



CDF600

Fieldbus module for integrating a SICK identification sensor into EtherCAT® networks

CDF600 EtherCAT®

SICK
Sensor Intelligence.



EtherCAT®



Intended use

The CDF600 EtherCAT® fieldbus module is used to integrate a SICK identification sensor as a participant in EtherCAT® networks in accordance with IEC 61158. The identification sensor is referred to simply as “device” in the following sections.

In terms of data technology, the fieldbus module and device constitute a unit (station). They communicate via a serial data interface (RS-232). One fieldbus module is required per device in the EtherCAT® network. The fieldbus module works either as a proxy of a 4Dpro sensor or generally as a gateway for a device with RS232 interface.

The CDF600 EtherCAT® fieldbus module supports the following devices:

In proxy mode:

- CLV62x to CLV65x bar code scanner
- Lector62x image-based code reader

In gateway mode:

- CLV61x bar code scanner
- RFH6xx (HF) RFID read/write device
- RFU62x (UHF) RFID read/write device

- IDMxxx hand-held scanner
- Any devices with RS-232 interface and suitable data format and data transmission rate

The fieldbus module can be used at an ambient temperature range of -35 °C to $+50\text{ °C}$ in interior areas.

Intended use also includes compliance with all information in these operating instructions.

About this document

These operating instructions provide information on the following:

- Quick and easy mounting of **one** fieldbus module at ambient temperatures of 0 °C to $+50\text{ °C}$
- Creation of the electrical connection of a fieldbus module with the device, fieldbus and, if possible, a local trigger sensor

The operating mode and the station address of the fieldbus module are set via the fieldbus module mechanical controls. The CDF600 EtherCAT® fieldbus module is referred to simply as “fieldbus module” in the following sections.

Supplementary and other relevant documents

The technical information of the CDF600 EtherCAT® fieldbus module (part number 8014621, English issue, PDF) describes:

- Mounting and electrical installation at ambient temperatures of 0 °C to -35 °C
- Software-supported configuration of the fieldbus module + device and fieldbus master

The technical information and more information, such as application examples and downloads of associated documents and associated software can be found on the SICK product page in the web at www.mysick.com/CDF600 → See also “Sources for obtaining additional information” on page 4.

For your safety

- This chapter is dedicated to the safety of commissioning personnel and the operator of the system in which the fieldbus module is integrated.
- Read these instructions carefully before commissioning the fieldbus module in order to familiarize yourself with it and its functions. The operating instructions are a component part of the fieldbus module and must be kept in the immediate vicinity of the device where they can be accessed at all times.

- Protect the fieldbus module from moisture and dust if the black rubber cover of the AUX connection has been removed. In this state, the device does not conform to a specified IP enclosure rating. To achieve the IP 65 enclosure rating in active operation, the following requirements must be met:
 - The black rubber cover of the AUX connection must lie flush on the fieldbus module.
 - The seal on the D-Sub HD female connector (DEVICE connection) must be present; both screws for the D-Sub plug connector must be fastened tight.
 - The SICK cables at the M12 connections are clamped and therefore vibration-proof.
 - Unused electrical connections must be fitted with protective caps and plugs that are screwed tight (as in the delivery condition).
 - If the optional cover (part number 2052296) is not used for the rotary encoding switch, the two provided threaded holes must remain uncovered.



Fig. 1: Delivery state

- Only operate the fieldbus module without a cover for short periods of use of the AUX connection.
- Opening the screws of the fieldbus module will invalidate any warranty claims against SICK AG. For further warranty provisions, see the General Terms and Conditions of SICK AG, e.g., on the delivery note of the fieldbus module.
- Data integrity: SICK AG uses standardized data interfaces, such as standard IP technology, in its products. The emphasis here is on the availability of products and their features. SICK AG always assumes that the integrity and confidentiality of the data and rights affected by the use of these products will be ensured by the customer. In all cases, appropriate security measures, such as network separation, firewalls, virus protection, and patch management, must be taken by the customer on the basis of the situation in question.

Commissioning and configuration

Scope of delivery

- The CDF600 EtherCAT® fieldbus module, equipped with yellow protective caps/plugs on the M12 connections. Without connecting cables.
- Mounting set part number 2033250
- Printed operating instructions in German and English. Possibly available in other languages as a PDF on the SICK product site of the fieldbus module in the Internet: www.sick.com/CDF600.
- Any optionally ordered accessories (cover, cables, trigger sensors, etc.)
- The required ESI files for the devices to be connected are also available on the fieldbus module product site online.

Operating principle of the fieldbus module (overview)

In the EtherCAT® network, the fieldbus module functions as a station that can be addressed. It can be operated by any EtherCAT® fieldbus master that conforms to the relevant standards (e.g. PLC).

The fieldbus module operates as a proxy for a device from the 4Dpro device families. For the fieldbus master, only the device is visible.

Alternatively, the fieldbus module can operate as a gateway for a device that is only gateway-compatible if it is outputting data and has a serial data interface (RS-232). In this case, for the fieldbus master, only the fieldbus module is visible.

As a proxy, the fieldbus module loads the device description for its parameters from the device on system startup. It must be capable of supporting the fieldbus module when it is functioning as a proxy. Communication takes place for all processes via the serial AUX interface of the device (RS-232). Direct access to the device via the fieldbus module for configuration/diagnosis with the PC is also possible. The fieldbus module also saves the parameter set of the device that supports proxy mode to its internal parameter memory. This makes device replacement easier if it fails.

As a gateway for devices that support gateway mode, the fieldbus module transmits data telegrams framed with STX and ETX. To do so, the module receives it at its serial data interface. It can be set with a data transmission rate of 9.6 kBd or 57.6 kBd.

