



**KERN & Sohn GmbH**

Ziegelei 1  
D-72336 Balingen  
email: [info@kern-sohn.com](mailto:info@kern-sohn.com)

Phone: +49-[0]7433- 9933-0  
Fax: +49-[0]7433-9933-149  
Internet: [www.kern-sohn.com](http://www.kern-sohn.com)

# Operating and Installation Instructions Display unit

## KERN KFS-T

Version 1.1  
05/2010  
GB



KFS-T-BA\_IA-e1011



# KERN KFS-T

Version 1.1 05/2010

## Operating and Installation instructions Display unit

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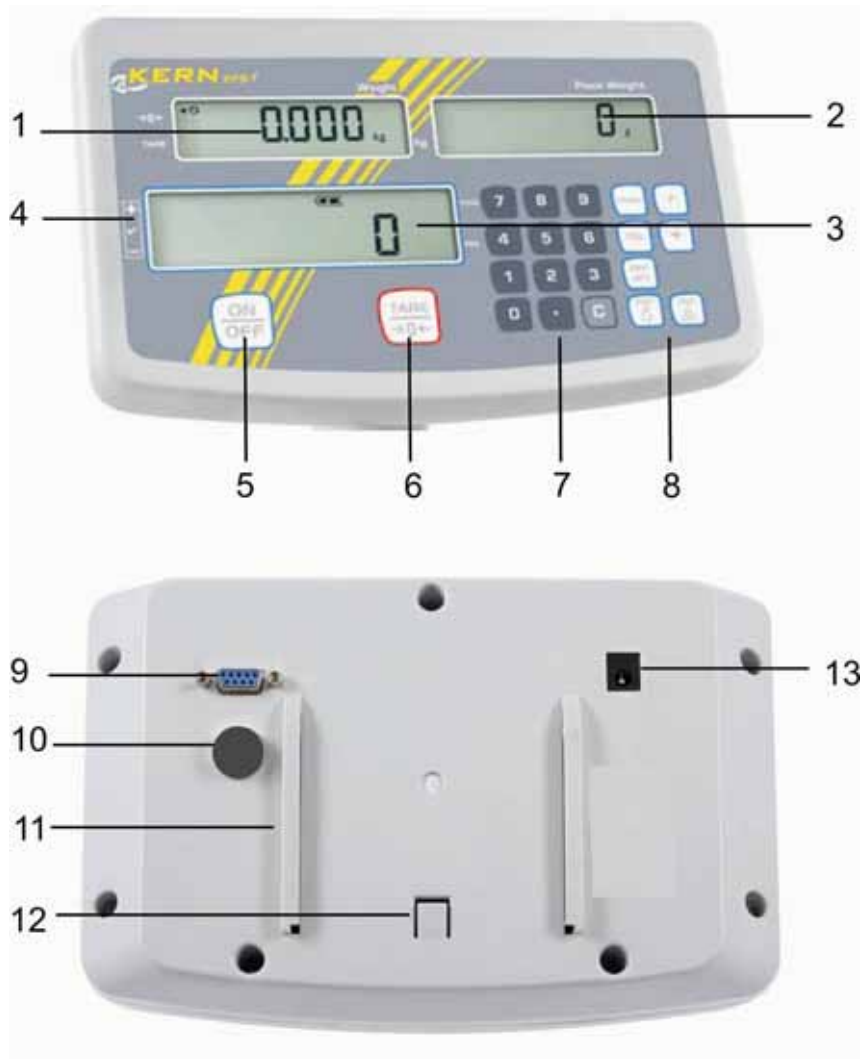
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## 1 Technical Specifications

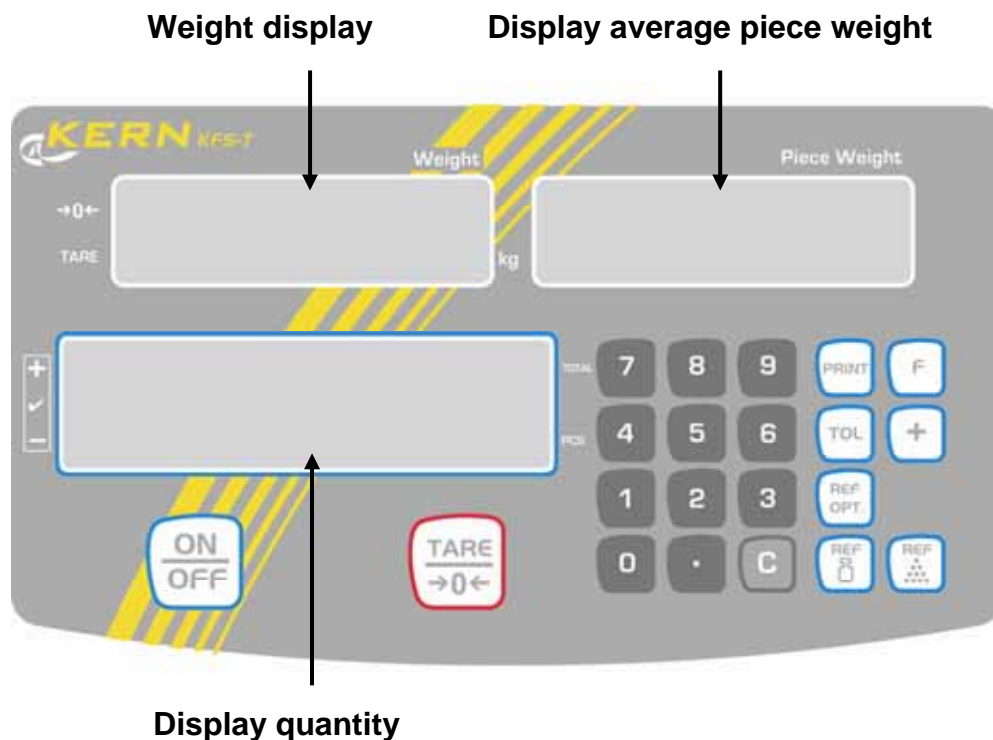
KERN	KFS-T
Display	6-digit
Divisions	1,2,5,...10n
Weighing Units	kg
Display	LCD 16.5 mm digits with back lighting
DMS weighing cells	80-100 $\Omega$ . Max. 4 item per 350 $\Omega$ ; Sensitivity 2-3 mV/V
Range calibration	We recommend $\geq 50$ % max.
Electric Supply	Input voltage 220 V – 240 V, 50 Hz
	Power pack secondary voltage 9V, 800mA
Casing, housing, case, box	260 x 150 x 65
Admissible ambient temperature	0°C – 40°C
Net weight	1.5 kg
Rechargeable battery (optional)	40 h / 12 h
Operating / charge time	
Support base incl. wall bracket	Standard
Data output	RS232

## 2 Appliance overview



1. Display "weight"
2. Display "average item weight"
3. Display "quantity"
4. Tolerance margin, see chpt 7.6
5. ON/OFF key
6. Tare and zero set key
7. Numeric keys
8. Function keys
9. RS-232
10. Input connection load cell cable
11. Guide rail support base / stand
12. End stop support base / stand
13. Mains adapter connection

## 2.1 Overview of displays



- **Weight display**

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

**Indicator [◀] next to symbol displays:**

<b>TARE</b>	Net weight
<b>○</b>	Stability display
<b>→0←</b>	Zeroing display

- **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.


