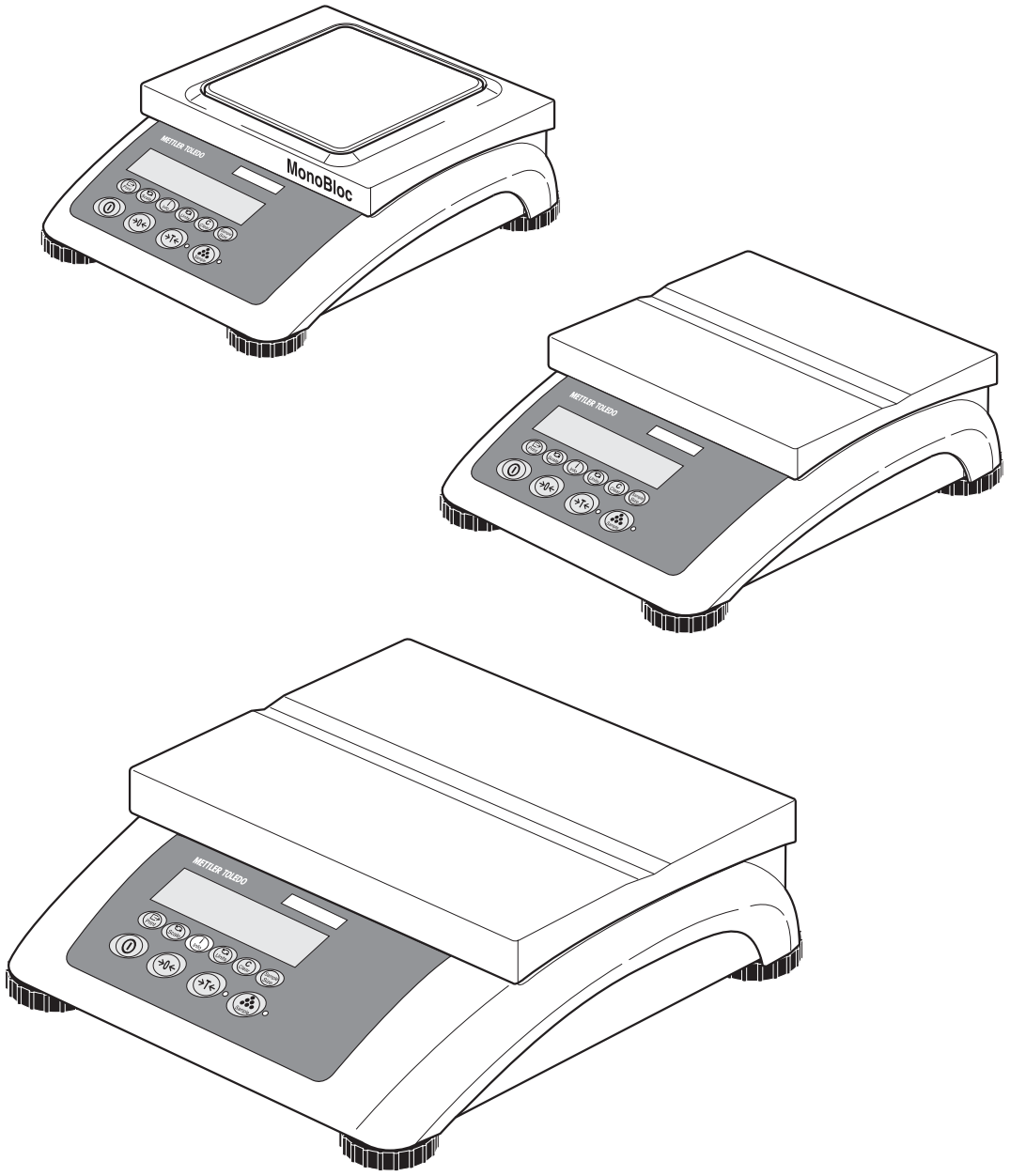
User manual

METTLER TOLEDO

METTLER TOLEDO
Compact scales BBA432 / BBK432



www.mt.com/support

ServiceXXL
Tailored Services

Congratulations on choosing the quality and precision of METTLER TOLEDO. Proper use according to this Operating Manual and regular calibration and maintenance by our factory-trained service team ensures dependable and accurate operation, protecting your investment. Contact us about a ServiceXXL agreement tailored to your needs and budget.

We invite you to register your product at www.mt.com/productregistration so we can contact you about enhancements, updates and important notifications concerning your product.

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1 Introduction

1.1 Safety instructions

CAUTION!

Do not use BBA432 / BBK432 in hazardous areas!

Our product range includes special devices for hazardous areas.

DANGER!

Electric shock hazard!

▲ Always pull out the mains plug before any work on the device.

DANGER!

Electric shock hazard if the mains cable is damaged!

▲ Check the mains cable for damage regularly and replace it immediately if it is damaged.

▲ On the rear side of the device, maintain a clearance of at least 1.2" (3 cm) in order to prevent the mains cable bending too much.

CAUTION!

On no account open the device!

The warranty is void if this stipulation is ignored. The device may only be opened by authorized persons.

▲ Call METTLER TOLEDO Service.

CAUTION!

Handle the compact scale with care.

The scale is a precision instrument.

▲ When the weighing pan has been removed, never clean the area under the load plate holder with a solid object!

▲ Do not put excessive loads on the scale.

▲ Avoid banging the weighing pan.

Note **Use with foodstuffs**

Parts coming into contact with foodstuffs have smooth surfaces and are easy to clean. The materials used do not splinter and are free of harmful substances.

With foodstuffs, it is recommended to use the protective cover, see section 7.2 Accessories.

➜ Clean the protective cover regularly and carefully.

➜ Replace damaged or very dirty protective cover immediately.

1.2 Description

This user manual applies to the following types of compact scales:

- Compact scale BBA432... with strain gauge weighing cell
- Compact scale BBK432... with MonoBloc

The compact scales are available in a small and large size in various capacities and resolutions.

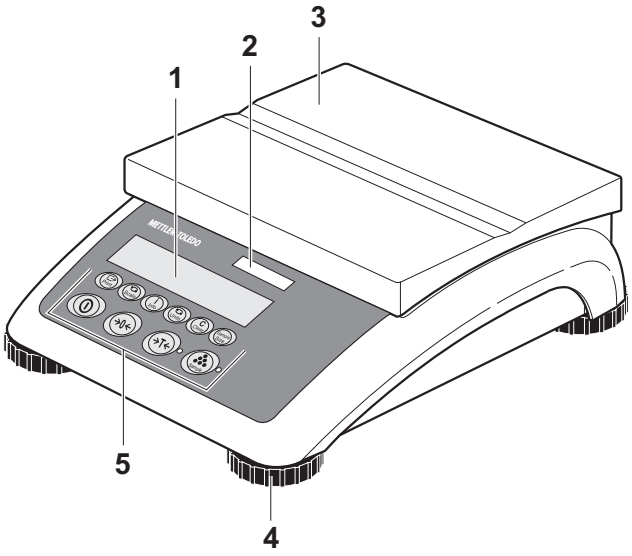
The power supply is carried out via a built-in power supply device, an internal rechargeable battery with an external mains adapter or an external battery.

One of the following options can also be ordered:

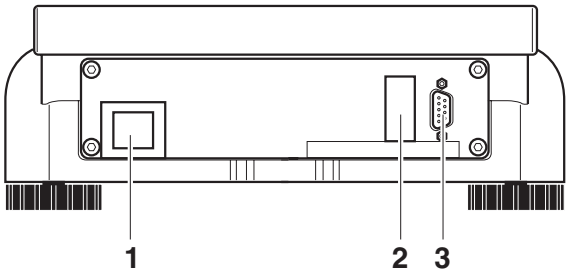
- Additional interface RS232 or RS485
- Ethernet interface
- USB interface
- Digital I/O
- Analog second scale interface

1.2.1 Overview

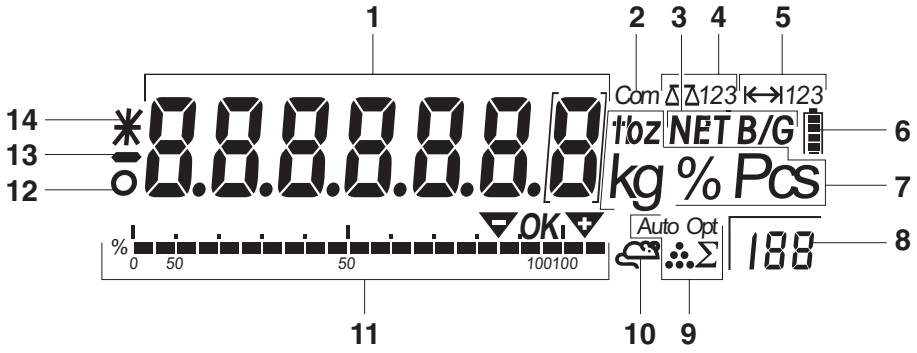
1 Display
2 Scale specifications
3 Load plate
4 Adjustable feet
5 Keys



