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Operating instructions
Precision balance

KERN PCD

Version 1.3
03/2015
GB

PCD-BA-e-1513

GB

KERN PCD

Version 1.3 03/2015

Operating instructions

Precision balance

English

Contents

English

1 Technical data

KERN	PCD 250-3
Readability (d)	0.001 g
Weighing range (max)	250 g
Taring range (subtractive)	250 g
Reproducibility	0.002 g
Linearity	±0.005 g
Minimum unit weight at piece counting	0.002 g
Warm-up time	2 hours
Reference quantities at piece counting	5, 10, 20, 25, 50
Weighing Units	Details **„Weighing units“** see chpt. 8.3.1
Recom. adjustment weight, not added (class) Details about **„Selection of adjustment weight“** see chap. 8.3.3	250 g (F1)
Stabilization time (typical)	3 sec.
Operating temperature	+ 5° C .... + 35° C
Humidity of air	max. 80 % (not condensing)
Dimensions, completely assembled (W x D x H) mm	165 x 245 x 142
Windshield rectangular mm	inside: 146x146x70 outside: 158x158x63
Dimensions Display housing	140 x 75 x 46
Weighing plate mm	Ø 10.5
Weight kg (net)	1.1
Electric Supply	220V-240V AC, 50 Hz / 9 V, 300 mA
Battery operation	9 V compound battery (optional)
Rechargeable battery (optional)	Operating time 24 h with display background illumination Operating time 48 h without display background illumination loading time 8 h
Interface	RS232

KERN	PCD 2500-2	PCD 10K0.1
Readability (d)	0.01 g	0.1 g
Weighing range (max)	2500 g	10 kg
Taring range (subtractive)	2500 g	10 kg
Reproducibility	0.02 g	0.1 g
Linearity	±0.05 g	±0.3 g
Minimum unit weight at piece counting	0.02 g	0.2 g
Warm-up time	4 hours	2 hours
Reference quantities at piece counting	5, 10, 20, 25, 50	
Weighing Units	Details **„Weighing units“** see chpt. 8.3.1	
Recom. adjustment weight, not added (class) Details about **„Selection of adjustment weight“** see chap. 8.3.3	2500 g (F1)	10 kg (F1)
Stabilization time (typical)	3 sec.	
Operating temperature	+ 5° C .... + 35° C	
Humidity of air	max. 80 % (not condensing)	
Dimensions, completely assembled (W x D x H) mm	165 x 280 x 73	
Dimensions Display housing	140 x 75 x 46	
Weighing plate mm	160x160	
Weight kg (net)	1.6	
Electric Supply	220V-240V AC, 50 Hz / 9 V, 300 mA	
Battery operation	9 V compound battery (optional)	
Rechargeable battery (optional)	Operating time 24 h with display background illumination Operating time 48 h without display background illumination loading time 8 h	
Interface	RS232	

2 Basic Information (General)

2.1 Proper use

The balance you purchased is intended to determine the weighing value of material to be weighed. It is intended to be used as a “non-automatic balance”, i.e. the material to be weighed is manually and carefully placed in the centre of the weighing plate.. As soon as a stable weighing value is reached the weighing value can be read.

2.2 Improper Use

Do not use balance for dynamic weighing. In the event that small quantities are removed or added to the material to be weighed, incorrect weighing results can be displayed due to the “stability compensation“. (Example: Slowly draining fluids from a container on the balance).
Do not leave permanent load on the weighing plate. This may damage the measuring system.
Impacts and overloading exceeding the stated maximum load (max) of the balance, minus a possibly existing tare load, must be strictly avoided. Balance may be damage by this.
Never operate balance in explosive environment. The serial version is not explosion protected.
The structure of the balance may not be modified. This may lead to incorrect weighing results, safety-related faults and destruction of the balance.
The balance may only be used according to the described conditions. Other areas of use must be released by KERN in writing.

2.3 Warranty

Warranty claims shall be voided in case

- Our conditions in the operation manual are ignored
- The appliance is used outside the described uses
- The appliance is modified or opened
- Mechanical damage and damage caused by media, liquids
- natural wear and tear
- The appliance is improperly set up or incorrectly electrically connected
- The measuring system is overloaded

2.4 Monitoring of Test Resources

In the framework of quality assurance the measuring-related properties of the balance and, if applicable, the testing weight, must be checked regularly. The responsible user must define a suitable interval as well as type and scope of this test. Information is available on KERN’s home page (www.kern-sohn.com) with regard to the monitoring of balance test substances and the test weights required for this. In KERN’s accredited DKD calibration laboratory test weights and balances may be calibrated (return to the national standard) fast and at moderate cost.

3 Basic Safety Precautions

3.1 Pay attention to the instructions in the Operation Manual

Carefully read this operation manual before setup and commissioning, even if you are already familiar with KERN balances.

Versions in other languages are non-binding translations.
The only binding version is the original document in German.

3.2 Personnel training

The appliance may only be operated and maintained by trained personnel.

4 Transport and storage

4.1 Testing upon acceptance

When receiving the appliance, please check packaging immediately, and the appliance itself when unpacking for possible visible damage.

4.2 Packaging / return transport

- ⇨ Keep all parts of the original packaging for a possibly required return.
- ⇨ Only use original packaging for returning.
- ⇨ Prior to dispatch disconnect all cables and remove loose/mobile parts.
- ⇨ Reattach possibly supplied transport securing devices.
- ⇨ Secure all parts such as the glass wind screen, the weighing platform, power unit etc. against shifting and damage.

English

5 Unpacking, Setup and Commissioning

5.1 Installation Site, Location of Use

The balances are designed in a way that reliable weighing results are achieved in common conditions of use.
You will work accurately and fast, if you select the right location for your balance.
On the installation site observe the following:

- Place the balance on a firm, level surface;
- Avoid extreme heat as well as temperature fluctuation caused by installing next to a radiator or in the direct sunlight;
- Protect the balance against direct draughts due to open windows and doors;
- Avoid jarring during weighing;
- Protect the balance against high humidity, vapours and dust;
- Do not expose the device to extreme dampness for longer periods of time. Non-permitted condensation (condensation of air humidity on the appliance) may occur if a cold appliance is taken to a considerably warmer environment. In this case, acclimatize the disconnected appliance for ca. 2 hours at room temperature.
- Avoid static charge of goods to be weighed and weighing container.
- Do not operate in areas with hazard of explosive material or in potentially explosive atmospheres due to materials such as gasses, steams, mists or dusts.
- Keep away chemicals (such as liquids or gasses), which could attack and damage the balance inside or from outside.
- Keep IP protection of the device.
- If electro-magnetic fields or static charge occur, or if the power supply is unstable major deviations on the display (incorrect weighing results) are possible. In that case, the location must be changed.

