Technical Guide - Hardware

MiNexx Indicator

NICC

986283010000 Edition 0.0.0 04/28/2025

Minebea Intec Bovenden GmbH & Co. KG, Leinetal 2, 37120 Bovenden, Germany
Phone: +49.551.309.83.0 Fax: +49.551.309.83.190

Foreword

Must be followed!

Any information in this document is subject to change without notice and does not represent a commitment on the part of Minebea Intec unless legally prescribed. The product must only be operated by trained operating personnel. Installation and commissioning must only be performed by trained specialist personnel. In correspondence concerning this product, the type, name, and release number/serial number as well as all license numbers relating to the product must be cited.

Note

Inhaltsverzeichnis

1 Introduction

1.1 Documentation overview

The full documentation can be found on the Minebea Intec website https://manuals.minebea-intec.com:

- Technical manual – Hardware for Minebea Intec indicator
- Technical manual – Firmware for Minebea Intec indicator
- Operating instructions for the application software

Technical manual – Hardware

The document describes the hardware for the Minebea Intec indicator in detail.

Technical manual – Firmware

The document describes the operation of the Minebea Intec indicator in detail.

Operating instructions for the application software

The document provides a detailed description of the operation of the currently installed application.

1.2 Read the safety instructions and the documentation

The following documents are included with the Minebea Intec product in printed form:

– Safety instructions

Please read the safety instructions and the documentation before using the product.
These are part of the product. Keep the safety instructions in a safe and easily accessible location.

1.3 This is what instructions look like

1. - n. are placed before steps that must be done in sequence.

▶ is placed before a step.

▷ describes the result of a step.

1.4 This is what lists look like

– indicates an item in a list.

1.5 This is what warnings look like

Signal words indicate the severity of the danger involved if measures for preventing hazards are not followed.

⚠ GEFAHR

Warning of personal injury
DANGER indicates that death or severe, irreversible personal injury will occur if appropriate safety measures are not observed.

▶ Take appropriate safety measures.

⚠ WARNUNG

Warning of hazardous area and/or personal injury
WARNING indicates that death or severe, irreversible injury may occur if appropriate safety measures are not observed.

▶ Take appropriate safety measures.

⚠ VORSICHT

Warning of personal injury.
CAUTION indicates that minor, reversible injury may occur if appropriate safety measures are not observed.

▶ Take appropriate safety measures.

ACHTUNG

Warning of damage to property and/or the environment.
NOTICE indicates that damage to property and/or the environment may occur if appropriate safety measures are not observed.

▶ Take appropriate safety measures.

Hinweis: User tips, useful information, and notes.

1.6 Support

Telephone Bovenden: +49.551.30983.111
Telephone Hamburg: +49.40.67960.444
Email: help@minebea-intec.com

2 Safety instructions

2.1 General instructions

The device complies with the directives and standards on electrical equipment, electromagnetic compatibility, and the prescribed safety requirements. However, improper use can cause injury to persons and damage to property.

The device was in perfect condition with regard to safety features when it left the factory.

– To maintain this condition and to ensure safe operation, the user must follow the instructions and observe the warnings in this manual.

2.2 Intended use

The device is exclusively intended for use in weighing and dosing systems, and is particularly suitable for tank and vessel scales, truck scales, platform scales, crane scales, dosing systems and as a weight indicator in intelligent control systems.
Installation must only be performed by trained electricians.
Device maintenance and commissioning must only be performed by trained specialists.

2.3 Non-intended use

The indicator must only be used as intended in order to prevent malfunctions and faults.

2.4 Exclusion of liability

The device reflects the state of the art.

No warranty is given that the device is free of faults, especially not in conjunction with third-party software and hardware components required for operation.

The manufacturer does not accept any liability for damage caused by third-party system components and/or due to incorrect use of the device. The use of this device signifies recognition of the stipulations listed above.

2.5 Target groups

Trained specialists

Employees that perform the commissioning and maintenance of the weighing technology and have received comprehensive training therein.

Trained electricians

Employees that perform the installation of the weighing technology and have received comprehensive training therein.

2.6 Initial inspection

Check the contents of the consignment for completeness. Inspect the contents visually to determine whether any damage has occurred during transport.
If there are grounds for rejection of the goods, a claim must be filed with the carrier immediately. A Minebea Intec sales or service organization must also be notified.

2.7 Before commissioning

Before commissioning, as well as after storage or transport, inspect the device visually for signs of mechanical damage.

- The device should not be put into operation if it displays signs of visible damage and/or is defective.

2.7.1 Installation

The device must be installed in an EMC-compliant manner.

To ensure proper cooling of the device, make sure air circulation around the device is not blocked. Always maintain a distance of at least 10 cm. Avoid exposing the instrument to excessive heat, e.g., from direct sunlight and vibrations. The ambient conditions specified under Ambient conditions must be taken into account at all times.

2.7.2 Use in hazardous areas

The NICC indicator must not be used in hazardous areas.

2.7.3 Failure and excessive stress

If safe operation of the device no longer appears to be possible, shut it down and make sure it cannot be used.

Safe operation is no longer ensured if any of the following is true:

- The device is physically damaged.
- The device has been incorrectly connected.
- The device has been operated with the incorrect supply voltage.
- The device has been subjected to stresses beyond the tolerance limits (e.g., during storage or transport).

2.7.4 For special attention

All inputs and outputs (with the exception of supply voltage) must be supplied via SELV/PELV – Limited Energy of UL-CSA-IEC EN 61010-1, -2-201 or Limited Power Source of UL-CSA-EN IEC 62368-1.
Make sure that the construction of the device is not altered to the detriment of safety. In particular, the leakage paths, safety distances (parts leading from the supply voltage) and clearances must not be impaired in any way.
Minebea Intec cannot be held responsible for personal injury or property damage caused by a device being repaired incorrectly by an operator or installer.

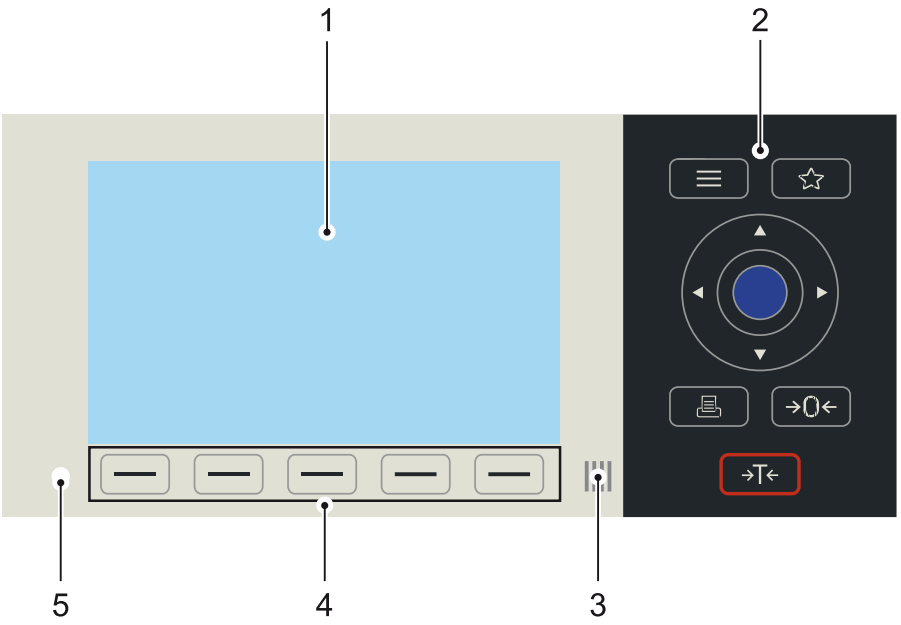
3 Device description

3.1 General description

MiNexx NICC is a weight indicator in a panel housing.
A maximum of one scale can be connected.
The device is equipped with a TFT color display for the display, and a keypad (membrane keypad) for operation.
The keypad and the display form one unit with the front.
The cables for the supply voltage, interfaces, etc. are connected at the back of the housing. A rectangular cut-out is required for the installation.
There are various option cards available, which can be integrated into the device (maximum of 4) as required. The type of option card installed determines the connections available and their assignment.

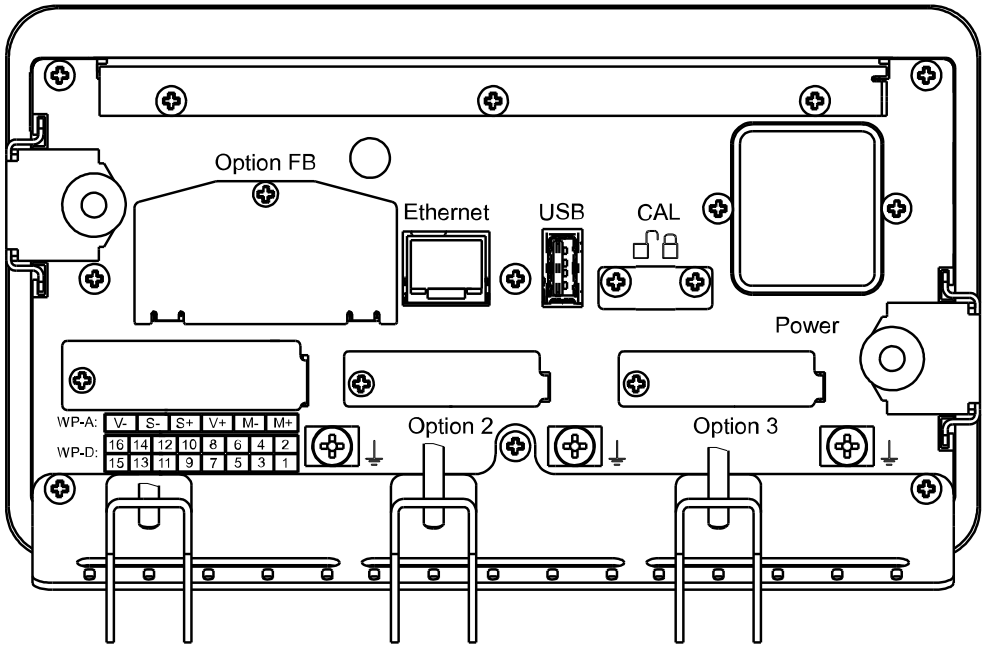
3.2 Hardware construction

3.2.1 Device front



Pos.	Name
	Display elements
1	TFT color display 4.3"
5	Power LED
	Operating elements
2	Keypad
4	Soft keys
	Other
3	NFC

3.2.2 Overview of connections



Connection	Description
FB option	Slot for fieldbus option
Ethernet	LAN connection (RJ45)
USB	USB 2.0 connection (host)
CAL	Menu lock switch (CAL-1)
Power	Power supply U_{AC} = 100...240 V or U_{DC} = 24 V
⏚	Functional ground
Option 2	Slot 2
Option 3	Slot 3
WP-A/WP-D	Slot for analog weighing electronics board/ or digital weighing electronics board

If a slot is not assigned, the relevant cut-out is covered with a metal cover on the back of the device.

3.2.3 Internal slots

The device has 4 internal slots.
The slots can be used for Option cards as follows:

Option card/slot	1	2	3	FB
Analog weighing electronics board	✗			
Digital weighing electronics board	✗			
Interface RS-232/485		✗	✗	
Analog inputs and outputs		✗	✗	
Digital inputs and outputs (2 IN/4 OUT)		✗	✗	
Digital inputs and outputs (4 IN/6 OUT)		✗	✗	
Fieldbus module				✗

> **Hinweis:**
> xBPI scales are connected to the digital weighing electronics board.
> It is not possible to connect to the serial option card RS-232/RS-485 (option CA2/CB2 or CA3/CB3).

