Image-based code reader
LECTOR®620 Professional,
High Speed, DPM Plus

Mounting, electrical installation and license texts
Software Versions

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<td>SOPAS ET/SOPAS SingleDevice</td>
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For information on startup, operation, and maintenance, see the *operating instructions* for the LECTOR®620.

Further information on the LECTOR®620 can be found on the internet on the LECTOR®620 product page at [www.sick.com/lector62x](http://www.sick.com/lector62x):

- Detailed technical data in the online data sheet
- Reading area diagrams and depth of field diagrams
- Operating instructions LECTOR®620
- Overview of accessories
- Online help for SOPAS Single Device and SOPAS ET as PDF
- Configuration software SOPAS ET
- Other useful software
- Scale drawing and 3D CAD scale models in various electronic formats
- EC Declaration of Conformity
- Identification solutions product catalog
- Product information LECTOR®620

Document on request:
- Overview of command language

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Erwin-Sick-Str. 1
79183 Waldkirch
Germany

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Note
USB interface
The USB interface of the device is used in industrial environments only as a service interface for temporary use (e.g. for configuration, troubleshooting). Permanent use in real operation of the system as a host interface is not intended.
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1  Notes on this document

This document contains information on the installation and electrical installation of the LECTOR®620.

Used symbols  To gain easier access, some information in this documentation is emphasized as follows:

💡 This symbol points out specific features.

📖 This symbol indicates supplementary technical documentation.

Intended use  The camera-based LECTOR®620 is an intelligent sensor for the automatic, stationary decoding of codes on moving or still-standing objects.

The LECTOR®620 reads all common 1D codes (barcodes)/2D codes (stacked codes/matrix codes). Via its host interface, the LECTOR®620 transmits the reading data to a higher-level computer for further processing.

Safety information  ➢ Read the information on installation and electrical installation before carrying out installation and electrical installation.

➢ Read the LECTOR®620 operating instructions and familiarize yourself with the device and its functions.

➢ To avoid the dazzle caused by integrated illumination, do not look into the reading window.

No maintenance is required in order to ensure compliance with risk group RGO / RG 1 / laser protection class 1.
Chapter 2

Installation

2 Installation

2.1 Device structure

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Blind hole thread M5, 5 mm deep (4 x), to attach the LECTOR®620</td>
</tr>
<tr>
<td>2</td>
<td>&quot;Ethernet&quot; connection</td>
</tr>
<tr>
<td>3</td>
<td>&quot;Power/Serial Data/CAN/I/O&quot; connection</td>
</tr>
<tr>
<td>4</td>
<td>Sliding block M5, 5 mm deep (2 x)</td>
</tr>
<tr>
<td>5</td>
<td>Rotatable plug unit</td>
</tr>
<tr>
<td>6</td>
<td>Reading window</td>
</tr>
<tr>
<td>7</td>
<td>Function key (2 x)</td>
</tr>
<tr>
<td>8</td>
<td>Bar graph display</td>
</tr>
<tr>
<td>9</td>
<td>LED for status display (2 levels), 5 x</td>
</tr>
<tr>
<td>10</td>
<td>Cover (flap)</td>
</tr>
<tr>
<td>11</td>
<td>&quot;USB&quot; connection, USB interface only for temporary use (service)</td>
</tr>
<tr>
<td>12</td>
<td>Slot for Micro-SD memory card</td>
</tr>
<tr>
<td>13</td>
<td>LED for Micro-SD memory card (status display)</td>
</tr>
</tbody>
</table>

All dimensions in mm (inch)
2.2 Installing the reading device

2.2.1 Scanning area

Form and extent of scanning area, extent dependent on distance

2.2.2 Reading area diagrams

The focus position of the LECTOR®620 is set to the code automatically.

- The reading area length and reading area width, as well as the minimum resolution R and depth of field must be taken into account when configuring the application.

2.2.2.1 Reading area diagram (valid for LECTOR®620 Professional and DPM Plus)
2.2.2.2 Depth of field diagram for resolution 1 mm, 0.75 mm, 0.5 mm and 0.25 mm (valid for LECTOR®620 Professional and DPM Plus)

![Graph showing depth of field for different resolutions.]

Resolution:
- a: 1.00 mm (39.4 mil)
- b: 0.75 mm (29.5 mil)
- c: 0.50 mm (19.7 mil)
- d: 0.25 mm (9.8 mil)

2.2.2.3 Depth of field diagram for resolution 0.2 mm, 0.15 mm and 0.1 mm (valid for LECTOR®620 Professional and DPM Plus)

![Graph showing depth of field for different resolutions.]

Resolution:
- e: 0.20 mm (7.9 mil)
- f: 0.15 mm (6.9 mil)
- g: 0.10 mm (3.9 mil)
2.2.3 Reading angle and reading distance

Typically tilt the LECTOR®620 20° from the perpendicular to the surface of the code to avoid disruptive reflections.

In the case of codes created on metal e.g. via dot peening, an angle of 0° (bright field illumination) or up to 45° (dark field illumination) may make sense.
2.2.5 Effect of alignment on reading in motion

Upright installation for maximum reading area width

Flat installation for maximum transport speed

2.2.6 Minimizing the influences of ambient light

During operation, the LECTOR®620’s internal illumination ensures a constant, sufficient illumination of the reading area. During installation of the LECTOR®620, make sure that no extreme ambient light influences (e.g. sunlight, workplace lighting, reflection from mirrors etc.) around the LECTOR®620 dazzle the sensor. That is why the installation location should be shaded using suitable measures.

The LECTOR®620 is protected against the influence of ambient light by an integrated filter.

2.3 Installing the connection module

The installation location for the connection module (distance to LECTOR®620) depends on the interface used and the max. cable length:

- Connection via Ethernet: Distance corresponds to cable length (max. 100 m)
- Connection via AUX interface (RS-232 at a Baud rate of 57.6 kBd): Cable length max. 3 m.

For detailed information on installation and electrical installation, see the operating instructions "Connection Module CDB620" (article no.: 8012119, German/English) or "Connection Module CDB420-0001" (article no.: 8010064, German/English).

2.4 Installing the reading pulse sensor (optional)
3 Electrical installation

3.1 Overview of all interfaces and connection options

3.2 Plug/socket pin assignment on device
Chapter 3

3.3 Notes on electrical installation

Prerequisites for protection class IP65 / IP67:

• The black cover for the memory card (optional) and USB interface must be closed and screwed on.
  The connectors must be firmly screwed on to the electrical connections of the Ethernet version.

The same applies to the EMC requirement (ESD) according to CE.

The possible cable length between the LECTOR®620 and the host computer depends on the selected physical version of the host interface and the set data transfer rate.

3.3.1 Separate fuse optionally required

If the supply voltage for the LECTOR®620 is not fed via connection module CDB620/CDM420, the LECTOR®620 must be protected with a separate fuse of max. 2.0 A T in the supplying circuit. The connection module already has a fuse (0.8 A) in the circuit after switch S1.

3.3.2 Electrical safety in accordance with EN 62368-1

The LECTOR®620 was designed for electrical safety in accordance with EN 62368-1. It is connected to the peripheral devices (power supply, reading pulse sensor(s), PLC, host etc.) via shielded cables. The cable shield of the data cable, for example, is on the metal housing of the LECTOR®620.

If connected peripheral devices also have a metal housing and the cable shield is also on their housing, it is assumed that all devices in the installation have the same ground potential. This is done e.g. via installation on conductive metal surfaces and correct grounding of the devices/metal surfaces in system.

If these conditions are not met, e.g. in the case of devices within a widely distributed system, equipotential bonding currents can flow between the devices via the cable shield because of different ground potentials, and can lead to dangers.

Risk of injury/damage from electrical current

Equipotential bonding currents between the LECTOR®620 and peripheral devices may have the following effects:

• Dangerous voltages on the metal housing e.g. of the LECTOR®620
• Incorrect functioning or destruction of the devices
• Damage/destruction to a cable shield caused by heat, and cable fires

➢ If the local, unfavorable situation does not ensure a safe grounding concept (same ground potential at all grounding points), measures as outlined in the section below must be taken.
3.3.3 Avoiding equipotential bonding currents in the cable shields

As a result of the different ground potentials of devices in a distributed system, high currents can occur in the cable shields and damage or destroy them.

The primary solution for avoiding equipotential bonding currents on the cable shields is to ensure low-impedance equipotential bonding that is able to carry currents. If this is not possible, the two solutions provided below can serve as a suggestion.

