

oneGRID

Original Operating Instructions



oneGRID | SYSTEM

Table of Contents

1 Foreword	4
2 Safety	4
2.1 Notes and symbols used.....	4
2.2 Term definitions.....	5
2.3 General safety.....	5
2.4 Personnel qualifications.....	6
2.5 Intended use.....	6
2.6 Reasonably foreseeable misuse.....	6
3 General description	6
3.1 smartCAP SMC47.....	7
3.2 smartCAP SMC46.....	7
3.3 SENSORhub SEH11.....	7
3.4 Power supply unit NTS 24-3750.....	8
4 Transport	8
4.1 Storage.....	8
5 Assembly	9
5.1 Install SMC46 and SMC47.....	10
5.1.1 Recommended screw types.....	11
5.1.2 Maximum dimensions of the screws.....	12
5.2 Install SEH11.....	12
5.3 Connect oneGRID System.....	12
5.3.1 Connecting the SMC.....	13
5.3.2 Connect SEH11.....	14
6 Operation	14
6.1 Operation.....	14
6.2 Read out address from the SMC47.....	15
7 Maintenance	15
7.1 Maintenance operations.....	15

8 Disassembly	16
9 Disposal	16
10 Technical specifications	17
10.1 SMC46.....	17
10.1.1 Dimensional drawing SMC46.....	17
10.1.2 Technical specifications SMC46.....	18
10.1.3 SMC46 plug assignment.....	18
10.2 SMC47.....	19
10.2.1 Dimensional drawing SMC47.....	19
10.2.2 Technical specifications SMC47.....	20
10.2.3 SMC47 plug assignment.....	20
10.3 SEH11.....	21
10.3.1 Dimensional drawing SEH11.....	21
10.3.2 Technical specifications SEH11.....	22
10.3.3 RS232 plug assignment.....	22
10.3.4 RJ45 plug assignment.....	23
10.4 Cable.....	23
10.4.1 Dimensional drawing cable.....	23
10.4.2 Technical specifications cable PVC 0.34 mm ²	24
10.4.3 Technical specifications cable PUR 0.5 mm ² (optional).....	24
10.5 NTS 24-3750.....	25
10.5.1 Dimensional drawing NTS 24-3750.....	25
10.5.2 Technical data NTS 24-3750.....	25
10.6 Load resistor.....	26
10.6.1 Load resistor dimensional drawing.....	26
10.6.2 Load resistor technical specifications.....	26
10.6.3 Load resistor plug assignment.....	27
11 Imprint	27

1 Foreword

This manual has been written for technicians/installers and operators and should be kept for future reference. Read these operating instructions carefully and make sure that you have fully understood the content before installing or working with the oneGRID System.

2 Safety

2.1 Notes and symbols used

Warning notes in relation to personal injury / material damage are formulated according to the "SAFE" principle. This means they contain information on the type and source of the hazard, potential consequences as well as how to avoid and avert danger. The following hazard classifications apply in the safety notes:

 **DANGER**

Danger designates a hazardous situation, which will lead to death or serious injury if attention is not paid.

 **WARNING**

Warning designates a hazardous situation, which may lead to death or serious injury if attention is not paid.

 **CAUTION**

Caution designates a hazardous situation, which may lead to injury if attention is not paid.

 **NOTICE**

Notice designates a situation, which may cause material damages and impair the product's function if attention is not paid.

 **TIP**

Tip provides additional useful information about the handling of the product.

Symbol	Meaning
▸	Avoiding and adverting danger in the warning note
▶	Instructions for action All instructions to be followed within a procedure are always listed in chronological order.
▪	List

TIP

Metric and imperial measurements are used in drawings. Imperial measurements are marked with [].

2.2 Term definitions

oneGRID System	The oneGRID System forms the entirety of smartCAP SMC, SEH, cables and power supply unit
SMC	Synonym for SMC46 and SMC47
SEH	Interface for the power supply and data connection of the SMC

2.3 General safety

All work on electrical systems or operating equipment may only be carried out by a specially qualified electrician according to the applicable electrotechnical regulations.

The following general safety notes for working with electrical energy must be observed:

WARNING

Improper work on electrical systems!

Electric shock can result in death or life-threatening injuries.

- Before working on electrical systems, disconnect them from their voltage supply and secure them against being switched on again.
- Wear appropriate personal protective equipment (PPE).
- Defects that are ascertained, such as damaged or loose cables, must be remedied immediately.