3.3 Power supply and protective grounding conductor

3.3.1 Power supply version 100–240 V AC

The 100–240 V AC power supply is connected via a C13 plug connector on the back of the device.
The device is protected (primary side) via two fuses and is equipped with a wide range power supply.
The power supply is protected against short circuits and overloads, and disconnects automatically in case of a fault.

> **Hinweis:**
> For technical data, see Supply voltage version 100–240 V AC.

Protective grounding conductor

The protective grounding conductor in the device is connected to the housing via the C13 plug connector.

> **Hinweis:**
> A C13 plug connector is delivered with the unit and can be installed as described under Version 100–240 V AC: Installing C13 plug connector (IEC 60320 C13).

3.3.2 Power supply version 24 V DC

The 24 V DC power supply is connected via a 3-pin plug connector (+/PE/-). The device is protected (primary side) via two fuses and against incorrect polarity.

> **Hinweis:**
>
> The device may only be operated with a 24 V power supply that meets the following requirements:
>
> “Class 2 of NEC or SELV/PELV – Limited Energy of UL-CSA-IEC EN 61010-1, -2-201 or Limited Power Source of UL-CSA-EN IEC 62368-1”

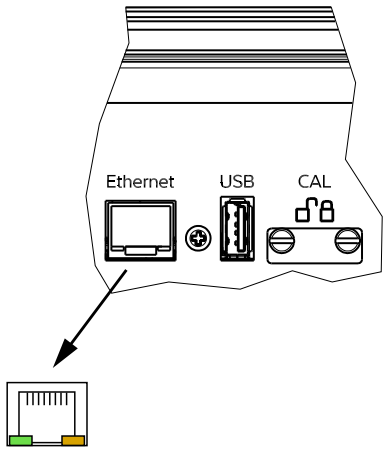
> **Hinweis:**
> For technical data, see Supply voltage version 24 V DC.

Protective grounding conductor

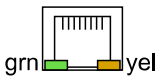
The protective grounding conductor is connected to the housing inside the device via the plug connector.

3.4 Network connection

The device includes an Ethernet interface with the following technical data:



Technical data

Name	Data
Connection 	RJ-45 plug connector, female on the device back Green (grn): flashes on data traffic (activity) Yellow (yel): lights up when there is an existing connection (link)
Transfer rate (baud rate)	Auto-detection: 10 Mbps or 100 Mbps, full or half duplex
Electrical isolation	Yes
Cable type	Min. CAT 5, screened
Cable length	Max. 100 m

ACHTUNG

IT operations halted due to corrupted data.

Protect the network against unauthorized access.

- Always observe the Chapter “Network security” in the Technical manual – Firmware.

Hinweis:
For information on setting up the network, see “Network settings” in the Technical manual – Firmware.

3.5 USB port

The device has a USB port with the following technical data:

Technical data

Name	Data
USB	Generation USB 2.0, USB-A plug connector, female
Max. current	I_{max} = 200 mA; protected against short circuit
Max. cable length	2 m

Hinweis:
The suspend function (see Chapter “Operating & display” in the Technical manual – Firmware) cannot be guaranteed if a load that requires a current of >200 mA is connected by USB.
Furthermore, exceeding the maximum current may damage the device and cause it to malfunction.

3.6 Option cards

3.6.1 General instructions

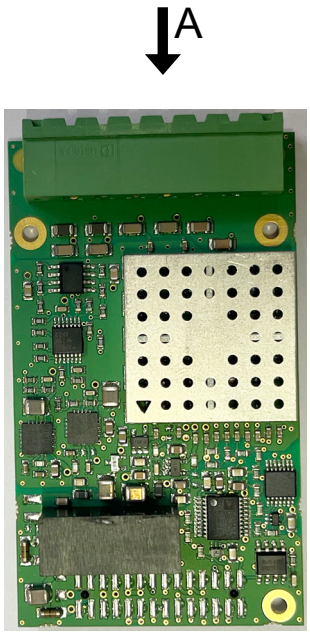
The options must only be operated with SELV/PELV energy/power limitation.

> **Hinweis:**
>
> The device may only be operated with a 24 V power supply that meets the following requirements:
>
> “Class 2 of NEC or SELV/PELV – Limited Energy of UL-CSA-IEC EN 61010-1, -2-201 or Limited Power Source of UL-CSA-EN IEC 62368-1”

3.6.2 “Performance” analog weighing electronics board

The analog weighing electronics board is required to connect a scale to DMS load cells.
The connection to the “Performance” weighing electronics board can be made using long cables, see Technical data.
For this purpose, software is used to set up a weighing point in the device.
The calibration data and parameters for the weighing point are permanently stored in the EAROM (non-volatile memory).

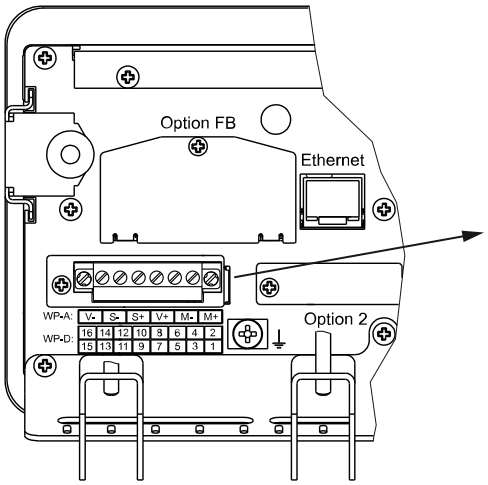
> **Hinweis:** For information on setting up the weighing point, see also Chapter “Analog weighing point” in the Technical manual – Firmware.



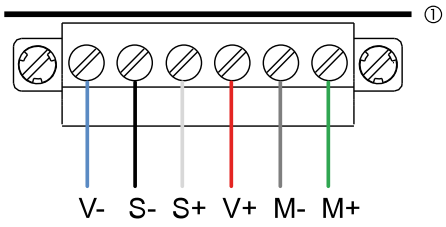
Weight indicator plug connector

Terminal contact	Connection		Description		Wire color Minebea Intec
M+	+	Meas.	+	Signal/LC output	green
M-	–	Meas.	–	Signal/LC output	gray
V+	+	Supply	+	Supply/excitation	red
S+	+	Sense	+	Sense	white
S-	–	Sense	–	Sense	black
V-	–	Supply	–	Supply/excitation	blue

Terminal contacts



View A



① PCB

Technical data

Name	Data
Load cell supply voltage	U_{DC} = 10 V (±5 V)
Measuring input signal range	0 mV...30 mV
Smallest permissible input signal per verification scale interval	0.5 µV/e
Max. quantity of verification scale intervals	10,000 (class 3); 1000 (class 4) (Class relevant for verification requirements)
Load cell impedance range	75...1200 Ω
Fraction of the error limit	0.5 (relevant for verification requirements)

Name	Data
Cable length in relation to cable cross section	≤1000 m/mm^2
Max. voltage at sense input	U_{DC} = ±6 V
Electrical isolation	Yes
Connections	
Internal connection	Contact strip
External connection	Plug connector, 6-pin Screen connection to the strain relief rail
Connection of connection/load cell cable	6-wire or 4-wire (with additional bridges)
Cable(s)	See specification, Phoenix Contact MVSTBR 2,5/ 6-STF - PCB connector 1835517
Absolute maximum ratings	
Sense voltage	±10 V

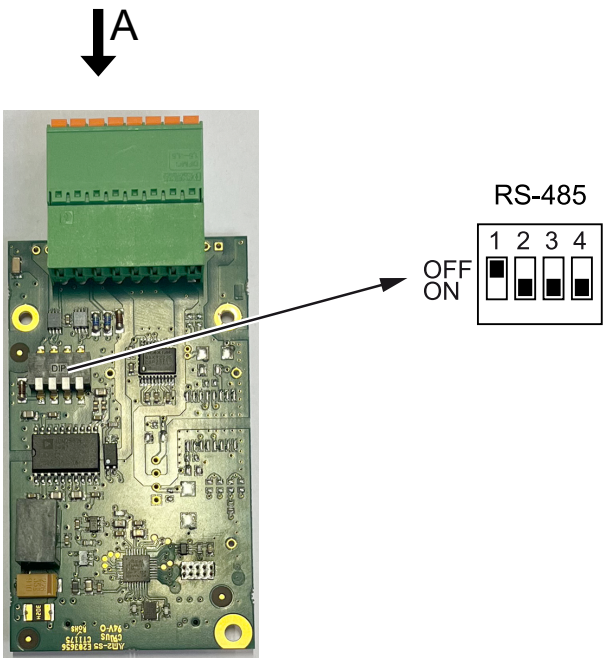
Hinweis:
Loads that exceed the values specified under “absolute maximum ratings,” can cause permanent damage to the device. The function and reliability of the device cannot be guaranteed if it is used under different conditions than those specified under “Technical data.”

Hinweis:
Do not shorten the load cell cable. Connect the prepared cable end and roll up the remaining cable.

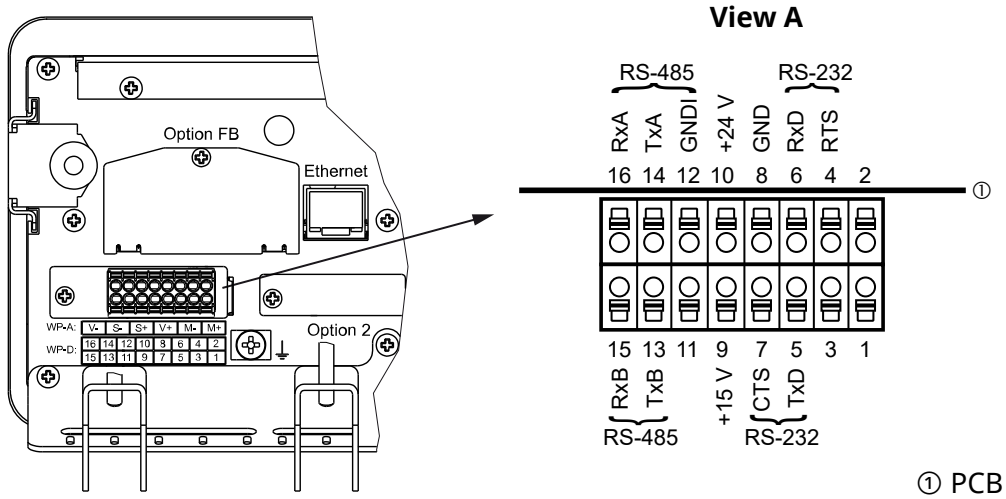
3.6.3 Digital weighing electronics board

The digital weighing electronics board is required to connect a digital weighing platform with xBPI protocol.
For this purpose, software is used to set up a weighing point in the device.
The digital weighing electronics board must only be connected using cables that remain within the building and are less than 30 m long.
The weighing platform is connected via RS-232 or RS-485.
Furthermore, the digital weighing electronics board provides a 15 V and 24 V power supply for the weighing platform.