1 Power supply connection
2 Optional interface
3 (Standard) RS interface



1.2.2 Display



1 7-segment display, 7 digits, with decimal point

2 Active interface

3 Symbol for displaying gross and net values

4 Active scale

5 Weighing range display

6 Battery charge level; only present on scales with a battery

7 Weight units

8 Selected reference quantity

9 Symbols for optimizing the average piece weight

10 Symbol for dynamic weighing

11 Graphic display of the weighing range

12 Stability monitor (goes out when a stable weight value is reached)

13 Sign

14 Identification for changed or calculated weight values, e.g. higher resolution, minimum weight not reached

1.2.3 Keypad

Main functions

Key	Function in operating mode	Function in the menu
	Switching device on / off, abort	To the last menu item –End–
	Setting scale to zero	Scrolling back
	Taring scale The LED next to the key flashes when the key must be pressed, if the operator guidance is activated in the menu.	Scrolling forward
	Determining average piece weight and displaying the number of pieces The LED next to the key flashes when the key must be pressed, if the operator guidance is activated in the menu.	No function
	Transfer key Long key press: Calling up menu	Activating menu item Accepting selected setting

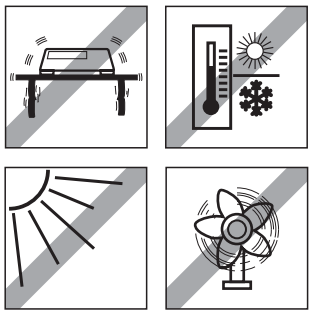
Additional functions

Key	Function
	Switching the scale
	Info key: Calling up additional information, e.g. gross weight, average piece weight, higher resolution …
	Switching weight unit
	Clear key
	Selecting reference quantity

1.3 Putting into operation

1.3.1 Selecting or changing the location

The correct location is crucial to the accuracy of the weighing results!

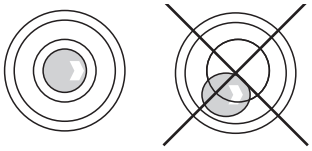


➜ Select a stable, vibration-free and if possible a horizontal location.

The ground must be able to safely bear the weight of the fully loaded scale.

Observe the following environmental conditions:

- No direct sunlight
- No strong drafts
- No excessive temperature fluctuations



Aligning the scale

Only scales that have been aligned precisely horizontally provide accurate weighing results.

➜ Turn the adjustable feet of the scale until the spirit level's air bubble is inside the inner circle.

Major geographical location changes

The manufacturer adjusts each scale to the local gravity conditions (GEO value). In the event of major geographical location changes, this setting must be adjusted by a service technician. Certified scales must also be recertified observing the national certification regulations. These steps are not necessary for scales with an internal calibration weight.

1.3.2 Connecting the power supply

CAUTION!

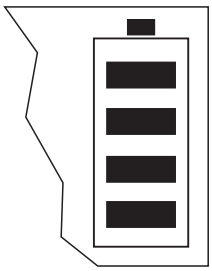
Before connecting the scale to the mains, check whether the voltage value printed on the rating plate corresponds with the local mains voltage.

▲ Never connect the device if the voltage value printed on the rating plate is different to the local mains voltage.

➜ Plug the mains plug into the socket.

After connection, the device performs a self-test. When the zero display appears, the device is ready to weigh.

➜ Calibrate the device in order to obtain the greatest possible precision, see Section 4.3.2.



Scales with a built-in battery can work independently from the mains for approximately 30 hours in normal operation. A prerequisite for this is that the background lighting is switched off and that no peripheral devices are connected.

The device automatically switches to battery operation as soon as the mains supply is interrupted. When the mains supply is restored, the device automatically switches back to mains operation.

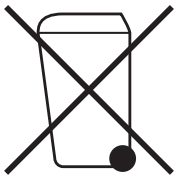
The battery symbol indicates the present charging level of the battery. 1 segment corresponds to approx. 25 % capacity. When the symbol flashes the battery must be charged (min. 4 hours). The charging period is extended if work is continued during charging. The battery is protected against overcharging.

The charging time of the storage battery amounts to approx. 6 hours. If the device continues to be operated during the charging process, the charging time is extended. The storage battery has a service life of approx. 1,000 charging/discharging cycles.

Note The storage battery is also suitable for permanent mains operation.

➜ In order to obtain the full nominal capacity we recommend that you discharge the storage battery at regular intervals (approx. every 4 weeks) through normal operation.

1.4 Disposal



In conformance with the European Directive 2002/96 EC on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of with domestic waste. This also applies to countries outside the EU, per their specific requirements.

➜ Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment.

If you have any questions, please contact the responsible authority or the distributor from which you purchased this device.

Should this device be passed on to other parties (for private or professional use), the content of this regulation must also be related.

Thank you for your contribution to environmental protection.

If the device is equipped with a storage battery:

The nickel metal hydride (NiMH) storage battery does not contain any heavy metals. However, it may not be disposed of with the normal refuse.

➜ Observe the local regulations on the disposal of materials that are hazardous to the environment.

2 Operation

2.1 Switching on and off

Switching on

➜ Press ⏻.

The scale conducts a display test. When the weight display appears, the scale is ready to weigh.

Switching off

➜ Press ⏻.

Before the display goes out, `-OFF-` appears briefly.

2.2 Zeroing / Zero point correction

Zeroing corrects the influence of slight changes on the load plate.

Manual

1. Unload scale.
2. Press →0←.

   The zero display appears.

Automatic

In the case of scales that cannot be certified, the automatic zero point correction can be deactivated in the menu or the amount can be changed.

As standard, the zero point of the scale is automatically corrected when the scale is unloaded.

2.3 Simple weighing

1. Place weighing sample on scale.
2. Wait until the stability monitor ○ goes out.
3. Read weighing result.

2.4 Weighing with tare

2.4.1 Taring

➜ Place the empty container on the scale and press →T←.

The zero display and the symbol **NET** appear.

The tare weight remains saved until it is cleared.

2.4.2 Clearing the tare

➜ Press C Clear.

The symbol **NET** goes out, and the scale goes to gross mode.

If `A.CL-tr` is activated in the menu, the tare weight is automatically cleared as soon as the scale is unloaded.

2.4.3 Automatic taring

Prerequisite

`A-tArE` is activated in the menu under `SCALE` –> `tArE`, the symbol **T** flashes in the display.

The packaging material must be heavier than 9 display steps of the scale.

➜ Place the container or packaging material on the scale.

The packaging weight is automatically saved as the tare weight, the zero display and the symbol **NET** appear.

2.4.4 Chain tare

Prerequisite

The tare function `CHAIn.tr` is activated in the menu.

With this function it is possible to tare several times if, for example, cardboard is placed between individual layers in a container.

1. Place the first container or packaging material on the scale and press →T←.

   The packaging weight is automatically saved as the tare weight, the zero display and the symbol **NET** appear.
2. Weigh the weighing sample and read/print out the result.
3. Place the second container or packaging material on the scale and press →T← again.

   The total weight on the scale is saved as the new tare weight. The zero display appears.
4. Weigh the weighing sample in the second container and read/print the result.
5. Repeat the last two steps for other containers.

2.5 Displaying the capacity available

The scale has a graphic display of the scale capacity available. The bar indicates how many per cent of the scale capacity is already occupied and what capacity is still available. In the example, approx. 65 % of the scale capacity is occupied.

2.6 Dynamic weighing

With the dynamic weighing function, it is possible to weigh restless weighing samples such as live animals. If this function is activated, the symbol appears in the display.

With dynamic weighing, the scale calculates the mean value from 56 weighing operations within 4 seconds.

With manual start

Prerequisite

`AVErAGE -> MAnuAL` is selected in the menu.

The weighing sample must be heavier than 5 scale divisions.

1. Place the weighing sample on the scale and wait until it has stabilized.
2. Press (Print) to start dynamic weighing.

   During dynamic weighing, horizontal segments appear in the display, and the dynamic result is then displayed with the symbol *****.
3. Unload the scale to be able to start a new dynamic weighing operation.

With automatic start

Prerequisite

`AVErAGE -> AUtO` is selected in the menu.

The weighing sample must be heavier than 5 scale divisions.

1. Place the weighing sample on the scale.

   The scale starts the dynamic weighing automatically.

   During dynamic weighing, horizontal segments appear in the display, and the dynamic result is then displayed with the symbol *****.
2. Unload the scale to be able to perform a new dynamic weighing operation.

2.7 Printing results

If a printer or computer is connected to the scale, the weighing results can be printed out or sent to a computer.

➜ Press (Print).

The display contents are printed out and transferred to the computer.