The device receives external object trigger signals in the proxy mode via the EtherCAT® network. Alternatively, they can also be received locally, e.g. from a trigger sensors via one of the two local switching inputs of the fieldbus module.

The device reports selectable results in identification events (e.g. Good Read) to the fieldbus master in proxy mode via the fieldbus. Alternatively, this can also be done on-site via the local OUT 1 and OUT 2 switching outputs of the fieldbus module, e.g. LEDs.

Six optical indicators signal the statuses of the fieldbus module: connection status, status of the switching inputs and outputs, system status and the ECAT link/activity.

A smaller SICK-specific CAN sensor network of SICK devices with CAN interface can be set up as a subnetwork using the CAN bus. The device connected to the EtherCAT® network via the fieldbus module performs a coordinating function, e.g., as master. Wiring of the CAN bus is carried out via the POWER connection.

In normal operation, the fieldbus module and device work fully automatically.

Step 1: Mounting and alignment

NOTE

Radio interference may occur when used in residential areas!

➤ Only use the fieldbus module in industrial environments (EN 61000-6-4).

Equipment required

• 2 M5 x 30 mm screws from the mounting set, part number 2033250 to fasten the fieldbus module to a mounting device (bracket) provided by the user. If applicable, another screw length is required dependent on the mounting base (wall thickness of the bracket).

Mounting requirements

• The permissible ambient conditions for operating the fieldbus module must be observed, e.g., ambient temperature, ground potential. → See “Technical data” on page 5 and “Step 2: Electrical installation” on page 2.

• Stable mounting equipment with sufficient load-bearing capacity and appropriate dimensions for the fieldbus module. Weight approx. 600 g (without cables). → See “Device layout” on page 4.

- Only mount the device using the two domes on the side areas or alternatively using the two elongated drill holes on the housing body. → See “Device layout” on page 4.
- In order to achieve electromagnetic-compatible mounting, a continuous metallic connection must be established with the housing of the fieldbus module.
- Shock and vibration-free mounting
- Required switching space across the electrical connections approx. 300 mm
- Clear view of the rotary encoding switches and optical indicators

Mounting the fieldbus module

1. Select a suitable mounting location for the fieldbus module. **Maximum cable distance from the device 5 m (RS-232).**
2. Mount the fieldbus module using the supplied mounting set, part number 2033250 (2 M5 x 30 mm hexagon socket cylinder head screws and 2 M5 sliding nuts) to a stable mounting bracket.
3. Ideally, the fieldbus module should be mounted in a horizontal or vertical position so the writing on the rotary encoding switches reads correctly when viewed by the user.
4. Mount the device and align it with the codes/transponders to be identified as indicated in the corresponding operating instructions. The  operating instructions of the relevant device are available on the corresponding SICK product site in the Internet, e.g., for the CLV62x bar code scanner at www.sick.com/CLV62x. → See also “Sources for obtaining additional information” on page 4.

NOTE

Protection from manipulation

Using the optional cover (part number 2052296), the encoding switches of the fieldbus module can be largely protected from manipulation during operation.

➤ Mount the cover made of clear plastic with the scratch-proof surface over the encoding switches after configuration. To do so, only use the two supplied m 2.5 Torx screws.
→ See also “Device layout” on page 4.

Step 2: Electrical installation

- **The electrical installation must only be performed by electrically qualified persons.**
- **Standard safety requirements must be met when working on electrical systems.**
- Electrical connections between the fieldbus module and other devices may only be made or separated when there is no power to the system. Otherwise, the devices may be damaged.
- When using connecting or extension cables with an open end, make sure that bare wire ends are not touching (risk of short-circuit when the supply voltage is switched on). Wires must be appropriately insulated from each other. This also applies for unused signal wires.
- Wire cross sections of the supply cable from the customer’s power system for the fieldbus module should be designed and protected in accordance with the applicable standards. Insert a separate, external fuse (max. 0.8 A slow-blow) at the start of the supply cable to protect the fieldbus module (and the device connected to it).
- Connect the shield ground of the fieldbus module above the unpainted surfaces of the elongated drill hole to the system ground provided by the user.
- All circuits to be connected to the fieldbus module must be designed as SELV circuits (SELV = Safety Extra Low Voltage).
- The supply voltage must satisfy the requirements of SELV in accordance with the currently applicable EN 60950-1.

⚠ WARNING

Risk of injury and damage caused by electrical current!

The fieldbus module is designed for operation in a system with proficient grounding of all connected devices and mounting surfaces to the same ground potential. As a result of equipotential bonding currents between the fieldbus module and other grounded devices in the system, faulty grounding of the fieldbus module can give rise to the following effects:

- Metal housings are vulnerable to dangerous currents
 - Malfunction and destruction of devices
 - Damages of the cable shield due to overheating caused by cable fires.
- Ensure that the ground potential is the same at all grounding points.
- If the cable insulation is damaged, disconnect the voltage supply immediately and have the damage repaired.

1. Wire fieldbus module to create the desired application, depending on the device type, in accordance with the block diagram (→ see “Fieldbus module block diagram” on page 6). To do so, use the optional SICK cables which are ready to assemble. The cables must be ordered as optional accessories. The part numbers for the required M12 adapter cable on D-SUB-HD (connection DEVICE) is type-dependent for devices with Ethernet interface. It can be found in the Internet on the relevant SICK product site.

Cable types and lengths:

- The cable used for the incoming supply cable must be a shielded cable, length of cable < 30 m.

