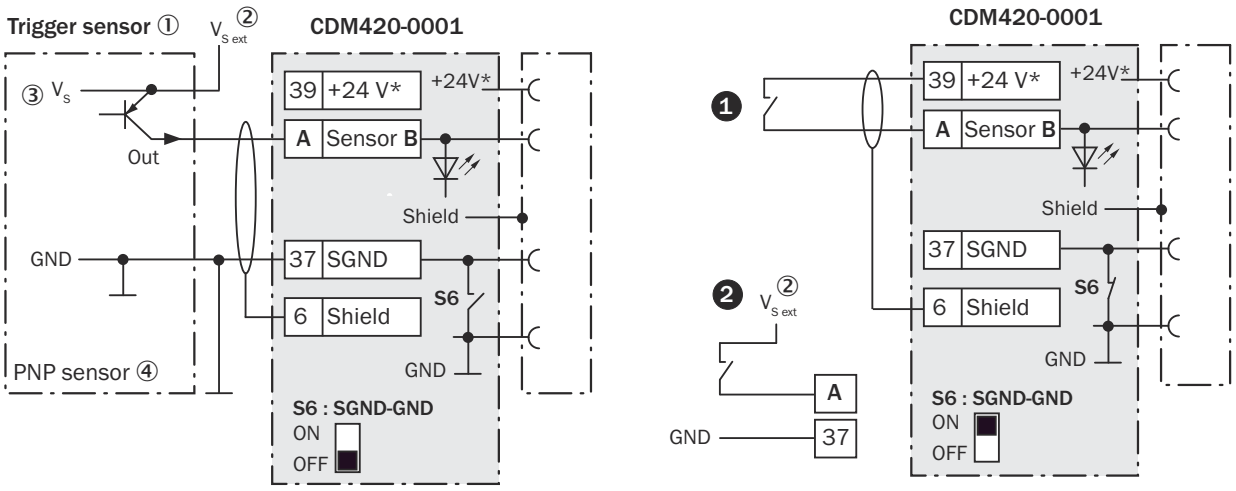


Figure 78: Left: Trigger sensor connected potential-free and supplied with power externally. Right: alternative switch, ❶ supplied with power by connection module CDM420-0001 or ❷ connected volt-free and supplied with power externally. Now select switch setting S6 as shown in the left figure.

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 77: Assignment of placeholders to the digital inputs

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

Function of switch S6

Table 78: 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 79: 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.

