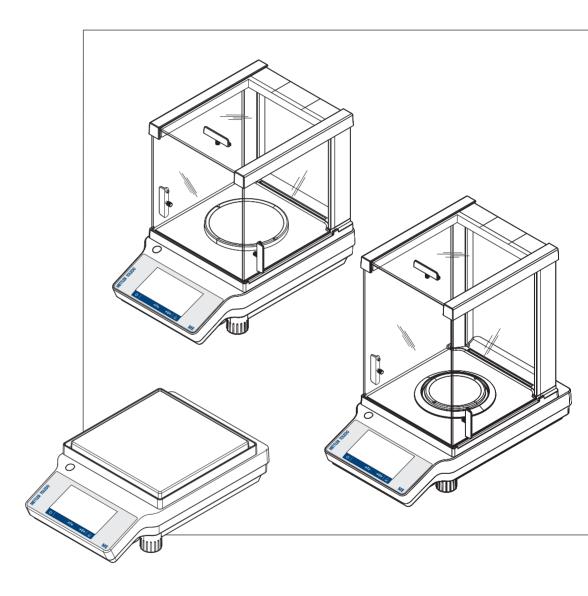
ME-T





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### Introduction

Thank you for choosing a METTLER TOLEDO balance. The balance combines high performance with ease of

This document refers to the originally installed firmware (software) version V 3.50.

### Finding more information

- www.mt.com/met-analytical
- ► www.mt.com/met-precision

Search for documents.

www.mt.com/library

For further questions, please contact your authorized METTLER TOLEDO dealer or service representative.

www.mt.com/contact

# Conventions and symbols used in these operating instructions



Refers to an external document.

Key and/or button designations and display texts are shown in graphic or bold text (e.g. 🖫, Language). for useful information about the product.

These symbols indicate an instruction:

- prerequisites
- steps
- 2 ...
- results

## 2 Safety Information

- Read and understand the instructions in these Operating Instructions before using the instrument.
- Keep these Operating Instructions for future reference.
- Include these Operating Instructions if you pass on the instrument to other parties.

If the instrument is not used according to the information in these Operating Instructions or if it is modified, the safety of the instrument may be impaired and Mettler-Toledo GmbH assumes no liability.

## 2.1 Definition of signal warnings and symbols

Safety notes are marked with signal words and warning symbols. These show safety issues and warnings. Ignoring the safety notes may lead to personal injury, damage to the instrument, malfunctions and false results.

**WARNING** for a hazardous situation with medium risk, possibly resulting in death or severe

injury if not avoided.

**CAUTION** for a hazardous situation with low risk, resulting in minor or moderate injury if not

avoided.

**NOTICE** for a hazardous situation with low risk, resulting in damage to the balance, other

material damage, malfunctions and erroneous results, or loss of data.



Electrical shock



General hazard: read the Operating Instructions for information about the hazards and the resulting measures.

## 2.2 Product safety information

The balance has been tested for the experiments and intended purposes documented in the appropriate manual. However, this does not absolve you from the responsibility of performing your own tests of the products supplied by us regarding their suitability for the methods and purposes you intend to use them for.

### Intended use

This balance is designed to be used in laboratories by trained staff. The balance is intended for weighing purposes.

Any other type of use and operation beyond the limits of technical specifications without written consent from Mettler-Toledo GmbH is considered as not intended.

#### Responsibilities of the balance owner

The balance owner is the person that uses the balance for commercial use or places the balance at the disposal of his staff. The balance owner is responsible for product safety and the safety of staff, users and third parties.

METTLER TOLEDO assumes that the balance owner provides the necessary protective gear, appropriate training for the daily work and for dealing with potential hazards in their laboratory.



# **MARNING**

### Risk of electric shock

Contact with parts that contain a live current can lead to injury and death.

- Only use the METTLER TOLEDO power supply cable and AC/DC adapter designed for your balance.
- 2 Connect the power cable to a grounded power outlet.
- 3 Keep all electrical cables and connections away from liquids and moisture.
- 4 Check the cables and power plug for damage and replace damaged cables and power plugs.



# **NOTICE**

## Risk of damage to balance due to incorrect parts

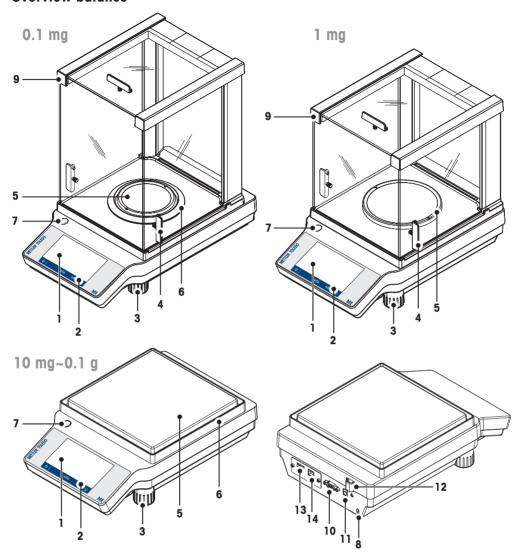
Using incorrect parts with the balance can damage the balance or cause the balance to malfunction.

 Only use parts supplied with the balance, listed accessories and spare parts from Mettler-Toledo GmbH.

# 3 Design and Function

# 3.1 Overview

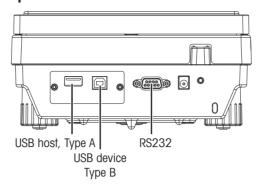
# 3.1.1 Overview balance



# Balance overview legend

1	Capacitive color TFT touch screen	2	Operating keys
3	Level indicator	4	Draft shield element
5	Weighing pan	6	Handle for operation of the draft shield door
7	Glass draft shield	8	Leveling foot
9	Legal for trade (LFT) sealing	10	Kensington slot for anti-theft purposes
11	Socket for AC/DC adapter	12	RS232 serial interface
13	USB device	14	USB host

# 3.1.2 Overview peripheral devices

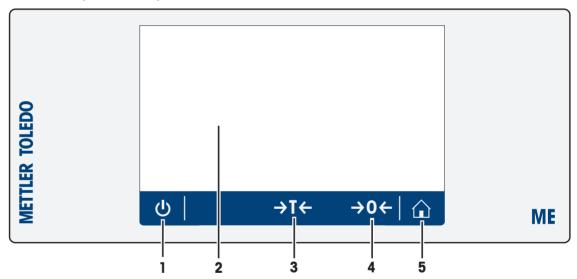


Interfaces and possible connectivity of peripheral devices:

USB Device	RS232	USB Host
PC	RS-P20 / P-50 printer	Barcode reader
	Barcode reader	USB-P25 printer
	RS 2 <sup>nd</sup> display	P-50 printer
	PC	USB memory stick

For more information about peripheral devices, **see** [Accessories ▶ Page 103].

# 3.1.3 Overview operation keys



### Terminal keys legend

No.	Key	Name	Explanation
1	மு	ON/OFF	Switches the balance on or off.
2		Capacitive color TFT touch screen	General navigation
3	→T←	Tare	Tares the balance.
4	<b>→0</b> ←	Zero	Zeros the balance.
5	$\hat{\mathbf{\Omega}}$		Returns from any menu level, or other window to the application home screen.

### 3.2 User Interface



## **NOTICE**

### Risk of damaging the touch screen with pointed or sharp objects

Do not use pointed or sharp objects to navigate the touch screen. This may damage the surface of the touch screen.

Operate the touch screen with your fingers.

The screen is a capacitive color TFT touch screen. The screen displays information and allows the user to enter commands by tapping certain areas on its surface. You can choose the information displayed on the screen, change the balance settings and perform certain operations on the balance.

Only those elements which are available for the current dialog appear on the display.

### 3.2.1 Application home screen

The application home screen appears after switching the balance on. It always displays the last application that was in use before the balance was switched off. The application home screen is the main screen of the balance. Every function can be accessed from here. You can return to the application home screen at any time by pressing the home button  $\widehat{\mbox{\mbox{}}}$  in the lower right corner of the screen.



### Information and work bars

	Name	Explanation
1	Weighing information bar	Displays the weighing-in aid and general balance information.
2	Work title bar	Displays information about the current activity.
3	Value bar	Displays information about the current weighing process.
4	Main navigation	Work-related functions.

### Information fields

	Name	Explanation
5	Weighing-in aid	A dynamic graphic indicator displays how much of the total weighing range is in use.
6	Short balance information	Readability and capacity of the balance.*
7	Weighing value field	Displays the value of the current weighing process (model-specific).
8	Coach text field	Displays instructions for the current weighing process.

<sup>\*</sup> For approved balances: **Min** (minimum capacity) and **e** (verification of scale interval) are shown in the upper left corner.

#### **Action buttons**

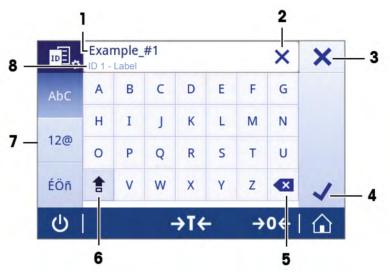
	Name	Explanation
9	Main activity configuration	To configure the current application (e.g. Weighing).
10	Detailed balance information	Displays detailed technical data about the balance.
11	Weighing unit	Displays the unit of the current weighing process (model- and country-specific).
12	Activities	Opens the activities selection.
13	Print	Prints out results and/or settings (printer required).
14	Settings/preferences	Configures settings/preferences.
15	Status information field	Displays information about the system status.

## 3.2.2 Input dialogs

## 3.2.2.1 Entering characters and numbers

The keyboard allows the user to enter characters, including letters, numbers and a range of special characters.

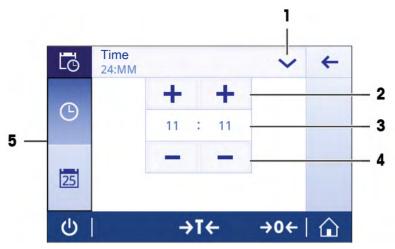
If a barcode reader is connected to your balance and your sample provides a barcode, scan the product barcode instead of entering the designation manually. The name of the sample appears in the respective information field and can be printed on the reports. The ID is frequently scanned via barcode reader to ensure that the sample is clearly assigned to the corresponding product.



	Name	Explanation
1	Input field	Displays all characters that have been entered.
2	Delete all	Deletes all entered characters.
3	Discard	Discards the entered data and exits the dialog.
4	Delete	Deletes the last character.
5	Confirm	Confirms the data entered.
6	Shift	Switches between lower and upper case letters.
7	Specialized tabs	Switches keyboard mode for entering letters, numbers or special characters.
8	Explanation field	Extra information about the value to be entered (e.g. maximum number of characters available).

### 3.2.2.2 Changing the date and time

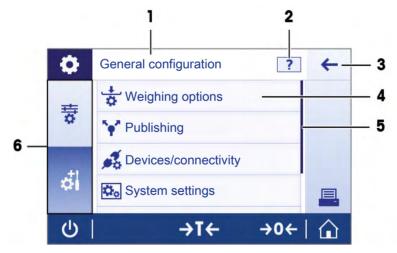
The dialog (Picker view) allows the user to set the date and time.



	Name	Explanation
1	Change date/time format	Various date/time formats can be selected.
2	Pick button	Increment.
3	Picker field	Displays the defined time/date.
4	Pick button	Decrement.
5	Selection tabs	Tabs of the selectable sub-categories.

### 3.2.3 Lists and tables

The basic elements in a simple list include a content title and a list of sub-elements. Tapping an element opens a list of sub-elements or an input dialog.



	Name	Explanation
1	List title	Title of the current list.
2	Contextual help	Additional information about the current process
3	Back button	Moves go one step back.
4	List element title	Title of the list element.
5	Scroll position	Scrolls through the list.
6	Selection tabs	Tabs of the selectable sub-categories.

### 3.2.4 Detailed balance information

- Tap i to open the general balance information menu.

#### **Balance** information

Tap **\boxed** to display **Balance identification**.

The display shows the **Balance identification** as defined by the user (**see** the chapter System settings) and information about the software and hardware.

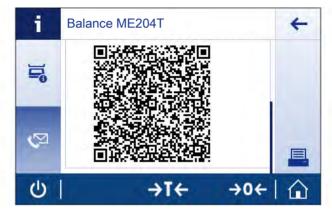
### **Balance support information**

Tap ♥ to display Support and service.

The display shows the Service information, Support information, and Quick support request.

### **Quick support request**

The **Quick support request** option contains a unique QR code. If you have a QR (Quick Response) code reader on your smart phone, you can take a picture of the QR code. The smartphone then creates an email with all relevant service information.

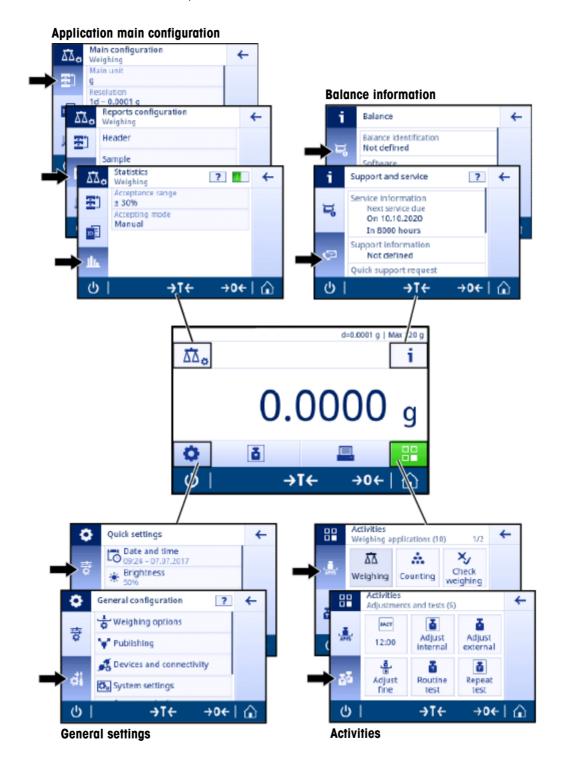




Make sure that the QR code can be identified by the smart phone. A program to read the QR codes must be installed. Make sure that there are no access restrictions, which could block your email program in some way.

## 3.3 Main settings and activities at a glance

The diagram below provides an overview of the main settings of an application (in this case, **Weighing**). Depending on the application, the options available to be selected and their content may differ. All applications is based on this concept.



## 3.3.1 Touch screen navigation

To interact with the balance, use the screen and the operating keys at the bottom of the screen. Using the screen to navigate is similar to using a smartphone or tablet PC.

### Opening an application

### Navigation: 🖫 > 🚣 Activities - Weighing applications

To open settings or applications, tap with your finger on the application symbol (e.g.  $\overline{\Delta \Delta}$  **Weighing**).

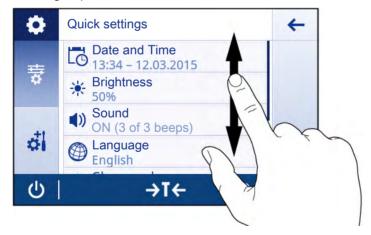
There is not enough space to show all the weighing applications on one screen. Scroll horizontally to reach the applications on the second page.