> **Hinweis:** See also, Chapter “Digital weighing point (xBPI)” in the Technical manual – Firmware



Terminal contacts



① PCB

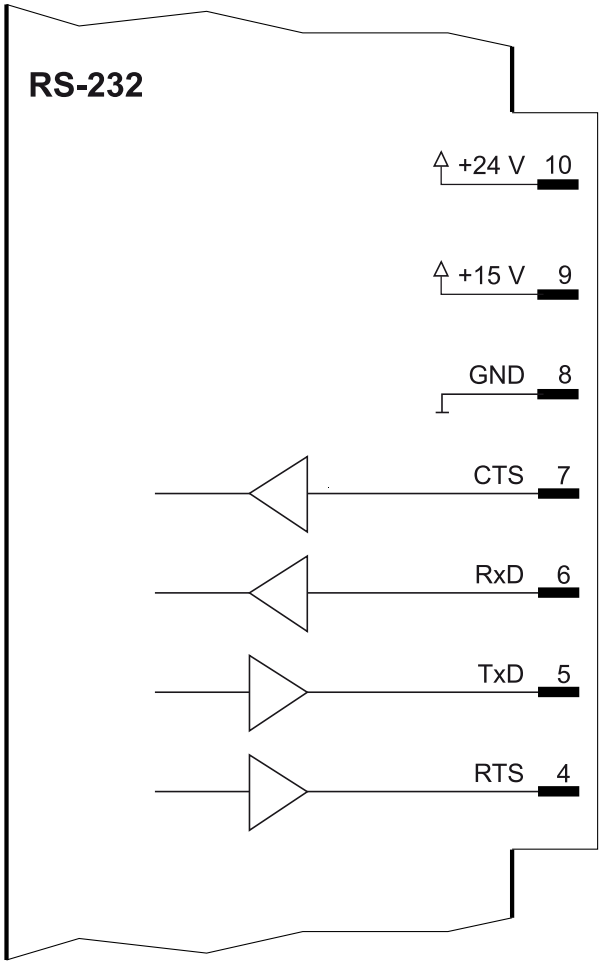
Technical data

Name	Data
RS-232	
Number of channels	1
Signals	Input: RxD, CTS Output: TxD, RTS
Reference potential	GND
Electrical isolation	no
Configuration	Full duplex
Transfer rate (baud rate)	1200...115.200 bit/s
Input signal level	Logic 1 (high) -3... -15 V Logic 0 (low) +3 to... +15 V
Output signal level	±5.4 V typ.
RS-485	
Number of channels	1
Signals	TxA, RxA, TxB, RxB
Reference potential	GNDI
Electrical isolation	Yes
Configuration	Half duplex (2-wire)

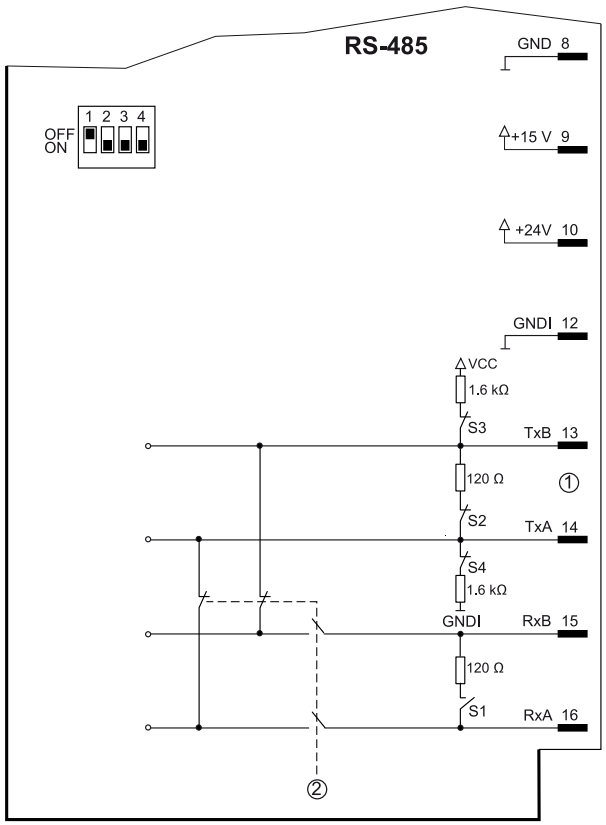
Name	Data
Terminating resistor	The bus is terminated.
Transfer rate (baud rate)	1200...115.200 bit/s
Signal level	Logic 1 (high) 2.4... 3.3 V Logic 0 (low) 0... 0.9 V
Power supply	
Voltage	15 V, 24 V, Selv/Pelv
Current	0.2 A @ 15 V 0.125 A @ 24 V
Reference potential	GND
Connections	
Internal connection	Contact strip
External connection	Plug connector, 16-pin (Phoenix Contact DFMC 1.5/8-ST-3.5)
Absolute maximum ratings	
Current @ 24 V	0.5 A
Current @ 15 V	0.5 A
Input signal RS-232	±25 V
Signals RS-485	-9 V...+14 V

Hinweis:
Loads that exceed the values specified under “absolute maximum ratings,” can cause permanent damage to the device. The function and reliability of the device cannot be guaranteed if it is used under different conditions than those specified under “Technical data.”

Block diagram RS-232



Block diagram RS-485



① TRx pair, half duplex

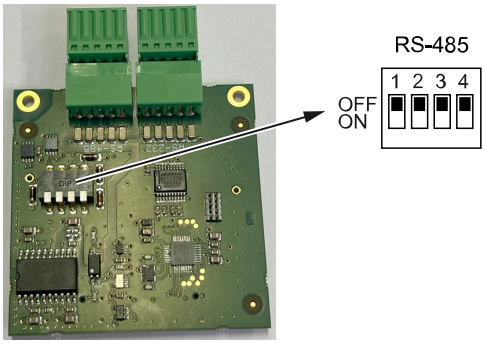
② 2-wire/4-wire switching via software

S	Function	Settings for RS-485 switch
1	Rx bus termination (4-wire)	OFF (switch up)
2	Tx bus termination	ON (switch down)
3	TxB pull-up resistor	ON (switch down)
4	TxA pull-down resistor	ON (switch down)

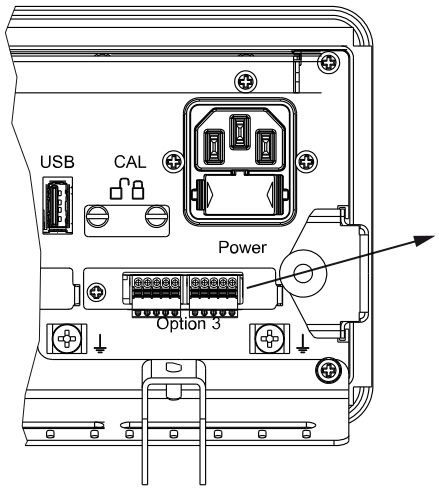
3.6.4 RS-232/485 interface

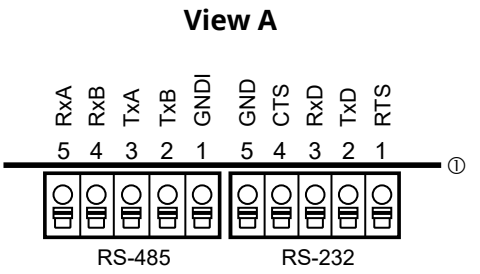
The option card has one RS-232 and RS-485 interface that can be used at the same time. It is not possible to connect digital weighing platforms or load cells.

> **Hinweis:** See also Chapter “Interfaces” in the Technical manual – Firmware.



Terminal contacts





① PCB

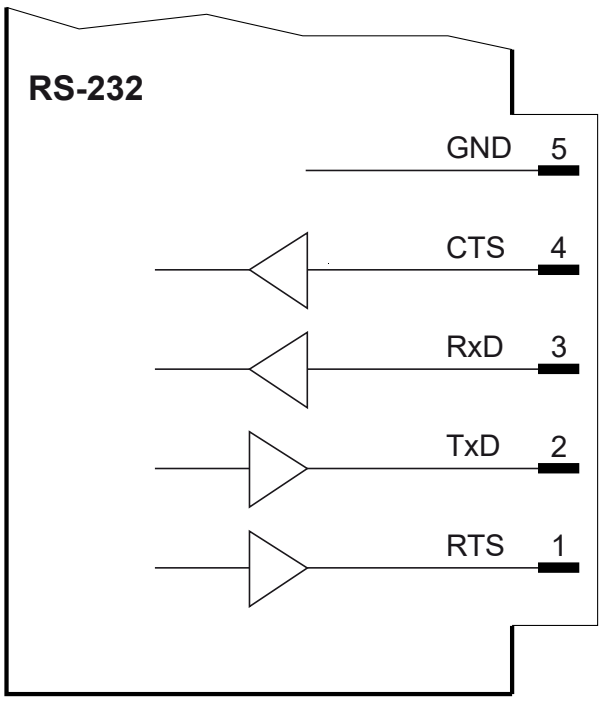
Technical data

Name	Data
RS-232	
Number of channels	1
Signals	Input: RxD, CTS Output: TxD, RTS
Electrical isolation	no
Configuration	Full duplex
Transfer rate (baud rate)	1200...115.200 bit/s
Input signal level	Logic 1 (high) -3... -15 V Logic 0 (low) +3 to... +15 V
Output signal level	±5.4 V typ.
RS-485	
Number of channels	1
Signals	TxA, RxA, TxB, RxB
Electrical isolation	Yes
Configuration	Full duplex (4-wire) Half duplex (2-wire)
Terminating resistor	Can be set via DIP switch, see block diagrams.
Transfer rate (baud rate)	1200...115.200 bit/s
Signal level	Logic 1 (high) 2.4... 3.3 V Logic 0 (low) 0... 0.9 V

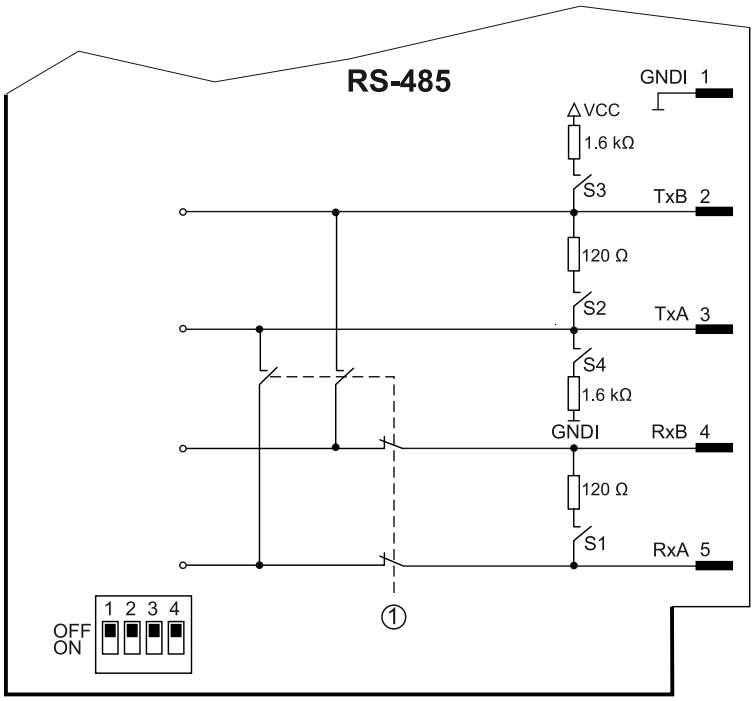
Name	Data
Connections	
Internal connection	Contact strip
External connection	Plug connector, 5-pin (Phoenix Contact FK-MC 0.5/5-ST-2.5)
Max. cable length	RS-485: according to EIA RS-232: according to EIA
Cable type	RS-485 screened twisted pair
Absolute maximum ratings	
Input signal RS-232	±25 V
Signals RS-485	-9 V...+14 V

Hinweis:
Loads that exceed the values specified under “absolute maximum ratings,” can cause permanent damage to the device. The function and reliability of the device cannot be guaranteed if it is used under different conditions than those specified under “Technical data.”

