

RFU63x

RFID WRITE/READ DEVICE (UHF)



Copyright

Copyright © 2011 - 2016

SICK AG

Erwin-Sick-Str. 1

79183 Waldkirch

Germany

Trademark

Windows 2000, XP, Vista, Windows 7 are registered trademarks or trademarks of the Microsoft Corporation in the USA and other countries.

Adobe Reader is a registered trademark of Adobe Systems Incorporated.

Table of contents

1 About this document..... 5

1.1 Purpose..... 5

1.2 Target group 5

1.3 Further sources for obtaining information 6

1.4 Symbols used 6

2 Safety information 7

2.1 General notes 7

2.2 Categories of safety notes 7

2.3 Warning note for electromagnetic radiation 8

3 Mounting..... 9

3.1 Notes on mounting..... 9

3.2 Optional mounting accessories..... 10

3.3 Mounting the CDB650-204 or CDM420-0006 connection module..... 15

3.4 Mounting optionals UHF antennas 16

4 Electrical installation 27

4.1 Notes on the electrical installation 27

4.2 Overview of all interfaces and connection options..... 28

4.3 M12 male and female connector pin assignments on the RFU630 31

4.4 Pin assignments and lead color assignments of cables 32

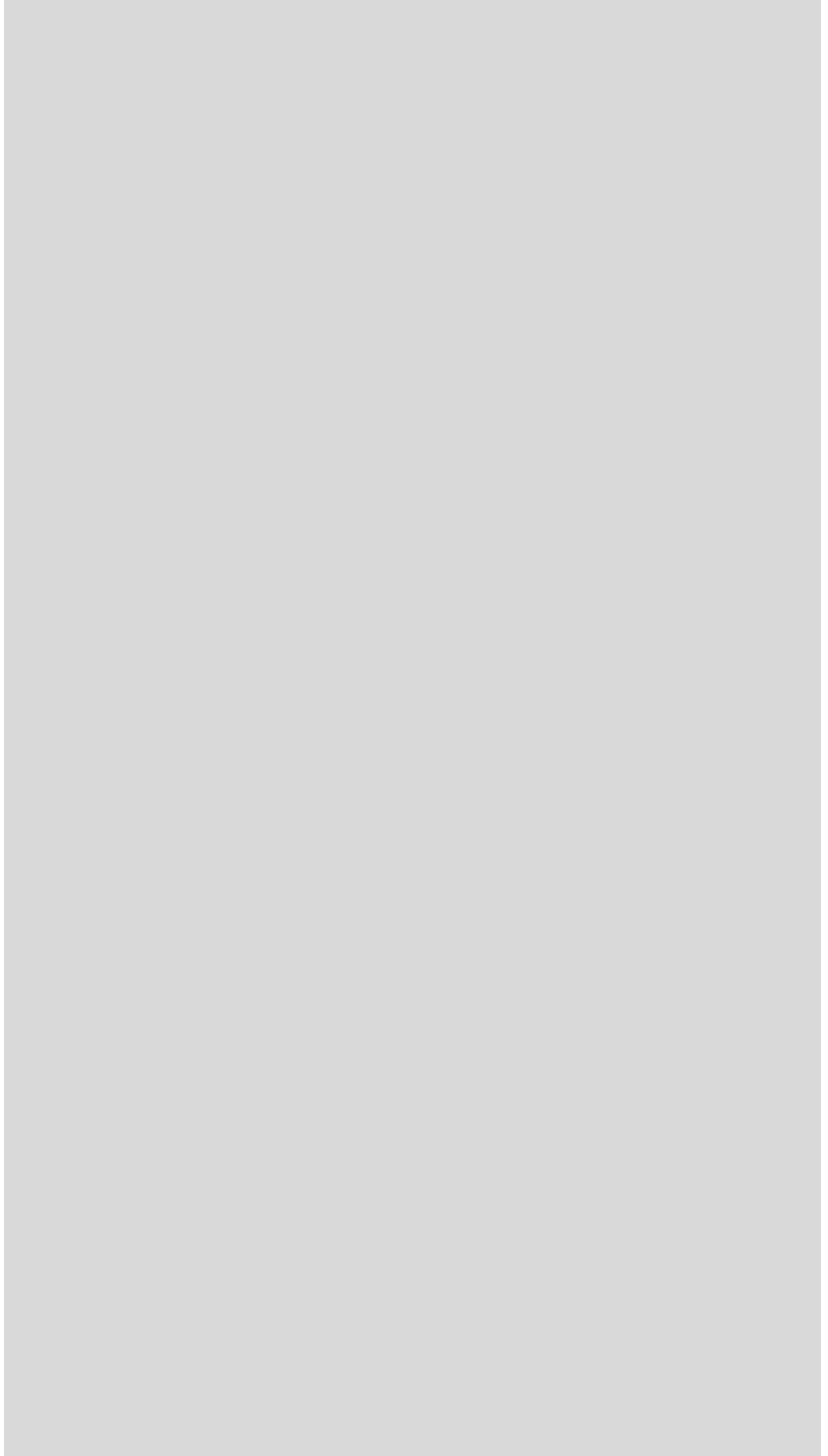
4.5 Notes on the electrical installation of the RFU630 at an ambient temperature below 0 °C..... 39

4.6 Prerequisites for the safe operation of the RFU630 in a system 41

4.7 Installation steps..... 44

4.8 Using the CDB650-204 connection module 50

4.9 Using the CDM420-0006 connection module 64



1 About this document

1.1 Purpose

Supplement to the Operating Instructions

This document completes the following "RFU63x RFID write/read device (UHF)" quick starts which are published in English:

- No. 8016526 for standard devices of the RFU630-131xx version serie, English edition
- No. 8015215 for standard devices of the RFU630-041xx version serie, English edition

The following information on the **mounting** and **electrical installation** of is summarized in this document:

- Optional mounting accessories (brackets)
- Mounting of the optional antennas RFA630-x0x, RFA641-3340 and RFA651-5731
- Pin and lead color assignments of cables
- Measures for electrical installation of the RFU63x at an temperature below 0 °C
- Prevention of ground potential equalization currents in applications with widely distributed systems
- Electrical wiring diagrams for the CDB650-204 and CDM420-0006 connection modules relating to the RFU63x

The document applies for all standard variants of the RFU63x in the following two version series (see also type plate):

Version serie	Devicie type	Region assignment
RFU630-131xx: With integrated antenna	RFU630-13100 RFU630-13101 RFU630-13102 RFU630-13103 RFU630-13104 RFU630-13105 RFU630-13106/-13107 RFU630-13108 RFU630-13110 RFU630-13111 RFU630-13112 RFU630-13113	Europe/Saudi Arabia/South Africa USA/Canada/Mexico Australia India Brazil China Japan Russia/Belarus Korea New Zealand Indonesia Indonesia Taiwan
RFU630-041xx: Without integrated antenna	RFU630-04100 RFU630-04101 RFU630-04102 RFU630-04105 RFU630-04106 RFU630-04108 RFU630-04109	Europa/South Africa USA/Canada Australia China Japan Russia Singapur

In the following the different standard variants of the RFU63x RFID write/read device (UHF) in both version series are referred to in simplified form as "RFU630", except where a distinction of the variants is necessary.

The specified material numbers (no.) for components are used as part numbers for the SICK ordering system.

1.2 Target group

This document is intended for **qualified and technical staff**, authorized for mounting and electrical installation.

1.3 Further sources for obtaining information

"RFUI630-131xx RFID write/read device (UHF)" Quickstart, no. 8016526

"RFUI630-041xx RFID write/read device (UHF)" Quickstart, no. 8015215

Notes on intended use, scope of delivery, mounting and electrical installation in principle, commissioning, configuration with SOPAS ET, maintenance, transport and storage as well as on repair is included in the RFU63x quickstart.

Internet Product page of RFU630

www.sick.com/RFU63x

- For type-depending, detailed technical data see online data sheets (PDF)
- Dimensional drawings and 3D CAD dimension models in various electronic formats
- Range diagram for the internal antenna (PDF) for RFU630-131xx
- EC Declarations of Conformity (PDF)
- Overview and description of the command strings (on demand)
- SOPAS ET configuration software with online help function
- RFID Product information with an overview of the accessories (PDF), no. 8016267 (English version) and no. 8016266 (German version)
- RFU63x operating instructions of both version series (PDF), in English or German, other languages if applicable
- RFU63x technical information (PDF), no. 8014335 (English version), no. 8014334 (German version)

Support is also available from your sales partner in the web at www.sick.com/worldwide.

1.4 Symbols used

Some information in this document is highlighted as follows to facilitate quick access to this information.



WARNING

Risk of injury or risk of damage!

A warning refers to specific or potential dangers to the physical safety of the user. It is there to protect the user against accidents.

The safety mark next to the warning, on the left, refers to the type of accident risk, e.g. electricity-related. The ascending warning levels (CAUTION, WARNING, DANGER) refer to the severity of the possible danger.

- Always read the warnings carefully and make sure you comply with them.

1.4.1 Further markings

Important!

This important note is there to advise you on special aspects.

DATA PROCESSING

This type of script denotes a term in the user interface of the SOPAS ET configuration software.



This symbol refers to supplementary technical documentation.

2 Safety information

2.1 General notes

- This chapter is about the safety of commissioning personnel, as well as operators of the system in which the RFU630 is integrated.
- Read the RFU63x quickstart carefully (printed version delivered with device) before starting any work on the RFU630 in order to familiarize yourself with the device and its functions. No. 8016526 is needed for RFU630-131xx version serie respectively no. 8015215 for the RFU630-041xx version serie.
The printed quickstart is considered a part of the device and must be kept in an accessible location in the immediate vicinity of the RFU630 at all times!
- Read additionally the notes on mounting and the electrical installation in this technical information as supplement to the quickstart.
- Opening the housing of the RFU630 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 RFU630.
- Repair work on the RFU630 may only be performed by qualified and authorized service personnel from SICK AG

2.2 Categories of safety notes



DANGER

Risk of injury!

The combination of symbol and signal word indicates a **situation of imminent danger**, which will lead to a **fatality or serious injuries** if not prevented.



WARNING

Risk of injury!

The combination of symbol and signal word indicates a **potentially dangerous situation**, which may lead to a **fatality or serious injuries** if not prevented.



CAUTION

Risk of injury!

The combination of symbol and signal word indicates a **potentially dangerous situation**, which may lead to **minor/slight injuries** if not prevented.

NOTICE

Risk of damage!

A note indicates a potential risk of damage or impair on the functionality of the RFU63x RFID write/read device or other connected devices.

2.3 Warning note for electromagnetic radiation

RFU630-131xx

CAUTION

Health hazard due to high-frequency electromagnetic radiation!

The **RFU630-13100** (region: Europe) is designed for operation in accordance with ETSI EN 302208. During operation with the integrated antenna and/or one or several external antenna(e), the human exposure regulations covered by EN 50364 must be observed.

- In order to limit human exposure to electromagnetic fields, suitable safety distances must be maintained during both short-term and long-term work in the radiation range antenna(e).

Minimum distances to be maintained between the antenna and the human body during long-term transmission:

30 cm with a max. radiation power of the antenna of 2 W ERP as per ETSI,

15 cm with a reduced radiation power of 1 W ERP,

10 cm with a radiation power of 0.5 W ERP.

The **RFU630-13101** (region: USA/Canada/Mexico) satisfies the limit values of the FCC for exposure to radiation in an uncontrolled environment.

- During operation with the integrated antenna and/or one or several external antenna(e), a safety distance of at least 20 cm must be maintained between the antenna and the human body.

RFU630-041xx

CAUTION

Health hazard due to high-frequency electromagnetic radiation!

The **RFU630-04100** (region: Europe) is designed for operation in accordance with ETSI EN 302208. During operation with the external **RFA630-x00** antenna(e), the human exposure regulations covered by EN 50364 must be observed.

- In order to limit human exposure to electromagnetic fields, suitable safety distances must be maintained during both short-term and long-term work in the radiation range of the antenna(e).

Minimum distances to be maintained between the antenna and the human body:

30 cm with a max. radiation power of the antenna of 2 W ERP as per ETSI,

15 cm with a reduced radiation power of 1 W ERP,

10 cm with a radiation power of 0.5 W ERP.

The **RFU630-04101** (region: USA/Canada/Mexico) satisfies the limit values of the FCC for exposure to radiation in an uncontrolled environment.

- During operation with the external **RFA630-x01** antenna(e), a safety distance of at least 20 cm must be maintained between the antenna and the human body.

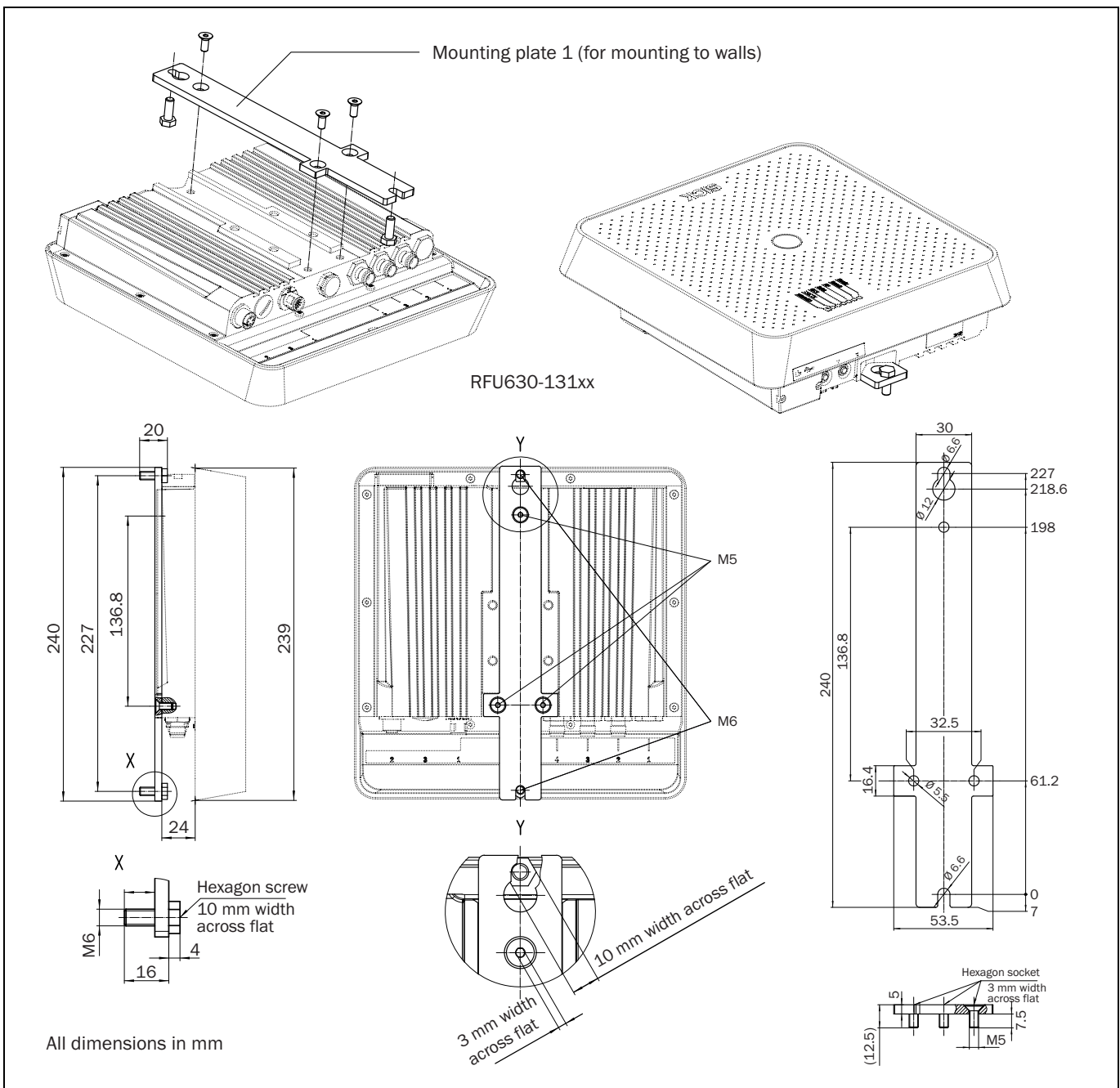
3 Mounting

3.1 Notes on mounting

- RFU630-13101 UL-certified: Install the device only inside of buildings. The device is not suitable for outdoor use.
- The RFU630 should be attached as free from shock and vibration as possible.
- If the external antenna or the RFU630 with an internal antenna is mounted in front of the front metal surfaces, observe an angle of approx. 10°.
- Use one of the optional SICK mounting sets 1 to 4, also in combination if required depending on the application. For mounting samples, regarding the RFU630-131xx version serie, see the following pages.

3.2 Optional mounting accessories

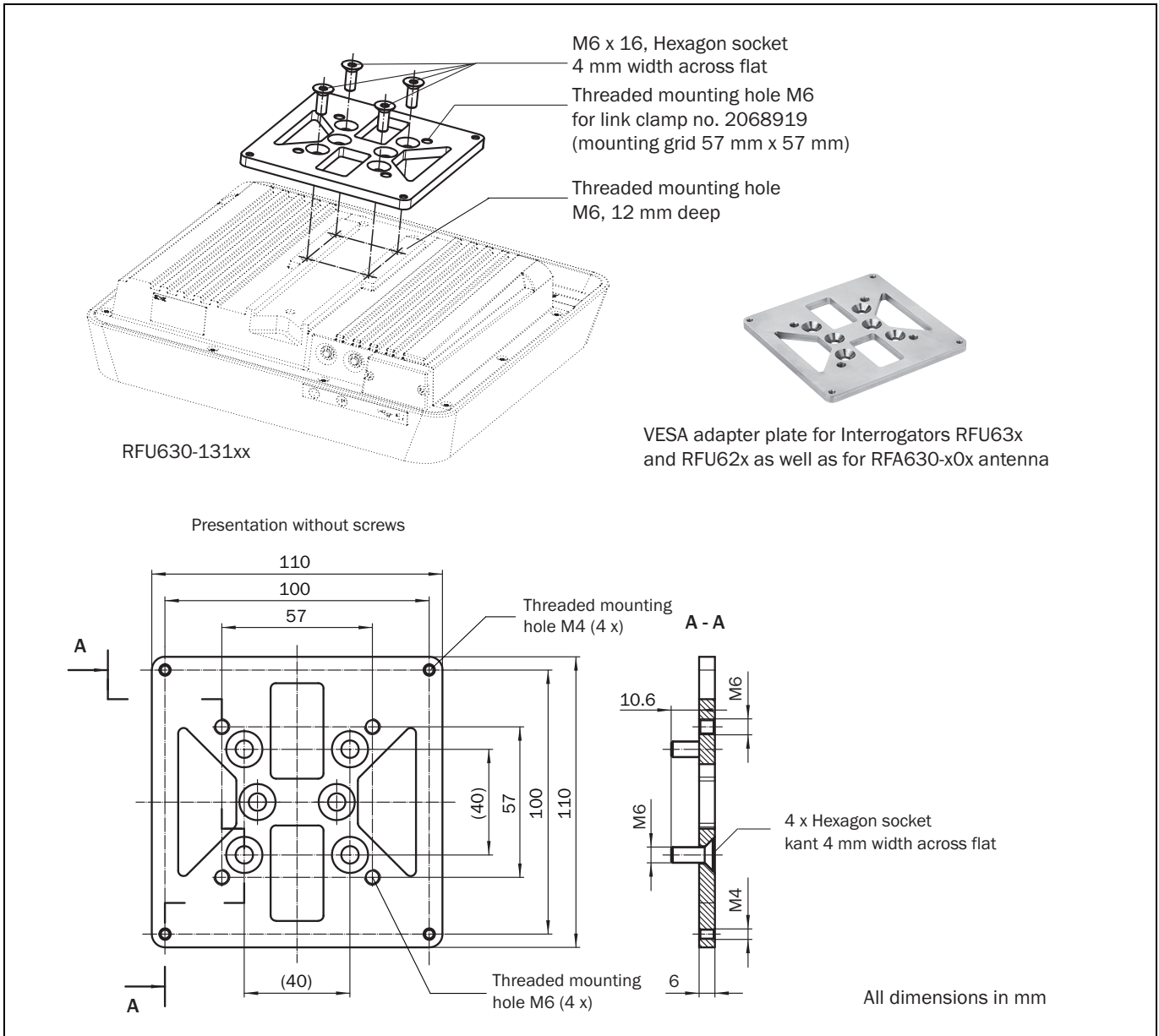
3.2.1 Installing wall mounting plate (no. 2060912) on the RFU630



Procedure for attachment on the RFU630:

1. Either cut two M6 threads or install two bore holes with $\varnothing 6.5$ mm through the assembly base provided by the customer with a spacing of 227 mm.
2. For the time being, fasten two supplied M6 x 16 mm screws in the assembly base such that the thread protrudes at least 8 mm up to the base of the screw head.
3. Install the mounting plate on the rear side of the RFU630 using the three supplied M5 x 12 mm screws.
4. Attach the RFU630 together with the mounting plate onto the two protruding M6 screws and tighten them.

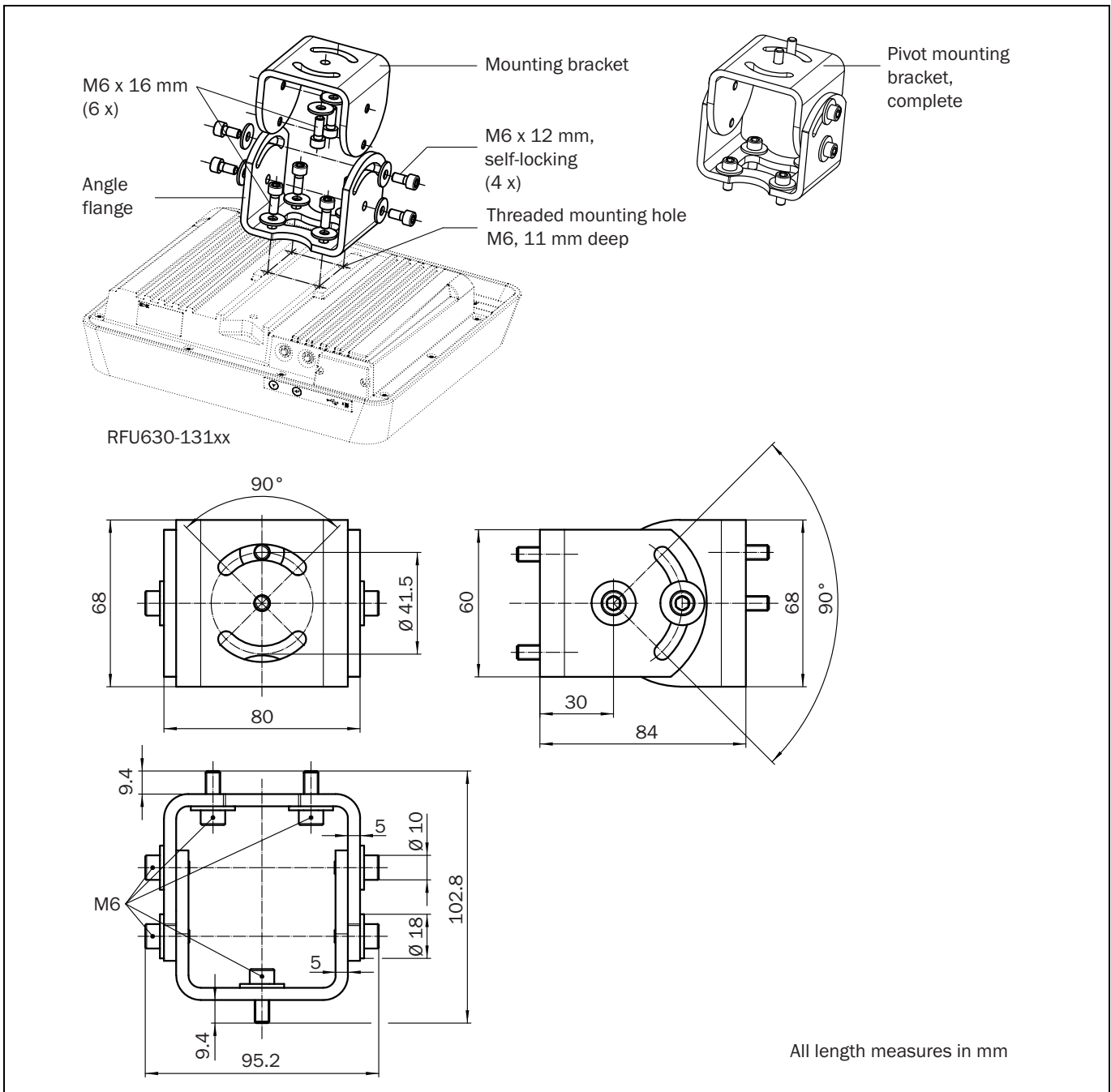
3.2.2 Installing VESA adapter plate (no. 2061688) on the RFU630



Procedure for attachment on the RFU630:

1. Install the adapter plate on the rear side of the RFU630 using the four supplied M6 x 16 mm screws.
2. Affix the RFU630 and adapter plate to the VESA bracket using four M4 screws, or to a standard industrial bracket with a 57 mm x 57 mm grid using four M6 screws. The screw length depends on the wall thickness of the front end of the VESA bracket. Take care to ensure that the screwed in screws do not damage the housing of the RFU630.

3.2.3 Installing pivot mounting bracket (no. 2061737) on the RFU630



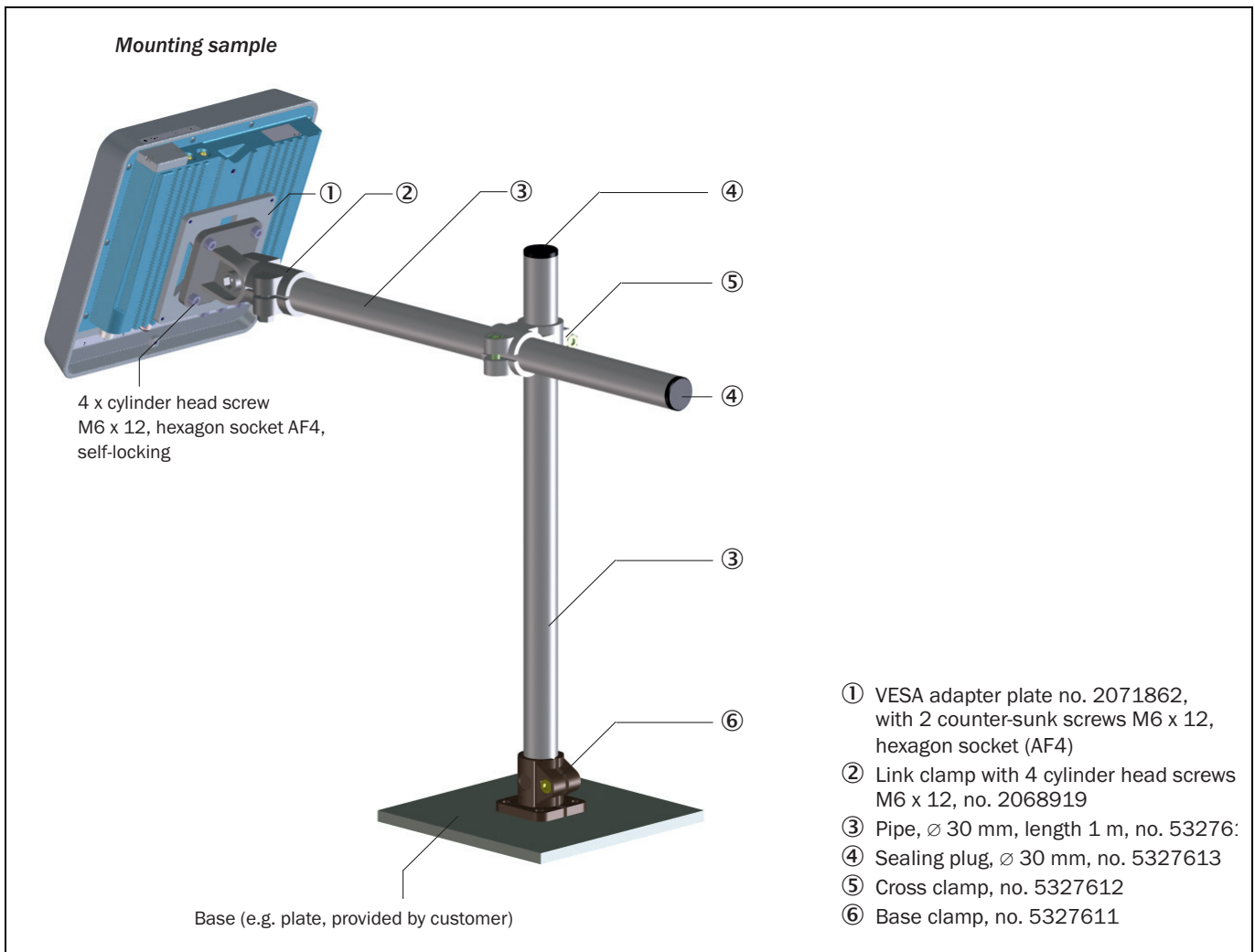
Procedure for attachment on the RFU630:

1. Fasten the angle flange to the RFU630 (supplied are: 4x M6 x 16 mm screws with A6 washer).
2. Fasten the mounting bracket to the assembly base provided by the customer (supplied are: 2 x M6 x 16 mm screws with A6 washer). Do not tighten the screws just yet.
3. Fasten the RFU630 together with the mounting bracket to the angle flange (supplied are: 4x self-locking M6 x 12 mm screws and A6 washers). Do not tighten the screws just yet.
4. Align RFU630 to the scanning point in two axes.
5. Tighten all screws.