- **Display quantity**

Here the current piece quantity (PCS = pieces) or in totalizing mode the sum Sum of the placed parts is displayed, see chapter 7.8.













**Indicator [◀] next to symbol displays:**

<b>TOTAL</b>	Total number of pieces
<b>+</b>	Target quantity of items above upper tolerance limit
<b>✓</b>	Target quantity of items within tolerance limits
<b>-</b>	Target quantity of items below lower tolerance limit

- **Other displays**

	<ul style="list-style-type: none"> <li>• Power supply via line adapter</li> <li>• Status display battery (optional)</li> </ul>
<b>BUSY</b>	<ul style="list-style-type: none"> <li>• Saving / calculating weighing data</li> </ul>
<b>LIGHT</b>	<ul style="list-style-type: none"> <li>• Piece below minimum weight of piece</li> </ul>

## 2.2 Keyboard overview

Key	Function
	⇒ Turn on/off
	⇒ Taring (>2 % Max) ⇒ Zero setting (< 2 % Max) ⇒ Change menu settings
	<ul style="list-style-type: none"> <li>• For entering of item weight by weighing see chpt 7.7.1</li> </ul>
	<ul style="list-style-type: none"> <li>• For numeric entry of item weight see chpt 7.7.2</li> </ul>
	⇒ Reference optimisation
	⇒ Set / call limits for tolerance control
	⇒ Addition in total memory
	⇒ Calculate weighing data via interface
	⇒ Call function menu ⇒ How to select menu items ⇒ Display total quantity of items
	⇒ Numeric keys
	⇒ Decimal point
	⇒ Delete key

## 2.3 Audio signal

1 x briefly	Confirm by pressing key
1 x longer	Saving was successful
2 x briefly	Invalid entry
3 x briefly	Missing entry
continuous	Tolerance check depending on menu settings „14.bu“, see chap. 8

### 3 Basic Information (General)

#### 3.1 Proper use

The display unit acquired by you is used in combination with a weighing plate and serves to determine the weighing value of material to be weighed. It is intended to be used as a “non-automatic weighing system”, 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 display unit for dynamic weighings. 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 display unit. (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 weighing plate, minus a possibly existing tare load, must be strictly avoided. Both, the weighing plate and the display unit may be damaged during this process.

Never operate display unit in explosive environment. The serial version is not explosion protected.

Changes to the display unit's design are not permitted. This may lead to incorrect weighing results, safety-related faults and destruction of the display unit.

The display unit may only be operated in accordance with the described default settings. 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 use
- 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 display unit 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](http://www.kern-sohn.com)) with regard to the monitoring of display units' test substances and the test weights required for this. In KERN's accredited DKD calibration laboratory test weights and display units 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 and installation

### 6.1 Installation Site, Location of Use

The display units are designed in a way that reliable weighing results are achieved in common conditions of use.

Precise and fast work is achieved by selecting the right place for your display unit and your weighing plate.

#### On the installation site observe the following:

- Place the display unit and the weighing plate on a stable, even surface.
- Avoid extreme heat as well as temperature fluctuation caused by installing next to a radiator or in the direct sunlight;
- Protect the display unit and the weighing plate against direct draft from open windows or doors.
- Avoid jarring during weighing;
- Protect the display unit and the weighing plate against high humidity, vapours and dust.
- Do not expose the display unit 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 Scope of delivery / serial accessories:

- For display unit, see chapter 2
- Mains power supply
- Support base incl. wall bracket
- Protective cover
- Operating instructions

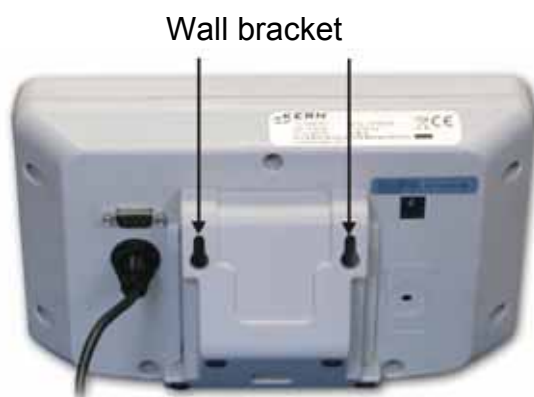
### 6.3 Unpacking/erection

Carefully remove the display unit from packaging, remove plastic cover and place it in the designated work area.

and place it in the designated work area.

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

#### Use with support base incl. wall bracket



Push support base in guide rail [11] up to end stop [12], see chpt 2.

#### Use with tripod (optional)



In order to raise the display, the display unit can be assembled to an optionally available tripod (KERN IFB-A01/A02).

## 6.4 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.

## 6.5 Adjustment

As the acceleration value due to gravity is not the same at every location on earth, each display unit with connected weighing plate 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 weighing system 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 display unit periodically in weighing operation.



- The weight to be used depends on the capacity of the scale. Carry out adjustment as near as possible to the scale's maximum weight. Weights of different nominal values (10-100% max.) or tolerance classes may be used for adjustment but are not optimal for technical measuring. The accuracy of the adjustment weight must correspond approximately to or, if possible, be better than, the readability **d** of the balance. Info about test weights can be found on the Internet at: <http://www.kern-sohn.com>
- Observe stable environmental conditions. Stabilisation requires a certain warm-up time.

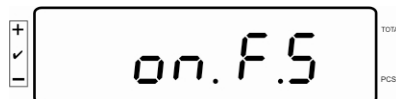
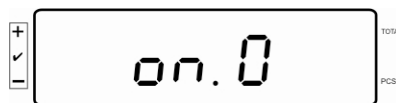
⇒ Unload scales and set to zero.



⇒ In weighing mode press **F** and hold for approx. 5-6 sec until **FUNC** followed by **CAL** appears. Release button.

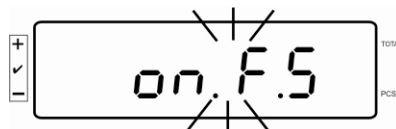


⇒ Keep **TARE** key pressed down and press **F** briefly then release both keys simultaneously. „on. 0“ appears. Ensure that there are no objects on the weighing plate.



⇒ When “on FS” is displayed. carefully place adjusting weight in the centre of the weighing plate.

⇒ Adjusting process starts, “on. F.S” is flashing.




⇒ After successful adjustment the balance automatically returns to weighing mode.



- An adjusting error or incorrect adjusting weight will be indicated by the error message; repeat adjustment procedure.
- You can cancel adjustment by pressing any key with the exception of **C** und **TARE** .


## 7 Operation

### 7.1 Start-up

- ⇒ Press , the instrument will carry out a self-test. As soon as the weight display appears, the instrument will be ready to weigh.