2.8 Displaying info

Up to 7 different values to be displayed can be configured in the menu for the key (i Info).

Depending on the configuration in the menu, see Section 4.4.2, the following values can be stored in any order (for example):

- Net quantity
- Gross weight
- Average piece weight
- Average piece weight, higher resolution
- Counting accuracy

1. Press (i Info).
   The first value is displayed.
2. Press (i Info) again.
   The next value is displayed.
3. Repeat as often as necessary until the weight display appears again.

Note If (i Info) is not pressed again within 5 seconds, the scale automatically changes to the weight display, even if all information has not yet been queried.

2.9 Switching scales

If a second scale or a weighing platform is connected, e. g. via the optional analog second scale interface, the currently active scale is shown in the display.

The second scale can be operated in exactly the same way as the first scale.

➜ Press (Scale).
The display changes from one scale to the other.

Changing the operating mode of the second scale

The second scale can be operated as bulk scale (bulk), reference scale (ref) or auxiliary scale (auxiliary), see Section 4.6. In the factory setting the second scale operates as bulk scale.

➜ To change the operating mode, keep the (⚖) key pressed until the new operating mode appears briefly in the display.
The second scale will now operate in the other operating mode. The setting in the menu has been changed automatically.

2.10 Cleaning

CAUTION!

Electric shock hazard!

▲ Before cleaning with a damp cloth, pull out the mains plug to disconnect the unit from the power supply.

CAUTION!

When the weighing pan has been removed, never clean the area under the load plate holder with a solid object!

This could damage the weighing cell.

Other cleaning information:

- Use damp cloths.
- Do not use any acids, alkalis or strong solvents.
- Do not clean using a high-pressure cleaning unit or under running water.
- If very dirty, remove the weighing pan, protective cover (if present) and adjustable feet and clean these items separately.
- Follow all the relevant instructions regarding cleaning intervals and permissible cleaning agents.

3 Counting

The compact scales BBA432 / BBK432 have additional functions for piece counting. The relevant settings in the menu are described in Section 4.4.1.

3.1 Counting parts into a container

1. Place the empty container on the scale and press →T←.

   The container is tared and the zero display appears.
2. Put the number of pieces displayed above the key Sample Size on the scale and press Sample.

   The scale determines the average piece weight and then shows the number of pieces preset.
3. Add more parts to the container until the required number of pieces is reached.
4. When the piece counting is completed, press the key C Clear to clear the result.

   The scale is ready for the next weighing or counting.

Note

- The average piece weight remains saved in the factory setting until a new average piece weight is determined.
- With Units it is possible to switch between the number of pieces and the weighing units preset.
- Depending on the assignment, it is possible to display the average piece weight, i. e. the weight of an individual reference unit, with i Info.
- If `A.CL-APW ON` is set in the menu, the average piece weight is automatically cleared after each counting operation. The average piece weight must be determined again for the next counting operation.
- If `ACCurCY ON` is set in the menu, the accuracy achieved is briefly shown after the number of pieces is determined.

3.2 Counting parts out of a container

1. Place the full container on the scale and press →T←.

   The container is tared and the zero display appears.
2. Remove the number of pieces displayed above the key Sample Size and press Sample.

   The scale determines the average piece weight and then shows the number of pieces removed, together with a minus sign.
3. Remove more parts from the container until the required number of pieces is reached.

3.3 Counting with operator guidance

The compact scales BBA432 / BBK432 have 2 LEDs on the right next to the keys →T← and Sample. A flashing LED requests the relevant action and, if applicable, confirmation with the key. A corresponding setting in the menu enables the work sequence for counting to be defined.

3.3.1 First taring, then counting

Prerequisite

`PrOMPt -> tAr-SPL` is set in the menu. The LED next to the key →T← flashes when the load is taken off the scale.

1. Place the empty container on the scale and press →T←.

   The container is tared, the zero display appears and and the LED next to the key Sample flashes.

2. Place the number of pieces displayed via the key Sample Size into the container.

   The scale automatically determines the average piece weight and the weight display changes to **PCS**.

3. Fill the container with the material being counted.

3.3.2 First specifying a reference, then taring

This mode is particularly suitable when counting out of a full container.

Prerequisite

`PrOMPt -> SPL-tAr` is set in the menu. The LED next to the key Sample flashes when the scale is relieved.

1. Place the number of pieces displayed via the key Sample Size on the scale.

   The scale automatically determines the average piece weight, the weight display changes to **PCS** and the LED next to the key →T← flashes.

2. Take the reference parts off the scale and place a (full) container on the scale.
3. Press →T←.

   The container is tared and the zero display appears.

4. Count the material out of the container.

3.3.3 Hands free

In this mode, no keys need to be pressed on the scale, which leaves the hands free for handling the material being counted.

Prerequisite

`PrOMPt -> hAndSFr` is set in the menu. The LED next to the key (→T←) flashes when the scale is relieved.

1. Place an empty container on the scale.

   The container is automatically tared, the zero display appears and the LED next to the key (Sample) flashes.

2. Place the number of pieces displayed above the key (Sample Size) into the container.

   The scale automatically determines the average piece weight and the weight display changes to **PCS**.

3. Fill the container with the material being counted.

3.4 Counting with variable reference quantity

If `VAr-SPL ON` is set in the menu, it is possible to select from 5 preset reference quantities via (Sample Size).

➜ Press (Sample Size) as often as necessary until the display above the key has changed to the desired reference quantity.

The rest of the counting process is as described earlier.

3.5 Counting with minimum accuracy

The item `Min.rEFW` in the menu allows to preset a minimum accuracy of 97.5 %, 99.0 % or 99.5 %. On the basis of this, the scale calculates the minimum reference weight necessary to reach the defined accuracy.

4. Place the reference parts on the scale and press (Sample).
5. If the average piece weight is not sufficient to ensure the desired accuracy, `Add x` **PCS** appears.
6. Add the displayed number of pieces.

   The scale then automatically determines the average piece weight with the larger reference quantity.

The rest of the counting process is as described earlier.

3.6 Reference optimization

3.6.1 Automatic reference optimization

`rEF.OPt` -> `AUtO` must be set in the menu for this. The symbol **Auto Opt** appears in the display.

7. Place the reference parts on the scale and press Sample.
8. Place additional reference parts, max. the same number as for the first reference determination, on the scale.

   The scale automatically optimizes the average piece weight with the larger number of reference parts.

The rest of the counting process is as described earlier.

Note Reference optimization can be carried out several times. If the parts differ too strongly, no automatic reference optimization is carried out.

3.6.2 Manual reference optimization

`rEF.OPt -> MAnuAL` must be set in the menu for this.

1. Place the reference parts on the scale and press Sample.
2. Place additional reference parts, max. the same number as for the first reference determination, on the scale and press Sample.

   The scale optimizes the average piece weight with the larger number of reference parts.

The rest of the counting process is as described earlier.

Note The reference optimization can be performed several times.

3.7 Counting with automatic reference determination

Prerequisite

`A-SMPL ON` is set in the menu.

➜ Place the number of pieces displayed above the key Sample Size into the container.

The scale automatically determines the average piece weight and then shows the quantity.

The rest of the counting process is as described earlier.

3.8 Counting with two scales

For piece counting, it is possible to connect a second scale or weighing platform, e.g. a floor scale for counting a large number of pieces via the optional analog second scale interface.

The necessary settings for the application and interface parameters are described in the Sections 4.4.1, 4.6.1 and 4.6.5.

3.8.1 Counting with a reference scale

Prerequisite

The connected second scale is configured as reference scale.

1. Place the reference parts on the reference scale and press  .

   The scale determines the average piece weight and changes to the display in pieces (PCS).
2. Place the parts to be counted on the first scale.

   The total quantity is displayed.

Note

- If `tOtAL-Ct` -> `bULK` is set in the menu, only the number of pieces on the bulk scale is displayed.
- If `tOtAL-Ct` -> `bOtH` is set in the menu, the reference quantity is added to the bulk quantity.

3.8.2 Counting with a bulk scale

Prerequisite

The connected second scale is configured as bulk scale.

1. Place the reference parts on the first scale and press  .

   The scale determines the average piece weight and changes to the display in pieces (PCS).
2. Place the parts to be counted on the bulk scale.

   The total quantity is displayed.

Note

- If `tOtAL-Ct` -> `bULK` is set in the menu, only the number of pieces on the bulk scale is displayed on the bulk scale.
- If `tOtAL-Ct` -> `bOtH` is set in the menu, the reference quantity is added to the bulk quantity.

3.8.3 Counting with an auxiliary scale

Note This configuration allows counting of diverse parts, for example very small parts on one scale and large parts on the other scale.

Prerequisite

The connected second scale is configured as an auxiliary scale. The scale doesn't change automatically but only after pressing the Scale key.

1. Activate the appropriate scale.
2. Place the reference parts on this scale and press Sample.

   The scale determines the average piece weight and changes to the display in pieces (PCS).
3. Place the parts to be counted on the same scale.