WARNING

Danger of burns if using non-original spare parts!

Non-original spare parts can heat up considerably and start to burn.

Persons can be killed or suffer life-threatening injuries.

- ▶ Only use original spare parts.

2.4 Personnel qualifications

A qualified electrician is a person with suitable technical training, expertise and experience as well as knowledge of relevant standards, who can evaluate the work assigned to them correspondingly and recognize potential risks.

2.5 Intended use

The oneGRID System is a pick-by-light system that assists employees for order picking tasks. Employees are guided by the displays of the SMC.

2.6 Reasonably foreseeable misuse

A use other than that specified under chapter [Intended use](#) or extending beyond this is deemed to be improper.

The oneGRID System is not suitable for:

- use in potentially explosive atmospheres.
- use in damp rooms (only SEH11 and NTS 24-3750 are not suitable for damp rooms).
- use of cables and power supply units other than original CAPTRON spare parts.
- use with interfaces other than the SEH11.
- use outside the range of the technical specifications.

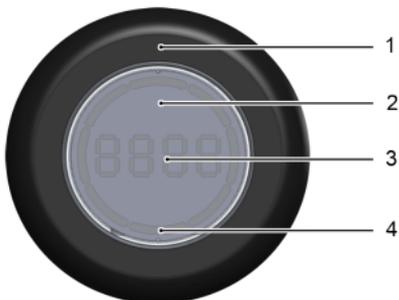
3 General description

The oneGRID System is used as a pick-by-light system. The oneGRID System assists the user for manual order picking processes or stocking processes. The SMC46 and SMC47 indicate the correct storage compartment with the LED ring. The SMC47 additionally shows the number of pieces to be picked. Correct removal or stocking is acknowledged by touching the SMC.

3.1 smartCAP SMC47

The SMC47 is designed for signaling the parts to be removed and for confirming the removed quantity in pick-by-light systems.

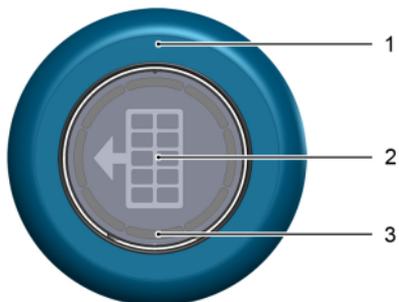
- 1 Colored cover ring
- 2 Button surface
- 3 Four-digit 7-segment display shows numerals and certain letters.
 Numeric range 0000 . . . 9999
 Examples of donE
 combined letters Eror
- 4 LED ring for individual visualization
 (7 colors and individual areas
 of the LED ring can be actuated
 separately)



3.2 smartCAP SMC46

The SMC46 is suitable for requesting and confirming in pick-by-light systems. The SMC46 does not have a four-digit 7-segment display.

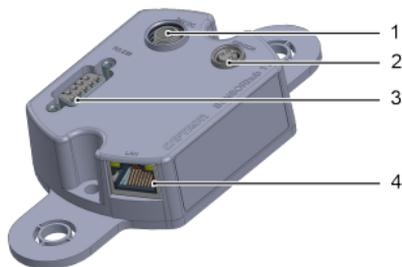
- 1 Colored cover ring
- 2 Button surface
- 3 LED ring for individual visualization
 (7 colors and individual areas
 of the LED ring can be actuated
 separately)



3.3 SENSORhub SEH11

The SEH11 is the interface between the customer application (for example, ERP system or inventory management system) and SMC

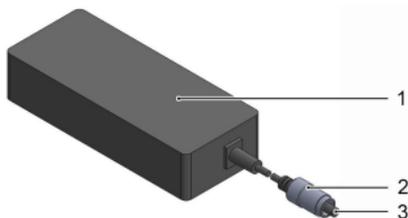
- 1 Power supply unit connection (24 V DC)
- 2 Sensor connection M12x1 socket
- 3 Serial interface RS232
- 4 LAN port



3.4 Power supply unit NTS 24-3750

The power supply unit serves for the voltage supply of the SMC and the SEH11.

- 1 Power supply unit
- 2 Threaded sleeve M12 x 1 to secure the plug
- 3 Plug Ø 2.5 x Ø 5.5 x 11 mm



TIP

The cable with the rubber connector IEC-60320 C13 and the country-specific plug are not included in delivery.