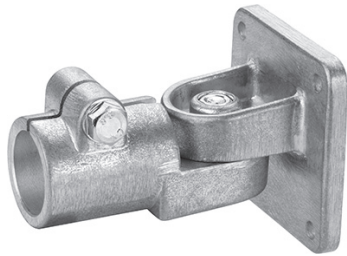
RFU63x

3.2.4 Installing a customer-specific holder for the RFU630 by using pipe elements and clamp-connections, with VESA adapter plate no. 2071862 (sample)

Part 1: Total view

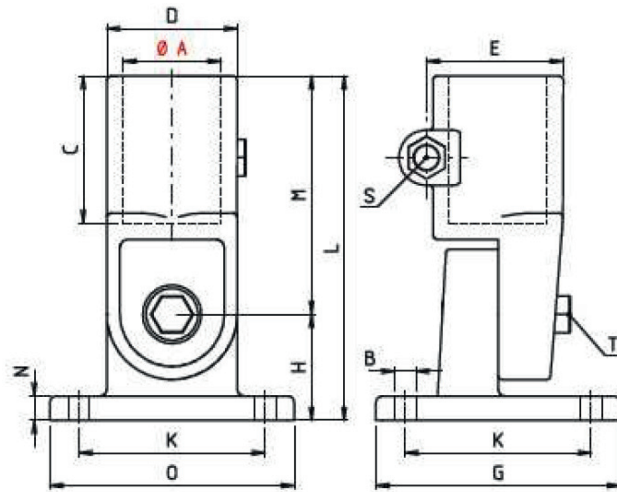


Part 2: Dimensional drawings of components



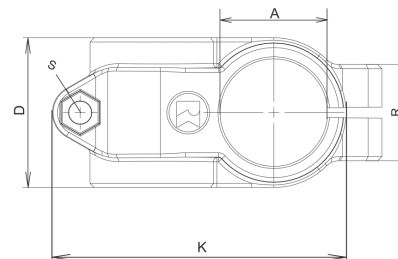
Link clamp no. 2068919,
with 4 cylinder head screws M6 x 12

A	30.1
B	6.5
C	45
D	40
E	40
G	75
H	33
K	57
L	106
M	73
N	7
O	7 5
S	M8 x 35
T	M8 x 35



Cross clamp, no. 5327612

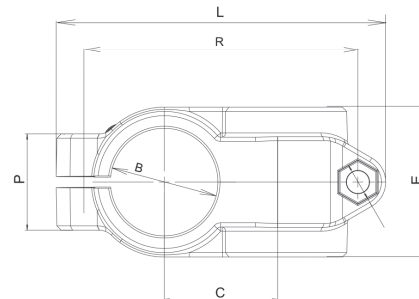
A	30.1	K	73
B	30.1	L	99
C	33	P	33
D	40	R	78
E	40	S	M8 x 25



Sealing plug, \varnothing 30 mm,
no. 5327613

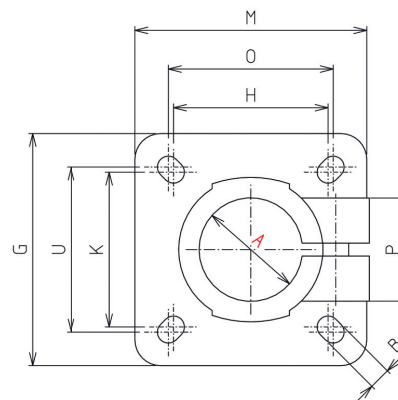
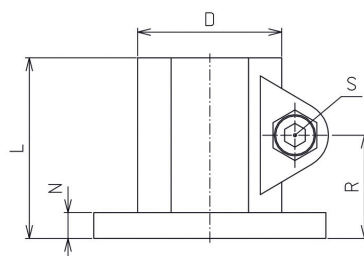


Pipe, \varnothing 30 mm,
length 1 m,
no. 5327610



Base clamp, no. 5327611

A	30.1	K	42	P	33
B	6.5	L	50	R	29
D	40	M	60	S	M8 x 25
G	60	N	8	U	45
H	40	O	42		



All dimensions in mm

3.3 Mounting the CDB650-204 or CDM420-0006 connection module

The mounting location for the connection module (distance to RFU630) depends on the physical design (RS-232) and the transmission rate used of the serial data interface AUX 1.

Recommended cable length between RFU630 and connection module:

Max. 3 m with fixed data transmission 57.6 kBd.



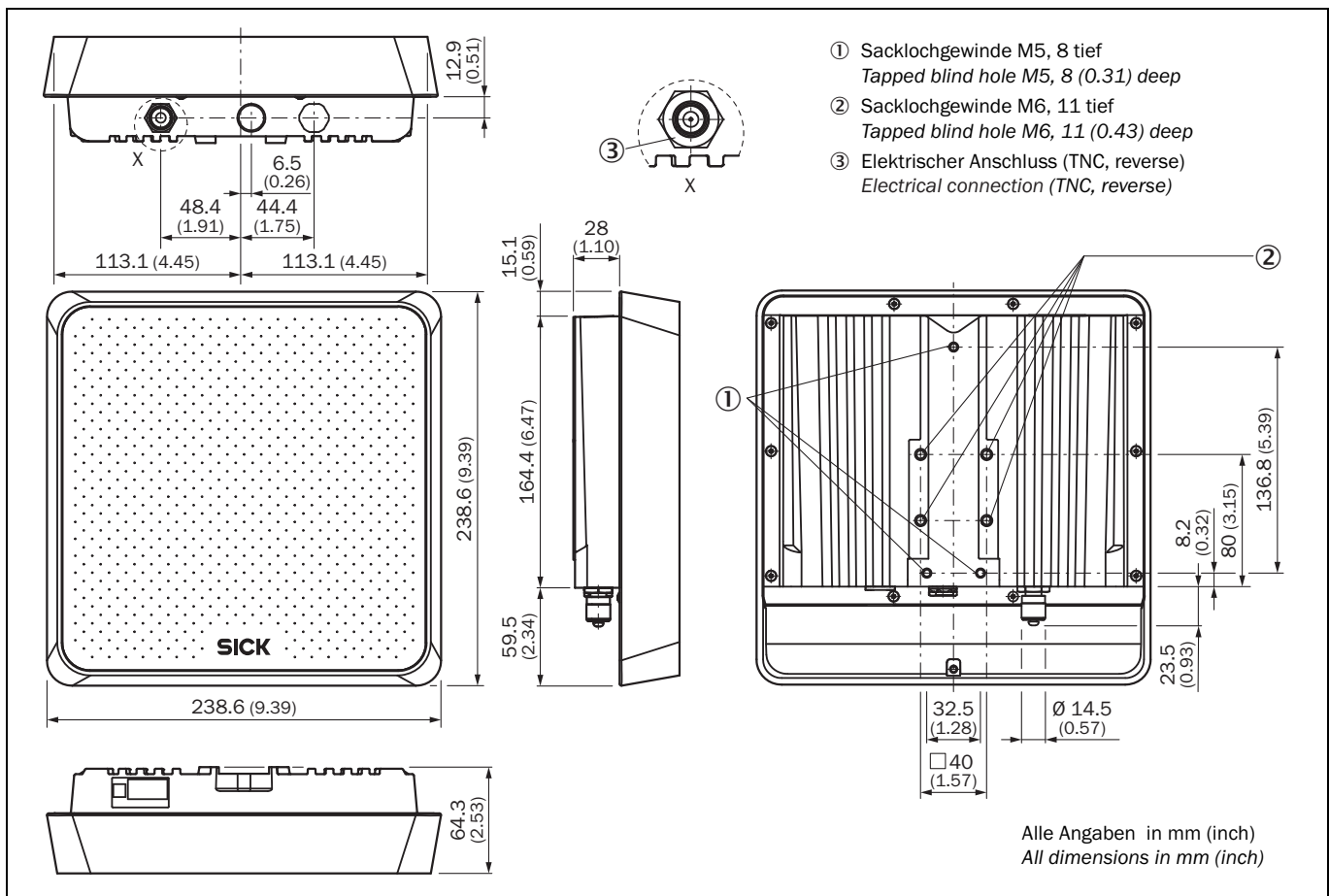
For detailed information on mounting and the electrical installation, see:

- "CDB650-204 connection module" operating instructions (no. 8016155, German + English version) e.g. as PDF in the web via www.mysick.com/CDB
- "CDM420-0006 connection module" operating instructions (no. 8014808, German + English version) e.g. as PDF in the web via www.mysick.com/CDM

The documents are also supplied in printed form with the relating connection module.

3.4 Mounting optionals UHF antennas

3.4.1 RFA630-000/-001 antenna



CAUTION

Health hazard due to high-frequency electromagnetic radiation!

The **RFA630-000** antenna (region: Europe) is designed for operation in accordance with ETSI EN 302208. During operation, the human exposure regulations covered by EN 50364 must be observed.

- In order to limit human exposure to electromagnetic fields, suitable safety distances must be maintained during both short-term and long-term work in the radiation range antenna(e).
Minimum distances to be maintained between the antenna and the human body during long-term transmission:
30 cm with a max. radiation power of the antenna of 2 W ERP as per ETSI,
15 cm with a reduced radiation power of 1 W ERP,
10 cm with a radiation power of 0.5 W ERP.

The **RFA630-001** antenna (region: USA/Canada/Mexico) satisfies the limit values of the FCC for exposure to radiation in an uncontrolled environment.

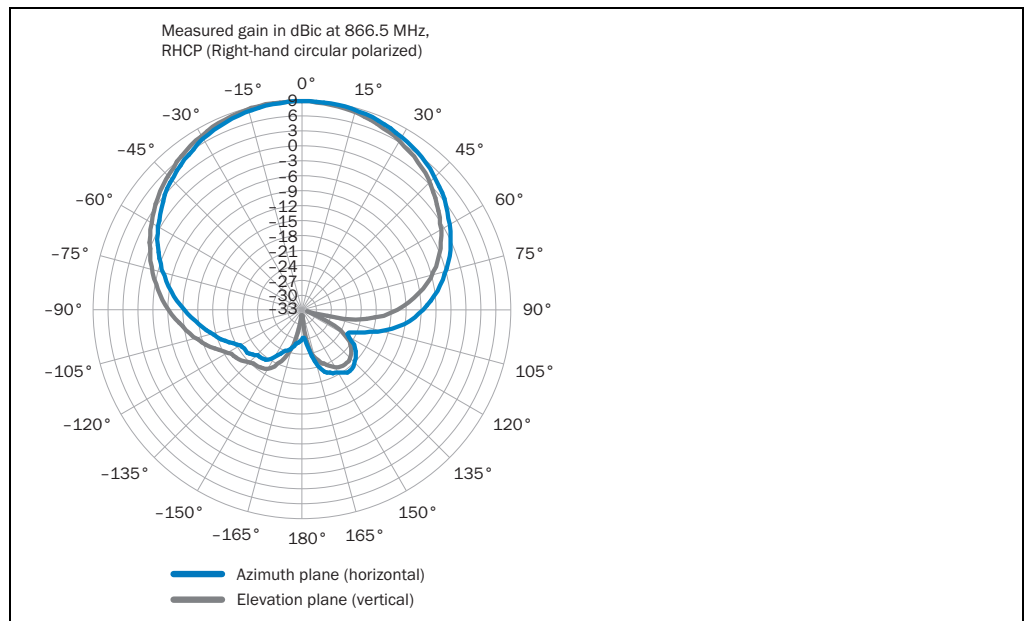
- During operation, a safety distance of at least 20 cm must be maintained between the antenna and the human body.

Technical Data

Type	RFA630-000	RFA630-001
Part no.	1058383	1058384
Frequency band	860 MHz ... 960 MHz	
Carrier frequency	865 MHz ... 868 MHz	902 MHz ... 928 MHz
Permissible write/read device	RFU630-13100	RFU630-13101 RFU630-13102 RFU630-13105 RFU630-13106/-13107
Maximum rated power	Max. 2 W ERP ¹⁾	Max. 4 W EIRP ²⁾
Polarization	Circular /RHCP ³⁾	
VSWR ⁴⁾	Typical < 1,2	
Gain	Max. 9 dBic	
Axial ratio	Typical < 2 dB	
3 dB aperature angle	Typical 72 Grad	
Front to back ratio	Typical > 17 dB	
Electrical connection	TNC reverse, 50 Ohm	
Housing (material)	Aluminum, Front: polycarbonate	
Enclosure rating	IP 67	
Weight	3 kg	
Dimensions (L x W x H)	238.6 mm x 238.6 mm x 64.3 mm, see <i>dimensional drawing</i>	
Mounting	4 x M6 threaded mounting holes (standard fixing grid 40 mm x 40 mm) or 3 M5 threaded mounting holes	
Operation ambient temperature	-25 °C ... +50 °C	
Stockage temperature	-30 °C ... +70 °C	
Relative air humidity	5 % ... 95 %, non-condensing	

1) ERP = Equivalent Radiated Power. 2) EIRP = Equivalent Isotropic Radiated Power.
 3) RHCP = Right-Hand Circular Polarisation.
 4) VSWR = Voltage Standing Wave Ration.

Radiation pattern diagram RFA630-000/-001



Accessories

Internet Ordering information about the antennae and their accessories (mountings sets and connection cables of different lengths) is available on the following SICK product pages on the web:

RFA630-000: www.sick.com/1058383

RFA630-001: www.sick.com/1058384

The corresponding power loss values of the cables in the frequency band of 860 MHz to 960 MHz are also listed there.

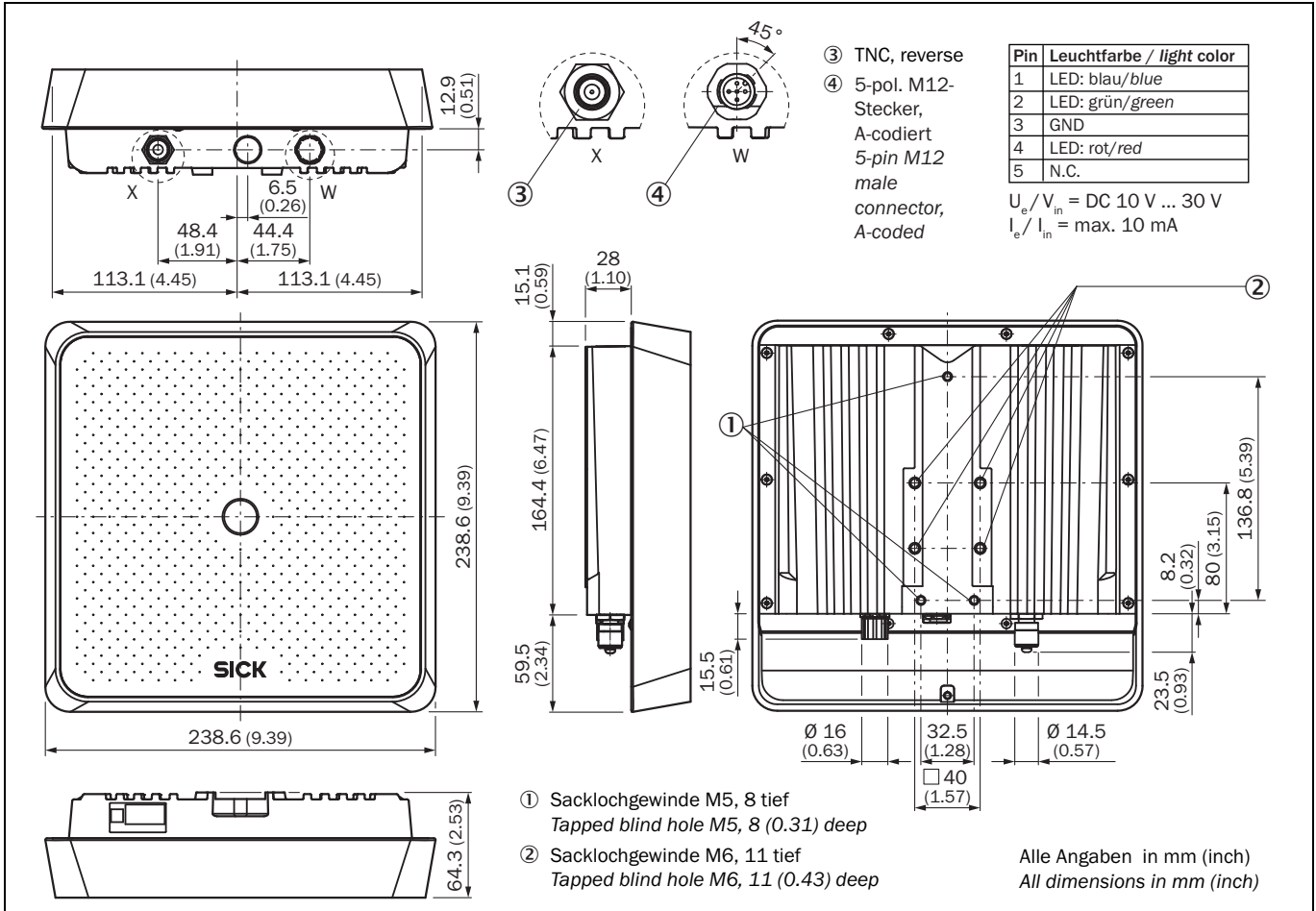
Mounting

The housing of the RFA630-00x antenna has the same dimensions and mounting thread holes like the RFU630 write/read device. You can use the same optional mounting accessories (brackets, plates). To do so, see [Chapter 3.2 Optional mounting accessories, Page 10](#).

If several antennas are used in a reading station, e.g. two on each side of a conveyor system, make sure that the antennas are not directly facing each other, but are installed at staggered parallel positions.

3.4.2 RFA630-100/-101 antenna

As special feature of this antenna a process feedback LED on the front plate center can be powered externally for controlling the displayed RGB color to signalize an event in the reading process.



CAUTION

Health hazard due to high-frequency electromagnetic radiation!

The RFA630-100 antenna (region: Europe) is designed for operation in accordance with ETSI EN 302208. During operation, the human exposure regulations covered by EN 50364 must be observed.

- In order to limit human exposure to electromagnetic fields, suitable safety distances must be maintained during both short-term and long-term work in the radiation range antenna(e). Minimum distances to be maintained between the antenna and the human body during long-term transmission:
 - 30 cm with a max. radiation power of the antenna of 2 W ERP as per ETSI,
 - 15 cm with a reduced radiation power of 1 W ERP,
 - 10 cm with a radiation power of 0.5 W ERP.

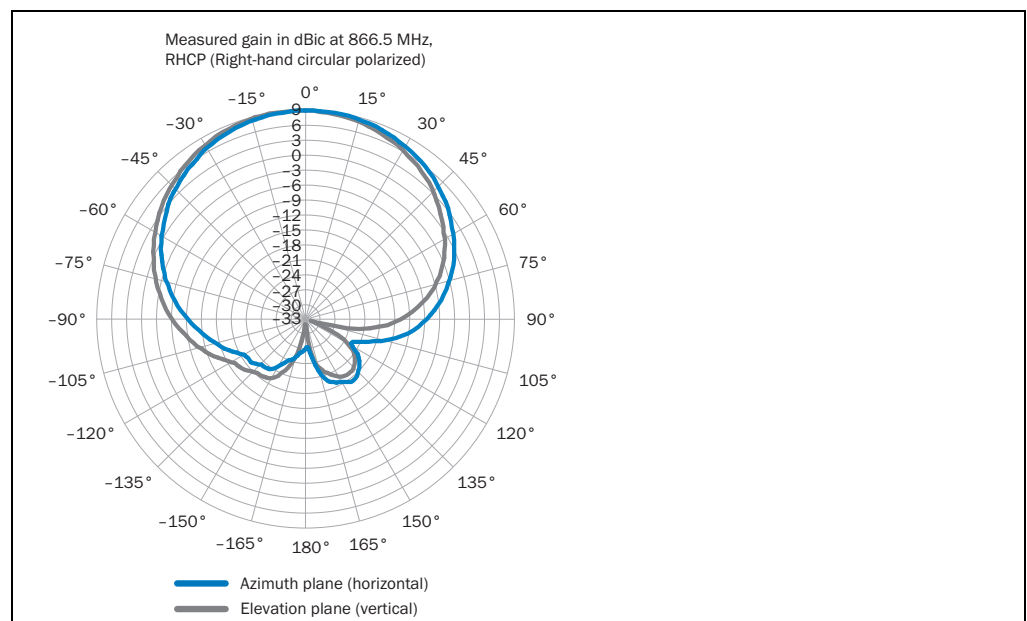
The RFA630-101 antenna (region: USA/Canada/Mexico) satisfies the limit values of the FCC for exposure to radiation in an uncontrolled environment.

- During operation, a safety distance of at least 20 cm must be maintained between the antenna and the human body.

Technical Data

Type	RFA630-100	RFA630-101
Part no.	1059946	1059947
Frequency band	860 MHz ... 960 MHz	
Carrier frequency	865 MHz ... 868 MHz	902 MHz ... 928 MHz
Permissible write/read device	RFU630-13100	RFU630-13101 RFU630-13102 RFU630-13105 RFU630-13106/-13107
Maximum radiated power	Max. 2 W ERP ¹⁾	Max. 4 W EIRP ²⁾
Polarization	Circular /RHCP ³⁾	
VSWR ⁴⁾	Typical < 1,2	
Gain	Max. 9 dBic	
Axial ratio	Typical < 2 dB	
3 dB aperture angle	Typical 72 Grad	
Front to back ratio	Typical > 17 dB	
Electrical connection	- TNC reverse, 50 Ohm - 5-pin M12 male connector, A-coded for process feedback LED	
Housing (material)	Aluminum, front: polycarbonate	
Enclosure rating	IP 67	
Weight	3 kg	
Dimensions (L x W x H)	238.6 mm x 238.6 mm x 64.3 mm, see <i>dimensional drawing</i>	
Mounting	4 x M6 threaded mounting holes (standard fixing grid 40 mm x 40 mm) or 3 M5 threaded mounting holes	
Ambient temperature	Operation: -25 °C ... +50 °C, Stockage: -30 °C ... +70 °C	
Relative air humidity	5 % ... 95 %, non-condensing	
<p>1) ERP = Equivalent Radiated Power. 2) EIRP = Equivalent Isotropic Radiated Power. 3) RHCP = Right-Hand Circular Polarisation. 4) VSWR = Voltage Standing Wave Ration</p>		

Radiation pattern diagram RFA630-100/-101



Accessories

Internet Ordering information about the antennae and their accessories (mountings sets and connection cables of different lengths) is available on the following SICK product pages on the web:

RFA630-100: www.sick.com/1059946

RFA630-101: www.sick.com/1059947

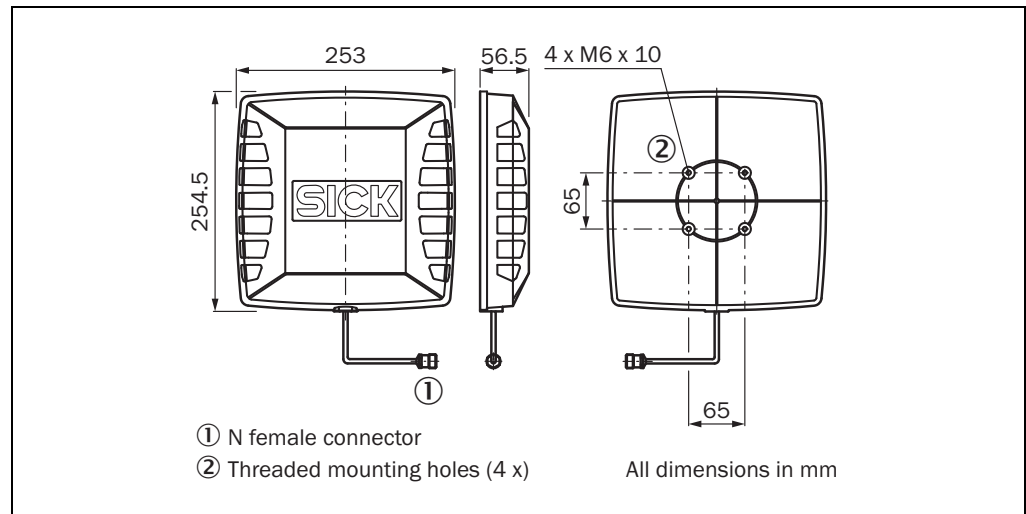
The corresponding power loss values of the cables in the frequency band of 860 MHz to 960 MHz are also listed there.

Mounting

The housing of the RFA630-10x antenna has the same dimensions and mounting thread holes like the RFU630 write/read device. You can use the same optional mounting accessories (brackets, plates). To do so, see [Chapter 3.2 Optional mounting accessories, Page 10](#).

If several antennas are used in a reading station, e.g. two on each side of a conveyor system, make sure that the antennas are not directly facing each other, but are installed at staggered parallel positions.

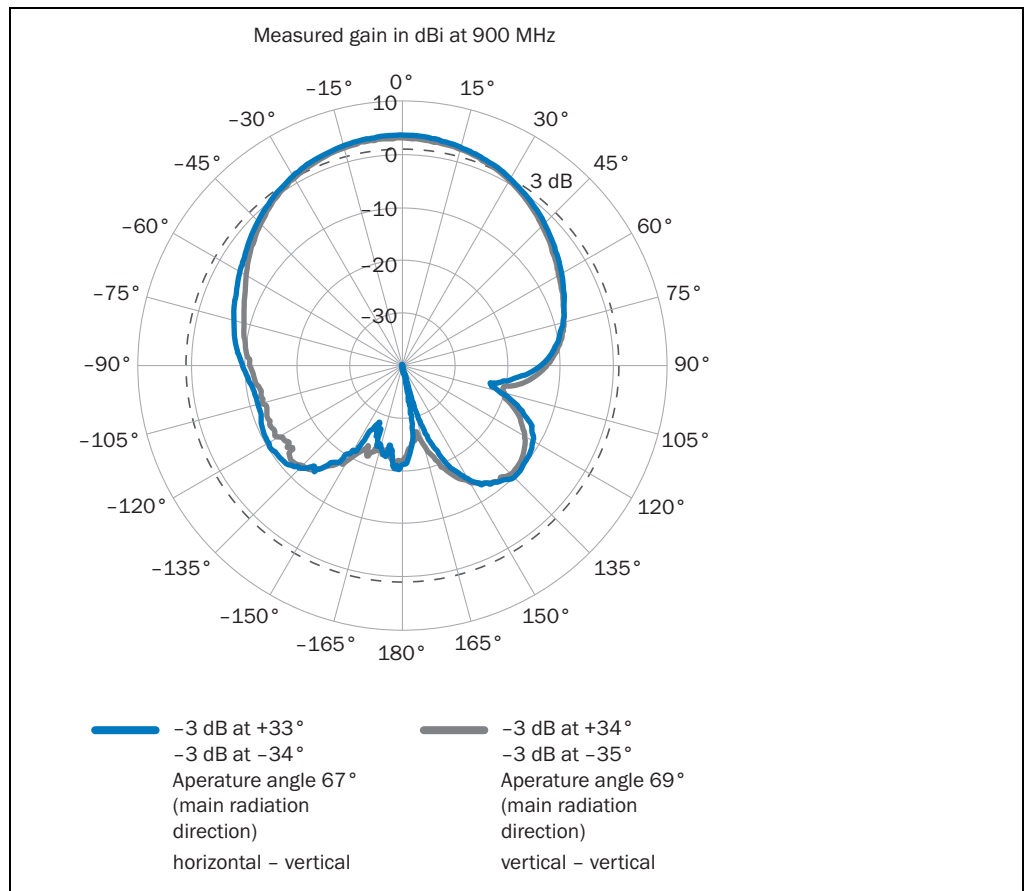
3.4.3 RFA641-3440 antenna



Technical Data

Type	RFA641-3440
Part no.	6034316
Frequency range	860 MHz ... 960 MHz (for Europe and USA)
Maximum radiated power	10 W
Polarization	Circular
VSWR ^{*)}	< 1.3 : 1
Gain	7 dBi ± 1 dBi
Axial ratio	< 1dB
3 dB aperture angle	
Front to back ratio	
Electrical connection	Cable 0.3 m with N female connector
Impedance	50 Ohm
Housing (material)	ABS
Enclosure rating	IP 54 accord. to EN 60529/A1
Weight	Approx. 470 g
Dimension (L x B x H)	254.5 mm x 253 mm x 56.5 mm, see <i>dimensional drawing</i>
Mounting	4 x M6 threaded mounting holes, 10 mm deep
Operation ambient temperature	-20 °C ... +70 °C
Stockage temperature	-20 °C ... +70 °C
Relative air humidity	5 % ... 95 %, non-condensing
*) VSWR = Voltage Standing Wave Ration.	