   The number of pieces is displayed.

4 Settings in the menu

Settings can be changed and functions can be activated in the menu. This enables adaptation to individual weighing requirements.

The menu consists of 6 main blocks containing various submenus on several levels.

4.1 Operating the menu

4.1.1 Calling up the menu and entering the password

The menu differentiates between 2 operating levels: Operator and Supervisor. The Supervisor level can be protected by a password. When the device is delivered, both levels are accessible without a password.

Operator menu

1. Press (Print) and keep it pressed until `COdE` appears.
2. Press (Print) again.

   The menu item `tErMINL` appears. Only the submenu `dEVICE` is accessible.

Supervisor menu

1. Press (Print) and keep it pressed until `COdE` appears.
2. Enter the password and confirm with (Print).

   The first menu item `SCALE` appears.

Note

No supervisor password has been defined when the device is first delivered. Therefore respond to the password inquiry with (Print) when you call up the menu for the first time.

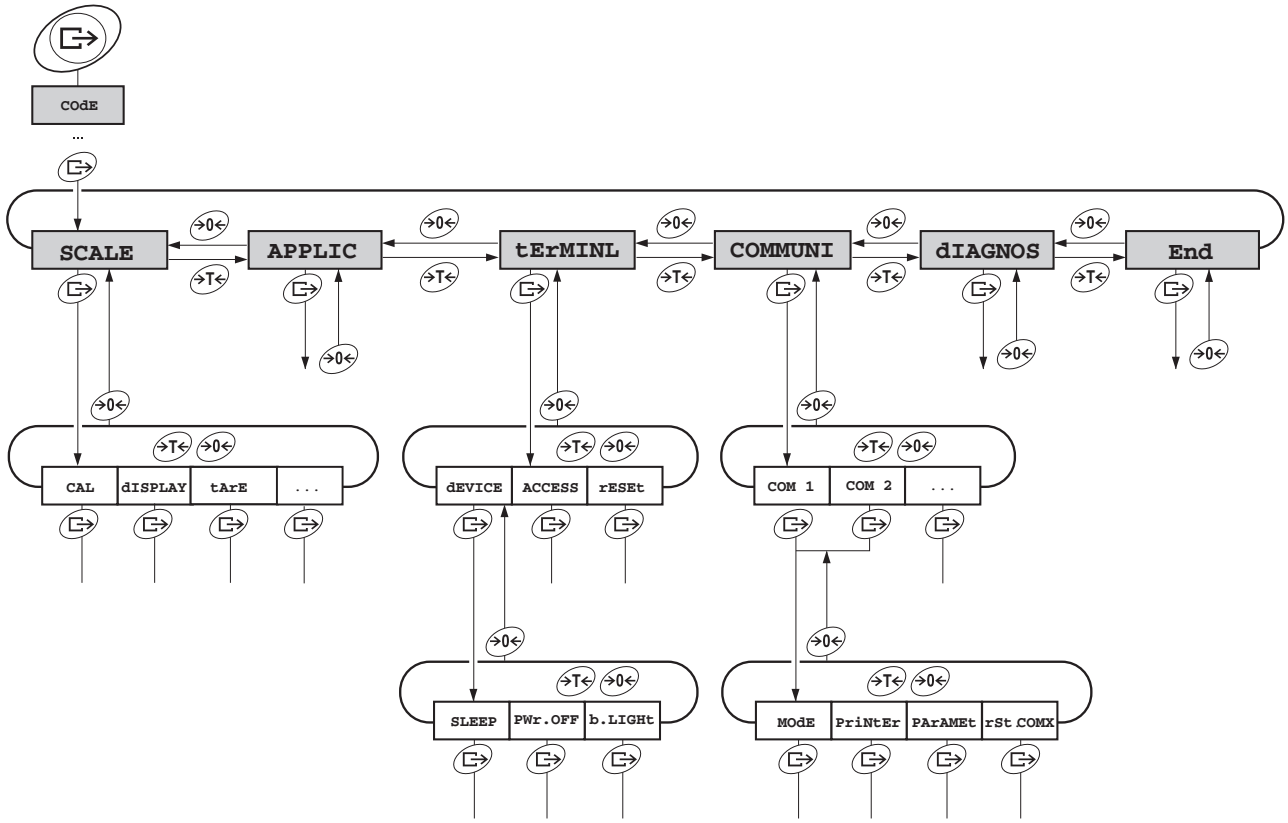
If a password has still not been entered after a few seconds, the scale returns to weighing mode.

Emergency password for Supervisor access to the menu

If a password has been issued for Supervisor access to the menu and you have forgotten it, you can still enter the menu:

➜ Press (→0←) 3 times and confirm with (Print).

4.1.2 Selecting and setting parameters



Scrolling on one level

➜ Scroll forward: Press →T←.

➜ Scroll back: Press →0←.

Activating menu items/ accepting selection

➜ Press Print.

Exiting menu

1. Press ⏻.
   The last menu item END appears.
2. Press Print.
   The inquiry SAVE appears.
3. Confirm inquiry with Print to save the settings and return to weighing mode.
   -or-

➜ Press →T← to discard changes and return to weighing mode.

4.2 Overview

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Page
SCALE	SCALE1/SCALE2					29
	CAL					29
	dISPLAY	UNIt1	g, kg, oz, **lb**, t			29
		UNIt2	g,**kg**, oz, lb, t			
		rESOLU				
		UNt.rOLL	ON, **OFF**			
	tArE	A-tArE	ON, **OFF**			30
		ChAIn.tr	**ON**, OFF			
		A.CL-tr	ON, **OFF**, 9d			
	ZErO	AZM	OFF; 0.5 d; 1 d; 2 d; 5 d; 10 d			30
	rEStArt	ON/**OFF**				30
	FILtEr	VibrAt	LOW, **MEd**, HIGH,			30
		PrOCESS	**UNIVEr**, dOSING			
		StAbILI	FASt, **StAndrd**, PrECISE			
	FACt	tEMP	OFF, 1K, 2K, 3K, **5K**			31
	Min.WEiG	ON/OFF	ON, **OFF**			31
	rESEt	SUrE?				31
APPLIC	COUNt	Prompt	**OFF**, TAr-SPL, SPL-tAr, handSFr			31
		VAr-SPL	ON, **OFF**			
		SPL-qtY	Sq1 ... Sq5			
		Min.reFW	**OFF**, 97.5%, 99.0%, 99.5%			
		rEF.OPt	**OFF**, AUtO, MAnuAL			
		A-SMPL	ON, **OFF**			
		A.CL-APW	ON, **OFF**			
		ACCurCY	ON, **OFF**			
		tOtAL.Ct	**bULK**, bOth			
	inFO.KEY	INFO 1 ... INFO 7	NOt.USEd, PCS NEt, GrOSS, tArE, APW, HIGHRES, ACCurCY			32
	AVErAGE	**OFF**, AUtO, MAnuAL				33
	rESEt	SUrE?				33

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Page
tERMINL	dEVICE	SLEEP	**OFF**, 1 min, 3 min, 5 min, 15 min, 30 min			33
		PWr OFF	OFF, 1 min, **3 min**, 5 min, 15 min, 30 min			
		b.LIGHt	ON, **OFF**, 5 sec, 10 sec, 30 sec, 1 min			
	ACCESS	SUPErVI				34
	rESEt	SUrE?				34
COMMUNI	COM 1/COM 2	MOdE	**Print**			34
			A.Print			
			CONtINU			
			dIALOG			
			CONt.OLd			
			dIAL.OLd			
			dt-b	GrOSS	ON, OFF	
				tArE	ON, OFF	
				nEt	ON, OFF	
			dt-G	GrOSS	ON, OFF	
				tArE	ON, OFF	
				nEt	ON, OFF	
			COnt-Wt			
			COnt-Ct			
			2nd.dISP			
			rEF			
			bULK			
			AuXILIA			
			InSt.Prn			
		PriNtEr	Type	**ASCII**, LAbEL		35
			tEmPLat	**StdArd**, tEMPLt1, tEMPLt2		
			ASCi.Fmt	LINE.FMt	**MULtI** SINGLE FIXEd	
				LENGtH	1 … 100	
				SEPArAt	, ;…	
				Add LF	0 … 9	

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Page
		PArAMEt	bAUd	300 … 38400		35
			PArityY	7 nonE, 8 nonE, 7 odd, 8 odd, **7 EVEN**, 8 EVEN		
			H.SHAKE	NO, **XONXOFF**, nEt 422, nEt 485		
			NEt.Addr	0 … 31		
			ChECSuM	ON, **OFF**		
			Vcc	ON, **OFF**		
		rSt.COMx	SUrE?			36
COMMUNI	OPtION	EtH.NEt	IP.AddrS, SUbNEt, GAtEWAY			36
		USb	USb tESt			36
		diGitAL	IN 0 … 3	**OFF**, ZErO, tArE, Print, rEF 10, rEF n, SCALE, Unit, …		36
			OUT 0 … 3	**OFF**, StAbLE, bEL.Min, AbV.Min, UndErLd, OVErLd, StAr, …		
			SEt.Pt 1			
			SEt.Pt 2			
		ANALOG	Mode	rEF, **bULK**, AuXILIA, bYPASS		36
	dEF.PrN	tEMPLt1/ tEMPLt2	LINE 1 ... LINE 12	**NOt.USEd**, HEAdEr, SCALE.NO, GrOSS, tArE, nEt, APW, rEF Ct, PCS, StArLN, CrLF, F FEEd		38
dIAGNOS	tESt SC	intErN/ExtErN				39
	KboArd					
	dISPLAY					
	SNr					
	SNr2					
	LiSt					
	LiSt2					
	rESEt.AL	SUrE?				