5.2 Unpacking/installation

Carefully remove the balance from the packaging, remove plastic cover and setup balance at the intended workstation.

Scope of delivery / serial accessories

- Balance
- Weighing plate
- Mains adapter
- Protective cover
- Operating instructions
- Windshield (only models PCD 400-3)

Mount the display unit in a way that facilitates operation and where it is easy to see.

1. Display unit assembled

For disassembly remove the assembly sheet by loosening the marked screws.
After that the display unit can be placed freely.

2. Display unit freely placed

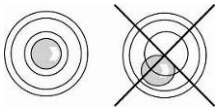
English

3. Using with tripod (optional)

In order to raise the display, the display unit can be assembled to an optionally available tripod (KERN PCD-A03).
Assembly see installation instructions of the tripod.

or

The balance must be installed in a way that the weighing plate is exactly in horizontal position.



Level balance with foot screws until the air bubble of the water balance is in the prescribed circle.

5.3 Mains connection

Power is supplied via the external mains adapter. The stated voltage value must be the same as the local voltage. Only use original KERN mains adapters. Using other makes requires consent by KERN.

5.4 Operation using a rechargeable battery (optional)

Lift-off the battery cover on the lower side of the balance. Connect 9 V compound battery.
Replace the battery compartment cover.

For battery operation the balance has an automatic switch-off function which can be activated or deactivated in the menu.

- ⇨ In weighing mode keep the **PRINT** key pressed until "**Unit**" appears.
- ⇨ Press **MODE** key repeatedly until „**AF**" appears.
- ⇨ Use the **SET** key to confirm.
- ⇨ Use the **MODE** key to choose between the two following settings:

  „AF on": In order to save the battery, the balance switches automatically off after 3 minutes without weighing.

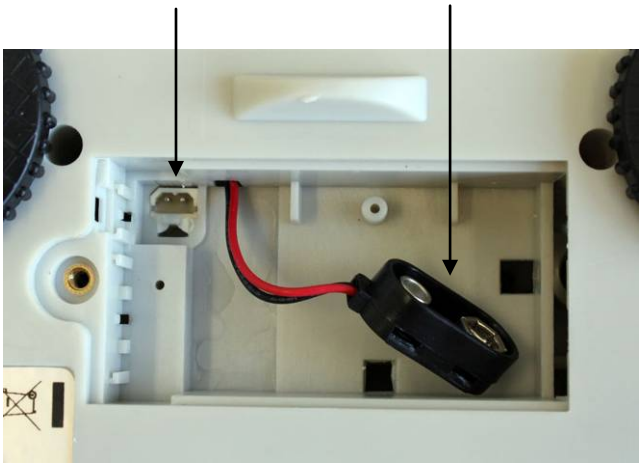
  „AF off": Switch-off function deactivated.

- ⇨ Use the **SET** key to confirm selection. The balance returns to weighing mode.

The empty battery is indicated on the display by "**LO**". Press **ON/OFF**-key and replace the battery immediately.
If the balance is not used for a longer time, take out the batteries and store them separately. Leaking battery liquid could damage the balance.

If there exists an optional rechargeable battery, it has to be connected in the battery compartment via a separate plug-in socket. Now the mains adapter delivered with the rechargeable battery must be applied.

Connection of rechargeable battery Connection of battery



5.5 Connection of peripheral devices

Before connecting or disconnecting of additional devices (printer, PC) to the data interface, always disconnect the balance from the power supply.
With your balance, only use accessories and peripheral devices by KERN, as they are ideally tuned to your balance.

5.6 Initial Commissioning

In order to obtain exact results with the electronic balances, the balance must have reached the operating temperature (see warming up time chap. 1. During this warming up time the balance must be connected to the power supply (mains, accumulator or battery).

The accuracy of the balance depends on the local acceleration of gravity.
Strictly observe hints in chapter Adjustment.

5.7 Linearisation
(only models PCD 250-3, PCD 2500-2)

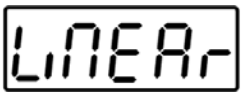
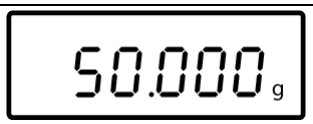
Linearity shows the greatest deviation of a weight display on the scale to the value of the respective test weight according to plus and minus over the entire weighing range.
If linearity deviation is discovered during a monitoring of test resources, you can improve this by means of linearization.

- Carrying out linearization is restricted to specialist staff possessing well acquainted with the workings of weighing scales.
- The test weights to be used must be adapted to the weighing scale's specifications; see chapter 3.4 "Testing instruments control".
- Observe stable environmental conditions. Stabilisation requires a certain warm-up time.
- After successful linearization you will have to carry out calibration; see chapter 3.4 "Testing instruments control"

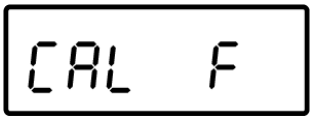
Tab. 1: Adjustment points

Adjustment weight	PCD 250-3	PCD 2500-2
1.	50 g	500 g
2.	100 g	1000 g
3.	150 g	1500 g
4.	200 g	2000 g
5.	250 g	2500 g

Operation	Display
How to carry out linearization: ⇨ Switch on balance	
Press PRINT repeatedly until UNIT is displayed	

⇨ Press MODE CAL repeatedly until LinEAr is displayed	
⇨ Ensure that there are no objects on the weighing pan.	
⇨ Start linearisation with SET M. The value of the first adjustment weight will be displayed.	 (example)
⇨ Place adjustment weight and acknowledge by SET M. The scales will change to zero display.	
⇨ Take away adjustment weight. After a short time the value of the second adjustment weight appears in the display.	 (example)
⇨ Place second adjustment weight and acknowledge by SET M. The scales will change to zero display.	
⇨ Take away adjustment weight. After a short time the value of the third adjustment weight appears in the display.	 (example)
⇨ Place third adjustment weight and acknowledge by SET M. The scales will change to zero display.	
⇨ Take away adjustment weight. After a short time the value of the forth adjustment weight appears in the display.	 (example)
⇨ Place forth adjustment weight and acknowledge by SET M. The scales will change to zero display.	
⇨ Take away adjustment weight. After a short time the value of the fifth adjustment weight appears in the display.	 (example)

English

⇨ Place fifth adjustment weight and acknowledge by SET M. The scales will change to zero display.	
⇨ Take away adjustment weight. After a short time CAL F is displayed.	
Finally the balance will switch off automatically. Now the linearization is concluded successfully.	

