



KERN & Sohn Ltd

Ziegelei 1
72336 Balingen-Frommern
Germany

www.kern-sohn.com

+0049-[0]7433-9933-0

+0049-[0]7433-9933-149

info@kern-sohn.com

Installation instructions

Display device



KERN KXC-TM-EX2

Type TKXC-TM-EX2-A

Version 1.0

2026-06

en



TKXC-TM-EX2-A-IA-e-2610



KERN KXC-TM-EX2

Version 1.0 2026-06

Installation instructions

Signalling unit

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1 Safety instructions

1.1 Observe the instructions in the operating manual



Read the operating instructions carefully before installation and commissioning, even if you already have experience with KERN scales.

1.2 Staff training

The device must only be operated and maintained by trained staff.

Planning, installation, maintenance and repair must only be carried out by qualified personnel with the necessary and up-to-date knowledge of explosion protection. The qualified personnel must also have sound knowledge of handling scales.



Please observe EN 60079-14 and any country-specific requirements (Germany: Technical Rules for Operational Safety TRBS 1203).

1.3 Notes on explosion protection

- Observe the ATEX directives, the applicable standards and the local safety and accident prevention regulations during selection, installation, maintenance, repair and operation.
- The device complies with Ex category 3, protection level c, and may be used in zones 2 and 22.
- Do not install the device in areas where high electrostatic charges are to be expected.
- Only open the signal conditioning instrument when it is de-energised.
- Only open the signal conditioning instrument when there is no explosive atmosphere present.
- Do not connect or disconnect the terminals whilst they are live. Exception: The intrinsically safe battery YKR-04-EX2 may be connected to and disconnected from the KXC-TM-EX2 signal conditioning unit in the hazardous area.
- Additional devices are connected to the signal conditioning instrument via interfaces with the "ec" or "tc" type of protection. The specified connection values must be observed. See the installation instructions for the interface modules.
- The YKR-05-EX2 battery charger must only be operated in a safe area.
- Use a damp cloth for cleaning.
- Do not use solvents to clean plastic surfaces.
- Use the equipotential bonding connection on the evaluation unit and on the platform.
- Use only genuine KERN spare parts.
- Avoid tensile stress on the cable gland.

1.4 Labelling

1.4.1 Indicator and scales

Manufacturer: KERN & SOHN GmbH, DE-72336 Balingen, Ziegelei
1

Model designation: T...XC...-EX2...

Certificate: TUV-A 2026-000xxx

Issued by: TÜV AUSTRIA Deutschland GmbH
Kurze Straße 40, 70794 Filderstadt, GERMANY

Gas marking: II 3G Ex ec [ic] IIC T4 Gc

Dust classification: II 3D Ex tc [ic] IIIC T80°C Dc

1.4.2 Battery

Manufacturer: KERN & SOHN GmbH, DE-72336 Balingen, Ziegelei
1

Model designation: TYKR-04-EX2...

Certificate: TUV-A 2026-000xxx

Issued by: TÜV AUSTRIA Deutschland GmbH
Kurze Straße 40, 70794 Filderstadt, GERMANY

Gas marking: II 3G Ex ic IIC T4 Gc

Dust classification: II 3D Ex ic IIIC T80°C Dc

1.4.3 Explanatory notes on the Ex marking

II3G Group II (not for mines), Category 3, gas for Zone 2

ec Type of protection "Increased safety" in accordance with EN 60079-7, safety level "c"

ic Type of protection "Intrinsic safety" in accordance with EN 60079-11, safety level "c"

[ic] Associated equipment with the "Intrinsic Safety" type of protection

IIC Gas group; IIC is also suitable for gas groups IIA and IIB

T4 Temperature class, also includes T1, T2 and T3
Not suitable for temperature classes T5 and T6

Gc Equipment protection level 'c' for explosive gas atmospheres

II3D Group II (not for mines), Category 3, Dust for Zone 22

tc Type of protection "Enclosure protection", EN 60079-31, protection level "c"

IIIC Dust group; IIIC is also suitable for IIIA and IIIB

T80°C The surface temperature of the enclosure is below 80°C

Dc Device protection level 'c' for explosive dust atmospheres

2 Special conditions for safe use in potentially explosive areas

In addition to the general requirements of EN 60079-14, the following must be observed:

- a) The equipment may only be operated at ambient temperatures T_a of -10 to 40 °C. However, the battery must be charged at T_a of 0 to 40 °C outside the potentially explosive area.
- b) When operating on mains power, the green-yellow conductor of the signal conditioning unit must be connected to the protective conductor. In addition, the equipotential bonding conductor with a cross-section of at least 4 mm² must be connected to the external terminal below the U-shaped disc.
- c) When the signal conditioner is operated on battery power, the external earth connection must be used to dissipate electrostatic
, the external earth connection must be permanently connected via a ring terminal with
at least 1.5 mm² to a voltage-free and low-interference earth. The battery is earthed via its connection cable.
- d) To discharge electrostatic charges, the load cell's earth connection must be permanently connected via a ring terminal with a cross-section of at least 1.5 mm² to the
external terminal of the evaluation unit.
- e) For battery operation, use type TYKR-04-EX2-d.
- f) The membrane keypad cannot become dangerously charged during operation or when wiped by hand with a cloth. Other types of strong charging that could cause sliding-needle discharges must be ruled out.
- g) The battery socket must be protected from dirt with the cap when the plug is not inserted.
- h) The signal conditioning unit must only be opened when de-energised and provided that there is no risk of an explosive atmosphere. The interior of the unit must not be contaminated.

3 Technical data

KERN	KXC-TM-EX2	
Item number / Type	TKXC-TM-EX2-A	
Classification of evaluation unit TKXC-TM-EX2-A		II 3G Ex ec [ic] IIC T4 Gc IP65/IP69 II 3D Ex tc [ic] IIIC T80°C Dc
Classification Battery TYKR-04-EX2-A		II 3G Ex ic IIC T4 Gc II 3D Ex ic IIIC T80°C Dc
Display	6 LCD digits, digit height 48 mm, backlit	
Resolution (verifiable)	Single (Max.) 3000 e	
	Multi-range/multi-interval (max.) 2x3000 e	
Resolution (non-verified)	100 – 999,999 d	
Calibration class	III	
Weighing ranges	1 or 2	
Resolution	1, 2, 5, 10, n	
Strain gauge load cells	87 / 1227Ω (minimum/maximum resistance)	
Applications	Weighing, counting, checkweighing	
Weighing units	g, kg, lb, pcs, %, FFA	
Permissible ambient temperature	-10 °C ... + 40 °C	
Battery, permissible temperature range during charging	0 °C ... + 40 °C	
Humidity	max. 80% rel. (non-condensing)	
Power supply	Input voltage 100 ~ 240 VAC; 50 / 60 Hz; 0.12 A Overvoltage category III Mains voltage fluctuations ±10%	
	Alternative battery TYKR-04-EX2-A; 3.7 VDC; 10 Ah	
Mains cable	100–240 VAC, 0.12 A, 2.5 m open ends, type H07RN-F ^{3x1mm²} , Ø 8.3 – 10.7mm Flame-retardant in accordance with EN 60332-1-2 Oil-resistant in accordance with EN 60811-404	
Battery operation (alternative to mains operation)	Operating time 160 h (backlight off) Operating time 60 h (backlight on) Charging time approx. 6 hours with charger TYKR-05-EX2-A	
Dimensions of the display unit	252 x 79 x 162.5 (W x D x H) [mm] Dimensions of AC version with star handles, without mounting bracket	
Net weight	Data logger: 3.2 kg; battery 0.85 kg	

Interfaces	RS-232, USB device, Wi-Fi, analogue (0 – 10 V, 4 – 20 mA), Ethernet, Bluetooth
Installation	Up to 2000 m above sea level
Pollution class	2
Surge category	III
IP protection	Data logger: IP65 / IP69; Battery: IP65

4 Declaration of Conformity / Downloads

The current EC/EU Declaration of Conformity can be found online at:

<https://www.kern-sohn.com/shop/de/downloads/>

Select the “Product Documents” section and enter “TKXC-TM-EX2-A” in the item number field [REF][TYPE].

You will find further useful information in the downloads section:

- Operating and installation instructions
- KCP protocol description (KERN Communication Protocol)
- Technical drawings and CAD models
- Software that can be used with this device
- Brochures and catalogues

5 Introduction

5.1 General notes on this manual

INFORMATION

- !** Please read this document in full before installing and configuring the device. Only use the device in accordance with the specifications described in this document. This is to prevent personal injury and damage to property.

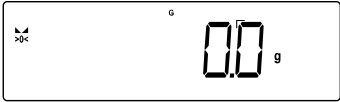
- This document contains the necessary information for the correct installation and adaptation of the indicating instrument to the weighing platform or weighing bridge in use.
- The operation of the indicator and its adaptation to the working and environmental conditions are described in the indicator's operating instructions.
- The necessary steps for installing the weighing platform or weighing bridge are described in the relevant installation instructions.
- The necessary steps for the complete installation of interface modules are described in the respective installation manuals. This document describes only the steps for opening the indicator and the designated connection points.

5.2 Presentation conventions

5.2.1 Text formatting

Text	Designation
•	List
⇒	Instructions
1. 2. ...	Steps in assembly/installation instructions where the order must be followed
[]	Square brackets are used to represent buttons <i>Example: [X] button</i>
< >	Angle brackets are used to represent content displayed on the device's screen (e.g. menu items, parameters, notifications, etc.) <i>Example: <MENU></i>

5.2.2 Illustrations of how to operate the equipment

Symbol	Meaning
	Short press
	Long press / hold down the button
	Display on the scales (illustrative example)

5.2.3 Binding information

Important and binding information describes matters that require special attention, which you must take note of and which are always valid (e.g. legal provisions or terms and conditions).

INFORMATION



Important binding information is provided here

5.2.4 Supplementary information, tips and recommendations



Supplementary information, tips or recommendations can be found here

6 Description of the device

This device is a signal conditioning unit for connection to a weighing platform or weighbridge with strain gauge load cells.



Optimal interaction between the components of the weighing system is achieved with a weighing platform or weighing bridge from KERN.

Information on weighing platforms and weighing bridges, as well as pre-configured weighing systems from KERN can be found online at:

www.kern-sohn.com

7 Overview of the device

7.1 Keypad



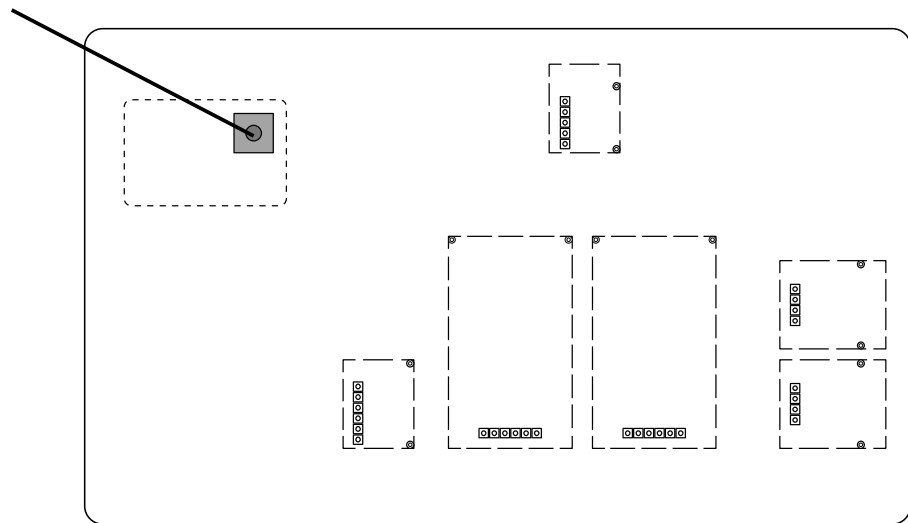
This document describes only the key functions relevant to configuration. Further functions can be found in the operating instructions for the indicating instrument.

Key	Designation		Function	Numeric input
	ON/OFF		➤ Switch on ➤ Switch off (long press)	
	F2	←	➤ Navigation key ← ➤ Go back one menu level ➤ Exit menu	➤ Select previous digit
	CHANGE	→	➤ Navigation key → ➤ Activate menu item ➤ Confirm selection	➤ Select next digit
	PRINT	↓	➤ Navigation key ↓ ➤ Scroll forward through menu items	➤ Decrease flashing digit (0 – 9)
	ZERO	↑	➤ Navigation key ↑ ➤ Scroll back through menu items	➤ Increase flashing digit (0 – 9)

7.2 Adjustment switch

Evaluation unit circuit board:

Adjustment switch
(under the cover)



8 General safety information

INFORMATION



Read this document in full before installing the device. Only use the device in accordance with the specifications described in this document. This is to prevent personal injury and damage to property.

8.1 Inspection on delivery

Please check the packaging immediately upon receipt and the device whilst unpacking for any visible external damage.

8.2 Refer to the accompanying documentation

Read all supplied documents thoroughly before using the device. Observe all the notes and instructions contained therein.

8.3 General information on warnings

Warnings are used in this document to alert you to potential personal injury or property damage in specific situations.

Signal word	Description
DANGER	Failure to observe this warning will result directly in serious injury, permanent impairment (e.g. loss of a limb) or the death of the user or third parties
WARNING	Failure to observe this warning may result in serious injury, permanent impairment (e.g. loss of a limb) or the death of the user or third parties
CAUTION	Failure to observe this warning may result in minor injuries or temporary impairment to the user or third parties (e.g. minor cuts)
NOTE	Failure to observe this note may result in damage to property

Warning of personal injury:

⚠ SIGNAL WORD



Type and source(s) of the hazard

Possible consequences of the hazard

Symbol

⇒ Measures to prevent the hazard

Warning of property damage:

NOTE



⇒ Measures to prevent property damage

Symbols in warning notices:

Symbol	Meaning
Warning signs	Warning signs alert you to hazards that may result in personal injury. The symbol indicates the type of hazard.
	Indicates general hazards or a hazardous area
	Warning of electrical voltage
	Warning of a potentially explosive atmosphere
Mandatory signs	Mandatory signs prescribe measures you must take to prevent personal injury or damage to property. The symbol indicates the necessary actions or items required to prevent damage.
	Indicates a mandatory action

8.4 Intended use

- The evaluation unit is a Class III verifiable device designed for non-automatic scales and weighing systems with standard strain gauge load cells in industrial environments.
- The indicator is designed for the display, acquisition, storage, transmission and analysis of measurement data within the approved environmental conditions.
- The indicator must only be operated with original spare parts.

8.5 Improper use

- The indicator must not be cleaned with high-pressure cleaners.
- The indicator must not be operated with incompletely connected or damaged load cells.
- This evaluation unit does not comply with the Medical Devices Act (MPG) and is not intended for medical purposes.

8.6 User qualifications

Scales or weighing systems that use this indicator must only be installed by qualified personnel. The relevant guidelines and regulations for the specific application must be strictly observed.

8.7 Ambient conditions

- The ambient conditions described in the operating instructions must be observed. Please refer to the technical data in the device overview.