Radiation pattern diagram RFA641-3440



Accessories

Internet Ordering information about the antenna and its accessories (mounting bracket and adapter cables [N male connector / TNC reverse] of different lengths) is available on the following SICK product pages on the web:

www.sick.com/6034316

The corresponding power loss values of the cables in the frequency band of 860 MHz to 960 MHz are also listed there.

Mounting

If several antennas are used in a reading station, e.g. two on each side of a conveyor system, make sure that the antennas are not directly facing each other, but are installed at staggered parallel positions.

Fixed wall-mounting (alignment not adjustable):

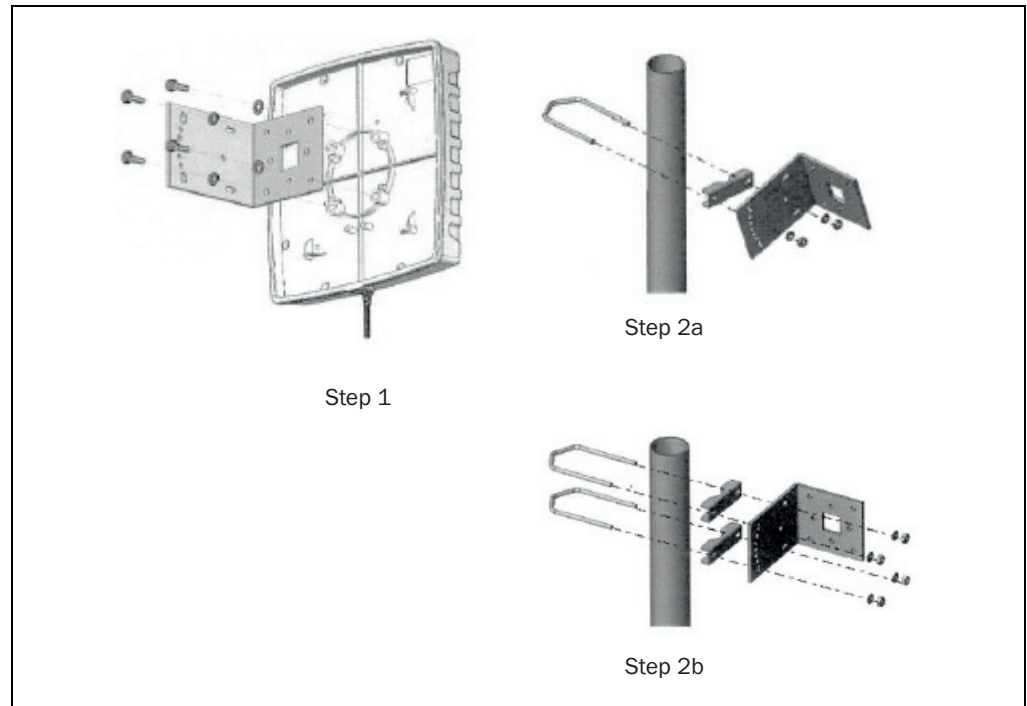
1. Mark and drill four fixing holes in the installation surface in accordance with the dimensional drawing.
2. When installing on a plate or frame, insert the supplied bolts from the rear through the installation surface and tighten the antenna.

Installation to a tube (alignment adjustable in two axis):

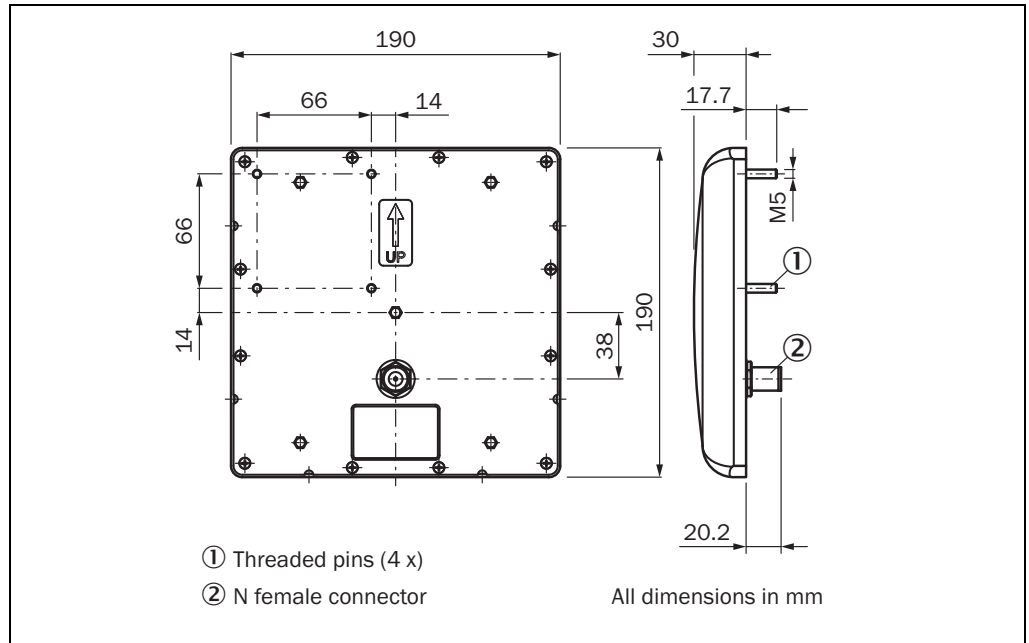
Use the mounting bracket no. 5321692.

1. Tight the bracket to the antenna (step 1).

2. Use a retainer and a bushing to install the bracket to the tube (step 2a).
Due to the combination of the retainer on the tube and the curved arranged drill holes at the der leading edge of the bracket, the antenna can adjust in two axis to the objects.
If mounting across to the axis of the tube is sufficient, both retainers can also be used for stable installation (step 2b).



3.4.4 RFA651-5731 antenna



Technical Data

Type	RFA651-5731
Part no.	6036102
Frequency band	865 MHz ... 870 MHz (Europe)
Permissible write/read device	RFU630-13100
Maximum radiated power	
Polarization	Linear
VSWR ^{*)}	Typical < 1.3
Gain	Max. 8 dBic
Axial ratio	
3 dB aperture angle	
Front to back ratio	
Electrical connection	N female connector, 50 Ohm
Housing (material)	Plastic (PP)
Enclosure rating	IP 67 accord. to EN 60529: 1991-10; A1: 2002-02
Weight	Approx. 0.8 kg
Dimensions (L x W x H)	190 mm x 190 mm x 30 mm, see <i>dimensional drawing</i>
Mounting	4 x Befestigungsgewindestange M5 x 17.7 mm
Ambient temperature (operation/stockage)	-45 °C ... +70 °C
Relative air humidity	5 % ... 95 %, non-condensing
*) VSWR = Voltage Standing Wave Ration	

Accessories

Internet Ordering information about the antenna and its accessories (mounting bracket and adapter cables [N male connector / TNC reverse] of different lengths) is available on the following SICK product pages on the web:

www.sick.com/6036102

The corresponding power loss values of the cables in the frequency band of 865 MHz to 870 MHz are also listed there.

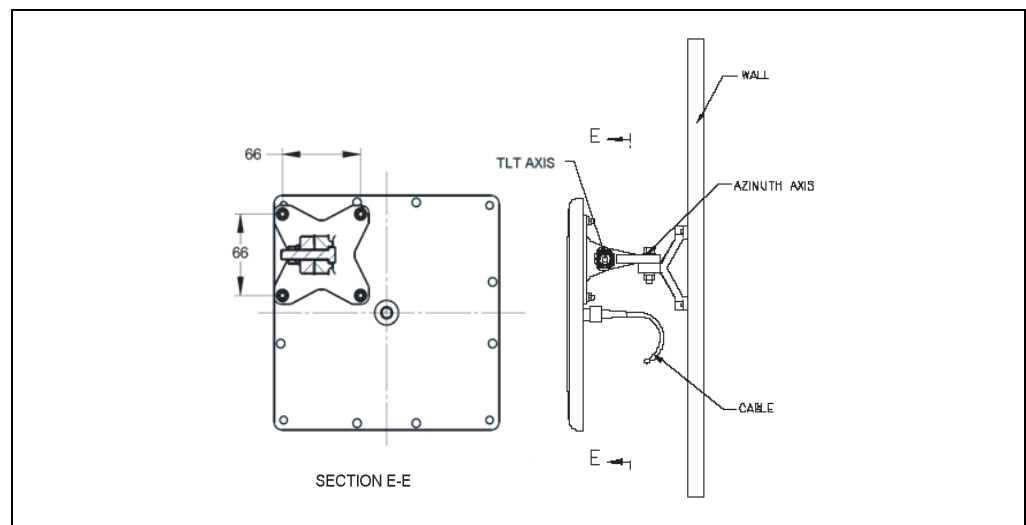
Mounting

If several antennas are used in a reading station, e.g. two on each side of a conveyor system, make sure that the antennas are not directly facing each other, but are installed at staggered parallel positions.

Wall-mounting (alignment adjustable in two axis):

Use the mounting bracket no. 5322196.

1. For the foot of the bracket, mark and drill four fixing holes on the wall in accordance with the dimensional drawing in the enclosed mounting instructions.
2. Install the cruciformed mounting plate of the adjusting arm to the antenna.
3. Connect the cable to the antenna.
4. Fix the foot of the bracket on the wall using the enclosed bolts.
5. Align the antenna with the help of both hinges to the objects.



4 Electrical installation

4.1 Notes on the electrical installation

- **The electrical installation must only be performed by electrically qualified persons.**
- **Standard safety requirements must be met when working in electrical systems.**
- Electrical connections between the RFU630 and other devices may only be connected or disconnected when the system is not live, otherwise the devices may be damaged. The permissible ambient temperature range for this work is 0 °C to +50 °C.
- RFU630-13101 (UL-certified):
 - UL certified only if UL logo is printed on type plate.
 - Install the device only inside of buildings. The device is not suitable for outdoor use.
 - Lead the connection cables to the external device interfaces only inside of buildings.
 - Use a supply voltage according to SELV (EN 60950-1:2006-04) and LPS (EN 60950-1:2006-04) or Class 2 (UL 1310).
- Operation of the RFU630 below 0 °C:
For information on configuring the electrical installation when using the RFU630-101xx at temperatures down to -25 °C, see [Chapter 4.5, Page 39](#).
- 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). Take appropriate measures to isolate the wires.
- Customer-specific provided cables:
Wire cross sections of the supply cable from the customer's power system as well of data and switching signal cables should be designed in accordance with the applicable standards.
- All circuits connected to the RFU630 must be designed as SELV circuits. The power supply or power supply unit must satisfy the requirements of SELV in accordance with the currently applicable EN 60950-1. (SELV = **S**afety **E**xtra **L**ow **V**oltage.)
- Do not switch on the supply voltage for the RFU630 respectively the CDB650-204 or CDM420-0006 connection module until the connection work has been completed and the wiring work has been tested thoroughly.

Prerequisites for enclosure rating IP 65

- The cover for the USB female connector and Micro SD card slot has to be screwed onto the housing during normal operation.
Protect the RFU63x from moisture and dust when the cover is open.
- The electrical connections not used have to be fitted with protective caps or plugs.
- The same also applies for the EMC requirements (ESD) according to CE.

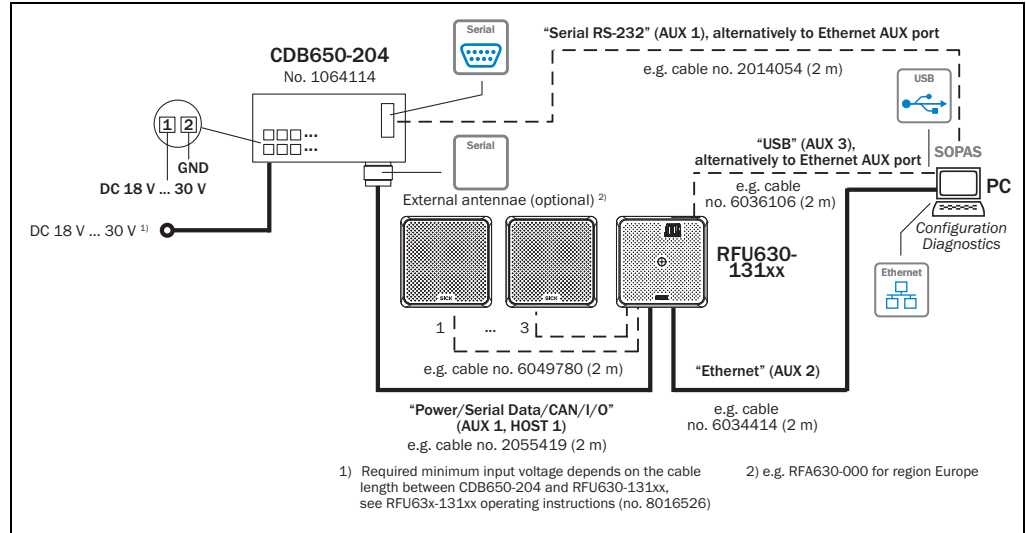
Cable lengths

The possible length of cable between RFU630 and the host computer depends on the selected physical design of the host interface and the set data transmission rate. For the serial interfaces, see [Chapter 4.7.3 Wiring the data interface, Page 47](#).

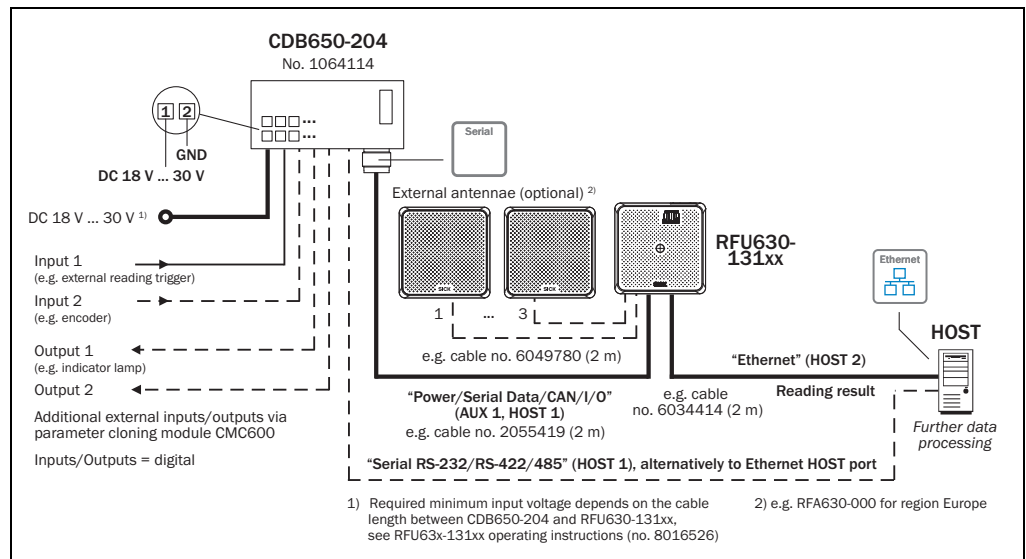
4.2 Overview of all interfaces and connection options

4.2.1 RFU630-131xx with integrated antenna

Configuration and diagnostics

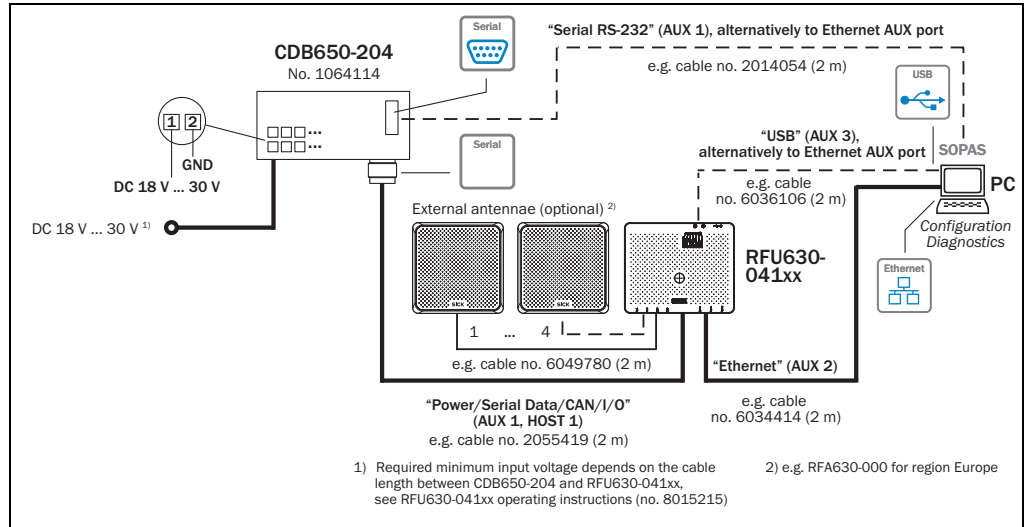


Reading mode

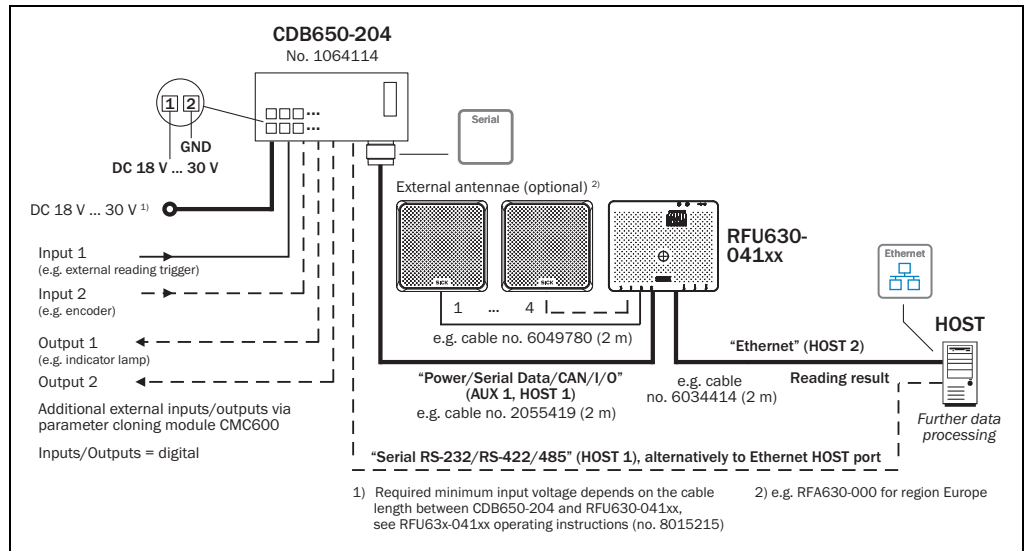


4.2.2 RFU630-041xx without integrated antenna

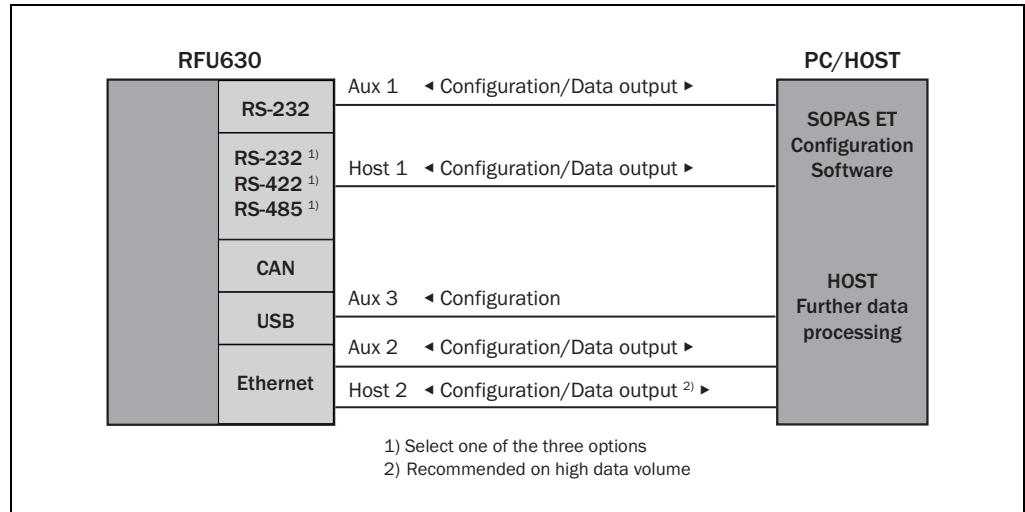
Configuration and diagnostics



Reading mode



4.2.3 Using the data interfaces



Possible interface →	HOST 1	AUX 1	HOST 2	AUX 2	AUX 3
Assignable function ↓	RS-232/-422/485	RS-232	Ethernet	Ethernet	USB
Read result output (format 1)	●	●	●	●	
Read result output (format 2)	●	●	●	●	
Read diagnosis output (fixed format)		●		●	
Observation of HOST interface traffic		●		●	
Configuration (SOPAS ET, commands)	○	○	○	○	○
● = Output of the same function simultaneously possible via the interfaces ○ = Access only makes practical sense via one of the interfaces (risk of collision)					

Important! Only one of several selectable functions can be allocated to each interface.

The logical AUX interface of the RFU630 can operate the serial data interface, USB interface and Aux port of the Ethernet interface in parallel.

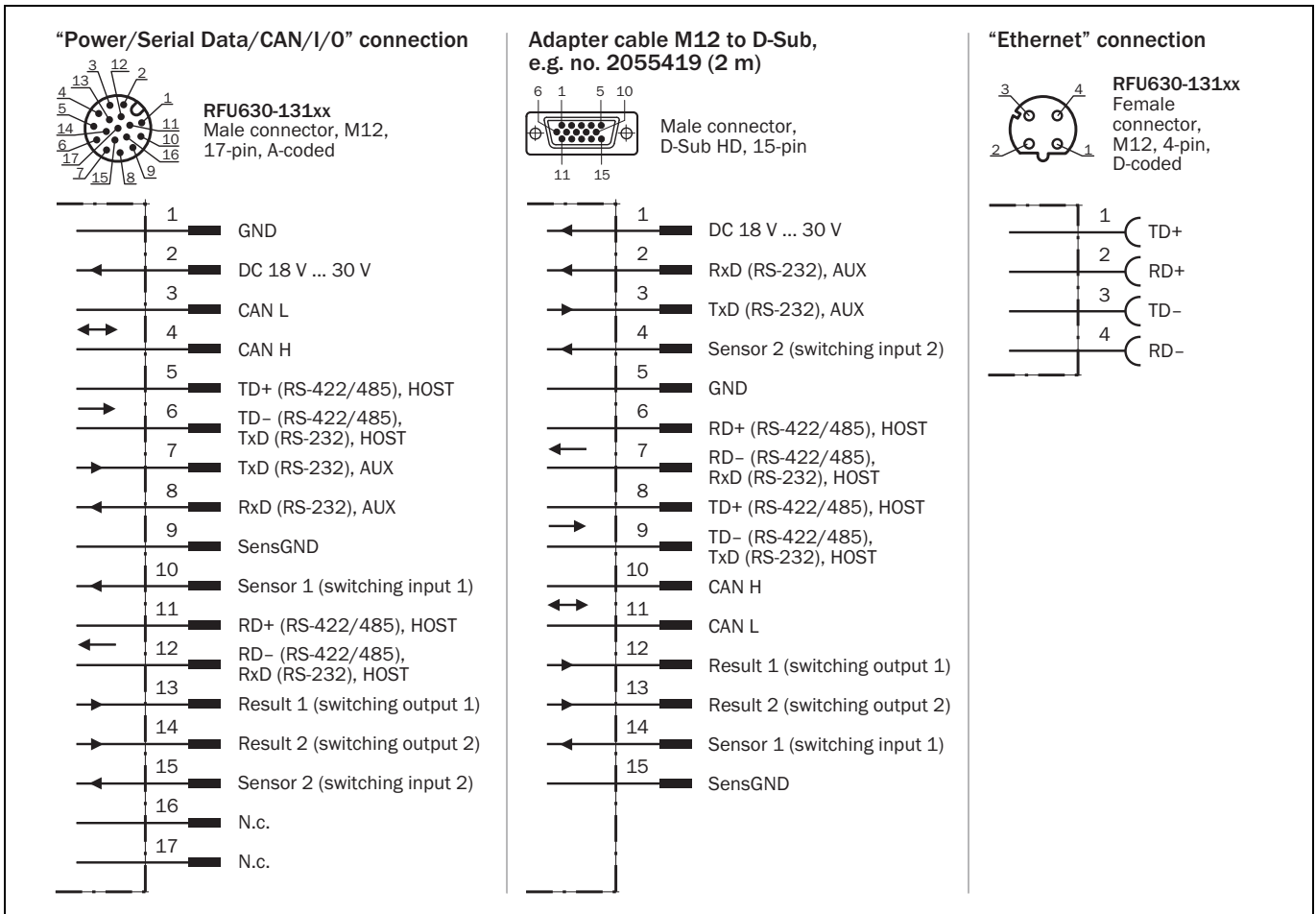
In a similar manner, the logical HOST interface of the RFU630 can operate the serial data interface and the Host port of the Ethernet interface in parallel. The physical RS-232 and RS-422/485 Host interfaces cannot be used simultaneously.

However, the data released by means of a command string is only output on the interface on which the request was received.

For output in real time, one of the two ports of the Ethernet interface must be selected.