Block diagram RS-232



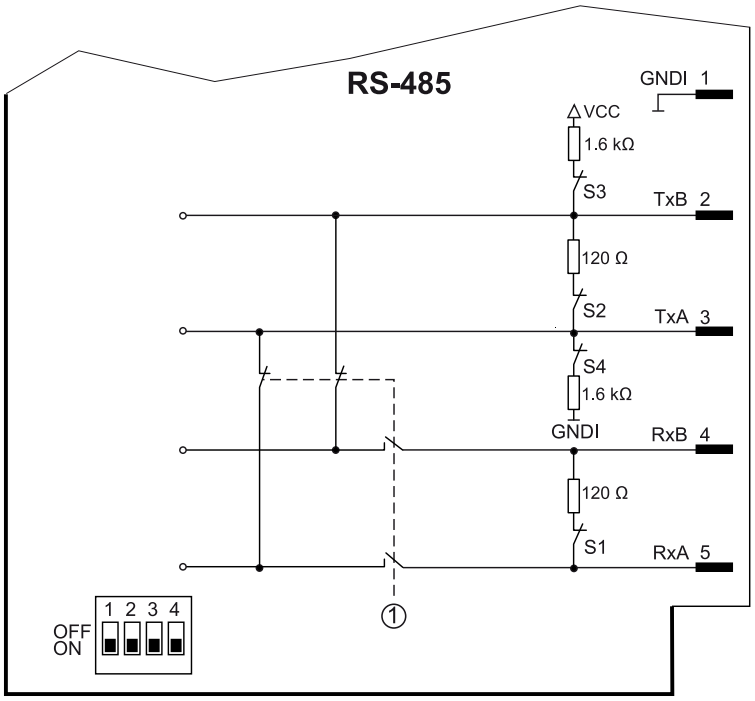
Block diagram RS-485 without terminating resistors (CA2/CA3)



① 2-wire/4-wire switching via software

S	Function	Settings for RS-485 switch
1	Rx bus termination (4-wire)	OFF (switch up)
2	Tx bus termination	OFF (switch up)
3	TxB pull-up resistor	OFF (switch up)
4	TxA pull-down resistor	OFF (switch up)

Block diagram RS-485 with terminating resistors (CB2/CB3)



① 2-wire/4-wire switching via software

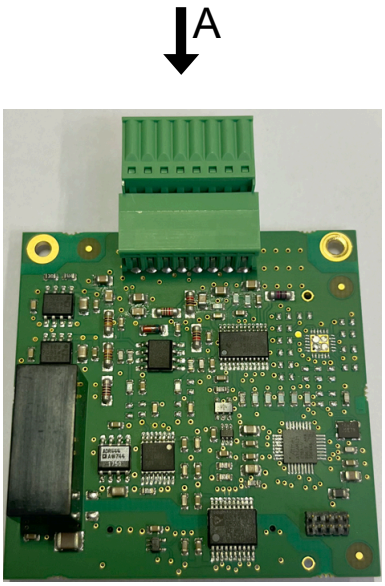
S	Function	Settings for RS-485 switch
1	Rx bus termination (4-wire)	ON (switch down)
2	Tx bus termination	ON (switch down)
3	TxB pull-up resistor	ON (switch down)
4	TxA pull-down resistor	ON (switch down)

3.6.5 Analog inputs and outputs

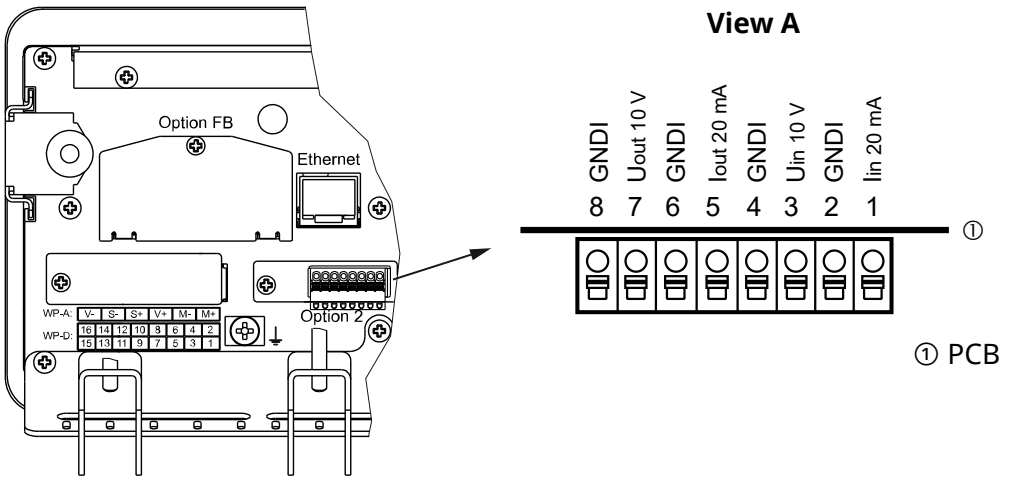
The option card has
- 1 analog current input
- 1 analog voltage input
- 1 analog current output or analog voltage output

Both inputs can be used at the same time.
Only one output can be used.

> **Hinweis:** See also, Chapter “Analog inputs and outputs” in the Technical manual – Firmware



Terminal contacts



Technical data for current and voltage input

Name	**Data**	
Type	**Current input**	**Voltage input**
Quantity	1 (I_{in})	1 (V_{in})
Range	0...25 mA	0...12 V
Input impedance	200 Ω	150 kΩ
Reference potential	GNDI	GNDI
Electrical isolation	Yes	Yes
Resolution	14 bits	14 bits
Max. error	Offset error: ±0.009 % @ 20 mA	Offset error: ±0.001 % @ 10 V
	Gain error: ±0.300 % @ 20 mA	Gain error: ±0.300 % @ 10 V
	Linearity error: ±0.054 % @ 20 mA	Linearity error: ±0.029 % @ 10 V
Max. cable length	150 m	10 m

Technical data for current and voltage output

Name	**Data**	
Type	**Current output**	**Voltage output**
Quantity	1 (I_{out})	1 (V_{out})
Range	0...24 mA	0...10 V
Load	Max. 500 Ω	Min. 1 kΩ
Reference potential	GNDI	GNDI
Electrical isolation	Yes	Yes
Resolution	16 bits	16 bits

Name	Data	
Type	**Current output**	**Voltage output**
Max. error	Offset error: ±0.008 % @ 20 mA	Offset error: ±0.005 % @ 10 V
	Gain error: ±0.720 % @ 20 mA	Gain error: ±0.081 % @ 10 V
	Linearity error: ±0.030 % @ 20 mA	Linearity error: ±0.020 % @ 10 V
Max. cable length	150 m	10 m

Connections

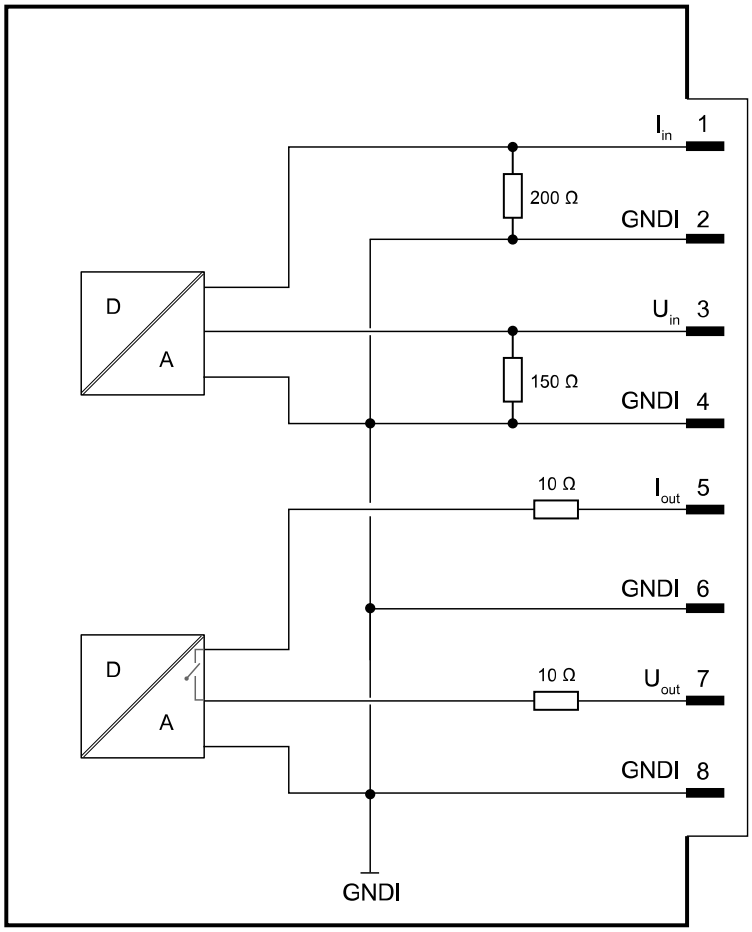
Name	Data
Internal connection	Contact strip
External connection	Plug connector, 8-pin (Phoenix Contact FK-MC 0.5/8-ST-2.5)
Cable type	Screened

Absolute maximum ratings

Name	Data
Current input	Voltage: -0.5 V...+15.5 V Current: 30 mA
Voltage input	Voltage: -0.5 V...+15.5 V Current: 80 µA
Current output	Max. load: 6000 Ω

Hinweis:
Loads that exceed the values specified under “absolute maximum ratings,” can cause permanent damage to the device. The function and reliability of the device cannot be guaranteed if it is used under different conditions than those specified under “Technical data.”

Block diagram



3.6.6 Digital inputs and outputs (2 IN/4 OUT)

On the option card, there are two opto-decoupled inputs (IN 1, IN 2) and 4 passive outputs decoupled by relays (OUT 1, OUT 2, OUT 3, OUT 4).

The two opto-decoupled inputs are active for the following options:
- FA2/FC2
- FA3/FC3

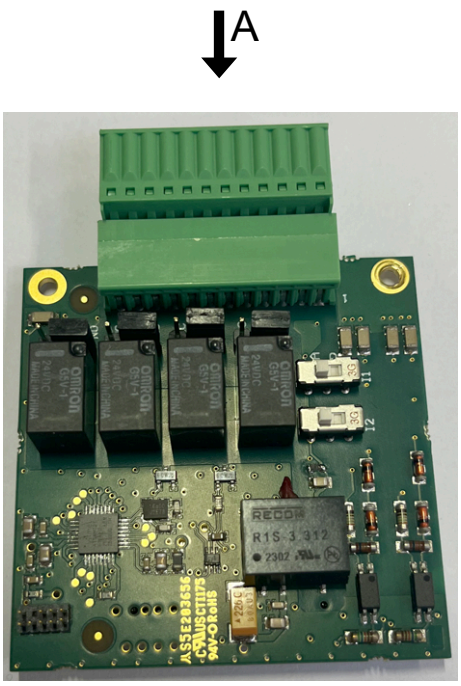
The two opto-decoupled inputs are passive for the following options:
- FB2/FD2
- FB3/FD3

The 4 relay outputs are NO for the following options:
- FA2/FB2
- FA3/FB3

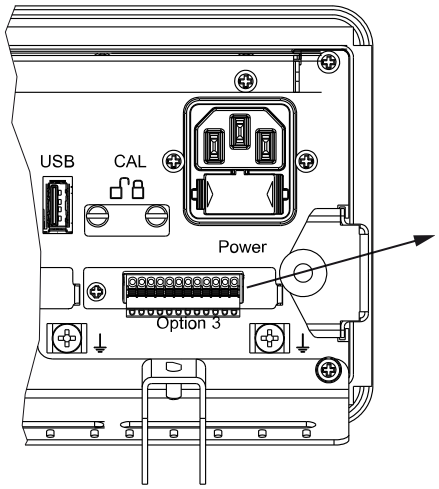
The 4 relay outputs are NC for the following options:
- FC2/FD2
- FC3/FD3

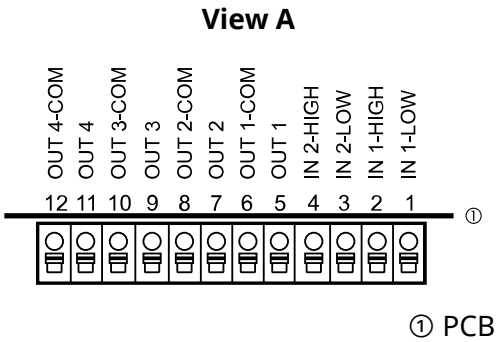
> **Hinweis:**
>
> The following can only be carried out by trained specialists:
> - The respective input can be set to active or passive via two switches.
> - The respective output can be set to “normally closed” or “normally open” via four jumpers.
>
> The option card needs to be removed to change the switch/jumper setting.