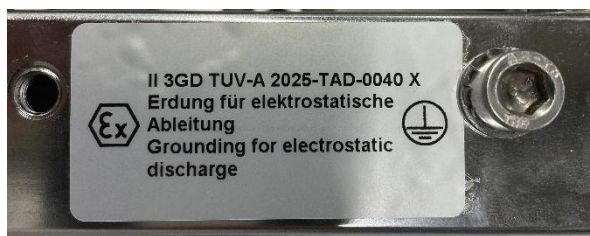
8.8 Mains connection

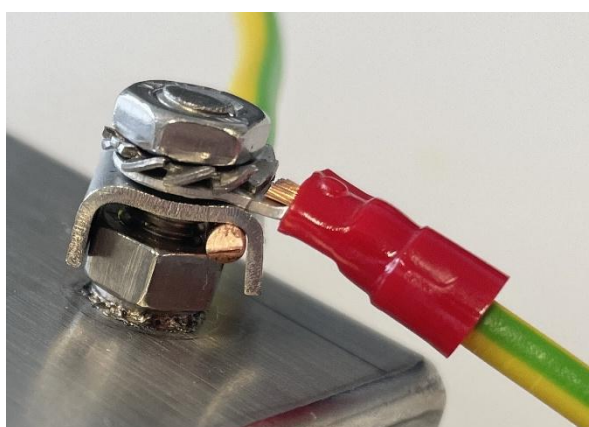
Incorrect use of electrical equipment may result in it catching fire or the user suffering an electric shock. Therefore, the following applies to mains-powered equipment and its connection:

- The mains connection must be designed with a suitable type of ignition protection for the existing Ex zone.
- The requirements of EN 60079-14 and country-specific requirements must be met.
- Only connect the balance to the mains supply if the information on the type plate matches the mains voltage.
- The mains connection must have an easily accessible disconnecting device.
- Protect the mains cable from contact with liquids and from mechanical damage.
- Ensure that the power cable is not trapped or kinked.
- Ensure that the power cable does not pose a tripping hazard.
- Check the mains cable at regular inspection intervals.

8.9 Equipotential bonding

The evaluation unit and the KERN balance must be connected to an equipotential bonding point or earth via the appropriately marked connection.

Marking of the PE connection on the indicator	Earthing connection on the balance with information label
	

Connection type: PA connection on the evaluation unit	Type of connection for the earth connection on the scale
	

8.10 Rechargeable and standard batteries

When used correctly, the YKR-04-EX2 rechargeable battery offers a high level of safety. The battery is housed in an IP65-rated stainless steel casing and is encapsulated.

The battery is short-circuit-proof and protected against overcharging.

Improper use of rechargeable or standard batteries can cause them to catch fire, explode, emit toxic fumes or release corrosive liquids. Therefore, the following applies to all rechargeable and standard batteries:

- Protect from cold, fire and heat. Please refer to the technical data regarding the permitted operating temperature ranges.
- Never expose to high pressure or microwaves.
- Do not allow them to come into contact with liquids or chemicals.

- Never allow the electrical contacts of rechargeable and non-rechargeable batteries to come into contact with metal objects or be short-circuited.
- Do not modify rechargeable batteries, batteries or chargers.
- Never use or charge a defective, damaged or deformed battery.

Insertion, replacement and storage:

Replace rechargeable and non-rechargeable batteries only with types recommended by the manufacturer.

If the scales are not used for a prolonged period, remove the battery and cover the terminals with the protective caps.

Warning:

Disconnect the battery immediately from the readout unit or charger if it emits any odours, becomes hot, changes colour or becomes deformed. The battery must then be taken out of service.

If battery fluid leaks:

Fluid may leak from damaged rechargeable and non-rechargeable batteries. Therefore, please note the following:

- Avoid contact between leaking fluid and your skin, eyes or clothing.
- Wear protective clothing/equipment when handling or removing a defective battery.
- Thoroughly clean any skin or clothing that has come into contact with battery fluid using soapy water, then rinse the affected areas thoroughly with clean water.
- If battery fluid gets into your eyes, rinse your eyes immediately with clean water. Seek medical attention straight away.

8.11 Components susceptible to electrostatic discharge

Electrostatic discharge (ESD) can cause damage to electronic components. Damaged components do not always lead to malfunctions immediately, but sometimes only after a certain period of time.

You should therefore take precautions for ESD protection before removing vulnerable components from their packaging and carrying out work on electronic equipment:

- Ground yourself before touching electronic components (ESD clothing, wrist strap, shoes, etc.).
- Only carry out work on electronic components at suitable ESD workstations (EPA) using suitable ESD tools (anti-static mat, conductive screwdrivers, etc.).
- Only transport electronic components outside the ESD work area in suitable ESD packaging.
- Never remove electronic components from their packaging when you are outside the EPD.

9 Assembly, installation and commissioning

INFORMATION



- It is essential that you follow the instructions in this manual before starting work.
- The illustrations are examples and may differ from the actual product (e.g. component positions).

⚠ DANGER



Risk of electric shock from touching live components

Electric shock can cause serious injury or death
Risk of explosion

- ⇒ Assembly and installation work must only be carried out in the absence of an explosive atmosphere.
- ⇒ Only open the signal conditioning instrument when it is de-energised. Disconnect the instrument from the mains supply or remove the battery.

9.1 Unpacking and inspection

Remove all parts included in the scope of delivery from the packaging and discard the packaging materials. Then check that all parts included in the scope of delivery are present and undamaged.

9.2 Scope of delivery

9.2.1 Scope of delivery: evaluation unit

Evaluation unit with mains connection	Evaluation unit with factory-fitted battery
Connected mains cable, 2.5 m, with open ends	TYKR-04-EX2-A battery, charger and battery holder
TKXC-TM-EX2-A data logger with: - Mounting bracket - Ferrite and cable ties for connecting a scale - M12 ring with connection tab for shielding - M12 cable gland for cable diameters from 3 to 6.5 mm with flat seal for the scale connection - Operating instructions for the evaluation unit - Installation instructions for the evaluation unit	

9.2.2 Scope of delivery: Platform scale

Scale with mains connection	Scale with Factory Option battery
Connected mains cable, 2.5 m, with open ends	TYKR-04-EX2-A battery, charger and battery holder
TKXC-TM-EX2-A display unit with - mounting bracket - Operating instructions for the evaluation unit - Installation instructions for the evaluation unit - Configuration overview - Platform installation instructions	

9.2.3 Scope of delivery for Factory Option interface

If you have ordered an interface as a factory option, the following items are also included:

- Installation instructions for interface
- For wired interfaces, an M12 cable gland for cable diameters of 3 to 6.5 mm and the appropriate flat gasket

9.2.4 Scope of delivery: Factory option alibi memory with real-time clock

If you have ordered an alibi memory with real-time clock as a factory option, the following items are also included:

- Installation instructions for alibi memory with real-time clock

9.3 Preparing the weighing platform or weighbridge

The preparation of the weighing platform or weighing bridge, such as unpacking, removing transport locks and levelling, is described in the relevant installation instructions. Follow the steps described there.

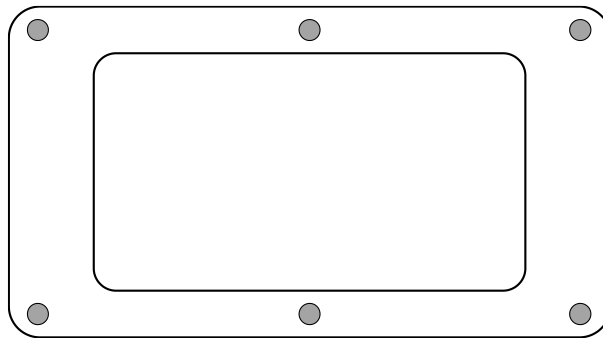
9.4 Connecting the weighing platform or weighing bridge

The following points 9.4.x are only to be carried out if no weighing platform or weighing bridge has been connected to the KXC-TM-EX2 evaluation unit ex works.

9.4.1 Opening the signal conditioning unit

Observe the instructions in chapter 1.3 “Notes on explosion protection” and

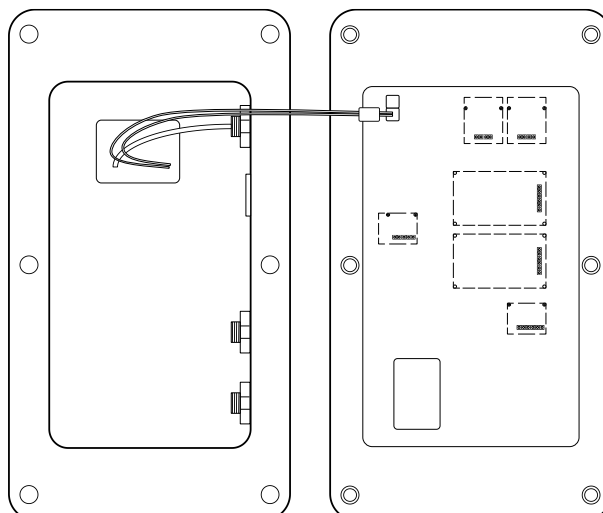
1. disconnect the unit from the mains supply or remove the battery.
2. Loosen the screws on the rear of the signal conditioning unit.



NOTE

⇒ Take care not to damage any cables (e.g. by tearing them off or pinching them).

3. Carefully open both halves of the indicator.



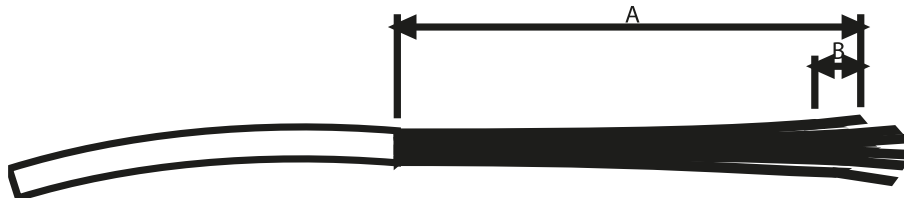
9.4.2 Connect the indicator to a weighing platform or weighing bridge

Strip the cable:

1. Strip the cable as shown in the figure below, using the following measurements.

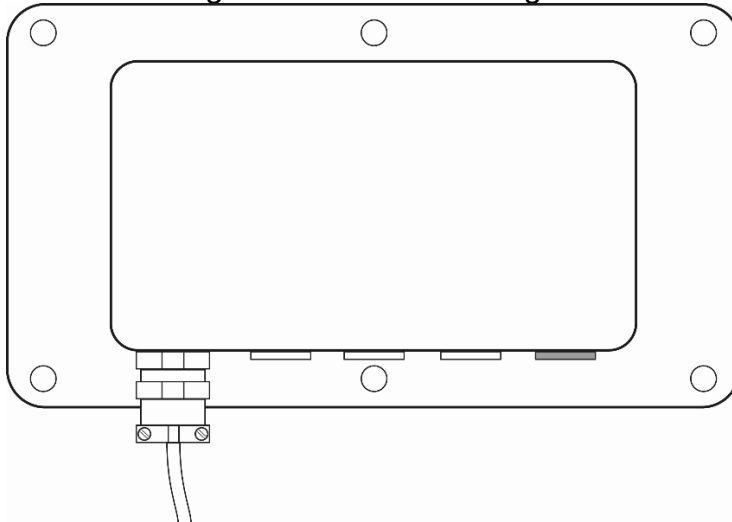
A = approx. 500 mm

B = approx. 5 mm



Insert the cable into the indicator:

2. Remove the right-hand outer blanking cover.

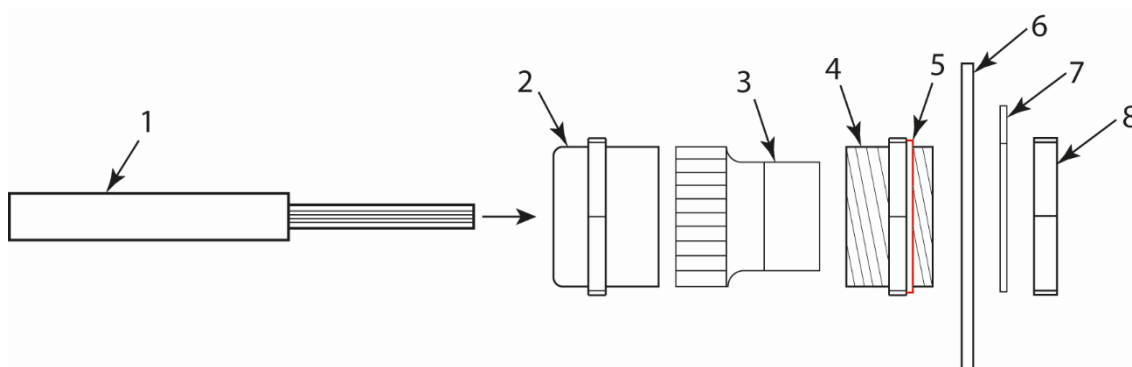


The cable gland supplied is suitable for cables with a diameter of 3 to 6.5 mm.

3. Fit the cable gland. The M12 ring with the terminal lug for the shielding is positioned inside the housing beneath the M12 nut.

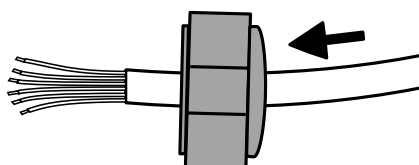


M12 ring with terminal lug for the shielding.

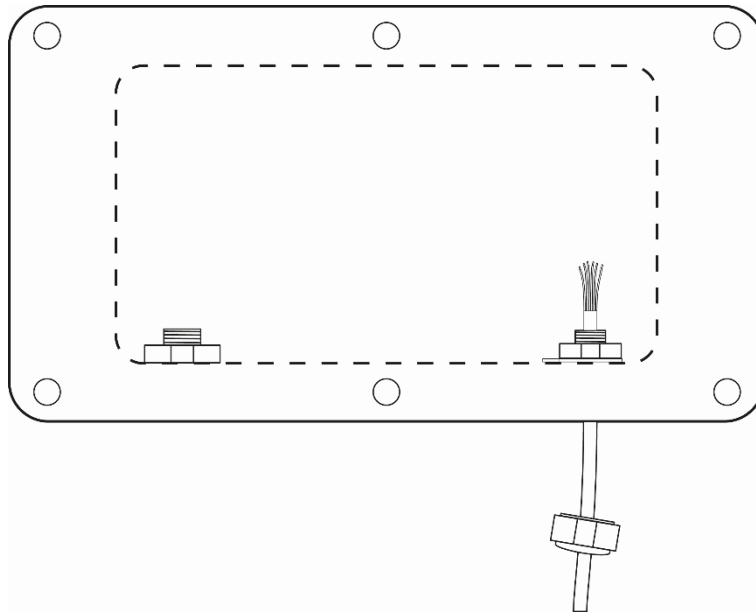


Item	Designation
1	Cable sheath
2	Union nut
3	Plastic insert
4	Metal housing
5	Flat gasket
6	Housing
7	M12 connection lug
8	Lock nut

4. Fit the metal housing of the cable gland with the flat gasket into the housing and tighten the lock nut over the M12 ring.
5. Feed the cable with the conductors through the union nut and the plastic insert.