We expressly advise against disconnecting the cable shields. If this measure is carried out, there is no guarantee that the EMC thresholds can be observed or that the devices’ data interfaces will operate reliably.
Electrical installation

Measures for system installations distributed over wide areas

In the case of system installations distributed over wide areas, with the correspondingly high differences in potential, we recommend the setup of local islands and the connection of these islands via commercially available optical signal conditioners. This measure results in a high degree of robustness against electromagnetic interference.

![Diagram of electrical installation](image)

The ground loop is opened by using the electro-optical signal converters between the islands. Within the local islands, a stable equipotential bonding prevents equalizing currents from occurring at the cable shields.

Measures for small system installations

For smaller installations with only small potential differences, the isolated installation of the LECTOR®620 and peripherals may be sufficient.

![Diagram of electrical installation](image)

Ground loops are, even in the event of large differences in the ground potential, effectively prevented. Meaning that equalizing currents cannot occur anymore via the cable shield and the metal housing.

The power supply for the LECTOR®620 and connected periphery must then also guarantee the required isolation.

In some cases, a tangible potential may arise between the isolated metal housings and the local ground potential.
3.4 Installation steps

3.4.1 Connecting the cables

Pin assignment on 17-pole M12 socket and 15-pole D-Sub-HD plug

Cable no. 2049764, 2055419, 2055420 (LECTOR®620 - CDB620/CDM420)

<table>
<thead>
<tr>
<th>Pin (17-pole)</th>
<th>Signal</th>
<th>Function</th>
<th>Pin (15-pole)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>DC 10 ... 30 V</td>
<td>Supply voltage</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>RxD (Aux)</td>
<td>Aux interface (receiver)</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>TxD (Aux)</td>
<td>Aux interface (transmitter)</td>
<td>3</td>
</tr>
<tr>
<td>15</td>
<td>Sensor 2</td>
<td>Digital switching input</td>
<td>4</td>
</tr>
<tr>
<td>1</td>
<td>GND</td>
<td>Ground</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>RD+ (RS-422), Host</td>
<td>Host interface (receiver)</td>
<td>6</td>
</tr>
<tr>
<td>12</td>
<td>RD- (RS-422); RxD (RS-232), Host</td>
<td>Host interface (receiver)</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>TD+ (RS-422), Host</td>
<td>Host interface (transmitter)</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>TD- (RS-422) TxD (RS-232), Host</td>
<td>Host interface (transmitter)</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>CAN H</td>
<td>CAN bus (IN/OUT)</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>CAN L</td>
<td>CAN bus (IN/OUT)</td>
<td>11</td>
</tr>
<tr>
<td>13</td>
<td>Result 1</td>
<td>Digital switching output</td>
<td>12</td>
</tr>
<tr>
<td>14</td>
<td>Result 2</td>
<td>Digital switching output</td>
<td>13</td>
</tr>
<tr>
<td>10</td>
<td>Sensor 1</td>
<td>Digital switching input</td>
<td>14</td>
</tr>
<tr>
<td>9</td>
<td>SensGND</td>
<td>Common ground of switching inputs</td>
<td>15</td>
</tr>
<tr>
<td>16</td>
<td>Result 3*</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>Result 4*</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Shield</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*only available via 17-pole M12 socked with open ends

Pin assignment on 4-pole M12 plug and on 6-pole RJ45 plug

Cable no. 6034414, 6029630, 6034415, 6030928 (LECTOR®620 - PC)

<table>
<thead>
<tr>
<th>Pin (4-pole)</th>
<th>Signal</th>
<th>Function</th>
<th>Pin (6-pole)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TD+</td>
<td>Transmitter+</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>TD-</td>
<td>Transmitter-</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>RD+</td>
<td>Receiver+</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>RD-</td>
<td>Receiver-</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>Shield</td>
<td>-</td>
</tr>
</tbody>
</table>
### Electrical installation

#### Pin assignment on USB plug

Cable no. 6036106 (USB connection LECTOR®620 - PC)

<table>
<thead>
<tr>
<th>Pin (4-pole)</th>
<th>Signal</th>
<th>Function</th>
<th>Pin (4-pole)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DC 5 V</td>
<td>USB voltage</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Data -</td>
<td>USB</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Data +</td>
<td>USB</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>GND</td>
<td>Ground</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>Shield</td>
<td>–</td>
</tr>
</tbody>
</table>

#### Pin assignment on 17-pole M12 socket and strand colors on open end

Cable no. 6042772, 6042773 (LECTOR®620 - power supply unit terminal)

<table>
<thead>
<tr>
<th>Pin (17-pole)</th>
<th>Signal</th>
<th>Function</th>
<th>Strand color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GND</td>
<td>Ground</td>
<td>brown</td>
</tr>
<tr>
<td>2</td>
<td>DC 10 ... 30 V</td>
<td>Supply voltage</td>
<td>blue</td>
</tr>
<tr>
<td>3</td>
<td>CAN L</td>
<td>CAN bus (IN/OUT)</td>
<td>white</td>
</tr>
<tr>
<td>4</td>
<td>CAN H</td>
<td>CAN bus (IN/OUT)</td>
<td>green</td>
</tr>
<tr>
<td>5</td>
<td>TD+ (RS-422); TxD (RS-232)</td>
<td>Host interface (transmitter)</td>
<td>pink</td>
</tr>
<tr>
<td>6</td>
<td>TD- (RS-422); TxD (RS-232)</td>
<td>Host interface (transmitter)</td>
<td>yellow</td>
</tr>
<tr>
<td>7</td>
<td>TxD (Aux)</td>
<td>Aux interface (transmitter)</td>
<td>black</td>
</tr>
<tr>
<td>8</td>
<td>RxD (Aux)</td>
<td>Aux interface (receiver)</td>
<td>gray</td>
</tr>
<tr>
<td>9</td>
<td>SensGND</td>
<td>Common ground of switching inputs</td>
<td>red</td>
</tr>
<tr>
<td>10</td>
<td>Sensor 1</td>
<td>Digital switching input</td>
<td>purple</td>
</tr>
<tr>
<td>11</td>
<td>RD+ (RS-422)</td>
<td>Host interface (receiver)</td>
<td>grey-pink</td>
</tr>
<tr>
<td>12</td>
<td>RD- (RS-422); RxD (RS-232)</td>
<td>Host interface (receiver)</td>
<td>red-blue</td>
</tr>
<tr>
<td>13</td>
<td>Result 1</td>
<td>Digital switching output</td>
<td>white-green</td>
</tr>
<tr>
<td>14</td>
<td>Result 2</td>
<td>Digital switching output</td>
<td>brown-green</td>
</tr>
<tr>
<td>15</td>
<td>Sensor 2</td>
<td>Digital switching input</td>
<td>white-yellow</td>
</tr>
<tr>
<td>16</td>
<td>Result 3</td>
<td>Digital switching output</td>
<td>yellow-brown</td>
</tr>
<tr>
<td>17</td>
<td>Result 4</td>
<td>Digital switching output</td>
<td>white-gray</td>
</tr>
</tbody>
</table>
Pin assignment on 5-pole M12 plug and strand colors on open end

Cable no. 6012166 (CDB620 - CDB620; CDM420 - CDM420; CAN network)

<table>
<thead>
<tr>
<th>Pin (5-pole)</th>
<th>Signal</th>
<th>Function</th>
<th>Strand color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-</td>
<td>Shield</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>DC +24 V</td>
<td>Supply voltage</td>
<td>red</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>Ground</td>
<td>black</td>
</tr>
<tr>
<td>4</td>
<td>CAN H</td>
<td>CAN bus (IN/OUT)</td>
<td>white</td>
</tr>
<tr>
<td>5</td>
<td>CAN L</td>
<td>CAN bus (IN/OUT)</td>
<td>blue</td>
</tr>
</tbody>
</table>

Pin assignment on the 9-pole D-Sub-HD socket and strand colors on the open cable end

Cable no. 2014054 (CDB620 - PC)

<table>
<thead>
<tr>
<th>Pin (9-pole)</th>
<th>Signal Aux</th>
<th>Function</th>
<th>Strand color</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>RxD (Aux)</td>
<td>Aux interface (receiver)</td>
<td>purple</td>
</tr>
<tr>
<td>3</td>
<td>TxD (Aux)</td>
<td>Aux interface (transmitter)</td>
<td>yellow</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
<td>Ground</td>
<td>black</td>
</tr>
</tbody>
</table>

or

<table>
<thead>
<tr>
<th>Pin (9-pole)</th>
<th>Signal host</th>
<th>Function</th>
<th>Strand color</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>GND</td>
<td>Ground</td>
<td>black</td>
</tr>
<tr>
<td>6</td>
<td>RD+ (RS-422/485)</td>
<td>Host interface (receiver)</td>
<td>light blue</td>
</tr>
<tr>
<td>7</td>
<td>RD- (RS-422/485); RxD (RS-232)</td>
<td>Host interface (receiver)</td>
<td>blue</td>
</tr>
<tr>
<td>8</td>
<td>TD+ (RS-422/485)</td>
<td>Host interface (transmitter)</td>
<td>light gray-turquoise</td>
</tr>
<tr>
<td>9</td>
<td>TD- (RS-422/485); TxD (RS-232)</td>
<td>Host interface (transmitter)</td>
<td>green</td>
</tr>
</tbody>
</table>
3.4.2 Connecting the connection module

Information on startup/configuration of the connection module, as well as technical data, is provided in operating instructions “Connection Module CDB620” (article no. 8012119, German/English).