4.3 Scale settings (SCALE)

4.3.1 SCALE1/SCALE2 – Selecting scale

This menu item only appears if an analog second scale or a weighing platform is connected.

4.3.2 CAL – calibration (adjustment)

This menu item is not available for certified scales without internal calibration weight.

Internal	For scales **with** an internal calibration weight: 1. Unload scale. 2. Activate menu item `CAL` with (Print). The scale calibrates with the internal calibration weight. `-Int CAL-` appears in the display. After calibration is completed, `-donE-` appears briefly in the display, and the scale automatically changes to the next point of the scale menu.
External	For scales **without** an internal calibration weight: 1. Unload scale. 2. Activate menu item `CAL` with (Print). The scale determines the zero point. `-0-` appears in the display. The calibration weight to be placed on the scale then flashes in the display. 3. If necessary, change the weight value displayed with (→T←). 4. Place the calibration weight on the scale and confirm with (Print). The scale calibrates with the calibration weight loaded. After calibration is completed, `-donE-` appears briefly in the display, and the scale automatically changes to the next point of the scale menu.

4.3.3 DISPLAY – weighing unit and display accuracy

`UNIt1`	Select weighing unit 1: g, kg, oz, lb, t
`UNIt2`	Select weighing unit 2: g, kg, oz, lb, t
`rESOLU`	Select readability (resolution), model-dependent
`UNt.rOLL`	When `UNT.rOLL` is switched on, the weight value can be displayed in all available units with (Units).
Notes	• In the case of certified scales individual sub-items of the `dISPLAY` menu item may not be available or only to a limited extent, depending on the respective country. • On dual-range/dual interval scales, resolutions marked with **I<–>I 1/2** are divided up into 2 weighing ranges/intervals, e.g. 2 x 3000 d.

4.3.4 TARE – tare function

A-tArE	Switching on/off automatic taring
CHAIn.tr	Switching on/off chain tare
A.CL-tr	Switching on/off automatic clearing of the tare weight when the load is removed from scale Possible settings: OFF, ON, 9d

4.3.5 ZERO – automatic zero update

AZM	On certified scales, this menu item does not appear. Switching on/off automatic zero update and selecting zeroing range. Possible settings: OFF; 0.5 d; 1 d; 2 d; 5 d; 10 d

4.3.6 RESTART – automatic saving of zero point and tare value

ON/OFF	When the Restart function is activated, the last zero point and tare value are saved. After switching off / on or after a power interruption, the device continues to work with the saved zero point and tare value.

4.3.7 FILTER – adaptation to the ambient conditions and the weighing type

VIbrAt	Adaptation to the ambient conditions
LOW	• Very steady and stable environment. The scale works very quickly, but is very sensitive to external influences.
MEd	• Normal environment. The scale operates at medium speed.
HIGH	• Restless environment. The scale works more slowly, but is insensitive to external influences.
PrOCESS	Adaptation to the weighing process
UNIVEr	• Universal setting for all weighing samples and normal weighing goods
dOSING	• Dispensing liquid or powdery weighing samples
StAbILI	Adjusting the stability detection
FASt	• The scale operates very fast.
StAndrd	• The scale operates at medium speed.
PrECISE	• The scale operates with the greatest possible reproducibility. The slower the scale works, the greater the reproducibility of the weighing results.

4.3.8 FACT – automatic temperature-dependent adjustment

This menu item appears only on scales with an internal calibration weight.

tEMP	Defining the temperature difference for automatic calibration
OFF	• Switching off automatic calibration in the case of a temperature difference
1K/2K/3K/5K	• Automatic calibration in the case of a temperature change of 1 K, 2 K, 3 K or 5 K since the last adjustment

4.3.9 MIN.WEIG – minimum weight

This menu item appears only if the service technician has saved a minimum weight.

ON/OFF	Switching minimum weight function on/off If the weight on the scale falls below the stored minimum weight, an * appears on the display in front of the weight indicator.

4.3.10 RESET – resetting scale settings to factory settings

SUrE?	Confirmation inquiry • Reset the scale settings to factory settings with Print • Do not reset scale settings with →T←

4.4 Application settings (APPLICATION)

4.4.1 COUNT – settings for counting

PrOMPt	Operator guidance
OFF	• No operator guidance
tAr-SPL	• The scale first requests the tare weight, then the reference parts. The tare weight must be confimed with the corresponding key.
SPL-tAr	• The scale first requests the reference parts, then the tare weight. The reference parts must be confirmed with the corresponding key.
hAndSFr	• The scale first requests the tare weight, then the reference parts. The tare weight and reference parts do not have to be confirmed, the hands are free for handling the material to be counted.
VAr-SPL	Adaptation of the reference quantity
ON	• The reference quantity can be changed in operating mode
OFF	• Counting only with defined reference quantities
SPL-qtY	Reference quantity
Sq1 ... Sq5	• Define 5 fixed reference quantities

Min.reFW	Monitoring the minimum reference weight
OFF	• No monitoring of the minimum reference weight
97.5, 99.0, 99.5	• Monitoring the minimum reference weight so that a counting accuracy of 97.5 %, 99.0 % or 99.5 % is achieved
rEF.OPt	Optimizing the average piece weight
OFF	• No reference optimization
AUtO	• Automatic reference optimization
MAnuAL	• Manual reference optimization
A-SMPL	Automatic determination of the average piece weight
ON	• After taring, the average piece weight is determined with the next weight placed on the scale and the displayed reference quantity
OFF	• No automatic determination of the average piece weight
A.CL-APW	Automatic clearing of the average piece weight
ON	• When the load is taken off the scale after a counting operation, the average piece weight is automatically cleared. The next counting operation begins with determining the average piece weight again.
OFF	• The average piece weight must be cleared manually by pressing C Clear
ACCurCY	Displaying the counting accuracy
ON	• After the average piece weight is determined, the counting accuracy that can be achieved is shown briefly in the display.
OFF	• No counting accuracy display
tOtAl.Ct	Counting on two scales
bULK	• Display number of pieces for the parts on the bulk scale only
bOth	• Display number of pieces for all parts on the bulk and the reference scale

4.4.2 INFO-KEY – assignment of the Info key

INFO1	
NOt.USEd	• Info space not occupied
PCS NEt	• Displays net weight in counting
GrOSS	• Displays gross weight
tArE	• Displays tare weight
APW	• Displays average piece weight
HIGHrES	• Shows display with a higher resolution for a short time
ACCUrCY	• Displays counting accuracy
INFO2 ... INFO7	As per INFO1

4.4.3 AVERAGE – determining the average weight for an unstable load

OFF	Calculating average weight switched off
AUtO	Calculating average weight with automatic start of the weighing cycle
MAnuAL	Calculating average weight with manual start of the weighing cycle via Print

4.4.4 RESET – resetting application settings to factory settings

SUrE?	Confirmation inquiry • Reset the application settings to factory settings with Print • Do not reset the application settings with →T←

4.5 Terminal settings (TERMINAL)

4.5.1 DEVICE – Sleep mode, energy-saving mode and display backlighting

SLEEP	This menu item only appears on devices in mains operation. When SLEEP is activated, the scale switches off display and backlighting after the time period set when not in use. The display and backlighting are switched on again at the press of a key or if the weight changes. Possible settings: OFF, 1 min, 3 min, 5 min, 15 min, 30 min
PWr OFF OFF / 1 min / ...	This menu item only appears on devices in battery operation. When PWr OFF is activated, the device switches itself off automatically after approx. 3 minutes when not in use. Afterwards it has to be switched on using ⇨. Possible settings: OFF (switched off), 1 min, 3 min, 5 min, 15 min, 30 min
b.LIGHt	Switching the display backlighting on/off. Scales with a storage battery switch the background lighting off automatically by default when no action takes place at the scale for approx. 5 seconds. Possible settings: OFF (switched off), 5 sec, 10 sec, 30 sec, 1 min, ON (switched on)
Note	This menu item is accessible without a Supervisor password.

