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Operating Manual

Counting balance/counting system

KERN CFS/CCS

Version 1.4

03/2011

GB



CFS/CCS-BA-e-1114



KERN CFS/CCS

Version 1.4 03/2011

Operating instructions Counting balance/counting system

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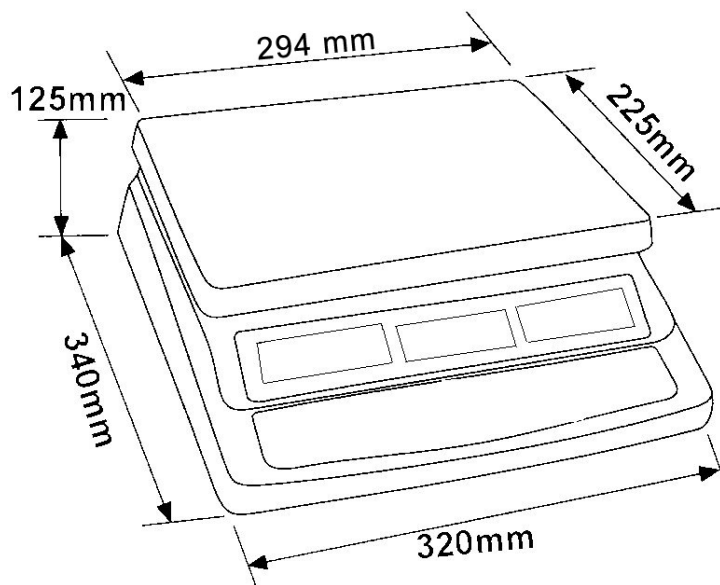
1 Technical Data

1.1 KERN CFS

KERN	CFS 6K0.1
Readability (d)	0.1 g
Weighing range (max)	6 kg
Reproducibility	0.1 g
Linearity	± 0.2 g
Stabilization time	2 s
Weighing Units	kg, lb
Recommended adjusting weight (not supplied)	6 kg (F2)
Warm-up time	2 h
Minimum unit weight at piece count	50 mg
Reference unit weights at piece counting	freely selectable
Net weight (kg)	3.8 kg
Permissible ambient condition	0° C to 40° C
Humidity of air	max. 80 % relative (not condensing)
Weighing plate, stainless steel	294 x 225 mm
Dimensions of the housing (B x D x H)	320 x 330 x 125 mm
Mains connection	Mains adapter 230 V AC, 50 Hz; balance 9 V DC, 500 mA
Rechargeable battery (Option)	Operating duration approx. 70 h / loading time approx. 12 hours

KERN	CFS 15K0.2	CFS 30K0.5
Readability (d)	0.2 g	0.5 g
Weighing range (max)	15 kg	30 kg
Reproducibility	0.2 g	0.5 g
Linearity	± 0.4 g	± 1 g
Stabilization time	2 s	
Weighing Units	kg, lb	
Recommended adjusting weight (not supplied)	15 kg (F2)	30 kg (F2)
Warm-up time	2 h	
Minimum unit weight at piece count	100 mg	
Reference unit weights at piece counting	freely selectable	
Net weight (kg)	3.8 kg	
Permissible ambient condition	0° C to 40° C	
Humidity of air	max. 80 % relative (not condensing)	
Weighing plate, stainless steel	294 x 225 mm	
Dimensions of the housing (B x D x H)	320 x 330 x 125 mm	
Mains connection	Mains adapter 230 V AC, 50 Hz; balance 9 V DC, 500 mA	
Rechargeable battery (Option)	Operating duration approx. 70 h / loading time approx. 12 hours	

Dimensions:



English

1.2 KERN CCS

Counting system	Bulk material balance	Weighing range (Max) kg	Readability (d) g	Weighing plate stainless steel mm	Recommended adjustment weight, not added, kg (class)
KERN CCS 30K0.1	KERN KFP 30V20M	30	10	400x300x78	30 (M2)
CCS 60K0.1	KFP 60V20M	60	20	400x300x78	50 (M2)
CCS 60K0.1L	KFP 60V20LM	60	20	500x400x79	50 (M2)
CCS 150K0.1	KFP150V20M	150	50	500x400x79	150 (M3)
CCS 150K0.1L	KFP 150V20LM	150	50	650x500x115	150 (M3)
CCS 300K0.1	KFP300V20M	300	100	650x500x115	300 (M3)

2 Declaration of conformity



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Declaration of conformity

EC-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	Manifetamos 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 conformità	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 Scale: KERN CFS

Mark applied	EU Directive	Standards
CE	2004/108/EC EMC	EN 61000-6-1 :2007 EN 61000-6-3 :2007 EN 61000-3-3 : 1995+A1 :2001+A2 :2005 EN 61000-3-2 :2006

Date: 14.07.2010

Signature: _____

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Management

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3 Basic Information (General)

3.1 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.

3.2 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” in the balance. (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 damaged 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.

3.3 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 or damage by media, liquids, natural wear and tear
- The appliance is improperly set up or incorrectly electrically connected
- The measuring system is overloaded

3.4 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.

4 Basic Safety Precautions

4.1 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.

4.2 Personnel training

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

5 Transportation & Storage

5.1 Testing upon acceptance

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

5.2 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.

6 Unpacking, Setup and Commissioning

6.1 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.

Therefore, observe the following for the installation site:

- 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, vapors 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 or weighing container.

Major display deviations (incorrect weighing results) may be experienced should electromagnetic fields (e.g. due to mobile phones or radio equipment), static electricity accumulations or instable power supply occur. Change location or remove source of interference.

6.2 Unpacking/erection

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

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

When using as counting system balance and weighing bridge must be levelled.

6.2.1 Counting balance

KERN CFS



1. Weighing plate / rechargeable battery compartment (under weighing plate)
2. Bubble level
3. RS 232 interface
4. Second balance interface
5. Foot screws
6. ON/OFF switch
7. Mains adapter connection

6.2.2 Counting system

KERN CCS



↑
Bulk material balance KERN KFP

↑
Reference balance KERN CFS

i In factory the counting system **KERN CCS** is preconfigured in a way that no more changes will be necessary.