Wiring diagrams see chapter 3.5 Wiring diagram of connection module CDB620, page 25 or chapter 3.6 Wiring diagram of connection module CDM420-0001, page 38.
3.4.3 Connecting the voltage supply

Connection is via the SICK connection module CDB620 (see chapter 3.5.1 Voltage supply via connection module CDB620, page 26) or CDM420 (see chapter 3.6.1 Voltage supply via connection module CDM420-0001, page 40) or in the case of wiring without a SICK connection module, using connection cable article no. 6042772 (17-pole D-Sub-HD socket and open cable end).

Power supply unit required:
- Supply voltage required: DC 10 ... 30 V (ES1 and PS2 (EN 62368-1) or SELV and LPS (EN 60950-1))
- Output power: at least 3 W for LECTOR®620 / $I_{\text{peak}}$: at least 1.5 A
- Additional output power with use of optional modules in connection module CDB620: chapter 3.4.2 Connecting the connection module, page 18

The output circuit of the power supply unit must be electrically separated from the input circuit. Electrical separation is usually created by a safety transformer in accordance with standard IEC742 (VDE0551).

Short circuit/overload protection

In order to ensure short circuit/overload protection of the incoming supply cables, the strand cross sections used must be selected and fused accordingly.

The following standards are to be observed here:
- DIN VDE 0100 (Part 430)
- DIN VDE 0298 (Part 4) / DIN VDE 0891 (Part 1)

The strand cross section for the supply voltage should be at least 0.15 mm².

3.4.4 Connecting the Ethernet interface or USB interface

1. Connect the LECTOR®620 to the PC via an Ethernet cable or USB.
2. Set up the connection using the configuration software SOPAS.

Important

The Ethernet interface of the LECTOR®620 has an Auto-MDIX function. As a result, the speed and a cross connection that may be required are configured automatically.
### 3.4.5 Wiring serial data interfaces

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

<table>
<thead>
<tr>
<th>Interface type</th>
<th>Transfer rate</th>
<th>Distance to the host</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-232</td>
<td>up to 19,200 Bd</td>
<td>max. 10.94 yd</td>
</tr>
<tr>
<td></td>
<td>38,400 ... 57,600 Bd</td>
<td>max. 3.28 yd</td>
</tr>
<tr>
<td></td>
<td>115,200 Bd</td>
<td>max. 2.19 yd</td>
</tr>
<tr>
<td>RS-422</td>
<td>max. 38,400 Bd</td>
<td>max. 1.312.34 yd</td>
</tr>
<tr>
<td></td>
<td>max. 115,200 Bd</td>
<td>max. 500 m</td>
</tr>
</tbody>
</table>

#### NOTICE

**Damage to the interface module.**

Incorrect wiring of the serial data interface can damage electronic components in the LECTOR®620.

- Observe the information about wiring the serial data interface.
- Check the wiring carefully before switching on the LECTOR®620.

1. Connect the serial interface of the LECTOR®620 to the host in accordance with the EMC regulations using shielded cables.
   Adhere to the maximum cable lengths.
2. To prevent interference, do not lay cables parallel to power supply cables and motor lines over a longer distance, e.g., in cable channels.

The interface is connected using SICK connection module CDB620 (see chapter *Serial host data interface RS-232 on connection module CDB620, page 27* or chapter *Serial host data interface RS-422 on connection module CDB620, page 28*) or CDM420 (see chapter *Serial host data interface RS-232 on connection module CDM420-0001, page 41* or chapter *Serial host data interface RS-422 on connection module CDM420-0001, page 42*).

**Terminating data interface RS-422**

Termination can take place in connection module CDB620 or CDM420. See operating instructions “Connection Module CDB620” or “Connection Module CDM420”.

Pin assignment for the serial Aux data interface on the 15-pole D-Sub-HD plug:
- RxD = Pin 2
- TxD = Pin 3
- GND = Pin 5
3.4.6 Connecting the CAN interface

The interface is connected using SICK connection module CDB620 (see chapter 3.5.4 CAN interface on connection module CDB620, page 29) or CDM420 (see chapter 3.6.4 CAN interface on connection module CDM420-0001, page 43).

For more details on connecting and configuring the CAN interface of the LECTOR®620 for use in the CAN scanner network, see operating instructions "Anwendung der CAN-Schnittstelle von Identifikations-Sensoren" [using the CAN interface of identification sensors] (article no. 8009179, German only).

3.4.7 Wiring switching inputs

The switching inputs can be used to start and/or end the reading gate, to teach-in a match-codes or for other functions.

If the 15-pole D-Sub-HD plug is used, two switching inputs, SENSOR 1 and SENSOR 2, are available.

With extension module CMC600 in conjunction with connection module CDB620 or CDM420, two further switching inputs, EXTERNAL INPUT 1 and EXTERNAL INPUT 2, are available.

For information on wiring the switching inputs, see:

- chapter 3.5.5 Switching output Sensor 1 on connection module CDB620, page 30
- chapter 3.6.5 Switching output Sensor 1 on connection module CDM420-0001, page 44
- chapter 3.5.6 Switching output Sensor 2 on connection module CDB620, page 31
- chapter 3.6.6 Switching output Sensor 2 on connection module CDM420-0001, page 45
- chapter 3.5.7 Switching output External Input 1 on connection module CDB620, page 32
- chapter 3.6.7 Switching output External Input 1 on connection module CDM420-0001, page 46
- chapter 3.5.8 Switching output External Input 2 on connection module CDB620, page 33
- chapter 3.6.8 Switching output External Input 2 on connection module CDM420-0001, page 47
3.4.8 Wiring switching outputs

The switching outputs can be assigned various functions for outputting the result status independently of each other. If the assigned event occurs during the reading process, the corresponding switching output at the end of the reading pulse is live for the selected impulse duration.

If the 15-pole D-Sub-HD plug is used, two switching outputs, RESULT 1 and RESULT 2, are available with identical electrical properties.

With extension module CMC600 in conjunction with connection module CDB620 or CDM420, two further switching outputs, EXTERNAL OUTPUT 1 and EXTERNAL OUTPUT 2, are available.

If you use the 17-pole M12 socket with open ends, four switching outputs, RESULT 1, RESULT 2, RESULT 3 and RESULT 4 with identical electrical properties are available directly on the LECTOR®620.

Capacity loads on the switch outputs affect the on and off switching behavior. A maximum capacity of 100 nF applies as the threshold.