4.5.2 ACCESS – password for Supervisor menu access

SUPErVI	Password entry for Supervisor menu access
ENtER.C	Request to enter password ➜ Enter the password and confirm with Print
rEtYPE.C	Request to repeat the password entry ➜ Enter the password again and confirm with Print
Notes	• The password can consist of up to 4 characters. • The key Print must not be part of the password. It is required for confirming the password. • The key →0← may only be used in combination with another key. • If you enter an impermissible code or make a typing error in the repetition, COdE.Err. appears in the display.

4.5.3 RESET – resetting terminal settings to the factory settings

SUrE?	Confirmation inquiry • Reset terminal settings to the factory settings with Print • Do not reset the terminal settings with →T←

4.6 Configuring interfaces (COMMUNICATION)

4.6.1 COM1/COM2 -> MODE – operating mode of the serial interface

Print	Manual data output to the printer with Print
A.Print	Automatic output of stable results to the printer (e.g. for series weighing operations)
CONtINU	Ongoing output of all weight values via the interface
dIALOG	Bi-directional communication via MT-SICS commands, control of the scale via PC
CONt.OLd	As per CONtINU, see above, but with 2 fixed blanks in front of the unit (compatible with Spider 1/2/3)
dIAL.OLd	As per dIALOG, see above, but with 2 fixed blanks in front of the unit (compatible with Spider 1/2/3)
dt-b	DigiTOL-compatible format.
GROSS	• Transfer of the gross weight, identified with "B"
tArE	• Transfer of the tare weight
nEt	• Transfer of the net weight
dt-G	As per dt-b, see above, gross weight identified with "G"
COnt-Wt	TOLEDO Continuous mode
COnt-Ct	TOLEDO Continuous mode, transfer of the number of pieces

2nd.dISP	For connecting a second display (automatically activates the 5-V voltage supply at Pin 9)
rEF	Data transfer from the reference scale (automatic switchover)
bULK	Data transfer from the quantity scale (automatic switchover)
AuXILIA	Data transfer from the reference or quantity scale (manual switchover)
InSt.Prn	Immediate manual data output to the printer with (not certifiable)

4.6.2 COM1/COM2 -> PRINTER – settings for protocol printout

This menu item only appears if the mode "Print" or "A.Print" is selected.

tYPE	Select the printer type
ASCII	• ASCII printer, e.g. Sprinter 1
LabEL	• Label printer, capable of printing graphics
tEmPLat	Selecting protocol printout
StdArd	• Standard printout
tEmPLt1	• Printout in accordance with Template 1
tEmPLt2	• Printout in accordance with Template 2
ASCi.Fmt	Selecting formats for the protocol printout
LINE.Fmt	• Line format: MULtI (multi-line), SINGLE (single-line) or FIXEd
LENGtH	• Line length: 0 ... 100 characters, appears only with line format MULtI or FIXEd
SEPArAt	• Separator: , ; . / \ _ and space; appears only with line format SINGLE
Add LF	• Line feed: 0 ... 9

4.6.3 COM1/COM2 -> PARAMET – communication parameter

bAUd	Selecting baud rate: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400 baud
PAritY	Selecting parity: 7 none, 8 none, 7 odd, 8 odd, 7 even, 8 even
H.SHAKE	Select handshake: NO, XONXOFF, NET 422 (network operation via the optional RS422/RS485 interface via 4-wire bus, only for COM1), NET 485 (network operation via the optional RS422/RS485 interface via 2-wire bus, only for COM1)
NET.Addr	Assigning network address: 0 ... 31, only for NET 485
ChECSuM	Activating checksum byte (appears only in TOLEDO Continuous mode)
Vcc	Switching 5V voltage, e.g. for a bar code reader, on / off

4.6.4 COM1/COM2 -> RESET COM1/RESET COM2 – resetting serial interface to factory settings

SUrE?	Confirmation inquiry • Reset interface settings to factory settings with Print • Do not reset the interface settings with →T←

4.6.5 OPTION – configuring options

If no option is installed or is not yet configured, `N.A.` appears in the display.

EtH.NEt	Configuration of the Ethernet interface
IP.AddrS	• Enter IP address
SUBNEt	• Enter Subnet address
GAtEWAY	• Enter Gateway address
USb	Configuration of the USB interface
USb TEST	• Test of the USB interface. After the test has been passed, `rEAdY` appears in the display.
diGitAL	Configuration of the digital inputs/outputs
IN 0 ... 3	Configuring inputs 0 ... 3
OFF	• Input not assigned
ZErO	• Key →0←
tArE	• Key →T←
PriNt	• Key Print
CLEAr	• Key C Clear
rEF 10	• Key Sample
rEF n	• Key Sample Size
SCALE	• Key Scale
inFO	• Key i Info
UNIt	• Key Units

OUT 0 ... 3	Configuring outputs 0 ... 3
OFF	• Output not assigned
StAbLE	• Stable weight value
bEL.MIN	• Minimum weight not reached
AbV.MIN	• Minimum weight reached or exceeded
UNdErLd	• Insufficient load
OVErLd	• Overload
StAr	• Changed/calculated value
bEL.SP1	• Setpoint 1 not reached
AbV.SP1	• Setpoint 1 reached or exceeded
bEL.SP2	• Setpoint 2 not reached
AbV.SP2	• Setpoint 2 reached or exceeded
SEt.Pt1	Enter value for setpoint 1
SEt.Pt2	Enter value for setpoint 2
ANALOG	Configuration of the analog second scale interface
Mode	Operating mode of the second scale
rEF	• Second scale can only be used to determine the average piece weight
bULK	• Second scale can only be used as bulk scale
AuXILIA	• No difference between reference and bulk scale, all functions available on the scale selected
BYPASS	• Second scale interface not assigned

4.6.6 DEF.PRN – configuring templates

tEMPLt1/tEMPLt2	Selecting Template 1 or Template 2
LINE 1 ... 12	Select line
NOt.USEd	• Line not used
HEAdEr	• Line as header. The contents of the header must be defined via an interface command, see Section 5.1.
SCALE.NO	• Scale number
GROSS	• Gross weight
tArE	• Tare weight
nEt	• Net weight
APW	• Average piece weight
rEF Ct	• Reference quantity
PCS	• Pieces
StARLN	• Line with ***
CrLF	• Line feed (blank line)
F FEEd	• Page feed

4.7 Diagnosis and printing out of the menu settings (DIAGNOS)

tESt SC	
Internal	Testing scale with internal calibration weight • `-Int CAL-` appears in the display during the test. • After completion of the test, ideally `*d=0.0g` briefly appears in the display, after which the scale changes to the next menu item `KboArd`.
External	Testing scale with external calibration weight 1. The scale checks the zero point. `-0-` appears in the display. The test weight flashes in the display. 2. If necessary, change the weight value displayed with →T←. 3. Put the calibration weight on the scale and confirm with Print. 4. The scale checks the calibration weight put on them. 5. After the test is completed, the deviation from the last calibration briefly appears in the display, ideally `*d=0.0g`, after which the scale changes to the next menu item `KboArd`.
KboArd	Keyboard test
`PUSH 1 ... 10`	• First press the large keys on the bottom row in order: ⏻ →0← →T← Sample • Then press the smaller keys in the top row: Print Scale i Info Units C Clear Sample Size If the key works, the scale changes to the next key. **Note** You cannot abort the keyboard test! If you have selected the menu item `KboArd`, you must press all keys.
dISPLAY	Display test: The scale displays all functioning segments
SNr	Display of the serial number
SNr2	Display of the serial number of scale 2. This menu item only appears if an analog second scale is connected.
LiSt	Printout of a list of all menu settings
LiSt2	Printout of a list of all menu settings of scale 2. This menu item only appears if an analog second scale is connected.
rESEt.AL	Resetting all menu settings to the factory settings
`SUrE?`	Confirmation inquiry • Reset all menu settings to the factory settings with Print • Do not reset the menu settings with →T←

5 Interface description

5.1 SICS interface commands

The compact scales BBA432 / BBK432 support the command set MT-SICS (METTLER TOLEDO **S**tandard **I**nterface **C**ommand **S**et). With SICS commands, it is possible to configure, query and operate the scales from a PC. SICS commands are divided up into various levels.

5.1.1 Available SICS commands

	Command	Meaning
LEVEL 0	@	Reset the scale
	I0	Inquiry of all available SICS commands
	I1	Inquiry of SICS level and SICS versions
	I2	Inquiry of scale data
	I3	Inquiry of scale software version
	I4	Inquiry of serial number
	I6	Inquiry of weighing parameters
	S	Send stable weight value
	SI	Send weight value immediately
	SIR	Send weight value repeatedly
	Z	Zero the scale
	ZI	Zero immediately
LEVEL 1	D	Write text into display
	DW	Weight display
	K	Keyboard check
	SR	Send and repeat stable weight value
	T	Tare
	TA	Tare value
	TAC	Clear tare
	TI	Tare immediately

In the case of Levels 0 and 1, these are commands which, if implemented, will function identically with all METTLER TOLEDO scales or weighing terminals.