### **Scrolling**

### Navigation: 🖸 > 늏 Quick settings

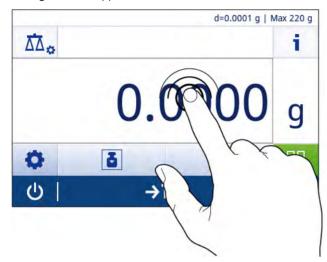
When the options are too numerous to be displayed on one screen, a blue bar on the right side appears. This means that the user can scroll up and down. To scroll simply place your finger anywhere on the list and drag it up or down.



### **Using shortcuts**

To simplify navigation on the capacitive color TFT touch screen, there are a few shortcuts that provide quick access to key areas of the balance. For example, the weighing value field on the application home screen works as a shortcut (see screen below), as does the weighing unit next to the weighing value field. Other shortcuts may be available to use depending on the application.

Every setting that can be changed directly via shortcut, can also be changed in the main configuration settings for that application.



# 4 Installation and Putting into Operation



# **MARNING**

### Risk of electric shock

The balance must be disconnected from the power supply before performing all setup and assembly work.

# 4.1 Scope of delivery



# **NOTICE**

### Risk of damage to balance due to incorrect parts

Using incorrect parts with the balance can damage the balance or cause the balance to malfunction.

 Only use parts supplied with the balance, listed accessories and spare parts from Mettler-Toledo GmbH.

Components		Model		
		0.1 mg	1 mg	10 mg / 100 mg
Draft shield	high, 235 mm	<b>✓</b>	_	_
	low, 170 mm	_	1	_
Weighing pan with pan support	ø 90 mm	✓	_	_
	ø 120 mm	_	1	_
	180 × 180 mm	_	_	✓
Draft shield element		1	_	✓
Pan support		_	_	✓
Protective cover		1	1	✓
Universal AC/DC adapter		-	1	✓
AC/DC adapter with country-specific power cable		✓	-	-
Operating Instructions or User Manua depending on country of use	; printed or on CD-ROM	✓	✓	<b>✓</b>
Declaration of conformity		✓	1	1

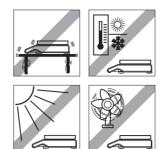
# 4.2 Selecting the location

A good location will enable the balance to work accurately and reliably. The surface must be able to safely take the weight of the balance when fully loaded. The following local conditions must be observed:

If the balance is not horizontal at the outset, it must be leveled during commissioning.

- Operate the balance in indoor environments only and at an altitude of less than 4000 m above sea level.
- Before switching on the balance, leave the parts to reach room temperature (+5 to 40°C).
   Ensure that the relative humidity is between 10% and 80% and non-condensing conditions are met.
- The power plug must be easily accessible.

- Find a firm horizontal location which is as free from vibrations as possible.
- · Avoid direct sunlight.
- Avoid excessive temperature fluctuations.
- Avoid powerful drafts.
- Ensure that the surroundings as free from dust as possible.

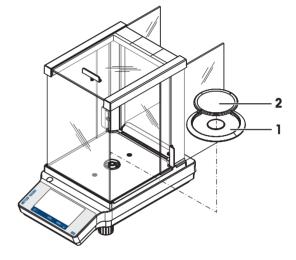


# 4.3 Installing components

### Balances with readability of 0.1 mg

Place the following components on the balance in the specified order:

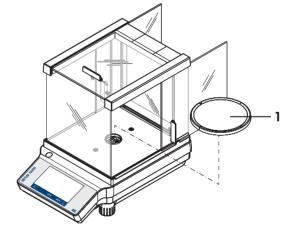
- 1 Push the side glass doors back as far as they will go.
- 2 Insert the draft shield element (1).
- 3 Insert the weighing pan (2).



### Balances with readability of 1 mg

Place the following components on the balance in the specified order:

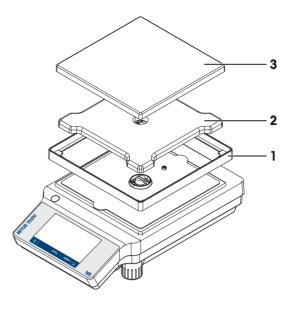
- 1 Push the side glass doors back as far as they will go.
- 2 Insert the weighing pan (1).



## Balances with readability of 10 mg / 100 mg

Place the following components on the balance in the specified order:

- 1 Place the draft shield element (1).
- 2 Carefully pull apart the draft shield element to fix it under the retaining plate.
- 3 Place the pan support (2).
- 4 Place the weighing pan (3).



# 4.4 Installing protective cover

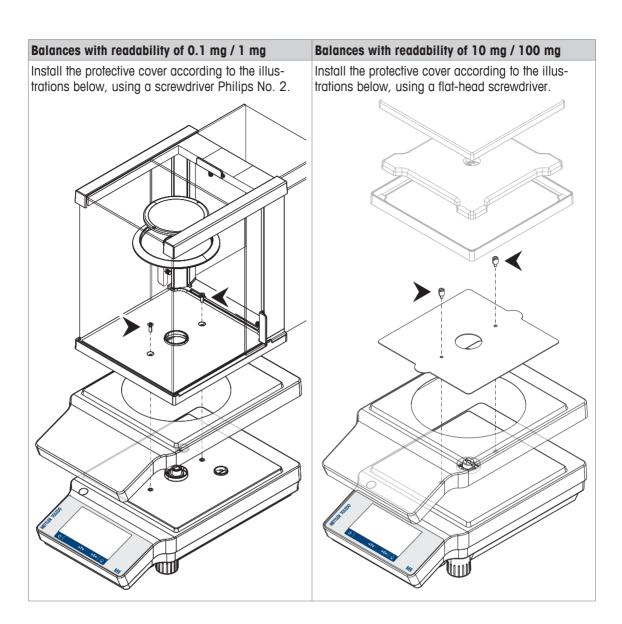


# **NOTICE**

## Risk of damage to balance due to incorrect parts

Using incorrect parts with the balance can damage the balance or cause the balance to malfunction.

 Only use parts supplied with the balance, listed accessories and spare parts from Mettler-Toledo GmbH.



## 4.5 Connecting the balance



### **↑** WARNING

### Risk of electric shock

Contact with parts that contain a live current can lead to injury and death.

- Only use the METTLER TOLEDO power supply cable and AC/DC adapter designed for your balance.
- 2 Connect the power cable to a grounded power outlet.
- 3 Keep all electrical cables and connections away from liquids and moisture.
- 4 Check the cables and power plug for damage and replace damaged cables and power plugs.



# **NOTICE**

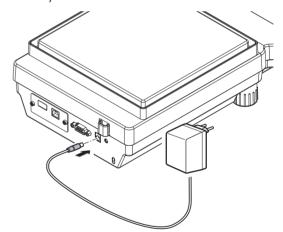
## Risk to the AC/DC adapter due to overheating

If the AC/DC adapter is covered or in a container, it is not sufficiently cooled and will overheat.

- 1 Do not cover the AC/DC adapter.
- 2 Do not put the AC/DC adapter in a container.

The balance is supplied with a universal AC/DC adapter or an AC/DC adapter with a country-specific power cable.

- Install the cables so that they cannot be damaged or interfere with operation.
- Insert the power cable in a grounded power outlet that is easily accessible.
- 1 Connect the AC/DC adapter to the connection socket on the back of your balance (see figure) and to the power line.
- 2 Screw the plug tight to the balance.
- ⇒ The balance is ready for use.



# 4.6 Setting up the balance

## 4.6.1 Switching on the balance

Before using the balance, it must be warmed up in order to obtain accurate weighing results. To reach operating temperature, the balance must be connected to the power supply for at least 30 minutes (60 minutes for 0.1 mg models).

- The balance is connected to the power supply.
- Press (b).
  - ⇒ After the start screen has disappeared, the application home screen will open.
- ⇒ The balance is ready to use.

When the balance is switched on for the first time, the **Weighing** application home screen will open. If the balance is switched on again, it will always go to the home screen of the application last used before switching it off.

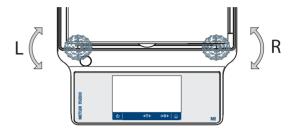
## 4.6.2 Leveling the balance

Exact horizontal and stable positioning are essential for repeatable and accurate weighing results.

There are two adjustable leveling feet to compensate for slight irregularities in the surface of the weighing bench.

The balance must be leveled and adjusted each time it is moved to a new location.

- 1 Position the balance at the selected location.
- 2 Align the balance horizontally.
- 3 Turning the two front leveling feet of the housing until the air bubble is in the middle of the glass.



### **Example**

Air bubble at 12 o'clock: turn both feet clockwise.

Air bubble at 3 o'clock: turn left foot clockwise, right foot counterclockwise.

Air bubble at 6 o'clock: turn both feet counterclockwise.

Air bubble at 9 o'clock: turn left foot counterclockwise, right foot clockwise.

## 4.6.3 Adjusting the balance

To obtain accurate weighing results, the balance must be adjusted to match the gravitational acceleration at its location. This is also dependent on the ambient conditions. After reaching the operating temperature, it is important to adjust the balance in the following cases:

- Before the balance is used for the first time.
- After reaching the operating temperature.
- If the balance has been disconnected from the power supply or in the event of power failure.
- After significant environmental changes (e. g. temperature, humidity, air draft or vibrations)
- At regular intervals during weighing service.

# 4.7 Performing a simple weighing

This section describes how to perform a simple weighing operation. The basic navigation concept and the basic functions of the balance are also explained.

When you switch on the balance for the first time, the **Weighing** application home screen opens automatically. If the balance has already been used, the application that was last used before the balance was switched off will open. If another application is running, switch to **Weighing**.

Navigation:  $\square > \frac{1}{APF}$  Activities - Weighing applications  $> \overline{\Delta\Delta}$  Weighing

- 1 Press  $\rightarrow 0 \leftarrow$  to zero the balance.
  - ⇒ The application home screen appears.
- 2 Place the sample on the weighing pan.
  - ⇒ The instability symbol appears and the value in the weighing value field becomes light blue.

- 3 Wait until the instability symbol **O** disappears and the value in the weighing value field becomes **dark blue** again.
  - ⇒ The weighing process is complete.
  - ⇒ The results are now displayed.

### Zeroing

Use the  $\rightarrow 0 \leftarrow$  zeroing key before starting to weigh anything.

- 1 Unload the balance.
- 2 Press  $\rightarrow 0 \leftarrow$  to zero the balance.
- ⇒ All weight values are measured in relation to this zero point.

#### Tarina

If you are working with a weighing container, tare the balance.

- 1 Place a container on the weighing pan.
  - ⇒ The weight is displayed.
- 2 Press  $\rightarrow$ **T** $\leftarrow$  to tare the balance.
  - ⇒ 0.000 g and Net appears in the display. Net indicates that all weight values displayed are net values.
- 3 Place the sample in the container.
  - ⇒ The results are now displayed.
- If the container is removed from the balance, the tare weight will be shown as a negative value.
- The tare weight remains stored until the → T ← key is pressed again or the balance is switched off.

## Switching weight units

There are several weighing units available. The default value is country-specific.

The weighing unit can be selected using the main configuration of the current application or via shortcut. This example describes how to change the weighing unit via shortcut.

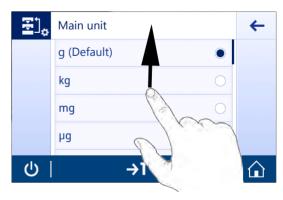
#### Legal-for-trade

With approved balances, the menu topic has a fixed setting and cannot be changed.

- 1 Tap the weighing process unit (shortcut) **gram (g)**.
  - ⇒ The screen Main unit appears.



- 2 Place your finger somewhere on the list and swipe up to scroll down.
- 3 Select another weighing unit (e.g. **ounce (oz)**) by tapping it.
- 4 Tap  $\checkmark$  to confirm.
- ⇒ The weighing unit **gram (g)** has now been changed to **ounce (oz)**.



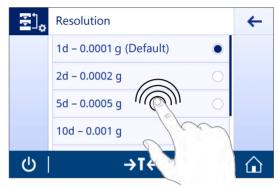
### Changing the resolution

There are several resolutions available. The default resolution is instrument-specific.

1 Tap the weighing value field.



- 2 Tap 10d 0.001 g.
- 3 Confirm the selected resolution by tapping  $\checkmark$ .
- ⇒ The resolution has now been changed.



#### Print / transmit data

The balance can send data to a printer or a PC. Press the 🗏 key to transmit the weighing results or settings via the interface. The procedure for activating and configuring a printer is described in the chapters "Publishing" and "Devices and connectivity".

- Printer is connected to the balance.
- Printer is switched on.
- Printer is activated and configured.
- Tap ■.
  - ⇒ The data are transmitted.

#### Switching off

- 1 Press and hold  $\textcircled{\textbf{U}}$  until the dialog **Switch-off** appears.
- 2 Tap  $\checkmark$  to confirm.
  - ⇒ The balance switches off and enters standby mode.
- After switching on from standby mode, the balance does not need to warm up. It is immediately ready to start weighing.
- If the balance has been switched off manually, the display will also be off.
   To switch off the balance fully, it must be disconnected from the power supply.

## 4.8 Transporting the balance

- 1 Press and hold the U key.
- 2 Disconnect the balance from the power supply.
- 3 Disconnect all interface cables.

### Transporting over short distances

To move the balance over a short distance to a new location, follow the instructions below.

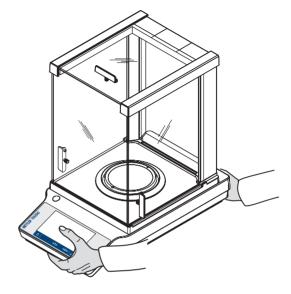


## **NOTICE**

### Risk of damage to the glass draft shield

Glass parts on the balance can become damaged.

- Do not lift the balance by the glass draft shield. The draft shield is not sufficiently fastened to the balance to allow for this.
- 1 Hold the balance with both hands as shown.
- 2 Carefully lift the balance and carry it to its new location.



### Transporting over long distances

We recommend using the original packaging for transportation or shipment of the balance or balance components over long distances. The elements of the original packaging are developed specifically for the balance and its components and ensure maximum protection during transportation.

## 4.9 Weighing below the balance

Your balance is equipped with a hanger for performing weighing operations below the work surface (weighing below the balance).



## **NOTICE**

### Risk of damage to the balance

Do not place the balance on the pan support location bolt.

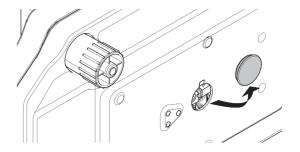


### |**■** Note

Models with a glass draft shield: carefully lift the draft shield from the weighing platform and put it aside.

- 1 Press and hold the **b** key.
- 2 Disconnect the balance from the power supply.
- 3 Disconnect all interface cables.

- 1 Remove weighing pan, pan support and draft shield element if present.
- 2 Turn the balance carefully on its side.
- 3 Remove the cap. Keep it for later use.
- 4 Turn the balance to its usual position and simply reinstall all components in the reverse order.