When connecting a weighing bridge (not preconfigured by **KERN**) the following must be observed:

- ⇒ Connect weighing bridge with a suitable cable via the second-balance interface.
Allocation of the interface connection see chapter 14.
- ⇒ Configure weighing bridge, see chapter 13
- ⇒ Adjust balance / weighing bridge, see chapter 7.2

6.2.3 Scope of delivery / serial accessories

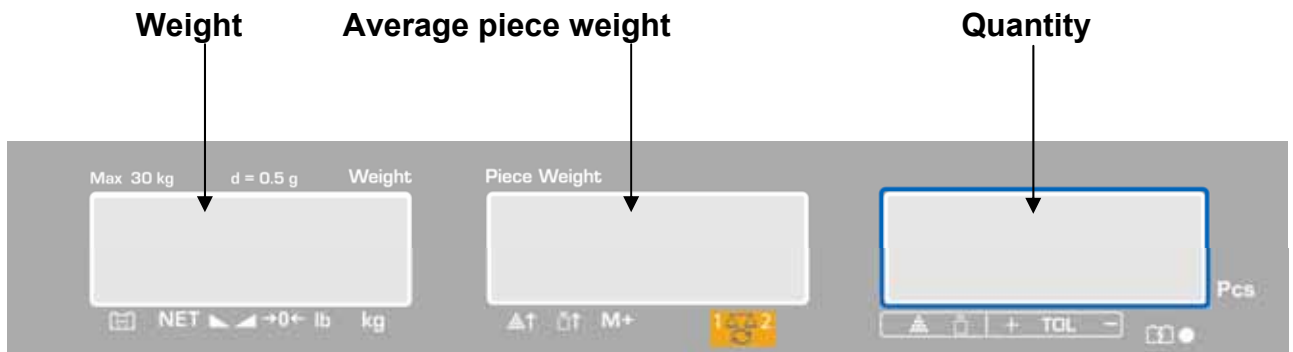
KERN CFS

- Balance see chpt. 6.2.1)
- Power cable
- Protective cover
- Operating Manual

KERN CCS

- Ref. balance KERN CFS, see chap. 6.2.1
- Bulk mat. balance KERN CFS, see chap. 6.2.2
- Operating instructions KERN CFS/CCS
- Operating instructions KERN KFP

6.3 Overview of displays



6.3.1 Display weight

Here the weight of your goods is displayed in [kg].

The arrows [▼] above the symbols show:

NET	Net weight
~	Stability display
→0←	Zeroing display
lb/kg	Current weighing unit

6.3.2 Display average piece weight

Here the average reference weight of a sample is displayed in [g]. This value is either numerically entered by user or calculated by weighing on balance.

The arrows [▼] above the symbols show:

	Number of parts placed on balance too small
	Piece below minimum weight of piece
M+	Data in summation memory
	Active balance: 1. Reference balance KERN CFS 2. Bulk material balance KERN KFP

6.3.3 Display quantity





Here the current piece quantity (PCS = pieces) or in totalizing mode the sum Sum of the placed parts is displayed, see chapter 9.










The arrows [▼] above the symbols show:

	Tolerance control in counting mode
	Tolerance control in weighing mode
+	Goods to be weighed above tolerance limit
TOL	Goods to be weighed within tolerance range
-	Goods to be weighed below tolerance limit

6.4 Keyboard overview



Choice	Function in Weighing mode	Function in Menu
 	<ul style="list-style-type: none"> Numeric keys 	
	<ul style="list-style-type: none"> Decimal point At numeric input number selection to the left 	
	<ul style="list-style-type: none"> Delete key 	

	<ul style="list-style-type: none"> • Addition in summation memory • Display total weight /number of weighings / total quantity • At numeric input digit selection to the right • Data output (menu setting "AU OFF" see chapter 12.2) 	
	<ul style="list-style-type: none"> • Set or call-up PLU, see chpt. 11.3 	
	<ul style="list-style-type: none"> • Tolerance control, see chpt. 11 	<ul style="list-style-type: none"> • Call up menu
	<ul style="list-style-type: none"> • Switch-over balance, see chpt. 8.3 	
	<ul style="list-style-type: none"> • Input of the average piece weight by weighing, see chapter 10.1 	
 	<ul style="list-style-type: none"> • Numeric input of the average piece weight see chapter 10.2 • Switch-over weighing unit 	<ul style="list-style-type: none"> • Function /parameter selection
	<ul style="list-style-type: none"> • Taring key 	<ul style="list-style-type: none"> • Confirm
	<ul style="list-style-type: none"> • Zeroing key 	<ul style="list-style-type: none"> • Back to menu/weighing mode

6.5 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.

6.6 Rechargeable battery operation (Option)

The battery is charged with the supplied mains cable.

Before the first use, the rechargeable battery should be charged by connecting it to the mains power cable for at least 15 hours. The operation time of the rechargeable battery is approx. 70 hours. When connecting a second balance, the operation time will be reduced. The charging period for total charge is c. 12 hours

To save the rechargeable battery, in the menu (see chap.12.2) the automatic switch-off function [„*F I OFF*“ ⇒ „*OFF* „] can be activated, switch-off time selectable after 0, 3, 5, 15, 30 minutes.

If an arrow appears on the weight display [▼] above the battery symbol  or "bat lo" when turning on the balance, this is an indication that the capacity of the rechargeable battery will soon be exhausted. The balance will be ready to operate for about another 10 hrs., then it will switch off automatically. Connect the power cable as soon as possible to load the rechargeable battery.

The LED display under the piece number window informs you during charging about the charging status of the rechargeable battery.

- red: Voltage has dropped below prescribed minimum. Connect mains adapter to load the rechargeable battery.
- green: Rechargeable battery is completely charged
- yellow: Rechargeable battery very low. Connect mains adapter as soon as possible to load the rechargeable battery.

6.7 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.

6.8 Initial Commissioning

In order to obtain exact results with the electronic balances, your 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.

7 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.





Procedure when adjusting:







Observe stable environmental conditions. A warming up time (see chapter 1) is required for stabilization. Ensure that there are no objects on the weighing plate.












- Info about adjustment weights can be found on the Internet at: <http://www.kern-sohn.com>
- In order to avoid errors at the piece quantity determination, both balances must be adjusted with the same acceleration due to gravity. In case of non-compliance counting errors will result!