6. Feed the cable through the cable entry.

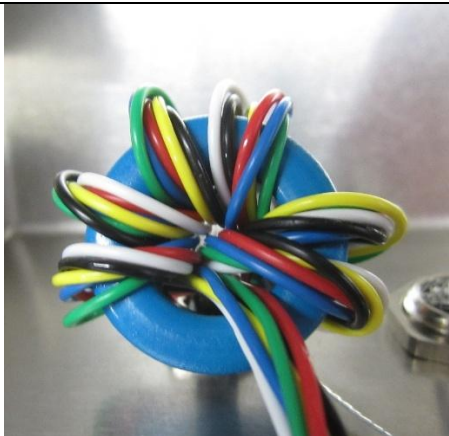


Note:

Here you can see the rear view of the display unit with a cut-away section of the sheet metal; the external connections are hidden.

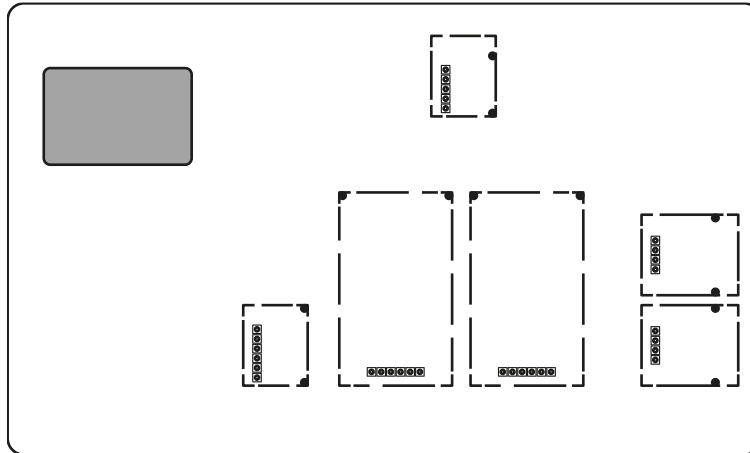
7. Secure the supplied cable tie inside the housing to the load cell cable to provide additional protection against it being pulled out. Tighten the cable tie securely!
8. Trim the shield wire and solder it directly to the terminal tab on the M12 ring. Alternatively, the shield can be connected using a cable lug.

Wind the 4 or 6 load cell wires tightly around the ferrite core about 6 times immediately after the housing.

Position of ferrite core, cable tie and connection of load cell shield Example with 4-wire load cell cable	Approximately 6 turns of the load cell cable around the ferrite core Example with 6-core load cell cable
	

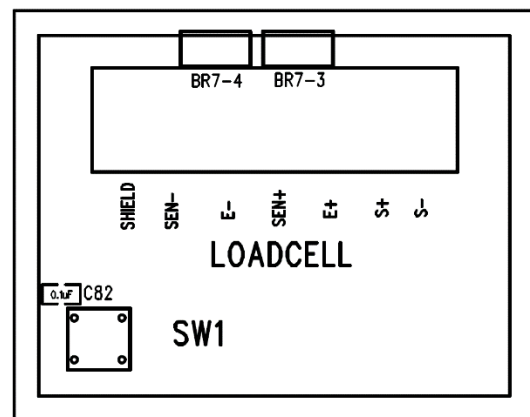
Connecting the cable to the circuit board:

9. Remove the cover over the load cell connection.



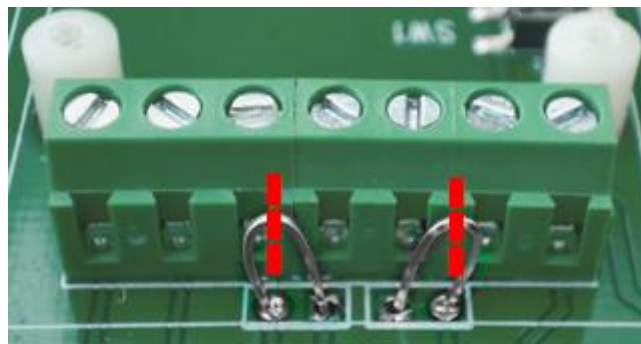
10. Connect the cable wires to the signal conditioning unit in accordance with the markings on the load cell and the circuit board.

	BM6G, L6E/G/N load cell IXC/SXC-EX2 scale
SEN-	Yellow or brown
E-	Black
SEN+	Blue
E+	Red
S+	Green
S-	White



Note:

The evaluation unit is preconfigured for a 4-wire load cell. When connecting a 6-wire load cell, the jumpers must be cut.



11. Secure the wires to the circuit board with cable ties so that they cannot slip when the evaluation unit is closed.

12. Refit the cover over the load cell connection.

Note: If you wish to configure a calibrated device, do not replace the cover until the configuration is complete.

To configure a calibrated device, the adjustment switch must be pressed frequently. The adjustment switch is located inside the housing.

Close the screw connection:

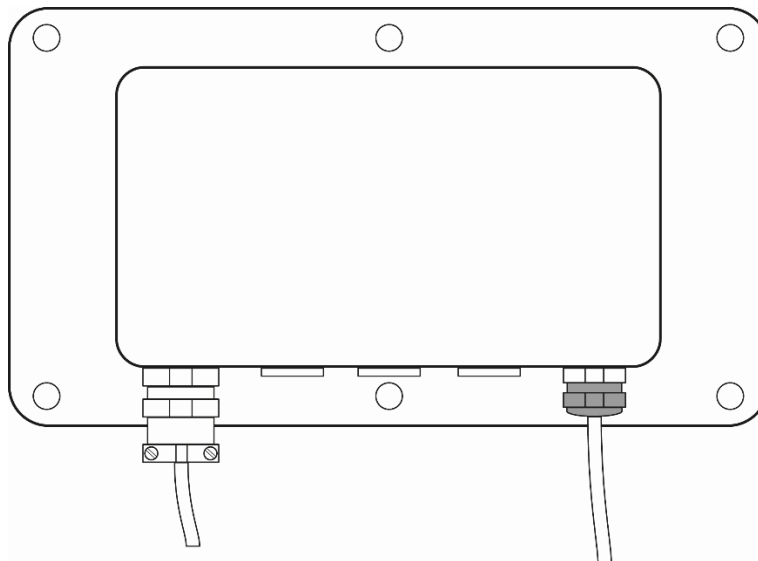


NOTE

⇒ Ensure that the load cell cable inside the housing is of a suitable length and cannot become trapped or crushed when the housing is closed.

13. Close the union nut and tighten it firmly from both sides using a suitable open-ended spanner.

Tightening torque = 4 Nm



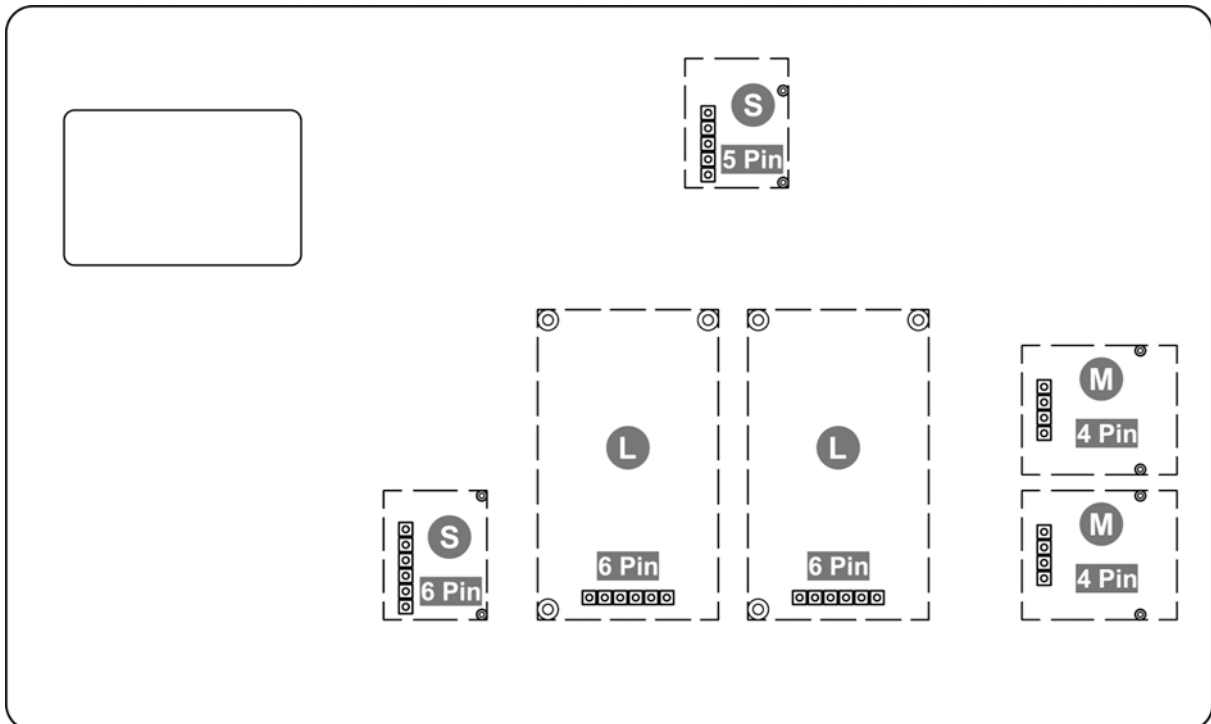
9.5 Installing optional interface modules



- This chapter describes how to open and close the signal conditioning unit for the installation of the optional KUM interfaces.
- The assembly of the KUM interfaces themselves is described in the respective installation instructions.

9.5.1 Circuit board

The circuit board of certain evaluation units offers several slots for KERN accessories, which you can use to expand the functionality of your unit as required. You can find information on this on our website: www.kern-sohn.com



The various slots are shown in the illustration above. There are three slot sizes for optional modules: S, M, L. These have a specific number of pins.

You can find the correct position for your module in the installation instructions for the interface module.

9.5.2 Installing interface modules



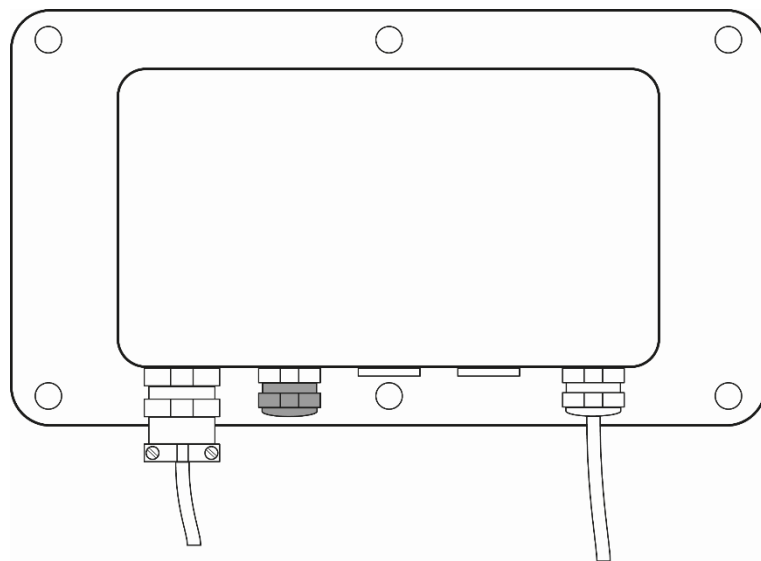
For wireless interface modules, simply open the data logger and attach the relevant module to the circuit board. These steps are described in the module's installation instructions.

Installing the wired interface module on the circuit board:

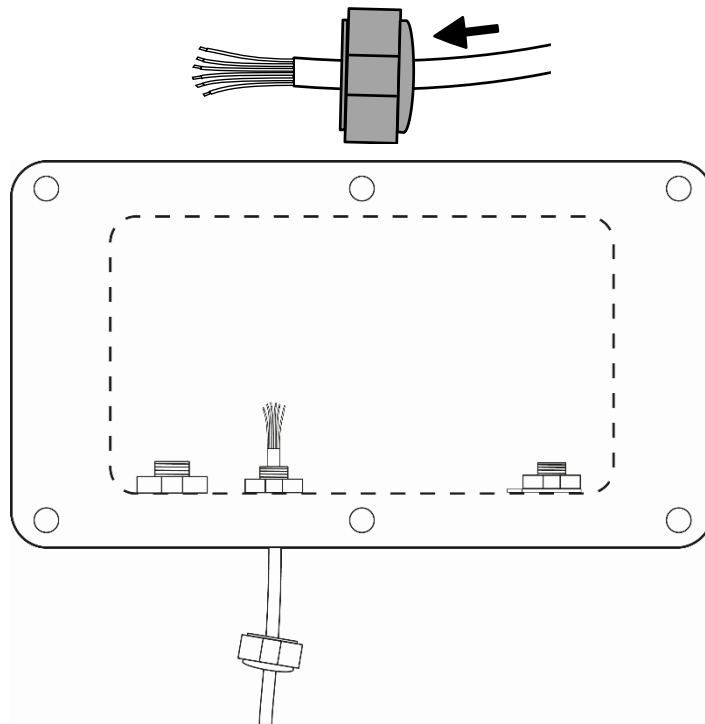
1. Peripheral devices are connected to the signal conditioning instrument in accordance with the “ec” and “tc” types of protection. You will find the permissible connection values in the installation instructions for the interface. Peripheral devices installed in potentially explosive atmospheres require a suitable type of explosion protection.
2. Only begin installing the cable gland once you have the interface cable to hand. With an ‘open’ cable gland, the evaluation unit is no longer explosion-protected.
3. Use only cables that are suitable for installation in potentially explosive atmospheres. See also EN 60079-14 and local regulations.
4. Open the signal conditioning instrument (see Section 9.4.1).
5. Install the module on the circuit board in accordance with its installation instructions.

Open the cable entry:

6. Remove a blanking cover.
7. The supplied cable gland is suitable for cables with a diameter of 3 to 6.5 mm.
8. Fit the cable gland.



9. Feed the cable through the union nut in accordance with the module's installation instructions.



Note: This shows the rear view of the display unit with a cut-away panel, and the external connections are hidden.

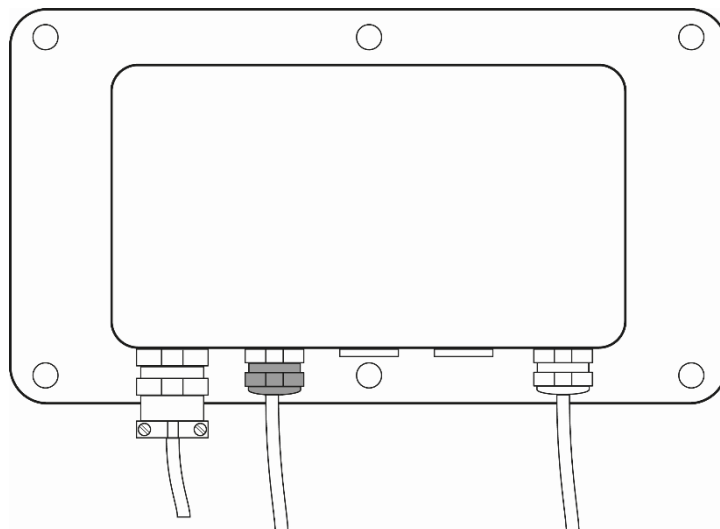
Close the cable gland:



NOTE

⇒ Ensure that the cable inside the housing is of a suitable length and cannot become trapped or crushed when the housing is closed.