In addition there are also further interface commands which apply either to the entire product series or to the particular application level. This and further information on the MT-SICS command set may be found in the MT-SICS Manual (Order Number 22 011 459 or at www.mt.com) or be obtained by request from your METTLER TOLEDO customer service representative.

5.1.2 Requirements for communication between scale and PC

- The scale must be connected to the RS232, RS485, USB or Ethernet interface of a PC with a suitable cable.
- The interface of the scale must be set to "Dialog" mode, see Section 4.6.1.
- A terminal progam must be available on the PC, e.g. HyperTerminal.
- The communication parameters baud rate and parity must be set in the terminal program and on the scale to the same values, see Section 4.6.3.

5.1.3 Notes on network operation via the optional interface RS422/485

Up to 32 scales can be networked with the optional RS422/485 interface. In network operation, the scales must be addressed from the computer before commands can be sent and weighing results received.

Address	Hex	ASCII
0	0x30	0
1	0x31	1
2	0x32	2
…	…	…
9	0x39	9
10	0x3A	:
11	0x3B	;
…	…	…
31	0x4F	O

Description of the steps	Host	Direction	Scale
1. Host addresses the scale, e.g. with the address 3A hex.	<ESC> :	——>	
2. Host sends a SICS command, e.g. SI	SI <CRLF>	——>	
3. The scale confirms receipt of the command and sends the address back		<——	<ESC>:
4. The scale responds to the command and returns control of the bus to the host		<——	S_S____45.02_kg <CRLF>

5.2 TOLEDO Continuous mode

5.2.1 TOLEDO Continuous commands

In TOLEDO Continuous mode the scale supports the following input commands:

Command	Meaning
P	Printing out the current result
T	Taring of the scale
Z	Zero setting of the display
C	Deleting of the current value
S	Determining the reference

5.2.2 Output format in TOLEDO Continuous mode

Weight values are always transferred in TOLEDO Continuous mode in the following format:

	Status			**Field 1**						**Field 2**							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
STX	SWA	SWB	SWC	MSD	–	–	–	–	LSD	MSD	–	–	–	–	LSD	CR	CHK

Field 1	Cont-Wt: 6 digits for the weight value that is transferred without comma and unit
Field 2	Cont-Wt: 6 digits for the tare weight that is transferred without comma and unit
STX	ASCII character 02 hex, character for "start of text"
SWA, SWB, SWC	Status words A, B, C, see below
MSD	Most significant digit
LSD	Least significant digit
CR	Carriage Return, ASCII character 0D hex
CHK	Checksum (2-complement of the binary sum of the 7 lower bits of all the characters sent beforehand incl. STX and CR)

Status word A								
		Status bit						
Function	**Selection**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
Decimal position	X00	0	1			0	0	0
	X0					0	0	1
	X					0	1	0
	0.X					0	1	1
	0.0X					1	0	0
	0.00X					1	0	1
	0.000X					1	1	0
	0.0000X					1	1	1
Numerical increment	X1			0	1			
	X2			1	0			
	X5			1	1			

Status word B	
Function/Value	**Bit**
Gross/Net: Net = 1	0
Sign: Negative = 1	1
Overload/Underload = 1	2
Movement = 1	3
lb/kg: kg = 1	4
1	5
Power up = 1	6

Status word C				
Function/Value				
kg/lb	**g**	**t**	**oz**	**Bit**
0	1	0	1	0
0	0	1	1	1
0	0	0	0	2
Print request = 1				3
Extended = 1				4
1				5
Tare manually, only kg = 1				6

6 Event and error messages

Error	Cause	Remedy
Display Dark	• Back lighting set too dark	➜ Set back lighting (`b.LIGHt`) brighter
	• No mains voltage	➜ Check mains
	• Unit switched off	➜ Switch on unit
	• Mains cable not plugged in	➜ Plug in mains plug
	• Brief fault	➜ Switch device off and back on again
Insufficient load L - - - - J	• Load plate not on the scale	➜ Place load plate on the scale
	• Weighing range not reached	➜ Set to zero
Overload r - - - - 7	• Weighing range exceeded	➜ Unload scale
		➜ Reduce preload
- - - - - -	• Result not yet stable	➜ If necessary adjust vibration adapter or weigh dynamically
- - no - -	• Function not permissible	➜ Unload scale and set to zero
r - no - 7 L - no - J	• Zeroing not possible with overload or insufficient load	➜ Unload scale
Err 4	• Reference weight too low	➜ Select and place larger number of reference parts on the scale
Err 5	• No valid value from the reference scale	➜ Check cable connection between the units
		➜ Check interface settings
Err 6	• No calibration	➜ Unplug the mains plug then plug it back in; switch unit off and then back on in battery mode
		➜ Calibrate scale
		➜ Call METTLER TOLEDO Service
Err 7	• Average piece weight too low	➜ Counting is not possible on this scale with this average piece weight

Error	Cause	Remedy
Err 9	• Unstable weight value when referencing	➜ Ensure stable surroundings ➜ Ensure that the weighing pan is freely movable ➜ Adjust vibration adapter
Err 17	• Printout not yet ended	➜ End printout ➜ Repeat required action
Err 18	• Switching the weighing unit impermissible during dynamic weighing	➜ End dynamic weighing ➜ Switch weighing unit
Err 53	• EAROM checksum error	➜ Unplug the mains plug then plug it back in; switch unit off and then back on in battery mode ➜ Call METTLER TOLEDO Service
Reference optimization not possible oPtErr	• The total weight of the reference parts exceeds 4 % of the scale capacity • No additional parts were put on the scale for manual reference optimization	➜ Put on fewer reference parts ➜ Put on reference parts for optimization ➜ Call METTLER TOLEDO Service
Weight display unstable	• Restless installation location • Draft • Restless weighing sample • Contact between weighing pan and/or weighing sample and surroundings • Mains fault	➜ Adjust vibration adapter ➜ Avoid drafts ➜ Dynamic weighing ➜ Remedy contact ➜ Check mains
Incorrect weight display	• Incorrect zeroing • Incorrect tare value • Contact between weighing pan and/or weighing sample and surroundings • Scale tilted	➜ Unload scale, set to zero and repeat weighing operation ➜ Clear tare ➜ Remedy contact ➜ Level scale

7 Technical data and accessories

7.1 Technical data

7.1.1 Type key

The compact scales BBA432 / BBK432 are available with various capacities and platforms that can be seen from the complete type designation.

Example

BBA432 – **3 PL** compact scale with capacity **6 lb/3 kg** and **small platform**

BBK432 – **35 SL** compact scale with capacity **70 lb/35 kg** and **large platform**

7.1.2 General data

BBA432 / BBK432	
Applications	• Weighing • Dynamic weighing • Counting with fixed or variable reference quantity • Counting with reference and bulk scale
Settings	• Resolution selectable • Weighing unit selectable: g, kg, oz, lb, t • Taring function: manual, automatic, chain tare • Automatic zero point correction when the scale is switched on and during operation • Filter for adapting to the ambient conditions (vibration adapter) • Filter for adapting to the weighing type, e.g. dispensing (weighing process adapter) • Switch-off function, sleep mode for mains-operated devices, energy-saving mode for battery operation • Display lighting • Handsfree mode for counting without touching any keys • Add mode for determining the piece weight when counting • Reference optimization • Graphic display of the weighing range
Accuracy class OIML/NTEP	• BBA4.. III • BBK4.. II
Display	• LCD (liquid crystal display), digits 0.83" (21 mm) high, with back lighting
Keypad	• Pressure point membrane keypad • Scratch-proof labeling

BBA432 / BBK432		
Housing	• Diecast aluminum housing; chromium nickel steel weighing pan • Dimensions, see Page 49	
Protection Class (IEC 529, DIN 40050, EN60529)	• IP43 (not with Ethernet interface)	
Mains connection	Direct connection to the mains (MAINS supply voltage fluctuations up to ±10% of the nominal voltage): • 120 V, 60 Hz, 90 mA • 100 V, 50/60 Hz, 90 mA For battery operation: • Connection via mains adapter: 90 – 264 V, 47 – 63 Hz, 300 mA • Infeed on the unit: 24 V, 1.3 A	
Battery operation	If the voltage supply is interrupted, the unit automatically switches over to battery operation	
Ambient conditions	• Use	Indoor use only
	• Altitude	up to 2000 m
	• Temperature range BBA4..	–10 .. +40 °C / 14 .. 104 °F
	• Temperature range BBK4..	+10 .. +30 °C / 50 .. 86 °F
	• Installation/overvoltage category	II
	• Pollution degree	2
	• Relative humidity	Maximum relative humidity 80 % for temperatures up to 31 °C / 88 °F, decreasing linearly to 50 % relative humidity at 40 °C / 104 °F
Interfaces	• 1 RS232 interface integrated • 1 other optional interface possible	
Resolution of the analog second scale interface	• 300000 points in noncertified configuration • 10000 points in certified configuration	
Supply of the weighing cell	• 8.2 V	