7.1 Adjustment models KERN CFS/CCS

Operation	Display
⇒ Switch-on balance and during the self test press  .	"PI N"
⇒ Use the number keys to enter password: Either <ul style="list-style-type: none"> • Standard password „0000“ or • personal password, input see chapter 13 ⇒ Confirm input with  .	"PI N" "-----"
⇒ When using as counting system, the bulk material balance as well as the reference balance must be adjusted. The adjustment process must be carried out on both balances. Select bulk material or reference balance via  . The appeared [▼] displays the current balance. Acknowledge with  .	"EECH" "LOCAL" ↕ "EECH" "rENote"

<p>⇒ If necessary, at balance zero display using UNIT select the weighing unit [kg or lb], which shall be used for adjustment. The appeared [▼] displays the current weighing unit.</p> <p>Acknowledge with .</p>	<p>“tECH” “UNI t”</p>
<p>⇒ Ensure that there are no objects on the weighing plate. After successful stop check press the  button.</p>	<p>“UNLoAd”</p>
<p>⇒ The weight value of the required adjustment weight will be displayed.</p> <p>Acknowledge with .</p> <p>⇒ Place the required adjusting weight carefully in the centre of the weighing plate and press  to confirm.</p>	<p>“SEL” “000003”</p> <p>“LoAd”</p>
<p>or</p> <p>⇒ Enter value of the necessary adjustment weight using numeric keyboard and acknowledge with .</p> <p>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.</p> <p>We recommend 80 % max.</p> <p>⇒ Place the required adjusting weight carefully in the centre of the weighing plate and press  to confirm.</p>	<p>“SEL” “000002”</p> <p>“LoAd”</p>
<p>⇒ After the adjustment the balance will carry out a self-test. Remove adjusting weight during self test, balance will return into weighing mode automatically. In case of an adjustment error or incorrect adjusting weight the display will show an error message (FRI L H / FRI L L), repeat adjustment process.</p>	

7.2 Adjustment bulk weighing balance, not preconfigured by KERN

Operation	Display
⇒ Switch-on balance and during the self test press  .	"PI n"
⇒ Use the number keys to enter password: Either <ul style="list-style-type: none"> • Standard password „0000“ or • personal password, input see chapter 13 ⇒ Confirm input with  .	"PI n" "-----"
⇒ Select bulk material balance using  . The appeared [▼] displays the current balance. Acknowledge with  .	"tECH" "LoCAL" ↕ "tECH" "rENote"
⇒ If necessary, at balance zero display using  select the weighing unit [kg or lb], which shall be used for adjustment. The appeared [▼] displays the current weighing unit. Acknowledge with  .	"tECH" "UNI t"
⇒ Ensure that there are no objects on the weighing plate. After successful stop check press the  button.	"UNLoAd"
⇒ Enter value of the necessary adjustment weight using numeric keyboard and acknowledge with  . 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. We recommend 80 % max. ⇒ Place the required adjusting weight carefully in the centre of the weighing plate and press  to confirm.	"SEL" "000003" "LoAd"
⇒ After the adjustment the balance will carry out a self-test. Remove adjusting weight during self test, balance will return into weighing mode automatically. In case of an adjustment error or incorrect adjusting weight the display will show an error message (<i>FAIL H / FAIL L</i>), repeat adjustment process.	

8 Basic Operation

8.1 Switching on/off


- ⇒ To switch-on actuate forward the switch-on/switch-out on the right lower side of the balance. The balance will carry out a self-test The balance is ready for weighing when the weight display appears.
- ⇒ To switch-off push backward the switch-on/switch-out on the right lower side of the balance.

8.2 Zeroing

Resetting to zero corrects the influence of light soiling on the weighing plate. The resetting range of the balance was adjusted to $\pm 2\%$ max. by factory. Further adjustments are possible in the menu, see chapter 13.

When using as counting system the zeroing range of both balances can be set in the menu, see chapter 13.

Manual

- ⇒ Unload the balance
- ⇒ Press  , the balance starts resetting to zero. The [▼] symbol over a appears.

Automatic

In the menu the automatic zero point correction can be switched off or the amount can be changed, see chapter 13.

8.3 Switch over balance/weighing bridge

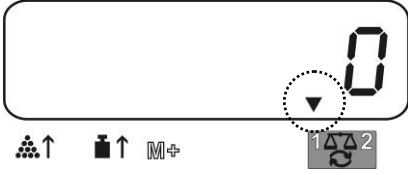
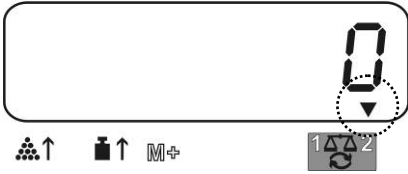
For piece counting a weighing bridge can be connected via the second balance interface. In the counting system KERN CCS the quantity counting is made on the bulk material balance KERN KFP. The reference balance KERN CFS permits due to its high resolution a very precise determination of the average piece weight.

The second balance can be operated in the same manner like the first balance.

By pressing  the display changes from one to the other balance.

In the display appears "CHANGE" "LoCAL" or "CHANGE" "rEnotE".

The appeared [▼] displays the current balance.

<p>"CHANGE" "LoCAL"</p>	<p>Piece weight</p> 	<p>(1) Reference balance KERN CFS</p>
<p>"CHANGE" "rEnotE"</p>	<p>Piece weight</p> 	<p>(2) Bulk material balance KERN KFP (counting system CCS)</p>




8.4 Weighing with tare

A tare value can be entered for the reference as well as for the bulk material balance. Before setting a tare value select an active balance, see chpt 8.3

8.4.1 Taring

- ⇒ Deposit weighing vessel. After successful stop check press the **TARE** button. The zero display and the [▼] symbol over **NET** will appear. The weight of the container is now internally saved.
- ⇒ Weigh the material, the net weight will be indicated.
- ⇒ The weight of the weighing container will be displayed as a minus number after removing the weighing container.
- ⇒ To delete the tare value, remove load from weighing pan and press the **TARE**-key.
- ⇒ The tare procedure can be repeated as many times as necessary, for example with initial weighing of several components for a mix (add-on weighing). The limit is reached when the total weighing range capacity is full.