For information on wiring the switching outputs, see:
- chapter 3.5.9 Switching output Result 1 on CDB620, page 34
- chapter 3.6.9 Switching output Result 1 on CDM420-0001, page 48
- chapter 3.5.10 Switching output Result 2 on CDB620, page 35
- chapter 3.6.10 Switching output Result 2 on CDM420-0001, page 49
- chapter 3.4.8.1 Switching output Result 3 on LECTOR®620, page 23
- chapter 3.4.8.2 Switching output Result 4 on LECTOR®620, page 24
- chapter 3.5.11 Switching output External Output 1 on CDB620, page 36
- chapter 3.6.11 Switching output External Output 1 on CDM420-0001, page 50
- chapter 3.5.12 Switching output External Output 2 on CDB620, page 37
- chapter 3.6.12 Switching output External Output 2 on CDM420-0001, page 51
3.4.8.1 Switching output Result 3 on LECTOR®620

Wiring the "Result 3" switching output of the LECTOR®620

![Wiring Diagram]

**Ratings for "Result 3" switching output**

<table>
<thead>
<tr>
<th>Switching behavior</th>
<th>PNP switching against the supply voltage $V_s$ (default setting: no function/disabled)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Features</td>
<td>Short-circuit proof + temperature protected + Galvanically not separate from $V_s$</td>
</tr>
<tr>
<td>Electrical values</td>
<td>$0 \leq V_{out} \leq V_s$ Guaranteed: $(V_s - 1.5 \text{ V}) \leq V_{out} \leq V_s$ with $I_{out} \leq 100 \text{ mA}$</td>
</tr>
</tbody>
</table>

**Pin and wire color assignment of prefabricated cables**

<table>
<thead>
<tr>
<th>Signal</th>
<th>Cable 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_s$</td>
<td>M12 plug, 17-pin, 17 core</td>
</tr>
<tr>
<td>Result 3</td>
<td>blue</td>
</tr>
<tr>
<td>GND</td>
<td>brown</td>
</tr>
<tr>
<td>$V_{ext}$</td>
<td>yellow-brown</td>
</tr>
</tbody>
</table>

1) cables no. 6042772 (3 m / 9.84 ft), no. 6042773 (5 m / 16.4 ft)

For inductive load:
Install an anti-surge diode directly at the load!

Quenching circuit:
$V_{out} = DC 10 \text{ to } 30 \text{ V}$
## 3.4.8.2 Switching output Result 4 on LECTOR®620

Wiring the "Result 4" switching output of the LECTOR®620

![Wiring diagram](image)

Ratings for "Result 4" switching output

<table>
<thead>
<tr>
<th>Switching behavior</th>
<th>PNP switching against the supply voltage $V_s$ (default setting: no function/disabled)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Features</td>
<td>- Short-circuit proof + temperature protected + Galvanically not separate from $V_s$</td>
</tr>
<tr>
<td>Electrical values</td>
<td>$0 , \text{V} \leq V_{\text{out}} \leq V_s$</td>
</tr>
<tr>
<td></td>
<td>($V_s - 1.5 , \text{V}) \leq V_{\text{out}} \leq V_s$ with $I_{\text{out}} \leq 100 , \text{mA}$</td>
</tr>
</tbody>
</table>

Pin and wire color assignment of prefabricated cables

<table>
<thead>
<tr>
<th>Signal</th>
<th>Cable¹</th>
<th>Open end, 17 core</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_s$</td>
<td>M12 socket, 17-pin</td>
<td></td>
</tr>
<tr>
<td>Result 4</td>
<td>2</td>
<td>blue</td>
</tr>
<tr>
<td>GND</td>
<td>1</td>
<td>brown</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>white-gray</td>
</tr>
</tbody>
</table>

¹ cables no. 6042772 (3 m/9.84 ft), no. 6042773 (5 m/16.4 ft)

---

### 3.4.9 Micro-SD memory card (optional)

**Functions of the Micro-SD memory card**

- Saving of images
- Cloning of parameters

If a memory card is inserted in the LECTOR®620, the LECTOR®620 also saves all the settings on the Micro-SD memory card when you permanently save the parameters. When you restart the LECTOR®620, these settings are automatically transferred from the Micro-SD memory card to the device. This function enables you to exchange the device easily in the event of an error. (Function available from Q3/2011.)

- Firmware update via Micro-SD card (function available from Q3/2011)

**Using the memory card**

To ensure reliable functioning of the memory card, only use SICK-approved types. The LECTOR®620 supports memory capacities up to max. 32 GB.
3.5 Wiring diagram of connection module CDB620

CDB620-001 connection module

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Sens 1</td>
</tr>
<tr>
<td>10</td>
<td>In 1</td>
</tr>
<tr>
<td>11</td>
<td>Sens 1</td>
</tr>
<tr>
<td>12</td>
<td>UIN*</td>
</tr>
<tr>
<td>13</td>
<td>Sens 2</td>
</tr>
<tr>
<td>14</td>
<td>UIN*</td>
</tr>
<tr>
<td>15</td>
<td>GND</td>
</tr>
<tr>
<td>16</td>
<td>Shield</td>
</tr>
<tr>
<td>17</td>
<td>Shield</td>
</tr>
<tr>
<td>18</td>
<td>Shield</td>
</tr>
<tr>
<td>19</td>
<td>Out 1</td>
</tr>
<tr>
<td>20</td>
<td>Out 2</td>
</tr>
<tr>
<td>21</td>
<td>CAN_H</td>
</tr>
<tr>
<td>22</td>
<td>CAN_L</td>
</tr>
<tr>
<td>23</td>
<td>T+</td>
</tr>
<tr>
<td>24</td>
<td>R+</td>
</tr>
<tr>
<td>25</td>
<td>GND</td>
</tr>
<tr>
<td>26</td>
<td>10</td>
</tr>
<tr>
<td>27</td>
<td>11</td>
</tr>
<tr>
<td>28</td>
<td>12</td>
</tr>
<tr>
<td>29</td>
<td>13</td>
</tr>
<tr>
<td>30</td>
<td>14</td>
</tr>
<tr>
<td>31</td>
<td>15</td>
</tr>
<tr>
<td>32</td>
<td>16</td>
</tr>
<tr>
<td>33</td>
<td>17</td>
</tr>
<tr>
<td>34</td>
<td>18</td>
</tr>
<tr>
<td>35</td>
<td>19</td>
</tr>
</tbody>
</table>

**Legend:**
- **F**: Fuse
- **S1-S4**: Switches
- **CMC**: Parameter cloning module (optional)
- **PLC**: External clock sensor (e.g. photoelectric switch)
- **SCANNER**: AUX interface to PC
- **Host**: RS-232 to LECTOR®620

**Notes:**
- $V_s = $DC 10 to 30V on terminal $U_s = U_{IN} +$ after fuse F and switch S1
- $U_{IN}$ = UIN after fuse F and switch S1
- $U_{IN}^*$ = UIN* after fuse F and switch S1
- = an CMC600 is required to provide the additional switching inputs and outputs
3.5.1 Voltage supply via connection module CDB620

Wiring the power supply voltage to the CDB620 connection module

DC 10 to 30 V

CDB620

1 U_in
2 GND
3 S1
4 U_in*
5 Shield

LEEPOR®620

1 U_in*
2 GND
3 S1
4 U_in*
5 Shield

VS = DC 10 to 30 V on terminal U_in = U_in* after fuse F and switch S1

Switch S1:
ON:
Power supply voltage U_in switched to U_in* via fuse to CDB620 and LECTOR®620.
Power supply voltage U_in* additionally available on terminals 11 and 14.
OFF:
CDB620 and LECTOR®620 disconnected from power supply voltage.
Recommended position during all electrical installation work.
3.5.2 Serial host data interface RS-232 on connection module CDB620

Wiring the RS-232 data interface of the LECTOR® 620 in the CDB620 connection module

Pin and wire color assignment of prefabricated cables

<table>
<thead>
<tr>
<th>Signal</th>
<th>Cable11</th>
<th>Cable12</th>
<th>Open end, 17 core</th>
</tr>
</thead>
<tbody>
<tr>
<td>TxD</td>
<td>6</td>
<td>9</td>
<td>yellow</td>
</tr>
<tr>
<td>RxD</td>
<td>12</td>
<td>7</td>
<td>red-blue</td>
</tr>
<tr>
<td>GND</td>
<td>1</td>
<td>5</td>
<td>brown</td>
</tr>
</tbody>
</table>

1) cables no. 2049764 (0.9 m/2.95 ft), no. 2055419 (2 m/6.56 ft), no. 2055420 (3 m/9.84 ft)
2) cables no. 6042772 (3 m/9.84 ft), no. 6042773 (5 m/16.4 ft)
3.5.3 Serial host data interface RS-422 on connection module CDB620

Wiring the RS-422 data interface of the LECTOR®620 in the CDB620 connection module

![Diagram of RS-422 wiring](image)

**Pin and wire color assignment of prefabricated cables**

<table>
<thead>
<tr>
<th>Signal</th>
<th>Cable 1</th>
<th>Cable 2</th>
<th>Open end, 17 core</th>
</tr>
</thead>
<tbody>
<tr>
<td>TD+</td>
<td>5</td>
<td>8</td>
<td>5 (pink)</td>
</tr>
<tr>
<td>TD–</td>
<td>6</td>
<td>9</td>
<td>6 (yellow)</td>
</tr>
<tr>
<td>RD+</td>
<td>11</td>
<td>6</td>
<td>11 (gray-pink)</td>
</tr>
<tr>
<td>RD–</td>
<td>12</td>
<td>7</td>
<td>12 (red-blue)</td>
</tr>
<tr>
<td>GND</td>
<td>1</td>
<td>5</td>
<td>1 (brown)</td>
</tr>
</tbody>
</table>

1) cables no. 2049764 (0.9 m/2.95 ft), no. 2055419 (2 m/6.56 ft), no. 2055420 (3 m/9.84 ft)
2) cables no. 6042772 (3 m/9.84 ft), no. 6042773 (5 m/16.4 ft)
3.5.4 CAN interface on connection module CDB620

Wiring the CDB620 connection module with LECTOR®620 for the SICK CAN SENSOR Network

Connection of power supplies as well as of reading clock sensor e.g. to the master here not shown.