### 7.2 Switching Off

- ⇒ Press , the display will disappear.

### 7.3 Zeroing

Resetting to zero corrects the influence of light soiling on the weighing plate.  
Resetting range  $\pm 2\%$  max.

- ⇒ To unload the weighing system

- ⇒ Press , the zero display as well as the indicator [◀] next to →0← will appear.



### 7.4 Simple weighing

- ⇒ Place goods to be weighed on balance.  
⇒ Wait for stability display [O].  
⇒ Read weighing result.





#### Overload warning


Overloading exceeding the stated maximum load (max) of the device, minus a possibly existing tare load, must be strictly avoided. This could damage the instrument.

Exceeding maximum loads is indicated by the display of "O-err", and an audio sound. Unload weighing system or reduce preload.


## 7.5 Weighing with tare

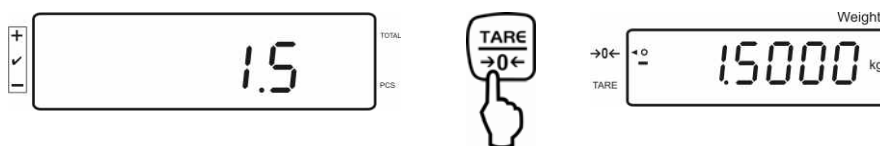
- ⇒ Deposit weighing vessel. After successful stop check press the  button. Zero display and the indicator  next to TARE appear. The weight of the container is now internally saved.




- ⇒ 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.
- ⇒ 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.
- ⇒ To delete the tare value, remove load from weighing plate and press .

## 7.6 PRE-TARE (Numerical input of tare)

- ⇒ Unload and reset to zero the balance.
- ⇒ Enter the established tare weight e.g. 1.5 kg including decimal point by pressing the numeric keys and press .



The entered weight will be stored as tare weight and displayed with negative sign.

- ⇒ 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 .





- The tare value will be rounded off according to the readability of the weighing scales.
- Tare range: Max – 1d

## 7.7 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 message **LIGHT** appearing on the display indicates that load falls below minimum weight value.
- Delete incorrect entries by pressing  .
- The accuracy of an average item weight can be improved at any time during additional counting processes. For this purpose add additional items and press  . After the reference optimization sounds a signal tone. As the additional pieces increase the base for the calculation, the reference also becomes more exact.

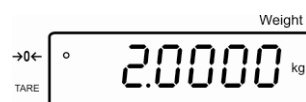
## 7.7.1 Determination of the average piece weight by weighing

### Set reference

- ⇒ Reset balance to zero or tare the empty weighing container if necessary.



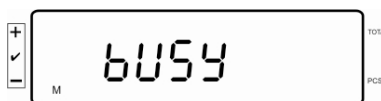
- ⇒ Place on the weighing plate a known number (e.g. 10 items) of individual pieces as a reference.



- ⇒ Wait for the stability display, then enter the number of individual items via the numeric keypad.



- ⇒ Acknowledge with .




The balance determines the average piece weight.

### Count the items

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



- ⇒ When connecting an optional printer, the displayed value can be edited by pressing . The contents of the data output depends on the menu setting 41.dA., see chap. 8 „Menu overview“.

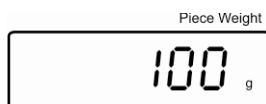
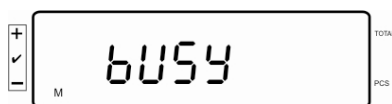
### Delete reference

- ⇒ Press , the average piece weight is deleted.

## 7.7.2 Numeric input of the average piece weight

### Set reference

⇒ Enter established item weight by pressing numeric keys and confirm by pressing



### Count the items

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



⇒ When connecting an optional printer, the displayed value can be edited by pressing . The contents of the data output depends on the menu setting 41.dA., see chap. 8 „Menu overview“.

### Delete reference

⇒ Press , the average piece weight is deleted.

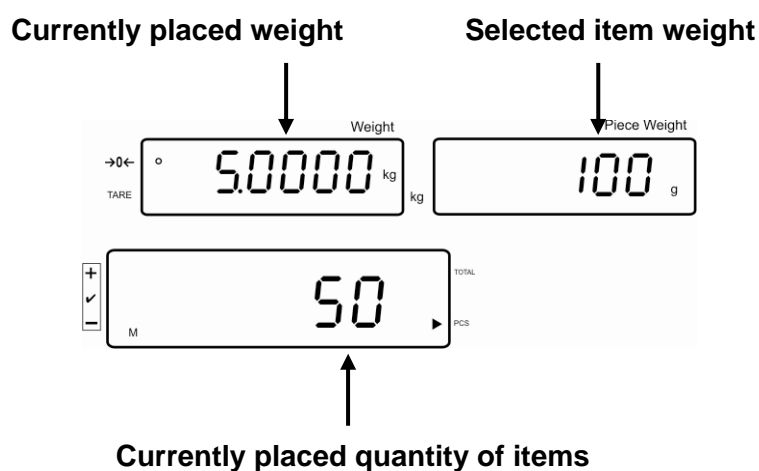
## 7.8 Add up piece quantity



- Menu setting: „4if 4.“, see chpt. 8

### Adding-up during weight display:

- ⇒ Determine the average piece weight (see chpt. 7.7.1) or manually (see chpt. 7.7.2).
- ⇒ Place goods to be weighed A.



Wait for stability display, then press . The display value (e.g. 50 items) is added to the totalising memory and output to the optional printer.

Printout example:

ACC No:	1
COUNT:	50PCS
TOTAL	50 PCS
GS:	5.0000 kg
UNIT.W	100 g

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


⇒ Place goods to be weighed B.




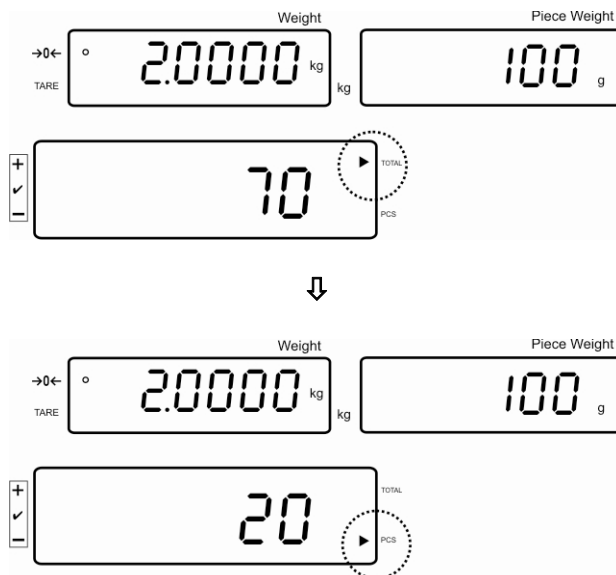
Wait for stability display, then press . The display value (e.g. 20 items) is added to the totalising memory and output to the optional printer.