In case of an adjustment error or incorrect adjusting weight the display will show an error message; repeat linearization process.

English

5.8 Adjustment

As the acceleration value due to gravity is not the same at every location on earth, each balance must be coordinated - in compliance with the underlying physical weighing principle - to the existing acceleration due to gravity at its place of location (only if the balance has not already been adjusted to the location in the factory). This adjustment process must be carried out for the first commissioning, after each change of location as well as in case of fluctuating environment temperature. To receive accurate measuring values it is also recommended to adjust the balance periodically in weighing operation.

5.9 Adjustment

The adjustment should be made with the recommended adjustment weight (see chap. 1 "Technical data"). Adjustment is also possible with the weights of other nominal values (see table 1), but not the optimum for measuring technique.

Procedure when adjusting:
Observe stable environmental conditions. A warming up time (see chapter 1) is required for stabilization.

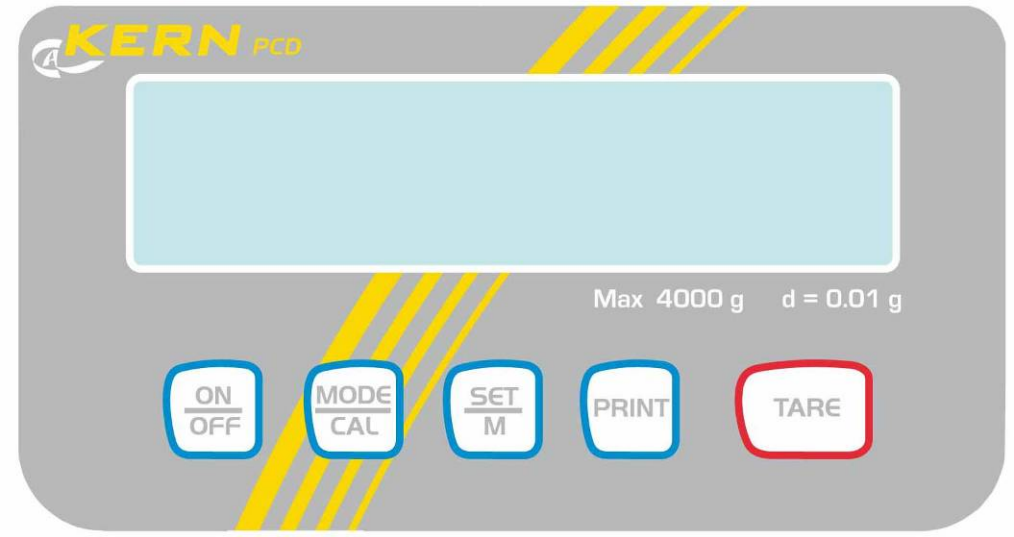
- ⇨ Turn on balance by pressing the **ON/OFF** key.
- ⇨ Press the **MODE** key and keep it pressed, in the display appears shortly „**CAL**“. After that the exact size appears flashing in the display (see chapter. 8.3.3) of the adjustment weight.
- ⇨ Now set the adjusting weight in the centre of the weighing plate.
- ⇨ Press the **SET** key. Short time later there appears „**CAL F**“, then the automatic return to the weighing mode. In the display there appears the value of the adjustment weight.

  An error during adjustment or the use of an incorrect adjusting weight will result in an error message „**CAL E**“. Repeat adjustment.

Keep the adjustment close to the balance. Daily control of the weighing exactness is recommended for quality-relevant applications.

6 Operating elements

6.1 Overview of display



6.2 Keyboard overview

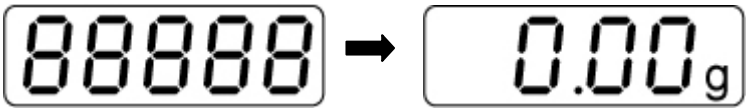
Key	Description	Function
PRINT	**PRINT** button	• Calculate weighing data via interface • Call up menu (keep key pressed until UNIT appears)
SET M	**SET** button	• Confirm settings in the menu • Save and exit menu
MODE CAL	**MODE** button	• How to select menu items • Change settings in the menu • Adjustment
TARE	**TARE** button	• Taring
ON OFF	**ON/OFF** button	• Turn on/off

English

7 Basic Operation

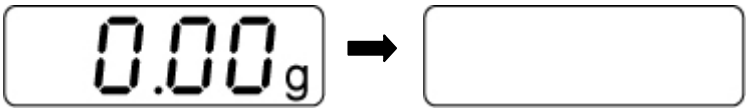
7.1 Start-up

⇨ Press **ON** button.
The balance will carry out a self-test As soon as the weight display appears, the balance is ready for weighing.



7.2 Switching Off

⇨ Press **OFF** button, the display disappears



7.3 Weighing

⇨ Place goods to be weighed on balance.

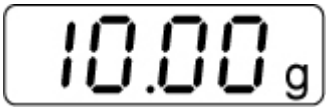
⇨ Wait for standstill control, after the standstill control, the weighing unit appears right hand in the display (e.g. g or kg)

⇨ Read weighing result.

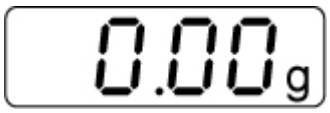
⇨ If the material to be weighed is heavier than the weighing range, the display will show "**Error**" (=Overload).