1) cable: no. 2049764 (0.9 m/2.95 ft) or no. 2055419 (2 m/6.56 ft) or no. 2055420 (3 m/9.84 ft)
3.5.5 Switching output Sensor 1 on connection module CDB620

Wiring the "Sensor 1" switching input of the LECTOR®620 in the CDB620 connection module

a) Sensor supplied by CDB620

b) Sensor connected electrically isolated/externally supplied

c) Switch supplied by CDB620

d) Switch connected electrically isolated/externally supplied

Pin and wire color assignment of prefabricated cables

<table>
<thead>
<tr>
<th>Signal</th>
<th>Cable1)</th>
<th>Cable2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M12 socket, 17-pin</td>
<td>D-Sub HD plug, 15-pin</td>
<td>M12 socket, 17-pin</td>
</tr>
<tr>
<td>Open end, 17 core</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V'in</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Sensor 1</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>SensGND</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>GND</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

1) cables no. 2049764 (0.9 m/2.95 ft), no. 2055419 (2 m/6.56 ft), no. 2055420 (3 m/9.84 ft)
2) cables no. 6042772 (3 m/9.84 ft), no. 6042773 (5 m/16.4 ft)

Ratings for "Sensor 1" switching input

Switching behavior
- Power fed to the input starts the assigned function, e.g. start of reading clock.
- Optodecoupled, reverse polarity protected
- Can be wired with the PNP output of a sensor
- (default setting: logic not inverted (active high), debouncing 10 ms)

Features
- Start of reading clock
- Stop of reading clock
- Start teach-in matchcode/start code comparison
- Increment input
- If required further functions in the future

Electrical values
- Low: \( V_{in} \leq 2 \text{ V}; \ I_{in} \leq 0.3 \text{ mA} \)
- High: \( 6 \text{ V} \leq V_{in} \leq 32 \text{ V}; \ 0.7 \text{ mA} \leq I_{in} \leq 5 \text{ mA} \)

Function assignment to "Sensor 1" switching input via SOPAS ("Sensor/Input 1"):
- Start of reading clock
- Stop of reading clock
- Start teach-in matchcode/start code comparison
- Increment input
- If required further functions in the future

Switch S3: SGND-GND
- ON: GND of the sensor connected to GND of CDB620/LECTOR®620.
- OFF: Sensor connected electrically isolated to the CDB620/LECTOR®620.

Reference potential valid for all switching inputs ("Sensor 1/2" and "In 1/2")
3.5.6 Switching output Sensor 2 on connection module CDB620

Wiring the "Sensor 2" switching input of the LECTOR®620 in the CDB620 connection module

a) Sensor supplied by CDB620
e.g. photo-electric switch

b) Sensor connected electrically isolated/externally supplied
e.g. photo-electric switch

Pin and wire color assignment of prefabricated cables

<table>
<thead>
<tr>
<th>Signal</th>
<th>Cable 1</th>
<th>Cable 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>V&lt;sub&gt;in&lt;/sub&gt;</td>
<td>M12 socket, 17-pin</td>
<td>M12 socket, 17-pin</td>
</tr>
<tr>
<td>Sensor 2</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>SensGND</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>GND</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>S3: SGND-GND</td>
<td>ON</td>
<td>OFF</td>
</tr>
</tbody>
</table>

Ratings for "Sensor 2" switching input

Function assignment to "Sensor 2" switching input via SOPAS (*Sensor/Input 2*):
- Start of reading clock
- Stop of reading clock
- Start teach in matchcode/start code comparison
- Increment input
- If required further functions in the future

Switch S3: SGND-GND
ON: GND of the sensor connected to GND of CDB620/LECTOR®620.
OFF: Sensor connected electrically isolated to the CDB620/LECTOR®620.
Reference potential valid for all switching inputs ("Sensor 1/2" and "In 1/2")
### 3.5.7 Switching output External Input 1 on connection module CDB620

Wiring the "External input 1" of the LECTOR®620 in the CDB620 connection module ("In 1" switching input)

#### a) Sensor supplied by CDB620

e.g. photo-electric switch

#### b) Sensor connected electrically isolated and externally supplied

e.g. photo-electric switch

#### c) Switch supplied by CDB620

#### d) Switch connected electrically isolated and externally supplied

Connect the switch as shown in b)

Software-controlled, the CMC600 transfers the switching status of its physical "In 1" input automatically via the cable to the serial Aux data interface of the LECTOR®620. The LECTOR®620 converts the status internally to its logical "External input 1".

#### Ratings for "External input 1" ("In 1" switching input)

**Switching behavior**
- Power fed to the input starts the assigned function, e.g. start of reading clock.
- (default setting: logic not inverted (active high), debouncing 10 ms)

**Features**
- Optodecoupled, reverse polarity protected
- Can be wired with the PNP output of a sensor

**Electrical values**
- Low: $V_{\text{in}} \leq 2 \, \text{V; } I_{\text{in}} \leq 0.3 \, \text{mA}$
- High: $6 \, \text{V} \leq V_{\text{in}} \leq 32 \, \text{V; } 0.7 \, \text{mA} \leq I_{\text{in}} \leq 5 \, \text{mA}$

Function assignment to "External input 1" via SOPAS:
- Start of reading clock
- Stop of reading clock
- Start teach-in matchcode/start code comparison
- If required further functions in the future

#### Switch S3: SGND-GND

- **ON**: GND of the sensor connected to GND of CDB620/CMC600.
- **OFF**: Sensor connected electrically isolated to the CDB620/CMC600.

Reference potential valid for all switching inputs ("Sensor 1/2" and "In 1/2")
### 3.5.8 Switching output External Input 2 on connection module CDB620

Wiring the “External input 2” of the LECTOR®620 in the CDB620 connection module (“In 2” switching input)

- **a) Sensor supplied by CDB620**
  - e.g. photo-electric switch

- **b) Sensor connected electrically isolated and externally supplied**
  - e.g. photo-electric switch

- **c) Switch supplied by CDB620**

- **d) Switch connected electrically isolated and externally supplied**
  - Connect the switch as shown in b)

---

#### Software-controlled, the CMC600 transfers the switching status of its physical “In 2” input automatically via the cable to the serial Aux data interface of the LECTOR®620. The LECTOR®620 converts the status internally to its logical “External input 2”.