# **5** General Settings

Navigation: D

The section **Settings** is divided into two sub-sections:

- Quick settings
- General configuration

# 5.1 Quick settings

Navigation: 🖸 > Quick settings

The following options are available:

- Date and Time
- Brightness
- Sound
- Language
- Glove mode
- Quick adjustment
- Date/Time widget

### 5.1.1 Date and time

Navigation:  $\Box > \overline{\overline{\overline{\overline{\overline{\overline{\overline{\overline{\overline{\overline{\overline}}}}}}}}}$  Quick settings > Date and Time

This menu item can be used to set the date and time. Tap (a) for **Time** and (as for **Date**. The format can be selected by tapping .

Parameter	Explanation	Values
Time format	Sets the time format.	24:MM*   12:MM   24.MM   12.MM
Time	Sets the time.	Hours I Minutes
	The time can be set with the pick buttons.	
Date format	Sets the date format.	DD.MM.YYYY*   D.MMM YYYY   MM/DD/ YYYY   MMM DD YYYY   YYYY-MM-DD
Date	Sets the date.	Day I Month I Year
	The date can be set with the pick buttons.	

<sup>\*</sup> Factory setting

### 5.1.2 Brightness

### Navigation: O > 壹 Quick settings > Brightness

This menu item can be used to adjust the display brightness. Each time you tap the bar, the brightness adjusts in increments of 10%.

The following options can be set:

Parameter	Explanation	Values
Brightness	Sets the brightness of the display (in 10% increments).	10100% (50%*)

<sup>\*</sup> Factory setting

### 5.1.3 Sound

Navigation: 口 > 壹 Quick settings > Sound

This menu item can be used to adjust the sound and the sound volume.

The following options can be set:

Parameter	Explanation	Values
Stability beep	Indicates when an unstable weight becomes stable.	OFF   Low*   Medium   High
Workflow feedback beep	Provides additional feedback in the event of input errors, messages and status notifications.	OFF   Low*   Medium   High
Touch beep	Notifies every touch of the interactive elements on the touch display and zero/tare bar.	OFF*   Low   Medium   High

<sup>\*</sup> Factory setting

## 5.1.4 Language

## Navigation: 🌣 > 늏 Quick settings > Language

This menu item can be used to set the dialog language. The language changes immediately. All windows and messages are displayed in the selected language.

The following options can be set:

Parameter	Explanation	Values
Language	Sets the preferred language.  The language is normally preset for the country of use.	English   Deutsch   Français   Español   Italiano   Русский   Polski   Česky   Magyar   Nederlands   Português PT.   Português BRA.   Türkçe   中文   日本語   한국어

### 5.1.5 Glove mode

### 

If **Glove mode** activated, the touch screen becomes more sensitive and easier to navigate when wearing gloves.

The following options can be set:

Parameter	Explanation	Values
Glove mode	Activates or deactivates the function <b>Glove mode</b> .	ON I OFF*

<sup>\*</sup> Factory setting

## 5.1.6 Quick adjustment

### Navigation: 🖸 > 향 Quick settings > Quick adjustment

If **Quick adjustment** is activated, the symbol appears in the main navigation of the application. You can start the adjustment directly from the work area.

The following options can be set:

Parameter	Explanation	Values
Quick adjustment	Activates or deactivates Quick adjustment.	Internal adjustment
		(model-specific) I
		External adjustment

<sup>\*</sup> Factory setting

### 5.1.7 Date/Time widget

Navigation: ♥ > \frac{1}{15} Quick settings > Language

This option can be activated to permanently display the current date and time in the work area in the value bar above the weighing value field.

Parameter	Explanation	Values
Date/Time widget	Activates or deactivates the permanent display of the current	ON I OFF*
	date and time in the work area.	

<sup>\*</sup> Factory setting

## 5.2 General configuration

## Navigation: D > d General configuration

The following options are available:

- Weighing options
- Publishing
- Devices/connectivity
- · System settings
- Access protection
- ISO-Log

## 5.2.1 Weighing options

### Navigation: ♥ > ₺ General configuration > Weighing options

This menu item can be used to adapt the balance to suit specific requirements.

### 5.2.1.1 Weighing mode

### Navigation: ♥ > ₺ General configuration > Weighing options > Weighing mode

This setting can be used to configure the balance to the weighing mode.

The following options can be set:

Parameter	Explanation	Values
Weighing mode	Sets the weighing mode.	Universal*   Dosing
	<b>Universal</b> = for all standard weighing applications.	
	<b>Dosing</b> = for dosing liquid or powdery samples.	

<sup>\*</sup> Factory setting

### 5.2.1.2 Environment

### Navigation: 🗘 > 🗗 General configuration > Weighing options > Environment

This setting is used to adapt the balance optimally to the ambient conditions at specific locations.

The following options can be set:

Parameter	Explanation	Values
Environment	Sets the ambient conditions.	Stable I Standard* I Unstable I Very unstable

<sup>\*</sup> Factory setting

#### 5.2.1.3 Autozero

## Navigation: 🗘 > 🖒 General configuration > Weighing options > Autozero

This menu item can be used to switch the automatic zero correction on or off. It corrects the zero deviation, that may occur e.g. due to slight fouling of the weighing pan.

#### Legal-for-trade

The **Autozero** cannot be deactivated for approved balances (except for some selected countries).

Parameter	Explanation	Values
Autozero	Activates or deactivates the automatic zero correction.	ON* I OFF

<sup>\*</sup> Factory setting

### 5.2.1.4 Auto tare

### Navigation: ♥ > # General configuration > Weighing options > AutoTare

Tare automatically the first weight loaded on the empty weighing pan (zeroed). This function applies to all applications except for **Formulation** and **Back-weighing**.

The following options can be set:

Parameter	Explanation	Values
AutoTare	Activates or deactivates the auto tare function.	ON I OFF*

<sup>\*</sup> Factory setting

### 5.2.1.5 Auto clear tare

## Navigation: ♥ > # General configuration > Weighing options > Auto clear tare

If the function **Auto clear tare** activated, the current tare is automatically cleared after removing all loaded weight from the weighing pan. This function applies to all applications except for **Formulation** and **Backweighing**.

The following options can be set:

Parameter	Explanation	Values
Auto clear tare	Activates or deactivates the auto clear tare function.	ON I OFF*

<sup>\*</sup> Factory setting

### 5.2.1.6 Recall

### Navigation: ♥ > # General configuration > Weighing options > Recall

To retain and recall the last stable weight.

Parameter	Explanation	Values
Recall	Activates or deactivates recall.	ON I OFF*

<sup>\*</sup> Factory setting

## 5.2.2 Publishing

## Navigation: □ > d General configuration > Publishing

In this section, the print and output options can be set.

The options available in this section may vary depending on the connected and in the section "Device and Connectivity" configured - peripheral device. Not every option described in this section may be available for the peripheral device in question.

### **Print**

This option can be activated or deactivated. An example workflow of how a USB printer could be set up correctly to publish the data is shown below. As a prerequisite, the printer needs to be configured correctly beforehand in the section "Device and Connectivity".

- 1 Tap Print.
  - ⇒ The screen **Print** appears.
- 2 Tap Printer.
- 3 Tap e.g. USB printer.
- 4 Tap  $\checkmark$  to confirm.
- 5 Tap Single values report.
- 6 Select e.g. Automatic, stable.
- 7 Tap  $\checkmark$  to confirm.
  - ⇒ The next stable weight is automatically printed.
- 8 Tap Workflow reports.
  - ⇒ The screen **Workflow reports** appears.
- 9 Select e.g. Automatic.
- 10 Tap ✓ to confirm.
  - ⇒ The workflow report is automatically printed.
  - ⇒ The screen **Print** appears.
- 11 Tap to return to the previous screen.

The following options can be set:

Parameter	Explanation	Values
Printer	Defines to which printer the data will be sent. The printer is configured as set out in the section "Device and Connectivity".	Serial printer I USB printer I Print to file
	<b>Print to file</b> = save data to a USB stick.	
Single values report	Sets the behaviour of the printer for single values.	Manual, stable*   Manual, all values   Automatic, stable   Automatic, stable (zero included)
Workflow reports	Sets the workflow for the reports.	Automatic* I Manual
FACT report	Defines whether the FACT report is being printed automatically or must be printed manually after the adjustment.	Automatic* I OFF

<sup>\*</sup> Factory setting

#### Send value

The values can be transmitted via the RS232 interface or the USB connection.

Parameter	Explanation
Manual, stable*	Send next stable weight at will

Manual, all values	Send any stable or unstable weight at will	
Automatic, stable	Send next stable weight automatically	
	The next stable weight is sent after a minimal deviation, <b>see</b> table relationship between resolution and deviation below.	
Automatic, continuous	Send any stable or unstable weight automatically	

<sup>\*</sup> Factory setting

# Table relationship between resolution and deviation

Resolution	Min. deviation
0.001 mg	0.001 g
0.01 mg	0.01 g
0.1 mg	0.1 g
0.001 g	1 g
0.01 g	1 g
0.1 g	1 g
1 g	5 g

## **Advanced options**

Parameter	Explanation	Values
Adjustments/ Tests – Reports configuration	Defines the <b>Header</b> and <b>Footer</b> for the adjustment and test reports.	Header I Footer
Autopublish	Sets the publishing time interval of single values.	ON numerical values (165535 seconds) I OFF*
Commands options	Activates or deactivates the function <b>Print and tare</b> . The balance will tare automatically after publishing.	ON I OFF*

<sup>\*</sup> Factory setting

## 5.2.3 Devices and connectivity

## Navigation: ♥ > ₺ General configuration > Devices and connectivity

This section describes to configure how the peripheral devices.

- 1 Tap e.g **RS232**.
  - $\Rightarrow$  The screen **RS232** appears.
- 2 Tap e.g Baudrate.
  - ⇒ The screen **Baudrate** appears.
- 3 Tap e.g 9600.
- 4 Tap  $\checkmark$  to return to the **RS232** screen.
- 5 If necessary, change the other settings.
- 6 Tap  $\checkmark$  to return to the **Devices and connectivity** screen.

### **RS232**

Parameter	Values	
Device type	P-20*   P-50   Printer   Host   PC-Direct   Second display   Barcode Reader	
Command set	MT-SICS*   MT-PM   Sartorius 22   Sartorius 16	
	MT-SICS = MT-SICS data transfer format is used.	
	MT-PM = emulates the data format of PM balances.	
	Sartorius 22/Sartorius 16 = emulates the data format of Sartorius balances.	
Baudrate	600   1200   2400   4800   9600*   19200   38400   57600   115200	
	(available values are device-specific)	
Bit/Parity	8/No*   7/No   7/Mark   7/Space   7/Even   7/Odd	
Stop bits	1 bit*   2 bits	
Handshake	Xon/Xoff*   RTS/CTS   None	
Character set	IBM/DOS*   ANSI/WIN   UTF-8	
	<b>UTF-8</b> = is a character encoding capable of encoding all possible characters, or code points, defined by unicode (device-specific).	
End of line	<cr><lf>*   <cr>   <lf>   <tab></tab></lf></cr></lf></cr>	
	<cr><lf> = writes in the same column (e.g. in Excel).</lf></cr>	
	<tab> = writes in the same row (e.g. in Excel).</tab>	

<sup>\*</sup> Factory setting

# USB Device (Typ B)

The following options can be set:

Parameter	Values	
Device type	Host*   PC-Direct	
Command set	MT-SICS*   MT-PM   Sartorius 22   Sartorius 16	
	MT-SICS = MT-SICS data transfer format is used.	
	MT-PM = emulates the data format of PM balances.	
	Sartorius 22/Sartorius 16 = emulates the data format of Sartorius balances.	
Character set	ANSI/WIN*	
	Cannot be changed.	
End of line	<cr><lf>*   <cr>   <lf>   <tab></tab></lf></cr></lf></cr>	
	<cr><lf> = writes in the same column (e.g. in Excel).</lf></cr>	
	<tab> = writes in the same row (e.g. in Excel).</tab>	

<sup>\*</sup> Factory setting

# USB Host (Typ A)

The following options can be set:

Parameter	Values	
Device type	not selectable	
Character set	IBM/DOS   ANSI/WIN*   UTF-8	
	<b>UTF-8</b> = is a character encoding capable of encoding all possible characters, or code points, defined by unicode (device-specific).	
End of line	<cr><lf>*   <cr>   <lf></lf></cr></lf></cr>	

<sup>\*</sup> Factory setting

## 5.2.4 System settings

### Navigation: 🗘 > 🛊 General configuration > System settings

This section describes the procedure for adapting the balance to suit specific requirements.

- 1 Tap System settings.
  - $\Rightarrow$  The screen **System settings** appears.
- 2 Tap e.g. Sleep mode.
- 3 Activate Sleep mode.
- 4 Tap  $\checkmark$  to return to the **System settings** screen.
- 5 If necessary, change the other settings.
- 6 Tap  $\checkmark$  to return to the **General configuration** screen.

The following options can be set:

Parameter	Explanation	Values
Balance identifi- cation	Defines a balance identification.	Values can be defined individually.
Sleep mode	Determines when the screen saver appears with date and time. Tap on the screen to exit the screen saver.	After 30 seconds After 1 minute After 2 minutes After 5 minutes After 10 minutes*
Backlight OFF	Determines when the display turns off.  Tap the screen to end <b>Backlight OFF</b> mode.	After 30 seconds After 1 minute After 2 minutes After 5 minutes After 10 minutes
Quick wake up	Terminates Sleep mode and/or Backlight OFF.	ON* I OFF
	By placing the sample on the weighing pan, the <b>Sleep mode</b> and/or <b>Backlight OFF</b> will be terminated.	
Out of level notification	Activates or deactivates the function <b>Out of level notification</b> .	ON* I OFF
Service due notification	Activates or deactivates the function <b>Service due notification</b> .	ON* I OFF

<sup>\*</sup> Factory setting

If **Sleep mode** and **Backlight OFF** have the same value, the screen saver briefly appears before the backlight switches off.

#### System and data management

The following options can be set:

Parameter	Explanation
Touch screen adjustment	The balance performs a screen adjustment.
Reset balance	Resets the balance to factory settings.
Backup and restore	Generates a backup of the current balance settings (excluding MinWeigh and Service due notification settings).
	To execute a backup, an external storage device must be connected to the USB host (Type A).



By resetting the balance, any changes to the general settings and contextual settings that have been made along with any temporary collected data (e.g. paused applications or statistics) will be lost.

### 5.2.5 Access protection

## Navigation: ♥ > ₺ General configuration > Access protection

The function **Access protection** enables certain functionalities of the balance to be protected by a numerical passcode.

- 1 Tap Access protection.
  - ⇒ The screen Access protection appears.
- 2 Activate the appropriate protection.
- 3 Tap  $\checkmark$  to return to the **General configuration** screen.