Printout example:


ACC No:	2
COUNT:	20PCS
TOTAL	70 PCS
GS:	2.0000 kg
UNIT.W	100 g

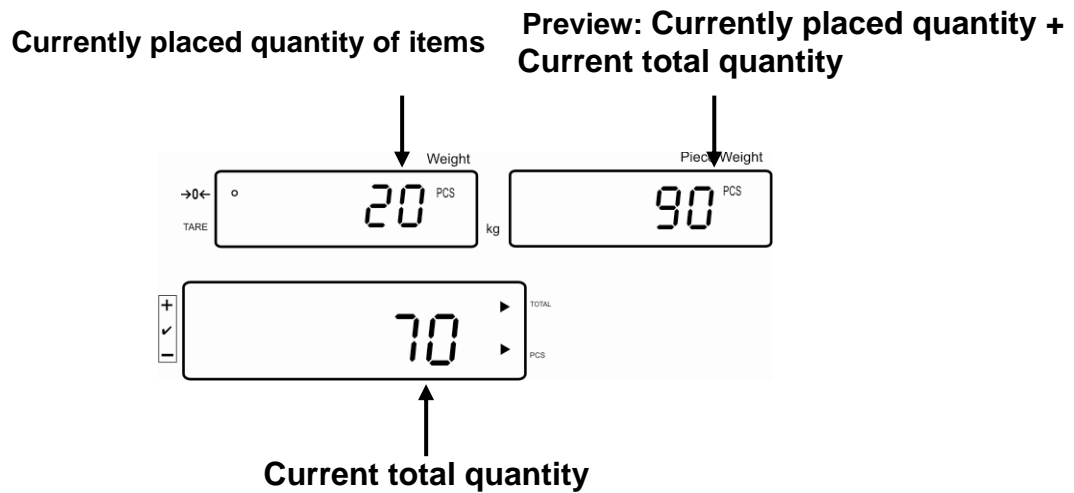
⇒ In the piece counting display the total quantity appears approx. 3 seconds (indicator  next to TOTAL).

After that the display changes to the currently placed quantity (indicator  next to PCS)




### Display total quantity of items:

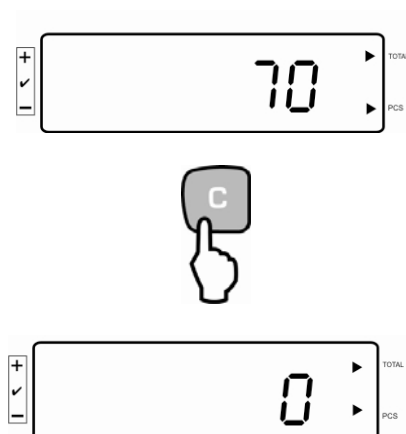
⇒ Press  to change to item display where the total item quantity is continuously displayed.



- ⇒ Add more weighed goods as described before. Please note that the weighing system must be unloaded between the individual weighing procedures.
- ⇒ You can repeat this process until the capacity of the weighing system is exhausted.

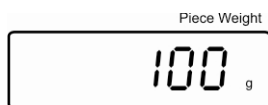
### Delete total quantity:

⇒ In the display press total quantity .

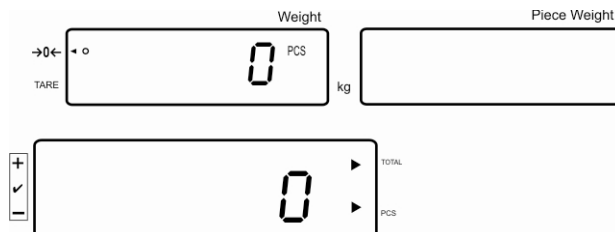


### Adding-up during item display:

- ⇒ Determine the average piece weight (see chpt. 7.7.1) or manually (see chpt. 7.7.2).



- ⇒ Press **F** and the display changes to item display.



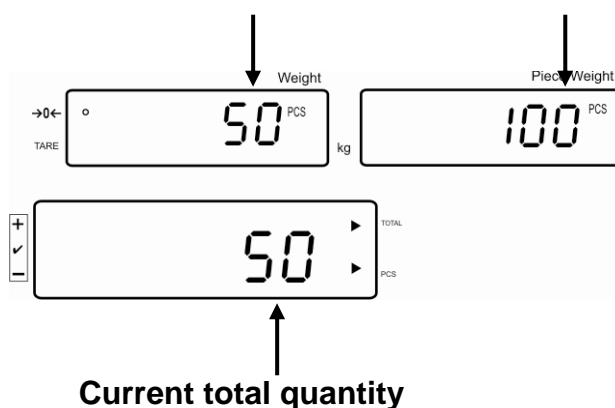
- ⇒ Place goods to be weighed A.

Wait for stability display, then press **+**. The display value (e.g. 50 items) is added to the totalising memory and output to the optional printer.

Printout example:

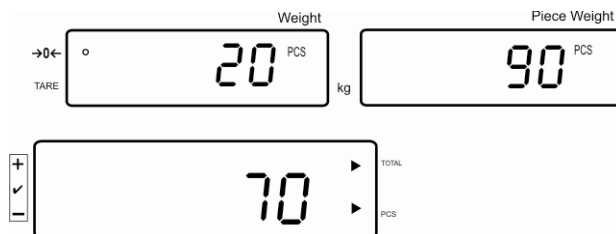
ACC No:	1
COUNT:	50PCS
TOTAL	50 PCS
GS:	5.0000 kg
UNIT.W	100 g

**Currently placed quantity of items**      **Preview: Currently placed quantity + Current total quantity**



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

⇒ Place goods to be weighed B.



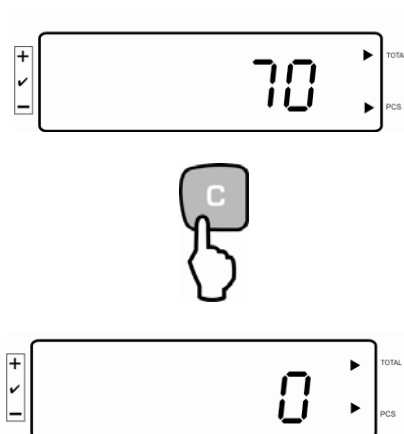
Wait for stability display, then press . The display value (e.g. 20 items) is added to the totalising memory and output to the optional printer.

Printout example:

ACC No:	2
COUNT:	20PCS
TOTAL	70 PCS
GS:	2.0000 kg
UNIT.W	100 g

- ⇒ Add more weighed goods as described before.  
Please note that the weighing system must be unloaded between the individual weighing procedures.
- ⇒ You can repeat this process until the capacity of the weighing system is exhausted.

**Delete total quantity:**



## 7.9 Tolerance control for target quantity

The weighing scales allow weighing of items within set limits in keeping with the target quantity. With this function one can also check if the weighing good is within a defined tolerance range. Reaching target quantity is indicated by an audio sound (if enabled in menu) and a visual signal (Tolerance margin ◀) displayed.