7.4 Taring

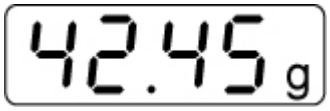
⇨ Place an empty weighing container, the weight of the weighing container will be displayed.



⇨ Press the **TARE** button, the zero display disappears. The tare weight is saved until it is deleted.



⇨ Weigh the material, the net weight will be indicated.



The taring process can be repeated any number of times, e.g. when adding several components for a mixture (adding). The limit is reached when the whole weighing range is exhausted.

After removing the weighing container, the weight of the weighing container appears as negative display.

The tare weight is saved until it is deleted.

Delete tare

⇨ Unload the balance and press the **TARE** button, the zero display appears.

English

7.5 Pre-Tare function

Using this function the weight of a tare vessel is stored. Even after turning off/on the weighing balance will continue working with the saved tare value.

⇨ In weighing mode put tare vessel on the weighing plate

⇨ Press repeatedly the **MODE** key until „**PtArE**“ flashing appears.

⇨ Use **SET** key to store the current weight on the weighing plate as a PRE-TARE value.

Delete PRE-TARE value

⇨ Unload the balance and set the **TARE** button to zero

⇨ Press repeatedly the **MODE** key until „**PtArE**“ flashing appears.

⇨ Use the **SET** key to confirm. The PRE-TARE value is deleted, the zero display appears.

7.6 Plus/minus weighings

For example unit weight control, fabrication control etc.

⇨ Put the nominal weight on the weighing plate and tare using the **TARE** button.

⇨ Remove the nominal weight

⇨ Put the test objects subsequently on the weighing plate, the respective deviation from the nominal weight is displayed with the respective sign to „+“ and „-“.

According to the same procedure also packages with the same weight can be produced, referring to a nominal weight.

⇨ Back to weighing mode by pressing the **TARE** button.

7.7 Parts counting

During piece counting parts can either be counted into a container or out of a container. To count a greater number of parts the average weight per part has to be determined with a small quantity (reference quantity).
The larger the reference quantity, the higher the counting exactness. High reference must be selected for small parts or parts with considerably different sizes.
The larger the reference quantity, the more accurate the parts counting.

The process has four steps:

Tare the weighing container
Determine the reference unit
Original weighing of reference weight
Count the items

⇨ In weighing mode press **MODE** key shortly. Reference piece number „**5**$^{\mathbf{PCS}}$**“** appears flashing.

⇨ By pressing the **MODE** button several times other reference quantities **5, 10, 20, 25** and **50** can be called up. Place as many pieces to count on the weighing plate as the set reference quantity requires.

⇨ Use the **SET** key to confirm. The balance is now in parts counting mode counting all units on the weighing plate.

- **Back to weighing mode** by pressing the **MODE** button.
- **Error message „Er 1“**
  Piece below minimum weight of piece (See chpt. 1 “Technical specifications“): Press **MODE** key and restart reference determination.
- **Taring**
  The tare vessels can also be used for piece counting. Before starting piece counting use the **TARE** button to tare out the container.

English

7.8 Net-total weighing

It is useful if a mixture of several components is weighed into a tare vessel and finally the sum weight of all weighed components is necessary for control purposes (net-total, i.e. the weight of the tare vessel).

Example:

1. Place tare container on the weighing plate. Press the **TARE** button, the zero display disappears.

2. Weigh-in component ❶. Press the **SET** button, the zero display disappears. [▲] is displayed on the right border of the display.

3. Weigh-in component ❷ and press **SET** key. Net-total (sum weight of the components ❶ and ❷) is displayed.

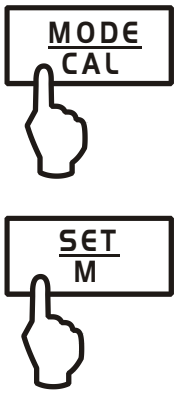
4. Press the **SET** button, the zero display disappears.

5. Weigh-in component ❸ and press **SET** key. Net-total (sum weight of the components ❶ and ❷ and ❸.) is displayed.

⇨ If necessary, also fill the formula up to the desired final value. For every component more repeat the steps 4-5.

⇨ Back to weighing mode by pressing the **TARE** button.

7.9 Percent determination



Percentage calculation facilitates weight display in percent related to a reference weight equivalent to 100 %.

⇨ In weighing mode press **MODE** key repeatedly, until "**100 %**" is displayed flashing.

⇨ Put a reference weight which corresponds to 100 %.

⇨ Store by pressing the **SET** key. If the display stops flashing, remove the reference weight.

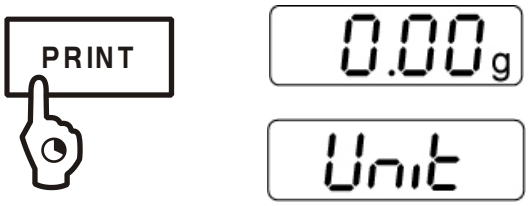
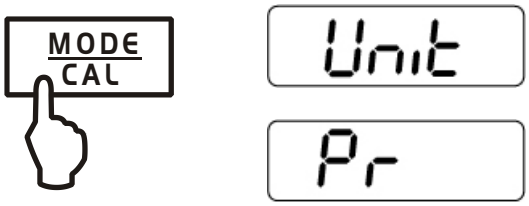
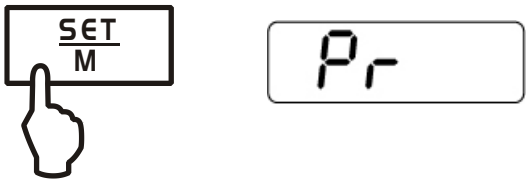
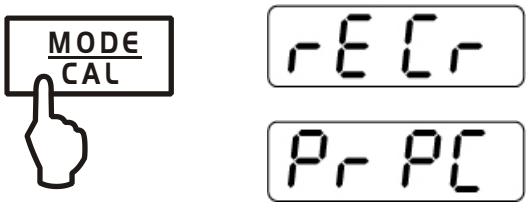
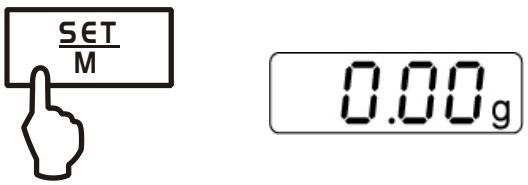
⇨ Place goods to be weighed on balance.
The weight of the sample is displayed in percentage in terms of the reference weight.