The following options can be set:

Parameter	Explanation	Values
Applications	Activates or deactivates application protection.	ON I OFF*
Adjustments and tests	Activates or deactivates the protection of the adjustments and tests.	ON I OFF*
Settings	Activates or deactivates the protection of all settings.	ON I OFF*
Passcode	Defines the passcode by the user.	19 (1-12 digits)

<sup>\*</sup> Factory setting

### User passcode

The user passcode can be defined by the user. The default value is 12345678. The length of the configurable user passcode is restricted to 12 digits.

Passcode and access options are not affected by a balance reset.

### What if you forget the passcode?

If you forget or lose the passcode, please contact a METTLER TOLEDO representative.

## 5.2.6 ISO-Log

### Navigation: □ > d General configuration > ISO-Log

In this section, detailed information about adjustments already performed, intensity of use and settings can be displayed.

- 1 Tap ISO-Log.
  - ⇒ The screen **ISO-Log** appears.
- 2 Tap e.g. **▼ ISO-Log Adjustments**.
  - ⇒ The screen **ISO-Log Adjustments** with all results appears.
- 3 Tap to return to the configuration screen.
- 4 Tap ← to return to the application home screen.

The following options can be selected:

Parameter	Explanation
ISO-Log – Adjustments	Displays detailed information about adjustments already performed.
ISO-Log – Balance	Displays detailed information about the balance history.
ISO-Log – Settings and status	Displays detailed information about setting changes.

# **6 Application Settings**

## Navigation: 🖫 > 🚣 Activities - Weighing applications

Each application can be defined manually via its application settings. Select the application and tap the application settings symbol in the upper left corner to define the application (e.g.  $\%_a$  in the application **Percent weighing**.

The application settings can only be changed if no measurement is in progress.

The available options may differ depending on the application. Most applications have the following options:

- **∑** Main configuration
- Reports configuration
- III Statistics

# 6.1 Main configuration

In this section, the current application individually be defined individually. The available options may vary depending on the application.

More information about the available options can be found in the activities section.

# **6.2** Reports configuration

In this section, the report options can be configured.

The available options are model and country-specific and may vary depending on the application.

#### Header

The following options can be set:

Parameter	Explanation	Values
Date, time	Defines if the date and time are shown on the report.	ON I OFF*
Balance type	To define if the balance type is shown on the report.	ON I OFF*
Serial number (SNR)	Defines if the serial number is shown on the report.	ON I OFF*
Balance ID	Defines if the balance ID appears.	ON I OFF*
Leveling infor- mation	Defines if the leveling information appear in the report.	ON I OFF*
ID 1	Defines if ID 1 appears on the report.	ON I OFF*
ID 2	Defines if ID 2 appears on the report.	ON I OFF*
ID 3	Defines if ID 3 appears on the report.	ON I OFF*
Signature line	Defines if the signature line is shown on the report.	ON I OFF*
Empty lines	Defines the number of empty lines (199).	ON I OFF*

<sup>\*</sup> Factory setting

#### Sample

The following options can be set:

Parameter	Explanation	Values
ID 4	Defines if ID 4 is shown on the report.	ON I OFF*
Gross/Tare	Defines if <b>Gross/Tare</b> is shown on the report.	ON I OFF*
Additional unit	Defines if an additional unit is shown on the report.	ON I OFF*

<sup>\*</sup> Factory setting

#### **Footer**

The following options can be set:

Parameter	Explanation	Values
Date, time	Defines if date and time is shown on the report.	ON I OFF*
Signature line	Defines if the signature line is shown on the report.	ON I OFF*
Empty lines	Defines the number of empty lines (199).	ON I OFF*

<sup>\*</sup> Factory setting

# 6.2.1 Working with IDs

Identifications (IDs) contain descriptive text for measurements, enabling samples to be easily allocated to specific tasks or customers. This feature defines identifications in order to be able comment on measurements, such as company ID, batch ID or sample ID.

Identifications must be defined under the application settings in the section **Reports configuration**. Usage and definition of the ID differ depending on the application for which the ID is used.

#### Identification dialog screen

The Identification dialog screen can slightly differ depending on the application in which the ID is used. The dialog screen always consists of two parts:

- The table with the ID definitions on the upper part of the screen.
- The Workflow options on the lower part of the dialog screen.

### 6.2.2 Defining an ID

The maximum length of an ID is 12 characters.

- 1 Open an application (e. g. Weighing).
- 2 Tap the application settings symbol in the upper left corner.
- 3 Tap **Reports configuration**.
- 4 Tap e.g. Header.
- 5 Tap ID 1.
  - ⇒ The input dialog **ID 1** appears. The input dialog is inactive.
- 6 Activate ID 1 with the switch in the title bar.
  - ⇒ The input dialog **ID 1** is activated.
- 7 Define ID 1 Label.
- 8 Tap  $\checkmark$  to confirm.
- 9 Define ID 1 Value.
- 10 Tap  $\checkmark$  to confirm.
  - ⇒ The screen ID 1 shows the values for ID Label and ID 1 Value.

- 11 Tap  $\checkmark$  to accept the defined values.
  - ⇒ The screen **Header Reports configuration** appears the defined ID.
- 12 Tap  $\checkmark$  to confirm.
  - ⇒ The screen Header Reports configuration appears.
- 13 Tap ✓ to confirm.



## 6.2.3 Workflow handling options

The workflow handling options differ depending on the application in which they are used. The following functions are available:

- Autoincrement
- Input prompt

#### **Autoincrement**

The function **Autoincrement** specifies that the last part of the ID is incremented with each use of that ID. There are two basic functions depending on how the ID is defined:

- If there is no counter in the ID, the system automatically adds a counter to the ID starting with 1 (e.g. the ID **Process** will be **Process1** in the next use).
- If a counter is part of the ID, the system automatically increments the ID starting at that counter (e.g. the ID **Process 1** will be **Process 2** in the next use).
- The counter must be set at the end of the ID, otherwise the system doesn't recognize the number as a counter (e.g. in **567Apple** the system doesn't recognize **567** as a counter).
- If the ID has no counter and a maximum length of 12 characters, the last few characters will be overwritten by the counter.

#### Assign to sample

If the option **Assign to sample** is activated, the ID will be used for each sample.

#### Input prompt

The **Input prompt** function can be used for every ID. If **Input prompt** is activated, the ID will be prompted on the display before it is used. The user can decide whether to use the default value that has been defined with the ID or define an individual value.

## 6.3 Statistics

The **Statistics** function generates statistics for a series of results. The **Statistics** function is not available for the applications **Totaling** and **Formulation**.

The **Automatic** setting is used to automatically transfer the result to the statistics. If using the **Manual** setting, the + key must be pressed to transfer the result.

If there are more than 3 values from a series in the statistics, the result is also displayed as a Gaussian curve.

If statistics are activated, the following options are available during the weighing process:

- Discard value
- Terminate application
- Discard data
- View result

#### Statistics configuration

The following options can be set:

Parameter	Explanation	Values
Acceptance range	Defines the acceptable deviation in relation to the average value.	1%100% (30%*)
Accepting mode	Defines if a weight sample is added automatically to the result.	Manual*   Automatic

<sup>\*</sup> Factory setting

#### **Defining statistics**

- 1 Open an application, e.g. Weighing.
- 2 Tap the main configuration symbol of the application, e.g.  $\Delta a$ 
  - ⇒ The main configuration screen appears.
- 3 Tap Ma.
  - ⇒ The screen **Statistics** appears.
- 4 Activate the **Statistics**.
- 5 Define the available options.
- 6 Tap  $\checkmark$  to confirm.

### Discard value

If a weighing value was incorrect, it can be discarded from the result. Discard is only possible up to the last time the balance was tared.

- 1 Tap —.
  - ⇒ The dialog screen Confirm discard appears. An overview with all values within the current weighing process is displayed.
- 2 Tap  $\checkmark$  to discard the last value from the result.
  - ⇒ The incorrect value has been deleted. The weighing process can be continued.

#### Terminate the application

- 1 Tap ■.
  - ⇒ A dialog screen appears.
- 2 Tap ✓ Finish.
  - $\Rightarrow$  The results are published according to the publishing configurations and the data are deleted.
  - ⇒ The application home screen appears.

### Discard data

All results are deleted.

- 1 Tap **■**.
  - ⇒ A dialog screen appears.
- 2 Tap x Discard.
  - ⇒ All data are deleted.
  - ⇒ The application home screen appears.

### View result

- Tap ■.
  - ⇒ A dialog screen appears.
- 2 Tap View result.
  - ⇒ The results are now displayed.
- 3 Tap 🗏 to publish the results according to the configurations.
- 4 Tap  $\checkmark$  to return to the previous screen.

### 7 Activities

Navigation: 💾

The **Activities** section includes the following two sub-sections:

- Activities Weighing applications
- Activities Adjustments and tests

# 7.1 Activities - Weighing applications

Navigation: 🖫 > 🚣 Activities - Weighing applications

There is not enough space to show all the weighing applications on one screen. Scroll horizontally to reach the other applications on the second page.

Activities - Weighing applications includes the following applications:

- Weighing, see [Weighing ▶ Page 44] and [Performing a simple weighing ▶ Page 22]
- Counting, see [Counting ▶ Page 45]
- Check weighing, see [Check weighing ▶ Page 49]
- Formulation, see [Formulation ▶ Page 52]
- Totaling, see [Totaling ▶ Page 54]
- Back-weighing, see [Back-weighing ▶ Page 57]
- **Dynamic weighing**, **see** [Dynamic weighing ▶ Page 60]
- Percent weighing, see [Percent weighing ▶ Page 62]
- **Density**, **see** [Density ▶ Page 63]
- Factor weighing, see [Factor weighing ▶ Page 65]

## 7.1.1 Weighing

### **Navigation**

 $\begin{bmatrix} \blacksquare \end{bmatrix}$  Activities >  $\begin{bmatrix} \bullet \\ ABS \end{bmatrix}$  Activities - Weighing applications >  $\begin{bmatrix} \triangle \Delta \end{bmatrix}$  Activities - Weighing applications

The **Weighing** application allows the user to perform simple weighing operations.

For more information about the basic weighing functions, **see** [Performing a simple weighing ▶ Page 22].

The statistics function can be activated; information on this topic can be found in the chapter [Statistics ▶ Page 41].

### Weighing – Main configuration

Parameter	Explanation	Values
Main unit	Sets the main unit of the weighing process.  The available units are model- and country-specific.	g*   mg   µg   ct   N   oz   ozt   GN   dwt   mom     msg   tlh   tls   tlt   tcl     tola   baht   lb:oz
Secondary information	Activates or deactivates the secondary information displayed on screen.  Additional unit*	ON I OFF*
	Selects the secondary information displayed on screen. The available units are model- and country-specific.	
	Current tare Current tare weight.	
Resolution	Defines the resolution of the weighing process.  The available resolutions are model-specific.	1d - 0.0001 g* l 2d - 0.0002 g l 5d - 0.0005 g l 10d - 0.001 g l 100d - 0.01 g l 1000d - 0.1 g
Target and	Defines the target weight and tolerances.	ON I OFF*
tolerances	<b>Target weight</b> Predefines a target weight. The value can be selected manually or by weighing.	
	Upper tolerance Defines the upper tolerance.	
	Lower tolerance Defines the lower tolerance.	
	If the value for Target weight, Upper tolerance or Lower tolerance has been defined, the option title Target and tolerances will be replaced by the defined values.	

<sup>\*</sup> Factory setting

### Setup the weighing application

- 1 Tap 🗖 🚜.
  - $\Rightarrow$  The screen **Weighing Main configuration** appears.
- 2 Tap e.g. Main unit.
  - ⇒ The screen **Main unit** appears.
- 3 Select the desired unit by tapping it.
- 4 Tap  $\checkmark$  to confirm.
  - ⇒ The screen **Weighing Main configuration** appears.
- 5 Tap  $\checkmark$  to confirm the configuration.

## 7.1.2 Counting

Navigation: 🖫 Activities > 🚣 Activities - Weighing applications > 🔥 Counting

The **Counting** application determines a specific number of pieces based on a predetermined reference piece weight.

There are two counting modes available: **Advanced** and **Standard**. With the additional features of **Advanced** mode, the entire process is more comfortable and more secure due to an automatic workflow. The mode can be changed in the section **Counting – Main configuration**. Default mode: **Advanced**.

The statistics function can be activated; information on this topic can be found in the chapter [Statistics > Page 41].

#### Legal-for-trade

A fixed minimum reference piece number of 10 and inactive reference weight options are predetermined for approved balances for selected countries.

### 7.1.2.1 Counting - Main configuration

The following options can be set:

Parameter	Explanation	Values
Counting mode	Select the <b>Counting mode</b> .	Advanced*   Standard
Reference piece weight	Sets the number and weight of the reference piece(s).	1999 (10*)
Secondary information	Activates or deactivates the secondary information displayed on screen.	ON I OFF*
	Additional unit* Selects the secondary information displayed on screen. The available units are model- and country-specific.	
	Current tare Current tare weight.	
Target and	Defines the target weight and tolerances.	ON I OFF*
tolerances	<b>Target weight</b> Predefines a target weight. The value can be selected manually or by weighing.	
	<b>Upper tolerance</b> Defines the upper tolerance.	
	<b>Lower tolerance</b> Defines the lower tolerance.	
	If the value for <b>Target weight</b> , <b>Upper tolerance</b> or <b>Lower tolerance</b> has been defined, the option title <b>Target and tolerances</b> will be replaced by the defined values.	

<sup>\*</sup> Factory setting

### **Advanced mode options**

The following options can be set:

Parameter	Explanation	Values
Reference mode	Selects the <b>Reference mode</b> .	Automatic*   Manual
	Automatic The next stable weight is automatically accepted as a reference weight according to the defined piece number.	
	Manual	
	The reference can be defined manually.	

Auto clear reference	Activates or deactivates the <b>Auto clear reference</b> .  The current value of the option <b>Reference piece weight</b> will be automatically deleted after zeroing or removing all loaded weights from the weighing pan.	ON I OFF*
Reference optimization	Activates or deactivates the <b>Reference optimization</b> .  The current reference will be continuously optimized during operation by accepting additional pieces automatically or manually.	ON I OFF*
Reference check	Activates or deactivates the <b>Reference check</b> .	ON I OFF*
Accuracy infor- mation	Activates or deactivates the <b>Accuracy information</b> .  Counting accuracy can be shown in percent (default mode) or piece(s).	ON I OFF*

<sup>\*</sup> Factory setting

### 7.1.2.2 Defining reference piece weight in standard mode

To define the **Reference piece weight**, the **Reference piece number** and **Reference weight** must be successively defined. The system will automatically navigate from one option to the other.

### Defining reference piece number

The reference piece number must be a number between 1 and 999.

- Tap ♣...
  - ⇒ The screen **Counting Main configuration** appears.
- 2 Tap Counting mode.
  - ⇒ The screen **Counting mode** appears.
- 3 Activate Standard.
- 4 Tap  $\checkmark$  to confirm.
- 5 Tap Reference piece weight.
  - ⇒ The dialog screen **Reference piece number** appears.
- 6 Tap x to delete the value.
- 7 Enter the number of reference pieces.
- 8 Tap  $\checkmark$  to confirm.
  - ⇒ The dialog screen **Reference weight** appears.