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

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

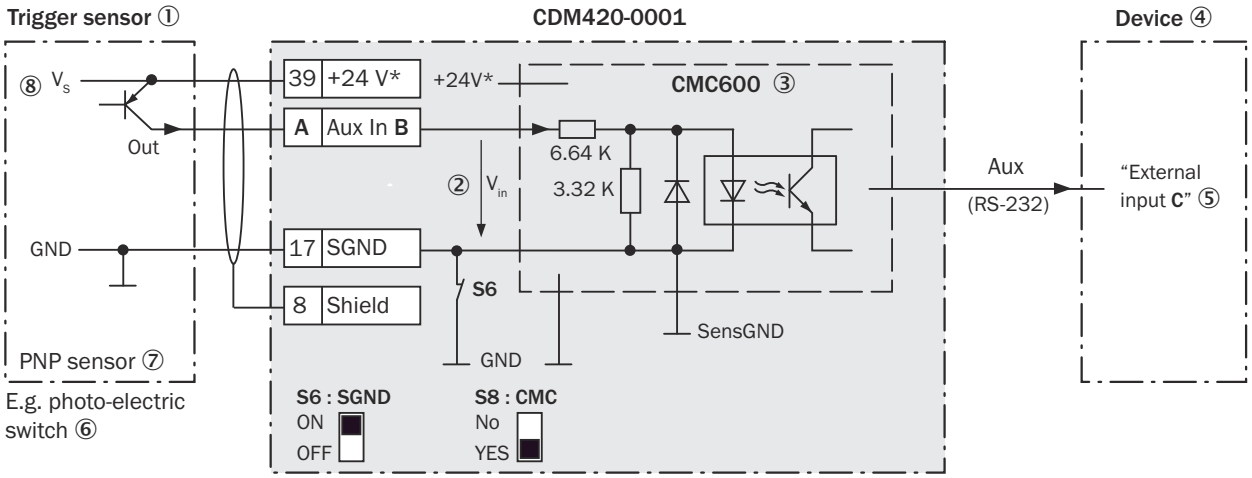


Figure 79: Trigger sensor supplied with power by connection module CDM420-0001

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

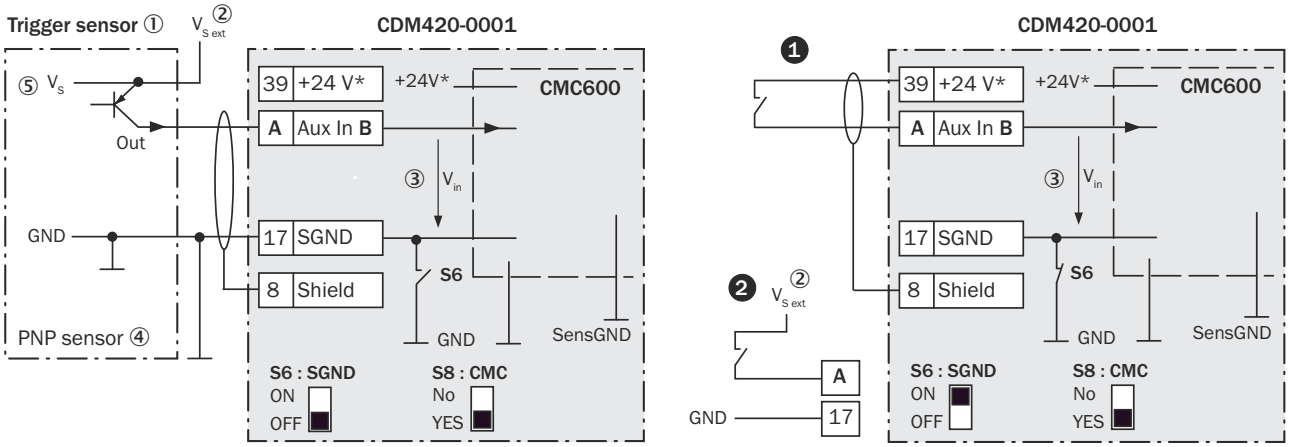


Figure 80: Left: Trigger sensor connected potential-free and supplied with power externally. Right: Alternatively switch, ❶ supplied with power by connection module CDM420-0001 or ❷ connected potential-free and supplied with power externally. Switch setting S3 then as in left figure.

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 80: 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 81: 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 82: 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.