8.4.2 Numeric entering of tare weight

- ⇒ Unload and reset to zero the balance
- ⇒ Enter known tare weight numerically with decimal dot and press  .
The entered weight will be stored as tare weight and displayed with negative sign.
The  symbol over **NET** appears.
- ⇒ Put the filled weighing container on the balance, the net weight will be displayed.
- ⇒ The tare value remains stored until it will be deleted by .



i The tare value will be rounded up according to the readability of the balance, e.g. at a balance 60 kg max/5 g readability the input value of 103 g will be displayed as -105 g.

9 Adding


The balance can totalize weight values or piece quantities.

When using in the counting system, no matter, if the weighed goods are on the reference or on the bulk material balance.

Preparing:

- ⇒ When using as counting system select using  the balance, on which will be totalized. The appeared  displays the current balance.
- ⇒ When totalizing in counting mode set the average piece weight.
(see chpt. 10.1 or 10.2)
- ⇒ If necessary, tare the empty balance container.


9.1 Manual totalizing

With this function the individual weighing values are added into the summation memory by pressing  and edited, when an optional printer is connected.

- i** • Menu settings:
„F1 off“ ⇒ „ACC“ ⇒ „ON“ and „F2 Prt“ ⇒ „P mode“ ⇒ „Print“ ⇒ „Au OFF“, see chpt. 12.2
- When using as counting system there can be totalized on the reference as well as on the bulk material balance.
Before the totalizing process select the active balance, see chpt. 8.3.


Add up:

- ⇒ Place goods to be weighed A.

Wait until the stability display appears, then press . The weight value or the number of items are stored and printed out.

- ⇒ Remove the weighed good. More weighed goods can only be added when the display = zero.

- ⇒ Place goods to be weighed B.


Wait until the stability display appears, then press . The weight value or the number of items are added in the summation memory and printed out. Total weight, number of weighing procedures as well as total parts counting appear 2 sec.

- ⇒ Add more weighed goods as described before.

Please note that the balance must be unloaded between the individual weighing procedures.

- ⇒ This process can be repeated 99 times or until the weighing range of the balance is exhausted.

Display of the saved weighing data:

- ⇒ Press , the total weight, number of weighing procedures as well as total number of items are displayed.

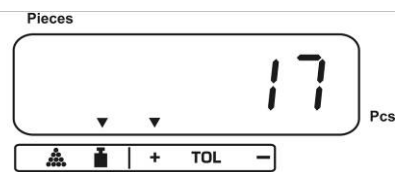
Total weight placed on balance:





Number of weighing procedures:



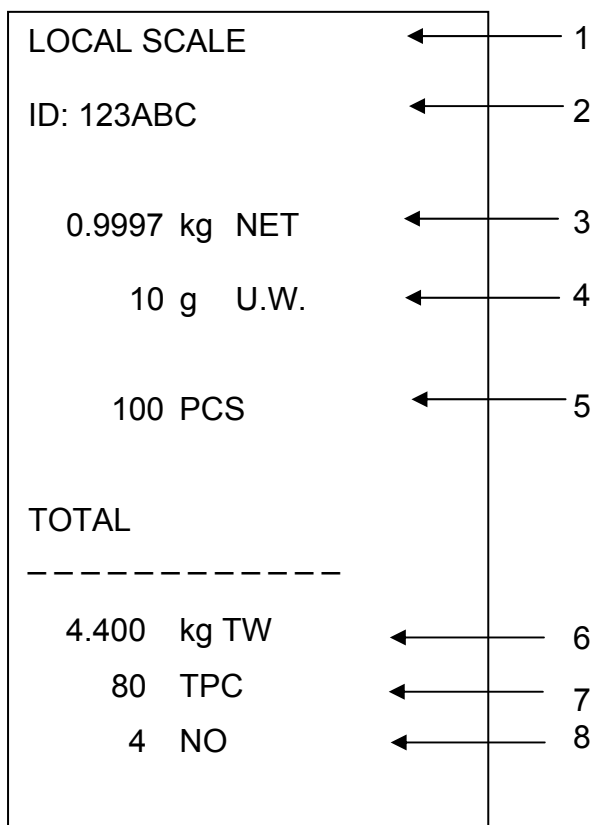
Total number of pieces:



Delete weighing data:

- ⇒ Press , the total weight, number of weighing procedures as well as total number of items are displayed. During this display press . The data in the summation memory are deleted.


Printout example:



English

- | | | |
|---|--------------------|--|
| 1 | LOCAL/REMOTE SCALE | Active balance, see chpt. 8.3. |
| 2 | ID | User identification number, see chapter 12.2 |
| 3 | NET | Currently placed net weight |
| 4 | U. W. | Average piece weight (Unit weight) |
| 5 | PCS | Currently placed number of pieces (Pieces) |
| 6 | TW | Placed total weight (Total weight) |
| 7 | TPC | Total number of pieces (Total pieces) |
| 8 | NO | Number weighing processes |

9.2 Automatic adding-up

With this function the individual weighing values are automatically added into the summation memory when the balance is unloaded without pressing  and edited, when an optional printer is connected.

- Menu settings:
„F1 off“ ⇒ „ACC“ ⇒ „ON“ and „F2 Prt“ ⇒ „P mode“ ⇒ „Print“ ⇒ „Au ON“, see chpt. 12.2
- When using as counting system there can be totalized on the reference as well as on the bulk material balance.
Before the totalizing process select the active balance, see chpt. 8.3.

Add up:

- ⇒ Place goods to be weighed A.
After the standstill control sounds a signal tone. Unload the weighing good, the weighing value is added into the summation memory and printed out.
- ⇒ Place goods to be weighed B.
After the standstill control sounds a signal tone. Unload the weighing good, the weighing value is added into the summation memory and printed out.
- ⇒ Add more weighed goods as described before.
Please note that the balance must be unloaded between the individual weighing procedures.
- ⇒ This process can be repeated 99 times or until the weighing range of the balance is exhausted.


- Display and delete the weighing data, as well as printout examples see chpt. 9.1.