**For menu settings, see chapter 8:**

Target quantity with Tolerance	2 limits	For menu setting "13.Pn 2" see chpt 8
Exact target quantity without tolerance	1 limit	For menu setting "13.Pn 1" see chpt 8

### Audio signal:


The audio sound depends on the settings made in menu block "14bu", see chpt 8.


Options:


- 0 Acoustic signal turned off
- 1 Audio sound when load is within tolerance limits.
- 2 Audio sound when load is outside tolerance limits.

### Optical signal:

The triangular tolerance marker [◀] in the display of the display shows whether the goods to be weighed are within the two tolerance limits.

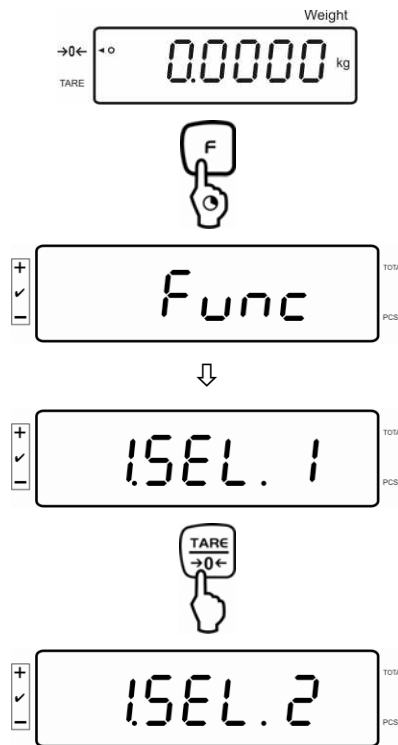

 ◀ Target quantity of items above upper tolerance limit


 ◀ Target quantity of items within tolerance limits


 ◀ Target quantity of items below lower tolerance limit

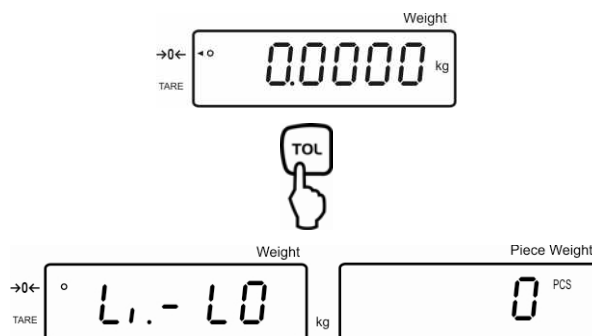
## Activate function

⇒ For menu setting “1 sel 2” see chpt 8

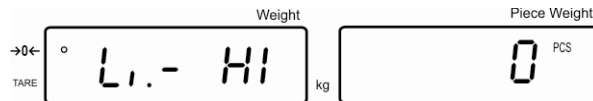
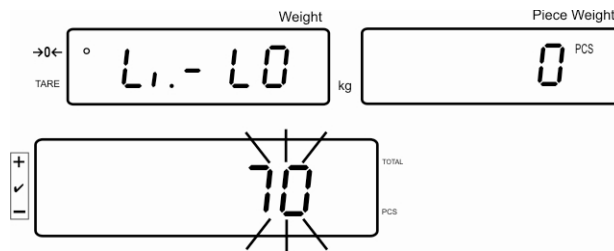


## Set limit values


⇒ Press **TOL** and the lower limit **Li-LO** showing current settings will be displayed.

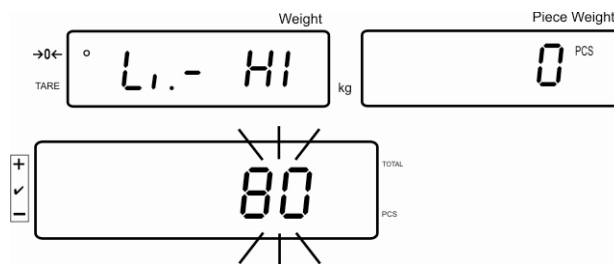


⇒ Press the numeric keys to enter item quantity for the lower limit value (e.g. 70 PCS) and confirm by pressing **TOL**.



The upper limit **Li-HI** showing current settings will be displayed.

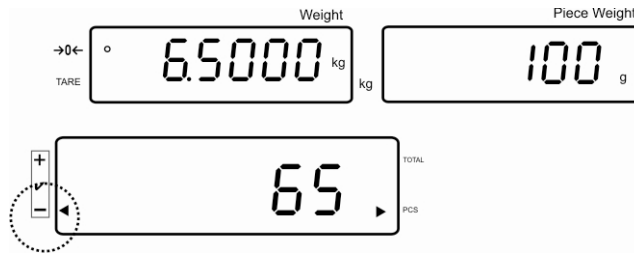
- ⇒ Press the numeric keys to enter item quantity for the upper limit value (e.g. 80 PCS) and confirm by pressing .



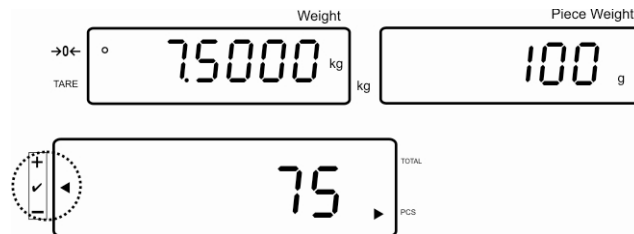
## Start tolerance control

- ⇒ For setting of item weight see chpt 7.7.1 or 7.7.2
- ⇒ Place load and wait until tolerance margin [◀] appears. With the help of the tolerance margin check if the weighed goods are under, inside or over the default tolerance  
Depending on the settings in them menu also the acoustic signal sounds.

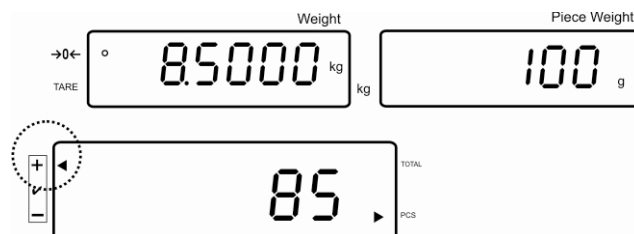
### Target quantity below tolerance limit:




### Target quantity within tolerance limit:

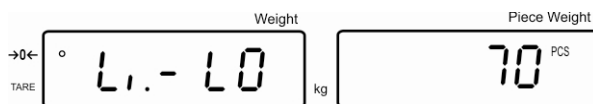


### Target quantity above tolerance limit:

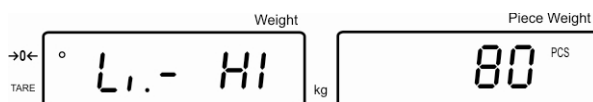


## Display limits

⇒ Press  and the lower limit **Li-LO** showing current settings will be displayed.



⇒ Again press  and the upper limit **Li-HI** showing current settings will appear.