> **Hinweis:**
> See also, Chapter “Digital inputs and outputs” in the Technical manual – Firmware



Terminal contacts





Technical data

Name	Data
Inputs, active (A)	
Quantity	2 (IN 1-LOW, IN 1-HIGH; IN 2-LOW, IN 2-HIGH)
Configuration	active
Current	Max. 3 mA
Voltage	12 V

Name	Data
Logic level	LOW: open HIGH: closed
Reference potential	GNDI
Electrical isolation	Yes, via optocoupler
Inputs, passive (P)	
Quantity	2 (IN 1-LOW, IN 1-HIGH; IN 2-LOW, IN 2-HIGH)
Configuration	passive
Current	Max. 7 mA @ 24 V Max. 3 mA @ 12 V
Voltage	10...28 V
Logic level	LOW: 0...5 V HIGH: 10...28 V
Reference potential	IN1-LOW, IN2-LOW
Electrical isolation	Yes, via optocoupler
Outputs	
Quantity	4 (OUT 1, OUT 2, OUT 3, OUT 4)
Configuration	Passive, NO or NC
Voltage	U_{DC} = 30 V/U_{AC} = 30 V
Current	0.5 A
Reference potential	OUT 1-COM, OUT 2-COM, OUT 3-COM, OUT 4-COM
Electrical isolation	Yes, via relay
Connections	
Internal connection	Contact strip
External connection	Plug connector, 12-pin (Phoenix Contact FK-MC 0.5/12-ST-2.5)
Max. cable length	50 m
Cable type	Screened Screen connected to strain relief rail

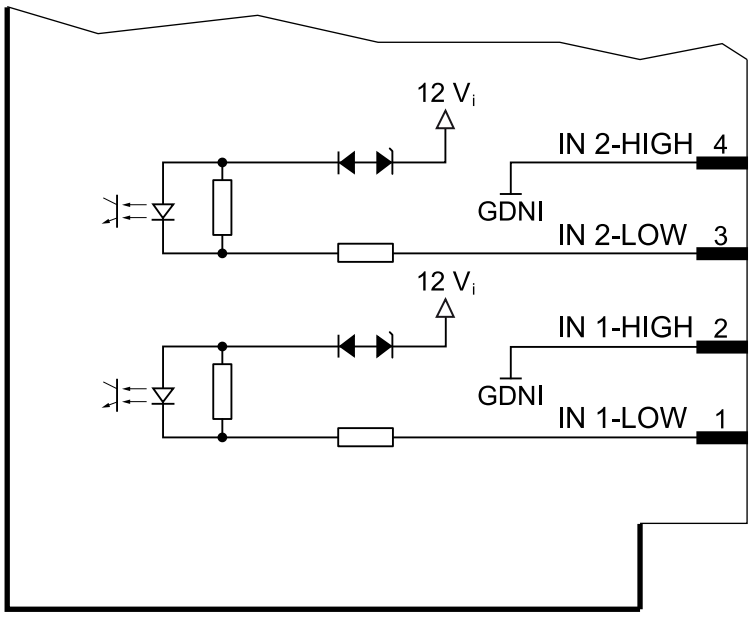
Name	Data
Absolute maximum ratings	
Inputs	Current: 50 mA Voltage: 30 V
Outputs	Current: 1 A Voltage: U_{DC} = 60 V, U_{AC} = 125 V Switching processes: min. 100,000, max. 1800/ hour

Hinweis:
Loads that exceed the values specified under “absolute maximum ratings,” can cause permanent damage to the device. The function and reliability of the device cannot be guaranteed if it is used under different conditions than those specified under “Technical data.”

3.6.6.1 Digital inputs (2 IN)

Block diagram for active inputs

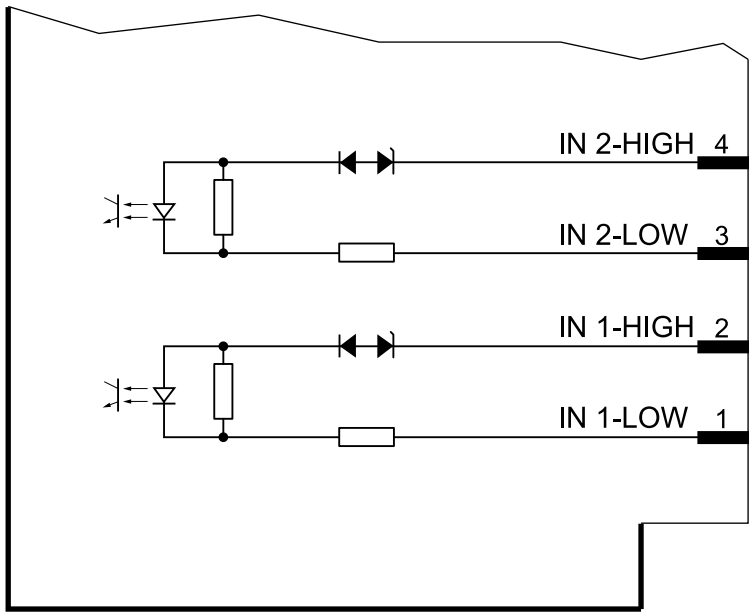
Option:
- FA2/FC2
- FA3/FC3



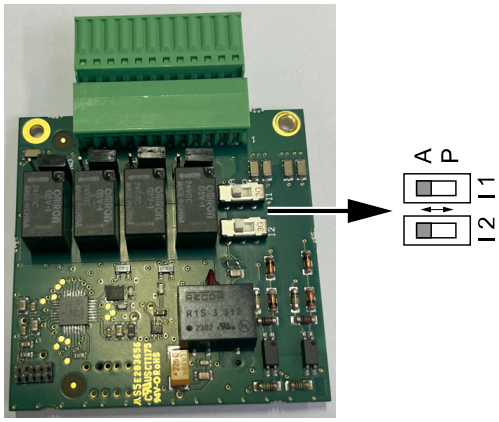
Block diagram for passive inputs

Option:

- FB2/FD2
- FB3/FD3



There is one switch (I 1, I 2) for each of the 2 inputs (IN 1, IN 2).



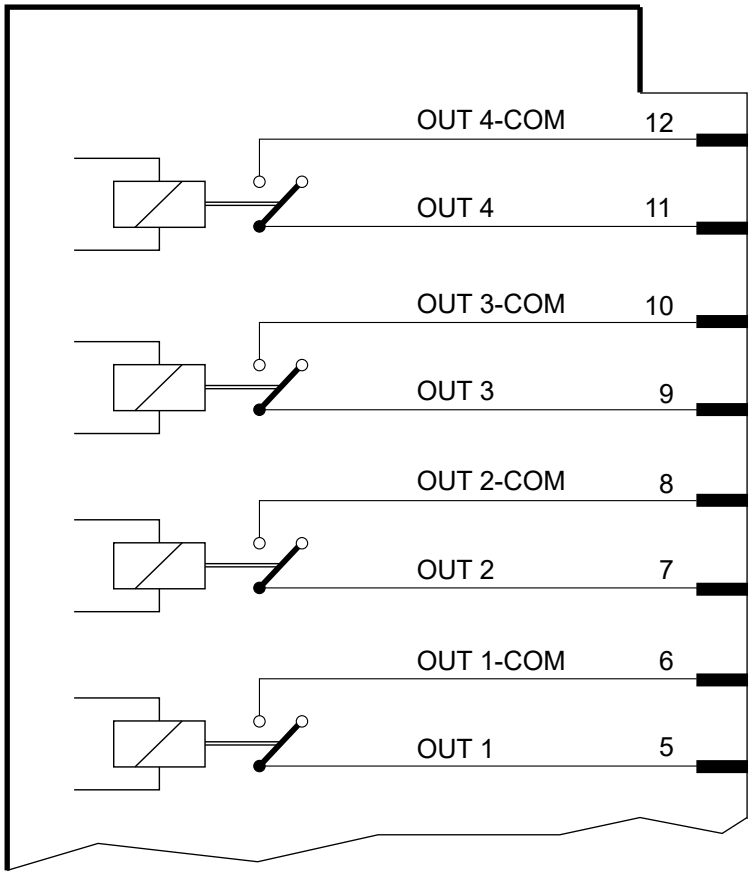
Each channel can be switched actively (A) or passively (P) independently of one another.
The delivery condition depends on the option.

3.6.6.2 Digital outputs (4 relays OUT)

Block diagram for outputs as normally open (NO) contacts

Option:

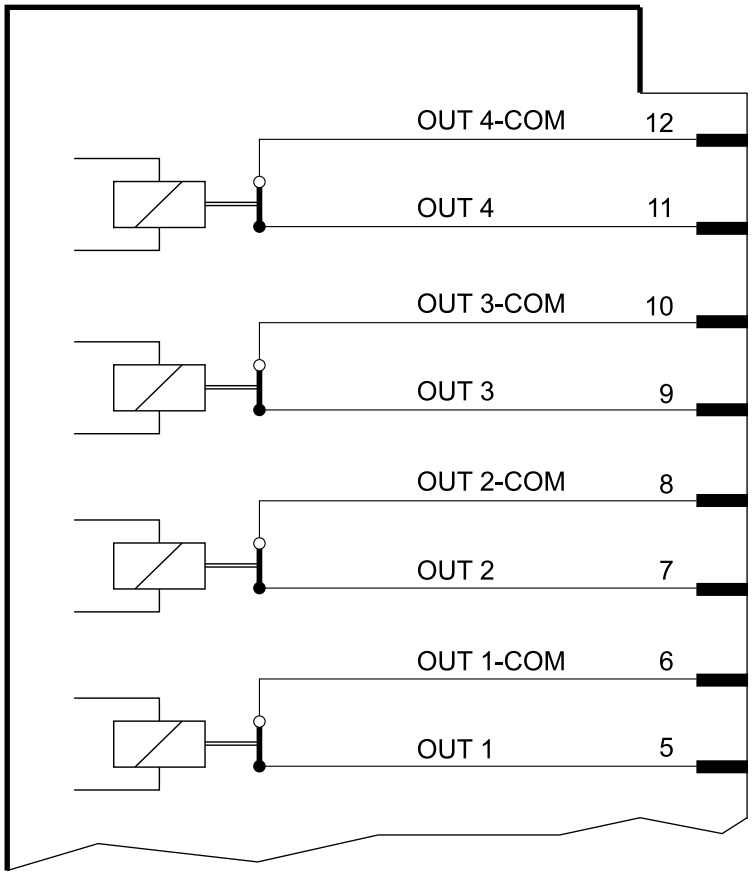
- FA2/FB2
- FA3/FB3



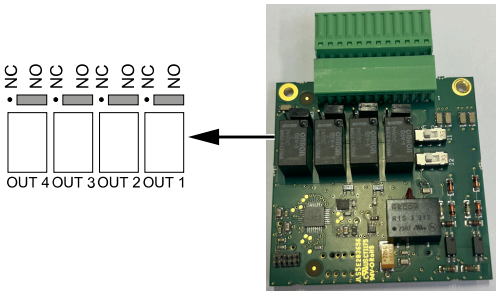
Block diagram for outputs as normally closed (NC) contacts

Option:

- FC2/FD2
- FC3/FD3



There is a jumper for each of the four relay outputs (OUT 1, OUT 2, OUT 3, OUT 4).