Take appropriate measures to isolate unused open wire ends (optional CAN bus) for the “POWER” connection (risk of short-circuit)

- Shielded connection cable (RS-232) between fieldbus module and device max. 5 m.
2. Prepare and protect the supply voltage for the fieldbus module. The level of the supply voltage for the unit consisting of fieldbus module and device is dependent on the connected device (→ see “CDF600 EtherCAT®-relevant specifications of devices” on page 2.). The fieldbus module provides a supply voltage range of DC 18 V to DC 30 V. The supply voltage is also applied to the connected device.

Power output of the power source:

The fieldbus module itself consumes max. 7 W of power (without device and trigger sensor, with unloaded switching outputs). The additional power consumed by the connected device and trigger sensor (if there is one) varies by type. The output of the power supply unit must be dimensioned based on the total consumption of all loads.

3. Do **not** connect the supply voltage yet.

CDF600 EtherCAT®-relevant specifications of devices

Device	Supply voltage V _s	Power consumption ¹⁾	Firmware version
Devices that support proxy mode			
CLV62x	DC 10 V ... 30 V	Max. 4.5 W	V. 5.10 or higher
CLV63x Line/Raster	DC 18 V ... 30 V	Typically 5 W	
CLV63x Line with OM	DC 18 V ... 30 V	Typically 6 W	
CLV64x Line/Raster	DC 18 V ... 30 V	Typically 5 W	

Device	Supply voltage V _s	Power consumption ¹⁾	Firmware version
CLV64x Line with OM	DC 18 V ... 30 V	Typically 6.5 W	V5.10 or higher
CLV65x Line	DC 18 V ... 30 V	Typically 8.5 W	
CLV65x Line with OM	DC 18 V ... 30 V	Typically 9.5 W	
CLV63x ... 65x, for heating in addition	DC 24 V ± 10%	Electronics type-specific, see above, heating max. 30 W	
Lector62x	DC 10 V ... 30 V	Typically 3 W	V2.10

Devices that support gateway mode			
CLV61x	DC 10 V ... 30 V	Typically 2.8 W	
RFH62x	DC 10 V ... 30 V	Max. 5 W	
RFH63x	DC 10 V ... 30 V	Max. 8 W	
RFU62x	DC 10 V ... 30 V ²⁾	Typically 8 W ³⁾	
IDM160	Transducer DC 24 V/5 V	Typically 1.15 W	
IDM161	Transducer DC 24 V/5 V	Typically 0.9 W	
IDM260	Transducer DC 24 V/5 V	Typically 1.68 W	
IDM261	Transducer DC 24 V/5 V	Typically 1.65 W	

- 1) For switching outputs without load.
Power consumption of the fieldbus module additionally max. 7 W.
- 2) DC 20 V to 30 V when using the RFU62x-101xx in ambient temperatures of -20 °C to -40 °C.
- 3) Additionally max. 12 W from -20 °C to -40 °C
- Line with OM = Line scanner with oscillating mirror**

Tab. 1: Device characteristics

Other devices for connection on request.

Step 3: Configuration with PC

a. Overview of the configuration process

1. Set the operating mode of the fieldbus module and its station address (configured station alias) with the 3 rotary encoding switches.
2. Integrate the fieldbus module as a network participant in the fieldbus master.
3. Configure data communication in the fieldbus.
4. Only device that supports proxy mode: Use the SOPAS ET configuration software to set the remaining functions of the device.

b. Setting the operating mode and station address in the fieldbus module



Fig. 2: Rotary encoding switches of the fieldbus module

Rotary encoding switch 1 ("Mode")

Setting: operating mode and communication mode.
Additional: 100s place of the station address
(→ see "Tab. 3: Function of rotary encoding switches 2 and 3" on page 3).

Position	Function
0 and 1	Operation with device that supports proxy mode. CDF600 communication mode with/without handshake. Parameter cloning for device.
2 and 3	Operation with device that supports gateway mode. The fieldbus module operates as a gateway. CDF600 communication mode with handshake. Data transmission rate between device and fieldbus module: 57.6 kBd.
4 and 5	As position 2 and 3, but data transmission rate 9.6 kBd
Other functions	
6 ... 9	Reserved.
A ... D	Reserved.
E	Operation for firmware update of fieldbus module. No communication with EtherCAT®
F	Transparent operation of the fieldbus module for firmware update of the device. No communication with EtherCAT®.

Tab. 2: Function of rotary encoding switch 1

Rotary encoding switches 2 and 3 ("Adr")

Setting: 10s and 1s place of the station address

Position Switch 1 (Xxx)	Position Switch 2 (xXx)	Position Switch 3 (xxX)	Possible station address
0, 2, 4	0	0	Not used
	0 ... 9	0 ... 9	001 ... 099
1, 3, 5	0 ... 9	0 ... 9	100 ... 199
6 ... F	Any	Any	Invalid

Tab. 3: Function of rotary encoding switches 2 and 3

1. Use rotary encoding switch 1 (Mode) to set the operating mode and the 100s place of the station address. The possible operating mode depends on the device to be connected (→ see "Technical data" on page 5)
- Position 0 and 1:**
The fieldbus module works as a proxy of a device (e.g. bar code scanner of the CLV6xx product family).

- Position 2 to 5:**
Fieldbus module operates as a device that supports gateway mode (e.g., hand-held scanner). Data transmission rate according to switch setting. List of rates that can be configured
→ see "Rotary encoding switch 1 ("Mode")" on page 3.