4 Transport

4.1 Storage

Component	Operating temperature	Storage temperature
smartCAP SMC46	-10°C...+50°C	-20°C...+60°C
smartCAP SMC47	-10°C...+50°C	-20°C...+60°C

Component	Operating temperature	Storage temperature
SENSORhub SEH11	-10°C...+50°C	-20°C...+60°C
Cable PVC 0.34 mm ² mobile	-5°C...+80°C	-25°C...+80°C
Cable PVC 0.34 mm ² fixed	-25°C...+80°C	-25°C...+80°C
Cable PUR 0.5 mm ² (optional) mobile	-25 °C...+80 °C	-25 °C...+80 °C
Cable PUR 0.5 mm ² (optional) fixed	-25°C...+80°C	-25°C...+80°C
Power supply unit	-30°C...+70°C	-40°C...+85°C

5 Assembly



WARNING

Improper work on electrical systems!

Electric shock can result in death or life-threatening injuries.

- Before working on electrical systems, disconnect them from their voltage supply and secure them against being switched on again.
- Wear appropriate personal protective equipment (PPE).

**WARNING**

Improper handling of the power supply unit can damage the power supply unit!

A damaged power supply unit can result in death or life-threatening injuries.

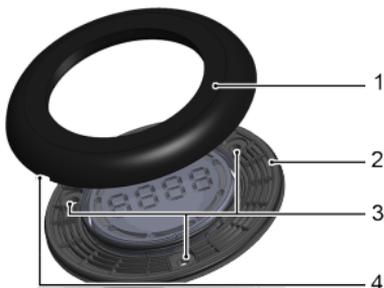
- ▶ Before working on electrical systems, disconnect them from their voltage supply and secure them against being switched on again.
- ▶ Wear appropriate personal protective equipment (PPE).
- ▶ Defects that are ascertained, such as damaged or loose cables, must be remedied immediately.
- ▶ Connection openings must be protected against foreign objects and liquids.
- ▶ Secure the power supply unit against falling down.
- ▶ Keep the power supply unit away from sources of heat.
- ▶ Only operate the power supply unit with an IEC-60320 C13 plug and the country-specific plug.

5.1 Install SMC46 and SMC47

SMC46 and SMC47 are installed identically.

Requirements: Mounting surface is level and clean.

- ▶ Disconnect the system from its voltage supply and secure it against being switched on again.
- ▶ Set the desired position of the SMC and provide a center hole of minimum \varnothing 58 mm to maximum \varnothing 60 mm.
- ▶ Position the SMC, lining up the center and vertical axis, and mark the holes (3).



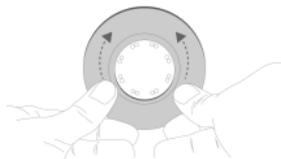
- ▶ Select the diameter of the holes according to the recommended screw type and start drilling.
- ▶ Depending on the installation position, you now need to connect the SMC46 or the SMC47. [see "Connect oneGRID System", page 12.](#)

NOTICE

Risk of damage to the mounting flange!

Unsuitable screw heads or too great a tightening torque for the screws can damage the mounting flange.

- ▶ Do not use countersunk screws.
 - ▶ Tighten screws with a maximum torque of 1.1 Nm.
 - ▶ The screw must not deform the mounting flange during tightening.
- ▶ Install the mounting flange with the recommended screws. [see "Recommended screw types", page 11](#) .
 - ▶ Place cover ring (1) with groove (4) downward and press close to the button surface. The cover ring must be flush with the entire button surface.



NOTICE

Mineral grease and oils can attack the plastic of the button!

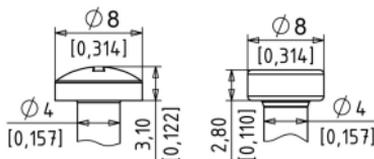
- ▶ Do not use grease or oils to apply the cover ring (1).

5.1.1 Recommended screw types

- DIN EN ISO 1207 M4
- DIN EN ISO 7045 M4
- DIN EN ISO 1481 Ø3.9 mm
- DIN EN ISO 7049 Ø3.9 mm

5.1.2 Maximum dimensions of the screws

The drawing shows the maximum dimensions of the screws.