#### Ratings for “External input 2” (“In 2” switching input)

<table>
<thead>
<tr>
<th>Switching behavior</th>
<th>Power fed to the input starts the assigned function, e.g. stop of reading clock. (default setting: logic not inverted (active high), debouncing 10 ms)</th>
</tr>
</thead>
</table>
| Features            | - Optodecoupled, reverse polarity protected  
|                     | - Can be wired with the PNP output of a sensor  |
| Electrical values   | Low: \( V_i \leq 2 \text{ V}; I_i \leq 0.3 \text{ mA} \)  
|                     | High: \( 6 \text{ V} \leq V_i \leq 32 \text{ V}; 0.7 \text{ mA} \leq I_i \leq 5 \text{ mA} \)  |

Function assignment to “External input 2” via SOPAS:
- Start of reading clock
- Stop of reading clock
- Start teach in matchcode/start code comparison
- if required further functions in the future
### 3.5.9 Switching output Result 1 on CDB620

Wiring the "Result 1" switching output of the LECTOR®620 in the CDB620 connection module

#### Ratings for "Result 1" switching output

<table>
<thead>
<tr>
<th>Switching behavior</th>
<th>PNP switching against the supply voltage $V_s$ (default setting: Device Ready (static), logic: not inverted (active high))</th>
</tr>
</thead>
</table>
| Features           | - Short-circuit proof + temperature protected  
|                    | - Galvanically not separate from $V_s$                                                                                   |
| Electrical values  | $0 \, V \leq V_{out} \leq V_s$  
|                    | Guaranteed:  
|                    | $(V_s - 3.0 \, V) \leq V_{out} \leq V_s$ with $I_{out} \leq 100 \, mA$                                                |

#### Pin and wire color assignment of prefabricated cables

<table>
<thead>
<tr>
<th>Signal</th>
<th>Cable(^{1})</th>
<th>Cable(^{2})</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_s$</td>
<td>2 1 2 blue</td>
<td>M12 socket, 17-pin</td>
</tr>
<tr>
<td>Result 1</td>
<td>13 12 13 white-green</td>
<td>M12 socket, 17-pin</td>
</tr>
<tr>
<td>GND</td>
<td>1 5 1 brown</td>
<td>Open end, 17 core</td>
</tr>
</tbody>
</table>

1) cables no. 2049764 (0.9 m/2.95 ft), no. 2055419 (2 m/6.56 ft), no. 2055420 (3 m/9.84 ft)  
2) cables no. 6042772 (3 m/9.84 ft), no. 6042773 (5 m/16.4 ft)
3.5.10 Switching output Result 2 on CDB620

Wiring the “Result 2” switching output of the LECTOR®620 in the CDB620 connection module

<table>
<thead>
<tr>
<th>Switching behavior</th>
<th>PNP switching against the supply voltage $V_s$ (default setting: Good Read, 100 ms, logic: not inverted (active high))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Features</td>
<td>Short-circuit proof + temperature protected + Galvanically not separate from $V_s$</td>
</tr>
<tr>
<td>Electrical values</td>
<td>$0 \leq V_{\text{res}} \leq V_s$ Guaranteed: $(V_s - 3.0 \text{ V}) \leq V_{\text{res}} \leq V_s$ with $I_{\text{out}} \leq 100 \text{ mA}$</td>
</tr>
</tbody>
</table>

Pin and wire color assignment of prefabricated cables

<table>
<thead>
<tr>
<th>Signal</th>
<th>Cable¹</th>
<th>Cable²</th>
<th>Open end, 17 core</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_s$</td>
<td>M12 socket, 17-pin</td>
<td>D-Sub HD plug, 15-pin</td>
<td>M12 socket, 17-pin</td>
</tr>
<tr>
<td>Result 2</td>
<td>2</td>
<td>1</td>
<td>2 blue</td>
</tr>
<tr>
<td>GND</td>
<td>1</td>
<td>5</td>
<td>1 brown-green</td>
</tr>
</tbody>
</table>

1) cables no. 2049764 (0.9 m/2.95 ft), no. 2055419 (2 m/6.56 ft), no. 2055420 (3 m/9.84 ft)
2) cables no. 6042772 (3 m/9.84 ft), no. 6042773 (5 m/16.4 ft)

Quenching circuit: Install an anti-surge diode directly at the load!
### 3.5.11 Switching output External Output 1 on CDB620

**Wiring the "External output 1" of the LECTOR®620 in the CDB620 connection module ("Out 1" switching output)**

**LECTOR®620**

- "External output 1"
- Serial Aux (RS-232)

**CDB620**

- CMC600
- Shield 6
- Out 1 23
- GND 22

**Load (e.g. PLC)**

- V_{out}

---

**U_{in}^* = DC 10 to 30 V**

---

**Ratings for "External output 1" ("Out 1" switching output)**

<table>
<thead>
<tr>
<th>Switching behavior</th>
<th>PNP switching against the supply voltage U_{in}^* (default setting: no function/disabled, logic: not inverted (active high))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Features</td>
<td>- Short-circuit proof + temperature protected</td>
</tr>
<tr>
<td></td>
<td>- Galvanically not separate from U_{in}^*</td>
</tr>
<tr>
<td>Electrical values</td>
<td>0 V ≤ V_{out} ≤ U_{in}^*</td>
</tr>
<tr>
<td></td>
<td>Guaranteed: (U_{in}^* - 1.5 V) ≤ V_{out} ≤ U_{in}^* with I_{out} ≤ 100 mA</td>
</tr>
</tbody>
</table>

---

The LECTOR®620 indicates the switching status of its logical "external output 1" via the serial Aux data interface. Software-controlled, the status is automatically taken over by the CMC600 via the cable and converted to the physical "Out 1" output in the CDB620.

**Quenching circuit:** Install an anti-surge diode directly at the load!
### 3.5.12 Switching output External Output 2 on CDB620

**Wiring the "External output 2" of the LECTOR®620 in the CDB620 connection module ("Out 2" switching output)**

**LECTOR®620**

"External output 2"

(External output 2)

**CDB620**

Serial Aux

(RS-232)

GND

Out 2

24

GND

22

Load (e.g. PLC)

For inductive load:

Quenching circuit:

Install an anti-surge diode directly at the load!

\[ V_{out} \]

\[ U_{in}^{*} = \text{DC 10 to 30 V} \]

**Ratings for "External output 2" ("Out 2" switching output)**

| Switching behavior | PNP switching against the supply voltage \( U_{in}^{*} \)
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(default setting: no function/disabled, logic: not inverted (active high))</td>
</tr>
<tr>
<td>Features</td>
<td>- Short-circuit proof + temperature protected</td>
</tr>
<tr>
<td></td>
<td>- Galvanically not separate from ( U_{in}^{*} )</td>
</tr>
</tbody>
</table>
| Electrical values  | \( 0 \text{ V } \leq \text{ } V_{out} \text{ } \leq \text{ } U_{in}^{*} \) Guaranteed:
|                    | \( (U_{in}^{*}-1.5 \text{ V}) \leq \text{ } V_{out} \text{ } \leq \text{ } U_{in}^{*} \) with \( I_{out} \leq 100 \text{ mA} \) |

The LECTOR®620 indicates the switching status of its logical "external output 2" via the serial Aux data interface. Software-controlled, the status is automatically taken over by the CMC600 via the cable and converted to the physical "Out 2" output in the CDB620.
3.6 Wiring diagram of connection module CDM420-0001

CDM420-0001 connection module

- **POWER**: ON/OFF
- **S1**: POWER
- **S2/S3/S4/S6**: ON/OFF
- **LEDs**: ON/OFF

CMC600 parameter cloning module (optional)

No CMC →

**CDM420-0001 connection module**

- **POWER**: ON/OFF
- **S1**: POWER
- **S2/S3/S4/S6**: ON/OFF
- **LEDs**: ON/OFF

**Electrical installation**

- **Pin 2**: RxD
- **Pin 3**: TxD
- **Pin 5**: GND

**RS-422**

Host
to LECTOR®620

**RS-232**

Host
to PC

**PLC Result 1**

**Result 2**

**GND**

**Shield**

**T+**

**R+**

**+24 V**

**Sensor 1**

**Aux Out 1**

**GND**

**SGND**

**CAN_H**

**CAN_L**

**`TO`**

**`TD-`**

**`TD+`**

**`RD-`**

**`RD+`**

**`GND`**

**RS-485 Term422**

**Aux In 2**

**SGND**

**GND**

**SGND**

**CAN_H**

**CAN_L**

**`T-`**

**`T+`**

**`RD-`**

**`RD+`**

**`GND`**

**RS-422**

**Host**

**Pin 2**: RxD

**Pin 3**: TxD

**Pin 5**: GND

**V_s = DC 10 to 30 V**

External reading clock sensor (e.g. photo-electric switch)

**V_s on terminal **"(+24 V"** complies with **V_s on terminal **"(+24 V** after fuse F and switch S1

**VS = DC 10 to 30 V**

= an CMC600 is required to provide the additional switching inputs and outputs

---

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Using connection module CDM420-0001 with other modules

If connection module CDM420-0001 is used with other modules, the following supply voltages are required:

<table>
<thead>
<tr>
<th>Connection module</th>
<th>Additional module</th>
<th>Function</th>
<th>Supply voltage/ additional power consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDM420-0001</td>
<td>-</td>
<td>-</td>
<td>DC 10 ... 30 V</td>
</tr>
<tr>
<td></td>
<td>Connection Module Cloning CMC600 Article no. 1042259</td>
<td>Parameter memory module for the external storage of the LECTOR®620's parameter values and automatic activation of operating modes after switching on</td>
<td>DC 10 ... 30 V/ 0.5 W</td>
</tr>
<tr>
<td></td>
<td>Connection Module Power CMP400 Article no. 2029468</td>
<td>Power supply module for supplying a LECTOR®620 with voltage from the AC mains power supply</td>
<td>AC 100 ... 250 V, 50 ... 60 Hz</td>
</tr>
<tr>
<td></td>
<td>Connection Module Power CMP490 Article no. 2030091</td>
<td>Power supply module for supplying a LECTOR®620 with voltage directly from the AC mains power supply</td>
<td>AC 100 ... 250 V, 50 ... 60 Hz</td>
</tr>
</tbody>
</table>

Information on wiring/configuration of the connection module, as well as technical data, is provided in operating instructions “Connection Module CDM420-0001” (article no. 8010004, German/English).