RFU63x

4.3 M12 male and female connector pin assignments on the RFU630



4.4 Pin assignments and lead color assignments of cables

4.4.1 RFU63x ("Power/SerialData/CAN/I/O" connection) to CDB650-204

Connection cable 1:1: no. 6052286 (2 m), no. 6051194 (3 m), no. 6051195 (5 m)

Ambient temperature range:

Stationary installation: -40 °C to +80 °C, mobile installation: -25 °C to +80 °C

Supply voltage: DC 18 V ... 30 V

4.4.2 RFU630 ("Power/SerialData/CAN/I/O" connection) to CDM420-0006

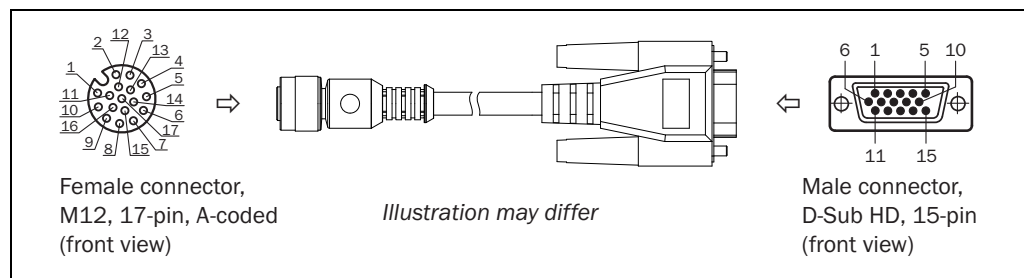
a) Adapter cable no. 2056184 (0.35 m), no. 2049764 (0.9 m), no. 2055419 (2 m), no. 2055420 (3 m), no. 2055859 (5 m)

b) Adapter cable, suitable for drag chain use, no. 2061480 (2 m), no. 2061605 (3 m), no. 2061481 (5 m)

Ambient temperature range:

Stationary installation: -40 °C to +80 °C, mobile installation: -25 °C to +80 °C

Supply voltage: DC 18 V ... 30 V



Pin	Signal	Function	Pin
2	DC 18 V ... 30 V	Supply voltage	1
8	RxD (RS-232), AUX	Aux interface (receiver)	2
7	TxD (RS-232), Aux	Aux interface (sender)	3
15	Sensor 2	Switching input 2	4
1	GND	Ground	5
11	RD+ (RS-422/485), Host	Host interface (receiver+)	6
12	RD- (RS-422/485)/ RxD (RS-232), Host	Host interface (receiver-)	7
5	TD+ (RS-422/485), Host	Host interface (sender+)	8
6	TD- (RS-422/485)/ TxD (RS-232), Host	Host interface (sender-)	9
4	CAN H	CAN bus (IN/OUT)	10
3	CAN L	CAN bus (IN/OUT)	11
13	Result 1	Switching output 1	12
14	Result 2	Switching output 2	13
10	Sensor 1	Switching input 1	14
9	SensGND	Common ground for all inputs	15
16	N.c.	-	-
17	N.c.	-	-

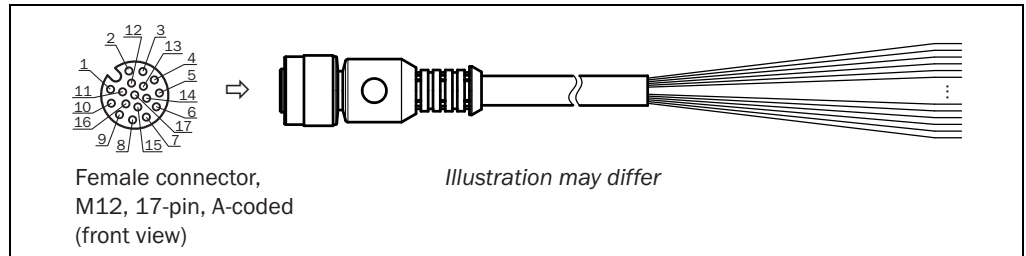
4.4.3 RFU630 ("Power/AUX/CAN/I/O" connection) to customer-specific connection unit (power supply unit or switching cabinet)

a) Adapter cable no. 6042772 (3 m), no. 6042773 (5 m), no. 6048817 (10 m)

Ambient temperature range:

Stationary installation: -40 °C to +80 °C, mobile installation: -5 °C to +80 °C

Supply voltage: DC 18 V ... 30 V, has to be protected by fuse 2 A



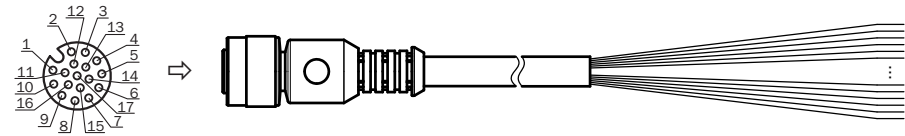
Pin	Signal	Function	Color of lead
1	GND	Ground	Brown
2	DC 18 V ... 30 V	Supply voltage	Blue
3	CAN L	CAN-Bus (IN/OUT)	White
4	CAN H	CAN-Bus (IN/OUT)	Green
5	TD+ (RS-422/485), Host	Host interface (sender+)	Pink
6	TD- (RS-422/485)/ TxD (RS-232), Host	Host interface (sender-)	Yellow
7	TxD (RS-232), Aux	Aux interface (sender)	Black
8	RxD (RS-232), Aux	Aux interface (receiver)	Gray
9	SensGND	Common ground for all inputs	Red
10	Sensor 1	Switching input 1	Purple
11	RD+ (RS-422/485), Host	Host interface (receiver+)	Gray-pink
12	RD- (RS-422/485)/ RxD (RS-232), Host	Host interface (receiver-)	Red-blue
13	Result 1	Switching output 1	White-green
14	Result 2	Switching output 2	Brown-green
15	Sensor 2	Switching input 2	White-yellow
16	N.c.	-	Yellow-brown
17	N.c.	-	White-gray

b) Adapter cable, suitable for drag chain use, ECOLAB, no. 2070425 (3 m), no. 2070426 (5 m), no. 2070427 (10 m)

Ambient temperature range:

Stationary installation: -40 °C to +80 °C, mobile installation: -25 °C to +80 °C

Supply voltage: DC 18 V ... 30 V, has to be protected by fuse 2 A

 <p>Female connector, M12, 17-pin, A-coded (front view)</p> <p><i>Illustration may differ</i></p>			
Pin	Signal	Function	Color of lead
1	GND	Ground	Blue
2	DC 18 V ... 30 V	Supply voltage	Brown
3	CAN L	CAN-Bus (IN/OUT)	Green
4	CAN H	CAN-Bus (IN/OUT)	White
5	TD+ (RS-422/485), Host	Host interface (sender+)	Pink
6	TD- (RS-422/485)/ TxD (RS-232), Host	Host interface (sender-)	Yellow
7	TxD (RS-232), Aux	Aux interface (sender)	Black
8	RxD (RS-232), Aux	Aux interface (receiver)	Gray
9	SensGND	Common ground for all inputs	White-black
10	Sensor 1	Switching input 1	Purple
11	RD+ (RS-422/485), Host	Host interface (receiver+)	Gray-pink
12	RD- (RS-422/485)/ RxD (RS-232), Host	Host interface (receiver-)	Red-blue
13	Result 1	Switching output 1	White-green
14	Result 2	Switching output 2	Brown-green
15	Sensor 2	Switching input 2	White-yellow
16	N.c.	-	Yellow-brown
17	N.c.	-	White-gray

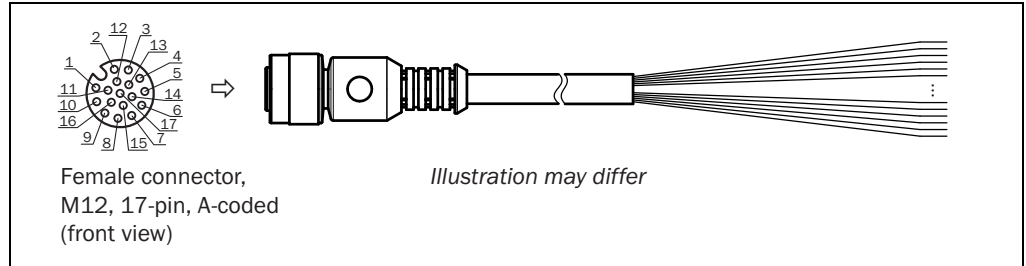
RFU63x

c) Adapter cable, suitable for drag chain use, no. 6045141 (5 m)

Ambient temperature range:

Stationary installation: -40 °C to +85 °C, mobile installation: -25 °C to +80 °C

Supply voltage: DC 18 V ... 30 V, has to be protected by fuse 2 A



Pin	Signal	Function	Color of lead
1	GND	Ground	Gray
2	DC 18 V ... 30 V	Supply voltage	White
3	CAN L	CAN-Bus (IN/OUT)	Gray-pink
4	CAN H	CAN-Bus (IN/OUT)	Purple
5	TD+ (RS-422/485), Host	Host interface (sender+)	Red
6	TD- (RS-422/485)/ TxD (RS-232), Host	Host interface (sender-)	Black
7	TxD (RS-232), Aux	Aux interface (sender)	Green
8	RxD (RS-232), Aux	Aux interface (receiver)	Brown
9	SensGND	Common ground for all inputs	White-yellow
10	Sensor 1	Switching input 1	Brown-green
11	RD+ (RS-422/485), Host	Host interface (receiver+)	Pink
12	RD- (RS-422/485)/ RxD (RS-232), Host	Host interface (receiver-)	Blue
13	Result 1	Switching output 1	Red-blue
14	Result 2	Switching output 2	White-green
15	Sensor 2	Switching input 2	Yellow
16	N.c.	-	Yellow-brown
17	N.c.	-	White-gray

4.4.4 RFU630 ("Power/AUX/CAN/I/O" connection) to customer-specific power supply unit

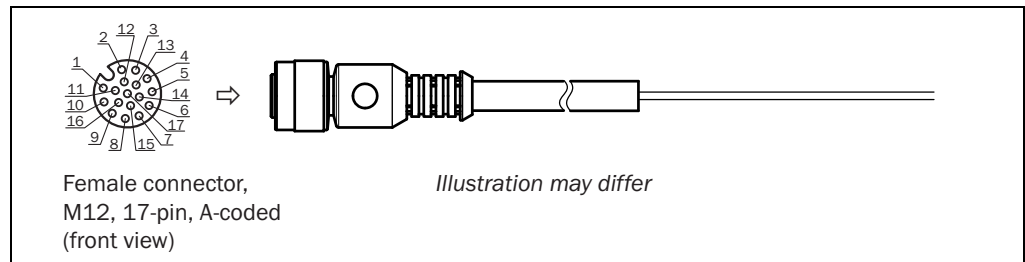
Adapter cable no. 6048319 (10 m)

Ambient temperature range:

Stationary installation: -40 °C to +85 °C, mobile installation: -25 °C to +80 °C

Supply voltage: DC 18 V ... 30 V, has to be protected by fuse 2 A or

Supply voltage: DC 12 V ... 30 V, has to be protected by fuse 2.5 A



Pin	Signal	Function	Color of lead
1	GND	Ground	Brown
2	DC 18 V (12 V) ... 30 V	Supply voltage	Blue

4.4.5 RFU630 ("Ethernet" connection) to Ethernet (RJ-45) or PROFINET (RJ-45)

Ethernet cables:

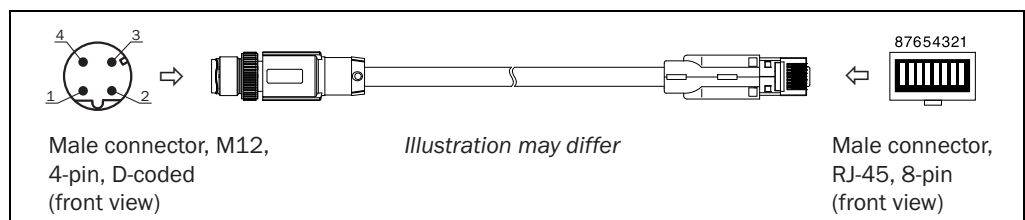
a) Adapter cable no. 6034414 (2 m), no. 6044400 (3 m), no. 6034415 (5 m), no. 6030928 (10 m), no. 6036158 (20 m)

Ambient temperature range:

Stationary installation: -20 °C to +60 °C, mobile installation: -0 °C to +50 °C

b) Adapter cable, suitable for drag chain use, ECOLAB no. 6050198 (2 m), no. 6050199 (3 m), no. 6050200 (5 m), no. 6050201 (10 m), no. 6050596 (20 m)

Ambient temperature range: mobile installation: -25 °C to +60 °C



Pin	Signal	Function	Pin
1	TD+ (Ethernet)	Sender+	1
3	TD- (Ethernet)	Sender-	2
2	RD+ (Ethernet)	Receiver+	3
4	RD- (Ethernet)	Receiver-	6

PROFINET cables:

a) Adapter cable no. 6048244 (2 m), no. 6048245, (5 m), no. 6048246 (10 m)

b) Adapter cable with M12 male connector, angled (here not shown): no. 6048253 (2 m), no. 6048254 (5 m), no. 6048255 (10 m)

Ambient temperature range:

Stationary installation: -40 °C to +70 °C, mobile installation: -20 °C to +60 °C

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

Male connector, RJ-45, 8-pin (front view)

Pin	Signal	Function	Pin
1	TD+ (Ethernet)	Sender+	1
3	TD- (Ethernet)	Sender-	2
2	RD+ (Ethernet)	Receiver+	3
4	RD- (Ethernet)	Receiver-	6

4.4.6 RFU630 ("Ethernet" connection) to PROFINET (open end)

Ethernet cables:

a) Adapter cable no. 6048247 (2 m), no. 6048248 (5 m), no. 6048249 (10 m)

Ambient temperature range:

Stationary installation: -40 °C to +70 °C, mobile installation: -20 °C to +60 °C

PROFINET cables:

b) Adapter cable with M12 male connector, angled (here not shown): no. 6048256 (2 m), no. 6048257 (5 m), no. 6048258 (10 m), no. 6048259 (25 m)

Ambient temperature range:

Stationary installation: -40 °C to +70 °C, mobile installation: -20 °C to +60 °C

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

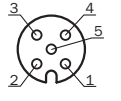
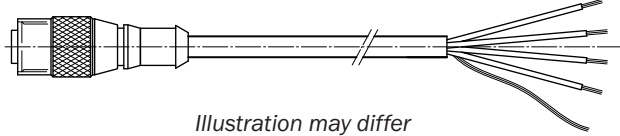
Pin	Signal	Function	Color of lead
1	TD+ (Ethernet)	Sender+	Yellow
2	TD- (Ethernet)	Sender-	White
3	RD+ (Ethernet)	Receiver+	Orange
4	RD- (Ethernet)	Receiver-	Blue

4.4.7 CDB650-204 or CDM420-0006 connection module to CAN network

CAN data cable no. 6021166 (5 m)

Ambient temperature range:

Stationary installation: -40 °C to +70 °C, mobile installation: -20 °C to +70 °C

Female connector,
M12, A-coded
(front view)

Illustration may differ

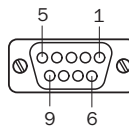
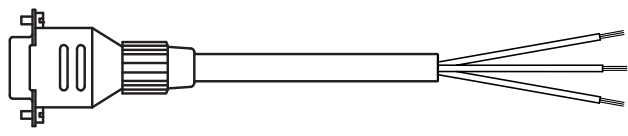
Pin	Signal	Funktion	Color of lead
1	-	Shield	-
2	DC +24 V	Supply voltage	Red
3	GND	Ground	Black
4	CAN H	CAN-Bus (IN/OUT)	White
5	CAN L	CAN-Bus (IN/OUT)	Blue

4.4.8 CDB650-204 or CDM420-0006 connection module (Host interface RS-232 of RFU630) to PC

RS-232 data cable no. 2020319 (3 m)

Ambient temperature range:

Stationary installation: -30 °C to +90 °C, mobile installation: -5 °C to +90 °C

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

Pin	Signal	Function	Color of lead	Terminal CDB650-204/ Terminal CDM420-0006
1	-	-	-	-
2	RxD (RS-232)	Host interface (receiver)	Brown	43 / 34 (TxD Host)
3	TxD (RS-232)	Host interface (sender)	Blue	44 / 35 (RxD Host)
4	-	-	-	-
5	GND	Ground	Black	42 / 36 (GND)
6 ... 9	-	-	-	-

4.5 Notes on the electrical installation of the RFU630 at an ambient temperature below 0 °C

The RFU630 can be operated at ambient temperatures between +50 °C and -25 °C.

4.5.1 Prerequisites

- RFU630-13101 UL-certified: Install the device only inside of buildings. The device is not suitable for outdoor use.
- All other variants: For use outdoors, use suitable weather protection, which prevents the device from heating up due to direct sunlight during the summer and protects the device from being cooled by the wind during the winter.
- Use supply voltage DC 18 V ... 30 V if:
 - RFU630 is connected to the optional CDB650-204 or CDM420-0006 connection module by a specified SICK cold-resistant cable.
 - RFU630 is operated without a SICK connection module and connected with a specified SICK cold-resistant cable.
Protect the cable by a separate fuse 2 A at the start of the incoming supply circuit.
- Use supply voltage DC 12 V ... 30 V if:
 - RFU630 is optionally operated without a SICK connection module and connected with the specified SICK cold-resistant cable no. 6048319 (2 x 2.5 mm², 10 m).
Protect the cable by a separate fuse 2.5 A at the start of the incoming supply circuit.
- Use SICK standard cables for the ambient temperature range specified, also see [Chapter 4.4 Pin assignments and lead color assignments of cables, Page 32](#).
- Only carry out connection work in ambient temperatures ranging from 0 °C to +50 °C. The connecting cables must be fixed in place.
- All cables connected to the device are locked. Yellow protective caps or plugs are screwed onto any electrical connections that are not in use.
- The RFU630 may only be operated in ambient temperatures below 0 °C when no mounting or connection work is being carried out.
- When the device is operated on the lowest limit value of the ambient temperature of -25 °C, it must not be exposed to strong air movement (e.g. inhouse due to ventilation).

4.5.2 Behavior of the device after switch-on



Following application of the supply voltage and initialization, the RFU630 can immediately be accessed by the SOPAS ET configuration software.


Internal temperature of housing	Behavior after switch-on
Below -25 °C	"Ready" LED continuously flashes yellow. Device is not operational as -25 °C is below the specified minimum limit value.
-20 °C ... -25 °C	"Ready" LED continuously flashes green (warm-up phase). Device is not operational (communication channel still disabled) until the internal temperature has increased to -20 °C as a result of the heat generated by the electronics. Duration approx. 2 min.
From -20 °C	"Ready" LED permanently lights up green. The device has started regular operation.

Once the supply voltage has been applied, the device uses integrated temperature sensors to measure its internal temperature. This is handled during booting.

Supplement to the RFU630 operating instructions:

Status indicators on the first display level

Display	LED	Farbe	Status
Ready		Yellow	Flashing, frequency 1 Hz. Internal temperature of RFU63x below -25 °C. The device is not ready for operation
		Green	Flashing, frequency 1 Hz. Internal temperature of RFU63x between -25 °C and -20 °C. The device is not ready for operation. After a warm-up phase of approx. 2 min, the RFU63x starts regular operation.RFU630.

 = LED flashes

4.6 Prerequisites for the safe operation of the RFU630 in a system

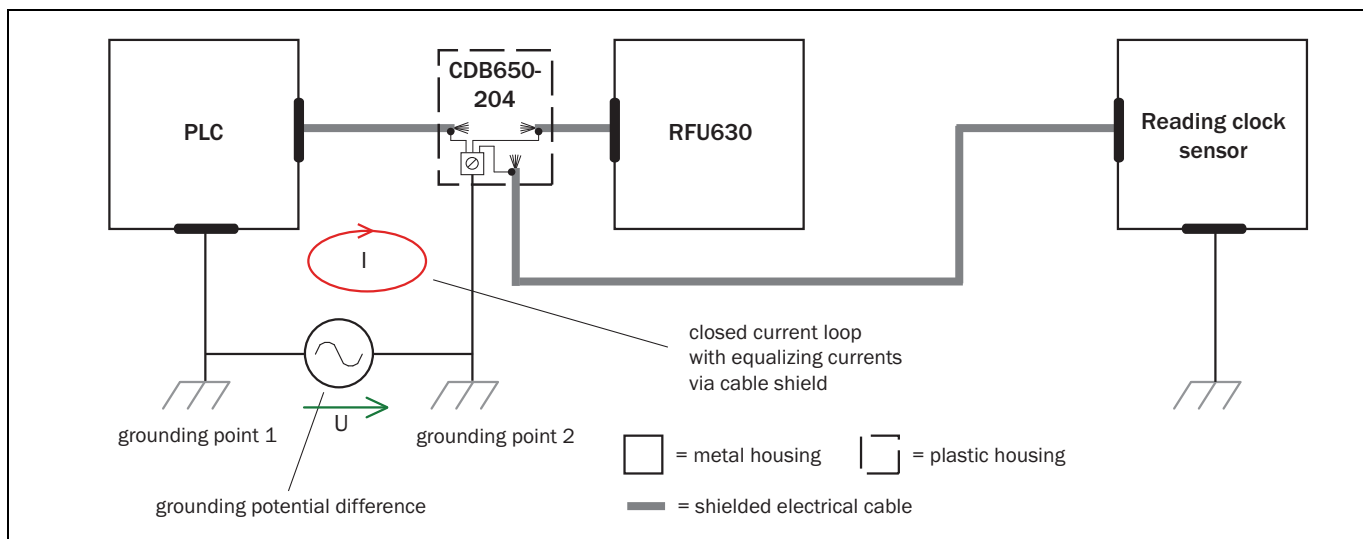
The RFU630 is designed and tested for electrical safety according to EN 60950-1: 2006-04/A1: 2010-03/A11: 2009-03/A12: 2011-02. It is connected to the peripheral devices (power supply, clock reading pulse sensor(s), PLC, Host etc.) via shielded cables. The cable shield, for example, for the data cable rests against the metal housing of the RFU630. The device can either be grounded through the cable shield or through one of the blind hole threads on the rear side.

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

This is achieved for instance by complying with the following conditions:

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

If these conditions are not met, e.g. on devices in a widely distributed system over several buildings, potential equalization currents may, due to different ground potentials, flow along the cable shields between the devices, which can lead to hazards.



DANGER

Risk of injury/risk of damage via electrical current!

Potential equalization currents between the RFU630 and other grounded devices in the system can have the following effects:

- Dangerous voltages on the metal housing of the RFU630, for instance
- Incorrect function or irreparable damage to the devices
- Damage/irreparable damage of the cable shield due to heating and cable fires
- Where local conditions are unfavorable and thus do not meet conditions for a safe earthing method (same ground potential at all grounding points), take measures in accordance with the following explanations.

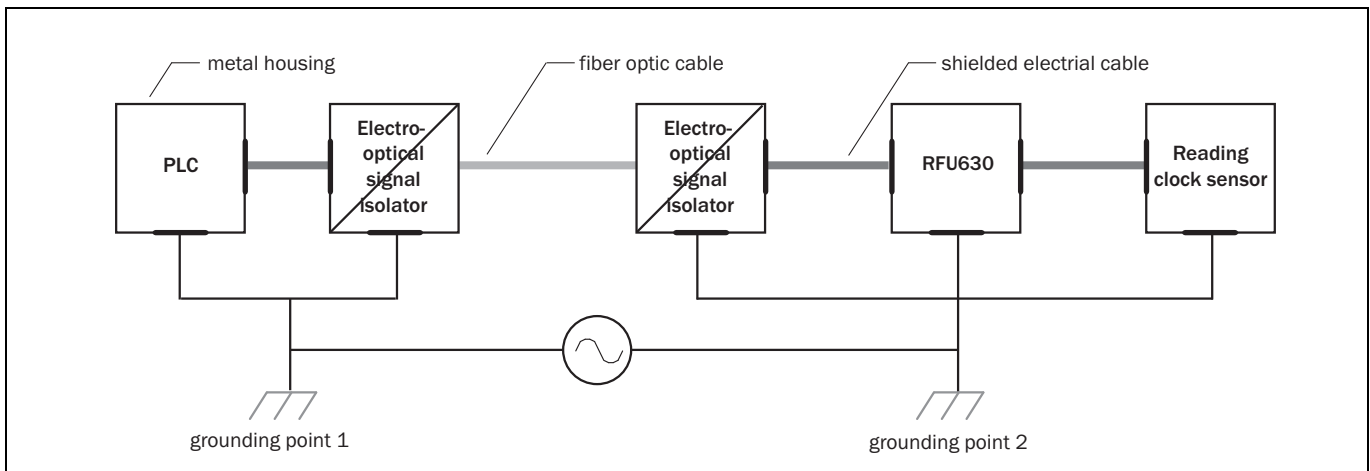
Remedial measures

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

Important! We expressly advise against opening up the cable shields. Doing this means that the EMC limit values can no longer be complied with and that the safe operation of the device data interfaces can no longer be guaranteed.

a) Measures for widely distributed system installations

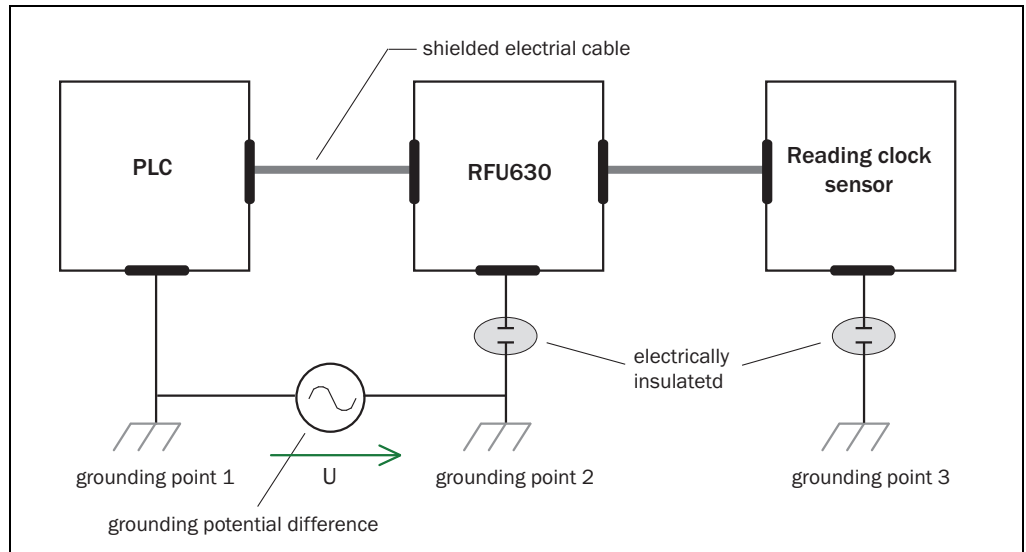
On widely distributed system installations with correspondingly large potential differences, we recommend setting up local islands and connecting them using commercially available **electro-optical signal isolators**. This measure achieves a high degree of resistance to electromagnetic interference while at the same time complying with all the requirements of EN 60950-1.



The ground loop is isolated by using the electro-optical signal isolator between the islands. Within the islands, a stable equipotential bonding prevents equalizing currents at the cable shields.

b) Measures for small system installations

For smaller installations with only slight potential differences, insulated installation of the RFU630 and of peripheral devices may be a sufficient solution.



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

Important! The power supply for the RFU630 and the connected peripheral devices must also guarantee the required level of insulation.

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

Special national regulations for Sweden and Norway



Varning och atjarder

Utrustning som ar kopplad till skyddsjord via jordat vagguttag och/eller via annan utrustning och samtidigt ar kopplad till kabel-TV nat kan i vissa fall medfora risk for brand.

- For att undvika detta skall vid anslutning av utrustningen till kabel-TV nat galvanisk isolator finnas mellan utrustningen och kabel-TV natet.



Advarsel og tiltaker

Utstyr som er koplet til beskyttelsesjord via nettplugg og/eller via annet jordtilkopleet utstyr - og er tilkopleet et kabel - TV nett, kan forarsake brannfare.

- For a unnga dette skal det ved tilkopling av utstyret til kabel-TV nettet installeres en galvanisk isolator mellom utstyret og kabel-TV nettet.