10. Close the M12 screw connection and tighten it to the specified torque of 4 Nm.



9.6 Optional installation of the alibi memory and real-time clock



Further information on the alibi memory and real-time clock can be found in the respective installation instructions.

Observe the safety instructions regarding explosion protection!

1. Open the signal conditioning instrument (see section '9.4.1').
2. Install the alibi memory and real-time clock in accordance with their installation instructions.
3. After installation, the alibi memory must be initialised and the date and time set.
 - The initialisation of the alibi memory is described in the chapter '10.6'.
 - You will find instructions for setting the date and time in the operating manual for the evaluation unit.

Malfunction of the real-time clock may be due to a flat battery. The battery for the real-time clock is located on the mainboard. When replacing it, use only a CR2032 battery (3V lithium battery).

The error message 5E1-1c may indicate a flat battery.

9.7 Disconnect the evaluation unit

NOTE



- ⇒ Take care not to damage any cables (e.g. by tearing them or trapping them).
- ⇒ Ensure that the seals are undamaged and in their correct positions.
- ⇒ Ensure that all cables are inserted into the cable glands and that the cable glands are tightened. Open cable glands are not permitted!

-
1. Carefully fold both halves of the signal conditioning unit together.
 2. Screw the signal conditioning unit together (tightening torque = 1.5 Nm).



If you wish to configure a calibrated unit, do not connect the evaluation unit until the configuration is complete.

To configure a calibrated unit, the adjustment switch must be pressed frequently. The adjustment switch is located inside the housing.

9.8 Initial commissioning

Before initial commissioning in potentially explosive atmospheres, the device or the balance must be checked for explosion protection by a competent person in accordance with EN 60079-14 (see also Appendix C, test plans for ignition protection types Ex "e", Ex "t" and Ex "i")

For additional tests, see chapter 9.10

9.9 Periodic inspections

To ensure that the devices are maintained in a proper condition for continuous use within a potentially explosive atmosphere, tests must be carried out in accordance with EN 60079-17 (see also test tables for the different test depths of the types of protection Ex "e", Ex "t" and Ex "i")

For additional tests, see chapter 9.10

9.10 Additional tests

Effectiveness of the electrostatic connection for explosion protection between the load plate and the load frame. The connection is established by a metal spring. Resistance between load plate and load frame < 1 MΩ The image shows the load frame with spring, load plate removed.	
Tightening torque for cable glands	M12: Tightening torque 4 Nm M16: Tightening torque 5 Nm

9.11 Repair

KERN & SOHN offers a repair service for faulty equipment.

Service hotline for industrial scales: +49 7433 9933 - 333

10 Configuration

INFORMATION



- Please ensure you read the instructions in this manual carefully before starting work.
- The illustrations are examples and may differ from the actual product (e.g. the positions of the components).
- The scale is already configured when you receive the KERN indicator with the platform connected.

To configure the indicator in the service menu, you must know the following configuration data for the weighing system:

- Verifiable or non-verifiable device
- Number of weighing ranges and scale type (single-range, multi-range or multi-division scale)
- Unit
- Number of decimal places displayed
- Weighing range
- Readability

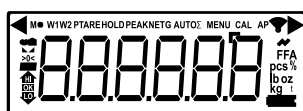


Further menus and settings (e.g. application menu, setup menu) are described in the operating instructions for the indicator.

10.1 Switching on



⇒ Press **[ON/OFF]**



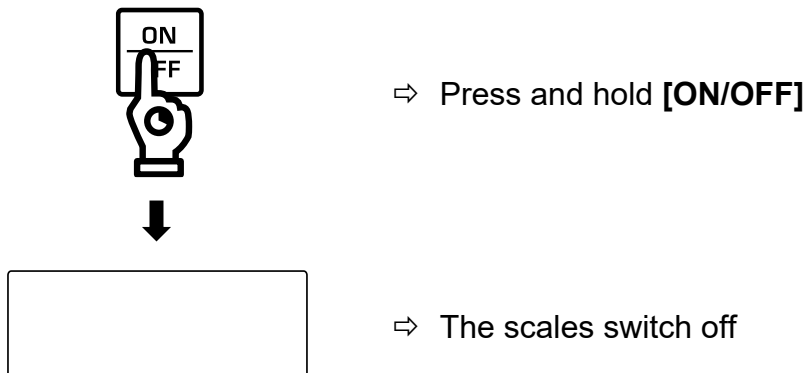
⇒ The balance performs a self-test

⇒ Then configure the instrument as uncalibrated or calibrated (see following chapters)

To obtain optimal weighing results, we recommend switching on the balance 10 minutes before use.

10.2 Switching off

Note: The device must be in operating mode to be switched off.

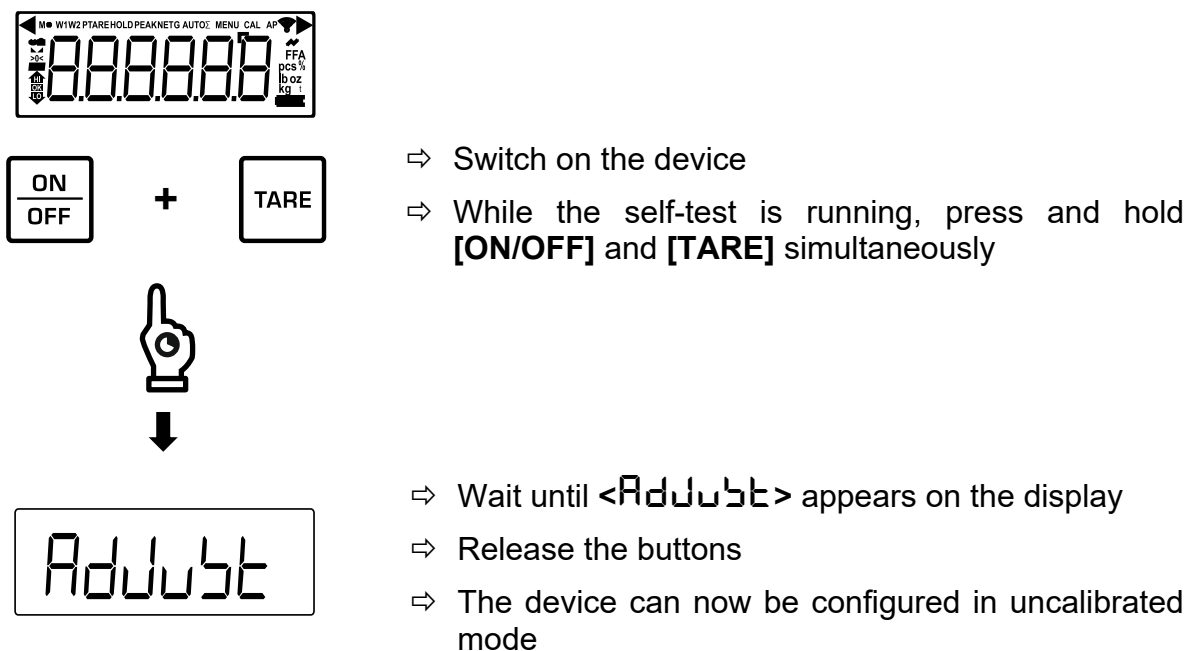


10.3 Open the service menu

10.3.1 Open the service menu in non-calibratable mode



The menu can no longer be opened in this way once verification capability has been activated. Menu item Verified = on.



10.3.2 Open the service menu in calibration mode

INFORMATION



Please note that to configure a calibrated device, the calibration seal must be broken and the balance must be recalibrated and resealed by an authorised body (e.g. when converting to a different platform). On initial delivery, the indicator is neither calibrated nor sealed.

If you order the indicator from KERN together with a platform and conformity assessment (calibration), the calibration seal is already affixed. Calibrated scales can be identified by the type plate. The type plate shows the symbol for the calibration class: . The calibration seal is affixed to the cover of the adjustment switch.

⚠ DANGER



Electric shock from touching live components

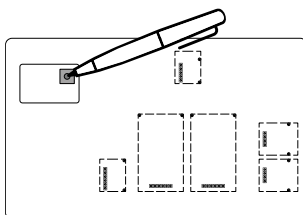
Electric shock can cause serious injury or death

- ⇒ Do not touch any live components; touch only the adjustment switch. Caution: There are exposed areas carrying mains voltage on the underside of the power supply board!

NOTE



- ⇒ It is essential that you observe the instructions regarding electrostatic-sensitive components in the chapter "Components susceptible to electrostatic discharge".
- ⇒ Observe the safety instructions regarding explosion protection



+



- ⇒ Remove the cover of the adjustment switch on the circuit board (for the position of the adjustment switch, see chapter 7.2)
- ⇒ Switch on the unit and press the adjustment switch

- ⇒ Wait until <H 10> appears on the display
- ⇒ Release the buttons

⇒ The device can now be configured in calibrated mode

10.3.3 Exit the service menu

You can exit the service menu by pressing the [←] button. To do this, press the button repeatedly until you reach the top-level menu.

10.4 Configuring weighing parameters

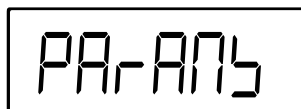


All weighing parameters are to be configured in the <PAR AN> menu.

10.4.1 Activate calibration capability



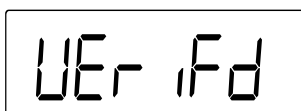
The menu option for activating calibration capability is only visible in the calibration mode of the service menu (press the calibration switch; see 10.3.2).



⇒ Navigate to <PAR AN> using [↑] or [↓]



⇒ Press [→]



⇒ Select <UEr iF>

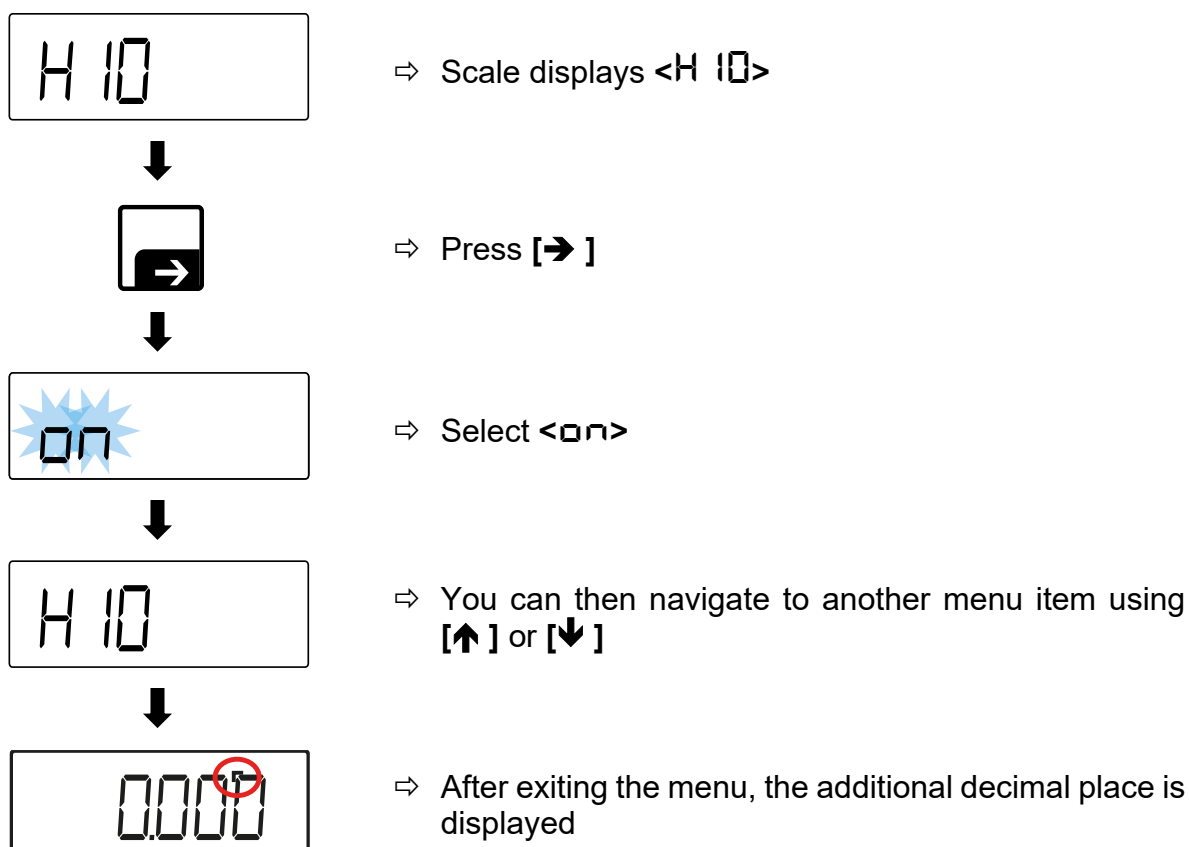


⇒ Select <on>

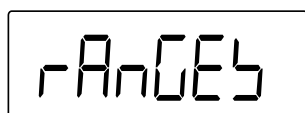
10.4.2 Activate increased resolution for calibratable devices



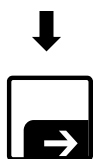
- The increased resolution facilitates the conformity assessment by displaying an additional decimal place.
- The prompt for increased resolution only appears if the device has been set to calibration-capable mode and the calibration switch is pressed again after a restart (press the calibration switch, see section 10.3.2).
- The increased resolution is displayed after it has been activated and the menu exited. In weighing mode, the 10-fold resolution (additional decimal place in brackets) is then displayed until the next restart.
- As soon as you switch to another menu item and change a parameter, the prompt disappears from the menu. A new prompt is then only possible after restarting in the calibratable mode and pressing the adjustment switch again.



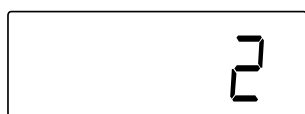
10.4.3 Set weighing ranges



⇒ Use [↑] or [↓] to navigate to <rAnGEs>



⇒ Press [→]



⇒ Select the number of weighing ranges:

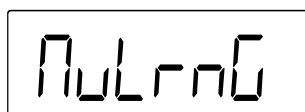
1	1 weighing range
2	2 weighing ranges

⇒ Press [→] to confirm the setting



When selecting 2 weighing ranges:

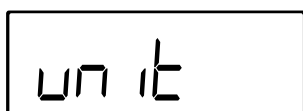
⇒ Select scale type:



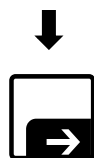
NuL int	Multi-range scale
NuLrng	Multi-range balance

⇒ Press [→] to confirm the setting

10.4.4 Set the base unit



⇒ Use [↑] or [↓] to navigate to <un it>

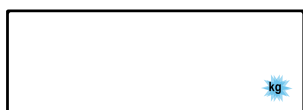


⇒ Press [→]

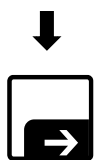


⇒ The balance switches to the weighing unit display.