Detailed descriptions on the functions and installation of the additional modules can be found in the corresponding installation/operating instructions.
### 3.6.1 Voltage supply via connection module CDM420-0001

Wiring the power supply voltage to the CDM420-0001 connection module

S1: POWER

<table>
<thead>
<tr>
<th>ON</th>
<th>OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>+24 V</td>
<td>Shield</td>
</tr>
<tr>
<td>GND</td>
<td>Shield</td>
</tr>
<tr>
<td>+24 V*</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td></td>
</tr>
</tbody>
</table>

$V_S = \text{DC 10 to 30 V}$

$V_S$ on terminal "+24 V" complies with terminal "+24 V*" after fuse F and switch S1

Switch S1:

**ON:**
- Power supply voltage $U_V (+24 \\text{V})$ switched as $U_V (+24 \\text{V}*)$ via fuse to CDM420-0001 and LECTOR®620.
- $U_V (+24 \\text{V}*)$ additionally available on terminals 29 and 39.

**OFF:**
- CDM420-0001 and LECTOR®620 disconnected from power supply voltage.
- Recommended position during all electrical installation work.
3.6.2 Serial host data interface RS-232 on connection module CDM420-0001

Wiring the RS-232 data interface of the LECTOR® 620 in the CDM420-0001 connection module

Pin and wire color assignment of prefabricated cables

<table>
<thead>
<tr>
<th>Signal</th>
<th>Cable 1</th>
<th>Cable 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>TxD</td>
<td>M12 socket, 17-pin</td>
<td>D-Sub HD plug, 15-pin</td>
</tr>
<tr>
<td></td>
<td>M12 socket, 17-pin</td>
<td>Open end, 17 core</td>
</tr>
<tr>
<td>RxD</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>GND</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

1) cables no. 2049764 (0.9 m/2.95 ft), no. 2055419 (2 m/6.56 ft), no. 2055420 (3 m/9.84 ft)
2) cables no. 6042772 (3 m/9.84 ft), no. 6042773 (5 m/16.4 ft)
3.6.3 Serial host data interface RS-422 on connection module CDM420-0001

Wiring the RS-422 data interface of the LECTOR®620 in the CDM420-0001 connection module

Pin and wire color assignment of prefabricated cables

<table>
<thead>
<tr>
<th>Signal</th>
<th>Cable 1</th>
<th>Cable 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>TD+</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>TD−</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>RD+</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>RD−</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>GND</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

1) cables no. 2049764 (0.9 m/2.95 ft), no. 2055419 (2 m/6.56 ft), no. 2055420 (3 m/9.84 ft)
2) cables no. 6042772 (3 m/9.84 ft), no. 6042773 (5 m/16.4 ft)
3.6.4 CAN interface on connection module CDM420-0001

Wiring the LECTOR®620 in the CDM420-0001 connection module for the SICK CAN SENSOR Network

Connection of power supplies as well as of reading clock sensor e.g. to the master here not shown.

Connection cable:
- no. 2049764 (0.9 m/2.95 ft) or
- no. 2055419 (2 m/6.56 ft) or
- no. 2055420 (3 m/9.84 ft)

1) cable:
3.6.5 Switching output Sensor 1 on connection module CDM420-0001

Wiring the "Sensor 1" switching input of the LECTOR®620 in the CDM420-0001 connection module

a) Sensor supplied by CDM420-0001
   e.g. photo-electric switch

b) Sensor connected electrically isolated/externally supplied
   e.g. photo-electric switch

c) Switch supplied by CDM420-0001

d) Switch connected electrically isolated/externally supplied
   Connect the switch as shown in b)

Pin and wire color assignment of prefabricated cables

<table>
<thead>
<tr>
<th>Signal</th>
<th>Cable a)</th>
<th>Cable b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M12</td>
<td>D-Sub HD plug, 15-pin</td>
<td>M12 socket, 17-pin</td>
</tr>
<tr>
<td>Open end</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>V&lt;sup&gt;+&lt;/sup&gt;</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Sensor 1</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>SensGND</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>GND</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

1) cables no. 2049764 (0.9 m/2.95 ft), no. 2055419 (2 m/6.56 ft), no. 2055420 (3 m/9.84 ft)
2) cables no. 6042772 (3 m/9.84 ft), no. 6042773 (5 m/16.4 ft)

Ratings for "Sensor 1" switching input

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching behavior</td>
<td>Power fed to the input starts the assigned function, e.g. start of reading clock. (default setting: logic not inverted (active high), debouncing 10 ms)</td>
</tr>
<tr>
<td>Features</td>
<td>Optodecoupled, reverse polarity protected</td>
</tr>
<tr>
<td></td>
<td>Can be wired with the PNP output of a sensor</td>
</tr>
<tr>
<td>Electrical values</td>
<td>Low: ( V_\text{in} \leq 2 \text{ V}; I_\text{in} \leq 0.3 \text{ mA} )</td>
</tr>
<tr>
<td></td>
<td>High: ( 6 \text{ V} \leq V_\text{in} \leq 32 \text{ V}; 0.7 \text{ mA} \leq I_\text{in} \leq 5 \text{ mA} )</td>
</tr>
</tbody>
</table>

Function assignment to "Sensor 1" switching input via SOPAS
(Sensor/Input 1):
- Start of reading clock
- Stop of reading clock
- Start teach-in matchcode/start code comparison
- Increment input
- If required further functions in the future

Switch S6: SGND
ON: GND of the sensor connected to GND of CDM420-0001/LECTOR®620.
OFF: Sensor connected electrically isolated to the CDM420-0001/LECTOR®620.
Reference potential valid for all switching inputs
("Sensor 1/2" and "Aux In 1/2")
### 3.6.6 Switching output Sensor 2 on connection module CDM420-0001

**Wiring the "Sensor 2" switching input of the LECTOR®620 in the CDM420-0001 connection module**

- **a) Sensor supplied by CDM420-0001**
  - E.g. photo-electric switch
  - CDM420-0001
  - LECTOR®620
  - Cable, e.g. no. 2055419
    - (2 m/6.56 ft)
  - Vin = max. 32 V
  - +24 V* = DC 10 to 30 V
  - Ratings for "Sensor 2" switching input
    - Power fed to the input starts the assigned function, e.g. stop of reading clock.
    - (default setting: logic not inverted (active high), debouncing 10 ms)
    - Optodecoupled, reverse polarity protected
    - Can be wired with the PNP output of a sensor
  - Electrical values
    - Low: V_in ≤ 2 V; I_in ≤ 0.3 mA
    - High: 6 V ≤ V_in ≤ 32 V; 0.7 mA ≤ I_in ≤ 5 mA

- **b) Sensor connected electrically isolated/externally supplied**
  - E.g. photo-electric switch
  - CDM420-0001
  - LECTOR®620
  - Pin and wire color assignment of prefabricated cables
    - Signal | Cable |
    - V_in | M12 socket, 17-pin | D-Sub HD plug, 15-pin | M12 socket, 17-pin |
    - 2 | 2 | 1 | 1 |
    - 15 | 4 | 15 | white-yellow |
    - 9 | 15 | 9 | red |
    - GND | 1 | 5 | 1 | brown |
  - Ratings for "Sensor 2" switching input
    - Switching behavior
      - Power fed to the input starts the assigned function, e.g. stop of reading clock.
      - (default setting: logic not inverted (active high), debouncing 10 ms)
    - Features
      - Optodecoupled, reverse polarity protected
      - Can be wired with the PNP output of a sensor
    - Electrical values
      - Low: V_in ≤ 2 V; I_in ≤ 0.3 mA
      - High: 6 V ≤ V_in ≤ 32 V; 0.7 mA ≤ I_in ≤ 5 mA