10 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 average piece weight can only be determined by stable weighing values.
- If weighing values are under zero, the piece counter display shows a negative number of items.
- The exactness of the average piece weight can be increased at any time during piece counting, by entering the displayed number of items and confirming by . After the reference optimization sounds a signal tone. As the additional pieces increase the base for the calculation, the reference also becomes more exact.

10.1 Determination of the average piece weight by weighing

Set reference

- ⇒ Reset balance to zero or tare the empty weighing container if necessary.
- ⇒ Place on the weighing plate a known number (e.g. 10 items) of individual pieces as a reference.
Wait for the stability display, then enter the number of individual items via the numeric keypad.


Confirm within 5 sec by pressing  .

The balance determines the average piece weight.




Count the items

- ⇒ Tare if necessary, place weighing good and read off the number of items.

When an optional printer is connected, the displayed value can be edited by pressing  (menu settings „P mode“ ⇒ „Print“ ⇒ „Au OFF“, chpt. 12.2).

10.2 Numeric input of the average piece weight


Set reference

- ⇒ Enter the average piece weight via the numeric keyboard and acknowledge within 5 sec using button .



If in the weight display as weighing unit [kg] is active, the average piece weight will be displayed in [g]. If as weighing unit [lb] is active, the average piece weight is also displayed in [lb].

Count the items


- ⇒ Tare if necessary, place weighing good and read off the number of items.

When an optional printer is connected, the displayed value can be edited by pressing  (menu settings „P mode“ ⇒ „Print“ ⇒ „Au OFF“, chpt. 12.2).

10.3 Automatic reference optimization

If at the reference determination the placed weight or the placed piece number is too small, in the display of the average piece weight the triangle symbol will appear over [ ↑] or [ ↑] .

To optimize the calculated average piece weight automatically, add further parts whose number is smaller than that of the first reference determination. After the reference optimization sounds a signal tone. For each reference optimization the average piece weight is newly calculated. As the additional pieces increase the base for the calculation, the reference also becomes more exact.

By pressing the  key, recalculation can be avoided and the reference weight can be blocked.

Automatic reference optimization will be deactivated as soon as the number of added parts exceeds the saved reference quantity.

10.4 Counting with counting system



Bulk material balance e.g. KERN KFP


- Here pieces of huge quantities will be counted.
- Big parts (max > 3kg) are counted on the weighing bridge.
- If in the determination of the average piece weight no such high resolution is asked for as that of the **KERN CFS**, the reference formation can also be made in the bulk material balance.



Reference balance KERN CFS

- Due to its high resolution it is useful for accurate determination of the average piece weight.
- Smallest parts (max < 3kg) are counted on the precise **KERN CFS**.

Zählen mit Mengenwaage:

1. On the reference balance **KERN CFS** set average piece weight, see chpt. 10.1. or chpt. 10.2.
2. Switch-over balance with , see chpt. 8.3
3. Put empty vessel on the weighing plate of the bulk material balance **KERN KFP** and tare.
4. Fill counted quantity in the vessel on the bulk material balance. The piece number is shown in the display.











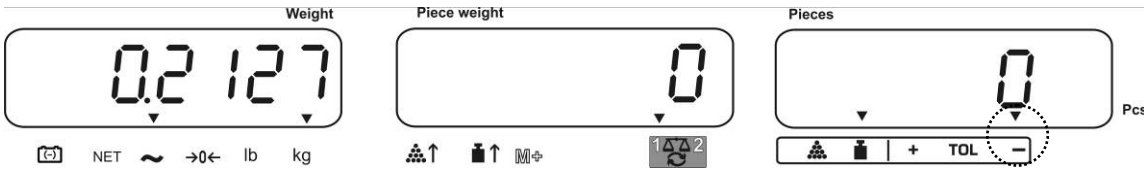
In order to avoid errors at the piece number determination, both balances must be adjusted with the same acceleration due to gravity (see chpt. 7.1 or chpt.7.2). In case of non-compliance counting errors will result!

11 Weighing to a certain target weight /target quantity and tolerance control

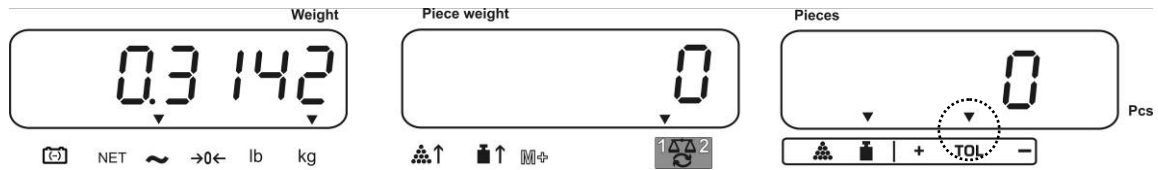
The balance allows weighing of goods to a certain target weight (net weight) or target piece number within defined tolerances. With this function one can also check if the weighing good is within a defined tolerance range. Tolerance control is possible in weighing or target mode.

Reaching the target value is indicated by an acoustic (if activated in menu) and an optic signal (tolerance mark ▼).

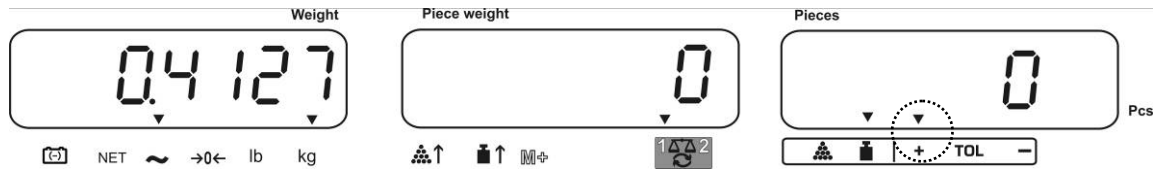
11.1 Tolerance control in weighing mode

Operation	Display
<p>⇒ Press , the active tolerance weighing mode is indicated.</p> <p>⇒ If necessary, with  "Tolerance control weighing mode" select ["nEt"]</p>	<p>" PSt " " nEt "</p>
<p>⇒ Press , the currently set upper limit value is displayed.</p> <p>⇒ Using numeric keyboard enter desired value or delete using .</p>	<p>" Hi nEt " " 0.0000 "</p> <p>↓</p> <p>" Hi nEt " " 0.3234 "</p>
<p>⇒ Press , the currently set lower limit value is displayed.</p> <p>⇒ Using numeric keyboard enter desired value or delete using .</p>	<p>" Lo nEt " " 0.0000 "</p> <p>↓</p> <p>" Lo nEt " " 0.2234 "</p>
<p>⇒ Press , tolerance control is started. The ▼ symbol over  appears.</p> <p>⇒ Place the weighing goods and with help of the tolerance mark ▼ check if the net weight of the weighed goods is under, within or over the specified tolerance.</p> <p>Display of tolerance mark ▼, if weighing goods under the specified tolerance:</p>	