Back to weighing mode by pressing the **MODE** button.

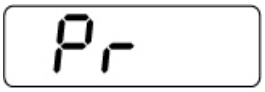
English

8 Menu

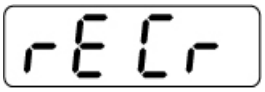
8.1 Navigation in the menu

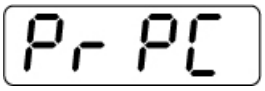
Access to menu 	In weighing mode keep the **PRINT** key pressed until „**Unit**“ appears.
How to select menu items 	Using the **MODE** key the individual menu items can be selected one after the other.
Change settings  	Acknowledge selected menu item using **SET** key, the current setting is displayed. Change the settings using the **MODE** key. At any pressing of the **MODE** key, the next setting is displayed, see chapter .8.2 „Menu Overview“.
1. Save change of a menu item and exit the menu 	⇨ Press the **SET** key; balance will return to weighing mode.

2. Change settings of several menu items

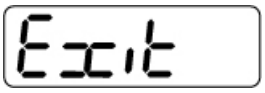


Acknowledge selected menu item using **SET** key, the current setting is displayed.



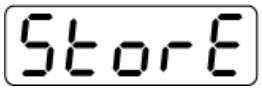


Use the **MODE** key to change settings.



Press the **TARE** key, „**Exit**“ is displayed.

Either



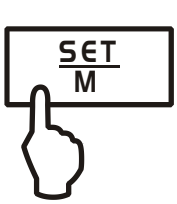
Acknowledge with **SET** key (yes), „**StorE**“ is displayed. Save (**SET** key) or reject (**PRINT** key) and exit the menu,

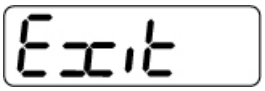
or

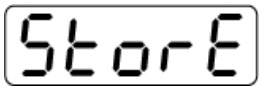
Press **PRINT** key (no) and make the changes on the other menu items as described above

English

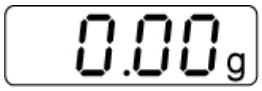
Save/reject and exit the menu



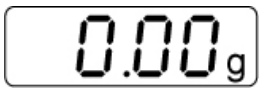




⇨ Save



⇨ Reject



Either

Any changes carried out are stored by pressing the **SET** key (yes). The balance returns automatically into weighing mode.

or

To cancel changes, press the **PRINT** key (no). The balance returns automatically into weighing mode.

English

8.2 Menu overview

Description of function	Function	Parameters	Description of options
Weighing units switching over (see chap. 8.3.1)	**UNIT**	**g***	Gram
		oz	Pound
		ozt	Ounce
		ct	Carat (dependent on model)
		tlh	Tael Hongkong
		tlt	Tael Taiwan
		gn	Grain (dependent on model)
		dwt	Pennyweight (dependent on model)
		mo	Momme
		Tol	Tola
		FFA	Freely selectable factor
Data transfer mode (see chapter 8.4.1)	**PR**	**rE CR***	Data output via remote control commands (see chapter . 9.3)
		Pr PC	Data output by pressing the PRINT key (see chapter 9.3)
		AU PC	Continuous data output (see chapter 9.3)
		bA Pr	Printout on barcode printer (see chapter 9.4)
		AU Pr	Autom. data output of stable weighing values (see chapter 9.3)
Selection printer output (see chapter 8.4.2)	**LAPr**	**Hdr***	Edition of the headlines
		GrS	Edition of the total weight
		Net	Issue of net weight
		tAr	Issue of tare weight
		N7E	Edition of the stored weight
		PCS	Edition of quantity
		AUJ	Issue of piece weight
		Rqt	Edition of the reference quantity
		FFd	Issue of a page forward feed when printout is started
		FFE	Issue of a page forward feed when printout is ended

English

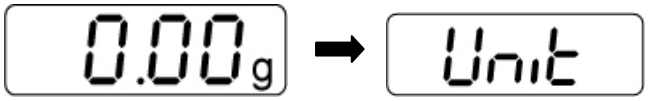
Baud rate (see chap. 8.4.4)	**bAUd**	**19200**	
		9600*	
		4800	
		2400	
		1200	
Auto off (battery operation), see (chap. 5.4)	**AF**	**on***	Automatic switch-off function after 3 min without changing load ON
		off	Automatic switch-off function after 3 min without changing load OFF
Auto Zero (see chapter 8.3.2)	**tr**	**on***	On
		off	Off
Selection adjustment weight (see chapter 8.3.3)	**CAL**	**400**	*dependent on model
		4000	
Filter function (see chapter 8.3)	**StAbiL**	**1**	Fast display
		2	Normal display
		3	Slow display
Linearisation (see chapter 5.7)	**LinEAr**		*dependent on model
Background illumination of the display, (see chap. 8.3.4)	**bL**	**on***	Background illumination on
		off	Background illumination off
		CH	The background illumination will be switched off automatically 10 sec after having reached a stable weighing value.
Animal weighing function (see chapter 8.3.5)	**ANL**	**off***	Off
		3	Period 3 seconds
		5	Period 5 seconds
		10	Period 10 seconds
		15	Period 15 seconds
Foot switch (see chap. 8.3.6)	**FOOt S**	**tAr**	Tare balance by pressing the foot switch
		Pr	Print the weighing value by pressing the foot switch
Reset to factory setting (see chap. 8.3.7)	**rSt**	**no***	no
		yes	yes

* = default setting

8.3 Description of individual menu items

8.3.1 Weighing Units

⇨ In weighing mode keep the **PRINT** key pressed until **[Unit]** appears.



⇨ Press **SET** key, the selected unit is displayed.

⇨ Use the **MODE** key to select between the different units (see following table).