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

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

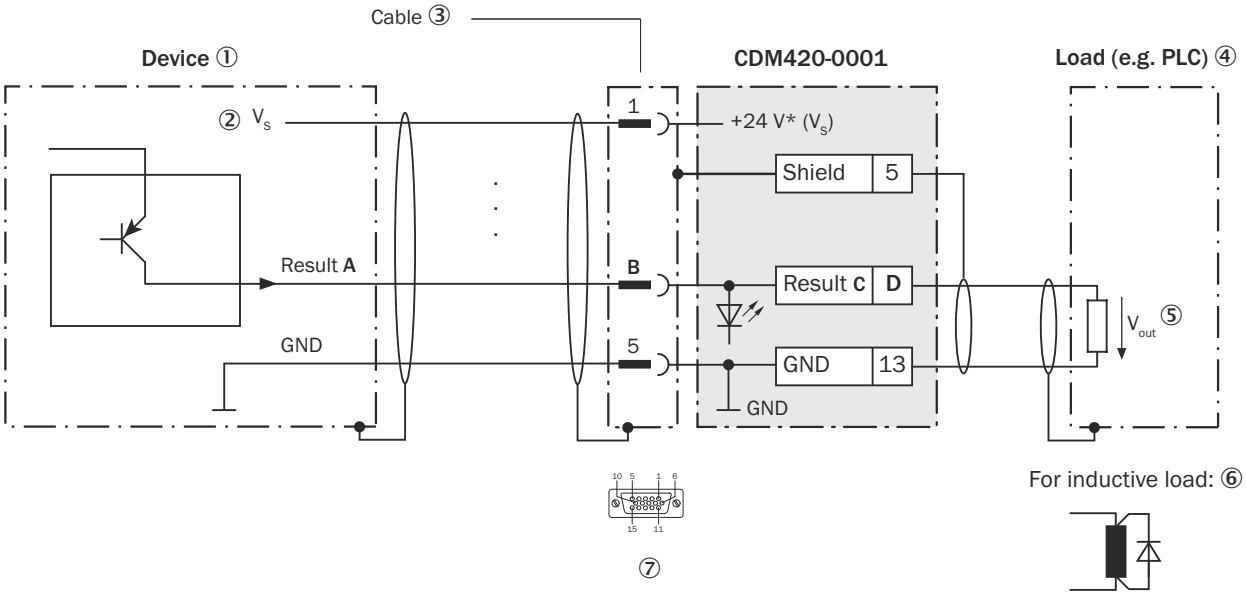


Figure 81: Wiring the "Result 1" and "Result 2" digital outputs of the device in the CDM420-0001 connection module.

① Device
② Supply voltage V_S
③ Connecting cable permanently connected with the device (male connector, D-Sub-HD, 15-pin)
④ Load (e.g. PLC)
⑤ Output voltage V_{out}
⑥ With inductive load: see note
⑦ Connection module: female connector, D-Sub-HD, 15-pin

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 83: Assignment of placeholders to the digital outputs

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

Table 84: 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 85: 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.

13.6.10 Wiring the external digital outputs of the device in the CDM420-0001

Device = Lector621 ECO = V2D621x-xxxxxYx (serial variant, Y = D or E)

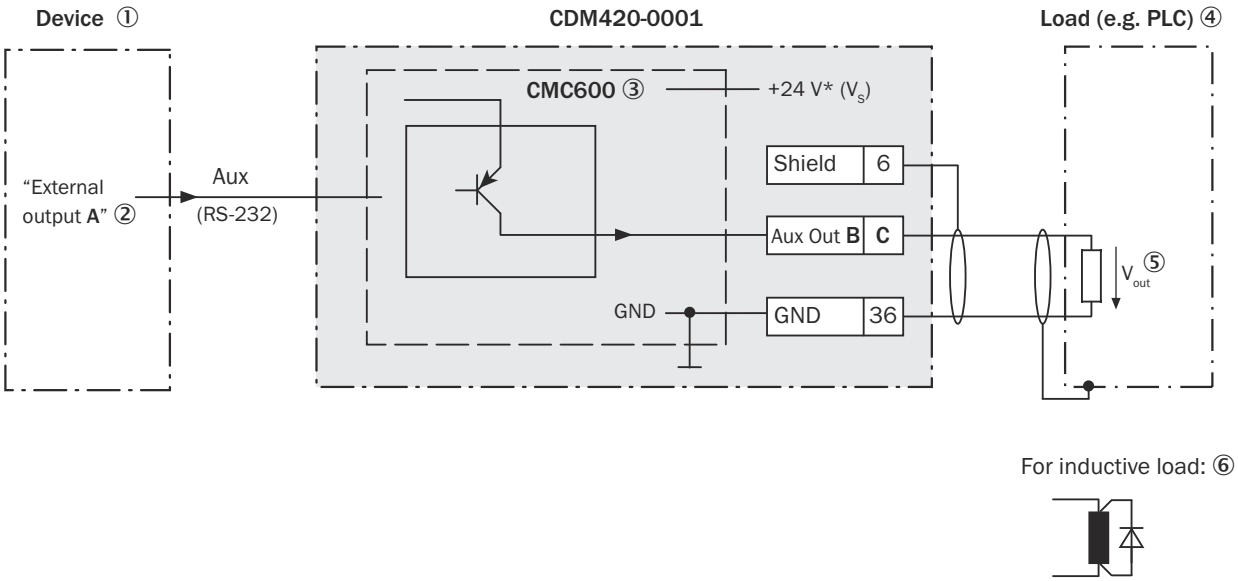


Figure 82: Wiring external digital outputs “Aux Out 1” and “Aux Out 2” of the device in the connection module CDM420-0001.