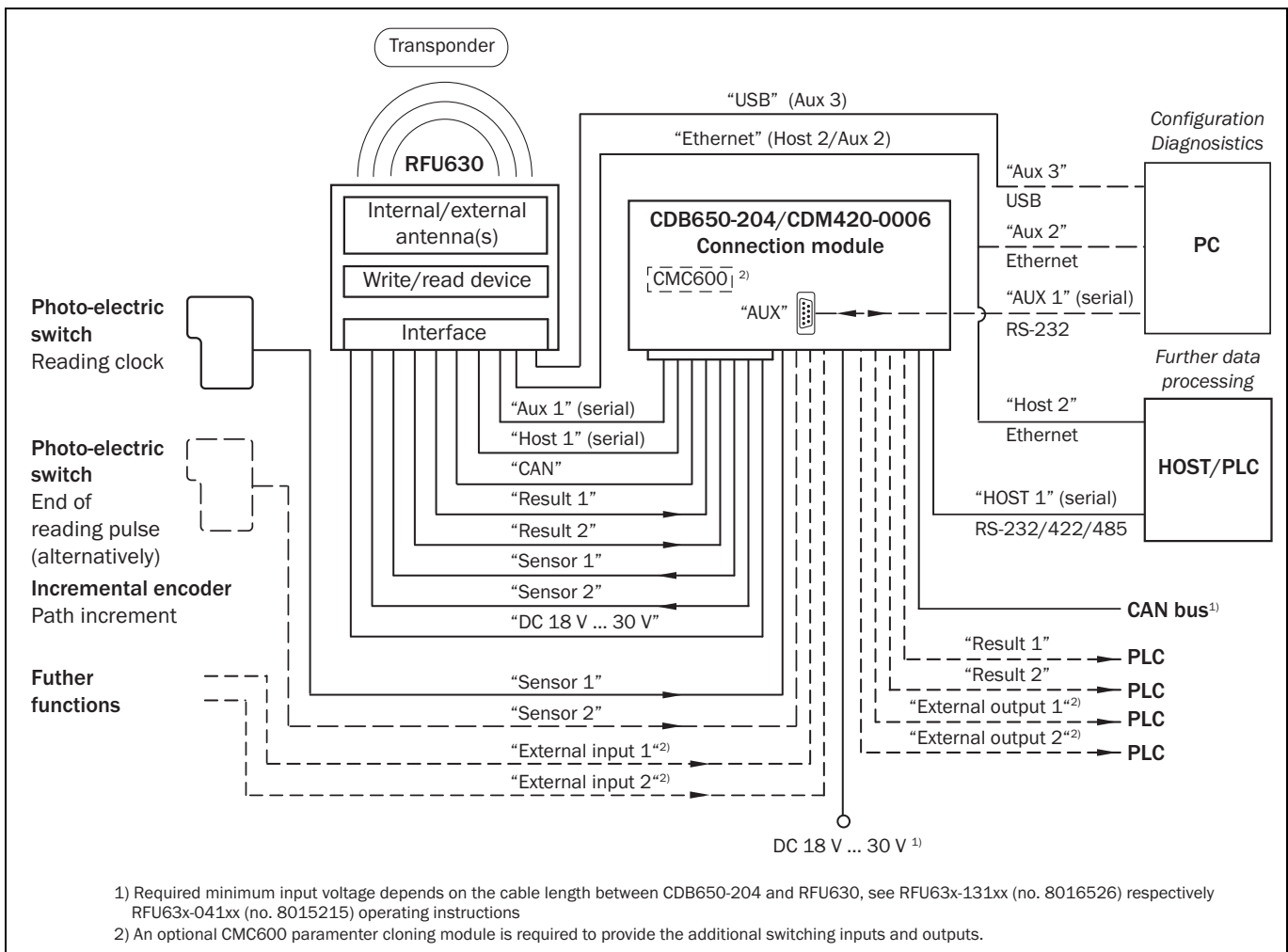
Corresponding English translation

Devices which are connected to the electrical system PE of the building via a mains connection or other devices with a connection to the PE, and which are connected to a cable distribution system with coaxial cables, can under certain circumstances cause a risk of fire.

- Connections to a cable distribution system must therefore be made such that electrical insulation is offered below a certain frequency range (galvanic separating link).

4.7 Installation steps

4.7.1 Block diagram: wiring the optional the CDB650-204 or CDM420-0006 connection module (overview)



The commissioning and configuration of the connection module as well as the technical data are described in the:

- "CDB650-204 connection module" operating instructions (no. 8016155, German + English version) e.g. as PDF in the web via www.sick.com/CDB
- "CDM420-0006 connection module" operating instructions (no. 8014808 German + English version) e.g. as PDF in the web via www.sick.com/CDM

The documents are also supplied in printed form with the relating connection module.

Important! Wiring the signals without SICK Connection Module

If a customer-specific connection unit is used, the wiring in principle of the data interfaces (serial and CAN) and switching interfaces signals can be designed according to the following wiring diagrams for the CDM420-0006 connection module.

4.7.2 Connecting up the supply voltage

The RFU630 requires a power supply unit with the following characteristics:

- Supply voltage (stabilized safety extra-low voltage (SELV) according to the currently applicable standard EN 60950-1)
- RFU630-13101 (UL-certified):
Use a supply voltage according to SELV (EN 60950-1:2006-04) and LPS (EN 60950-1:2006-04) or Class 2 (UL 1310).

Supply voltage for RFU630	Connection module	Cable (length)	Cross-section for supply voltage	Voltage drop down on the cable at DC 18 V/ $I_{max.} = 1.35 A$	Required minimum supply voltage on the connection module	Fuse value for protection of supply voltage
DC 18 V...30 V, P = max. 26 W	CDB650-204	No. 6052286 (2 m) No. 6051194 (3 m) No. 6051195 (5 m)	0.14 mm ² 0.14 mm ² 0.14 mm ²	1.0 V 1.5 V 2.3 V	DC 19.0 V DC 19.5 V DC 20.3 V	CDB650-204 (2 A)
	CDM420-0006	No. 2056184 (0,35 m) No. 2049764 (0,9 m) No. 2055419 (2 m) No. 2055420 (3 m) No. 2055859 (5 m) No. 2061480 (2 m) No. 2061605 (3 m) No. 2061481 (5 m)	0.10 mm ² 0.10 mm ² 0.10 mm ² 0.10 mm ² 0.10 mm ² 0.14 mm ² 0.14 mm ² 0.14 mm ²	0.2 V 0.5 V 1.0 V 1.5 V 2.5 V 1.0 V 1.5 V 2.3 V	DC 18.2 V DC 18.5 V DC 19.0 V DC 19.5 V DC 20.5 V DC 19.0 V DC 19.5 V DC 20.3 V	CDM420-0006 (2 A)
	Customer-specific connecting	No. 6042772 (3 m) No. 6042773 (5 m) No. 6048817 (10 m) No. 2070425 (3 m) No. 2070426 (5 m) No. 2070427 (10 m) No. 6045141 (5 m) No. 6048319 (10 m)	0.14 mm ² 0.14 mm ² 0.14 mm ² 0.14 mm ² 0.14 mm ² 0.14 mm ² 0.14 mm ² 0.25 mm ²	1.5 V 2.3 V 4.6 V 1.5 V 2.3 V 4.6 V 2.3 V 2.0 V	DC 19.5 V DC 20.3 V DC 22.6 V DC 19.5 V DC 20.3 V DC 22.6 V DC 20.3 V DC 20.0 V	2 A at beginning of the incoming cable
DC 12 V...30 V, P = max. 26 W		No. 6048319 (10 m)	0.25 mm ²	3.0 V bei DC 12 V/ 1.9 A	DC 15.0 V	2.5 A at beginning of the incoming cable

- The power source must be able to provide minimum power of 26 W respectively minimum 1.5 A at DC 18 V.
- If the optional CDB650-204 or CDM420-0006 connection module is used: additional 0.5 W output power when the optional CMC600 parameter cloning module is also used.
- For suitable cable see [Chapter 4.4 Pin assignments and lead color assignments of cables, Page 32](#).

Protection of supply cable

To ensure protection against short-circuits or overload in the supply cables from the customer's power system, the lead cross sections used have to be selected and protected according to the national standards.

The supply voltage is fed via the connection module, please see:

Connection module	interface	Chapter
CDB650-204	Supply voltage	Chapter 4.8.2 Wiring the supply voltage in the CDB650-204 connection module, Page 51

Connection module	interface	Chapter
CDM420-0006	Supply voltage	Chapter 4.9.2 Wiring the supply voltage in the CDM420-0006 connection module, Page 65

The CDB650-204 and CDM420-0006 connection modules have each one fuse (2 A slow blow) in the electrical circuit downstream of the S1 switch.

Wiring without SICK connection module

The connecting cable no. 6042772 (17-pin D-Sub HD female connector and open cable end) can be used for wiring without the CDB650-204 or CDM420-0006 connection module. The RFU63x must then be protected using a separate, slow-blow fuse (max. 2 A) at DC 18 V ... 30 V in the supplying circuit at the start of the supply cable.

Note on reverse polarity protected supply voltage for the RFU630

NOTICE

Risk of damage to the RFU630 due to possible short-circuit!

The supply voltage input for the RFU630 is designed with internal circuit protection to provide reverse polarity protection. The internal function ground of the RFU630 has a direct galvanic connection to the metal housing of the RFU630 due to reasons relating to high frequency.

If the supply voltage has the incorrect polarity, this will not cause any damage provided that the RFU630 is not connected

- by either other cables
- or its housing

to other peripheral devices that use the same grounding point.

4.7.3 Wiring the data interface

Wiring the Ethernet interface

1. Connect the RFU630 to the PC via an Ethernet cable (patch 1:1).
2. Set up communication via SOPAS ET configuration software.

Important! The Ethernet interface for the RFU630 has an Auto-MDIX function. This automatically adjusts the transmission speed as well as any necessary crossover connections.

Wiring serial data interfaces

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

Type of interface	Data transmission rate	Distance to the target computer (Host)
RS-232	Up to 19.2 kBd 38.4 kBd ... 57.6 kBd 115.2 kBd ... 500 kBd	Max. 10 m Max. 3 m Max. 2 m
RS-422/485 *)	Up to 38.4 kBd 38.4 kBd ... 57.6 kBd 57.6 kBd ... 500 kBd	Max. 1.200 m Max. 500 m Max. 10 m
*) RS-422/485 suitable cable and the according termination as per specification.		

NOTICE

Damage to the internal interface module

If the serial data interfaces are wired incorrectly, then electronic components of the RFU630 could get damaged.

- Observe the information on wiring.
- Carefully check the wiring prior to switching on the RFU630.

The wiring is done using the connection module, please see:

Connection module	Data interface	Chapter
CDB650-204	RS-232	Chapter 4.8.3 Wiring the RS-232 serial host data interface in the CDB650-204 connection module, Page 52
	RS-422	Chapter 4.8.4 Wiring the RS-422 serial host data interface in the CDB650-204 connection module, Page 53
	RS-485	Chapter 4.8.5 Wiring the RS-485 serial host data interface in the CDB650-204 connection module, Page 54
CDM420-0006	RS-232	Chapter 4.9.3 Wiring the RS-232 serial host data interface in the CDM420-0006 connection module, Page 66
	RS-422	Chapter 4.9.4 Wiring the RS-422 serial host data interface in the CDM420-0006 connection module, Page 67
	RS-485	Chapter 4.9.5 Wiring the RS-485 serial host data interface in the CDM420-0006 connection module, Page 68

- Recommendation**
- Use shielded data cables (twisted pair leads).
 - To prevent interference factors, do not lay data cables over a longer route in parallel with power supply cables and motor cables, in cable channels, for example.

Termination of the RS-422 data interface

Termination can be implemented in the CDB650-204 or CDM420-0006 connection module. See "CDB650-204 connection module" operating instructions (no. 8016155) respectively "CDM420-0006 connection module" operating instructions (no. 8014808).

4.7.4 Wiring the CAN interface

The wiring is done using the connection module, please see:

Connection module	Data interface	Chapter
CDB650-204	CAN	Chapter 4.8.6 Wiring the CAN interface in the CDB650-204 connection module, Page 55
CDM420-0006	CAN	Chapter 4.9.6 Wiring the CAN interface in the CDM420-0006 connection module, Page 69

4.7.5 Wiring the digital switching inputs

Physical switching inputs on the RFU630

The two physical switching inputs "Sensor 1" and "Sensor 2" of the RFU630 can be used for starting and/or ending the clock reading pulse or for feeding an incremental signal.

Expansion: Additional logical switching inputs in the RFU630 converted to physical "external" switching inputs in the optional connection module

Thanks to the optional CMC600 parameter memory module in combination with the CDB650-204 or CDM420-0006 connection module, the two additional switching inputs "External input 1" and "External input 2" are available on the terminals in the connection module.

Important! These two external switching inputs are not suitable for time critical applications.

The wiring of the switching inputs is done using the connection module, please see:

Connection module	Switching input	Chapter
CDB650-204	Sensor 1	Chapter 4.8.7 Wiring the "Sensor 1" switching input in the CDB650-204 connection module, Page 56
	Sensor 2	Chapter 4.8.8 Wiring the "Sensor 2" switching input in the CDB650-204 connection module, Page 57
	External input 1 („Ext. In 1“)	Chapter 4.8.9 Wiring the "External input 1" switching input in the CDB650-204 connection module, Page 58
	External input 2 („Ext. In 2“)	Chapter 4.8.10 Wiring the "External input 2" switching input in the CDB650-204 connection module, Page 59
CDM420-0006	Sensor 1	Chapter 4.9.7 Wiring the "Sensor 1" switching input in the CDM420-0006 connection module, Page 70
	Sensor 2	Chapter 4.9.8 Wiring the "Sensor 2" switching input in the CDM420-0006 connection module, Page 71
	External input 1 („Aux In 1“)	Chapter 4.9.9 Wiring the "External input 1" switching input in the CDM420-0006 connection module, Page 72
	External input 2 („Aux In 2“)	Chapter 4.9.10 Wiring the "External input 2" switching input in the CDM420-0006 connection module, Page 73

4.7.6 Wiring the digital switching outputs

Physical switching outputs on the RFU630

The two physical switching outputs "Result 1" and "Result 2" of the RFU630 can be allocated independently of each other with various functions for the output of events in the reading process. If the allocated event occurs, the corresponding switching output is live after the end of the reading clock for the selected pulse duration.

Expansion: Additional logical switching outputs in the RFU630 converted to physical "external" switching outputs in the optional connection module

Thanks to the optional CMC600 parameter cloning module in combination with the CDB650-204 or CDM420-0006 connection module, the two additional switching outputs "External output 1" and "External output 2" are available on the terminals in the connection module.

Important! These two external switching outputs are not suitable for time critical applications.

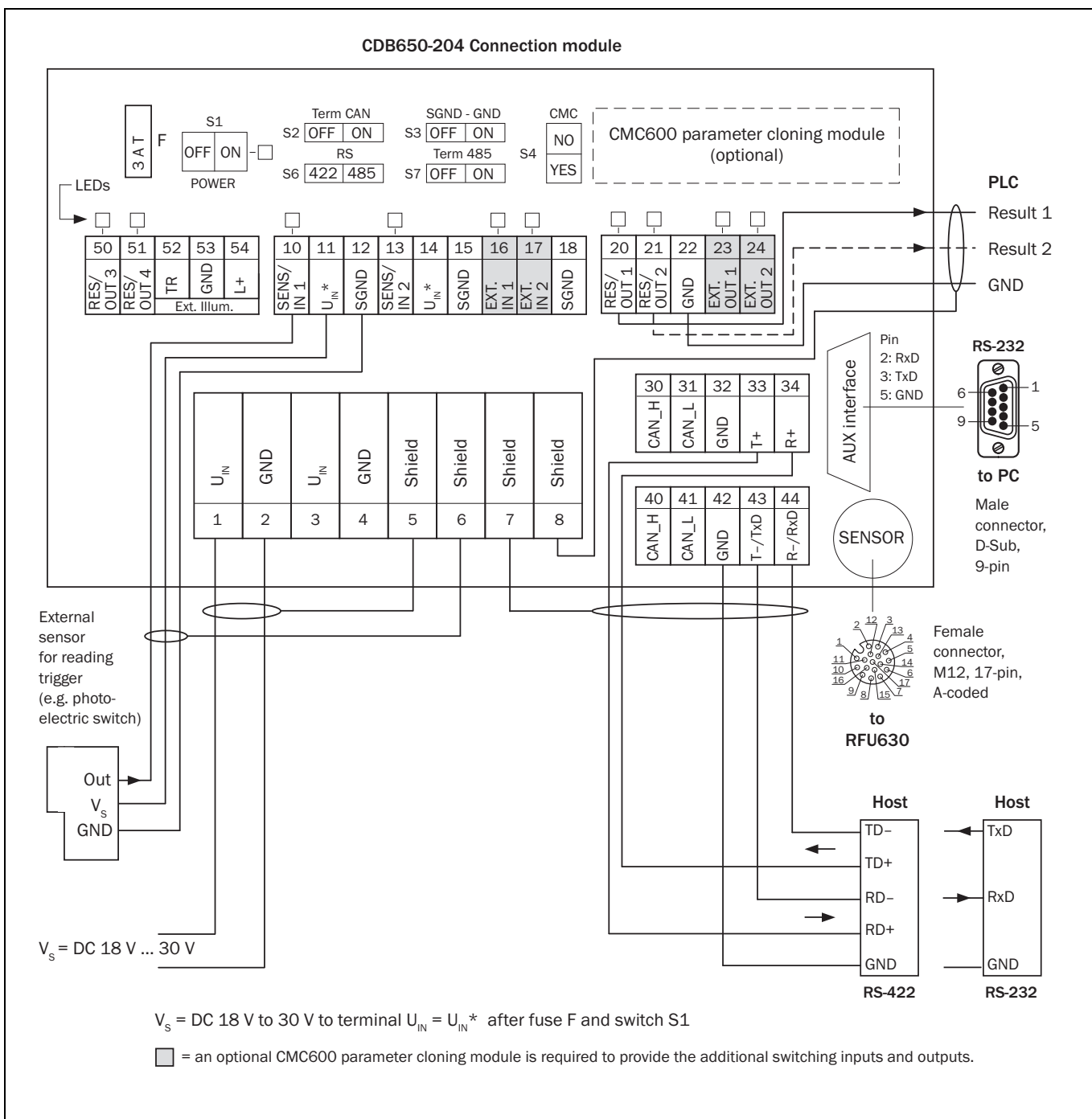
The wiring of the switching outputs is done using the connection module, please see:

Connection module	Switching output	Chapter
CDB650-204	Result 1	Chapter 4.8.11 Wiring the "Result 1" switching output in the CDB650-204 connection module, Page 60
	Result 2	Chapter 4.8.12 Wiring the "Result 2" switching output in the CDB650-204 connection module, Page 61
	External Output 1 („Ext. Out 1“)	Chapter 4.8.13 Wiring the "External output 1" switching output in the CDB650-204 connection module, Page 62
	External Output 2 („Ext. Out 2“)	Chapter 4.8.14 Wiring the "External output 2" switching output in the CDB650-204 connection module, Page 63
CDM420-0006	Result 1	Chapter 4.9.11 Wiring the "Result 1" switching output in the CDM420-0006 connection module, Page 74
	Result 2	Chapter 4.9.12 Wiring the "Result 2" switching output in the CDM420-0006 connection module, Page 75
	External Output 1 („Aux Out 1“)	Chapter 4.9.13 Wiring the "External output 1" switching output in the CDM420-0006 connection module, Page 76
	External Output 2 („Aux Out 2“)	Chapter 4.9.14 Wiring the "External output 2" switching output in the CDM420-0006 connection module, Page 77

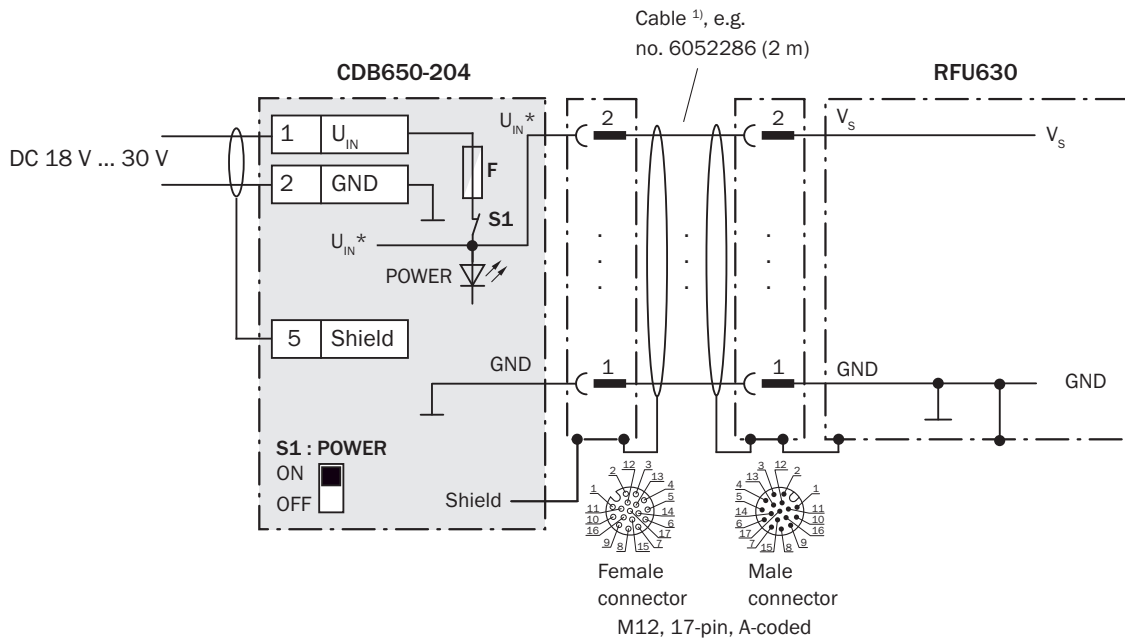
Important Capacitive loads on the switching outputs have an effect on the switch-on and switch-off behavior. The maximum capacity of 100 nF is a limit value.

4.8 Using the CDB650-204 connection module

4.8.1 Wiring overview (one switching input used)



4.8.2 Wiring the supply voltage in the CDB650-204 connection module



V_S = DC 18 V ... 30 V to 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 CDB650-204 and RFU630.
U_{IN}^{*} additionally available on terminals 11 and 14.

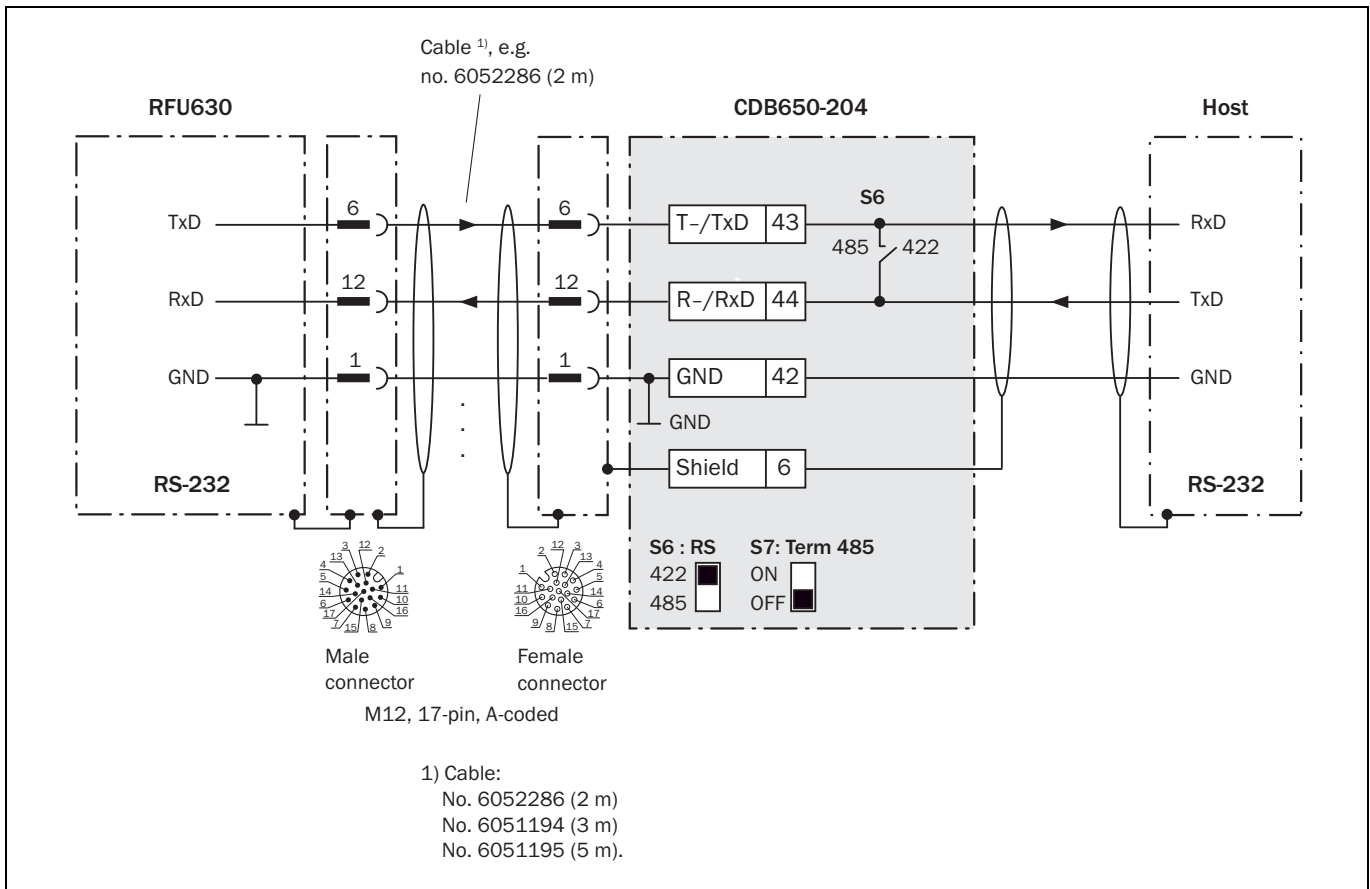
OFF:

CDB650-204 and RFU630 disconnected from power supply voltage.
Recommended position during all electrical installation work.

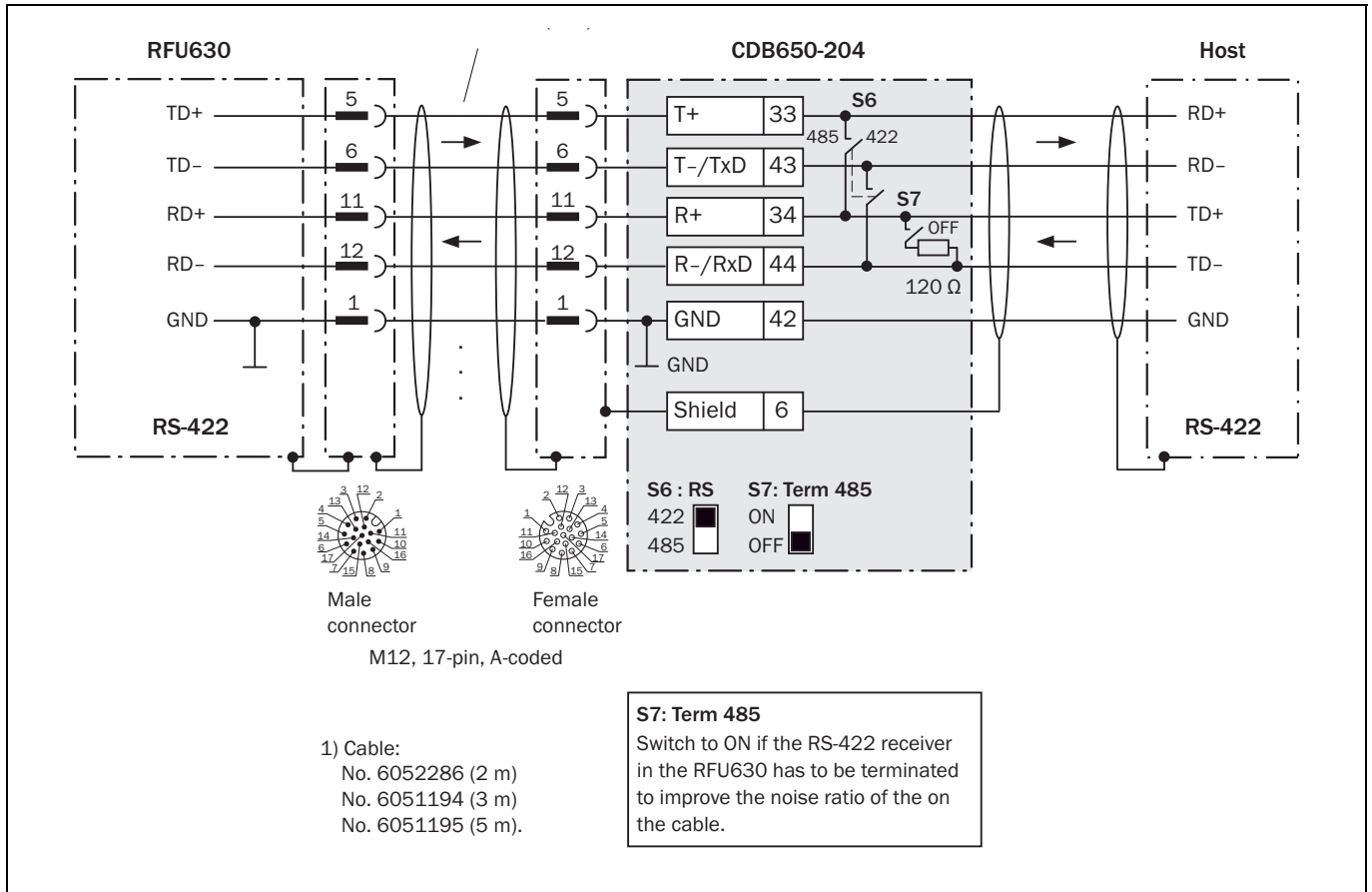
1) Cable:

- No. 6052286 (2 m)
- No. 6051194 (3 m)
- No. 6051195 (5 m).