#### Defining the reference weight

There are two ways to define the reference weight. The reference weight can be defined manually by entering the value or weighing the reference weight.

#### **Defining reference weight manually**

- 1 Tap x to delete the value.
- 2 Enter the new reference weight.
- 3 Tap  $\checkmark$  to confirm.
  - ⇒ The reference piece weight has been defined.
- 4 Tap  $\checkmark$  to confirm.

#### Defining the reference weight by weighing

- 1 Tap 📥.
  - ⇒ A dialog screen appears.
- 2 Place the reference weight on the weighing pan.
- 3 Tap ✓ to confirm.
  - ⇒ The screen **Reference weight** appears.
- 4 Tap  $\checkmark$  to confirm.
  - ⇒ The screen Counting Main configuration appears.
- 5 Tap  $\checkmark$  to confirm the configuration.

#### 7.1.2.3 Defining reference piece weight in advanced mode

To define the **Reference piece weight**, the **Reference piece number** and **Reference weight** can be defined directly via the shortcuts.

#### Defining the reference piece number

The reference piece number must be a number between 1 and 999.

- Counting mode Advanced is activated.
- 1 Tap 1 piece in the work title bar.
  - ⇒ A dialog screen appears.
- 2 Tap Piece number.
- 3 Tap x to delete the value.
- 4 Enter the number of reference pieces.
- 5 Tap  $\checkmark$  to confirm.
  - ⇒ The defined value for the option **Reference piece number** appears in the work title bar.

#### Defining the reference piece weight manually

- 1 Tap **Piece weight** in the work title bar.
  - ⇒ The screen **Reference piece weight** appears.
- 2 Tap x to delete the value.
- 3 Enter the new value.
- 4 Tap  $\checkmark$  to confirm.
  - ⇒ The defined value for the option **Reference piece weight** appears in the work title bar.

### Defining reference piece weight by weighing

If no reference weight has been defined yet, the work title bar shows Piece weight Not defined.

- 1 Place the reference sample weight on the weighing pan.
- 2 Depending on whether the option Reference mode is set to Automatic (Default) or Manual, the value will be automatically accepted or must be confirmed.
  - The balance returns to the application main screen and shows the defined value for the option **Reference piece weight** in the work title bar.

Once the reference weight has been defined in **Advanced** mode, it appears on the right side of the work title bar. The reference weight can be changed in **Main configuration** under **Reference piece weight** or using the shortcut on the left side of the work title bar.

#### Counting with reference weight check

The reference weight check ensures that the reference weight is high enough for the resulting counting accuracy to fit the customer process tolerance. Activate a reference weight check and define the process tolerance in percent. The percentage factor range is 0.01 - 30.00%. The higher the factor, the smaller the required minimum reference weight. Factory setting: 2%. The minimum reference weight is equal to d / factor.

### **Example**

d = 0.1 g

Factor = 20%

Minimum reference weight = 0.1 g / 20% = 0.5 g

If the reference calculation is activated manually or automatically, the minimum reference weight is checked to ensure the desired accuracy. If it is not sufficient, the user is prompted to add the number of additional parts needed. The number of additional parts needed is reduced to zero, after which the user adds additional parts. At zero, the reference calculation is activated automatically. If too many parts are added, the user is prompted to remove the number of parts until zero is reached.

## 7.1.3 Check weighing

## Navigation: 🖫 Activities > ♣ Activities - Weighing applications > 🌂 Check weighing

The **Check weighing** application allows the user to check the deviation of a sample weight within a tolerance limit against a reference target weight. The target weight can be determined manually or by weighing; the tolerance limit must be defined manually.

The statistics function can be activated; information on this topic can be found in the chapter [Statistics ▶ Page 41].

### 7.1.3.1 Check Weighing - Main configurations

### Legal-for-trade

For approved balances, this menu item has fixed settings and cannot be changed.

The following options can be set:

Parameter	Explanation	Values
Target and	Defines the target weight and tolerances.	ON I OFF*
tolerances	Target weight Predefines a target weight. The value can be selected manually or by weighing.	
	Upper tolerance Defines the upper tolerance.	
	Lower tolerance Defines the lower tolerance.	
	If the value for <b>Target weight</b> , <b>Upper tolerance</b> or <b>Lower tolerance</b> has been defined, the option title <b>Target and tolerances</b> will be replaced by the defined values.	
Tolerance threshold	Defines the tolerance threshold. Values below the defined threshold are not checked.	1%100% (1%*)
Within tolerance	Activates or deactivates the acoustic signal.	ON I OFF*
beeps	Gives an acoustic signal when the result is within tolerance.	
Main unit	Sets the main unit of the weighing process.	g*   mg   µg   ct   N   oz
	The available units are model- and country-specific.	ozt   GN   dwt   mom     msg   tlh   tls   tlt   tcl     tola   baht   lb:oz
Resolution	Defines the resolution of the weighing process.	1d - 0.0001 g* l
	The available resolutions are model-specific.	2d - 0.0002 g l 5d - 0.0005 g l 10d - 0.001 g l 100d - 0.01 g l 1000d - 0.1 g

<sup>\*</sup> Factory setting

### 7.1.3.2 Before performing check weighing

Before performing a check weighing operation, the following options can be set:

- Target weight
- Upper tolerance limit
- Lower tolerance limit
- Tolerance threshold

### Defining the target weight manually by entering the nominal weight

- 1 Tap **∜**•.
  - ⇒ The screen **Check weighing Main configuration** appears.
- 2 Tap Target and tolerances.
  - ⇒ The dialog screen **Target weight in g** appears.
- 3 Tap x to delete the value.
- 4 Enter the value of the target weight.
- 5 Tap  $\checkmark$  to confirm.
  - ⇒ The screen Check weighing Main configuration appears.
- 6 Tap to return to the application screen.

### Defining the target weight by weighing

- 1 Tap **¾.**..
  - ⇒ The screen **Check weighing Main configuration** appears.
- 2 Tap Target and tolerances.
  - $\Rightarrow$  The dialog screen **Target weight in g** appears.
- 3 Tap **≟**.
  - ⇒ The dialog screen **Target weight in g** appears.
- 4 Place the reference weight on the weighing pan.
- 5 Tap  $\checkmark$  to confirm.
  - ⇒ The dialog screen **Target weight in g** appears.
- 6 Tap  $\checkmark$  to confirm.
  - ⇒ The screen **Check weighing Main configuration** appears.
- 7 Tap to return to the application screen.

#### Defining the lower and upper limits manually by entering a percentage value or weight

- Tap ❤₀.
  - ⇒ The screen **Check weighing Main configuration** appears.
- 2 Tap Target and tolerances.
  - ⇒ The dialog screen **Target weight in g** appears.
- 3 Tap **to Upper tolerance limit** or tap **tolerance limit**.
  - ⇒ The dialog screen **Upper tolerance in g** or **Lower tolerance in g** appears.
- 4 Activate the option using the switch at the upper right.
- 5 Tap  $\mathbf{x}$  to delete the value.
- 6 Enter the tolerance limit.
- 7 Tap  $\checkmark$  to confirm.
  - ⇒ The screen **Check weighing Main configuration** appears.
- 8 Tap to return to the application screen.

#### **Defining tolerance threshold**

With the option **Tolerance threshold** a value limit can be set using the **Tolerance threshold** option. If the value of the check weight is below the defined threshold, it will not be checked.

- 1 Tap **४**√.
  - ⇒ The screen Check weighing Main configuration appears.
- 2 Tap Tolerance threshold.
  - ⇒ The dialog screen **Tolerance threshold in %** appears.
- 3 Activate the option using the switch at the upper right.
- 4 Tap x to delete the value.
- 5 Enter the value for the **Tolerance threshold**.
- 6 Tap  $\checkmark$  to confirm.
  - ⇒ The screen Check weighing Main configuration appears.
- 7 Tap to return to the application screen.

The Tolerance threshold option always refers to the lower tolerance limit.

### 7.1.3.3 Performing check weighing

After defining the target weight and tolerance limits, the **Check weighing** application can be performed. The color weighing-in aid bar at the top bar indicates whether the weight sample is within the defined tolerances.

Example: the defined target weight is 100.0000 g and the tolerance limit is  $\pm 2.5\%$ . The sample weight is 97.0000 g.

- Place the sample weight on the weighing pan.
  - ⇒ The weight is stable and the unstability symbol O disappears.
  - ⇒ The value is out of tolerance, and the weighingin aid bar and weighing value field are red.

Example: the defined target weight is still 100.0000 g and the tolerance limit is  $\pm 2.5\%$ . The sample weight is 99.0000 g.

- Place the sample weight on the weighing pan.
  - The weight is stable and the unstability symbol **O** disappears.
  - ⇒ The value is within the tolerance limit, and the weighing-in aid bar and weighing value field are green.

If the weight is below a defined tolerance threshold, the background color of the screen does not change.





#### 7.1.4 Formulation

## Navigation: Activities > Activities - Weighing applications > M Formulation

The **Formulation** application allows the user to:

- Weigh-in (add and store) up to 999 individual component weights without tare container and display the total.
- Tare/pre-tare and store up to 799 container weights and display the total.
- If tare containers need to be stored, the maximum number of permitted tares is 200.
- Fill up the sum of all component net weight values by adding a further component to a higher value.

### Formulation - Main configuration

The following options can be set:

Parameter	Explanation	Values
Main unit	Sets the main unit of the weighing process.  The available units are model- and country-specific.	g*   mg   µg   ct   N   oz   ozt   GN   dwt   mom     msg   th   tis   tit   tcl     tola   baht   lb:oz
Resolution	Defines the resolution of the weighing process.  The available resolutions are model-specific.	1d - 0.0001 g* l 2d - 0.0002 g l 5d - 0.0005 g l 10d - 0.001 g l 100d - 0.01 g l 1000d - 0.1 g

<sup>\*</sup> Factory setting

#### **Performing formulation**

- 1 Press  $\rightarrow 0 \leftarrow$  to zero the balance.
- 2 If using a container: place container on the weighing pan and press  $\rightarrow$  **T** $\leftarrow$  to tare the balance.
  - ⇒ The status information field displays **Net**.
- 3 Place the first component weight.
  - ⇒ The weighing value field displays the value of the first component weight.
- 4 Tap + to add the first component weight.
- 5 Place the second component weight.
  - ⇒ The weighing value field displays the value of the second component weight.
- 7 Continue adding components until all components are weighed.

#### **Defining fill up function**

**Fill up sample** allows an additional component weight to be added to the total weight of all components in order to reach a desired target weight.

- The weighing value field displays the total net weight.
- 1 Tap 🕹.
  - ⇒ A dialog screen appears.
- 2 Place the fill up sample.
  - ⇒ The weighing value field displays the total weight.
- 3 Tap  $\checkmark$  to confirm.
- 4 Tap to exit the application or to view the result.

The following options are available during the weighing process:

- Discard value
- Terminate application
- Pause the application
- View result

#### Discard value

If a weighing value was incorrect, it can be discarded from the result. Discard is only possible up to the last time the balance was tared.

- 1 Tap —.
  - ⇒ The dialog screen **Confirm discard** appears. An overview with all values within the current weighing process is displayed.
- 2 Tap  $\checkmark$  to discard the last value from the result.
  - ⇒ The incorrect value has been deleted. The weighing process can be continued.

### Terminate the application

- Tap ■.
  - ⇒ A dialog screen appears.
- 2 Tap . Finish.
  - ⇒ The results are published according to the publishing configurations and the data are deleted.
  - ⇒ The application home screen appears.

#### Pause the application

- Tap ■.
  - ⇒ A dialog screen appears.
- 2 Tap II Pause.
  - ⇒ The application is paused and another application can be used in the meantime.
  - ⇒ The application home screen appears.
- 3 Open the application again.
- 4 Tap **I**▶.
  - ⇒ The process can be continued.

### Discard data

All results are deleted.

- Tap ■.
  - ⇒ A dialog screen appears.
- 2 Tap x Discard.
  - ⇒ All data are deleted.
  - ⇒ The application home screen appears.

#### View result

- Tap ■.
  - ⇒ A dialog screen appears.
- 2 Tap View result.
  - ⇒ The results are now displayed.
- 3 Tap 🗏 to publish the results according to the configurations.
- 4 Tap  $\checkmark$  to return to the previous screen.

# 7.1.5 Totaling

# Navigation: $\square$ Activities $> \frac{1}{MPS}$ Activities - Weighing applications $> \sum$ Totaling

The **Totaling** application allows the user to weigh different samples, add their weight values and totalize them.

The application allows the user to:

- Weigh-in (add and store) up to 999 individual component weights without tare container and display the total
- Tare/pre-tare and store up to 799 container weights and display the total.
- If tare containers need to be stored, the maximum number of permitted tare values is 200.

### Totaling – Main configuration

The following options can be set:

Parameter	Explanation	Values
Accepting mode	Determines whether a weight sample is automatically added to the result.	Automatic*   Manual
	The next stable weight of at least 10 * resolution is accepted following minimal deviation; <b>see</b> relationship between resolution and deviation in the table below.	
Main unit	Sets the main unit of the weighing process.	g*   mg   µg   ct   N   oz
	The available units are model- and country-specific.	ozt   GN   dwt   mom     msg   tlh   tls   tlt   tcl     tola   baht   lb:oz
Resolution	Defines the resolution of the weighing process.	1d - 0.0001 g* l
	The available resolutions are model-specific.	2d - 0.0002 g l 5d - 0.0005 g l 10d - 0.001 g l 100d - 0.01 g l 1000d - 0.1 g

<sup>\*</sup> Factory setting

### Table relationship between resolution and deviation

Resolution	Min. deviation
0.001 mg	0.001 g
0.01 mg	0.01 g
0.1 mg	0.1 g
0.001 g	1 g
0.01 g	1 g
0.1 g	1 g
1 g	5 g

### Performing totaling

- 1 Press  $\rightarrow 0 \leftarrow$  to zero the balance.
- 2 If using a container, place container on the weighing pan and press  $\rightarrow$  **T** $\leftarrow$  to tare the balance.
- 3 Place the first sample on the weighing pan.
- 4 Wait until the unstability symbol **O** disappears.
  - ⇒ When the balance is stable, the weighing value becomes dark blue.
- 5 Tap + to accept the weight and start the procedure.
- 6 Place the next sample.
- 7 Tap + to accept the second sample weight.
  - $\Rightarrow$  The work title bar shows the number of samples (2 samples) and the total weight of the samples (e.g.  $\Sigma = 30.0000$  g).

The following options are available during the weighing process:

- · Discard value
- Terminate application
- Pause the application
- View result

#### Discard value

If a weighing value was incorrect, it can be discarded from the result. Discard is only possible up to the last time the balance was tared.

- 1 Tap —.
  - ⇒ The dialog screen Confirm discard appears. An overview with all values within the current weighing process is displayed.
- 2 Tap  $\checkmark$  to discard the last value from the result.
  - ⇒ The incorrect value has been deleted. The weighing process can be continued.