5.2 Install SEH11

- ▶ Disconnect the system from its voltage supply and secure it against being switched on again.
- ▶ Drill holes for the fastening. The hole spacing can be found in "[Dimensional drawing SEH11](#)", [page 21](#).
- ▶ Remove the webs (1) for larger screw diameters.



5.3 Connect oneGRID System



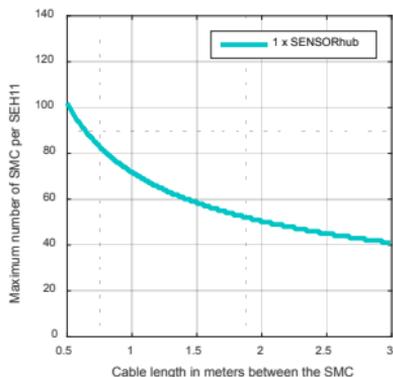
WARNING

Improper work on electrical systems!

Electric shock can result in death or life-threatening injuries.

- ▶ Before working on electrical systems, disconnect them from their voltage supply and secure them against being switched on again.
- ▶ Wear appropriate personal protective equipment (PPE).

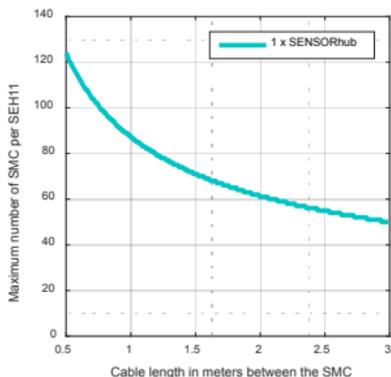
Depending on the cable lengths used for connecting the SMC, a different number of SMC per SEH11 may be



Strands 4 x 0.34 mm² (AWG22)

connected. The precise designation can be found in the diagram.

If the optional cables are used, more SMC can be connected per SEH11. The precise designation can be found in the diagram.



Strands 4 x 0.50 mm² (AWG20)

5.3.1 Connecting the SMC

- ▶ Disconnect the system from its voltage supply and secure it against being switched on again.
- ▶ Connect SEH11 (2) and the first SMC (1) with a cable.

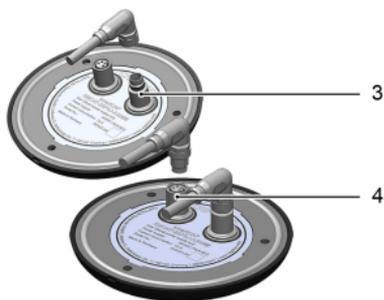
NOTICE

Too great a torque can damage the cable or the SMC!

- ▶ Tighten cable with a maximum torque of 0.4 Nm.



- ▶ Connect the first SMC (4) and the next SMC (3) with a further cable.
- ▶ Repeat this procedure until all SMC are connected. For the last SMC, close off the free connection with the optional cover cap.



TIP

Starting from a total line length of more than 130 m, the optional load resistor must be connected to the free connector of the last SMC.

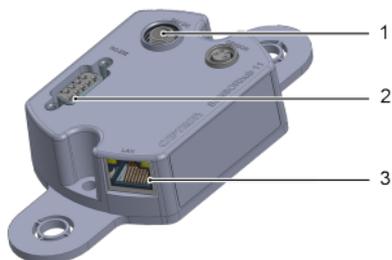
5.3.2 Connect SEH11

- ▶ Connect cable to the RS 232 slot (2) or LAN slot (3).
- ▶ Connect power supply unit to the 24 V slot (1).

NOTICE

Too great a torque can damage the power supply unit or the SEH11!

- ▶ Tighten cable of the power supply unit with a maximum torque of 1 Nm.



6 Operation

6.1 Operation

SMC46 and SMC47 are operated by touching the button surface.

6.2 Read out address from the SMC47

The SMC47 has an easy option for displaying its address.

- ▶ Touch the SMC47 button surface for five seconds.
- ✓ Address is displayed in the SMC47.

TIP

The address of the SMC46 is assigned permanently and cannot be exported.

7 Maintenance

7.1 Maintenance operations

Carry out the following maintenance operations at the specified intervals.

Maintenance operation	as needed	annually
Clean the button surface	X	
Check cables for intactness and firm fit		X
Check screw connections for tightness		X

NOTICE

Solvents contained in cleaning agents can attack the plastic of the button!

- Clean the surface of the button with a neutral cleaning agent or a damp microfiber cloth.