Display of tolerance mark ▼, if weighing goods within the specified tolerance:



Display of tolerance mark ▼, if weighing goods above the specified tolerance:





The indetermination if the goods to be weighed are within the tolerance limits, can additionally be given by an acoustic signal (menu item „BEEP“, see chpt. 12.2)

- i** For tolerance control, just one limit value can be set.
- If both limit values are deleted, the tolerance control is deactivated.

11.2 Tolerance control in counting mode

Operation	Display
<ul style="list-style-type: none"> ⇒ Press PRE SET, the active tolerance weighing mode is indicated. ⇒ If necessary, with REF "Tolerance control weighing mode" select ["Cnt"] 	<p>" PSt " " Cnt "</p>
<ul style="list-style-type: none"> ⇒ Press TARE, the currently set upper limit value is displayed. ⇒ Using numeric keyboard enter desired value e.g. 50 items or delete using C. 	<p>" Hi Cnt " " 0 "</p> <p style="text-align: center;">↓</p> <p>" Hi Cnt " " 50 "</p>
<ul style="list-style-type: none"> ⇒ Press TARE, the currently set lower limit value is displayed. ⇒ Using numeric keyboard enter desired value e.g. 40 items or delete using C. 	<p>" Lo Cnt " " 0 "</p> <p style="text-align: center;">↓</p> <p>" Lo Cnt " " 40 "</p>

- ⇒ Press , tolerance control is started. The ▼ symbol over  appears.
- ⇒ Determine the average piece weight (see chpt. 10.1 or 10.2), place the weighing goods and check using the tolerance mark ▼, if the number of the placed pieces is under, within or above the specified tolerance.

Display of tolerance mark ▼, if weighing goods are under the specified tolerance



Display of tolerance mark ▼, if weighing goods within the specified tolerance



Display of tolerance mark ▼, if weighing goods above the specified tolerance:











The indetermination if the goods to be weighed are within the tolerance limits, can additionally be given by an acoustic signal (menu item „BEEP“, see chpt. 12.2)

- i** ▪ For tolerance control, also only one limit value can be set.
- If both limit values are deleted, the tolerance control is deactivated.

11.3 Data store (PLU = Product Look up)

The balance has more than 100 memory locations (PLU numbers) for often used tare values, average piece weights and additional texts. These data can be called-up for a certain article by calling the respective PLU-number.

11.3.1 Save

Operation	Windows		
1. If necessary set balance to zero using  .	"00000"	"0"	"0"
<p>2. Tare, as required.</p> <p>If it's used as counting system, observe if bulk material or counting balance shall be tared. Select using bulk material or reference balance accordingly via . The appeared [▼] displays the current balance.</p> <p>Or place the weighing container and tare with  (see chap. 8.4.1) or enter tare value numerically (see chapter 8.4.2). Tare values can only be saved when they are situated in the admitted taring range (factory setting > 2 % max).</p> <p>At values < 2 % max, reset balance with .</p>			
<p>3. If used as a counting system select reference balance using .</p> <p>4. Determine the average piece weight or by weighing (see chpt. 10.1) or enter via numeric keyboard (see chpt. 10.2).</p>			
5. Enter memory location, e.g. B. PLU 27 Press 	"PLU"	"--"	
⇒ Via numeric keys "2" and "7" enter memory location "27".	"PLU"	"27"	
⇒ Press  , the currently stored additional text will appear. The first digit is flashing.	"PLU 27"	"XXXXXX"	"XXX"
⇒ If necessary, delete additional text using  .	"PLU 27"		

6. Enter the additional text as follows (max. 12 characters, e.g. "KERN 1234 AB").

"PLU 27"

"KERN 1"

"234 AB"


For input of numbers, actuate shortly the numeric button


For input of letters press the numeric button and keep it pressed until the desired letter is displayed. The characters according to keyboard assignation run through.


1	- / \
2	A B C
3	D E F
4	G H I
5	J K L
6	M N O
7	P Q R S
8	T U V
9	W X Y Z
0	_ [] _ = Space

Overview data input / data output:





A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	-	/	\	()
A	b	[d	E	F	G	H	,	J	K	L	ñ	n	o	P	õ	r	S	t	U	u	ü	ÿ	z	,	'	[]		

With  number selection to the left, the respective active position flashes.


With  number selection to the right, the respective active position flashes.

7. Confirm input with . The data are stored under the entered PLU-number; the data can be called-up at any time by calling the respective PLU-number.

11.3.2 Calling up

Operation	Windows		
⇒ When using as counting system select using  the balance, on which the tare value is stored. The appeared [▼] displays the current balance.			
⇒ Press 	“PLU”	“--”	
⇒ Via numeric keys "2" and "7" enter memory location "27".	“PLU”	“27”	
⇒ Press  anew, the memory location and the stored additional text are displayed for 1 s. If the data shall be displayed longer time, keep  pressed. The display changes into the counting mode, the stored tare value e.g. 100 g and the average piece weight e.g. 10g /pce. are displayed. ⇒ Place load on pan and read the number of pieces.	“PLU 27” ↓ “-0.100”	“Tern 1” ↓ “10”	“234 Ab” ↓ “- 10”

11.3.3 Print

⇒ When connecting an optional printer, the data can be edited by pressing 

Printout example:

LOCAL SCALE	←	1
ID: 123ABC	←	2
NAME: KERN 1234 AB	←	3
1.9003 kg NET	←	4
10 g U.W.	←	5
190 PCS	←	6









1	LOCAL/REMOTE SCALE	Active balance, see chpt. 8.3.
2	ID	User identification number, see chapter 12.2
3	NAME	Additional text, see chpt. 11.3.1
4	NET	Placed net weight
5	U. W.	Average piece weight (Unit weight)
6	PCS	Placed number of pieces (Pieces)

12 Menu


The menu is structured in the following menu blocks.