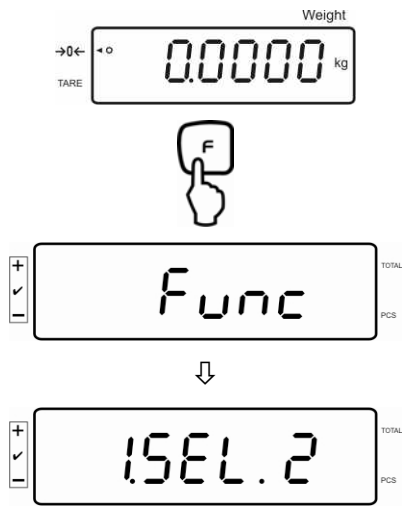

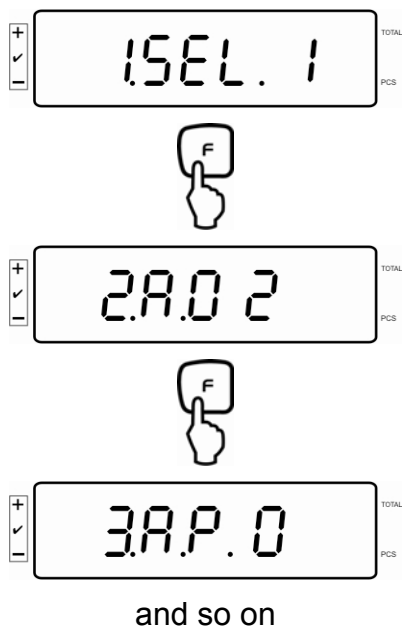






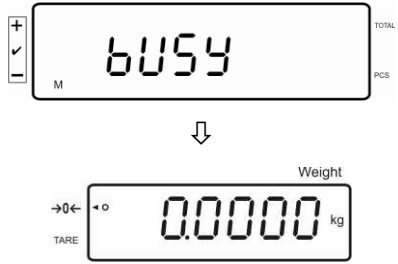
⇒ Instrument will return to weighing mode after  was pressed.







## 8 Function menu

### Navigation in the menu:

<p><b>Call up menu</b></p>	<ul style="list-style-type: none"> <li>Press and hold  in weighing mode until <b>FUNC</b> appears. Release button. First menu item 1.SEL with current setting will be displayed.</li> </ul> 
<p><b>How to select menu items</b></p>	<ul style="list-style-type: none"> <li>With help of , the individual menu items can be selected one after the other.</li> </ul>  <p style="text-align: center;">and so on</p>

<p><b>Change settings</b></p>	<ul style="list-style-type: none"> <li>Change setting in selected menu item by pressing .</li> </ul> 
<p><b>Confirm setting</b></p>	<ul style="list-style-type: none"> <li>Once the desired setting has appeared on the display you can select the next menu item by .</li> </ul>
<p><b>Return to weighing mode</b></p>	<ul style="list-style-type: none"> <li>Return to weighing mode by pressing any key apart from . Display will show “busy“ and afterwards return automatically to weighing mode.</li> </ul> 

## Overview:

Menu item		Available settings	
1.SEL.		1	Tolerance control re target quantity disabled
		2	Tolerance control re target quantity enabled
Menu setting "1.SEL2" only.	11.Co. Display conditions of the tolerance marker	1	Tolerance marker is always displayed, even if standstill control is not yet displayed.
	12.Li. Tolerance range	2	Tolerance marker is only displayed in connection with standstill control.
		0	Tolerance marker is only displayed above zero range.
	13.Pn. Number of limiting points	1	Tolerance marker is displayed for the whole range.
		2	1- Limiting point (OK/ -)
	14.bu. Audio signal	2	2- Limiting points (+/OK/-)
		0	Audio sound during tolerance control disabled
		1	Audio sound when load is within tolerance limits
2 A.O Automatic zero point correction (zero tracking)	2	Audio sound when load is beyond tolerance limits	
	0	Automatic zero tracking off	
	1	Automatic limiting point correction on, 0.5 d	
	2	Automatic limiting point correction on, 1 d	
	3	Automatic limiting point correction on, 2 d	
3. A.P. Automatic shutdown for battery operation	4	Automatic limiting point correction on, 4 d	
	0	AUTO OFF function disabled	
4. If. RS232	1	Instrument will be switched off after 3 minutes of inactivity of display unit or weighing bridge.	
	0	disabled	
	1	6-digit data format	
	2	7-digit data format	
	3	Auto print / ACC on Press  , the quantity is added into the summation memory and edited when a printer is connected. No output after pressing 	
4	Manual print / ACC off Press  , the quantity is added into the summation memory and edited when a printer is connected. Output of the displayed values after pressing 		
5	Not documented		

For menu setting "4. If.1 ~ 4" only	41. dA. Content of data output	1	Quantity COUNT: 10PCS TOTAL: 0PCS GS: 0.9998kg UNIT.W 100g  + 10PC S
	2	Weight COUNT: 10PCS TOTAL: 0PCS GS: 0.9998kg UNIT.W 100g  + 0.9998KG S	
	3	Item weight (U) COUNT: 10PCS TOTAL: 0PCS GS: 0.9996kg UNIT.W 100g  + 100 GUS	
	4	Total quantity (T) COUNT: 10PCS TOTAL: 0PCS GS: 0.9998kg UNIT.W 100g  + 0PCTS	
	5	Quantity (PCS), Weight (KG=kilogram, S=stable), item weight (U=unit weight, G= gram, S=stable)  COUNT: 10PCS TOTAL: 0PCS GS: 0.9998kg UNIT.W 100g  + 10PC S + 0.9998KG S + 100 GUS + 10PC S	
	6	Quantity (PCS), Weight (KG=kilogram, S=stable), Total quantity (T)  COUNT: 10PCS TOTAL: 0PCS GS: 0.9998kg UNIT.W 100g  + 10PC S + 0.9998KG S + 0PCTS	
	7	Print format ACC NO: COUNTS: TOTAL: GS:	
Printout examples KERN YKB-01N with menu setting 4. If 4 and 42.o.c.7			

42.o.c. Output condition at interface	0	No data output	
	1	Continuous data output	
	2	Continuous data output stable weighing values	
	3	Issue takes place after pressing the PRINT key.	
	4	Output for stable weighing value after previous relief of balance	
	5	One output for stable weighing value. No output for stable weighing values. Renewed output after stabilization	
	6	One output for stable weighing value. Continuous output for instable weighing values.	
	7	Output of stable weighing value after pressing the PRINT-key	
	43. b.l. baud rate	1	1200 bps
		2	2400 bps
		3	4800 bps
		4	9600 bps
	44. PA. Parity	0	No parity bit
1		Odd parity	
2		Even parity	
5. bkl. Display background illumination	1	Background illumination off	
	2	Automatic background illumination on when weighing pate is loaded or key pressed.	
	3	Continuous background lighting	

## 9 RS 232C interface

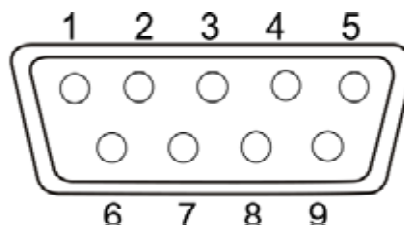
The RS 232C interface allows a bi-directional data exchange from the balance to external devices. This data exchange is asynchronous using ASCII - Code.