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 86: 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 87: 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.

13.7 Licenses

SICK uses open source software which is published by the rights holders under a free license. Among others, the following license types are used: GNU General Public License (GPL version 2, GPL version 3), GNU Lesser General Public License (LGPL), MIT license, zlib license and licenses derived from the BSD license.

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

More details can be found in the GNU General Public License.

For license texts see www.sick.com/licensetexts.

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

8022502/1R5E/2025-03-25/en

Australia
Phone +61 (3) 9457 0600
1800 33 48 02 – tollfree
E-Mail sales@sick.com.au

Austria
Phone +43 (0) 2236 62288-0
E-Mail office@sick.at

Belgium/Luxembourg
Phone +32 (0) 2 466 55 66
E-Mail info@sick.be

Brazil
Phone +55 11 3215-4900
E-Mail comercial@sick.com.br

Canada
Phone +1 905.771.1444
E-Mail cs.canada@sick.com

Czech Republic
Phone +420 234 719 500
E-Mail sick@sick.cz

Chile
Phone +56 (2) 2274 7430
E-Mail chile@sick.com

China
Phone +86 20 2882 3600
E-Mail info.china@sick.net.cn

Denmark
Phone +45 45 82 64 00
E-Mail sick@sick.dk

Finland
Phone +358-9-25 15 800
E-Mail sick@sick.fi

France
Phone +33 1 64 62 35 00
E-Mail info@sick.fr

Germany
Phone +49 (0) 2 11 53 010
E-Mail info@sick.de

Greece
Phone +30 210 6825100
E-Mail office@sick.com.gr

Hong Kong
Phone +852 2153 6300
E-Mail ghk@sick.com.hk

Hungary
Phone +36 1 371 2680
E-Mail ertekesites@sick.hu

India
Phone +91-22-6119 8900
E-Mail info@sick-india.com

Israel
Phone +972 97110 11
E-Mail info@sick-sensors.com

Italy
Phone +39 02 27 43 41
E-Mail info@sick.it

Japan
Phone +81 3 5309 2112
E-Mail support@sick.jp

Malaysia
Phone +603-8080 7425
E-Mail enquiry.my@sick.com

Mexico
Phone +52 (472) 748 9451
E-Mail mexico@sick.com

Netherlands
Phone +31 (0) 30 204 40 00
E-Mail info@sick.nl

New Zealand
Phone +64 9 415 0459
0800 222 278 – tollfree
E-Mail sales@sick.co.nz

Norway
Phone +47 67 81 50 00
E-Mail sick@sick.no

Poland
Phone +48 22 539 41 00
E-Mail info@sick.pl

Romania
Phone +40 356-17 11 20
E-Mail office@sick.ro

Singapore
Phone +65 6744 3732
E-Mail sales.gsg@sick.com

Slovakia
Phone +421 482 901 201
E-Mail mail@sick-sk.sk

Slovenia
Phone +386 591 78849
E-Mail office@sick.si

South Africa
Phone +27 10 060 0550
E-Mail info@sickautomation.co.za

South Korea
Phone +82 2 786 6321/4
E-Mail infokorea@sick.com

Spain
Phone +34 93 480 31 00
E-Mail info@sick.es

Sweden
Phone +46 10 110 10 00
E-Mail info@sick.se

Switzerland
Phone +41 41 619 29 39
E-Mail contact@sick.ch

Taiwan
Phone +886-2-2375-6288
E-Mail sales@sick.com.tw

Thailand
Phone +66 2 645 0009
E-Mail marcom.th@sick.com

Turkey
Phone +90 (216) 528 50 00
E-Mail info@sick.com.tr

United Arab Emirates
Phone +971 (0) 4 88 65 878
E-Mail contact@sick.ae

United Kingdom
Phone +44 (0)17278 31121
E-Mail info@sick.co.uk

USA
Phone +1 800.325.7425
E-Mail info@sick.com

Vietnam
Phone +65 6744 3732
E-Mail sales.gsg@sick.com

Detailed addresses and further locations at **www.sick.com**

SICK AG | Waldkirch | Germany | www.sick.com

SICK
Sensor Intelligence.