#### Terminate the application

- 1 Tap
  - ⇒ A dialog screen appears.
- 2 Tap J Finish.
  - ⇒ The results are published according to the publishing configurations and the data are deleted.
  - ⇒ The application home screen appears.

### Pause the application

- 1 Tap
  - ⇒ A dialog screen appears.
- 2 Tap II Pause.
  - ⇒ The application is paused and another application can be used in the meantime.
  - ⇒ The application home screen appears.
- 3 Open the application again.
- 4 Tap **I**▶.
  - ⇒ The process can be continued.

#### Discard data

All results are deleted.

- Tap ■.
  - ⇒ A dialog screen appears.
- 2 Tap x Discard.
  - ⇒ All data are deleted.
  - ⇒ The application home screen appears.

### View result

- 1 Tap ■.
  - ⇒ A dialog screen appears.
- 2 Tap View result.
  - ⇒ The results are now displayed.
- 3 Tap 🗏 to publish the results according to the configurations.
- 4 Tap 🗸 to return to the previous screen.

## 7.1.6 Back-weighing

## Navigation: 🔐 Activities > 🚣 Activities - Weighing applications > 🗘 Back-weighing

The balance displays and prints the automatically calculated difference of 2 measured weights. Automatic (default) and manual modes are possible. The use of a tare container can be activated (default) or deactivated. As result, the tare, initial weight, final weight and difference can be displayed and printed. The difference can be displayed and printed as absolute values (in main units), percentage (%), percentage (Abs. %), Atro AM, or Atro AD.

The statistics function can be activated; information on this topic can be found in the chapter [Statistics > Page 41].

If there are no function statistics, the following options are available during the weighing process:

- Discard value
- Terminate application
- Pause the application
- View result

#### Back-weighing – Main configuration

The following options can be set:

Parameter	Explanation	Values
Accepting mode	Determines whether a weight sample is automatically added to the result.	Automatic*   Manual
	The next stable weight of at least 10 * resolution is accepted following minimal deviation; <b>see</b> relationship between resolution and deviation in the table below.	
Use tare container	Activates or deactivates the use of a tare vessel.	ON* I OFF
Result value as	Select the result view for the calculated difference.	Weight (Default)* I
	<b>Percentage</b> = Reports the difference between back-weighing and initial weighing as a percentage of the initial weight.	Percentage   Absolute percentage   Moisture
	<b>Absolute percentage</b> = Reports the back-weighing as a percentage of the initial weight.	content I Dry content
	<b>Moisture content</b> = Reports the moisture content of the sample as a percentage of the dry weight.	
	<b>Dry content</b> = Reports the wet weight of the sample as a percentage of the dry weight.	
Result decimals	Defines the number of decimal places of the percentage (option only available if % result is activated).	1 2 3* 4 5
Show	Displays the calculated difference in work area and result view.	Signed (Default)* I
difference	<b>Signed (Default)</b> = Displays the value via algebraic sign.	Unsigned
	<b>Unsigned</b> = Displays the absolute value.	
Main unit	Sets the main unit of the weighing process.	g*   mg   µg   ct   N   oz
	The available units are model- and country-specific.	ozt   GN   dwt   mom     msg   tlh   tls   tlt   tcl     tola   baht   lb:oz
Resolution	Defines the resolution of the weighing process.	1d - 0.0001 g* l
	The available resolutions are model-specific.	2d - 0.0002 g l 5d - 0.0005 g l 10d - 0.001 g l 100d - 0.01 g l 1000d - 0.1 g

<sup>\*</sup> Factory setting

#### Table relationship between resolution and deviation

Min. deviation
0.001 g
0.01 g
0.1 g
1 g
1 g
1 g
5 g

### Setting up the back-weighing application

- Tap ♠₂.
  - ⇒ The screen **Back-weighing Main configuration** appears.
- 2 Tap Accepting mode.
  - ⇒ The screen **Accepting mode** appears.
- 3 Select Automatic (Default) or Manual and confirm with  $\checkmark$ .
- 4 Activate the option **Use tare container** if required.
- 5 Tap Result value as....
  - ⇒ The screen **Result value as...** appears.
- 6 Select the values for the result view, e.g. **Percentage (%)** and the print-out.
- 7 Tap  $\checkmark$  to confirm.
- 8 Tap Result decimals after percent value.
  - ⇒ The screen Result decimals appears.
- 9 Select the number of decimals for the difference in % and confirm with ...
- 10 Tap ← to return to the application screen.

#### Performing back-weighing with automatic accept mode and using a tare container

- Use tare container is activated.
- Accepting mode Automatic is selected.
- 1 Place a container on the weighing pan.
  - ⇒ The tare weight appears in the work title bar.
- 2 Place the initial sample in the container.
  - ⇒ The initial weight appears in the value bar.
- 3 Remove the container with the sample.
- 4 Place the container with the treated sample on the weighing pan.
  - ⇒ The final weight appears in the value bar.
- 5 Remove the container with the sample.
  - ⇒ The back-weighing result will be displayed and can be published according to the publishing configurations.
- 6 Tap ← to return to the application screen.

### Performing back-weighing with manual accept mode without using a tare container

- Use tare container is deactivated.
- Accepting mode Manual is selected.
- 1 Place the initial sample on the weighing pan.
  - ⇒ The initial weight appears in the value bar.
- 2 Tap  $\checkmark$  to confirm.
- 3 Remove the sample to continue.
- 4 Place the treated sample on the weighing pan.
  - $\Rightarrow$  The final weight appears in the value bar.
- 5 Tap  $\checkmark$  to confirm.
- 6 Push checkmark to access the result report.
  - ⇒ The back-weighing result will be displayed and can be published according to the publishing configurations
- 7 Tap to return to the application screen.

## 7.1.7 Dynamic weighing

## Navigation: 🖫 Activities > 🚣 Activities - Weighing applications > 🐠 Dynamic weighing

The **Dynamic weighing** application determines the weights of unstable samples or when the weighing process is being executed under unstable ambient conditions. The balance calculates the weight as an average of a number of weighing operations over a defined time.

The statistics function can be activated; information on this topic can be found in the chapter [Statistics > Page 41].

The displayed measuring time on the application home screen can be used as shortcut to define the measuring time.

### Dynamic weighing - Main configuration

The following options can be set:

Parameter	Explanation	Values
Measuring time	Defines the measuring time in seconds.	3120 (3 seconds*)
Start mode	Defines the <b>Start mode</b> .	Automatic*   Manual
Main unit	Sets the main unit of the weighing process.  The available units are model- and country-specific.	g*   mg   µg   ct   N   oz   ozt   GN   dwt   mom     msg   tlh   tls   tlt   tcl     tola   baht   lb:oz
Resolution	Defines the resolution of the weighing process.  The available resolutions are model-specific.	1d - 0.0001 g* l 2d - 0.0002 g l 5d - 0.0005 g l 10d - 0.001 g l 100d - 0.01 g l 1000d - 0.1 g
Secondary infor- mation	Activates or deactivates the secondary information displayed on screen.	ON I OFF*
	Additional unit* Selects the secondary information displayed on screen. The available units are model- and country-specific.	
	Current tare Current tare weight.	

<sup>\*</sup> Factory setting

### **Defining measuring time**

- 1 Tap **№**.
  - ⇒ The screen **Dynamic weighing Main configuration** appears.
- 2 Tap Measuring time.
  - ⇒ The dialog screen **Measuring time in seconds** appears.
- 3 Tap x to delete the value.
- 4 Enter a value between 3 and 120 seconds.
- 5 Tap  $\checkmark$  to confirm.
  - ⇒ The screen **Dynamic weighing Main configuration** appears.
- 6 Tap  $\checkmark$  to confirm.

### **Defining start mode**

- 1 Tap <u>₩</u>.
- 2 Tap Start mode.
- 3 Select Automatic or Manual.
- 4 Tap  $\checkmark$  to confirm.
- 5 Tap  $\checkmark$  to return to the application home screen.

#### Performing dynamic weighing

When the measuring time and the start mode have been defined, the dynamic weighing process can be started.

The weighing process will automatically be aborted when an overload or underload is detected.

- 1 Press  $\rightarrow$  **0**  $\leftarrow$  to zero the balance.
- 2 If using a container: place container on the weighing pan and press  $\rightarrow$  **T** $\leftarrow$  to tare the balance.
- 3 Place sample weight.
  - ⇒ If **Start mode** is set to **Automatic**, the weighing process starts automatically with relative stability and a minimum load of 5 g.
  - ⇒ It **Start mode** is set to **Manual**, tap **>** to start the weighing process.
  - ⇒ The weighing process starts. The defined measuring time in the work title bar is counting down.
- ⇒ The result is displayed in a blue weighing value field.

## 7.1.8 Percent weighing

## Navigation: 🖫 Activities > 🚣 Activities - Weighing applications > % Percent weighing

Percent weighing allows a sample weight to be checked as a percentage of a reference target weight.

The statistics function can be activated; information on this topic can be found in the chapter [Statistics > Page 41].

### Percent weighing – Main configuration

The following options can be set:

Parameter	Explanation	Values
Reference weight	Defines the reference weight manually or by weighing.	Available range is model-specific.
Secondary infor- mation	Activates or deactivates the secondary information displayed on screen.	ON I OFF*
	Additional unit* Selects the secondary information displayed on screen. The available units are model- and country-specific.	
	Current tare Current tare weight.	

<sup>\*</sup> Factory setting

### Defining the reference weight

There are two ways to define the reference weight. The reference weight can be defined manually by entering the value or weighing the reference weight.

### Defining the reference weight by weighing

- 1 Tap %a.
  - ⇒ The screen **Percent weighing Main configuration** appears.
- 2 Tap Reference weight.
  - ⇒ The screen **Reference weight** appears.
- 3 Tap \(\ddot\).
- 4 Press  $\rightarrow 0 \leftarrow$  to zero the balance.
- 5 Place the reference weight on the weighing pan.
- 6 Tap  $\checkmark$  to confirm.
  - ⇒ The screen **Reference weight** appears.
- 7 Tap  $\checkmark$  to confirm.
- 8 Tap  $\checkmark$  to return to the application home screen.

#### Defining the reference weight manually

- 1 Tap %a.
  - ⇒ The screen **Percent weighing Main configuration** appears.
- 2 Tap Reference weight.
  - ⇒ The screen **Reference weight** appears.
- 3 Tap x to delete the value.
- 4 Enter the value of the reference weight and confirm with .
- 5 Tap  $\checkmark$  to return to the application home screen.

## 7.1.9 Density

Navigation: 🖫 Activities > 🚣 Activities - Weighing applications > 🗗 Density

**Density** allows the density of solid bodies and liquids to be determined.

The density is determined via the Archimedes principle, according to which a body immersed in a fluid undergoes an apparent loss in weight which is equal to the weight of the fluid it displaces.

To determine the density of solid bodies, we recommend using the optional density kit, which contains all attachments and aids needed for convenient and precise density determination. To determine the density of liquids, a sinker is also required. This can be obtained from your METTLER TOLEDO dealer.

The statistics function can be activated; information on this topic can be found in the chapter [Statistics > Page 41].

#### **Density – Main configuration**

The following options can be set:

Parameter	Explanation	Values
Method	Depending if the weight type is solid or liquid.	Solid*   Liquid
Auxiliary liquid	Select the auxiliary liquid.	H2O*   Ethanol   Free
Sinker volume	This option is only available when <b>Liquid</b> is active.	(0.1500.0 cm <sup>3</sup> )
Main unit	Sets the main unit of the weighing process.  The available units are model- and country-specific.	g*   mg   µg   ct   N   oz   ozt   GN   dwt   mom     msg   tlh   tls   tlt   tc      tola   baht   lb:oz

<sup>\*</sup> Factory setting

### **Determination of density of solids**

- 1 Tap 🗗 👊
  - ⇒ The screen **Density Main configuration** appears.
- 2 Tap Method.
  - ⇒ When **Solid** has been activated (default value), the **Auxiliary liquid** appears in the list.
- 3 Tap Auxiliary liquid.
  - ⇒ The screen **Auxiliary liquid** appears.
- 4 Define the **Auxiliary liquid** that is used. Select between **H20** for distilled water, **Ethanol** or **Free...** for a freely definable auxiliary liquid.
- 5 Tap  $\checkmark$  to confirm.
  - ⇒ The selected **Auxiliary liquid** defines the next steps:
  - ⇒ The dialog screen **Temperature in °C** appears.
- 6 Enter the **Temperature in °C** for **Ethanol** and **H20**.
- 7 Auxiliary liquid name and H density in g/cm3 must be defined for the option Free....
- 8 Tap  $\checkmark$  to confirm.
  - ⇒ The screen **Density Main configuration** appears.
- 9 Tap ✓ to return to the application home screen.
  - ⇒ The balance is prepared for determining the density of solids.

#### Determining the density for solids

- The balance has been configured to determine the density of solids.
- 1 Tap ▶ to start the process.
  - ⇒ The dialog screen **Sample weight in air** appears.
- 2 Place the solid mass on the weighing pan.
- 3 Tap  $\checkmark$  to confirm.
  - ⇒ The dialog screen **Sample weight in liquid** appears.
- 4 Immerse solid in the liquid.
- 5 Tap  $\checkmark$  to confirm.
  - ⇒ The results are now displayed.
- 6 Tap 🗏 to publish the results according to the configurations.
- 7 Tap  $\checkmark$  to return to the application home screen.

### **Determination of density for liquids**

- 1 Tap 🗗 👊
  - ⇒ The screen **Density Main configuration** appears.
- 2 Tap Method.
- 3 Tap Liquid.
- 4 Tap ✓ to confirm.
  - ⇒ When **Liquid** has been activated, **Sinker volume** appears in the list.
- 5 Tap Sinker volume.
  - ⇒ The dialog screen **Sinker volume in cm³** appears.
- 6 Tap x to delete the value.
- 7 Enter the volume of the sinker.
- 8 Tap  $\checkmark$  to confirm.
  - ⇒ The screen **Density Main configuration** appears.
- 9 Tap  $\checkmark$  to return to the application home screen.

### Determining the density of liquids

- The balance has been configured to determine the density of liquids.
- 1 Tap ▶ to start the process.
  - ⇒ The dialog screen **Sinker in air** appears.
- 2 Place the sinker on the weighing pan.
- 3 Tap  $\checkmark$  to confirm.
  - ⇒ The dialog screen **Sinker in liquid** appears.
- 4 Immerse the sinker.
- 5 Tap  $\checkmark$  to confirm.
  - ⇒ The results are now displayed.
- 6 Tap 🗏 to publish the results according to the configurations.
- 7 Tap  $\checkmark$  to return to the application home screen.

## 7.1.10 Factor weighing

## Navigation: ☐ Activities > ♣ Activities - Weighing applications > ♣ Factor weighing

The application **Factor weighing** multiplies or divides a pre-defined factor by the measured weight value (in grams) and calculates it to a predefined number of decimal places.

The permitted range for the steps depends on the pre-defined factor and the resolution of the balance.