⇒ The weighing unit starts to flash.

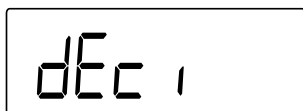


⇒ Use [↑] or [↓] to select the desired weighing unit



⇒ Press [→] to confirm the setting

10.4.5 Set the decimal places



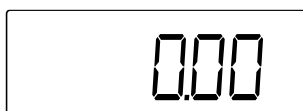
⇒ Use [↑] or [↓] to navigate to <dEc 1>



⇒ Press [→]



⇒ Use [↑] or [↓] to select the number of decimal places



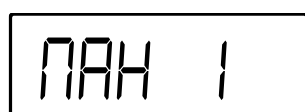
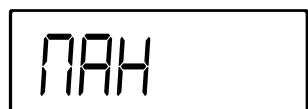
⇒ Press [→] to confirm the setting

10.4.6 Set the maximum weighing range(s)

NOTE



⇒ Do not enter a value that exceeds the maximum permissible load of the load cell and the dead weight on it. Otherwise, there is a risk that the end user will damage the load cell by applying excessive weights.



⇒ Use [**↑**] or [**↓**] to navigate to <NAH>

(If there are multiple weighing ranges: <NAH 1> (first weighing range), <NAH 2> (second weighing range))

⇒ Press [**→**]

⇒ The scale switches to numeric input

⇒ Set the maximum load (for numerical input, see section 7.1)

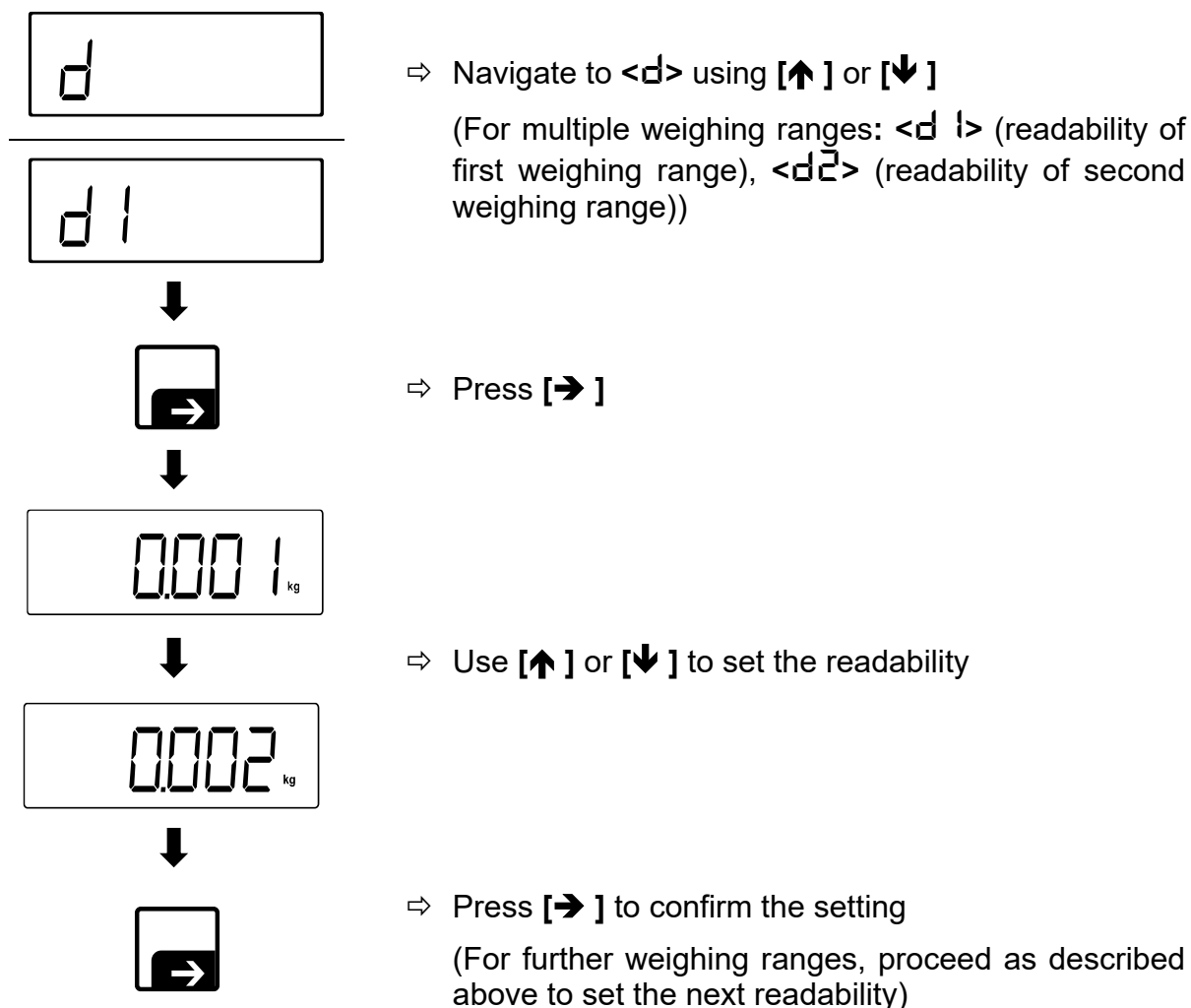
⇒ Press [**→**] to confirm the setting

(For further weighing ranges, proceed as described above to set the next maximum load)

10.4.7 Set the readability



If you are configuring a verifiable device, the readability **d** corresponds to the verification value **e**.



10.5 Perform linearisation and adjustment

INFORMATION



- **During initial commissioning, linearisation must be carried out after setting the weighing parameters.**
- The accuracy of the calibration weight must be at least equal to, or better than, the scale's readability d .
- The maximum load of the balance must not be exceeded during linearisation and adjustment.
- Information on test weights can be found online at: <http://www.kern-sohn.com>

NOTE



- ⇒ For linearisation and calibration, ensure that the ambient conditions are stable (e.g. avoid vibrations or draughts).
- ⇒ You will achieve better results if you switch on the balance for at least 10 minutes before linearisation and adjustment.
- ⇒ Ensure that during linearisation and calibration, only the calibration weight is on the weighing plate / load cell and no other load.

10.5.1 Linearisation for a single weighing range

INFORMATION



Perform custom 2-point linearisation and calibration as close as possible to the scale's maximum load.



These descriptions apply to the following weighing range settings:
<PAR AN> → <RANGE> → <I>

Example of 2-point linearisation:

Adjust

⇒ Navigate to <Adjust> using [↑] or [↓]



⇒ Press [→]

LINEAR

⇒ Select

2Po int

⇒ Select the number of linearisation points:

2-Po int	2-point (0, user-defined value)
3Po int	3 points (0, centre, max.)
5Po int	5 points (0, ¼ Max., ½ Max., ¾ Max., Max.)

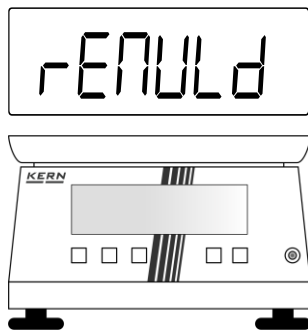
⇒ Press [→] to confirm the setting

6000 kg

⇒ Enter custom load (for numerical input, see chapter 7.1)



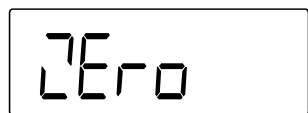
⇒ Press [→]



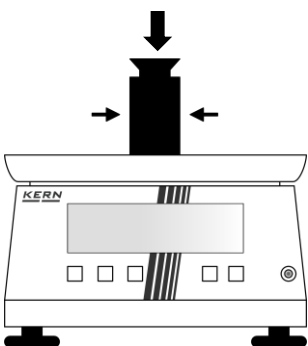
- ⇒ <rENUL> appears on the display
- ⇒ Unload the balance / load cell



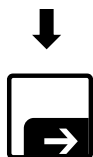
- ⇒ Press [→]



- ⇒ The zero point is determined first
- ⇒ The scale displays <Zero> → <PULd> in succession
- ⇒ The scales switch to display the load (in this example, load = 6 kg)



- ⇒ Place the calibration weight in the centre of the weighing platform



- ⇒ Press [→]



HA it



Success



2Po int

- ⇒ The balance performs linearisation
- ⇒ The balance displays <HA it> → <Success> in succession
- ⇒ The balance returns to <2Po int>

Example of 3-point linearisation (5-point linearisation is similar):

Adjust



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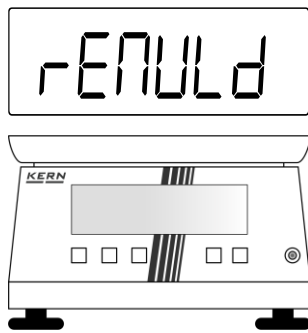


3Po int



- ⇒ Navigate to <Adjust> using [↑] or [↓]
- ⇒ Press [→]
- ⇒ Select
- ⇒ Select the number of linearisation points:

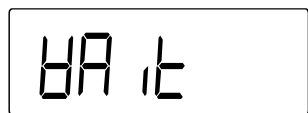
2-Po int	2-point (0, user-defined value)
3Po int	3 points (0, centre, max.)
5Po int	5 points (0, ¼ Max., ½ Max., ¾ Max., Max.)
- ⇒ Press [→] to confirm the setting



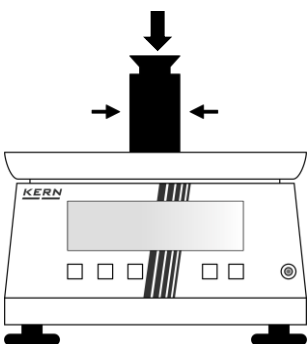
- ⇒ <rENUL> appears on the display
- ⇒ Unload the scale / load cell



- ⇒ Press [→]



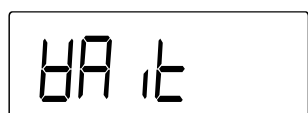
- ⇒ The zero point is determined first
- ⇒ The scale displays <0.000> → <Zero> → <PULd> in succession
- ⇒ → The scale switches to displaying half the maximum load (in this example, Max. = 6 kg, 1/2-Max. = 3 kg)



- ⇒ Place the calibration weight in the centre of the weighing platform



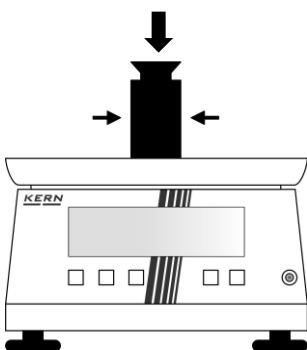
- ⇒ Press [→]



- ⇒ The balance performs 1/2-max linearisation
- ⇒ The balance displays <0.000> → <PULd> in succession
- ⇒ The balance switches to displaying the maximum load



6000 kg



⇒ Place the calibration weight in the centre of the weighing pan



⇒ Press [→]

HA it

Success

3Po int

⇒ The balance performs maximum linearisation

⇒ The balance displays <HA it> → <Success> in succession

⇒ The balance returns to <3Po int>

10.5.2 Linearisation for two weighing ranges

INFORMATION



Perform user-defined 2-point linearisation and calibration as close as possible to the scale's maximum load.



These descriptions apply to the following weighing range settings:
<PAR AN> → <RANGE> → <2>

Example of 2-point linearisation:

Adjust

⇒ Navigate to <Adjust> using [↑] or [↓]



⇒ Press [→]

LINEAR

⇒ Select

2Po int

⇒ Select the number of linearisation points:

2-Po int | 2-point (0, user-defined value)

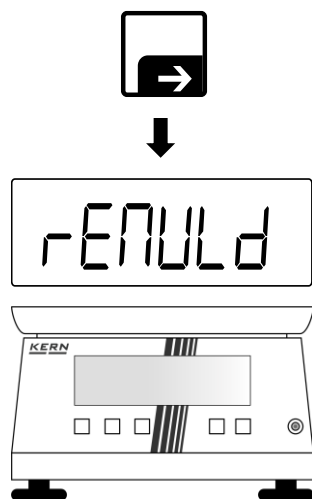
3Po int | 3 points (0, Max. 1, Max. 2)

5Po int | 5 points (0, 1/4 Max 2, 1/2 Max 2, 3/4 Max 2, Max 2)

⇒ Press [→] to confirm the setting

15000 kg

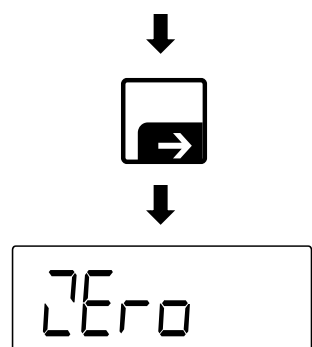
⇒ Enter custom load (for numerical input, see chapter 7.1)



⇒ Press [→]

⇒ <r-ENUL> appears on the display

⇒ Unload the scales / load cell

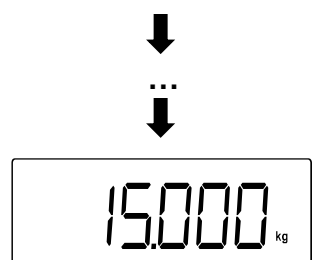


⇒ Press [→]

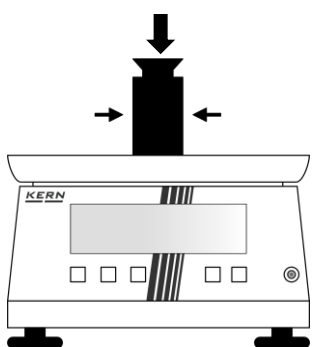
⇒ The zero point is determined first

⇒ The scale displays <Zero>→ <PutLd> in succession

⇒ The scale switches to displaying the user-defined load



⇒ Place the calibration weight in the centre of the weighing pan



⇒ Press [→]

HA It



Success



2Po int

- ⇒ The balance performs linearisation
- ⇒ The balance displays <HA It> → <Success> in succession
- ⇒ The balance returns to <2Po int>

Example of 3-point linearisation:

Adjust



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3Po int

- ⇒ Navigate to <Adjust> using [↑] or [↓]

- ⇒ Press [→]

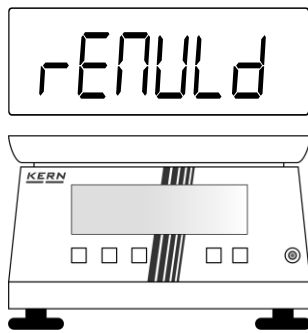
- ⇒ Select

- ⇒ Select the number of linearisation points:

2-Po int	2-point (0, user-defined value)
3Po int	3 points (0, Max. 1, Max. 2)
5Po int	5 points (0, ¼ Max. 2, ½ Max. 2, ¾ Max. 2, Max. 2)