2. Select the station address with rotary encoding switches 1, 2 and 3.
- Example 1:**
Desired station address: 67

Switch 1 (100s place): position 0, 2 or 4
Switch 2 (10s place): position 6
Switch 3 (1s place): position 7

Example 2:
Desired station address: 102

Switch 1 (100th place): position 1, 3 or 5
Switch 2 (10s place): position 0
Switch 3 (1s place): position 2

- The station address must only occur once in the EtherCAT® network.
3. Restart the fieldbus module together with the device. In order to do this, switch off the supply voltage for the fieldbus module and switch it on again. The fieldbus module adopts the settings for the rotary encoding switches.
Changes to the rotary encoding switches when the fieldbus module is switched on does not affect anything in the data communication. The changes are not adopted until the fieldbus module is restarted.

c. Configuring the device in the fieldbus module (continuation for device that supports proxy mode)

The SOPAS ET configuration software for SICK devices is used as standard for the commissioning and further configuration of the device that supports proxy mode connected to it.

The configuration of the fieldbus module is integrated in the menu of the respective device that supports proxy mode.

Installing SOPAS ET configuration software

1. Download and install from the SICK product page of the software in the Internet at www.sick.com/SOPAS:
 - Most current version of the configuration software
 - Current device description file (*.sdd) of the device to be connected.
2. For the configuration software, select the "Complete" option as selected by the installation wizard. Administrator rights may be required on the PC to install the software.

Connecting the PC to the fieldbus module and switching on devices

1. Connect the PC (switched-off) as follows:
 - Serial version of the device that supports proxy mode with fixed connecting cable (serial data interfaces only):
Connect AUX interface (RS-232) of the fieldbus module to the corresponding PC interface using a suitable data cable (male connector, M8, 4-pin / male connector, D-Sub, 9-pin).
 - Ethernet version of the device that supports proxy mode:
Connect the Ethernet interface of the device to the Ethernet network of the PC using a suitable data cable (male connector, M12, 4-pin, D-coded / male connector; RJ45, 8-pin).
2. Set rotary encoding switch 1 to position F.
3. On the user side, switch on the supply voltage chosen according to the table for the fieldbus module and the connected device.
(→ see "CDF600 EtherCAT@-relevant specifications of devices" on page 2).
Following initialization of the fieldbus module and while attempting to establish communication with the device, the green ECAT RUN LED flickers. The connection to the EtherCAT® network is indicated by the green L/A LED lighting up over the ECAT IN (and possibly ECAT OUT) connection. When

data exchange with the detected fieldbus master is active, the ECAT RUN LED lights up green and the L/A LEDs over the ECAT IN/OUT connections indicate activity on the network by flickering. Meaning of LEDs → see “Optical status indicators” on page 4.

- Switch on PC and start configuration software via the “SOPAS ET” option. Path: Start > Programs > SICK > SOPAS Engineering Tool > SOPAS ET.
- Start communication with the device with SOPAS ET as described in the operating instructions for the connected device that supports proxy mode. In order to do this, select the desired communication interface for searching in the connection wizard.
- Specify the object trigger source and the output format of the device for the fieldbus using SOPAS ET.
For the remaining steps in the process of configuring the connected device, see the  *technical information of the CDF600 EtherCAT® fieldbus module*.

d. Integrating the device in the fieldbus master and configuring data communication on the fieldbus

This section provides a brief overview of the general procedure.

Important!

The required SICK sensor-specific ESI file is accessible on the following product pages in the Internet:

- www.sick.com/CDF600
- e.g. www.sick.com/Lector62x

Device that supports proxy mode:

- Integrate the device as a new participant in the fieldbus master (e.g. PLC) with TwinCat.
For this purpose, transfer the SICK sensor-specific ESI file of the corresponding device to the device description database of the fieldbus master.
- Set the desired lengths of the fieldbus input and output data appropriately based on the selected communication mode of the device. Assign the corresponding data structures in the fieldbus master for data exchange with the fieldbus module.

Device that supports gateway mode:

- Integrate the device as a new participant in the fieldbus master (e.g. PLC) with TwinCat.
For this purpose, transfer the SICK-specific ESI file

for the fieldbus module to the device description database of the fieldbus master.

- IDMxxx hand-held scanner:**
Use the configuration codes to configure the hand-held scanner for data communication in the fieldbus module.
See  *technical information of the CDF600 EtherCAT® fieldbus module*.
 - Any device with RS-232 interface:**
Connect RS-232 interface to pin 2, 3, 5 of the fieldbus module (DEVICE connection).
Set communication parameters to:
 - Data string framework: STX and ETX
 - Data format: 8 data bits, no parity, 1 stop bit
 - Data transmission rate: 9.6 kBd or 57.6 kBd.
- e. Completing the configuration**
- Test the device when operating the system under real conditions and, if necessary, modify its settings.
 - Permanently save the entire configuration once it has been successfully tested:
Parameter set in the SICK device and fieldbus module: Click the  button.
Configuration file on the PC: Click the  button.

Device description

Device layout

→ See “Device layout” on page 5.

Optical status indicators

→ See “Optical status indicators” on page 6.

Overview of interfaces and connection options

→ See “Fieldbus module block diagram” on page 6.

Overview of pin assignments and wire color assignments (connections and cables)

→ See “Overview of pin and wire color assignments” on page 7.

Technical data

→ See “Technical data” on page 5.

Parameter cloning (in proxy mode)

The fieldbus module provides external parameter memory for the device that supports proxy mode. When the parameter values in the connected device are permanently saved **proxy mode 0 or 1**, the fieldbus module also stores a copy of this parameter set in its parameter memory.