1. *F1oFF* Balance and application settings
2. *F2PrE* Settings serial interface
3. *U id* Setting user identification number
4. *SC id* Setting balance identification number
5. *EETCH* Configuration balance or balance bridge

12.1 Navigation in the menu

Call up menu	⇒ Switch-on balance and during the self test press  . The first menu block <i>F1oFF</i> is displayed.
Select menu block	⇒ With help of  , the individual menu blocks can be selected one after the other. <i>F1oFF</i> ⇒ <i>F2PrE</i> ⇒ <i>U id</i> ⇒ <i>SC id</i> ⇒ <i>EETCH</i> ⇒ <i>F1oFF</i>
Select menu item	⇒ Confirm selected menu block with  . The first menu item is displayed, e.g. <i>F1oFF</i> ⇒ <i>bEEP</i> ⇒ With help of  , the individual menu items can be selected one after the other.
Select setting	⇒ Confirm selected menu item with  . The current setting will be displayed.
Change settings	⇒ Switch into the available settings using  .
Acknowledge setting / exit the menu	⇒ Press  , balance will return to submenu ⇒ Or make more adjustments in the menu or go back to main menu using.
Return to weighing mode	⇒ Press  anew

12.2 Menu overview

Menu block main menu	Menu item submenu	Disponible adjustments	Explanation
F1 OFF	bEEP	"bEEP" "OFF"	Signal tone switched off
		"bEEP" "on in"	Signal tone on, if weighing value within tolerance limits
		"bEEP" "on out"	Signal tone on, if weighing value outside tolerance limits
	EL	"LITE" "OFF"	Display background illumination off
		"LITE" "on"	Display background illumination on
		"LITE" "AUT"	Background illumination switches on automatically when loaded or a button is pressed
	Unit	"Unit" "kg/lb"	Weighing unit can be switched over kg ↔ lb
		"Unit" "kg"	Weighing unit "kg"
		"Unit" "lb"	Weighing unit "lb"
	OFF	0/3/5/15/30	Auto-off function, balance will switch off automatically after the set time. Selectable 0/3/5/15/30 minutes.
	"ACC"	"ACC" "on"	Totalizing mode on
		"ACC" "OFF"	Totalizing mode off
F2 Prt	Pmode	Print "AU OFF"	Data output of stable weighing values after pressing 
		"AU on"	Automatic data output of stable weighing values after unloading the balance
	P Cont	Continuous data output of all weighing data, (totalizing deactivated)	
	P SERrE	Continuous data output only weight value.	
	P bAUD	b 600	Baud rate 600
		b 1200	Baud rate 1200
		b 2400	Baud rate 2400
		b 4800	Baud rate 4800
		b 9600	Baud rate 9600

	PARITY	8 n l	8 bits, no parity
		7 E l	7 bits, even parity
		7 o l	7 bits, odd parity
	TYPE	EPUP	Standard printer setting
		LP50	Not documented
U id	"U id" "ABC234" ""	Shows the current user identification number, max. 6 characters, input see chpt. 11.3.1	
SC id	"SC id" "ABC234" ""	Shows the current balance identification number, max. 6 characters, input see chpt. 11.3.1	
E E C H	Details see chpt. 13	password-protected	

13 Configuration bulk material balance / technical parameters

- i** ⇒ Changes should only be carried out by trained specialized personnel.
- i** ⇒ Navigation in menu see chpt. 12.1










In factory the balance **KERN CFS** or the counting system **KERN CCS** are preconfigured in a way that normally no more changes will be necessary.














But if there are special conditions of use or if as bulk material balance an other weighing bridge (not preconfigured by **KERN**) is connected, in the menu block "E E C H" the required settings can be made.











Technical data:




Supply voltage	5 VDC
Max. signal voltage	0-20 mV
Zeroing range	0-5 mv
Sensitivity	> 0.02 µv
Resistance parameter	87 Ω Min., 4 x 350 Ω load cell
Connector	4 poles
Max. cable length	6 meter
Connection plug	9 pin d-subminiature bushing

Menu settings:

<p>Call up menu</p> <p>⇒ Switch-on balance and during the self test press . The first menu block <i>F T o F F</i> is displayed.</p>	<p><i>F T o F F</i></p>
<p>⇒ Press  repeatedly until <i>E E C H</i> is displayed.</p> <p><i>F T o F F</i> ⇒ <i>F 2 P r t</i> ⇒ <i>U i d</i> ⇒ <i>S C i d</i> ⇒ <i>E E C H</i></p>	<p><i>E E C H</i></p>
<p>⇒ Acknowledge with . The request to enter the password appears.</p>	<p>"P I N"</p>
<p>⇒ Or as standard password enter four times zero "0000" or the stored password (input see parameter "P I N"). Any other password can be overwritten with "9999".</p> <p>⇒ Acknowledge with .</p>	<p>"P I N" "-----"</p>
<p>⇒ Use  to select the balance which should be configured (bulk material/reference balance). The appeared  displays the current balance. Acknowledge with .</p>	<p>"E E C H" "LOCAL" ⇕ "E E C H" "rENotE"</p>
<p>⇒ Use UNIT to select the weighing unit [kg or lb], where the adjustment shall be made. The appeared  displays the current weighing unit. Confirm with , the first menu item "<i>C n t</i>" appears.</p>	<p>"E E C H" "UNIT" ↓ "<i>C n t</i>"</p>