The statistics function can be activated; information on this topic can be found in the chapter [Statistics > Page 41].

### Factor weighing – Main configuration

The following options can be set:

Parameter	Explanation	Values
Factor, step	Defines the factor and the step.	Factor I Step
Secondary infor- mation	Activates or deactivates the secondary information displayed on screen.	ON I OFF*
	Additional unit* Selects the secondary information displayed on screen. The available units are model- and country-specific.	
	Current tare Current tare weight.	
Target and	Defines the target weight and tolerances.	ON I OFF*
tolerances	Target weight Predefines a target weight. The value can be selected manually or by weighing.	
	Upper tolerance Defines the upper tolerance.	
	Lower tolerance Defines the lower tolerance.	
	If the value for Target weight, Upper tolerance or Lower tolerance has been defined, the option title Target and tolerances will be replaced by the defined values.	

<sup>\*</sup> Factory setting

### **Defining factor and step**

- 1 Tap **≛**xo.
  - ⇒ The screen **Factor weighing Main configuration** appears.
- 2 Tap Factor, step.
  - ⇒ The dialog screen **Factor Multiplication**appears.
- 3 Tap x to delete the value.
- 4 Define Factor.
- 5 Tap a to change the operation from Multiplication to Division or vice versa.
- 6 Tap **√**.
- 7 Tap 🖍.
  - ⇒ The dialog screen **Step** appears.
- 8 Define Step.
- 9 Tap  $\checkmark$  to confirm.
  - ⇒ The screen Factor weighing Main configuration appears.
- 10 Tap to return to the application screen.

## 7.2 Activities - Adjustments and tests

## Navigation: 무료 > 8월

To obtain accurate weighing results, the balance must be adjusted to match the gravitational acceleration at its location and depending on the ambient conditions. After reaching the operation temperature, adjusting is necessary.

- before the balance is used for the first time.
- when the balance was disconnected from the power or in case of power failure.
- after a change of the location.
- at regular intervals during weighing service.

Activities - Adjustments and tests consists of the following elements:

- FACT, see [Fully automatic adjustment (FACT) ▶ Page 66]
- Internal Adjustment, see [Internal adjustment ▶ Page 67]
- External Adjustment, see [External adjustment ▶ Page 67]
- Fine adjustment, see [Fine adjustment (model-dependent) > Page 67]
- Routine test, see [Routine test ▶ Page 68]
- Repeatability test, see [Repeatability test ▶ Page 69]

## 7.2.1 Fully automatic adjustment (FACT)

### Navigation: 🖫 Activities > 🖧 Activities - Adjustments and tests > FACT

**FACT** stands for **F**ully **A**utomatic **C**alibration **T**echnology. **FACT** is activated as a default value. If the **FACT** function is not activated, all functionalities, such as temperature and time, are inactive.

FACT means that the balance adjusts itself based on the following criteria:

- if the conditions change (temperature difference > 2°C), which may lead to a noticeable deviation in the measurement.
- on a predefined date and time programmed by the user.

### **Defining FACT**

The date and time of FACT can be defined as follows:

- 1 Tap FACT.
- 2 Activate Fully automatic adjustment.
  - ⇒ The dialog screen **Fully automatic adjustment** appears.
- 3 Select the time (hours : minutes) using the pick buttons.
- 4 Tap  $\checkmark$  to confirm.
  - ⇒ The time underneath **FACT** has been updated and displays the time of the daily adjustment.
- 5 Tap to return to the application screen.

When setting the time, hold the pick button to scroll faster.



If a predefined criterion is due, the flashing FACT status icon appears in the display. The balance indicates that it wishes to perform a FACT adjustment.

- Unload the balance.
- 2 Do not select any key.
  - ⇒ Adjustment starts automatically.
- ⇒ The status icon extinguishes after successful adjustment.

### 7.2.2 Internal adjustment

## Navigation: 🖫 Activities > 👪 Activities - Adjustments and tests > 👪 Adjust internal

The function **Internal adjustment** is available for models with internal weight only.

If the balance is configured and connected to a printer, the results of the adjustment process will be printed.

### Perform an internal adjustment manually

- Unload the balance.
- 2 Tap **a** Adjust internal.
  - ⇒ The internal adjustment procedure will start. The screen displays Adjustment ongoing....
  - ⇒ When the internal adjustment procedure is successfully completed, the results of the internal adjustment will appear.
- 3 Tap  $\checkmark$  to confirm.
  - ⇒ The screen **Activities Adjustments and tests** appears.
- 4 Tap to return to the application screen.

# 7.2.3 External adjustment

### Navigation: 🖫 Activities > 🚰 Activities - Adjustments and tests > 🚡 Adjust external

#### **Important**

Because of certification legislation, approved balances cannot be adjusted with an external weight (depending on the certification legislation of the selected country).

#### Performing an external adjustment

- 1 Tap **Adjust external**.
  - ⇒ The dialog screen **Adjustment weight** appears.
- 2 Tap to define the adjustment weight according to the weight certificate.
- 3 Tap x to delete the value.
- 4 Enter the new value.
- 5 Tap  $\checkmark$  to confirm.
- 6 Prepare the adjustment weight and tap ▶ to start the adjustment process.
- 7 Load the adjustment weight in the center of the weighing pan.
- 8 Unload the adjustment weight from the weighing pan.
  - ⇒ When the external adjustment procedure is successfully completed, the result will appear.
- 9 Tap ✓ to confirm.
  - ⇒ The screen **Activities Adjustments and tests** appears.
- 10 Tap to return to the application screen.

### 7.2.4 Fine adjustment (model-dependent)

### Navigation: 💾 > 🚰 Activities - Adjustments and tests > 着 Adjust fine

The the value of the internal adjustment weight can be individually adjusted in a very small range via the **Fine adjustment** function.

- This option is only available on models with internal weights.
- Use only certificated weights.
- Make sure that the environmental conditions are correct.
- The balance must be leveled.
- Balance and test weights must observe the operating temperature.
- For fine adjustments, we recommend contacting a balance expert or a METTLER TOLEDO representative.

#### Legal-for-trade

Approved models are not able to be adjusted with this function.

#### Performing fine adjustment

- Adjusting weight is prepared.
- 1 Tap 🖶 a Adjust fine.
  - ⇒ The dialog screen **Reference weight** appears.
- 2 Tap x to delete the value.
- 3 Enter the weight value according to the certificate.
- 4 Tap  $\checkmark$  to confirm.
- 5 Tap ▶ to start the process.
- 6 Place the adjustment weight in the center of the weighing pan.
- 7 Remove the adjustment weight.
  - ⇒ The result will appear once the fine adjustment procedure is successfully completed.
- 8 Tap  $\checkmark$  to confirm.
  - ⇒ The screen **Activities Adjustments and tests** appears.
- 9 Tap to return to the application screen.

Tap 3 to reset the defined reference weight back to the default value.

### 7.2.5 Routine test

## Navigation: $\blacksquare$ Activities > 35 Activities - Adjustments and tests > 5 Routine test

The **Routine test** function allows the sensitivity of the balance to be set for periodic tests.

The set values appear at the top of the screen in the weighing information bar. The bar works as a shortcut.

### Routine test - Main configuration

The following options can be set:

Parameter	Explanation	Values
Test weight in g	Defines the test weight.	Numerical value (depending on the balance type)
± Control limit in g	Defines the control limit.	Numerical value (depending on the balance model)
± Warning limit in g	Activates or deactivates the warning limit.	ON* numerical value (depending on the balance model) I OFF
Use tare container	Activates or deactivates the use of a tare vessel.	ON I OFF*

<sup>\*</sup> Factory setting

### Setting the test weight, control limits and warning limits

- 1 Tap & Routine test.
- 2 Tap a Test Weight.
  - ⇒ The screen **Check weighing Main configuration** appears.
- 3 Tap Test Weight.
  - ⇒ The dialog screen **Test weight in g** appears.
- 4 Tap x to delete the value.
- 5 Enter the new value.

- 6 Tap **⊗**.
  - ⇒ The dialog screen **± Control limit in g** appears.
- 7 Tap x to delete the value.
- 8 Enter the new value.
- 9 Tap **(**).
  - ⇒ The dialog screen **± Warning limit in g** appears.
- 10 Tap x to delete the value.
- 11 Enter the new value.
- 12 Tap  $\checkmark$  to confirm.
- 13 Activate or deactivate the option **Use tare container** if required.
- 14 Tap to return to the application screen.

#### Performing a routine test

- The routine test options Test weight in g, ± Control limit in g and ± Warning limit in g are defined.
- The test weight is prepared.
- 1 Tap ▶ to start the process.
- 2 Place the test weight in the center of the weighing pan.
  - ⇒ During the test, the screen shows Waiting for stable weight....
  - ⇒ When the test is finished, the screen shows **Please unload weight**.
- 3 Remove the test weight from the weighing pan.
  - ⇒ When the routine test is successfully completed, the result appears.
- 4 Tap to return to the application screen.

## 7.2.6 Repeatability test

## Navigation: 🖫 Activities > 👪 Activities - Adjustments and tests > 👪 Repeatability test

The function **Repeatability test** works only for models with internal weights.

A specific number of internal weight tests can be defined via the **Repeatability test** function.

The set number of tests appears at the top of the screen in the weighing information bar. The bar works as a shortcut.

### Setting the number of repetitions

- 1 Tap 🚡.
- 2 Tap 6 a.
  - ⇒ The dialog screen **Repeatability test Repetitions** appears.
- 3 Tap x to delete the value.
- 4 Enter the number of repetitions. The number must be between 5 and 100.
- 5 Tap  $\checkmark$  to confirm the number of repetitions.
- 6 Tap ▶ to start the process.
  - ⇒ The balance executes the defined number of tests. The message **Test ongoing**, **please wait...** appears on the display during the process. The process can be aborted by tapping **x**.
  - After the test is finished, an overview with the test results appears on the screen.
- 7 Tap to return to the application screen.

# 8 Communication with Peripheral Devices

This section lists some typical examples of where the balance can communicate with peripheral devices. In most cases, it is possible to do so via USB or RS232. The chapters are primarily restricted to a USB setup.

#### 8.1 USB - interface and installation

Before connecting the balance via the USB device interface and using either the **HOST** or **PC-Direct** function, the appropriate METTLER TOLEDO USB driver has to be assigned to the PC first. The USB driver can be found on the CD which is shipped with the balance or provided by your METTLER TOLEDO representative.



If you connect the balance via USB to the PC before installing the METTLER TOLEDO USB driver, Windows will automatically install the wrong driver.

### Requirements

- Balance with USB device interface
- PC with one of the following Microsoft Windows® 32-bit/64-bit operating systems: Win 7 (SP1), Win 8 or Win 10
- · Administrator rights for installing software
- USB connection cable to link PC to balance

#### Installing the USB driver

- Insert the product CD in the CD/DVD drive of the host computer.
- 2 Tap Software.
- 3 Tap Download Software MT-USBDriverInstaller (zip) (Win 7 Win 10).
  - ⇒ The extract screen appears.
- 4 Extract the file to your specified location.
- 5 Right-click on the downloaded installation program MT-USBDriverInstaller.exe and select Run as Administrator.
- 6 If a safety warning appears, confirm windows to perform the installation.
- 7 Click **Next** and follow the installer's instructions.

#### Installing the balance

- 1 Switch the balance off.
- 2 Connect the balance to the preferred USB port on the PC.
- 3 Switch the balance on.

## 8.2 Send weight value via USB or RS232 to a PC using PC-Direct

The numerical value displayed at the balance can be transferred to the cursor position in windows applications (e.g. Excel, Word) in the same way as typing with the keyboard.

The data is transferred via USB or via the serial RS232 interface.

The weight value without the unit will be transferred.

### Requirements

- PC with one of the following Microsoft Windows® 32-bit/64-bit operating systems: Win 7 (SP1), Win 8 or Win 10
- Serial interface RS232 or USB
- Administrator rights for installing the SerialPortToKeyboard software (if data transfer is via RS232)
- Windows application (e.g. Excel)
- Connection between balance and PC via cable RS232 or USB

### 8.2.1 PC-Direct via USB

The balance can send data (as a keyboard) to the PC used for PC applications, e.g. Excel. The balance sends the weight value without the unit to the PC.

Use the USB connection cable to connect the balance with the PC. Connect the USB cable to the USB device (Type B) on the balance.

- The balance must be disconnected from the PC.
- 1 Tap 🔼.
- 2 Tap di General configuration and data.
- 3 Tap **Publishing**.
  - ⇒ The screen Publishing appears.
- 4 Tap Send value.
  - ⇒ The screen **Send value** appears.
- 5 Activate the option.
- 6 Select the transmission mode (e.g. **Manual, stable**) and confirm with  $\checkmark$ .
- 7 Tap J to return to the previous screen.
- 8 Tap 🌠 Devices and connectivity.
  - ⇒ The screen Devices and connectivity appears.
- 9 Tap USB Host.
  - ⇒ The screen **USB Host** appears.
- 10 Tap Device type.
  - ⇒ The screen **Device type** appears.
- 11 Select **PC-Direct** and confirm with  $\checkmark$ .
- 12 Change the other settings (e.g. **End of line**) and confirm with  $\checkmark$ .
- 13 Tap  $\checkmark$  to return to the **Devices and connectivity** screen.
- 14 Tap to return to the previous screen.
- 15 Connect the balance to the PC.
- 16 Place the sample on the weighing pan.
- 17 Press 🗐, the next stable weight will be send to the cursor position of your application.

### 8.2.2 PC-Direct via RS232

### 8.2.2.1 Installing SerialPortToKeyboard software

The operation of PC-Direct via serial port RS232 requires the installation of **SerialPortToKeyboard** on your host computer. The file **SerialPortToKeyboard** can be found on the CD shipped with the balance. If you have any questions, please contact a METTLER TOLEDO representative.

### **Download SerialPortToKeyboard**

- 1 Insert the product CD in the CD/DVD drive of the host computer.
- 2 Tap Software.
- 3 Tap Download Software SerialPortToKeyboard (zip).
  - ⇒ An extract screen appears.
- 4 Extract the file to your specified location.
- 5 Right-click on the downloaded installation program SerialPortToKeyboard.exe and select Run as Administrator.
- 6 If a safety warning appears, confirm Windows to perform the installation.
- 7 Click **Next** and follow the installer's instructions.

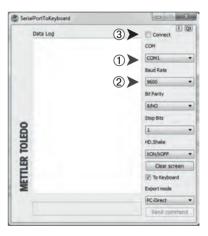
### **Checking operation**

- 1 Start SerialPortToKeyboard (RS232)
- 2 Start Excel (or another application) at the PC.
- 3 Activate a cell in Excel.

### Settings at the PC

### Settings for SerialPortToKeyboard

- 1 Select the serial port **COM** for the connection with the balance.
- 2 Set the Baud Rate to 9600.
- 3 Activate Connect.
- Closing the window terminates the session.



According to your selected **End of line** option, the displayed values will appear e.g. in the column one after the other one in the different rows.