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

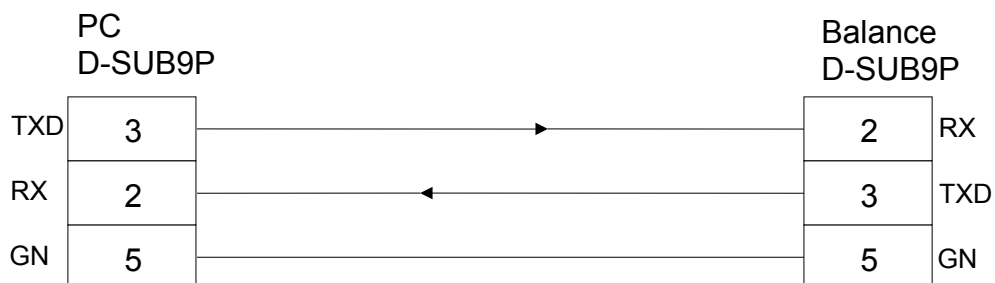
- Use a suitable cable to connect the display unit to the interface of the printer. Faultless operation requires an adequate KERN interface cable.
- Communication parameters (baud rate, bits and parity) of display unit and printer must match.  
Interface parameter „4.lf – 44. PA.“ see chpt. 8.

### Pin allocation of balance output plug:

Pin no.	Signal	Input/Output	Function
2	RXD	Input	Receive data
3	TXD	Output	Transmit data
4	DTR	Output	HIGH
5	GND	-	Signal ground
6	-	-	
7	-	-	
8	-	-	
9	GND	-	Signal ground



### Interface cable:



## Technical Specifications

1. Transmission system	Serial/start-stop synchronous	
2. Baud rate	1200/2400/4800/9600 bps	
3. Transmission code	ASCII codes (6/7 bits)	
4. Bit setting	Start bit	1 bit
	Data bits	6/7 bits
	Parity bit	0/1 bit
	Stop bits	2 bits
5. Parity	None/Odd/Even	

### 9.1 Data output

#### 9.1.1 Format for data transmission

You may customise the format of data transmission according to your requirements (6- or 7-digit data format), see chpt. 8, menu item „4. if.“

- Menu setting „4. if. 2“, (factory setting):

7-digit data format, consisting of 15 characters, including terminator;  
 CR=0DH, LF=0AH (CR=weighing balance reverse / LF=vertical spacing).  
 A parity bit may be attached.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
P1	D1	D2	D3	D4	D5	D6	D7	D8	U1	U2	S1	S2	CR	LF

- Menu setting „4. if. 1“:

6-digit data format, consisting of 14 characters, including terminator;  
 CR=0DH, LF=0AH (CR=weighing balance reverse / LF=vertical spacing).  
 A parity bit cannot be attached.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
P1	D1	D2	D3	D4	D5	D6	D7	U1	U2	S1	S2	CR	LF

### 9.1.2 Signs

P 1 = 1 character

P1	Code	Significance
+	2BH	Data is 0 or positive
-	2DH	Data is negative
△ (space)	20H	Data is 0 or positive

### 9.1.3 Numeric data

D1 to D7: 7 characters with 6-digit format

D1 to D8: 8 characters with 7-digit format

D*	Code	Significance
0 - 9	30H – 39H	Data 0 to 9 (Max. 6 characters with 6-digit format) (Max. 7 characters with 7-digit format)
●	2 EH	Decimal point, position not fixed
△	20H	Space character, leading zero suppressed

### 9.1.4 Units

U 1, U 2 = 2 characters (ASCII code)

U1	U2	Significance	Display
K	G	Kilogram	Kg
M	G	Milligram	mg
△	G	Gram	g
P	C	Parts counting	Pcs

### 9.1.5 Output weighing data

S 1 = 1 character

S1	Code	Significance	
L	4CH	Target quantity below tolerance limit	Tolerance control for target quantity
G	47H	Target quantity within tolerance limit	
H	48H	Target quantity above tolerance limit	
U	55H	Piece weight	File Type
T	54H	Total number of pieces	
p	70H	Lower tolerance limit	
q	71H	Upper tolerance limit	
△	20H	No rating	

### 9.1.6 Data status

S 2 = 1 character

S2	Code	Significance
S	53 H	Stable weighing value
U	55 H	Instable weighing value
E	45 H	Data error, all data excepted S2 not allowed. Balance indicating error (o-Err, u-Err)
△	20 H	No special status

### 9.1.7 External tare command

C1	C2	ASCII code		Description	Value	Feedback
T	△	54H	20H	Taring Zero setting	None	A00: Execution successful E01: Fault

### 9.1.8 Remote control instructions

C1	C2	Code		Significance	Feedback
O	0	4FH	30H	No data output	A00: Free from error
O	1	4FH	31H	Continuous data output	
O	2	4FH	32H	Continuous data output stable weighing values	
O	3	4FH	33H	Output for stable and instable weighing values after pressing PRINT key	
O	4	4FH	34H	Output for stable weighing value after previous relief of balance	
O	5	4FH	35H	One output for stable weighing value. No output for stable weighing values. Renewed output after stabilization	
O	6	4FH	36H	One output for stable weighing value. Continuous output for instable weighing values.	
O	7	4FH	37H	An output at stable weighing value, after pressing the PRINT-key	
O	8	4FH	38H	Single immediate output	
O	9	4FH	39H	Single output after stabilization	

## **10 Service, maintenance, disposal**

### **10.1 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.**

### **10.2 Service, maintenance**

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

Before opening, disconnect from power supply.

### **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.

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

## 11 Error messages, troubleshooting guide

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

<b>Fault</b>	<b>Possible cause</b>
The displayed weight does not glow.	<ul style="list-style-type: none"><li>• The display unit is not switched on.</li><li>• Mains power supply interrupted (mains cable defective).</li><li>• Power supply interrupted.</li><li>• (Rechargeable) batteries are inserted incorrectly or empty</li><li>• No (rechargeable) batteries inserted.</li></ul>
The displayed weight is permanently changing	<ul style="list-style-type: none"><li>• Draught/air movement</li><li>• Table/floor vibrations</li><li>• Weighing plate has contact with other objects.</li><li>• Electromagnetic fields / static charging (choose different location/switch off interfering device if possible)</li></ul>
The weighing result is obviously incorrect	<ul style="list-style-type: none"><li>• The display of the balance is not at zero</li><li>• Adjustment is no longer correct.</li><li>• The balance platform is on an uneven surface.</li><li>• Great fluctuations in temperature.</li><li>• Warm-up time was ignored.</li><li>• Electromagnetic fields / static charging (choose different location/switch off interfering device if possible)</li></ul>

<b>Error message</b>	<b>Possible cause</b>
<b><i>o-Err</i></b>	<ul style="list-style-type: none"><li>• Weighing range exceeded</li></ul>
<b><i>u-Err</i></b>	<ul style="list-style-type: none"><li>• Insufficient preload, e. g. missing weighing pan</li></ul>
<b><i>b-Err</i></b>	<ul style="list-style-type: none"><li>• Missing internal memory</li></ul>
<b><i>1-Err</i></b>	<ul style="list-style-type: none"><li>• Incorrect adjusting weight</li></ul>
<b><i>2-Err</i></b>	<ul style="list-style-type: none"><li>• Inappropriate adjustment</li></ul>
<b><i>I-Err</i></b>	<ul style="list-style-type: none"><li>• Item weight too low</li></ul>

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

## 12 Installing display unit / weighing bridge

**i** Installation / configuration of the weighing system must be carried out by a well acquainted specialist with the workings of weighing balances.