This makes it easier to exchange the device in the event of device failure because the new device of the same type automatically loads the parameter set from the parameter memory of the fieldbus module. This means that manual configuration is not required. In the event of failure of the fieldbus module, the device which supports proxy mode automatically copies its parameter set into the empty parameter memory of the replaced, connected fieldbus module of the same type after initialization.

Maintenance and care

The fieldbus module does not contain any components that require maintenance.

- In order to maintain the signaling effect of the LEDs, clean the housing as needed if there is strong contamination caused by rough ambient operating conditions (dust, wear, humidity, etc.). The fieldbus module corresponds with enclosure rating IP 65 and is only protected against penetration of liquids in this context. Do not immerse the device in water!

NOTE

Risk of damaging the type label

The type label attached to the housing base is made of polyester with writing printed on it. The print could come off the foil if the type label is rubbed for a long period of time under a high amount of pressure, e.g. with a solvent-soaked cloth.

- Remove dust from the housing with a cloth (lint-free) or brush.
- If necessary, moisten the towel with a mild cleaner or powder additive, e.g. a plastic cleaner.
- Do not use aggressive chemicals (e.g. acetone).

Transport and storage

Transport and store the fieldbus module in the original packaging, with protective plugs and caps completely screwed-on. Do not store outdoors. To ensure that any residual moisture present can escape, do not store the device in airtight containers. Do not expose to any aggressive substances. Storage conditions: dry, dust-free, no direct sunlight, as little vibration as possible, storage temperature -35 °C to +70 °C, relative humidity max. 90% (non-condensing).

Repairs

Repair work on the fieldbus module may only be performed by qualified and authorized service personnel from SICK AG.

Disassembly and disposal

Any fieldbus module which can no longer be used must be disposed of in an environmentally friendly manner in accordance with the applicable country-specific waste disposal regulations. As they are categorized as electronic waste, fieldbus modules must never be disposed of with household waste. SICK AG is not currently able to take back devices that can no longer be used.

Sources for obtaining additional information

You can obtain the operating instructions and further documentation online (for accessories as well).

- Select your country and language at www.sick.com.
- Enter the fieldbus module's type designation or part number into the search field.
- Select the desired fieldbus module.
- All documentation and other downloadable content relating to the fieldbus module can be found under Downloads.
The SOPAS ET configuration software can be downloaded from Software.
Documentation for usable accessories can be downloaded from Accessories.

Support is also available from your sales partner: www.sick.com/worldwide.

Copyright notices

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Technical data

Type	CDF600 EtherCAT® (part number 1052291)
Type code	CDF600-0300
Function	EtherCAT® fieldbus module
Supported SICK devices	Proxy mode: CLV62x to CLV65x bar code scanner, Lector®62x image-based code reader Gateway mode: CLV61x bar code scanner, RFH6xx (HF) RFID read/write device, RFU62x (UHF) RFID read/write device, IDMxxx hand-held scanner
EtherCAT® fieldbus interface	In accordance with IEC61158, station address assignment from firmware V1.20 (001 ... 199)
AUX communication interface (DEVICE connection)	Serial (RS-232), 9.6 kBd or 57.6 kBd, for data communication between fieldbus module and device
CAN bus data interface (POWER connection)	CAN interface of the device is accessible via the POWER connection, SICK CAN sensor network can be established, termination resistor available
AUX service interface	Serial (RS-232), 57.6 kBd, only for configuration and diagnosis
Digital switching inputs	2 x, opto-decoupled, not reverse polarity protected regarding supply voltage, $V_{in} = \max. 32 V$, can be wired, e.g., with PNP output of a trigger sensor
Digital switching outputs	2 x, PNP, $V_{out} = V_s - 1.5 V$, $I_{out} \leq 100 mA$ (typical). Short-circuit protected, temperature protected, not electrically isolated from the supply voltage
Optical indicators	6 x, 7 LEDs (OUT 1/2 assigned 2 LEDs)
Parameter cloning	Integrated for device that supports proxy mode
Electrical connections	1 x female connector, D-Sub-HD, 15-pin, with seal (DEVICE connection) 3 x female connector, M12, 5-pin, A-coded (IN1, IN2 and OUT1/2 connections) 2 x female connector, M12, 5-pin, D-coded (ECAT OUT and ECAT IN connections) 1 x male connector, M12, 5-pin, A-coded (POWER connection) 1 x female connector, M8, 4-pin (AUX connection) ¹⁾
Supply voltage IN (POWER connection)	$V_s = DC 18 V \dots 30 V$, reverse polarity protected, SELV in accordance with the currently applicable EN 60950-1. Voltage range might be restricted by connected device. Protection of supply cable with max. 0.8 A.
Supply voltage OUT (DEVICE connection)	DC 18 V ... 30 V, like supply voltage IN
Power consumption	< 7 W (no device connected, switching output not loaded)
Current flow to device	Max. 0.8 A
Housing/Housing color	Aluminum die cast/Light blue (RAL 5012)
Mounting	Two screw system
Safety	In accordance with EN60950-1:2006-04 + A11:2009-03 + A1:2010-03 + A12:2011-02 + A2:2013-08
Enclosure rating	IP 65, in accordance with EN 60529:1991-10 + A1:2000-02 ²⁾
Electrical protection class	III
Dimensions	225 mm x 76.5 mm x 47 mm (without connected cables)
Weight	590 g
EMC	Radiated emission: in accordance with EN 61000-6-4: 2007-01 + A1: 2011-02 Shock resistance: in accordance with EN 61000-6-2:2005-08
Vibration resistance/Shock resistance	In accordance with EN 60068-2-6:2008-02 / in accordance with EN 60068-2-27:2009-05
Ambient temperature	Operation: -35 °C ... +50 °C / Storage: -35 °C ... +70 °C
Permissible relative humidity	90%, non-condensing
Mark of conformity	CE

1) For configuration and diagnostics only

2) Under the following conditions: when using a SICK sensor standard connection cable for the device. M12 plug connectors of connected lines are clamped and unused connections are equipped with secured protective caps or plugs.