<p>Navigation in the menu</p> <p>⇒ With help of , the individual menu items can be selected one after the other.</p> <p>⇒ Confirm selected menu item with . The current setting will be displayed.</p> <p>⇒ Switch into the available settings using .</p> <p>⇒ Or store with  or reject with .</p>	
<p>Parameter selection</p> <p>1. Display internal resolution</p>	<p>"Cnt"</p>
<p>2. Balance capacity.</p> <p>Settings only possible on the bulk material balance.</p> <p>⇒ Press , the currently set position of the decimal dot is displayed.</p> <p>Select the desired setting by  and acknowledge on . The currently set capacity is displayed.</p> <p>For changes delete display using  and enter the desired value via the numeric keyboard. Confirm input with . The currently set readability is displayed, for changes see step 3 "Readability".</p>	<p>"CAP"</p> <p>↓</p> <p>"dESC" "0.00"</p> <p>↓</p> <p>"SEL" "000 100"</p> <p>↓</p> <p>"1 nC" "1"</p>
<p>3. Readability</p> <p>⇒ Press , the currently set readability is displayed.</p> <p>Select the desired setting by  and acknowledge on .</p>	<p>"div"</p> <p>Display at selection reference balance</p> <p>↓</p> <p>"1 nC" "1"</p>

<p>4. Automatic zero point correction (Autozero) by changing the display, digits selectable (0.5d, 1d, 2d, 4d)</p> <p>⇒ Press , the currently set value is displayed.</p> <p>Press  to select the desired setting (0.5d, 1d, 2d, 4d) and acknowledge by pressing .</p>	<p style="text-align: center;">“A2t”</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">“A2n” “1d”</p>
<p>5. Zero setting range Load range where the display after switching-on the balance is set to zero</p> <p>⇒ Press , the currently set zero setting range is displayed.</p> <p>Press  to select the desired setting (0 %, 2 %, 5 %, 10 , 20 %) and acknowledge by pressing .</p>	<p style="text-align: center;">“0 AUTO”</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">“0 AUTO” “10”</p>
<p>6. Zero setting range Load range where the display is set to zero by pressing </p> <p>⇒ Press , the currently set auto-zero range is displayed.</p> <p>Press  to select the desired setting (0 %, 2 %, 5 %, 10 %, 20 %) and acknowledge by pressing .</p>	<p style="text-align: center;">“0 nARnL”</p> <p style="text-align: center;">↓</p> <p style="text-align: center;">“0 nARnL” “2”</p>


<p>7. Password input for menu block „EECH“</p> <p>⇒ Press , “P i n 1” is displayed. Use the numeric keyboard to enter the desired code and acknowledge with .</p> <p>⇒ “P i n 2” is displayed, request to repeat the password input. Enter code anew and press  to acknowledge. At successful input, “donE” is displayed, at wrong input “FRI L”. In this case repeat the code input.</p>	<pre> “P i n 1” ↓ “P i n 1” ↓ “P i n 2” ↓ “donE” </pre>
--	---

14 Second balance interface

When using as counting system, the weighing bridge must be connected with a suitable cable via the second-balance interface.

9 pin d-subminiature bushing of the balance		Connection of weighing bridge KERN KFP
Pin no.:	Balance connection	
Pin 1 or 2	EXC+ (5V)	see labelling of load cell
Pin 4 or 5	EXC- (0)	
Pin 7	SIG-	
Pin 8	SIG+	

15 RS 232C interface

The balance is typically equipped with a RS 232C interface. Weighing data can be edited according to menu setting or automatically or by pressing  via the interface.

This data exchange is asynchronous using ASCII - Code.

The following conditions must be met to provide successful communication between the weighing balance and the printer.

- Use a suitable cable to connect the weighing balance to the interface of the printer. Faultless operation requires an adequate KERN interface cable.
- Communication parameters (baud rate, bits and parity) of balance and printer must match. Detailed description of the interface parameters see chpt. 11.2, Menu block "F2 P r t".

15.1 Technical Data

Connector	9 pin d-sub bushing Pin 2 output Pin 3 input Pin 5 signal earth
Baud rate	600/1200/2400/ 4800 /9600
Parity	8 bits, no parity / 7 bits, even parity / 7 bits, odd parity

bold printed = factory setting

15.2 Remote control instructions

All inputs finish with <CR><LF> (carriage return / line feed).

At wrong inputs the command will be preceded by "ER", e.g. order "NN<CR><LF>", error message "ER NN<CR><LF>".

15.2.1 Control commands

PLU _{xx}	Call-up PLU from data memory
T	Tare placed weighing vessel
T123.456	Numeric tare value
Z	Zeroing
P	Print
M+	Add and print weighing data in the summation memory
MR	Call-up data from memory
MC	Delete memory
U123.456	Save the average piece weight 123.456 [g] or [lb]
S123	Input number of pieces e.g. 123 pieces
SL	Reference balance
SR	Bulk material balance

15.2.2 Printing commands

\L	Selection reference or bulk material balance
\I	User identification number
\S	Balance identification number
\N	Net weight
\G	Gross weight
\U	Average piece weight
\P	Counting
\C	Total number of pieces
\W	Total weight
\M	Number weighing processes
\B	Insert space line

16 Service, maintenance, disposal

16.1 Cleaning

Before cleaning, 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.

Loose residue sample/powder can be removed carefully with a brush or manual vacuum cleaner.

Spilled weighing goods must be removed immediately.

16.2 Service, maintenance

The appliance may only be opened by trained service technicians who are authorized by KERN.

Before opening, disconnect from power supply.

16.3 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.

17 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.

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.
- (Rechargeable) batteries are inserted incorrectly or empty
- No (rechargeable) batteries inserted.


The displayed weight is permanently changing

- Draught/air movement
- Table/floor vibrations
- Weighing plate has contact with other objects.
- Electromagnetic fields / static charging (choose different location/switch off interfering device if possible)

The weighing result is obviously incorrect

- The display of the balance is not at zero
- Adjustment is no longer correct.
- Great fluctuations in temperature.
- Warm-up time was ignored.
- Electromagnetic fields / static charging (choose different location/switch off interfering device if possible)

17.1 Error messages

Error message	Description	Possible causes
"Err 4"	Zeroing range exceeded due to switching-on balance or pressing  (normally 4% max)	<ul style="list-style-type: none"> • Object on the weighing plate • Overload when zeroing • Improper adjustment • Damaged weighing cell • Damaged electronics
"Err 5"	Keyboard error	<ul style="list-style-type: none"> • Improper operation of the balance
"Err 6"	Value outside the A/D changer range	<ul style="list-style-type: none"> • Weighing plate not installed • Damaged weighing cell • Damaged electronics
FRI L H / FRI L L	Adjustment error	<ul style="list-style-type: none"> • Improper adjustment

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