- ⇒ Press [→]

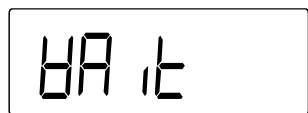




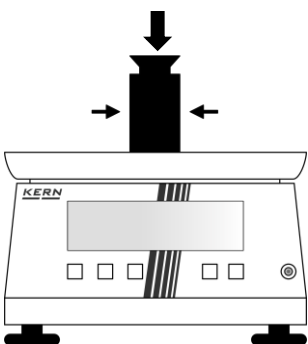
- ⇒ <rENUL> appears on the display
- ⇒ Unload the balance / load cell



- ⇒ Press [→]



- ⇒ The zero point is determined first
- ⇒ The scales display the following in sequence:
<bA it> → <Zero> → <PubLd>
- ⇒ The scales switch to displaying the maximum load 1
(in this example, Max. 1 = 6 kg)



- ⇒ Place the calibration weight in the centre of the weighing platform



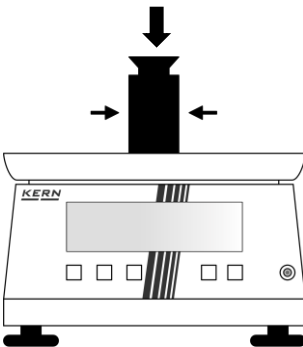
- ⇒ Press [→]



HA It



15.000 kg



HA It



Success



3Po int

- ⇒ The balance performs 1/2-max linearisation
- ⇒ The balance displays <HA It>→ <PULd> in succession
- ⇒ The balance switches to displaying the maximum load 2 (in this example, Max. 2 = 15 kg)

- ⇒ Place the calibration weight in the centre of the weighing platform

- ⇒ Press [→]

- ⇒ The scale performs maximum linearisation
- ⇒ The balance displays <HA It>→ <Success> in succession
- ⇒ The balance returns to <3Po int>

10.5.3 Perform the adjustment

Adjust

⇒ Navigate to <Adjust> using [↑] or [↓]



⇒ Press [→]

cAL

⇒ Select <cAL>

cALEHt

⇒ Select <cALEHt>

6000 kg

⇒ The calibration weight to be placed on the platform is displayed

⇒ Prepare the calibration weight (do not place it on the weighing pan yet)

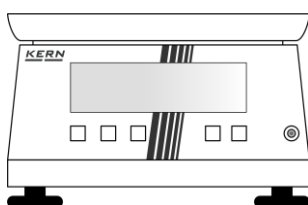


⇒ Press [→]

r-ENULd

⇒ <r-ENUL> appears on the display

⇒ Unload the balance / load cell

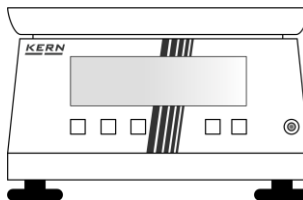
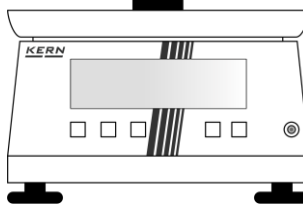


⇒ Press [→]

Zero



6000 kg



cALeHt

- ⇒ First, the zero point is determined
- ⇒ The balance displays <Zero> → <PutLd> in succession
- ⇒ The balance switches to displaying the calibration weight

- ⇒ Place the calibration weight in the centre of the weighing pan

- ⇒ Press [→]

- ⇒ Unload the balance / load cell

- ⇒ The balance returns to <cALeHt>

10.5.4 Perform calibration using a user-defined calibration weight

Adjust

⇒ Navigate to <Adjust> using [↑] or [↓]



⇒ Press [→]

cAL

⇒ Select <cAL>

cALEnd

⇒ Select <cALEnd>

06.000 kg

⇒ Enter the calibration weight (for numerical input, see the chapter '7.1')

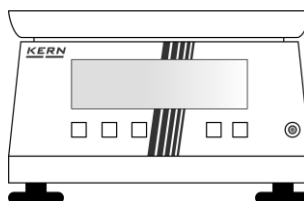


⇒ Press [→]

r-ENULd

⇒ <r-ENUL> appears on the display

⇒ Unload the balance / load cell



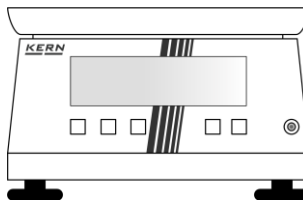
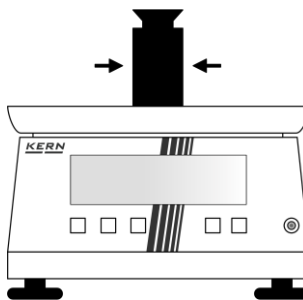
⇒ Press [→]



Zero



6000 kg



cALEnd

- ⇒ The zero point is determined first
- ⇒ The balance displays <Zero> → <PutLd> in succession
- ⇒ The scale switches to displaying the calibration weight

- ⇒ Place the calibration weight in the centre of the weighing pan

- ⇒ Press [→]

- ⇒ Unload the balance / load cell

- ⇒ The balance returns to <cALEnd>

10.5.5 Set the gravitational constants

INFORMATION



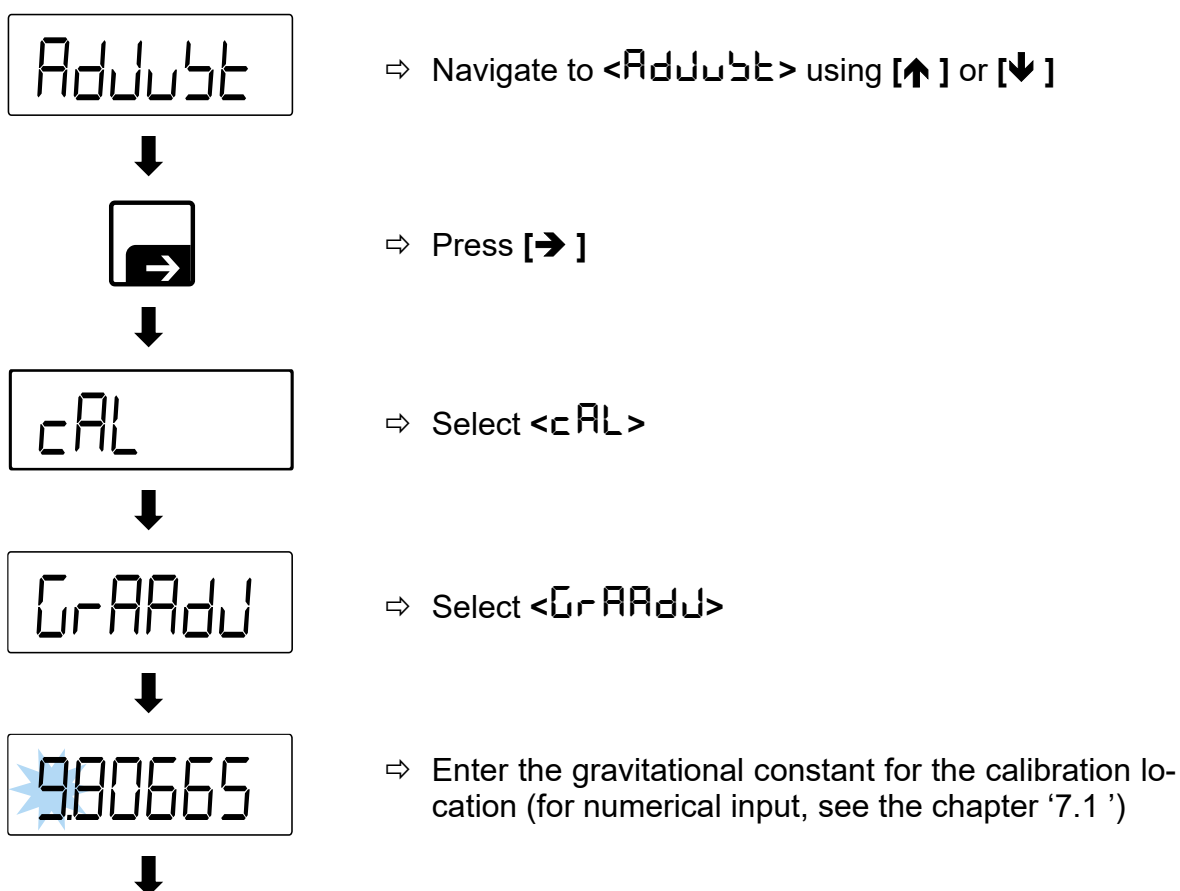
- Only enter the gravitational constants after calibration and linearisation. Both constants must be known for this.
- The two gravitational constants <Gr ADJ> and <Gr USE> are reset to their default values after recalibration.

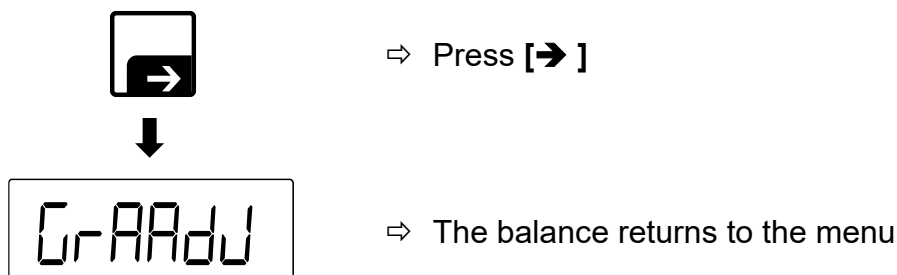


After setting the gravitational constants, the weight value in weighing mode is converted and displayed according to the set values.

Setting the gravitational constant at the calibration site:

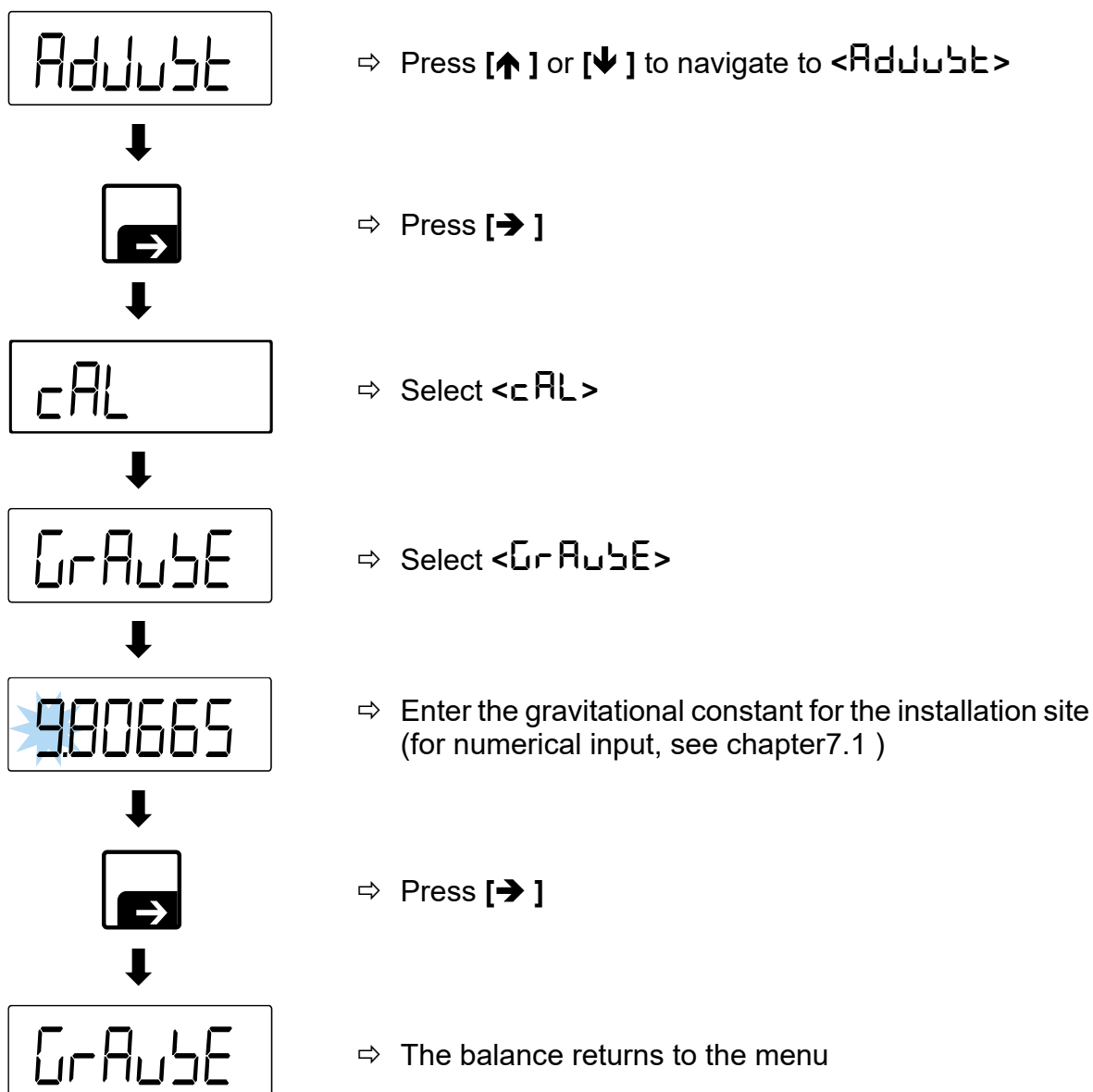
The calibration location is the place where the balance is calibrated and linearised during configuration. Before making the setting, find out which value of the constant is valid at your calibration and linearisation location.