Tab. 4: Technical data

Device layout

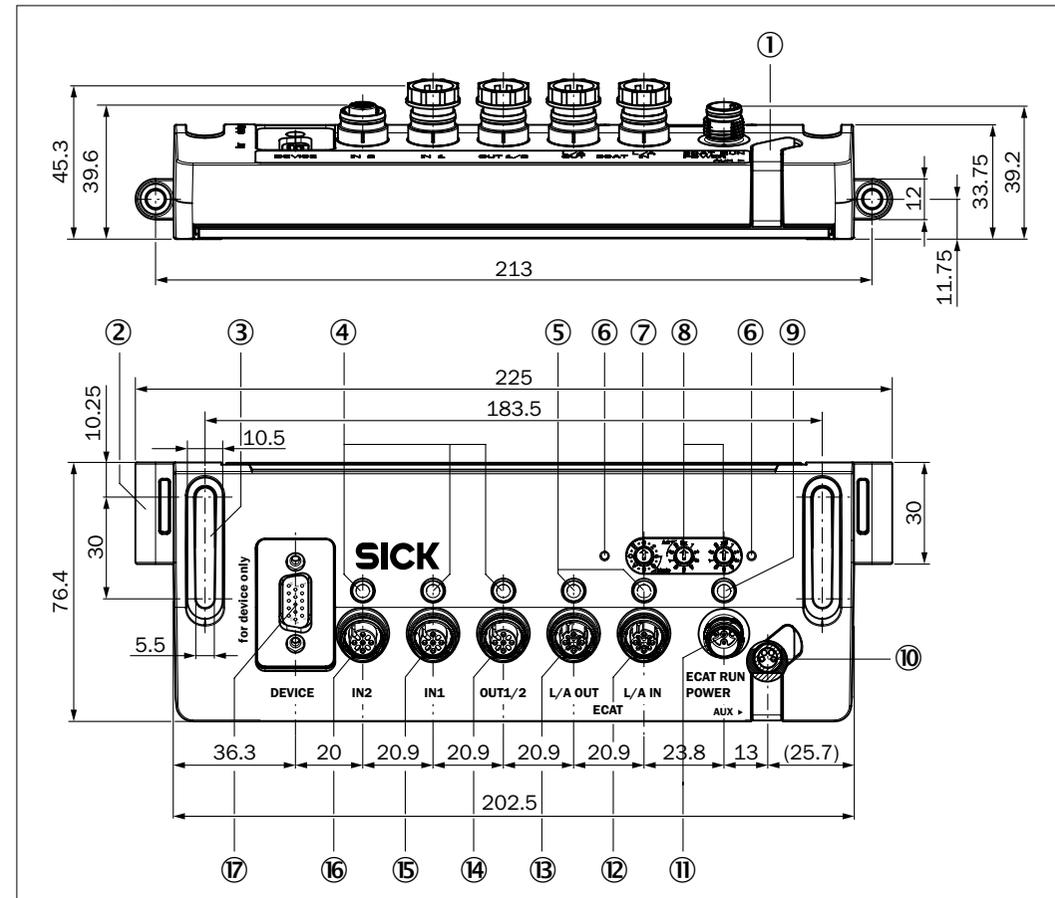


Fig. 3: Dimensions and device construction

- ① Rubber cover for AUX connection
- ② Dome (2 x), unpainted on the inside, for mounting with M5 screw.
- ③ Elongated hole (2 x), unpainted, for mounting with M5 screw, alternative to ②
- ④ Status indicators (4 x LED, OUT1/2 assigned double) for IN 2, IN 1 and OUT 1/2
- ⑤ Status indicators (2 x LED for L/A (link/activity) for ECAT IN and ECAT OUT
- ⑥ For threaded hole M2.5 (2 x) for mounting the optional cover, part number 2052296 for the rotary encoding switches
- ⑦ Rotary encoding switch for operating mode/setting of the 100s place of the station address
- ⑧ Rotary encoding switch (2 x) for setting the 10s place and 1s place of the station address
- ⑨ Status indicator (1 x LED) for ECAT RUN
- ⑩ AUX connection (female connector, M8, 4-pin), rubber cover removed here
- ⑪ POWER connection (male connector, M12, 5-pin, A-coded)
- ⑫ ECAT IN connection (female connector, M12, 4-pin, D-coded)
- ⑬ ECAT OUT connection (female connector, M12, 4-pin, D-coded)
- ⑭ OUT 1/2 connection (female connector, M12, 5-pin, A-coded)
- ⑮ IN 1 connection (female connector, M12, 5-pin, A-coded)
- ⑯ IN 2 connection (female connector, M12, 5-pin, A-coded)
- ⑰ DEVICE connection (female connector, D-Sub-HD, 15-pin)