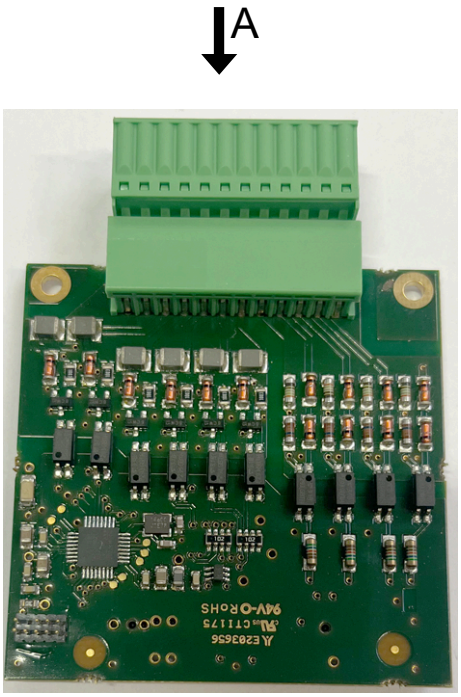


NO: normally open
NC: normally closed
The delivery condition depends on the option.

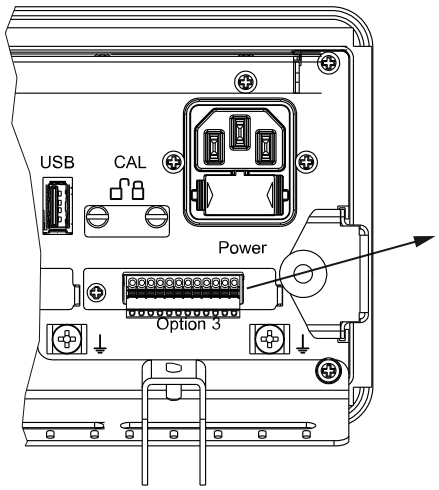
3.6.7 Digital inputs and outputs (4 IN/6 OUT)

The option card has 4 passive opto-decoupled inputs and 6 passive opto-decoupled outputs.

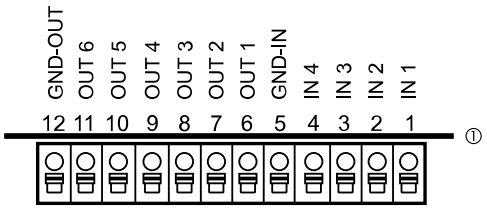
> **Hinweis:** See also, Chapter “Digital inputs and outputs” in the Technical manual – Firmware



Terminal contacts



View A



① PCB

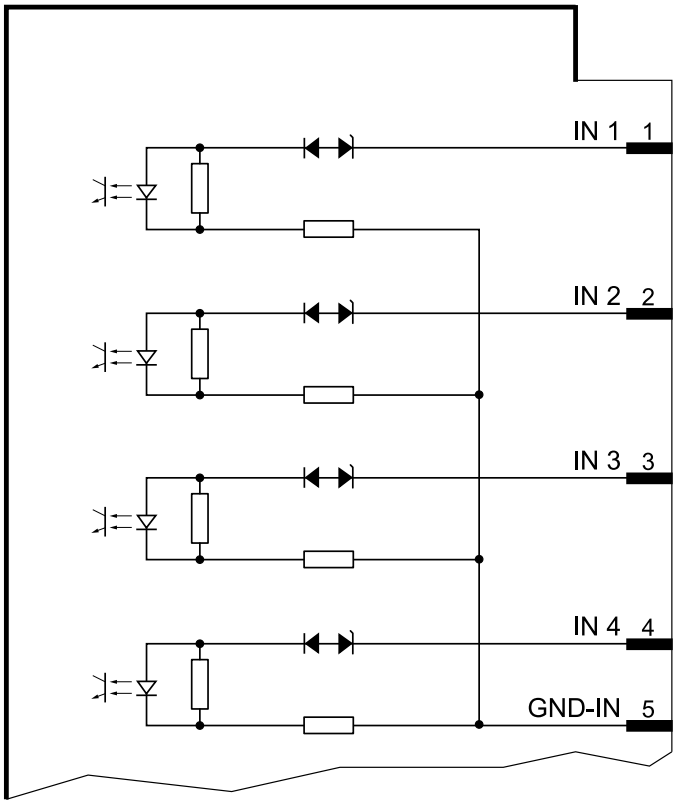
Technical data

Name	Data
Inputs	
Quantity	4 (IN 1, IN 2, IN 3, IN 4)
Configuration	Passive
Current	Max. 7 mA @ 24 V Max. 3 mA @ 12 V
Voltage	10...28 V
Logic level	LOW: 0...5 V HIGH: 10...28 V
Reference potential	GND-IN (signal GNDI)
Electrical isolation	Yes, via optocoupler
Outputs	
Quantity	6 (OUT 1, OUT 2, OUT 3, OUT 4, OUT 5, OUT 6)
Configuration	Passive
Current	30 mA
Voltage	24 V
Reference potential	GND-OUT (signal GNDO)
Electrical isolation	Yes, via optocoupler
Connections	
Internal connection	Contact strip
External connection	Plug connector, 12-pin (Phoenix Contact FK-MC 0.5/12-ST-2.5)
Max. cable length	50 m
Cable type	Screened
Absolute maximum ratings	
Inputs	Current: 50 mA Voltage: 30 V
Outputs	Current: 70 mA Voltage: 30 V

Hinweis:
Loads that exceed the values specified under “absolute maximum ratings,” can cause permanent damage to the device. The function and reliability of the device cannot be guaranteed if it is used under different conditions than those specified under “Technical data.”

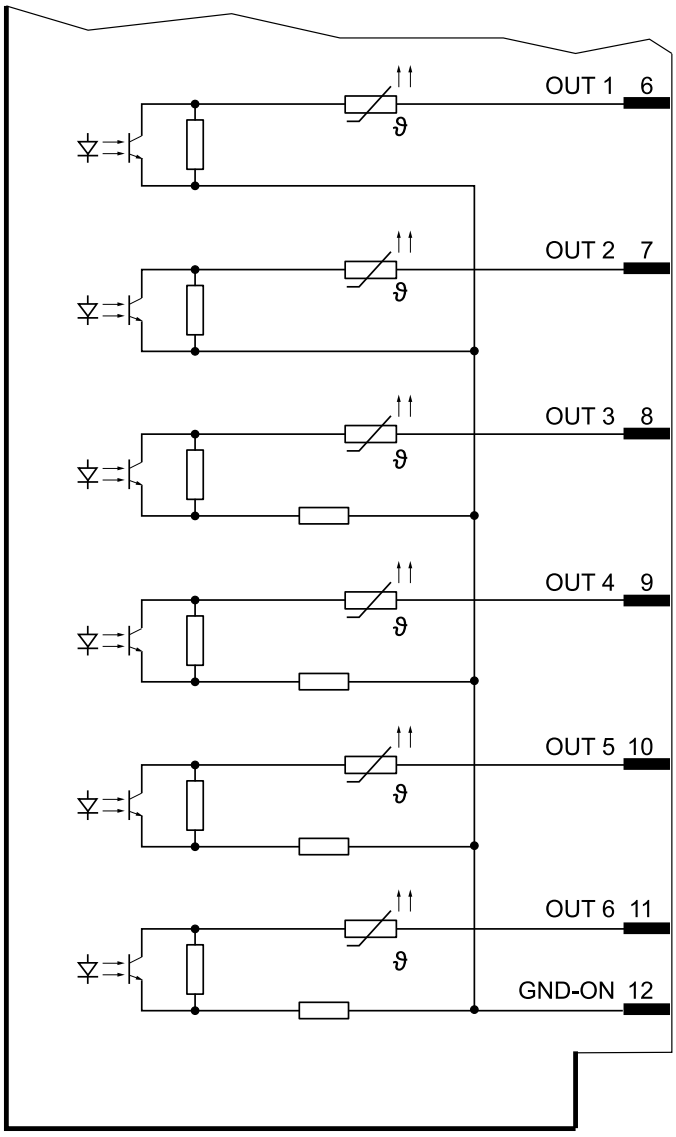
3.6.7.1 Digital inputs (4 IN)

Block diagram for digital inputs



3.6.7.2 Digital outputs (6 optocoupler OUT)

Block diagram for digital outputs



3.6.8 Fieldbus modules

3.6.8.1 ProfiBus DP interface

Communication protocol and syntax comply with the ProfiBus DP bus standard according to IEC 61158.

> **Hinweis:**
> See also Chapter “Fieldbus settings” in the Technical manual – Firmware.

> **Hinweis:**
> The configuration file can be downloaded at https://controller-software.minebea-intec.com/.

The fieldbus module “Anybus® CompactCom™ 40 PROFIBUS DPV1” (item number AB6600) is a product from HMS. For technical data and information on the function of the LEDs, please visit the HMS website.

3.6.8.2 DeviceNet interface

> **Hinweis:**
> See also Chapter “Fieldbus settings” in the Technical manual – Firmware.

> **Hinweis:**
> The configuration file can be downloaded at https://controller-software.minebea-intec.com/.

The fieldbus module “Anybus® CompactCom™ 40 – DeviceNet” (item number AB6601) is a product from HMS. For technical data and information on the function of the LEDs, please visit the HMS website.

3.6.8.3 ProfiNet interface

> **Hinweis:**
> See also Chapter “Fieldbus settings” in the Technical manual – Firmware.

> **Hinweis:**
> The configuration file can be downloaded at https://controller-software.minebea-intec.com/.

The fieldbus module “Anybus® CompactCom™ 40 – PROFINET IRT” (item number AB6605) is a product from HMS. For technical data and information on the function of the LEDs, please visit the HMS website.

3.6.8.4 EtherNet/IP interface

> **Hinweis:**
> See also Chapter “Fieldbus settings” in the Technical manual – Firmware.

> **Hinweis:**
> The configuration file can be downloaded at https://controller-software.minebea-intec.com/.

The fieldbus module “Anybus® CompactCom™ 40 – EtherNet/IP” (item number AB6604) is a product from HMS. For technical data and information on the function of the LEDs, please visit the HMS website.

4 Device installation

4.1 General instructions

Before starting work, please read Chapter 2 and follow all instructions.

⚠ WARNUNG

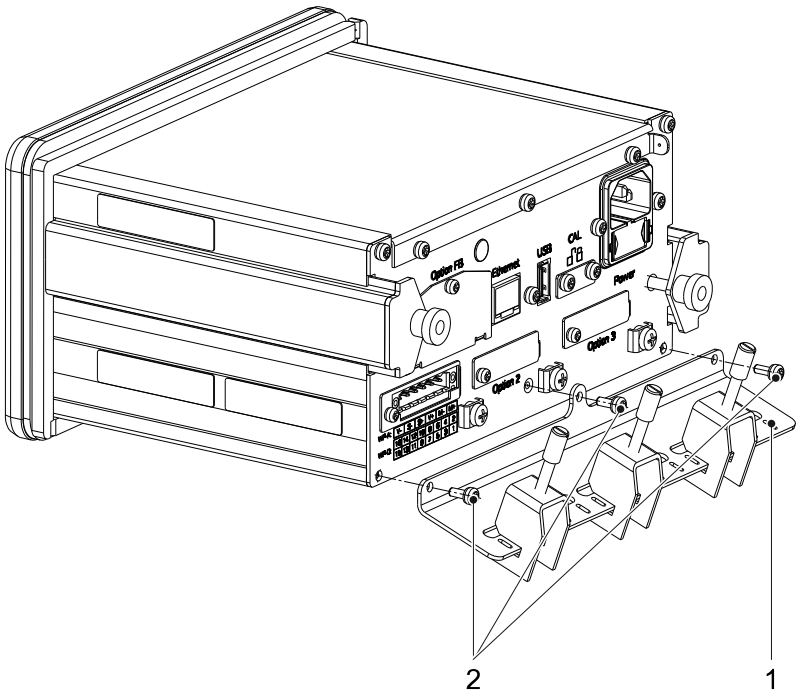
Performing electrical work on a device that is connected and/or switched on can have life-threatening consequences.