4.8.3 Wiring the RS-232 serial host data interface in the CDB650-204 connection module



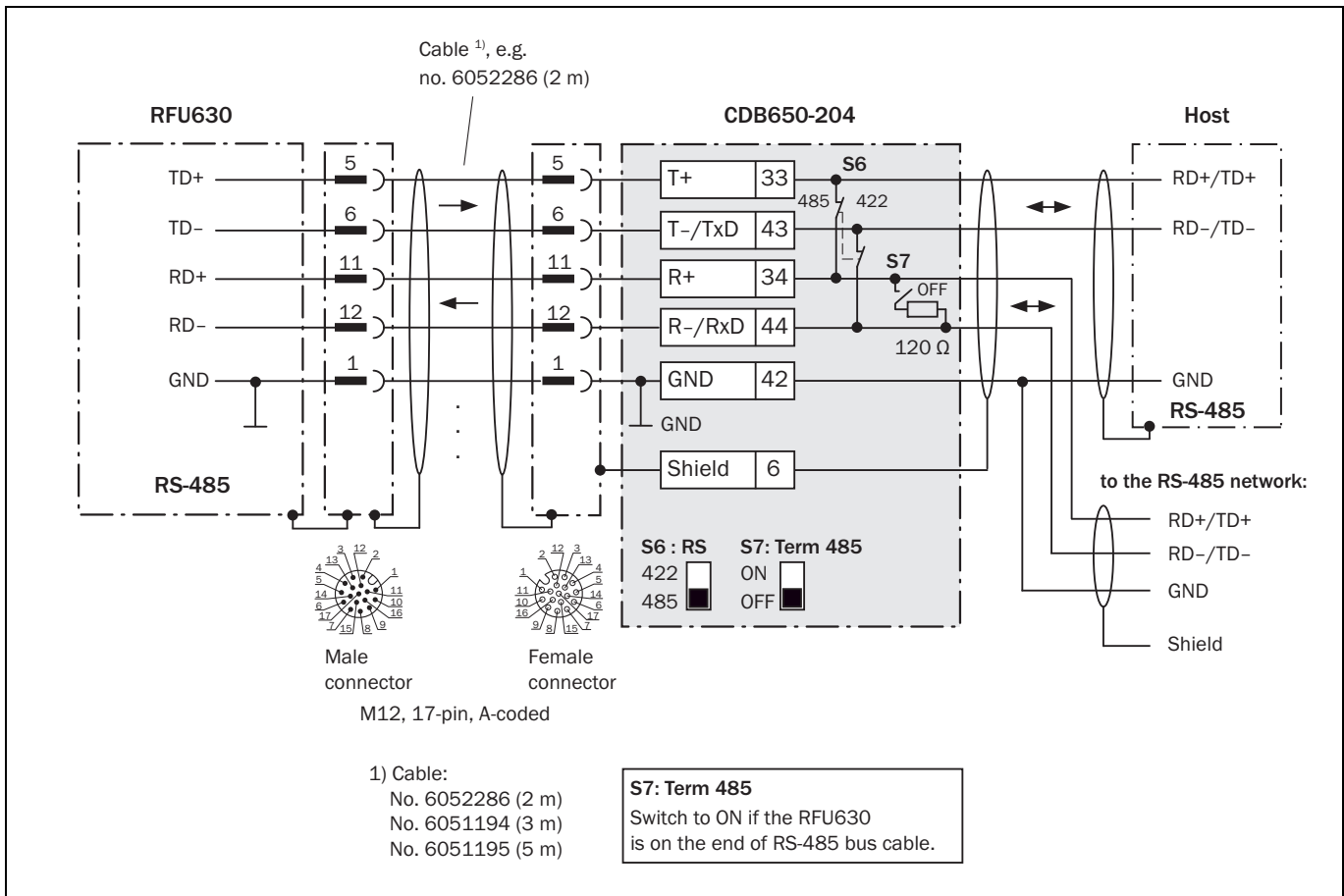
4.8.4 Wiring the RS-422 serial host data interface in the CDB650-204 connection module



Note on using the RS-422 data interface of the RFU630

- The relevant interface drivers for the RFU630 comply with the standard for RS-422 and RS-485
- Activation in the RFU630 with the SOPAS ET configuration software:
 SERIAL HOST INTERFACE/HARDWARE/RS-422/485 4 WIRE (POINT TO POINT) device page
- The connection shown above is configured for operation of the host with permanently activated drivers (often described as "RS-422 operation"). I.e., not RS-485 bus operation.

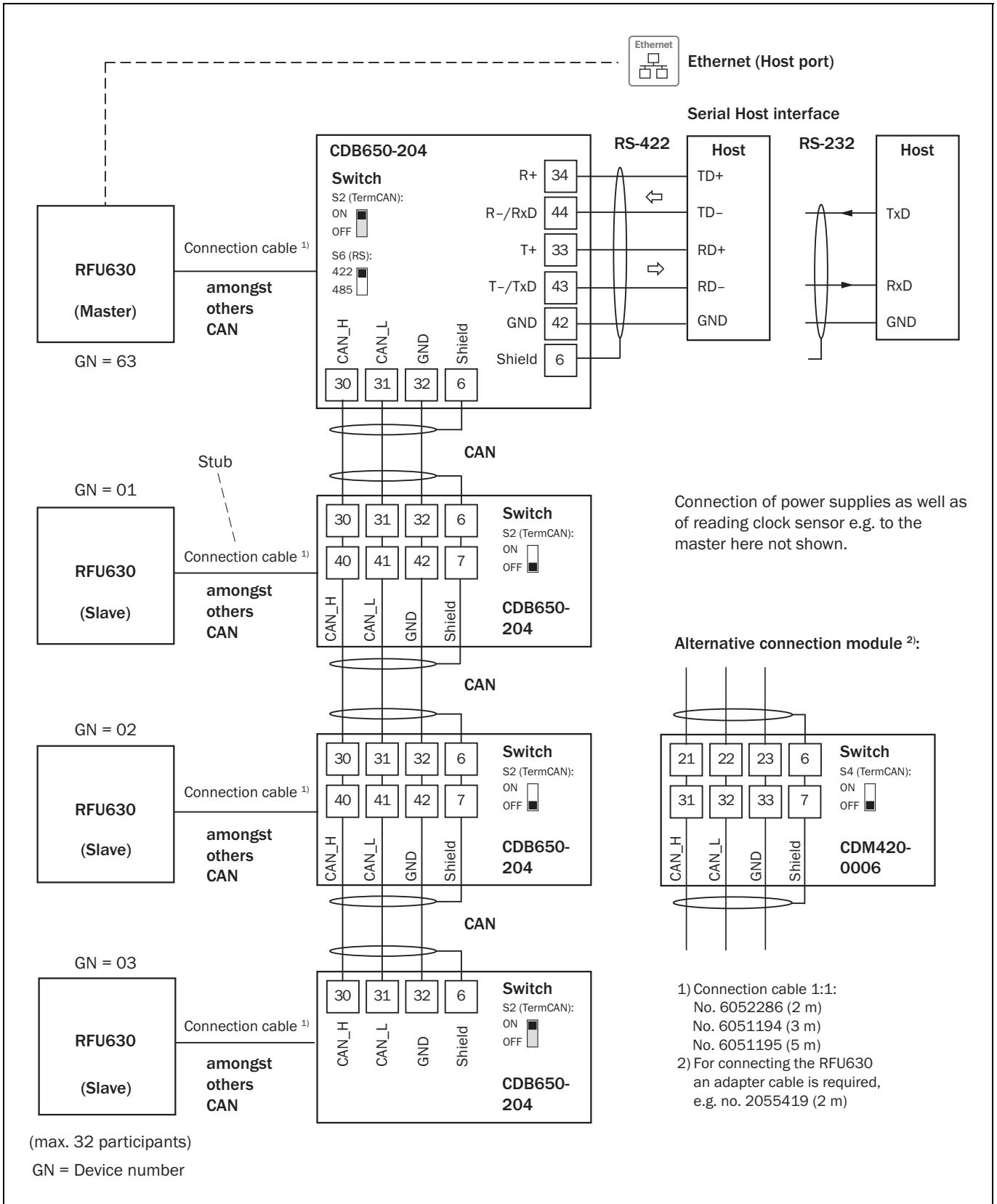
4.8.5 Wiring the RS-485 serial host data interface in the CDB650-204 connection module



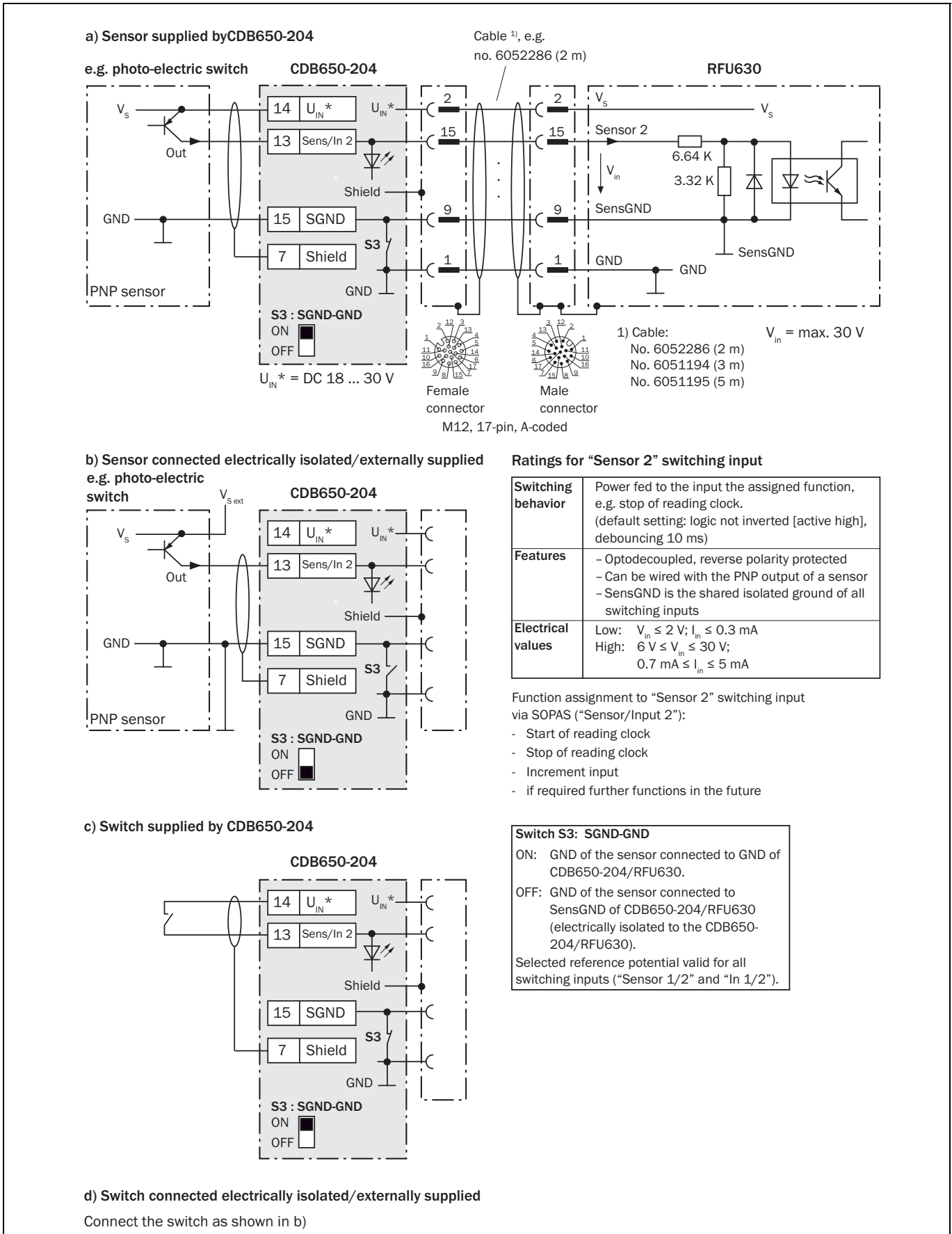
Note on using the RS-485 data interface of the RS-485 des RFU630

- The relevant interface drivers for the RFU630 comply with the standard for RS-422 and RS-485
- This operating mode is only permitted if all connected devices (RFU630 and host) use a corresponding RS-485 protocol
- Activation in the RFU630 with the SOPAS ET configuration software:
SERIAL HOST INTERFACE/HARDWARE/RS-485 4 WIRE (Bus) device page
- This configuration is not permitted in the standard data output/protocol for the RFU630. In case of doubt, contact SICK Service

4.8.6 Wiring the CAN interface in the CDB650-204 connection module

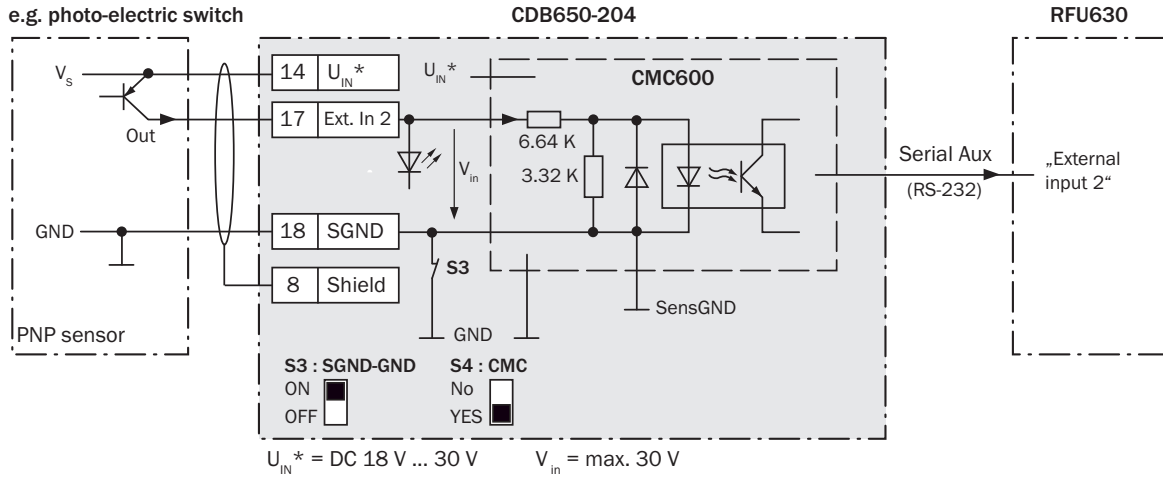


4.8.8 Wiring the "Sensor 2" switching input in the CDB650-204 connection module

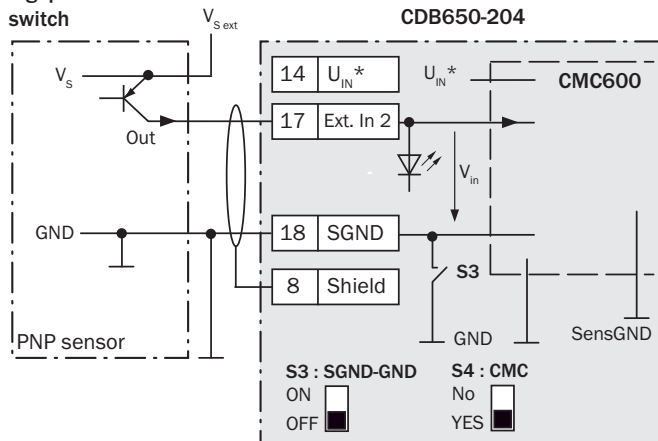


4.8.10 Wiring the "External input 2" switching input in the CDB650-204 connection module

a) Sensor supplied by CDB650-204



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

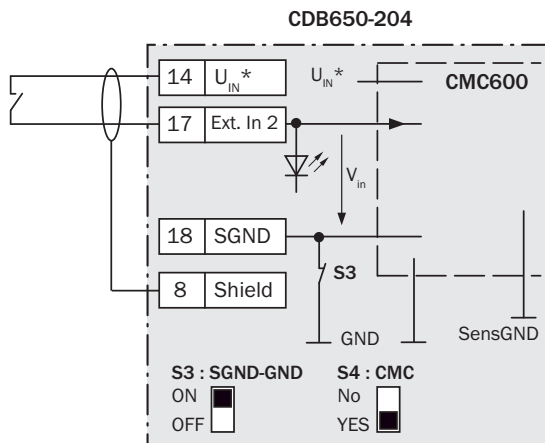


Software-controlled, the CMC600 transfers the switching status of its physical "Ext. In 2" input automatically via the cable to the serial Aux data interface of the RFU630. The RFU630 converts the status internally to its logical "External input 2".

Ratings for "External input 2" ("Ext. In 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 - SensGND is the shared isolated ground of all switching inputs
Electrical values	Low: V _{in} ≤ 2 V; I _{in} ≤ 0.3 mA High: 6 V ≤ V _{in} ≤ 30 V; 0.7 mA ≤ I _{in} ≤ 5 mA

c) Switch supplied by CDB650-204



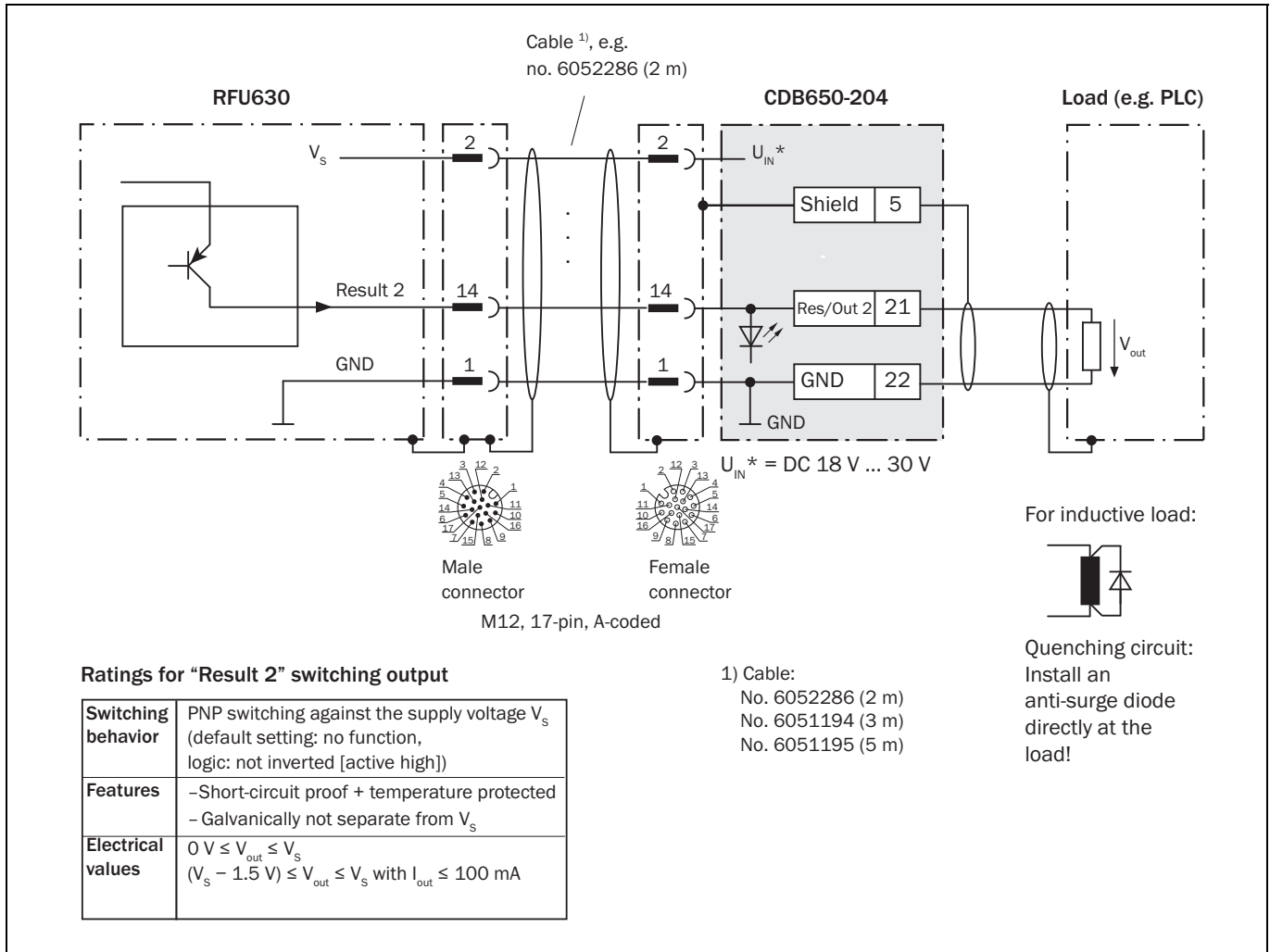
Function assignment to "External input 2" switching input via SOPAS:

- Start of reading clock
- Stop of reading clock
- if required further functions in the future

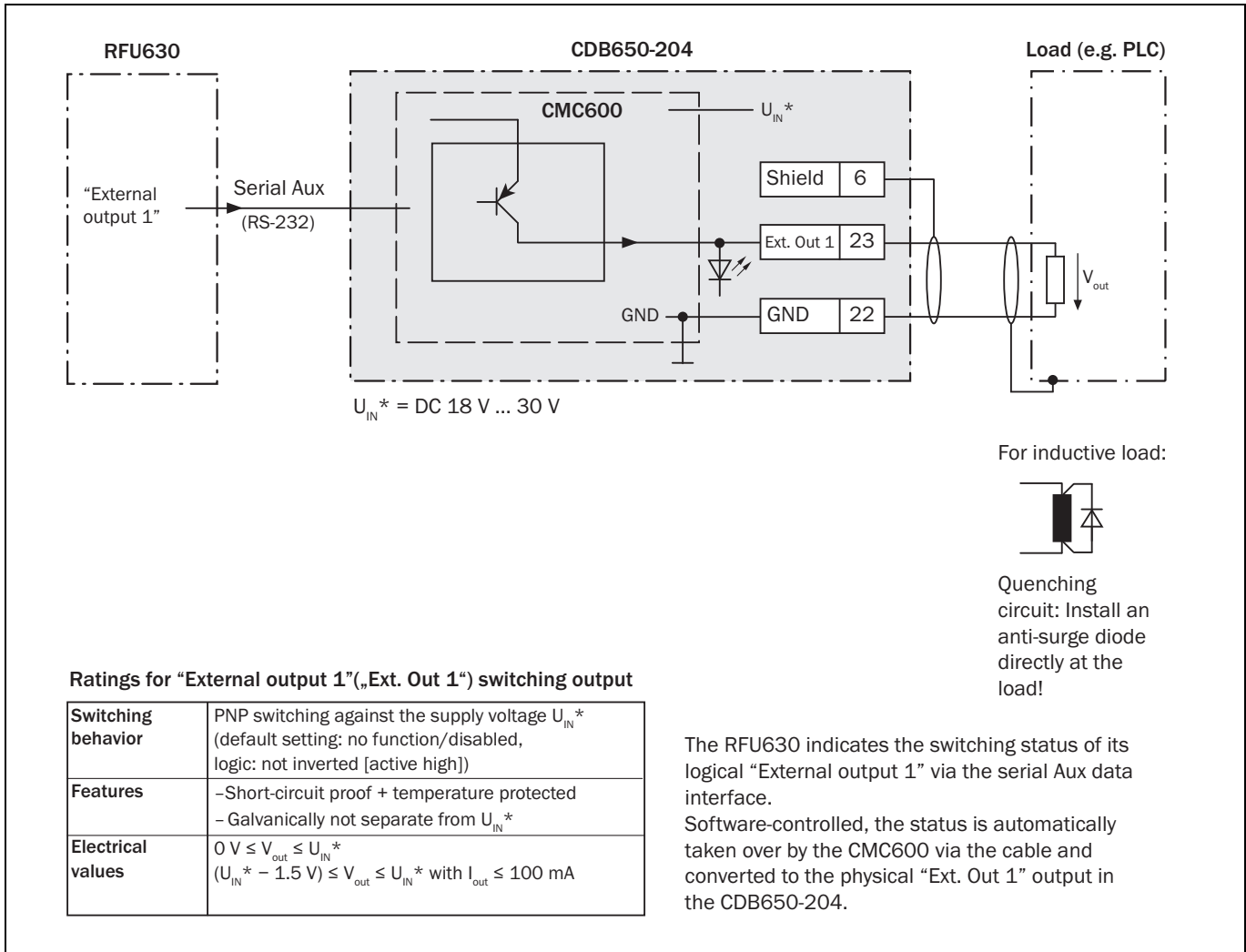
Switch S3: SGND-GND
ON: GND of the sensor connected to GND of CDB650-204/CMC600.
OFF: Sensor connected electrically isolated to the CDB650-204/CMC600.
Reference potential valid for all switching inputs ("Sensor 1/2" and "In 1/2")

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

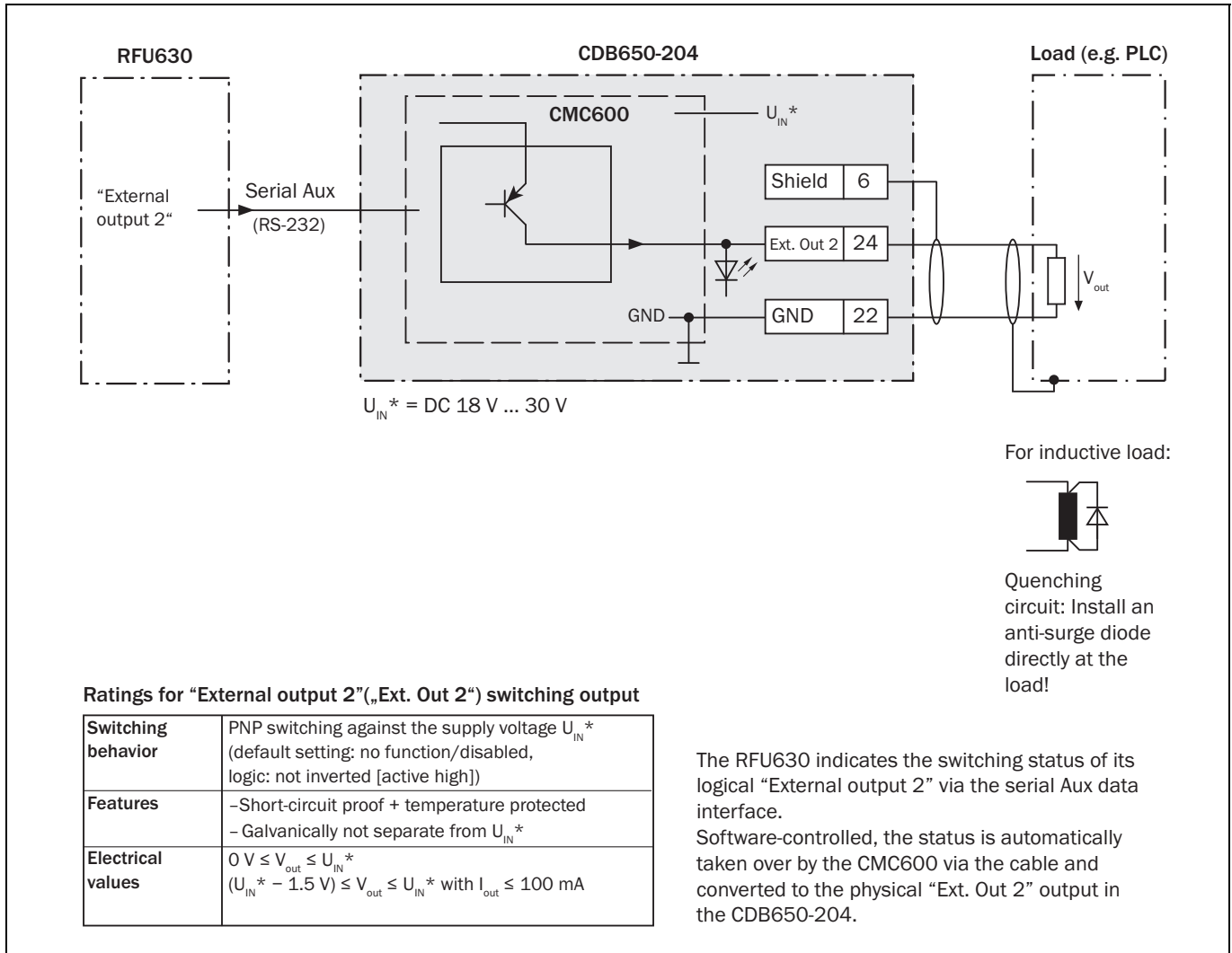
4.8.12 Wiring the "Result 2" switching output in the CDB650-204 connection module