8 Disassembly

- ▶ Disconnect the system from its voltage supply and secure it against being switched on again.
- ▶ Insert the flat head screwdriver into the groove (4) on the cover ring (1) and remove the cover ring with the screwdriver via lever action.
- ▶ Loosen the screw connections (3) and disconnect the electrical connection.



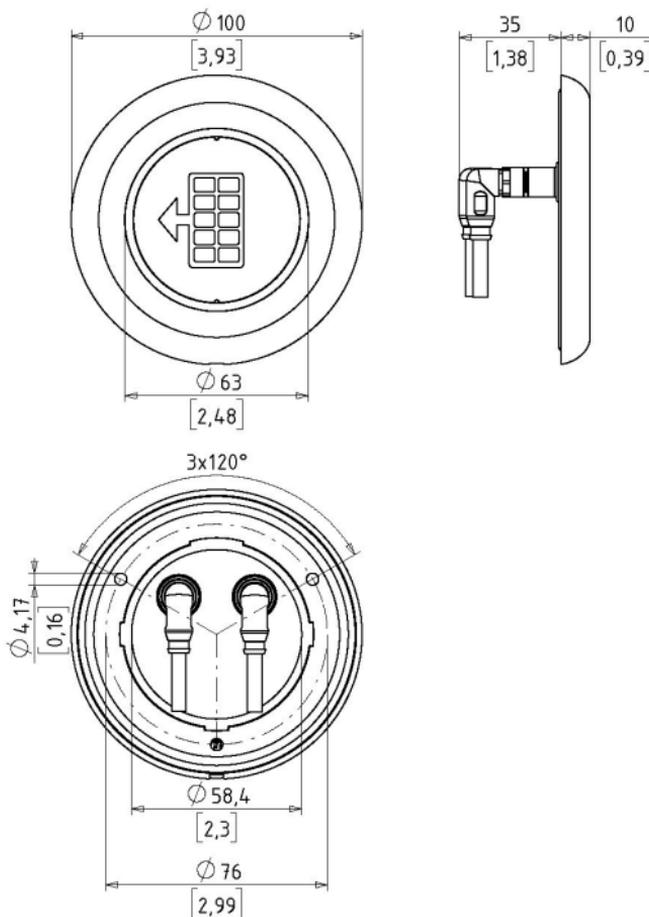
9 Disposal

Electrical and electronic components of various types must be recycled according to their type.

10 Technical specifications

10.1 SMC46

10.1.1 Dimensional drawing SMC46

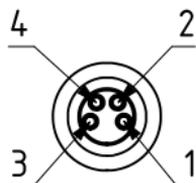


10.1.2 Technical specifications SMC46

Technical specifications at 24 V and 20 °C	
Operating voltage	DC 24 V (16.8...32 V)
Latency	Approx. 70 ms
LED colors	RGB LED's (7 colors programmable)
Reverse polarity protection	Protection of all cables/lines
Short circuit protection	Protected against short circuit and overload
Power consumption	Typically 0.4 W
Degree of protection IP	Front IP69K
Type of actuation	Capacitive
Actuation force	No actuation force required

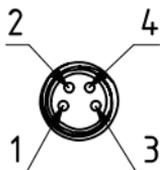
10.1.3 SMC46 plug assignment

Socket M8



- 1 + power supply
- 2 (RS485) T/R+ (A)
- 3 GND
- 4 (RS485) T/R- (B)