- ▶ Installation work must only be performed by trained electricians who are familiar with the risks involved and who avoid or protect themselves against those risks.
- ▶ Disconnect the device from the power supply before performing installation work.

Hinweis:

- Measurement cables should be kept away from three-phase equipment.
- Signal cables and measurement cables should be installed separately from electric power lines.
- Measurement cables should be laid in separate cable conduits.
- Network cables should be crossed perpendicularly.

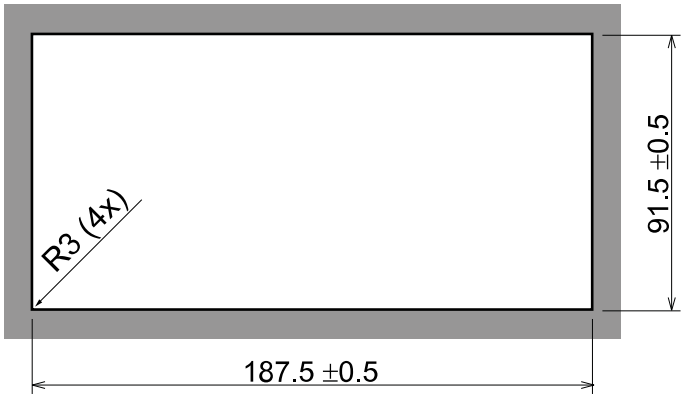
4.2 Installing the strain relief rail



Install the strain relief rail (1) using three screws (2).

Tightening torque is 1 Nm.

4.3 Creating the installation cut-out



All dimensions in mm

The cut-out shown must be created before the device is installed.

Hinweis:

The installation location must be suitable for the intended installation.

The rigidity and surface texture of the control cabinet door must allow even pressing of the gasket during installation.

Specification of the installation location

- Material thickness: 1.5 mm ≤ t ≤ 5 mm
- Evenness in the gasket area: 0.5 mm
- Roughness: Rz 6.3/Ra 0.8

The reinforcing frame optimizes the distribution of force.

4.4 Installing the device in the control cabinet

⚠ WARNUNG

Performing electrical work on a device that is connected and/or switched on can have life-threatening consequences.

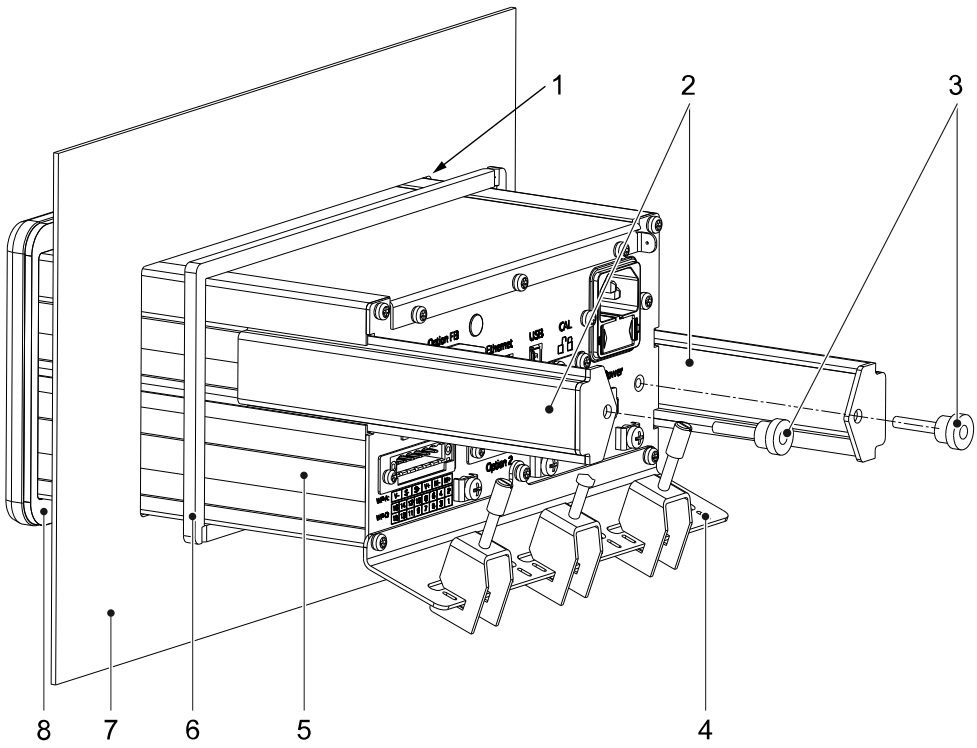
- Installation work must only be performed by trained specialists who are familiar with the risks involved and who avoid or protect themselves against those risks.

ACHTUNG

Possible sealing problems at the indicator.

The protection rating IP66 on the front of the indicator can only be guaranteed with the gasket installed.

- Always install the gasket provided between the indicator and the control cabinet.



1. Undo and remove both knurled screws (3) and set aside.
2. Remove both retaining brackets (2) and set aside.
3. Push reinforcing frame (6) backwards over the strain relief rail (4) and set aside.

4. Push the indicator (5) from the front through the control panel cut-out (1) until the gasket (9) abuts the outside of the control cabinet door.
5. Push the reinforcing frame (6) from behind against the inside of the control cabinet door (7).
6. Reinsert the two retaining brackets (2) into the device side walls and push against the reinforcing frame (6).
7. Screw each of the knurled screws (3) a few revolutions into the threaded holes on the device back wall, until the device sits loosely in the panel cut-out (1).
8. Position the device centrally in the panel cut-out (1).
9. Alternately tighten both knurled screws (3) until fully tightened. When doing so, repeatedly check the position of the device and that the gasket (8) is evenly pressed and correct if necessary.

   The tightening torque on the knurled screws is 0.5 Nm.

   > **Hinweis:** The plastic grips of the knurled screws can be removed to allow the use of a torque screwdriver.

4.5 Power supply

> **Hinweis:**
> Power cords or parts thereof must only be replaced with parts with sufficient rated power.

4.5.1 USA and Canada

Use the supplied power cable connection set to supply the device with power. Alternatively, a power cable connection set with the following identical technical data can be used:

Power plug with CSA or UL approval mark:
- NEMA (type B) with 10 A

Power cable with CSA or UL approval mark:
- ANSI/UL 498 and CSA C22.2 cabling with a minimum cross-section of AWG 18

Device plug with CSA or UL approval mark:
- Type C13 with 10 A and 250 V AC

The relevant applicable standards and requirements must be complied with.

4.5.2 Europe

Use a complete power cable connection set that complies with the national requirements.
The ratings and certifications must comply with the technical data specified below. (e.g., power cable connection set according to IEC 60799)

Power plugs with approval mark:
- Plug connector type E with 16 A (EU: France, Belgium, Slovakia, etc.)
- Plug connector type F with 16 A (EU: Germany, Austria, Netherlands, Spain, etc.)
- Plug connector type G with 13 A (EU: UK, Ireland, Cyprus, Malta, etc.)
- Plug connector type J with 10 A (EU: Switzerland and Liechtenstein)
- Plug connector type K with 16 A (EU: Denmark and Greenland)
- Plug connector type L with 10/16 A (EU: Italy)

Power cable with approval mark:
- IEC 60227 or EN 60245, minimum cross-section of 0.75 mm^2 (e.g. H05VV-F 3 x 0.75 mm^2)

Device plug with approval mark:

– Plug connector type C13 with 10 A and 250 V AC

The relevant applicable standards and requirements must be complied with.

> **Hinweis:**
> The use of this combination falls outside of CSA approval and is at your own risk.

4.5.3 Version 100–240 V AC: Installing C13 plug connector (IEC 60320 C13)

Alternatively, the device plug supplied can also be used with the previously specified power plugs and power cables.
The relevant applicable standards and requirements must be complied with.
The plug connector included is intended for use with flexible lines:

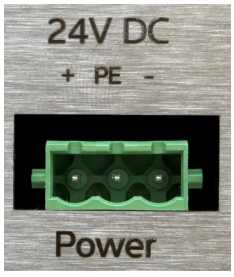
H05VV-F 3-core 0.75 mm^2 to 3-core 1.5 m^2
from 2 m supply cable length min. 3-core 1.0 mm^2
Max. Ø 8.0 mm

4.5.4 Version 24 V DC: Installing plug connector

The DC power supply is carried out via the plug connector supplied: 24 V DC (Phoenix Contact FKC 2.5/ 3-ST-5.08-RF).

The relevant applicable standards and requirements must be complied with.

Protective grounding conductor



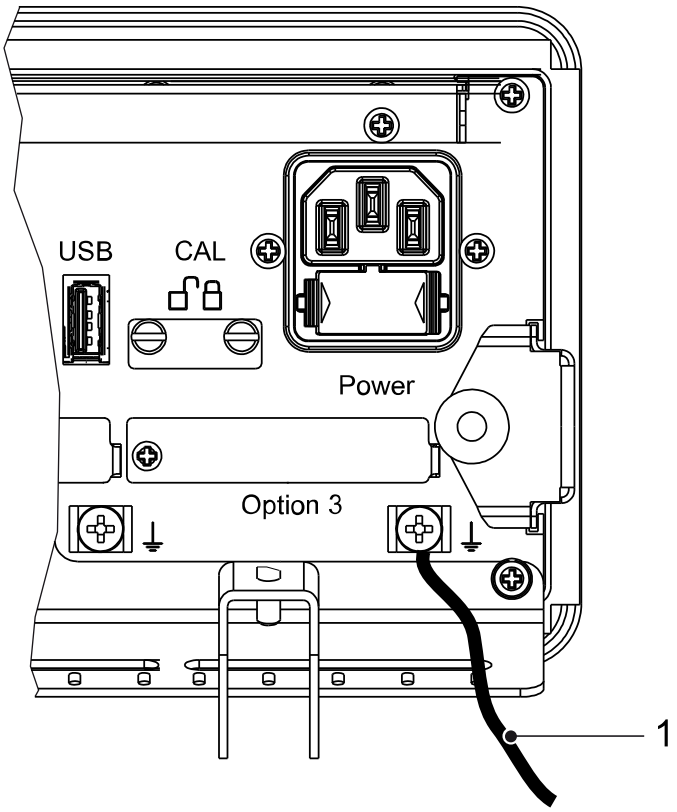
The protective grounding conductor (PE) must be connected to the middle contact of the terminal and is connected to the housing inside the device.

> **Hinweis:**
> For technical data, see Supply voltage version 24 V DC.

4.6 Implementing strain relief and screen connection for option cards

1. Strip the wires for the area near the terminals so that the shielding is electrically connected to the strain relief rail.
2. Secure the lines for option cards to the strain relief rail via the terminals to ensure strain relief.

4.7 Connecting the functional ground



The functional ground (1) must be connected as shown .

4.8 Establishing connections for option cards

The connections for the installed option cards can be found in the descriptions under Option cards.

4.9 Switching on the device

- Connect the device to a power supply.
- The device switches on.
- For further steps, see the Technical manual – Firmware.