- **c) Switch supplied by CDM420-0001**
  - CDM420-0001
  - LECTOR®620

- **d) Switch connected electrically isolated/externally supplied**
  - Connect the switch as shown in b)
3.6.7 Switching output External Input 1 on connection module CDM420-0001

Wiring the "External input 1" of the LECTOR®620 in the CDM420-0001 connection module ("Aux In 1" switching input)

a) Sensor supplied by CDM420-0001

b) Sensor connected electrically isolated/externally supplied

c) Switch supplied by CDM420-0001

d) Switch connected electrically isolated/externally supplied

Connect the switch as shown in b)
3.6.8 Switching output External Input 2 on connection module CDM420-0001

Wiring the "External input 2" of the LECTOR®620 in the CDM420-0001 connection module ("Aux In 2" switching input)

a) Sensor supplied by CDM420-0001

e.g. photo-electric switch

b) Sensor connected electrically isolated/externally supplied

e.g. photo-electric switch

Software-controlled, the CMC600 transfers the switching status of its physical "Aux In 2" input automatically via the cable to the serial Aux data interface of the LECTOR®620. The LECTOR®620 converts the status internally to its logical "External input 2".

Ratings for "External input 2" ("Aux In 2" switching input)

<table>
<thead>
<tr>
<th>Switching behavior</th>
<th>Power fed to the input starts the assigned function, e.g. stop of reading clock. (default setting: logic not inverted (active high), debouncing 10 ms)</th>
</tr>
</thead>
</table>

Features
- Optodecoupled, reverse polarity protected
- Can be wired with the PNP output of a sensor

Electrical values
Low: \( V_{\text{in}} \leq 2 \text{ V} \); \( I_{\text{in}} \leq 0.3 \text{ mA} \)
High: \( 6 \text{ V} \leq V_{\text{in}} \leq 32 \text{ V} \); \( 0.7 \text{ mA} \leq I_{\text{in}} \leq 5 \text{ mA} \)

Function assignment to "External input 2" via SOPAS:
- Start of reading clock
- Stop of reading clock
- Start teach-in matchcode/start code comparison
- if required further functions in the future

Switch S6: SGND
ON: GND of the sensor connected to GND of CDM420-0001/CMC600.
OFF: Sensor connected electrically isolated to the CDM420-0001/CMC600.
Reference potential valid for all switching inputs ("Sensor 1/2" and "Aux In 1/2")
3.6.9 Switching output Result 1 on CDM420-0001

Wiring the "Result 1" switching output of the LECTOR®620 in the CDM420-0001 connection module

Rating for "Result 1" switching output

**Switching behavior**
- PNP switching against the supply voltage \( V_s (+24 \text{ V}) \)
- Default setting: Device Ready (static), logic: not inverted (active high)

**Features**
- Short-circuit proof + temperature protected
- Galvanically not separated from \( V_s (+24 \text{ V}) \)

**Electrical values**
- \( 0 \text{ V} \leq V_{out} \leq V_s \)
- Guaranteed:
  \( (V_s - 3.0 \text{ V}) \leq V_{out} \leq V_s \) with \( I_{out} \leq 100 \text{ mA} \)

**Pin and wire color assignment of prefabricated cables**

<table>
<thead>
<tr>
<th>Signal</th>
<th>Cable(^a)</th>
<th>Cable(^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M12 socket, 17-pin</td>
<td>D-Sub HD plug, 15-pin</td>
</tr>
<tr>
<td>( V_s )</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Result 1</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>GND</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

1) cables no. 2049764 (0.9 m/2.95 ft), no. 2055419 (2 m/6.56 ft), no. 2055420 (3 m/9.84 ft)
2) cables no. 6042772 (3 m/9.84 ft), no. 6042773 (5 m/16.4 ft)
### 3.6.10 Switching output Result 2 on CDM420-0001

**Wiring the “Result 2” switching output of the LECTOR®620 in the CDM420-0001 connection module**

Cable, e.g. no. 2055419 (2 m/6.56 ft)

---

**LECTOR®620**

- **V_s**
- **Result 2**
- **GND**

**CDM420-0001**

- **+24 V* (V_s)**
- **Shield**
- **Result 2**
- **GND**

**Load (e.g., PLC)**

- **V_out**

---

**Ratings for “Result 2” switching output**

<table>
<thead>
<tr>
<th>Switching behavior</th>
<th>PNP switching against the supply voltage V_s (+24 V*) (default setting: Good Read, 100 ms logic: not inverted (active high))</th>
</tr>
</thead>
</table>
| Features           | - Short-circuit proof + temperature protected  
|                    | - Galvanically not separated from V_s (+24 V*)                                                 |
| Electrical values  | 0 V ≤ V_out ≤ V_s  
|                    | Guaranteed: (V_s − 3.0 V) ≤ V_out ≤ V_s with Iout ≤ 100 mA                                      |

**Pin and wire color assignment of prefabricated cables**

<table>
<thead>
<tr>
<th>Signal</th>
<th>Cablea</th>
<th>Cableb</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_s</td>
<td>M12 socket, 17-pin</td>
<td>M12 socket, 17-pin</td>
</tr>
<tr>
<td>Result 2</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>GND</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

- **Cablea**: M12 plug, 17-pin, A-type encoded
- **Cableb**: D-Sub HD plug, 15-pin

---

For inductive load:

**Quenching circuit:** Install an anti-surge diode directly at the load!

---

1) cables no. 2049764 (0.9 m/2.95 ft), no. 2055419 (2 m/6.56 ft), no. 2055420 (3 m/9.84 ft)  
2) cables no. 6042772 (3 m/9.84 ft), no. 6042773 (5 m/16.4 ft)
3.6.11 Switching output External Output 1 on CDM420-0001

Wiring the “External output 1” of the LECTOR®620 in the CDM420-0001 connection module (“Aux Out 1” switching output)

- **External output 1**
  
- Serial Aux (RS-232)

- **CDM420-0001**
  
- CMC600

- **Load (e.g. PLC)**

- VS = DC 10 to 30 V

Ratings for "External output 1" ("Aux Out 1" switching output)

<table>
<thead>
<tr>
<th>Switching behavior</th>
<th>PNP switching against the supply voltage $V_s$ (+24 V*) (default setting: no function/disabled, logic: not inverted (active high))</th>
</tr>
</thead>
</table>
| Features           | Short-circuit proof + temperature protected  
|                    | Galvanically not separated from $V_s$ (+24 V*)  
| Electrical values  | $0 \, V \leq V_{out} \leq V_s$ Guaranteed: $(U_r - 1.5 \, V) \leq V_{out} \leq V_s$ with $I_{out} \leq 100 \, mA$ |

The LECTOR®620 indicates the switching status of its logical “external output 1” via the serial Aux data interface. Software-controlled, the status is automatically taken over by the CMC600 via the cable and converted to the physical "Aux Out 1" output in the CDM420-0001.
### 3.6.12 Switching output External Output 2 on CDM420-0001

**Wiring the "External output 2" of the LECTOR®620 in the CDM420-0001 connection module ("Aux Out 2" switching output)**

The LECTOR®620 indicates the switching status of its logical "external output 2" via the serial Aux data interface. Software-controlled, the status is automatically taken over by the CMC600 via the cable and converted to the physical "Aux Out 2" output in the CDM420-0001.

#### Ratings for "External output 2" ("Aux Out 2" switching output)

<table>
<thead>
<tr>
<th>Switching behavior</th>
<th>PNP switching against the supply voltage $V_s$ (+24 V*) (default setting: no function/disabled, logic: not inverted (active high))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Features</td>
<td>Short-circuit proof + temperature protected; Galvanically not separated from $V_s$ (+24 V*)</td>
</tr>
<tr>
<td>Electrical values</td>
<td>$0 \leq V_{\text{out}} \leq V_s$; Guaranteed: $(V_s - 1.5 , \text{V}) \leq V_{\text{out}} \leq V_s$ with $I_{\text{out}} \leq 100 , \text{mA}$</td>
</tr>
</tbody>
</table>
Chapter 4  

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4.5 OpenSSH – 5.1p1

Cryptographic attack detector for ssh - source code

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