7.1.3 Weighing ranges and readability BBA4..

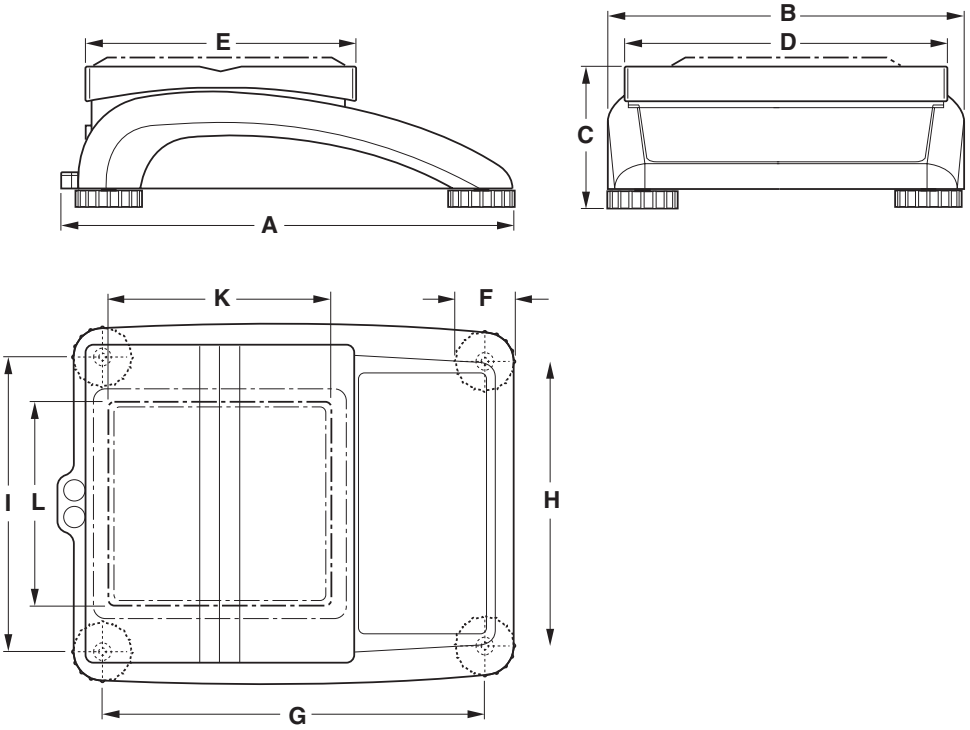
The compact scales BBA4.. with strain gauge weighing cells are supplied in the configuration 1 x 15.000 d.

Model	Weighing range	Readability d	Verification value e
BBA4.. – 3 P..	6 lb / 3 kg	0.0005 lb / 0.0002 kg	0.001 lb / 0.0005 kg
BBA4.. – 6 P..	12 lb / 6 kg	0.001 lb / 0.0005 kg	0.002 lb / 0.001 kg
BBA4.. – 15 S..	30 lb / 15 kg	0.002 lb / 0.001 kg	0.005 lb / 0.002 kg
BBA4.. – 35 S..	70 lb / 35 kg	0.005 lb / 0.002 kg	0.01 lb / 0.005 kg
BBA4.. – 60 S..	120 lb / 60 kg	0.01 lb / 0.005 kg	0.02 lb / 0.01 kg

7.1.4 Weighing ranges and readability BBK4..

Model	Weighing range	Readability d	Verification value e
BBK4.. – 3 P..	6 lb / 3 kg	0.00002 lb / 0.00001 kg	0.0002 lb / 0.0001 kg
BBK4.. – 6 P..	12 lb / 6 kg	0.00005 lb / 0.00002 kg	0.0005 lb / 0.0002 kg
BBK4.. – 15 S..	30 lb / 15 kg	0.0001 lb / 0.00005 kg	0.001 lb / 0.0005 kg
BBK4.. – 35 S..	70 lb / 35 kg	0.0002 lb / 0.0001 kg	0.002 lb / 0.001 kg

7.1.5 Dimensions



	A	B	C	D	E	F	G	H	I	K	L
P[1)]	13.19	10.43	3.94	9.45	7.87	1.81	10.87	8.19	8.47	6.50	6.50
S[1)]	14.57	14.17	4.53	13.78	9.45	2.05	12.24	12.00	12.24	–	–

[1)] dimensions in inch

7.1.6 Net weights

Model	without battery	with battery	with internal calibration weight (without battery)
With strain gauge cell:			
BBA4.2 – ..P..	10.2 lb (4.6 kg)	11.6 lb (5.3 kg)	–
BBA4.2 – ..S..	18.0 lb (8.2 kg)	19.4 lb (8.9 kg)	–
With Monobloc cell:			
BBK4.2 – ..P.., extra small load plate	10.7 lb (4.9 kg)	12.2 lb (5.6 kg)	11.8 lb (5.4 kg)
BBK4.2 – ..P..	10.3 lb (4.7 kg)	11.8 lb (5.4 kg)	11.3 lb (5.2 kg)
BBK4.2 – ..S..	22.9 lb (10.5 kg)	24.4 lb (11.2 kg)	25.5 lb (11.7 kg)

7.1.7 Interface connections

The compact scale can be fitted with a maximum of 2 interfaces. The following combinations are possible:

COM1	COM2	Note
RS232	–	
RS232	RS232	
RS485	RS232	COM1 can be optionally operated as RS422 or RS485
RS232	Ethernet	10BaseT, RJ45
RS232	USB	USB 1.1, Type B
RS232	Digital I/O	4 x in, 4 x out, D-Sub 9
RS232	Analog second scale interface	

7.1.8 Assignment of the interface connections

Pin	RS232 (COM1/ COM2)	RS422 (4-wire, COM1)	RS485 (2-wire, COM1)	Digital I/O (COM2)	Analog Interface
1	–	–	–	GND	+ Excitation (+8.2 VDC)
2	TxD1/2	TxD1–	TxD1–/RxD1–	OUT0	+ Sense
3	RxD1/2	RxD1–	–	OUT1	Shield
4	–	–	–	OUT2	– Sense
5	GND	GND	GND	OUT3	– Excitation (GND)
6	–	–	–	IN0	–
7	–	TxD1+	TxD1+/RxD1+	IN1	+ Signal
8	–	RxD1+	–	IN2	– Signal
9	VCC	VCC	VCC	IN3	–

7.2 Accessories

Designation	Order number
Protective cover for small model	21 203 207
Protective cover for large model	21 203 206
Second display RS-PD/PASM	21 302 875
Second display ADI412	22 013 978
Second display ADI412-B, with backlighting	22 013 977
Relay box 4 for connection to digital I/O interface	22 011 967
Connection cable for relay box 4, length approx. 1.5 m	21 254 225
Anti-theft device	00 229 175
RS232 cable for second scale, 39.37" (1.8 m) long	21 252 588
RS232 cable for PC, 39.37" (1.8 m) long	00 410 024

8 Appendix

8.1 Safety checks

The compact scales of the series BBA432 / BBK432 have been checked by accredited testing institutions. They have passed the safety checks listed below and carry the relevant test symbols. Production is subject to production monitoring by the inspection offices.

Country	**Test symbol**	**Standard**
Canada USA	C US	CAN/CSA-C22.2 No. 1010.1-92 UL Std. No. 61010A-1
Other countries	**CB Scheme** (no identification)	IEC/EN61010-1:2001

8.2 FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to both Part 15 of the FCC Rules and the radio interference regulations of the Canadian Department of Communications. These limits are designed to provide a reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the user manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Cet appareil a été testé et s'est avéré conforme aux limites prévues pour les appareils numériques de class A et à la partie 15 des règlements FCC et à la réglementation des radio-Interférences du Canadian Department of Communications. Ces limites sont destinées à fournir une protection adéquate contre les interférences néfastes lorsque l'appareil est utilisé dans un environnement commercial. Cet appareil génère, utilize et peut radier une énergie à fréquence radioélectrique; il est en outre susceptible d'engendrer des interférences avec les communications radio, s'il n'est pas installé et utilisé conformément aux instructions du mode d'emploi. L'utilisation de cet appareil dans les zones résidentielles peut causer interférences néfastes, auquel cas l'exploitant sera amené à prendre les dispositions utiles pour palier aux interférence à ses propres frais.

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Mettler-Toledo (Albstadt) GmbH
D-72458 Albstadt
Tel. ++49-7431-14 0, Fax ++49-7431-14 232
Internet: http://www.mt.com