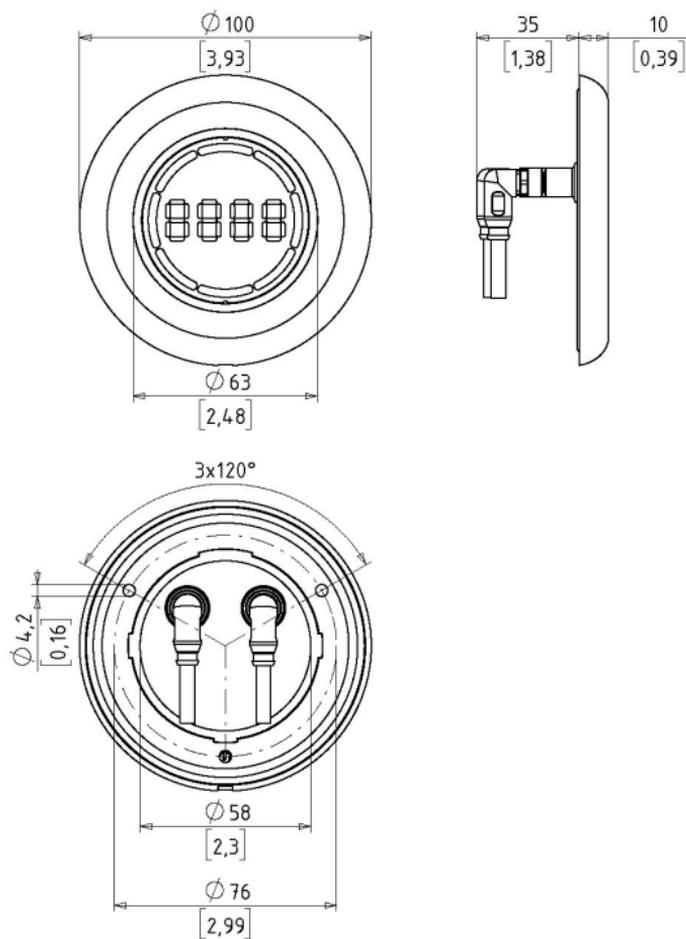
Plug M8



- 1 + power supply
- 2 (RS485) T/R+ (A)
- 3 GND
- 4 (RS485) T/R- (B)

10.2 SMC47

10.2.1 Dimensional drawing SMC47

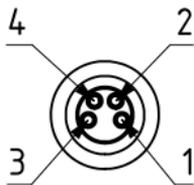


10.2.2 Technical specifications SMC47

Technical specifications at 24 V and 20 °C	
Operating voltage	DC 24 V (16.8...32 V)
Latency	Approx. 70 ms
LED colors	RGB LED's (7 colors programmable)
7-segment display	Available in green, red, blue or white
Reverse polarity protection	Protection of all cables/lines
Short circuit protection	Protected against short circuit and overload
Power consumption	Typically 0.4 W
Degree of protection IP	Front IP69K
Type of actuation	Capacitive
Actuation force	No actuation force required

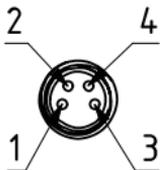
10.2.3 SMC47 plug assignment

Socket M8



- 1 + power supply
- 2 (RS485) T/R+ (A)
- 3 GND
- 4 (RS485) T/R- (B)