Optical status indicators

Display	LED	Status	Function	Description
IN 2	●	Orange	On	External input 2 active ¹⁾
		-	Off	External input 2 not active ¹⁾
IN 1	●	Orange	On	External input 1 active ¹⁾
		-	Off	External input 1 not active ¹⁾
OUT 1/2	●	Orange	On	External output 1 (PNP) active ¹⁾
		-	Off	External output 1 (PNP) not active ¹⁾
	●	Green	On	External output 2 (PNP) active ¹⁾
		-	Off	External output 2 (PNP) not active ¹⁾
L/A ECAT OUT	●	Green	On	Connection to EtherCAT® network available, no activity in this connection, i.e. fieldbus module is offline
		-	Off	Connection to EtherCAT® network not available
		Fllickering	Fllickering	Connection to EtherCAT® network available, activity in this connection, i.e. fieldbus module is online
L/A ECAT IN	●	Green	On	Connection to EtherCAT® network available, no activity in this connection, i.e. fieldbus module is offline
		-	Off	Connection to EtherCAT® network not available
		Fllickering	Fllickering	Connection to EtherCAT® network available, activity in this connection, i.e. fieldbus module is online
ECAT RUN	●	Green	On	The fieldbus module has OPERATIONAL status
		-	Off	The fieldbus module has INIT status
		Fllickering rapidly	Fllickering rapidly	The fieldbus module has PRE-OPERATIONAL status
		Fllickering slowly	Fllickering slowly	The fieldbus module has SAFE-OPERATIONAL status
		Fllickering	Fllickering	The device is booting and does not yet have INIT status

1) Regardless of the logic assigned via SOPAS ET.

● = illuminated; ● = flashing or flickering

Tab. 5: Function of the optical status indicators

Fieldbus module block diagram

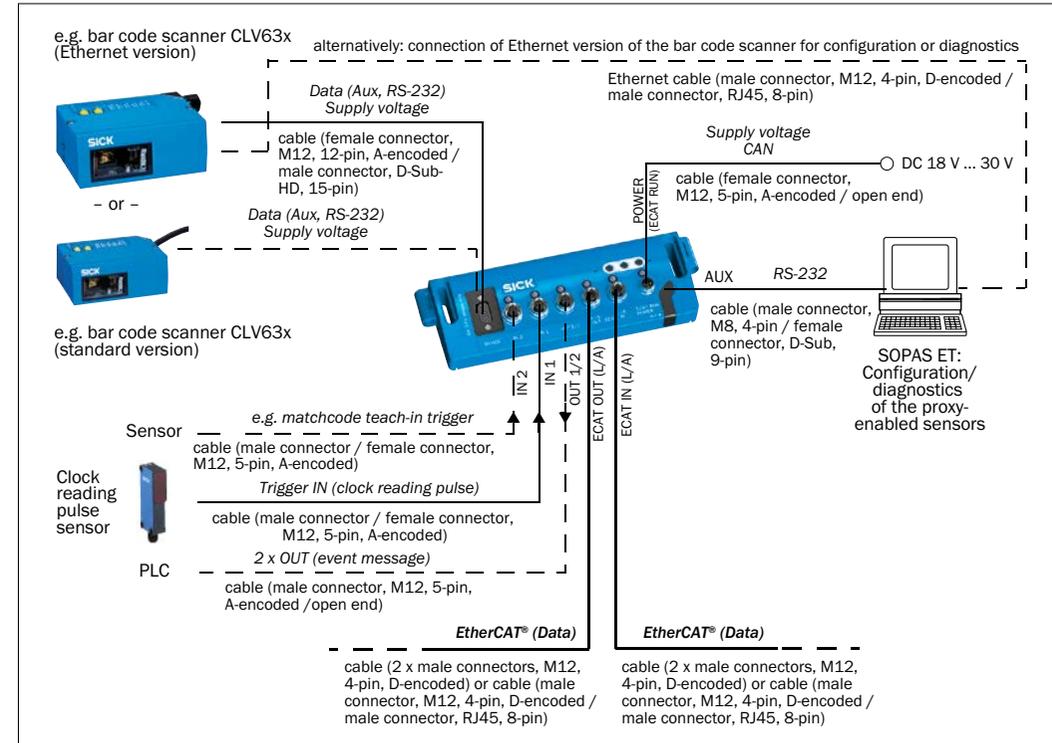
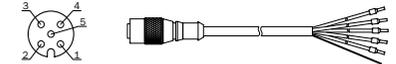


Fig. 4: Example: connection principle with CLV63x bar code scanner

Overview of pin and wire color assignments

Power connection

Cable part number 6036384 (5 m)



M12 - A / female connector

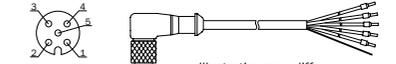
Illustration may differ

Pin	Signal	Function	Wire color
1	DC 24 V in	Supply voltage IN (DC 18 V ... 30 V)	Brown
2	CAN L	CAN bus ¹⁾	White
3	DC 0 V in	Supply voltage ground	Blue
4	CAN H	CAN bus ¹⁾	Black
5	N. c.	-	Gray
-	-	Shield	Metal

1) CAN-Bus only with support from SICK device with CAN interface

Tab. 6: Pin assignment of the female connector, M12, 5-pin, A-coded (straight) and wire colors of the open cable end

Cable part number 6049456 ¹⁾, SPEEDCON (3 m)



M12 - A / female connector

Illustration may differ

Pin	Signal	Function	Wire color
1	DC 24 V in	Supply voltage IN (DC 18 V ... 30 V)	Brown
2	CAN L	CAN bus ²⁾	White
3	DC 0 V in	Supply voltage ground	Blue
4	CAN H	CAN bus ²⁾	Black
5	N. c.	-	Gray
-	-	Shield	Metal

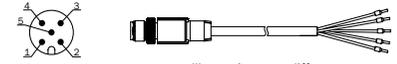
2) CAN-Bus only with support from SICK device with CAN interface

Tab. 7: Pin assignment of the female connector, M12, 5-pin, A-coded (straight) and wire colors of the open cable end

1) Other lengths: part number 6049455 (1.5 m), part number 6049457 (5 m), part number 6049458 (10 m)

IN 1 and IN 2 connections

Cable part number 6026133 (2 m) and part number 6026135 (10 m)



M12 - A / male connector

Illustration may differ

Pin	Signal	Function	Wire color
1	DC 24 V out	Supply voltage OUT (DC 18 V ... 30 V)	Brown
2	N. c.	-	White
3	GND	Ground	Blue
4	Ext IN 1 / Ext IN 2	External input 1 ¹⁾ or external input 2 ¹⁾	Black
5	N. c.	-	Gray

1) Signal designation in the SOPAS ET configuration software of the SICK device that supports proxy mode. Function assignment and logics can be configured in the device.