5 Cleaning

5.1 Instructions for cleaning

The device must be cleaned of contaminants on a regular basis.

⚠ WARNUNG

Performing electrical work on a device that is switched on can have life-threatening consequences.

- ▶ Disconnect the device from the power supply before cleaning (disconnect the power plug from the electrical outlet).
- ▶ Do not open the device for cleaning.

ACHTUNG

Property damage caused by the use of unsuitable cleaning utensils/ products.

Damage to the device.

- ▶ Prevent moisture from penetrating the interior.
- ▶ Do not use aggressive cleaning agents (solvents or similar agents), see Cleaning agents.
- ▶ For use in the food industry, use a cleaning agent suitable for that particular working environment.
- ▶ Use soft sponges, brushes, and cloths.
- ▶ Spraying with water or blowing off with compressed air is not permissible.

1. Clean the device, referring to the information provided by the manufacturer.
2. Wipe down the device with a soft, dry cloth after cleaning.

5.2 Cleaning agents

ACHTUNG

Some cleaning agents may not be compatible with the product material.

- Only use disinfectants and cleaning agents in line with the manufacturer’s instructions.
- Do not use any abrasive sponges containing iron, steel brushes, or cleaning sponges made of steel wool.
- Always test cleaning agents and materials in non-critical areas first before using them.

6 Disposal

Our products and their packaging must not be disposed of in municipal waste (e.g., garbage can for recyclable packaging, garbage can for paper packaging, etc.). They can either be recycled by the customer themselves, providing this complies with requirements set out by electrical or electronic waste or packaging waste laws, or sent back to Minebea Intec at a charge.

This option of returning the product is intended to provide proper recycling or reuse in a manner that is collected separately from municipal waste.

Before disposing of or scrapping the old products, any single-use or rechargeable batteries should be removed and taken to a suitable collection point. The type of battery used is specified in the technical data.

Please see our General Terms and Conditions for further information.

Service addresses for repair acceptance and collection points can be found in the product information enclosed with the product as well as on our website (www.minebea-intec.com).

Minebea Intec Bovenden GmbH & Co. KG
Leinetal 2
37120 Bovenden

WEEE Reg. no. DE58091735

Should you have any further questions, please contact your local service representative or our service center.

Minebea Intec Bovenden GmbH & Co. KG
Repair center
Leinetal 2
37120 Bovenden, Germany
Phone: +49.551.30983.333
service.bov@minebea-intec.com

We reserve the right not to accept products that are contaminated with hazardous substances (ABC contamination).

7 Specification

7.1 General technical data

The following characteristics are valid after a warm-up time of at least 2 hours (reference temperature: 23°C).

7.1.1 display

Type	Size	Display
TFT color display	4.3"	800 x 480 pixels

7.1.2 Supply voltage version 100–240 V AC

Supply voltage	U_{AC} = 100...240 V	+10 %/-15 %; 50/60 Hz
Max. power consumption	30 VA	
Primary fuse	T1AL 250 UAC 5×20 mm	

7.1.3 Supply voltage version 24 V DC

Supply voltage	U_{DC} = 24 V SELV/PELV Energy/power limitation	±10 %
Max. power consumption	20 W	
Primary fuse	T2AL 125UDC; 3×10.1 mm	
Connection conditions	Only for low-voltage DC power supply networks without transient overvoltages on secondary circuits	

7.1.4 Buffering of the date/time module

The lithium battery for buffering of the date/time module is already activated upon delivery and is not intended to be replaced by the customer.

Service life	Device continuously connected to mains voltage	up to 10 years
	Device not connected to mains voltage for some time (e.g., in storage)	up to 7 years

7.1.5 Backup batteries (for outages)

Type	NIMH AAA Max. 1.2 V; 600 mAh
Quantity	3 pcs
Manufacturer	GP

> **Hinweis:**
> See also Chapter “Operating & display” in the Technical manual – Firmware.

7.1.6 WLAN

ACHTUNG

IT operations halted due to corrupted data.
Protect the network against unauthorized access.

- In order to minimize risks, standard IT security guidelines must be complied with.

Connection to an existing network can be established via WLAN (host access).
Alternatively, an access point can be set up through this.
WLAN and wired LAN can be used at the same time.
WLAN and Bluetooth® can also be used at the same time.
WLAN is based on the IEEE 802.11 standards.

Hinweis:
For information on setting up the network, see “Network settings” in the Technical manual – Firmware.

Frequency	Application	Frequency range	Max. transmission power (EIRP*)
2.4 GHz	Host access Access point	2.400...2.4835 GHz	100 mW
5 GHz	Host access	5.150...5.350 GHz	200 mW
		5.470...5.725 GHz	1 W

* = Effective Isotropic Radiated Power

Hinweis: In the 5 GHz band for WLAN, the range of 5150 MHz to 5350 MHz is solely intended for use in enclosed spaces. This applies in the following countries: AT, BE, BG, CY, CZ, DE, DK, EE, EL, ES, FI, FR, HR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SE, SI, SK, UK.

7.1.7 Bluetooth®

Bluetooth® can be used to establish a connection to the following peripheral devices:

- Printer
- Barcode scanner
- Keypad

WLAN and Bluetooth® can be used at the same time.

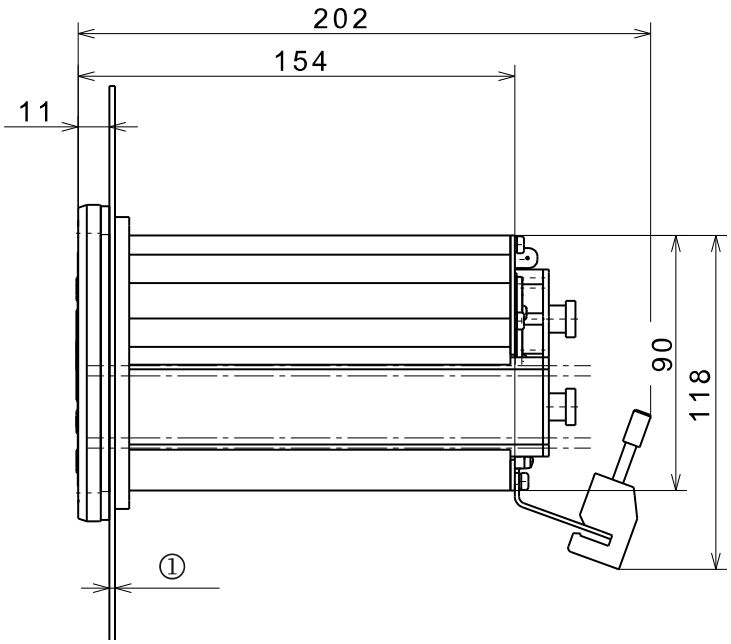
Hinweis:
For information on setting up Bluetooth devices, see also Chapter “Bluetooth printers” and “Activating Bluetooth devices” in the Technical manual – Firmware.

7.1.8 NFC

Data from NFC tags can be read by NFC if this is supported by the device configuration. This function can be used for user identification (see Chapter “Add/edit user” in the Technical manual – Firmware) or on an application-specific basis.
The antenna is positioned on the back of the front membrane (see Device front).

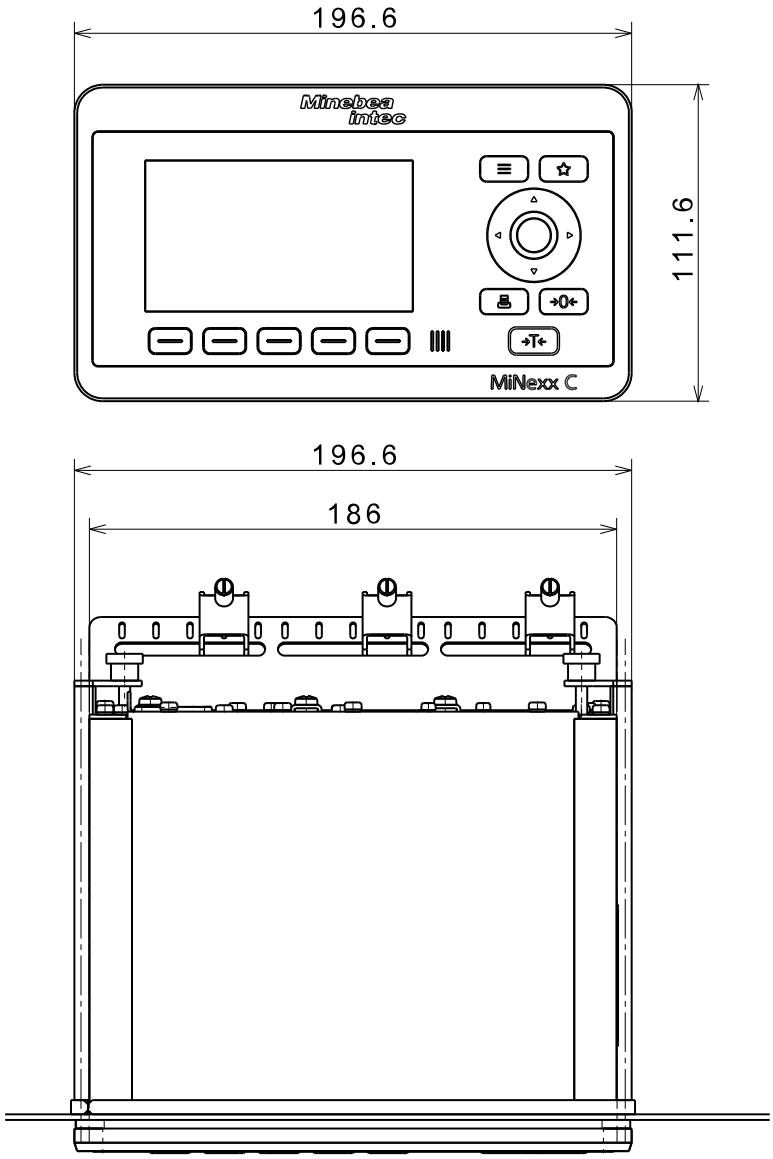
7.2 Housing

7.2.1 Housing dimensions



All dimensions in mm

① Wall thickness 1.5...5 mm



All dimensions in mm

7.2.2 Materials

Component	Material
Housing	Aluminum EN-AW 6060
Front panel	Aluminum EN AW-5754
Gasket	EPDM
Membrane keyboard	PET

7.2.3 IP protection

Component	Protection class
Front	IP65; IP66; NEMA 3X indoor
Housing + rear panel	IP30

7.3 Ambient conditions

The ambient conditions only apply for indoor use.

Temperature range	
Ambient temperature for operation*	-10...+40°C
Power-on temperature	> 0°C
Ambient temperature Storage/transport	-20...+60°C
Humidity*	< 95%, no condensation (in accordance with IEC 60068-2) at 40 °C
Protection grade	Front IP65, IP66 and NEMA 3X indoor, housing + rear panel IP30
Height	<2000 m above sea level (according to EN 61010)
Vibrations	The device must not be exposed to strong vibrations.
Degree of contamination	2

Hinweis: *
The indicator can be operated in a humid environment.
A combination of very high humidity and very high temperature at the installation location of the indicator should be avoided.
Always avoid aggressive chemical vapors.

7.4 Electromagnetic Compatibility (EMC)

All data in compliance with EN IEC 61326 industrial section.

8 Appendix

8.1 Certificates

Ser. no.	Name	Document no.
1	EU Declaration of Conformity	

Published by
Minebea Intec Bovenden GmbH & Co. KG
Leinetal 2 | 37120 Bovenden, Germany
Phone: +49.551.309.83.0 | Email: info@minebea-intec.com
www.minebea-intec.com

Minebea intec
The true measure