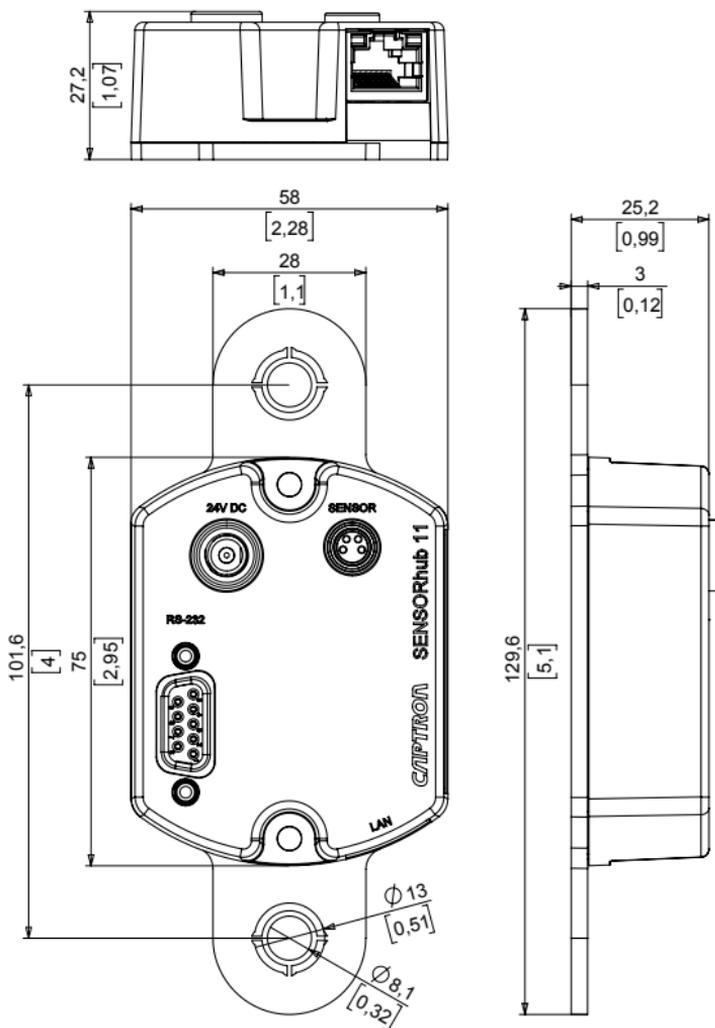
Plug M8



- 1 + power supply
- 2 (RS485) T/R+ (A)
- 3 GND
- 4 (RS485) T/R- (B)

10.3 SEH11

10.3.1 Dimensional drawing SEH11

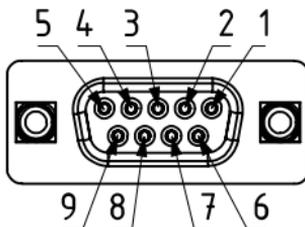


10.3.2 Technical specifications SEH11

Technical specifications at 24 V and 20 °C	
Operating voltage	DC 24 V (22 V...26 V)
Latency	Approx. 1 ms
Reverse polarity protection	Protection of all cables/lines
Short circuit protection	Protected against short circuit and overload
Power consumption	0.5 W
Degree of protection	IP 40
Cable length RS232	Max. 3.00 m [118 in]
Factory address	0x0000
Baud rate	115200 baud
Data length	8 bits
Stop bits	8 bits

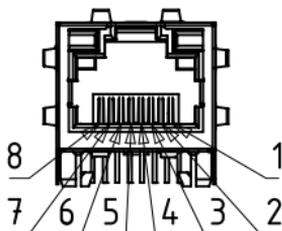
10.3.3 RS232 plug assignment

- | | |
|--------|--------|
| 1 n.c. | 6 n.c. |
| 2 RX | 7 RTS |
| 3 TX | 8 CTS |
| 4 n.c. | 9 n.c. |
| 5 GND | |



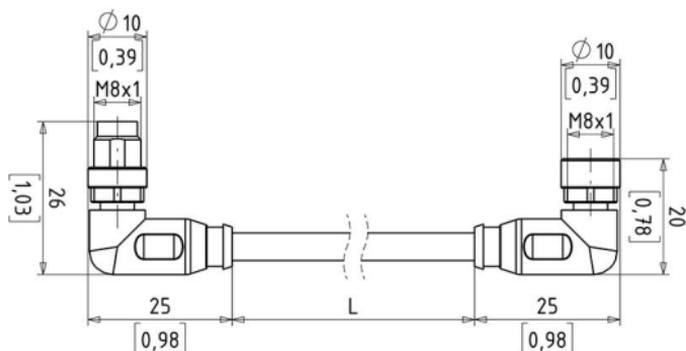
10.3.4 RJ45 plug assignment

1 TX+	5 n.c.
2 TX-	6 RX-
3 RX+	7 n.c.
4 n.c.	8 n.c.



10.4 Cable

10.4.1 Dimensional drawing cable



The cable is available in four lengths (L):

Length	Item number PVC 0.34 mm ²	Item number PUR 0.5 mm ²
0.5 m [19.69 in]	96963	96966
1.0 m [39.37 in]	96964	96967
2.0 m [78.74 in]	96965	96968
4.0 m [157.48 in]	97420	97421