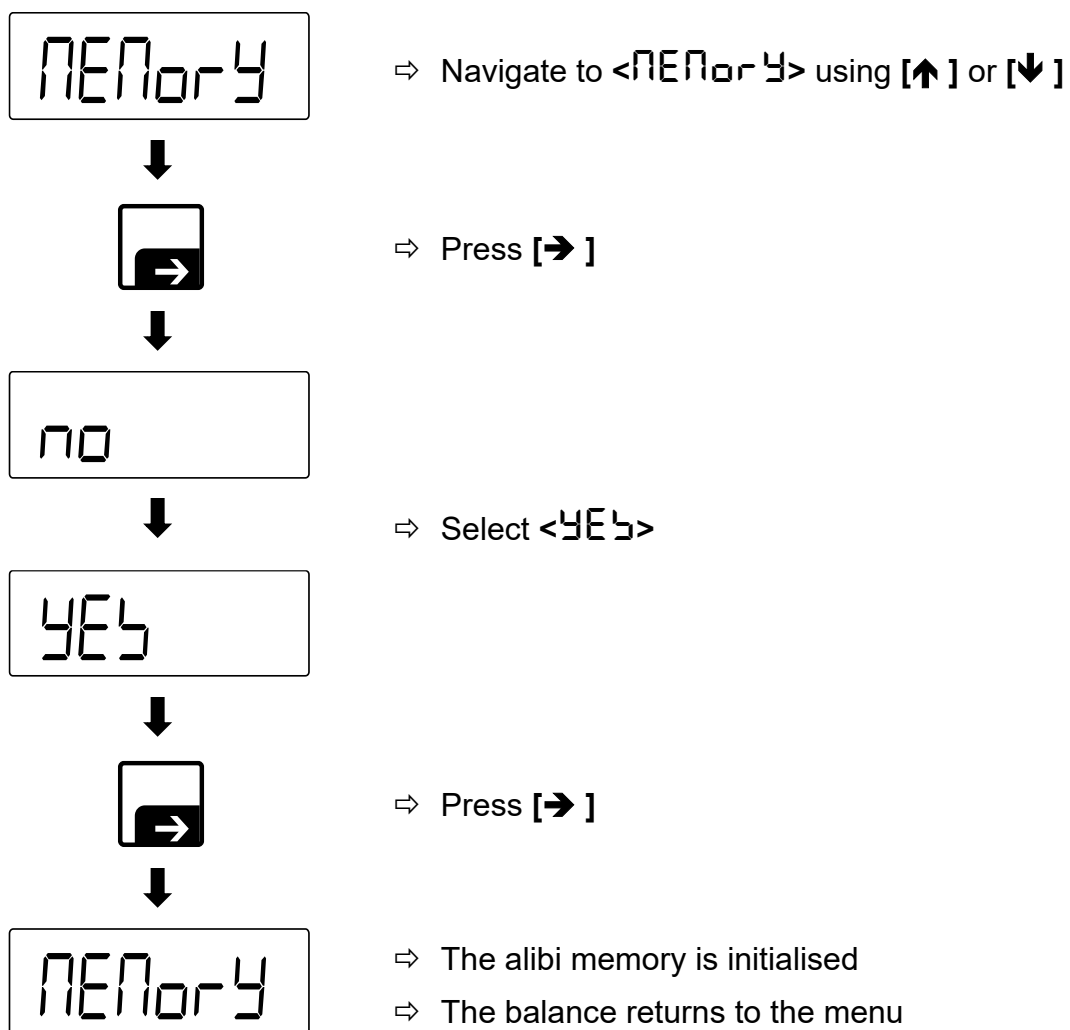


Set the gravitational constant at the installation site:

The installation site is the location where the balance will be used. This ensures accurate measurements. Before making the setting, check which value of the constant applies to the user.



10.6 Initialise the alibi memory



10.7 Display number of overloads

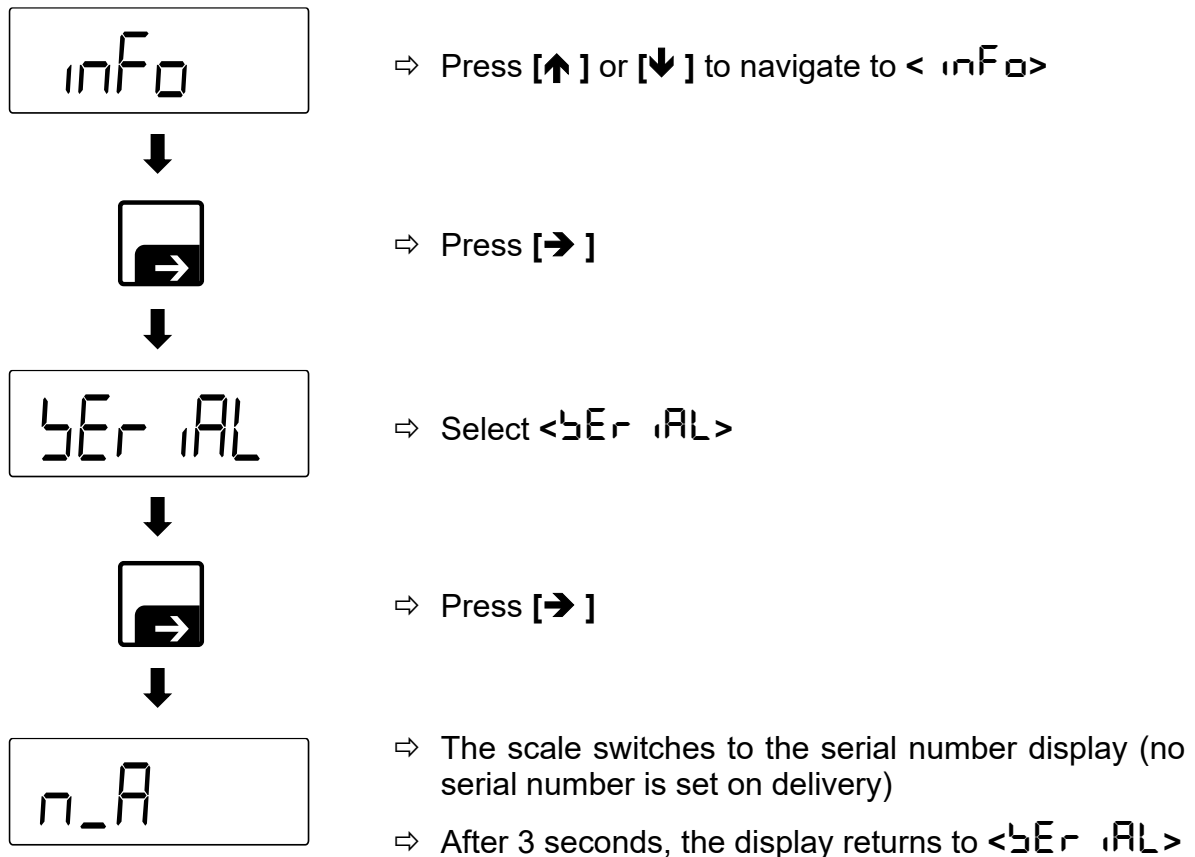
In the <OVERLd>→ <NENo> menu, you can see how often the balance has been overloaded in relation to the configured maximum load.

10.8 Display device information

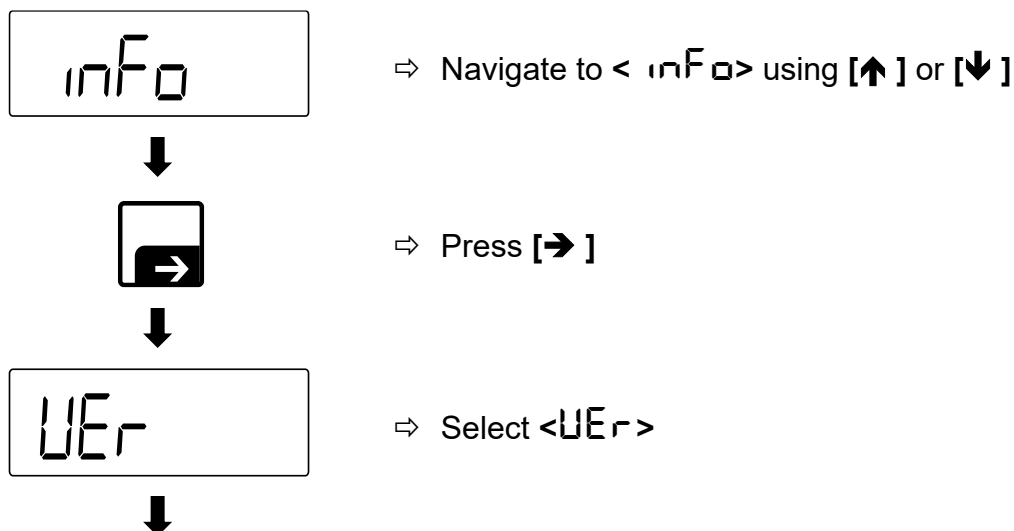
10.8.1 Display serial number

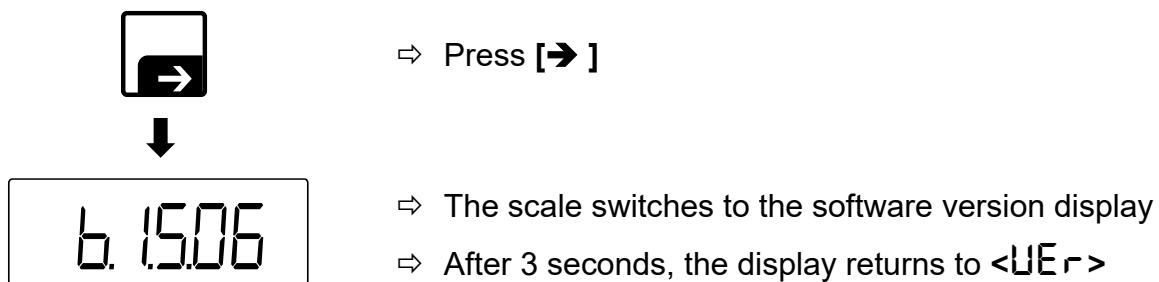


The serial number cannot be entered on the display unit. The serial number can be set via a KCP command using a data interface. Information on KCP can be found on the KERN website: <https://www.kern-sohn.com/shop/de/downloads/>

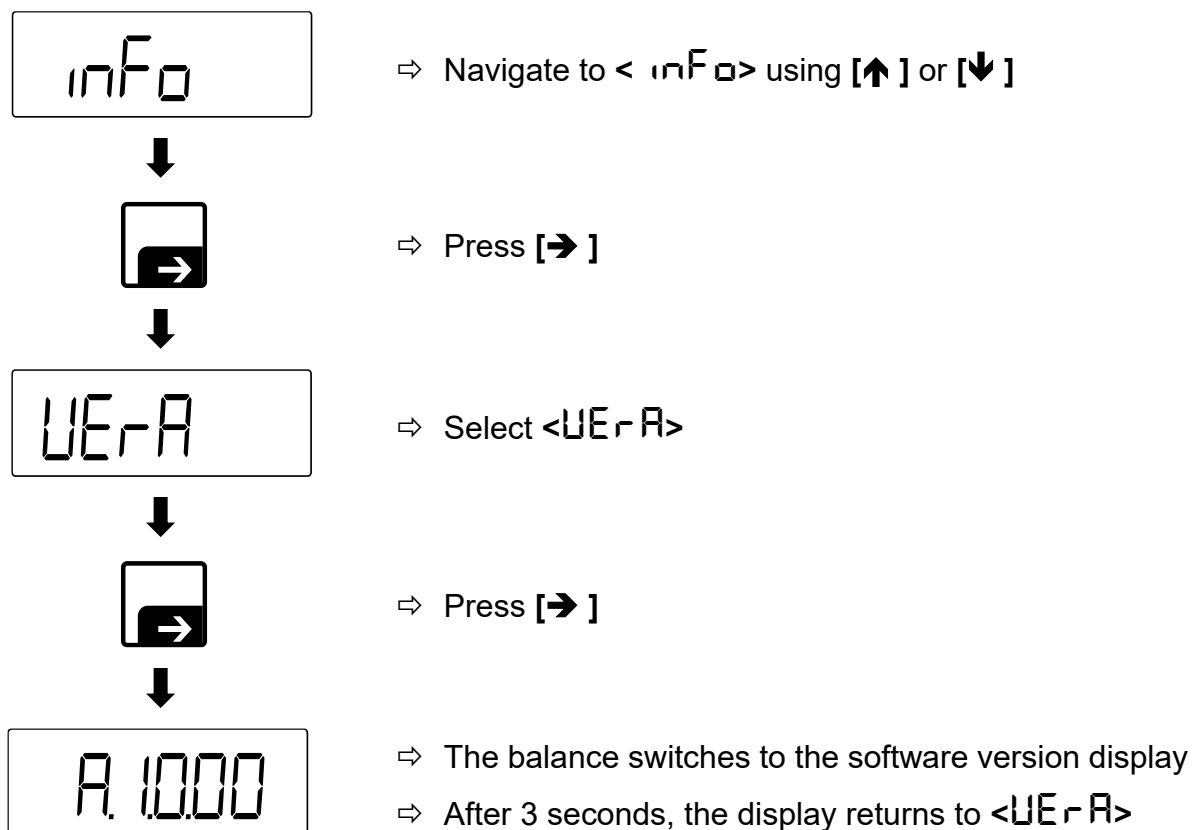


10.8.2 Display software version

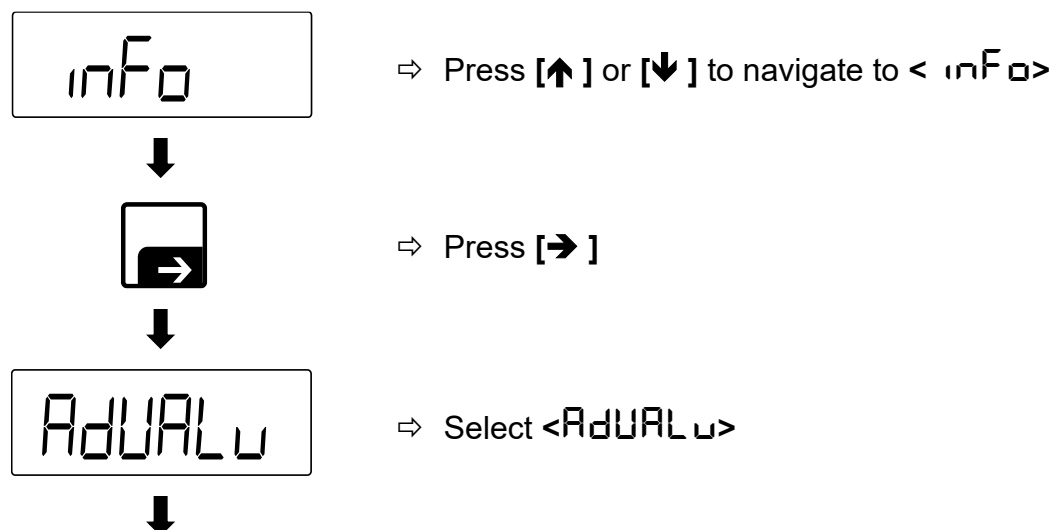


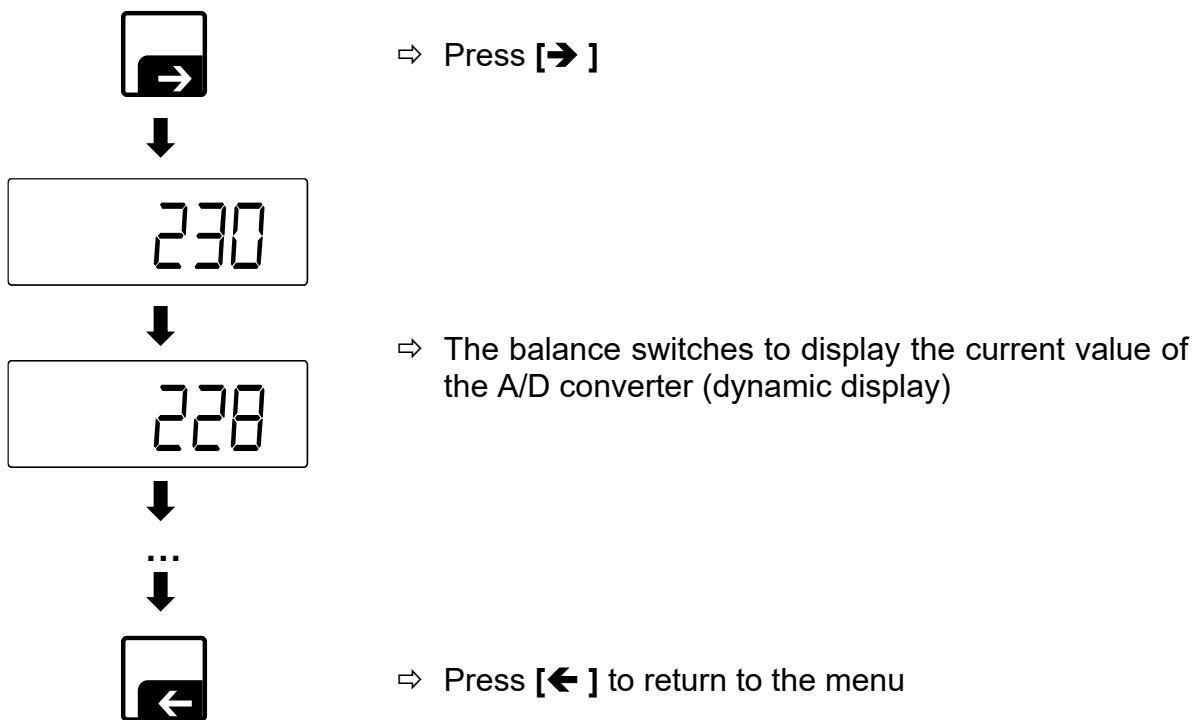


10.8.3 Display software version for calibratable devices



10.8.4 Display the value of the A/D converter

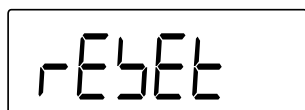




10.9 Restore factory settings



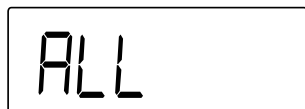
Restoring the factory settings resets the entire balance. All settings in the service menu and in the operating menus are reset.