Tab. 8: Pin assignment of the male connector, M12, 5-pin, A-coded (straight) and wire colors of the open cable end

Wiring of the IN 1 and IN 2 switching inputs

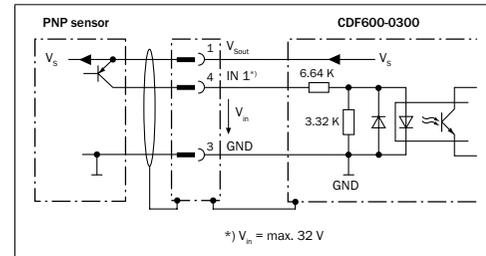


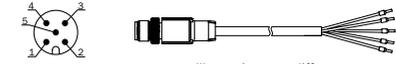
Fig. 5: Example: wiring of the IN 1 switching input

Feature	Description
Switching behavior	Power at the input starts the assigned function in the SICK device that supports proxy mode (default: level active high, debounce 10 ms)
Properties	<ul style="list-style-type: none"> • Opto-decoupled, not reverse polarity protected regarding supply voltage • Can be wired using PNP output of a sensor • IN 1 and IN 2 have a common reference potential in the CDF600 EtherCAT
Electrical values	Low: $ V_{in} \leq 2 \text{ V}$; $ I_{in} \leq 0.3 \text{ mA}$ High: $6 \text{ V} \leq V_{in} \leq 32 \text{ V}$; $0.7 \text{ mA} \leq I_{in} \leq 5 \text{ mA}$
LED IN 1 / IN 2	Low: OFF High: ON

Tab. 9: Characteristic data of the IN 1 and IN 2 switching inputs

OUT 1/2 connection

Cable part number 6026133 (2 m) and part number 6026135 (10 m)



M12 - A / male connector

Illustration may differ

Pin	Signal	Function	Wire color
1	N. c.	-	Brown
2	Ext OUT 2	External output 2 ¹⁾	White
3	GND	Ground	Blue
4	Ext OUT 1	External output 1 ¹⁾	Black
5	N.c.	-	Gray

1) Signal designation in the SOPAS ET configuration software of the SICK device that supports proxy mode. Function assignment and logics can be configured in the device.

Tab. 10: Pin assignment of the male connector, M12, 5-pin, A-coded (straight) and wire colors of the open cable end

Wiring of the OUT 1 and OUT 2 switching outputs

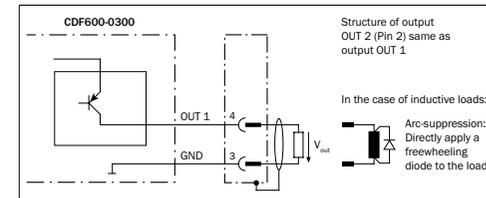


Fig. 6: Example: wiring of the OUT 1 switching output

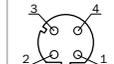
Feature	Description
Switching behavior	PNP switching against supply voltage V_s , high-side switch
Properties	<ul style="list-style-type: none"> • Short-circuit protected + temperature protected • Not electrically isolated from V_s
Electrical values	$0 \leq V_{out} \leq V_s$ $(V_s - 1.5 \text{ V}) \leq V_{out} \leq V_s$ at $I_{out} \leq 100 \text{ mA}$
LED OUT 1/2	Low: OFF High: ON OUT 1 = orange, OUT 2 = green

Tab. 11: Characteristic data of the OUT 1 and OUT 2 switching outputs

Important!

Capacitive loads on the switching output have an effect on the switch-on and switch-off behavior. The maximum capacity of 100 nF is a limit value. Undesired pulse behavior of the output can result if this value is exceeded.

ECAT IN and ECAT OUT connections

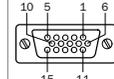


M12 - D / male

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

Tab. 12: Pin assignment of the female connector, M12, 4-pin, D-coded

DEVICE connection



Pin	Signal	Function
1	DC 24 V _{out}	Supply voltage OUT (DC 18 V ... 30 V), max. 0.8 A
2	TxD (AUX)	RS-232, sender
3	RxD (AUX)	RS-232, receiver
5	GND	Supply voltage ground
4, 6 ... 9	N. c.	-
10	CAN H	CAN bus ¹⁾
11	CAN L	CAN bus ¹⁾
12 ... 15	N. c.	-

1) CAN-Bus only with support from SICK device with CAN interface

Tab. 13: Pin assignment of the female connector, D-Sub-HD, 15-pin

AUX connection

Adapter cable part number 6021195 (2 m) and part number 2027649 (8 m)



Pin	Signal	Function	Signal	Pin
4	TxD	AUX, RS-232	RxD	2
2	RxD	AUX, RS-232	TxD	3
3	GND	Ground	GND	5
1	N.c.	-	-	-

Tab. 14: Pin assignment of the male connector, M8, 4-pin and the female connector, D-Sub, 9-pin

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