4.8.13 Wiring the "External output 1" switching output in the CDB650-204 connection module

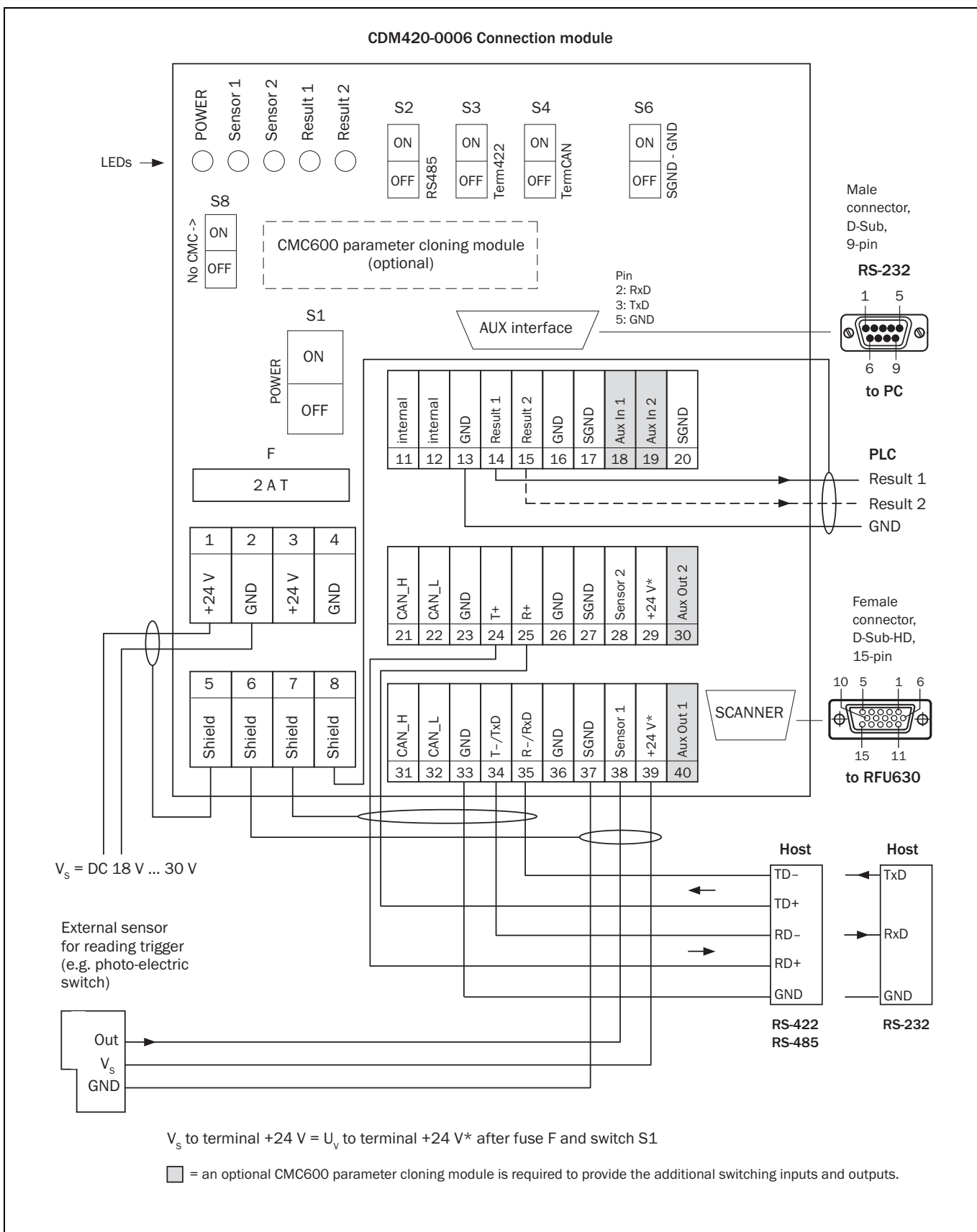


4.8.14 Wiring the "External output 2" switching output in the CDB650-204 connection module

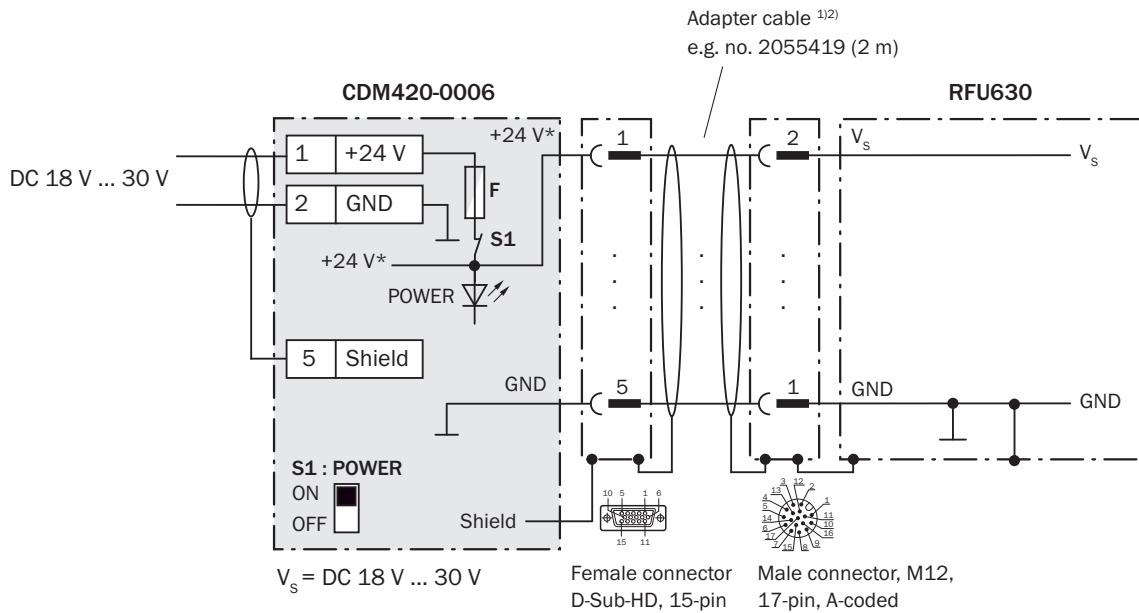


4.9 Using the CDM420-0006 connection module

4.9.1 Wiring overview (one switching input used)



4.9.2 Wiring the supply voltage in the CDM420-0006 connection module



V_s to terminal +24 V = U_v to terminal +24 V* after fuse F and switch S1

Switch S1:

ON:

Power supply voltage U_v (+24 V) switched to U_v (+24 V*) via fuse to CDM420-0006 and RFU630.
 U_v (+24 V*) additionally available on terminals 29 and 39.

OFF:

CDM420-0006 and RFU630 disconnected from power supply voltage.
Recommended position during all electrical installation work.

Pin and wire color assignment of prefabricated cables

Signal	Adapter cable ¹⁾²⁾		Adapter cable ³⁾⁴⁾⁵⁾⁶⁾				
	Female connector, M12, 17-pin	Male connector, D-Sub HD, 15-pin	Female connector, M12, 17-pin	Open end ³⁾ , 17 cores	Open end ⁴⁾ , 17 cores	Open end ⁵⁾ , 17 cores	Open end ⁶⁾ , 2 core
V_s	2	1	2	Blue	Brown	White	Blue
GND	1	5	1	Brown	Blue	Gray	Brown

1) Adapter cable no. 2056184 (0.35 m), no. 2049764 (0.9 m), no. 2055419 (2 m), no. 2055420 (3 m), no. 2055859 (5 m)

2) Adapter cable, suitable for drag chain use, no. 2061480 (2 m), no. 2061605 (3 m), no. 2061481 (5 m)

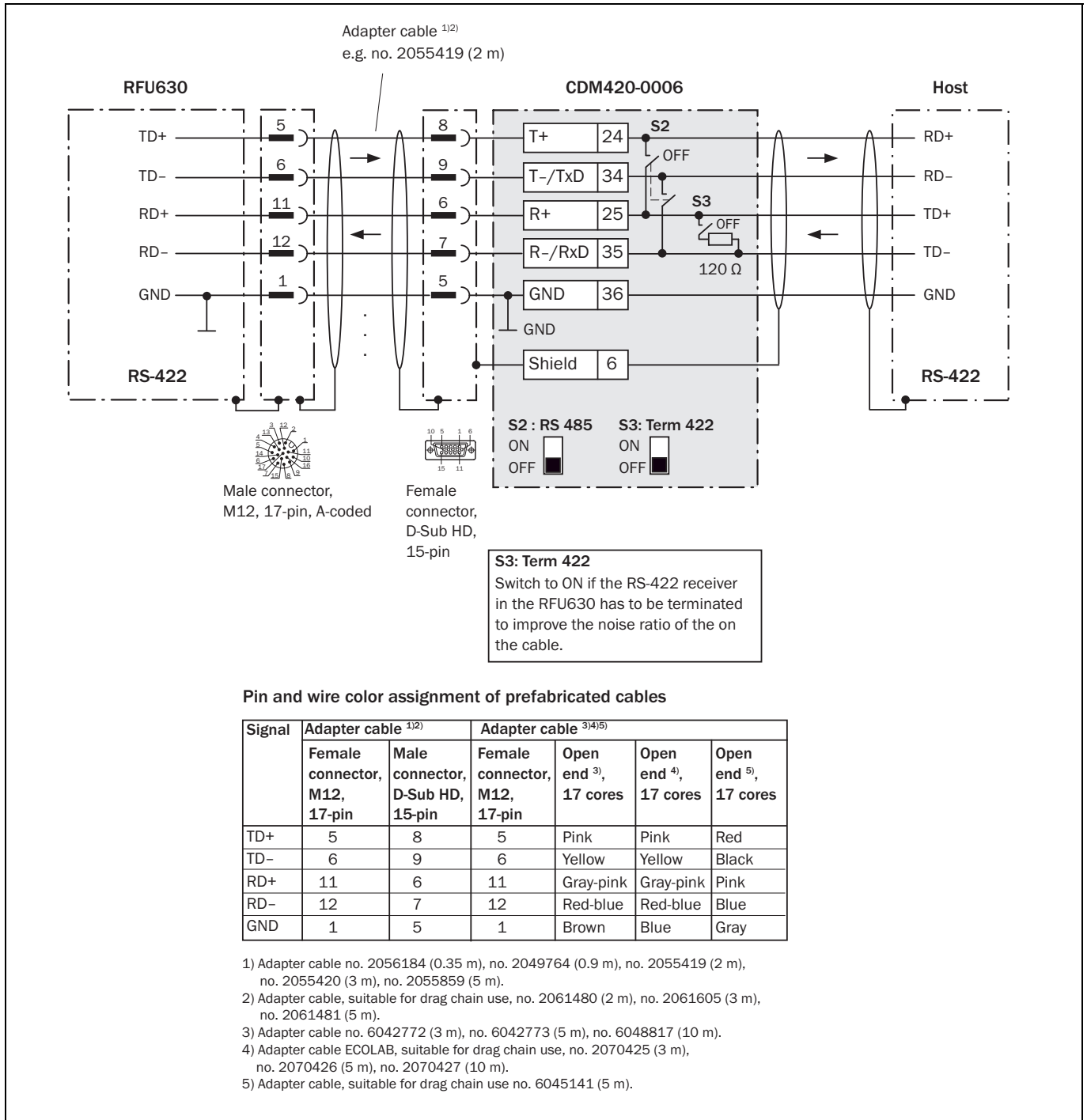
3) Adapter cable no. 6042772 (3 m), no. 6042773 (5 m), no. 6048817 (10 m)

4) Adapter cable ECOLAB, suitable for drag chain use, no. 2070425 (3 m), no. 2070426 (5 m), no. 2070427 (10 m)

5) Adapter cable, suitable for drag chain use, no. 6045141 (5 m)

6) Adapter cable no. 6048319 (10 m)

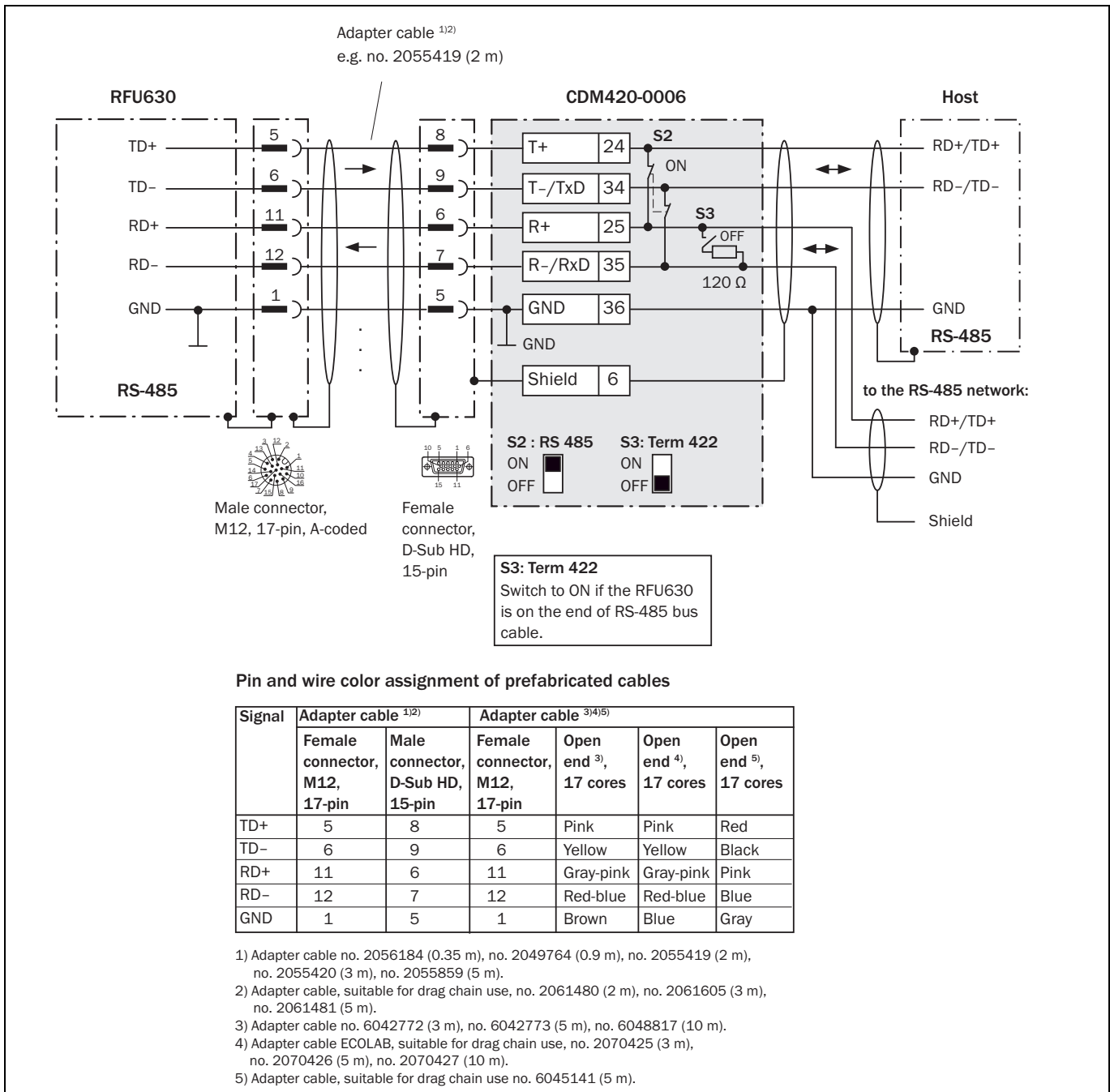
4.9.4 Wiring the RS-422 serial host data interface in the CDM420-0006 connection module



Note on using the RS-422 data interface of the RFU630

- The relevant interface drivers for the RFU630 comply with the standard for RS-422 and RS-485
- Activation in the RFU630 with the SOPAS ET configuration software:
SERIAL HOST INTERFACE/HARDWARE/RS-422/485 4 WIRE (POINT TO POINT) device page
- The connection shown above is configured for operation of the host with permanently activated drivers (often described as "RS-422 operation"). I.e., not RS-485 bus operation.

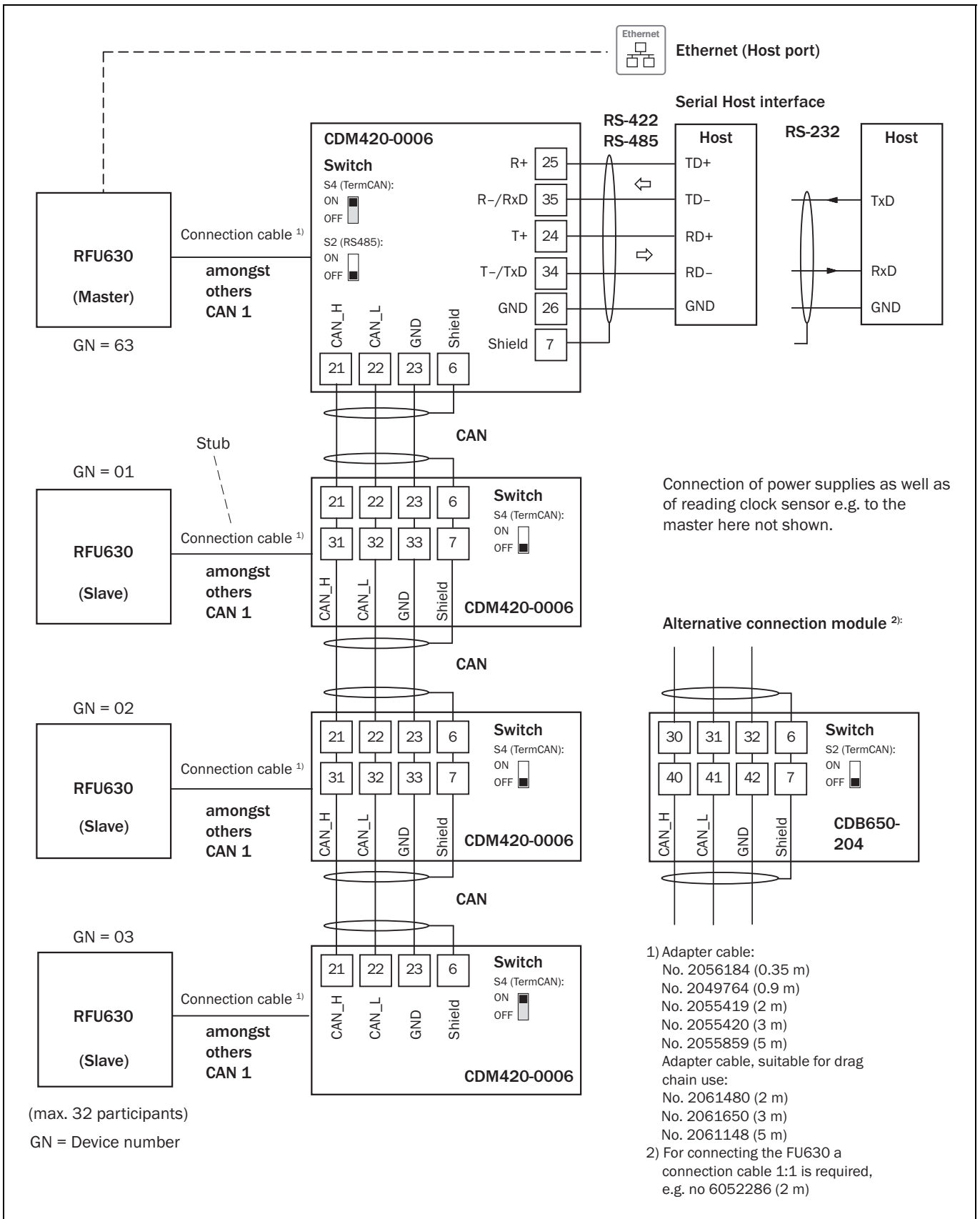
4.9.5 Wiring the RS-485 serial host data interface in the CDM420-0006 connection module



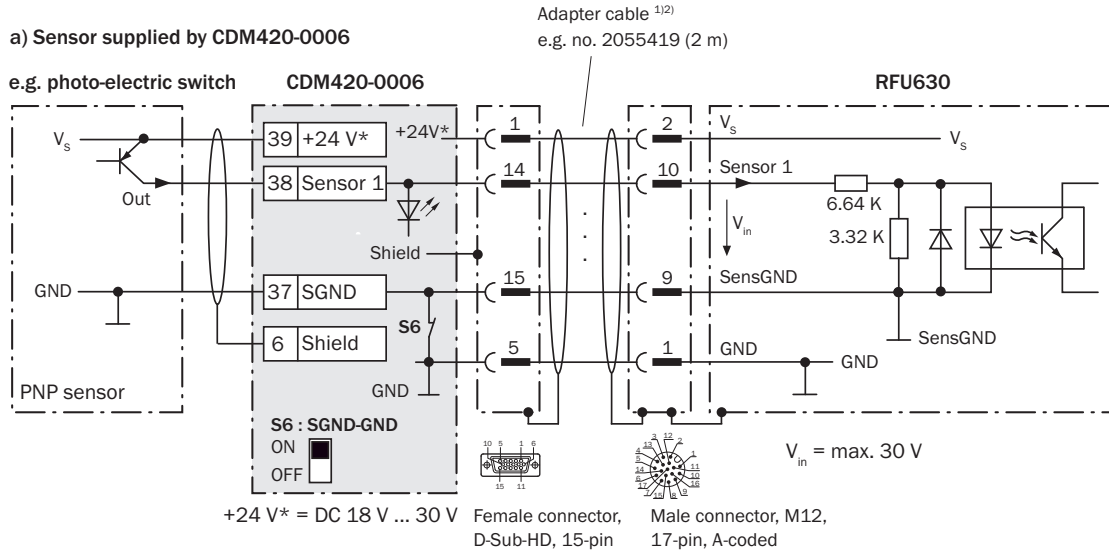
Note on using the RS-485 data interface of the RS-485 des RFU630

- The relevant interface drivers for the RFU630 comply with the standard for RS-422 and RS-485
- This operating mode is only permitted if all connected devices (RFU630 and host) use a corresponding RS-485 protocol
- Activation in the RFU630 with the SOPAS ET configuration software:
SERIAL HOST INTERFACE/HARDWARE/RS-485 4 WIRE (BUS) device page
- This configuration is not permitted in the standard data output/protocol for the RFU630. In case of doubt, contact SICK Service

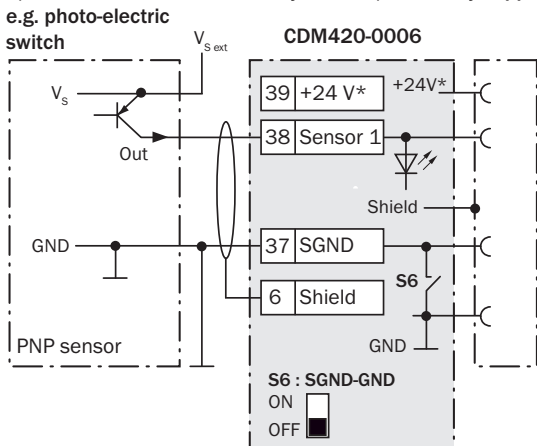
4.9.6 Wiring the CAN interface in the CDM420-0006 connection module



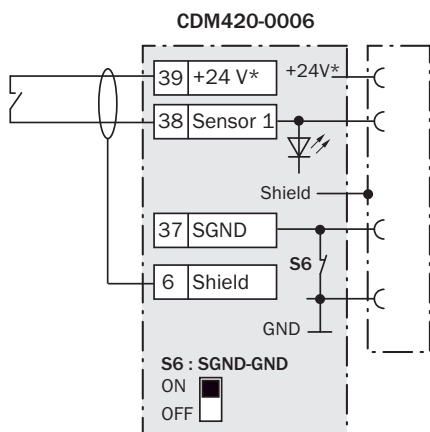
4.9.7 Wiring the "Sensor 1" switching input in the CDM420-0006 connection module



b) Sensor connected electrically isolated/externally supplied



c) Switch supplied by CDM420-0006



d) Switch connected electrically isolated/externally supplied

Connect the switch as shown in b)

Pin and wire color assignment of prefabricated cables

Signal	Adapter cable ¹⁾²⁾		Adapter cable ³⁾⁴⁾⁵⁾			
	Female connector, M12, 17-pin	Male connector, D-Sub HD, 15-pin	Female connector, M12, 17-pin	Open end ³⁾ , 17 cores	Open end ⁴⁾ , 17 cores	Open end ⁵⁾ , 17 cores
V _s	2	1	2	Blue	Brown	White
Sensor 1	10	14	10	Purple	Purple	Brown-green
SensGND	9	15	9	Red	White-black	White-yellow
GND	1	5	1	Brown	Blue	Gray

- 1) Adapter cable no. 2056184 (0.35 m), no. 2049764 (0.9 m), no. 2055419 (2 m), no. 2055420 (3 m), no. 2055859 (5 m)
- 2) Adapter cable, suitable for drag chain use, no. 2061480 (2 m), no. 2061605 (3 m), no. 2061481 (5 m)
- 3) Adapter cable no. 6042772 (3 m), no. 6042773 (5 m), no. 6048817 (10 m)
- 4) Adapter cable ECOLAB, suitable for drag chain use, no. 2070425 (3 m), no. 2070426 (5 m), no. 2070427 (10 m)
- 5) Adapter cable, suitable for drag chain use, no. 6045141 (5 m)

Ratings for "Sensor 1" switching input

Switching behavior	Power fed to the input the assigned function, e.g. start of reading clock. (default setting: logic not inverted [active high], debouncing 10 ms)
Features	<ul style="list-style-type: none"> - Optodecoupled, reverse polarity protected - Can be wired with the PNP output of a sensor - SensGND is the shared isolated ground of all switching inputs
Electrical values	Low: $V_{in} \leq 2\text{ V}; I_{in} \leq 0.3\text{ mA}$ High: $6\text{ V} \leq V_{in} \leq 30\text{ V}; 0.7\text{ mA} \leq I_{in} \leq 5\text{ mA}$

Function assignment to "Sensor 1" switching input via SOPAS ("Sensor/Input 1"):

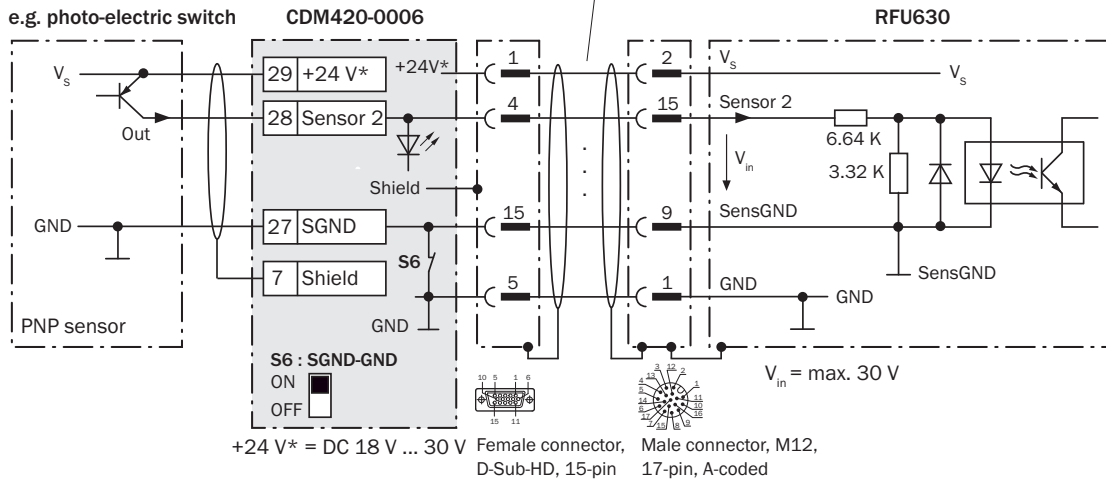
- Start or stop of reading clock
- Increment input
- if required further functions in the future

Switch S6: SGND-GND

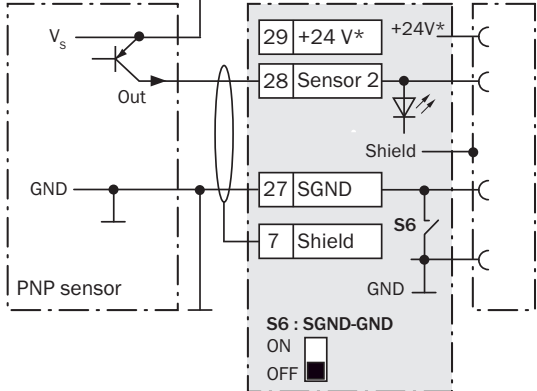
ON: GND of the sensor connected to GND of CDM420-0006/RFU630.
 OFF: GND of the sensor connected to SensGND of CDM420-0006/RFU630 (electrically isolated to the CDM420-0006/RFU630).
 Selected reference potential valid for all switching inputs ("Sensor 1/2" and "Aux In 1/2").