10.4.2 Technical specifications cable PVC 0.34 mm²

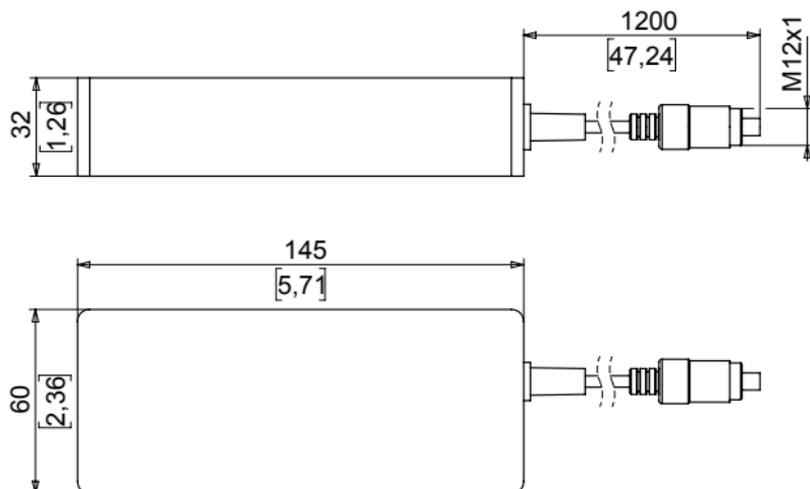
Technical specifications at 24 V and 20 °C	
Operating voltage	Max. 30 V AC/DC
Rated impulse voltage	1.5 kV
Operating current	Max. 4 A per contact
Screw connection	Zinc die casting nickel-plated M8
Degree of protection IP	IP65
Material	PVC
Bending radius of mobile cables	10 x external diameter
Bending radius of fixed cables	5 x external diameter
External diameter	Approx. 5 mm [0.197 in]
Strands	4 x 0.34 mm ² AWG 22

10.4.3 Technical specifications cable PUR 0.5 mm² (optional)

Technical specifications at 24 V and 20 °C	
Operating voltage	Max. 30 V AC/DC
Rated impulse voltage	1.5 kV
Operating current	Max. 4 A per contact
Screw connection	Zinc die casting nickel-plated M8
Degree of protection IP	IP65
Material	PUR
Bending radius of mobile cables	10 x external diameter
Bending radius of fixed cables	5 x external diameter
External diameter	Approx. 5 mm [0.197 in]

Technical specifications at 24 V and 20 °C

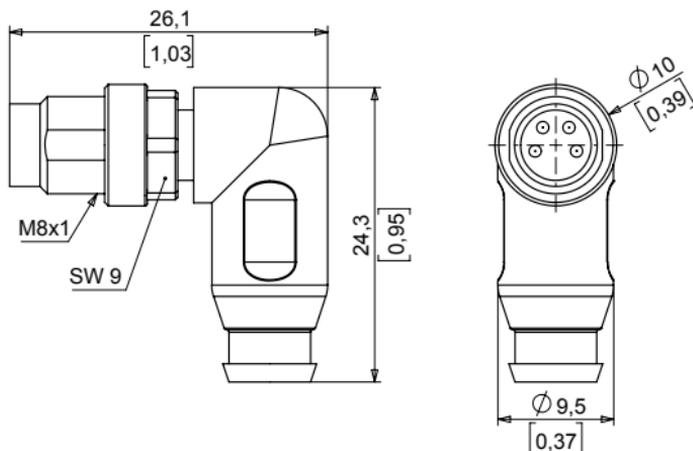
Strands	4 x 0.5 mm ² AWG 20
---------	-----------------------------------

10.5 NTS 24-3750**10.5.1 Dimensional drawing NTS 24-3750****10.5.2 Technical data NTS 24-3750****Technical specifications at 24 V and 20 °C**

Operating voltage	DC 24 V (16.8...26 V)
Operating current	3.75 A
Output	max. 90 W
Short circuit protection	Protected against short circuit and overload
Lowest idling speed	<0.15 W

10.6 Load resistor

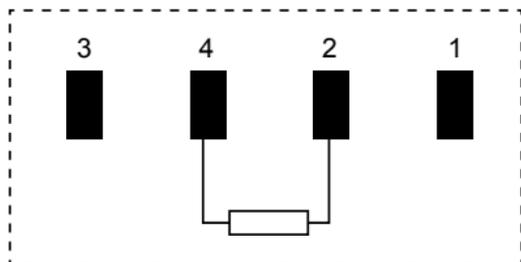
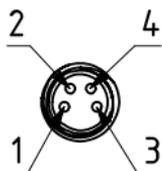
10.6.1 Load resistor dimensional drawing



10.6.2 Load resistor technical specifications

Technical specifications at 24 V and 20 °C	
Operating voltage	Max. 150 V peak
Power consumption permanent	Max. 0.25 W Max. 0.25 W
Screw connection	M8 recommended tightening torque 0.4 Nm
Resistance	Typically 120 Ω
Operating temperature	-25 °C...+60 °C
Degree of protection IP	IP67

10.6.3 Load resistor plug assignment



11 Imprint

The operating instructions have been authored and published by
CAPTRON Electronic GmbH – Johann-G.-Gutenberg Straße 7 – 82140 Olching
– Germany
Copyright 2018