⇨ Use the **SET** key to confirm the selected unit

	Display	**Conversion factor * 1 g =**
Gram	g	1.
Ounce	oz	0.035273962
Troy ounce	ozt	0.032150747
Tael Hongkong	tlh	0.02671725
Tael Taiwan	tlt	0.0266666
Grain (dependent on model)	gn	15.43235835
Pennyweight (dependent on model)	dwt	0.643014931
Momme	(mom)	0.2667
Tola	tol	0.0857333381
Carat (dependent on model)	ct	5
Freely selectable factor *)	FFA	xx.xx

***) Input conversion factor**

⇨ As specified above, press repeatedly the **MODE** key until „**FFA**“ appears.

⇨ To enter the factor, press the **SET** key; the enabled digit starts flashing.
Using the **MODE** button, the displayed value is increased by 1, with the **PRINT** button it is reduced by 1.
With the **TARE** key selection of the number to the left.

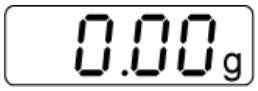
⇨ Confirm input by pressing the **SET** key.

⇨ Press repeatedly the **SET** key to take over the „Freely selectable factor“ as current weighing unit.

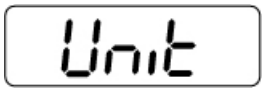
English

8.3.2 Dosing and Zero-tracking

The Auto-Zero function is used to tare small variations in weight automatically.
In the event that small quantities are removed or added to the material to be weighed, incorrect weighing results can be displayed due to the “stability compensation“. (Example: Slowly draining fluids from a container on the balance).
When apportioning involves small variations of weight, it is advisable to switch off this function.
If **Zero-Tracking** however is switched off, the weighing display becomes more busy.



⇨ In weighing mode keep the **PRINT** key pressed until “**Unit**“ appears.



⇨ Press the **MODE** button several times until „**tr**“ is displayed.

⇨ Acknowledge using **SET** key, the current setting is displayed.

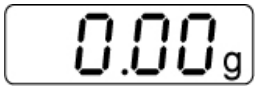
⇨ Select the desired settings by pressing the **MODE** key.

tr	**on**	Function activated
tr	**off**	Function deactivated

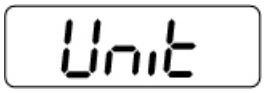
⇨ Use the **SET** key to confirm selection.

8.3.3 Selection of adjustment weight

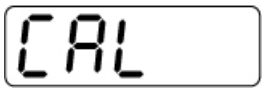
In the model series KERN PCD, the adjustment weight can be selected from pre-set nominal values (refer also to following table, factory setting with grey background). In order to achieve high-quality weighing results in the sense of the measuring technology, it is recommended to select the nominal value as high as possible. The non delivered adjustment weights can be purchased from KERN as option.



⇨ In weighing mode keep the **PRINT** key pressed until **[Unit]** appears.



⇨ Press the **MODE** key several times until „**CAL**“ is displayed.



⇨ Acknowledge using **SET** key, the current setting is displayed.

⇨ Select the desired settings by pressing the **MODE** key.

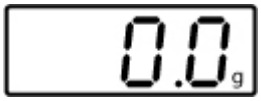
⇨ Use the **SET** key to confirm selection.

Possible Adjustment Points:

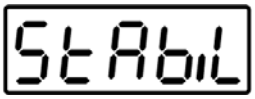
PCD 250-3	PCD 2500-2	PCD 10K0.1
-	-	-
50 g	500 g	-
100 g	1000 g	2 kg
150 g	1500 g	5 kg
200 g	2000 g	7 kg
250 g	2500 g	10 kg

8.3.4 Filterfunction

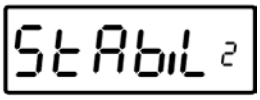
This menu item allows the balance to be set according to specific ambient conditions and measuring purposes.



⇨ In weighing mode keep the **PRINT** key pressed until **[Unit]** appears.



⇨ Press the **MODE** button several times until „**StAbiL**“ is displayed.



(Example)

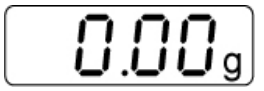
⇨ Acknowledge using **SET** button, the current setting is displayed.

⇨ Select the desired settings by pressing the **MODE** button.

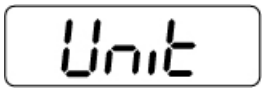
1	Filter 1: The balance reacts quickly and in a sensitive manner, quiet set-up location.
2	Filter 2: The scale reacts normally, normal installation site
3	Filter 3: The balance reacts slowly and in a robust manner, busy set-up location

⇨ Use the **SET** key to confirm selection.

8.3.5 Display background illumination



⇨ In weighing mode keep the **PRINT** key pressed until "**Unit**" appears.



⇨ Press the **MODE** button several times until „**bl**" is displayed.

⇨ Acknowledge using **SET** key, the current setting is displayed.

⇨ Select the desired settings by pressing the **MODE** key.

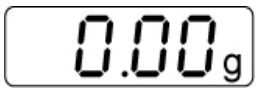
bl	**on**	Background illumination switched on	Contrastful display which can also be red in the darkness.
bl	**off**	Background illumination switched off	Battery saving
bl	**Ch**	The background illumination will be switched off automatically 10 sec after having reached a stable weighing value.	Battery saving

⇨ Use the **SET** key to confirm selection.

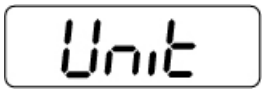
English

8.3.6 Animal weighing function

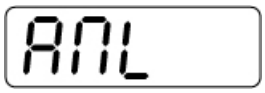
The animal weighing function can be applied for busy weighings. During a defined period the mean value of the weighing results is formed.
The more unquiet the weighed item, the longer the period should be selected.



⇨ In weighing mode keep the **PRINT** key pressed until "**Unit**" appears.



⇨ Press the **MODE** button several times until „**ANL**" is displayed.



⇨ Acknowledge using **SET** key, the current setting is displayed.

⇨ Select the desired settings by pressing the **MODE** key

ANL	**3**	Period 3 seconds
ANL	**5**	Period 5 seconds
ANL	**10**	Period 10 seconds
ANL	**15**	Period 15 seconds
ANL	**off**	Animal weighing not active

⇨ Use the **SET** key to confirm selection.

⇨ Put the weighing good (animal) on the weighing plate and press the **SET** button. In the display runs a „Countdown". The average value of the weighing results is displayed and remains displayed on the screen.