### 12.1 Technical Specifications

Power supply	5 V/150mA
Sensitivity	2-3 mV/V
Resistance parameter	80 - 100 $\Omega$ , max 4 items per 350 $\Omega$ load cell

### 12.2 Weighing system design

The display unit is suitable for connection to any analogue platform in compliance with the required specifications.

The following data must be established before selecting a weighing cell:

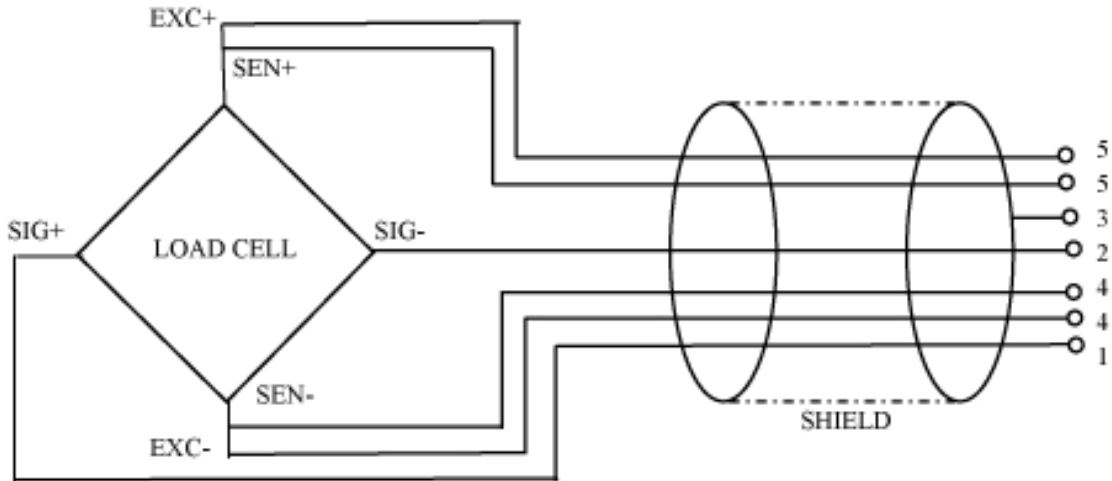
- **Weighing balance capacity**  
This usually corresponds to the heaviest load to be weighed.
- **Preload**  
This corresponds to the total weight of all parts that are to be placed on the weighing cell such as upper part of platform, weighing pan etc.
- **Total zero setting range**  
This is composed of the start-up zero setting range ( $\pm 2\%$ ) and the zero setting range available to the user via the ZERO-key (2%). The total zero setting range equals therefore 4 % of the scale's capacity.

The addition of weighing scales capacity, preload and the total zero setting range give the required capacity for the weighing cell.  
To avoid overloading of the weighing cell, include an additional safety margin.

- **Smallest desired display division**

### 12.3 How to connect the platform

- ⇒ Disconnect the display unit from the power supply.
- ⇒ Weld the individual wires of the load cell cable to the printed circuit board.
- ⇒ Please see diagram below for plug allocation.








## 12.4 How to configure the display unit

### Menu overview

<b>cap</b>	Capacity (max)
<b>res</b>	Resolution 1/2/5/10/20/50 (Available settings depend on the selected capacity)
<b>grv</b>	Not documented


#### Call technology menu

⇒ Turn off appliance

⇒ Keep pressed  and , switch-on by ; continue to keep pressed  und  until „M“ is displayed. The display changes to the weight display.

⇒ Keep  pressed until **FUNC** appears. The display changes to **1 FUNC**.

⇒ Press 

⇒ Press  and first menu item **CAP** will be displayed.

M 0.107d



0.0000 kg

FUNC





1 FUNC

2 TYPE


CAP


## Enter configuration data


Example of entry dual range scales: Capacity 6 kg/15 kg, resolution 0.2 g/0.5 g

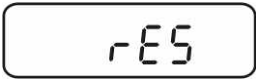
- ⇒ Press , the currently set capacity is displayed.
- ⇒ Select desired capacity (for instance max 15 kg) by .  
Note: The value for the first range (6 kg) will be computed by the instrument.




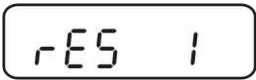
- ⇒ Confirm input by .




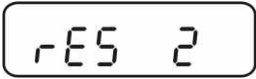
- ⇒ Using  go to next menu item to call RES.



- ⇒ Press  and current setting will be displayed.




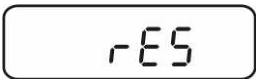
- ⇒ Select desired resolution by pressing .




**RES 1**  
Low resolution

**RES 2**  
high  
resolution

- ⇒ Confirm input by .



- ⇒ Return to weighing mode by pressing any key apart from .






## 5-point linearization

(standard setting at 0%, 25%, 50%, 75% and 100% max)





- 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 "testing instruments control"

⇒ Turn off appliance

⇒ Keep pressed  and , switch-on using ; continue to keep pressed  and  until „M“ is displayed. The display changes to the weight display.

⇒ Press and hold  until **FUNC** followed by **CAL2** appears.

⇒ Keep  but ton pressed down and press briefly , then release both keys simultaneously. „on. 0“ appears. Zero point will be saved.

⇒ When “on 1” is displayed, carefully place first adjustment weight in the centre of the weighing plate.

⇒ When message **PUSH F** appears, push 

⇒ When “on 2 is displayed, carefully place second adjustment weight in the centre of the weighing plate.

⇒ When message **PUSH F** appears, push 

⇒ When “on 3 is displayed, carefully place third weight in the centre of the weighing platform.

M 0.107d



0.0000 kg

FUnc



CAL2

on. 0







on. 1

PUSH F

on. 2

PUSH F

on. 3

<p>⇒ When message <b>PUSH F</b> appears, push </p>	
<p>⇒ When "on 4 is displayed, carefully place fourth weight in the centre of the weighing platform.</p>	
<p>⇒ When message <b>PUSH F</b> appears, push </p>	
<p>⇒ After successful adjustment the balance automatically returns to weighing mode.</p>	 <p style="text-align: center;">↓</p> 