⇒ Use [↑] or [↓] to navigate to <rESEt>



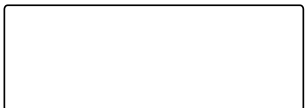
⇒ Press [→]



⇒ The balance switches to the <ALL> display



⇒ Press [→]



⇒ The scales are reset to factory settings

⇒ The scale switches off

11 Service menu



- Further menus and settings (e.g. application menu, setup menu) are described in the operating instructions for the indicating instrument.
- Only the first 3 menu levels are listed in the menu overview. Further levels are described in the respective operating steps.

Level 1	Level 2	Level 3	Description
H IO			Setting the increased resolution (only displayed if <PAR AN> → <UEr - rFd> → <on> and the adjustment switch has been pressed again)
	on		Enhanced resolution enabled
	off		Increased resolution deactivated
Adjust			Linearisation and adjustment
	cAL		Calibration settings
		cALExt	External calibration
		cALEud	Adjustment with user-defined weight
		GrARdJ	Gravitational constant at the calibration site (default: 9.80665)
		GrAubE	Gravitational constant at the installation site (default: 9.80665)
	L inEAR		Linearisation settings
		2Po int	2-point linearisation
		3-Po int	3-point linearisation
		5-Po int	5-point linearisation
	ZEro		Set new zero point

Level 1	Level 2	Level 3	Description
PARAMS			Weighing parameters
	WEr iFd		Calibration settings
	Appears only when the service menu is accessed using the adjustment switch.	ON	Enable calibration
		OFF	Deactivate calibration capability
	rAnGEs		Weighing range setting
		1	1 Weighing range
		2	2 weighing ranges
	un it	FG, G, Lb	Base unit
	dEc i		Number of decimal places
	MAH		Maximum load
	MAH 1		Maximum load of the 1st weighing range (for 2 weighing ranges)
	MAH2		Maximum load of the 2nd weighing range (for 2 weighing ranges)
	d		Readability (corresponds to the verification value for verifiable instruments)
	d 1		Readability of the 1st weighing range (for 2 weighing ranges)
	d2		Readability, 2nd weighing range (for 2 weighing ranges)
OVERL			Information on the number of overloads
	NEr		Display of the number of overloads
	orUEr		Clear overload count

Level 1	Level 2	Level 3	Description
MEMory			Alibi memory setting
	start ID		Set start ID
	init	no	Do not initialise memory
		yes	Initialise memory
info			Device information
	serial		Display serial number
	ver		Show software version
	verA		Display software version for calibratable devices
	ADUALU		Display value of the A/D converter
track			Enable / Disable all tracking functions (e.g. <track>)
	on		Enable
	off		Disable
reset			Reset user entries
	sure		Confirm reset

12 Errors and faults

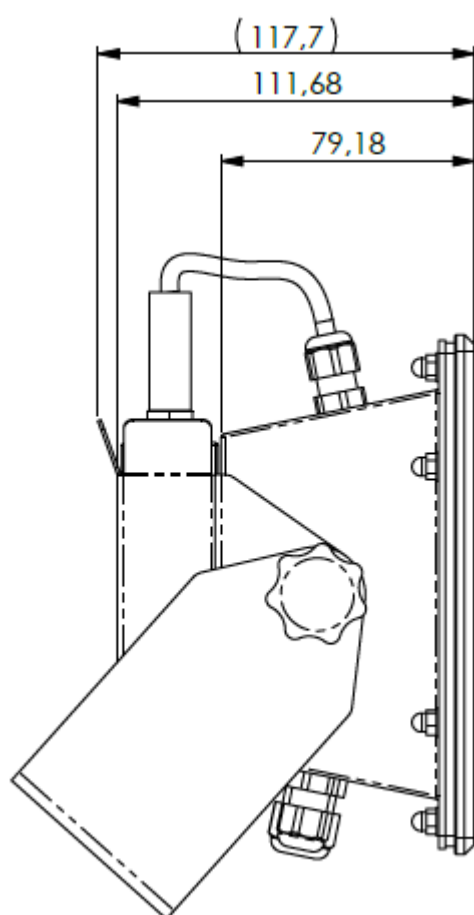
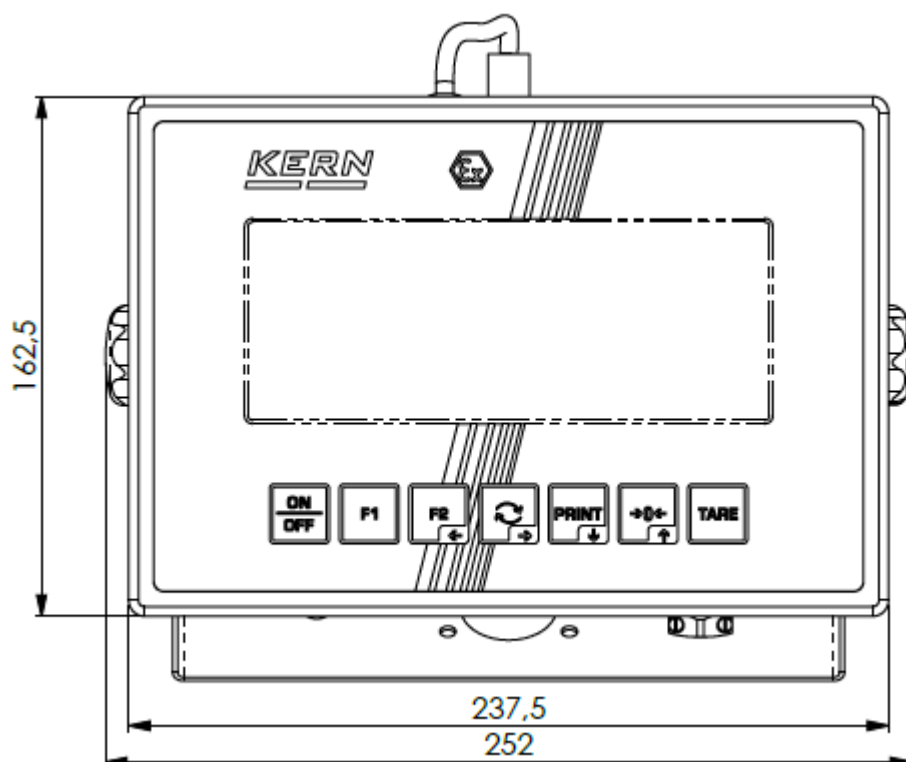
12.1 Error messages

Error message	Explanation
ZErohi	Zero range exceeded at start-up
ZEroLo	Zero range not reached at start-up
ZL in it	Zero range exceeded during operation
undErZ	Value fell below zero range during operation
instAb	Load unstable
L---	Overload
---	Underload
ErOnG	Error during linearisation or adjustment
oUErLoAd	Battery / rechargeable battery almost empty
SErEr	- Real-time clock faulty or not set - Button cell missing or discharged
MemAU	Memory faulty or not recognised
no232	No interface for data output available / selected

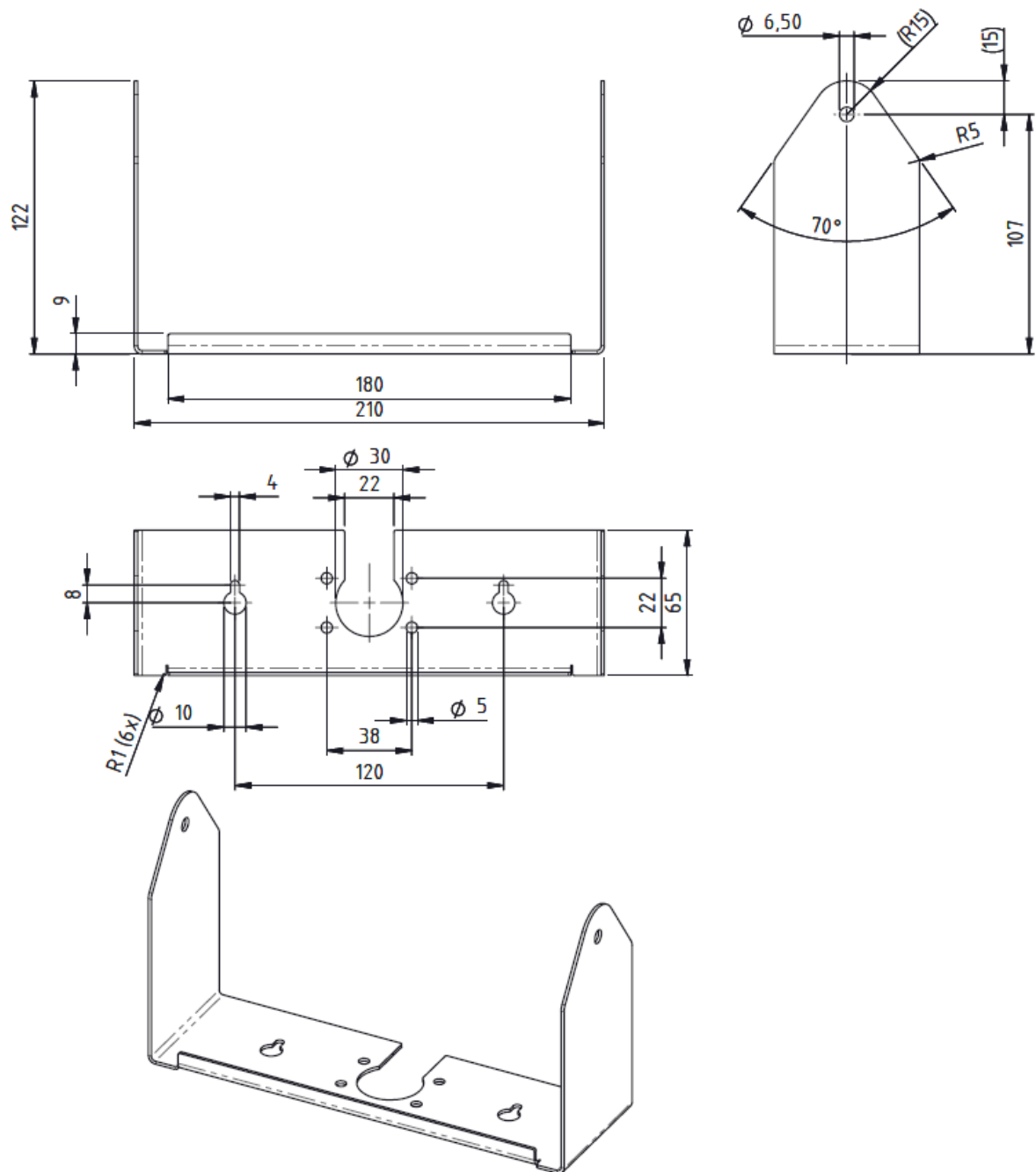
12.2 Faults

Fault	Possible cause
Display is not lit / does not switch on	• Scale is not switched on • Mains plug is not plugged in or is faulty • Mains power has failed • Battery is flat • Connection between battery / SMPS board and circuit board is faulty
Display is incomplete / some segments are missing	• LCD connection is faulty • LCD is faulty
Zero-setting ranges exceeded or not reached at start-up (<EroH i> / <EroLo>)	• Load cell cable is not connected correctly Note: This is also displayed when the scale is switched on but has not yet been linearised.
Values on the display are constantly changing or < iH- hEAb>	• Weighing platform is in contact with foreign objects • Load cell or indicator connection faulty • Vibrations from the table / floor • Draughts / air movement • Electromagnetic fields / static charge (choose a different location / switch off the interfering device if possible)
Display values are incorrect	• Calibration or linearisation is incorrect • <HrAdU> or <HrAuBE> in use • Scale is not set to zero • The balance is not level • Significant temperature fluctuations in the environment • Electromagnetic fields/static charge (choose a different location/switch off interfering devices if possible)
Display remains permanently at zero	• Analogue-to-digital converter faulty or defective
The full weighing range cannot be utilised	• Load cell defective • Overload protection is triggered too early
Buttons do not work	• Keyboard not correctly connected to the circuit board • Keyboard faulty.
Interface not working	• Internal interface module not installed correctly or faulty • Connection cable not connected correctly or faulty
Alibi memory not working	• Alibi memory not initialised • Alibi memory module faulty

13 Drawing of display device



14 Drawing of mounting bracket



15 Disposal



Old equipment and accessories must not be disposed of with household waste.

The operator must dispose of the packaging and the device in accordance with the applicable national or regional legislation at the place of use.

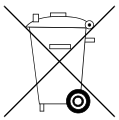
The device consists of various components and materials, such as:

- Electronic components (circuit boards, electrical cables)
- Plastic (e.g. housing parts, covers, ...)
- Metal (e.g. housing parts, screws, etc.)

Improper disposal of the device may have harmful effects on people and the environment.

Proper and environmentally sound disposal can prevent harmful effects and allow raw materials to be recovered.

Disposal of rechargeable and non-rechargeable batteries:



Rechargeable and non-rechargeable batteries must not be disposed of with household waste.

The operator must dispose of rechargeable and non-rechargeable batteries in accordance with the applicable national or regional legislation in the user's location.