⇨ Use the **SET** key to change between animal weighing and normal weighing.

⇨ Press the **SET** key to restart the weighing cycle for animal weighing.

8.3.7 Foot switch

The foot switch is used to send the weighing values to a printer or to a PC. Alternatively can also be tared.
Connection and operation see in the operating instructions supplied with this foot switch.

8.3.8 Reset to factory setting

This function resets all balance settings to factory setting.

⇨ In weighing mode keep the **PRINT** key pressed until "**Unit**" appears.

⇨ Press the **MODE** button several times until „**rSt**" is displayed.

⇨ Acknowledge using **SET** key, the current setting is displayed.

⇨ Select the desired settings by pressing the **MODE** key

rSt	**yes**	Balance will be reset to factory setting.
rSt	**no**	The balance keeps its individual setting

⇨ Use the **SET** key to confirm selection. The balance returns to weighing mode.

English

8.4 Interface parameters

Data output is carried out via interface RS 232 C.

General
The previous condition for the data transfer between balance and a peripherical device (e.g. printer, PC ...) is that the appliances are set to the same interface parameters (e.g. baud rate, transfer mode ...).

8.4.1 Data transfer mode

⇨ In weighing mode keep the **PRINT** key pressed until "**Unit**" appears.

⇨ Press the **MODE** button several times until „**Pr**" is displayed.

⇨ Acknowledge using **SET** key, the current setting is displayed.

⇨ Select the desired settings by pressing the **MODE** key

rE CR	Data output via remote control commands
Pr PC	Data output using the **PRINT** key
AU PC	Continuous data output
bA Pr	Output on bar code printer
AU Pr	Autom. data output of stable weighing values

⇨ Use the **SET** key to confirm selection. The balance returns to weighing mode.

8.4.2 Printout

Using this function data are selected which are to be sent via the RS232C (**not** valid for data transfer mode BAPr).

⇨ In weighing mode keep the **PRINT** key pressed until "**Unit**" appears.

⇨ Press the **MODE** key several times until „**LAPr**" is displayed.

⇨ Acknowledge using **SET** key, the current setting is displayed.

⇨ Select the desired output parameter by pressing the **MODE** key

Hdr	Edition of the headlines
GrS	Edition of the total weight
Net	Edition of net weight
tAr	Edition of tare weight
N7E	Edition of the stored weight
PCS	Edition of quantity
AUJ	Edition of piece weight
Rqt	Edition of the reference quantity
FFd	Edition of a page forward feed when printout is started
FFE	Edition of a page forward feed when printout is ended

⇨ After actuating the **SET** button, the current state is displayed (on / off).

⇨ Use **MODE** and **PRINT** key to change the status „**on ⇆ off**".

⇨ Use the **SET** key to confirm selection. The balance returns to weighing mode.

By that way the user can configure his own data block, which then is sent to a printer or to a PC.

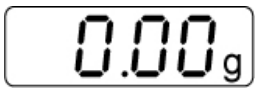
English

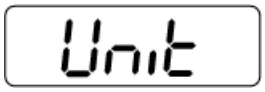
8.4.3 Printout example

		Page forward feed when started
line1		Edition of the headlines
line 2		
line 3		
line 4		
line 5		
G	135.81 g	Total weight
N	28.27 g	Net weight
T	1.49 g	Tare weight
M	12.25 g	Saved weight
P	5 pcs	Quantity
A	5.63 g	Piece weight
R	2 pcs	Reference quantity
		Page forward feed when ended

8.4.4 Baud rate

The baud rate defines the transfer speed vie the interface, 1 Baud = 1 Bit/second.





⇨ In weighing mode keep the **PRINT** key pressed until "**Unit**" appears.

⇨ Press the **MODE** key several times until „**bAUd**" is displayed.

⇨ Acknowledge using **SET** key, the current setting is displayed.

⇨ Use **MODE** key select the desired settings

9600 ⇨ 4800 ⇨ 2400 ⇨ 1200 ⇨ 19200

⇨ Use the **SET** key to confirm selection. The balance returns to weighing mode.

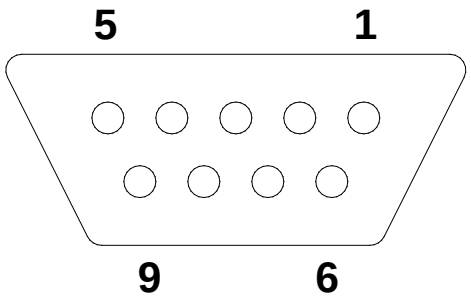
9 Data output RS 232 C

9.1 Technical data

- 8-bit ASCII Code
- 1 start bit, 8 data bits, 1 stop bit, no parity bit
- Baud rate selectable at 1200, 2400, 4800, **9600** and 19200 Baud
- Miniature plug-in necessary (9 pole D-Sub)
- For operation with interface faultless operation is only ensured with the correct KERN – interface cable (max. 2m)

9.2 Pin allocation of balance output bushing:

Front view:



Pin 2: Transmit data
Pin 3: Receive data
Pin 5: Signal ground

9.3 Explanation of the data transfer

Pr PC

Press the **PRINT** key, at stable weight the format is transferred from **LAPR**.

a. Format for stable values for weight/quantity/percentage

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
M	S	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	B	U_1	U_2	U_3	CR	LF

b. Format in case of fault

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
B	B	B	B	B	B	B	B	B	B	B	E	r	r	o	r	CR	LF

AU Pr:
As soon as the weighing value is stable, the format is automatically transferred from **LAPR**.

c. Format for stable values for weight/quantity/percentage

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
M	S	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	B	U_1	U_2	U_3	CR	LF

d. Format in case of fault

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
B	B	B	B	B	B	B	B	B	B	B	E	r	r	o	r	CR	LF

AU PC:
The weighing values are sent automatically and continuously, no matter if the value is stable or unstable.

e. Format for stable values for weight/quantity/percentage

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
M	S	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	B	U_1	U_2	U_3	CR	LF

f. Format in case of fault

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
B	B	B	B	B	B	B	B	B	B	B	E	r	r	o	r	CR	LF

g. Format for unstable values for weight/quantity/percentage

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
M	S	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	B	B	B	B	CR	LF

rE Cr:

The remote control commands s/w/t are sent from the remote control unit to the balance as ASCII code. After the balance having received the s/w/t commands, it will send the following data.