4.9.8 Wiring the "Sensor 2" switching input in the CDM420-0006 connection module

a) Sensor supplied by CDM420-0006



b) Sensor connected electrically isolated/externally supplied



Pin and wire color assignment of prefabricated cables

Signal	Adapter cable ^{1/2)}		Adapter cable ^{3/4/5)}			
	Female connector, M12, 17-pin	Male connector, D-Sub HD, 15-pin	Female connector, M12, 17-pin	Open end ³⁾ , 17 cores	Open end ⁴⁾ , 17 cores	Open end ⁵⁾ , 17 cores
V_s	2	1	2	Blue	Brown	White
Sensor 2	15	4	15	White-yellow	White-yellow	Yellow
SensGND	9	15	9	Red	White-black	White-yellow
GND	1	5	1	Brown	Blue	Gray

- 1) Adapter cable no. 2056184 (0.35 m), no. 2049764 (0.9 m), no. 2055419 (2 m), no. 2055420 (3 m), no. 2055859 (5 m)
- 2) Adapter cable, suitable for drag chain use, no. 2061480 (2 m), no. 2061605 (3 m), no. 2061481 (5 m)
- 3) Adapter cable no. 6042772 (3 m), no. 6042773 (5 m), no. 6048817 (10 m)
- 4) Adapter cable ECOLAB, suitable for drag chain use, no. 2070425 (3 m), no. 2070426 (5 m), no. 2070427 (10 m)
- 5) Adapter cable, suitable for drag chain use, no. 6045141 (5 m)

Ratings for "Sensor 2" switching input

Switching behavior	Power fed to the input the assigned function, e.g. stop of reading clock. (default setting: logic not inverted [active high], debouncing 10 ms)
Features	<ul style="list-style-type: none"> - Optodecoupled, reverse polarity protected - Can be wired with the PNP output of a sensor - SensGND is the shared isolated ground of all switching inputs
Electrical values	Low: $V_{in} \leq 2 V$; $I_{in} \leq 0.3 mA$ High: $6 V \leq V_{in} \leq 30 V$; $0.7 mA \leq I_{in} \leq 5 mA$

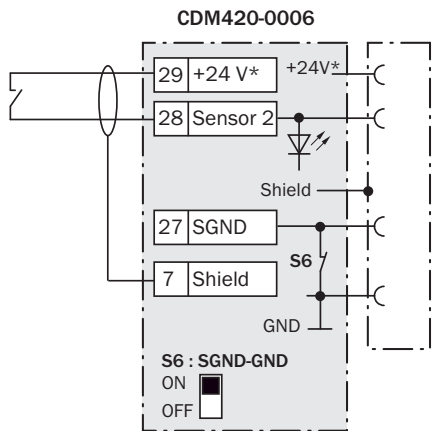
Function assignment to "Sensor 2" switching input via SOPAS ("Sensor/Input 2"):

- Start or stop of reading clock
- Increment input
- if required further functions in the future

Switch S6: SGND-GND

ON: GND of the sensor connected to GND of CDM420-0006/RFU630.
 OFF: GND of the sensor connected to SensGND of CDM420-0006/RFU630 (electrically isolated to the CDM420-0006/RFU630).
 Selected reference potential valid for all switching inputs ("Sensor 1/2" and "Aux In 1/2").

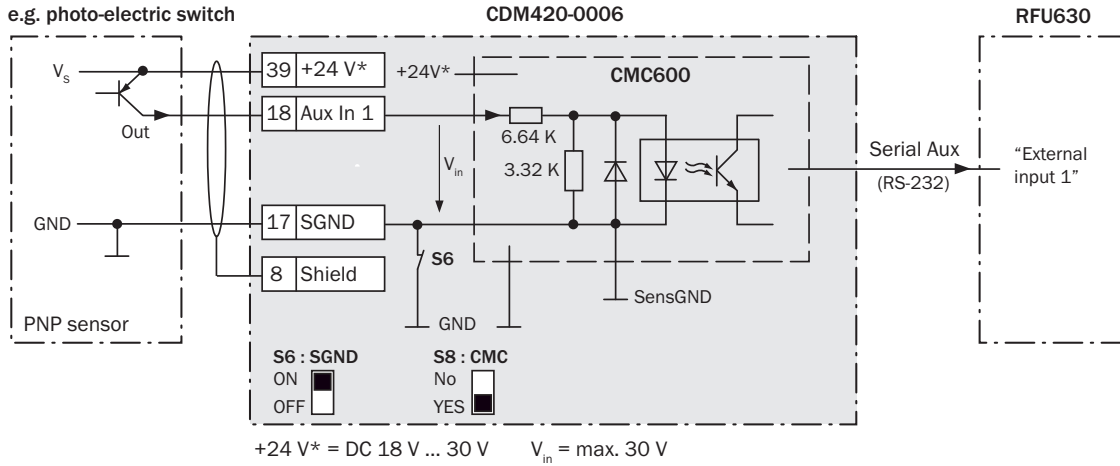
c) Switch supplied by CDM420-0006



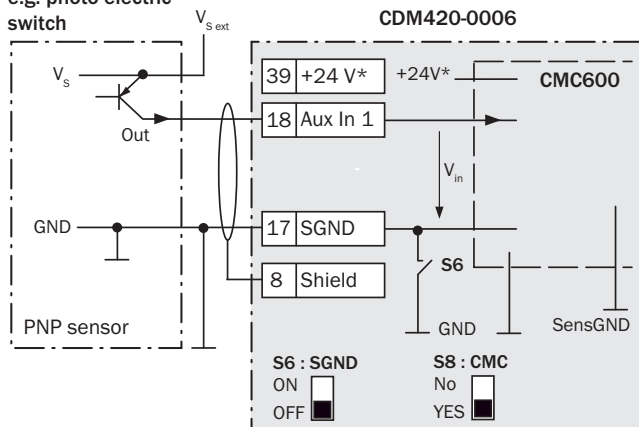
d) Switch connected electrically isolated/externally supplied
 Connect the switch as shown in b)

4.9.9 Wiring the "External input 1" switching input in the CDM420-0006 connection module

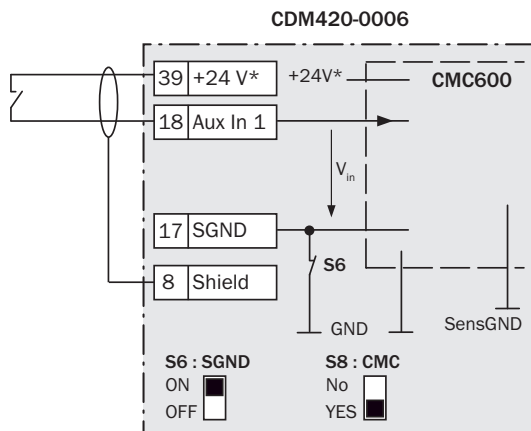
a) Sensor supplied by CDM420-0006



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



c) Switch supplied by CDM420-0006



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 "Aux In 1" input automatically via the cable to the serial Aux data interface of the RFU630. The RFU630 converts the status internally to its logical "External input 1".

Ratings for "External input 1" ("Aux 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 - SensGND is the shared isolated ground of all switching inputs
Electrical values	Low: $V_{in} \leq 2 \text{ V}; I_{in} \leq 0.3 \text{ mA}$ High: $6 \text{ V} \leq V_{in} \leq 30 \text{ V}; 0.7 \text{ mA} \leq I_{in} \leq 5 \text{ mA}$

Function assignment to "External input 1" via SOPAS:

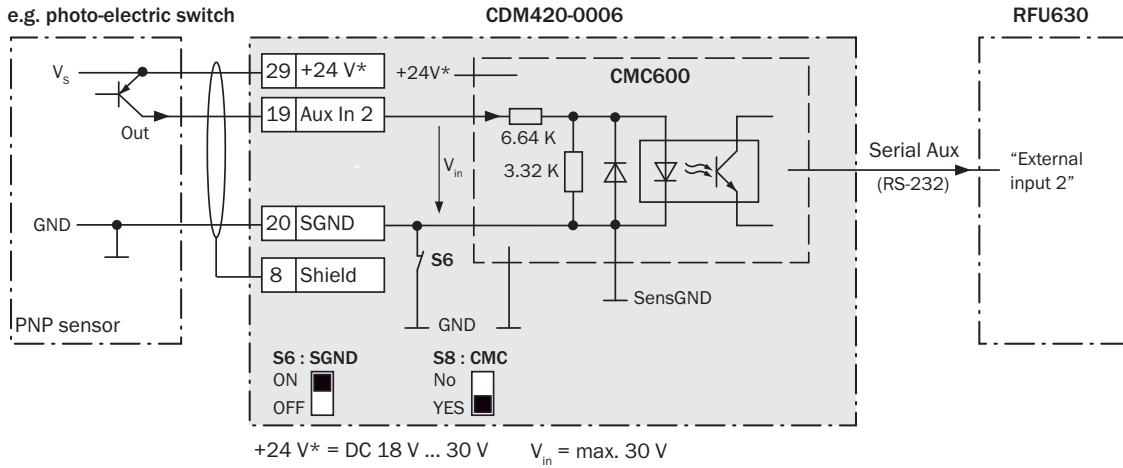
- Start of reading clock
- Stop of reading clock
- if required further functions in the future

Switch S6: SGND-GND

ON: GND of the sensor connected to GND of CDM420-0006/CMC600.
OFF: GND of the sensor connected to SensGND of CDM420-0006/RFU630 (electrically isolated to the CDM420-0006/RFU630).
Selected reference potential valid for all switching inputs ("Sensor 1/2" and "Aux In 1/2")

4.9.10 Wiring the "External input 2" switching input in the CDM420-0006 connection module

a) Sensor supplied by CDM420-0006



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

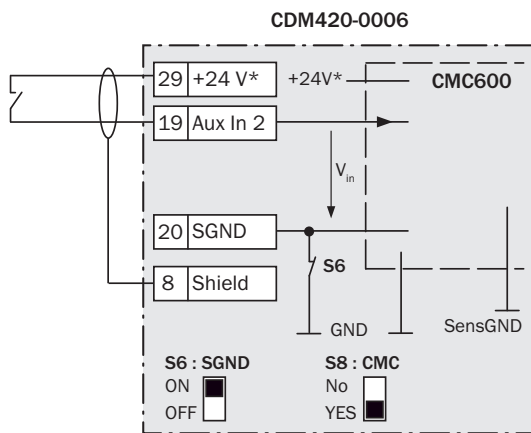


Software-controlled, the CMC600 transfers the switching status of its physical "Aux In 2" input automatically via the cable to the serial Aux data interface of the RFU630. The RFU630 converts the status internally to its logical "External input 2".

Ratings for "External input 2" ("Aux In 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	<ul style="list-style-type: none"> - Optodecoupled, reverse polarity protected - Can be wired with the PNP output of a sensor - SensGND is the shared isolated ground of all switching inputs
Electrical values	Low: $V_{in} \leq 2 \text{ V}; I_{in} \leq 0.3 \text{ mA}$ High: $6 \text{ V} \leq V_{in} \leq 30 \text{ V}; 0.7 \text{ mA} \leq I_{in} \leq 5 \text{ mA}$

c) Switch supplied by CDM420-0006



Function assignment to "External input 2" via SOPAS:

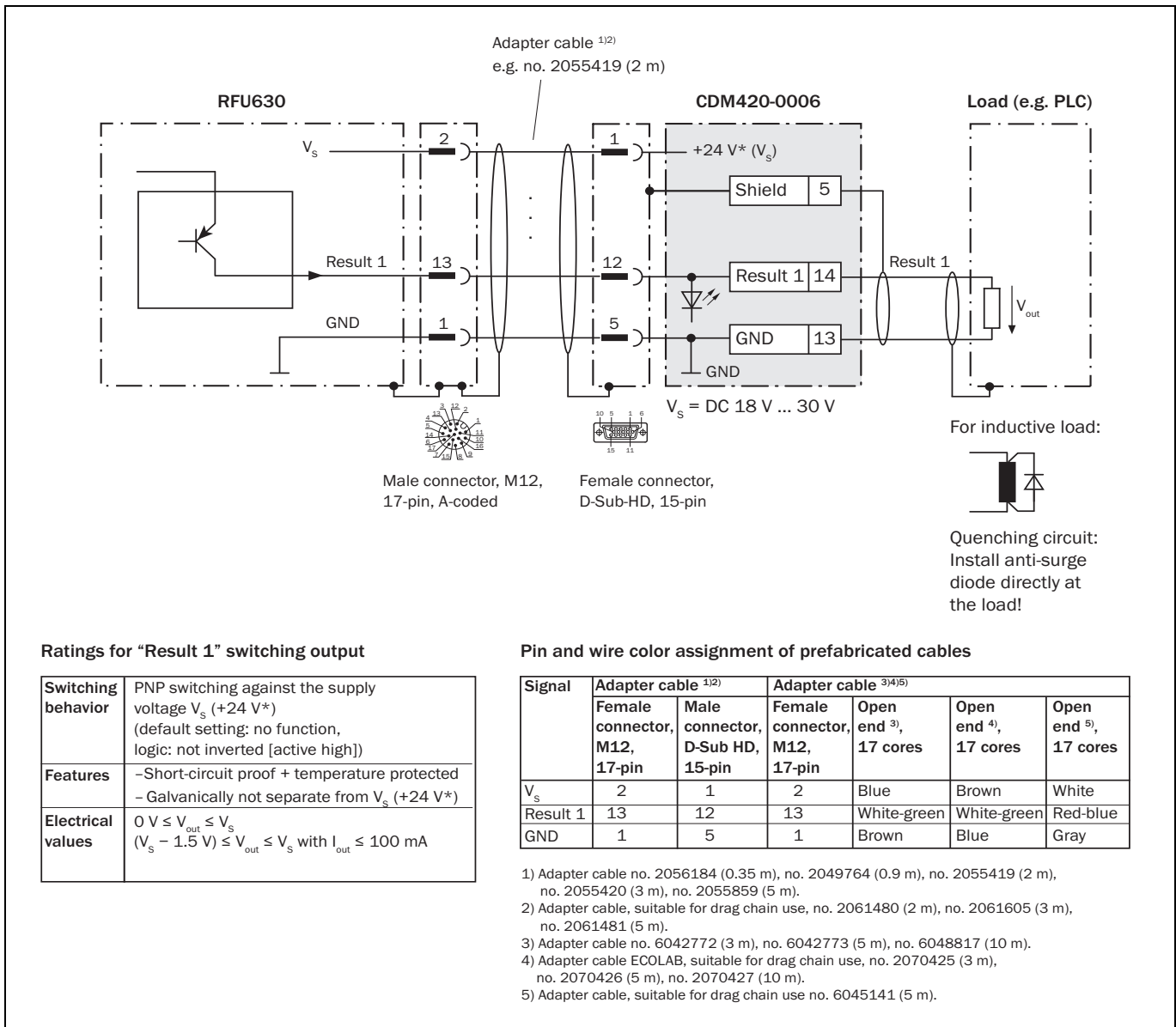
- Start of reading clock
- Stop of reading clock
- if required further functions in the future

Switch S6: SGND-GND
 ON: GND of the sensor connected to GND of CDM420-0006/CMC600.
 OFF: GND of the sensor connected to SensGND of CDM420-0006/RFU630 (electrically isolated to the CDM420-0006/RFU630).
 Selected reference potential valid for all switching inputs ("Sensor 1/2" and "Aux In 1/2")

d) Switch connected electrically isolated and externally supplied

Connect the switch as shown in b)

4.9.11 Wiring the "Result 1" switching output in the CDM420-0006 connection module



4.9.12 Wiring the "Result 2" switching output in the CDM420-0006 connection module

Adapter cable ¹⁾²⁾
e.g. no. 2055419 (2 m)

RFU630
 V_s
 Result 2
 GND

CDM420-0006
 $+24 V^* (V_s)$
 Shield 5
 Result 2 15
 GND 16
 $V_s = DC 18 V \dots 30 V$

Load (e.g. PLC)
 V_{out}

Male connector, M12, 17-pin, A-coded
 Female connector, D-Sub-HD, 15-pin

For inductive load:

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

Ratings for "Result 2" switching output

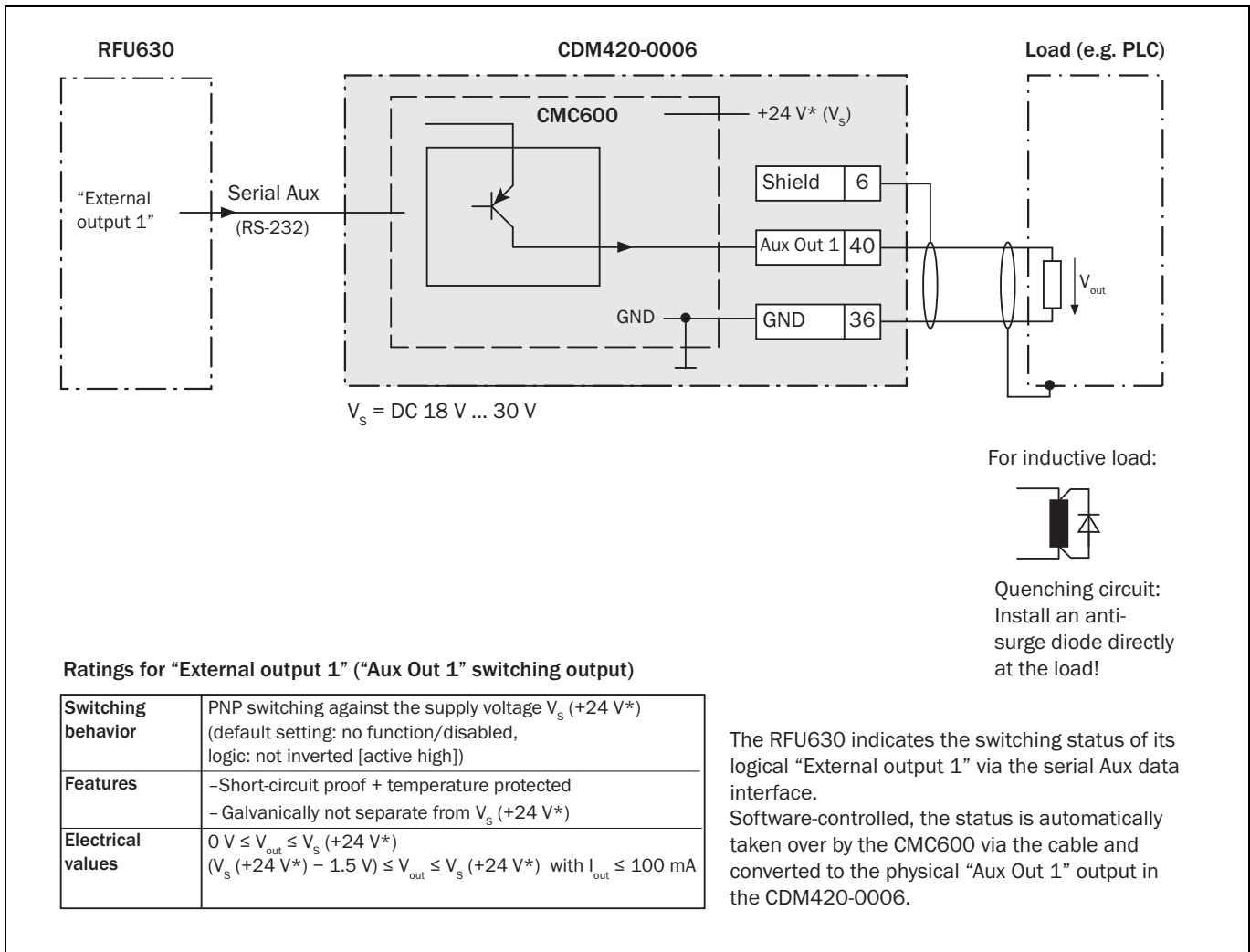
Switching behavior	PNP switching against the supply voltage V_s (+24 V*) (default setting: no function, logic: not inverted [active high])
Features	- Short-circuit proof + temperature protected - Galvanically not separate from V_s (+24 V*)
Electrical values	$0 V \leq V_{out} \leq V_s$ $(V_s - 1.5 V) \leq V_{out} \leq V_s$ with $I_{out} \leq 100 \text{ mA}$

Pin and wire color assignment of prefabricated cables

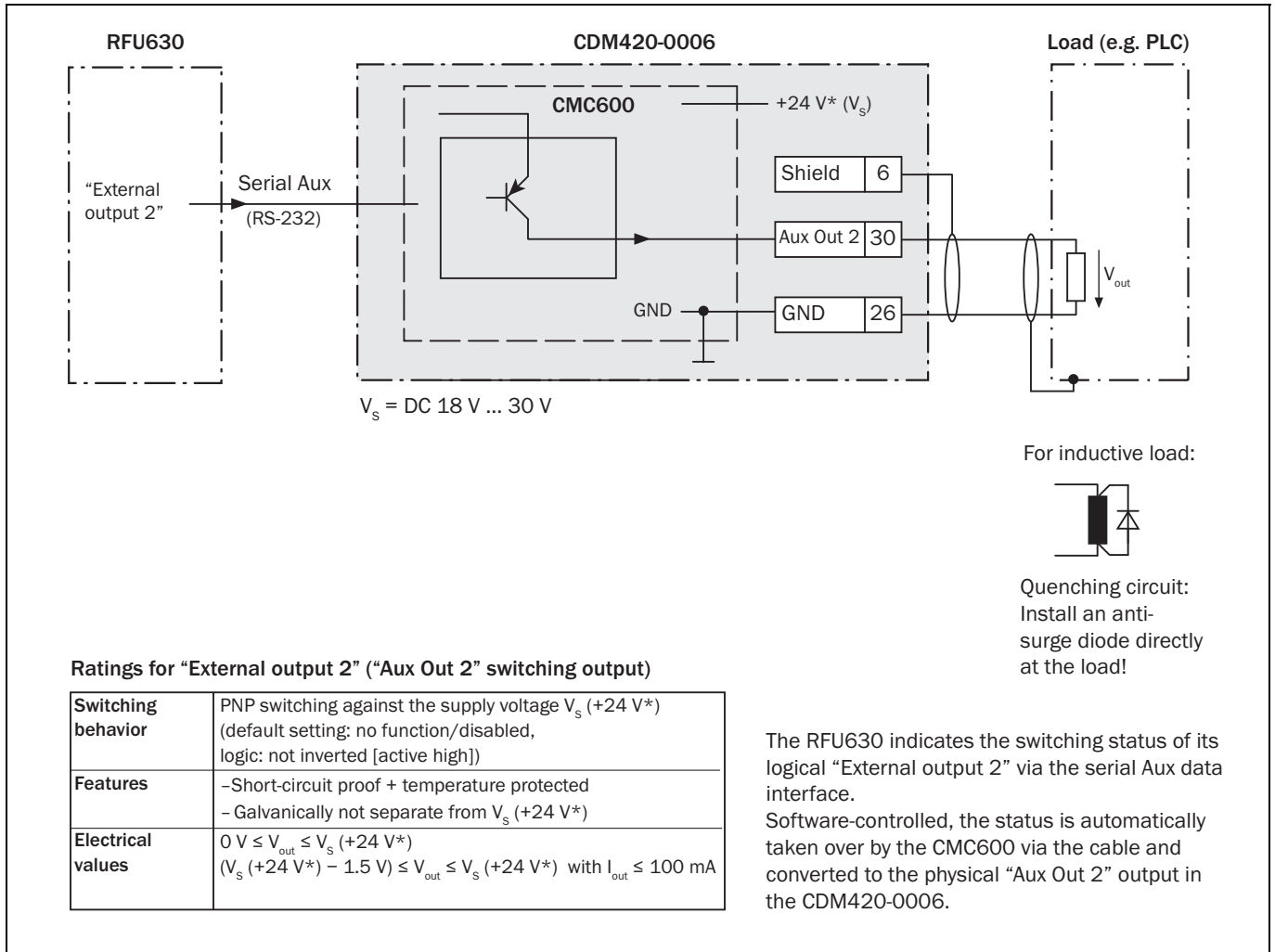
Signal	Adapter cable ¹⁾²⁾		Adapter cable ³⁾⁴⁾⁵⁾			
	M12 female connector, 17-pin	Male connector, D-Sub HD, 15-pin	M12-female connector, 17-pin	Open end ³⁾ , 17 cores	Open end ⁴⁾ , 17 cores	Open end ⁵⁾ , 17 cores
V_s	2	1	2	Blue	Brown	White
Result 2	14	13	14	Brown-green	Brown-green	White-green
GND	1	5	1	Brown	Blue	Gray

1) Adapter cable no. 2056184 (0.35 m), no. 2049764 (0.9 m), no. 2055419 (2 m), no. 2055420 (3 m), no. 2055859 (5 m).
 2) Adapter cable, suitable for drag chain use, no. 2061480 (2 m), no. 2061605 (3 m), no. 2061481 (5 m).
 3) Adapter cable no. 6042772 (3 m), no. 6042773 (5 m), no. 6048817 (10 m).
 4) Adapter cable ECOLAB, suitable for drag chain use, no. 2070425 (3 m), no. 2070426 (5 m), no. 2070427 (10 m).
 5) Adapter cable, suitable for drag chain use no. 6045141 (5 m).

4.9.13 Wiring the "External output 1" switching output in the CDM420-0006 connection module



4.9.14 Wiring the "External output 2" switching output in the CDM420-0006 connection module



Australia

Phone +61 3 9457 0600
1800 334 802 – tollfree
E-Mail sales@sick.com.au

Austria

Phone +43 (0)22 36 62 28 8-0
E-Mail office@sick.at

Belgium/Luxembourg

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

Brazil

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

Canada

Phone +1 905 771 14 44
E-Mail information@sick.com

Czech Republic

Phone +420 2 57 91 18 50
E-Mail sick@sick.cz

Chile

Phone +56 2 2274 7430
E-Mail info@schadler.com

China

Phone +86 4000 121 000
E-Mail info.china@sick.net.cn

Denmark

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

Finland

Phone +358-9-2515 800
E-Mail sick@sick.fi

France

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

Germany

Phone +49 211 5301-301
E-Mail info@sick.de

Great Britain

Phone +44 (0)1727 831121
E-Mail info@sick.co.uk

Hong Kong

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

Hungary

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

India

Phone +91-22-4033 8333
E-Mail info@sick-india.com

Israel

Phone +972-4-6881000
E-Mail info@sick-sensors.com

Italy

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

Japan

Phone +81 (0)3 5309 2112
E-Mail support@sick.jp

Malaysia

Phone +603 808070425
E-Mail enquiry.my@sick.com

Netherlands

Phone +31 (0)30 229 25 44
E-Mail info@sick.nl

New Zealand

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

Norway

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

Poland

Phone +48 22 837 40 50
E-Mail info@sick.pl

Romania

Phone +40 356 171 120
E-Mail office@sick.ro

Russia

Phone +7-495-775-05-30
E-Mail info@sick.ru

Singapore

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

Slovakia

Phone +421 482 901201
E-Mail mail@sick-sk.sk

Slovenia

Phone +386 (0)1-47 69 990
E-Mail office@sick.si

South Africa

Phone +27 11 472 3733
E-Mail info@sickautomation.co.za

South Korea

Phone +82 2 786 6321
E-Mail info@sickkorea.net

Spain

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

Sweden

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

Switzerland

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

Taiwan

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

Thailand

Phone +66 2645 0009
E-Mail tawiwat@sicksgp.com.sg

Turkey

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

United Arab Emirates

Phone +971 (0) 4 88 65 878
E-Mail info@sick.ae

USA/Mexico

Phone +1(952) 941-6780
1 (800) 325-7425 – tollfree
E-Mail info@sick.com

Vietnam

Phone +84 8 62920204
E-Mail Ngo.Duy.Linh@sicksgp.com.sg

More representatives and agencies
at www.sick.com