Take into account that the following remote control commands must be sent without a subsequent CR LF.

s	Function:	Stable weighing value for the weight is sent via the RS232 interface
w	Function:	Weighing value for the weight (stable or unstable) is sent via the RS232 interface
t	Function:	No data are sent, the balance carries out the tare function.

h. Format for stable values for weight/quantity/percentage

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
M	S	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	B	U_1	U_2	U_3	CR	LF

i. Format in case of fault

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
B	B	B	B	B	B	B	B	B	B	B	E	r	r	o	r	CR	LF

j. Format for unstable values for weight/quantity/percentage

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
M	S	N_1	N_2	N_3	N_4	N_5	N_6	N_7	N_8	N_9	N_{10}	B	B	B	B	CR	LF

Symbols

M	Blank or M
S	Space character or negative sign (-)
N_1 … N_{10}	10 numeric ASCII codes for weight values including decimal places or blanks
U_1 … U_3	3 ASCII codes for weighing unit pcs. / % / or blank
B	Blank
E, o, r	ASCII code or “E, o, r”
CR	Carriage Return
LF	(Line Feed)

English

9.4 Output on bar code printer

The data transfer mode has to be set on **„BA Pr“** (chapter 8.4.1).
As bar code printer the Zebra printer model LP2824 is provided.
Take into account that the output format of the balance is fixedly defined and cannot be changed.
The printer format is stored in the printer, i.e. in case of a failure the printer cannot be changed with a new one from factory, previously it is necessary that KERN installs the respective software.

The Zebra printer and the balance must be connected to the delivered interface cable when they are switched off.

After switching-on both appliances, and after reaching the status ready-for-operation, a label will be printed out when pressing the **PRINT** button.

10 Service, maintenance, disposal

10.1 Cleaning

Before any maintenance, cleaning and repair work disconnect the appliance from the operating voltage.

Please do not use aggressive cleaning agents (solvents or similar agents), but a cloth dampened with mild soap suds. Take care that the device is not penetrated by fluids and polish it with a dry soft cloth.

- ⇨ Clean the stainless-steel parts with a soft cloth soaked with a cleaning agent suitable for stainless steel.
- ⇨ For stainless steel parts do not use any cleaning agents which contain sodium hydroxide solution, acetic, hydrochloric, sulphuric or citric acid.
- ⇨ Do not use metal brushes or cleaning sponges of steel wool, as this causes superficial corrosion.

10.2 Service, maintenance

- ⇨ The appliance may only be opened by trained service technicians who are authorized by KERN.
- ⇨ Ensure that the balance is regularly calibrated, see chap. Testing instruments control.

10.3 Disposal

Disposal of packaging and appliance must be carried out by operator according to valid national or regional law of the location where the appliance is used.

11 Instant help

In case of an error in the program process, briefly turn off the balance and disconnect from power supply. The weighing process must then be restarted from the beginning.

Help:

Fault	Possible cause
The displayed weight does not glow.	• The balance is not switched on. • The mains supply connection has been interrupted (mains cable not plugged in/faulty). • Power supply interrupted. • Battery is inserted incorrectly or is empty. • No batteries inserted.
The displayed weight is permanently changing	• Draught/air movement • Table/floor vibrations • The weighing plate is in contact with foreign matter. • Electromagnetic fields / static charging (choose different location/switch off interfering device if possible)
The weighing value is obviously wrong	• The display of the balance is not at zero • Adjustment is no longer correct. • Great fluctuations in temperature. • Electromagnetic fields / static charging (choose different location/switch off interfering device if possible)

Should other error messages occur, switch balance off and then on again. If the error message remains inform manufacturer.

12 Declaration of -Conformity

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Declaration of Conformity

EG-Konformitätserklärung
EC- Déclaration de conformité
EC-Dichiarazione di conformità
EC- Declaração de conformidade
EC-Deklaracja zgodności

EC-Declaration of -Conformity
EC-Declaración de Conformidad
EC-Conformiteitverklaring
EC- Prohlášení o shode
EC-Заявление о соответствии

D	Konformitäts-erklärung	Wir erklären hiermit, dass das Produkt, auf das sich diese Erklärung bezieht, mit den nachstehenden Normen übereinstimmt.
GB	Declaration of conformity	We hereby declare that the product to which this declaration refers conforms with the following standards.
CZ	Prohlášení o shode	Tímto prohlašujeme, že výrobek, kterého se toto prohlášení týká, je v souladu s níže uvedenými normami.
E	Declaración de conformidad	Manifestamos en la presente que el producto al que se refiere esta declaración está de acuerdo con las normas siguientes
F	Déclaration de conformité	Nous déclarons avec cela responsabilité que le produit, auquel se rapporte la présente déclaration, est conforme aux normes citées ci-après.
I	Dichiarazione di conformitá	Dichiariamo con ciò che il prodotto al quale la presente dichiarazione si riferisce è conforme alle norme di seguito citate.
NL	Conformiteit-verklaring	Wij verklaren hiermede dat het product, waarop deze verklaring betrekking heeft, met de hierna vermelde normen overeenstemt.
P	Declaração de conformidade	Declaramos por meio da presente que o produto no qual se refere esta declaração, corresponde às normas seguintes.
PL	Deklaracja zgodności	Niniejszym oświadczamy, że produkt, którego niniejsze oświadczenie dotyczy, jest zgodny z poniższymi normami.
RUS	Заявление о соответствии	Мы заявляем, что продукт, к которому относится данная декларация, соответствует перечисленным ниже нормам.

Electronic Balance: KERN EMS, FCE-N, PCD

EU Directive	**Standards**
2004/108/EC	EN 61326-1: 2013 EN 61326-2-2: 2013 EN 61000-3-2: 2006+A2:2009 EN 61000-3-3: 2013
2006/95/EC	EN 60950-1: 2006/A2:2013
2011/65/EU	EN 50581:2012

Datum 07.08.2014
Date

Ort der Ausstellung 72336 Balingen
Place of issue

Signatur
Signature

Albert Sauter
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Geschäftsführer
Managing director

English