### 8.2.2.2 Settings on the balance

- The balance is connected to the PC via an RS232 cable.
- 1 Tap D.
- 2 Tap di General configuration and data.
- 3 Tap **Publishing**.
  - ⇒ The screen **Publishing** appears.
- 4 Tap Send value.
  - ⇒ The screen **Send value** appears.
- 5 Activate the option.
- 6 Select the transmission mode (e.g. Automatic, stable) and confirm with  $\checkmark$ .
- 7 Tap  $\checkmark$  to return to the previous screen.
- 8 Tap **S** Devices and connectivity.
  - ⇒ The screen **Devices and connectivity** appears.
- 9 Tap **RS232**.
- 10 Select **Host** and confirm with  $\checkmark$ .
- 11 Change the other settings (e.g. End of line) and confirm with .
- 12 Tap to return to the previous screen.
- 13 Place the sample on the weighing pan.
  - $\Rightarrow$  The next stable weight will be sent automatically.

## 8.3 Send weight value via USB to a PC using LabX Direct Balance

The software LabX Direct Balance, weighing results and additional data such as the date and time or the measurement unit to an Excel file or any other application. The software can be ordered at METTLER TOLEDO and must be installed on a PC.

- LabX Direct is installed on the PC according to the user requirements.
- The METTLER TOLEDO USB\* driver is installed on your PC.
- The balance is connected to the PC via the USB\* device interface.

### Configure balance

- 1 Tap 🔼.
- 2 Tap di General configuration.
- 3 Tap **S** Devices and connectivity.
  - ⇒ The screen Devices and connectivity appears.
- 4 Tap USB Device (USB B).
  - ⇒ The screen **USB Device (USB B)** appears.
- 5 Tap Device type.
  - ⇒ The screen **Device type** appears.
- 6 Select Host (Default).
- 7 Tap to return to the previous screen.
- 8 Tap Command set.
  - ⇒ The screen **Command set** appears.
- 9 Select the appropriate option.
- 10 Tap to return to the previous screen.
- 11 Tap to return to the **General configuration** screen.
- 12 Tap **Publishing**.
  - The screen Publishing appears.
- 13 Tap Send value Host (USB B).
- 14 Switch option **ON** and select the correct **Send value**.
- 15 Tap to return to the application screen.

#### Transfer values

- 1 Start LabX Direct Balance on your PC.
- 2 Select the correct COM port used by the balance.
- 3 Configure all settings according to the user requirements.
  - ⇒ The weighing result (and additional data) is transferred to the PC program either automatically or when the print icon is pressed. This depends on the settings in the publishing menu of the balance.
- \* The required settings and workflow are very similar when using an RS232 connection. In this case, a METTLER TOLEDO USB driver does not need to be installed on the PC as a prerequisite.

## 8.4 Connect a USB printer and print weighing results

### **Prerequisite**

- The printer is connected to the power supply.
- The printer is connected to the balance via USB cable.
- Printer is switched on.

The following example shows the option to automatically print the next stable value.

- 1 Tap 🗖.
- 2 Tap d General configuration.
- 3 Tap Y Publishing.
  - ⇒ The screen **Publishing** appears.
- 4 Tap **Print**.
  - ⇒ The screen **Print** appears.
- 5 Tap **USB printer** and confirm with  $\checkmark$ .
- 6 Tap Single values report.
- 7 Select the transmission mode (e.g. **Automatic, stable**) and confirm with  $\checkmark$ .
- 8 Tap  $\checkmark$  to return to the previous screen.
- 9 Tap 🌠 Devices and connectivity.
  - ⇒ The screen **Devices and connectivity** appears.
- 10 Tap USB Host.
  - ⇒ The screen **USB Host** appears.
- 11 Change the other settings (e.g. Character set) and confirm with .
- 12 Tap to return to the application screen.
- 13 Place the sample on the weighing pan.
  - ⇒ The next stable weight is automatically printed.

### 8.5 Connect a USB barcode reader and scan the barcode

The following example shows how to scan the sample ID via a barcode reader.

Use the USB connection cable to connect the barcode reader to a balance.

Only the balance settings are changed for this menu item.



Refer to your barcode reader's Operating Instructions for information about the barcode reader settings.

### Settings on the balance

- The barcode reader is connected to the power supply (if necessary).
- The barcode reader is connected via USB cable to the balance USB host (Type A).
- 1 Tap 🛱.
- 2 Tap di General configuration.
- 3 Tap **S** Devices and connectivity.
  - ⇒ The screen **Devices and connectivity** appears.
- 4 Tap USB Host.
  - ⇒ The input device **USB barcode/-keyboard** appears.
- 5 Check the **End of line** setting. The setting must be the same as the barcode reader.

### Typical setup to use the barcode reader

- 2 Select an application e. g. A Weighing
- 3 Tap ΔΔ .....
  - ⇒ The screen **Weighing Main configuration** appears.
- 4 Tap 🗐.
  - ⇒ The screen **Weighing reports configuration** appears.
- 5 Tap Sample.
  - ⇒ The screen **Sample** appears.
- 6 Tap ID 4.
- 7 Activate ID 4.
- 8 Select Input prompt, confirm with ...
- 9 Tap  $\checkmark$  to return to the previous screen.
- 10 Place the sample on the weighing pan.
  - ⇒ The screen **Sample ID** appears.
- 11 Enter an ID for the first sample and confirm with .
- 12 Tap 🗐.
  - ⇒ The screen **Sample ID entry** appears.
- 13 Scan the sample ID with the barcode reader.
  - ⇒ The sample ID is entered on the **Sample ID entry** screen and the screen is then closed.

# 9 Troubleshooting

# 9.1 Error messages

Error messages in the display draw your attention to incorrect operation or that the balance could not execute a procedure properly.

Error message	Cause	Rectification
NO STABILTY	No stability	Ensure more stable ambient
NO STABLETT	Tto Sidbilliy	conditions. If not possible, check settings for environment.
Adjustment aborted - Weight out of range	Wrong adjustment weight on the weighing pan or none at all.	Place required adjustment weight in center of weighing pan.
EEPROM error - Please contact your MT-Support representative.	<ul> <li>EEPROM (memory) error.</li> <li>Excessive mains voltage fluctuation or strong glitches occurred.</li> </ul>	Please contact your MT-Support representative.
Wrong cell data - Please contact your MT-Support representative.	Wrong cell data.	Please contact your MT-Support representative.
No standard adjustment - Please contact your MT-Support representative.	No standard calibration.	Please contact your MT-Support representative.
Program memory defect - Please contact your MT-Support representative.	Program memory defect.	Please contact your MT-Support representative.
Temperature sensor defect - Please contact your MT-Support representative.	Temperature sensor defect.	Please contact your MT-Support representative.
Wrong load cell brand - Please contact your MT-Support representative.	Wrong load cell brand.	Please contact your MT-Support representative.
Wrong type data set - Please contact your MT-Support representative.	Wrong type data set.	Please contact your MT-Support representative.
Please proceed and check date and time settings.	Some data could not be read correctly from memory.	Check date/time is correctly or if the problem persists <b>Please</b> <b>contact your MT-Support repre-</b> <b>sentative.</b>
The instrument will reset and restart.	Some data could not be read correctly from memory.	Please contact your MT-Support representative.
	Overload - The weight on the pan exceeds the weighing capacity of the balance.	Reduce the weight on the weighing pan.
	Underload	Check that the weighing pan is positioned correctly.
Weight is above initial zero range.	Wrong weighing pan or pan is not empty.	Mount correct weighing pan or unload weighing pan.
Weight is below initial zero range.	Wrong weighing pan or pan is missing.	Mount correct weighing pan.
Memory full	Memory full.	Clear the memory and start a new evaluation.

Error message	Cause	Rectification
Weight out of range	Sample weight is outside the allowed range.	Unload the pan and load a new sample weight.

# 9.2 Status messages/Status icons

Status messages are displayed by means of small icons. The status icons indicate the following:

	Cause	Solution
FACT	Automatic <b>FACT</b> adjustment is currently not possible as the balance is busy.	<ol> <li>Unload the balance.</li> <li>Do not press any key for 2 minutes. The display stabilizes.</li> </ol>
		The status icon disappears after successful adjustment.
<b>%</b>	The balance is due for a service.	Contact a METTLER TOLEDO representative as soon as possible.
		⇒ The balance should be serviced by a service engineer.

### 10 Maintenance

## 10.1 Cleaning and servicing

Clean the weighing pan, draft shield element, bottom plate, draft shield (depending on the model) and housing of your balance at regular intervals. The balance is made from high-quality, durable materials and can therefore be cleaned using a damp cloth or a standard cleaning agent.

To thoroughly clean the draft shield glass panels, remove the draft shield from the balance. When reinstalling the draft shield, make sure it is in the correct position.

### Please observe the following notes



### **⚠ WARNING**

### Risk of electric shock

Contact with parts carrying a live current can lead to injury and death.

- 1 Disconnect the balance from the power supply prior to cleaning and maintenance.
- 2 Only use METTLER TOLEDO power cables if they need to be replaced.
- 3 Prevent liquid from entering the balance, terminal or AC/DC adapter.
- 4 Do not open the balance, terminal or AC/DC adapter. They do not contain any parts that can be serviced by the user.



## **NOTICE**

### Risk of damage to balance due to inappropriate cleaning methods

The balance is made from high quality, resistant materials and can be damaged by certain cleaning agents, solvents or abrasives. Any liquid that enters the housing may damage the balance.

- 1 Use water and a mild detergent to clean the balance or terminal.
- 2 Wipe off any spills immediately.
- 3 Prevent liquid from entering the interior of the balance.

Contact a METTLER TOLEDO representative to find about the service options available – regular maintenance by an authorized service engineer will ensure consistent weighing accuracy over the long term and extend the service life of the balance.

## 10.2 Cleaning the draft shield (0.1 mg and 1 mg models)

### Removing or inserting sliding glass doors

It is possible to remove the sliding glass doors for cleaning or for replacing.

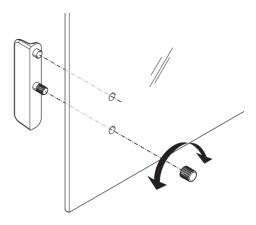


### Note

Front and rear glass panels cannot be removed.

- 1 Remove the handle.
- 2 Pull the side glass out to the rear.

After cleaning, reinstall all components in the reverse order. Installing the handle after insertion of the glass door.



## 10.3 Disposal

In conformance with the European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in 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.

### 11 Technical Data

### 11.1 General data



### **↑** WARNING

### Risk of electric shock

Contact with parts that contain a live current can lead to injury and death.

- 1 Only use an approved AC/DC adapter with a current-limited SELV output.
- 2 Ensure correct polarity ⊖—⊕—⊕

Standard power supply

AC/DC adapter: Primary:  $100 - 240 \text{ V, } \pm 10\%$ , 50/60 Hz, 0.3 A

Secondary: 12 V DC, 0.84 A (with electronic overload

protection)

Balance power supply: 12 V DC, 0.84 A

Can be used up to 2000 m above mean sea level.



### **NOTICE**

If the balance is used above 2000 m mean sea level, the optional power supply must be used.

Optional power supply

AC/DC adapter: Primary: 100 - 240 V,  $\pm 10\%$ , 50/60Hz

Secondary: 12 V DC ±3%, 2.5 A (with electronic overload

protection)

Cable for AC/DC adapter: 3-core, with country-specific plug

Balance power supply: 12 V DC ±3%, 2.25 A, maximum ripple: 80 mVpp

Can be used up to 4000 m above mean sea level.

**Protection and standards** 

Overvoltage category: II
Degree of pollution: 2

Protection: Protected against dust and water Standards for safety and EMC: See Declaration of Conformity

Range of application: For use in closed interior rooms only

**Environmental conditions** 

Height above mean sea level: Depending on the power adapter (2000 - 4000 m)

Except for China: max. 2000 m

Ambient temperature: Operating conditions for ordinary lab application: +10 to 30°C

(operability guaranteed between +5 and 40°C)

Relative air humidity: 10% up to 80% at 31°C with a linear decrease to 50% at

40°C, non-condensing

Warm-up time: At least 30 minutes (60 minutes for 0.1 mg models) after

connecting the balance to the power supply. When switched on

from standby, the instrument is ready for operation

immediately.

### **Materials**

Housing: Top housing: Plastic (ABS)

Bottom housing: Die-cast aluminum

Weighing pan: Pan ø 90 mm: Stainless steel X2CrNiMo 17-12-2 (1.4404)

All others: Stainless steel X5CrNi 18-10 (1.4301)

Draft shield element: 0.1 mg models: Stainless steel X5CrNi 18-10 (1.4301)

Draft shield: Plastic (ABS), glass

Protective cover: Plastic (PET)

TFT touch screen surface: Glass

# 11.2 Model-specific data

# 11.2.1 Balances with a readability of 0.1 mg with draft shield

	ME54T	ME54TE
Limit values		
Maximum capacity	52 g	52 g
Readability	0.1 mg	0.1 mg
Repeatability (at nominal load)	0.1 mg	0.1 mg
Linearity deviation	0.2 mg	0.2 mg
Sensitivity temperature drift	2 ppm/°C	2 ppm/°C
Typical values		
Repeatability (at nominal load)	0.08 mg	0.08 mg
Linearity deviation	0.06 mg	0.06 mg
Minimum sample weight (acc. to USP)	160 mg	160 mg
Minimum sample weight (U=1%, k=2)	16 mg	16 mg
Minimum sample weight OIML	10 mg	10 mg
Settling time	2 s	2 s
Adjustment	Int. Cal / FACT	Ext. Cal
Interface	1 × RS232 / 2 × USB	1 × RS232 / 2 × USB
Balance dimensions (w $\times$ d $\times$ h)	210 × 344 × 344 mm	210 × 344 × 344 mm
Weighing pan dimensions	ø 90 mm	ø 90 mm
Usable height of draft shield	238 mm	238 mm
Weight of balance	5.6 kg	5.3 kg
Weights for routine testing		
OIML CarePac	#11123003	#11123003
Weights	50 g F2, 2 g E2	50 g F2, 2 g E2
ASTM CarePac	#11123103	#11123103
Weights	50 g 1, 2 g 1	50 g 1, 2 g 1

	ME104T	ME104TE
Limit values		
Maximum capacity	120 g	120 g
Readability	0.1 mg	0.1 mg
Repeatability (at nominal load)	0.1 mg	0.1 mg
Linearity deviation	0.2 mg	0.2 mg
Sensitivity temperature drift	2 ppm/°C	2 ppm/°C
Typical values		
Repeatability (at nominal load)	0.08 mg	0.08 mg
Linearity deviation	0.06 mg	0.06 mg
Minimum sample weight (acc. to USP)	160 mg	160 mg
Minimum sample weight (U=1%, k=2)	16 mg	16 mg
Minimum sample weight OIML	10 mg	10 mg
Settling time	2 s	2 s
Adjustment	Int. Cal / FACT	Ext. Cal
Interfaces	1 × RS232 / 2 × USB	1 × RS232 / 2 × USB
Balance dimensions ( $w \times d \times h$ )	210 × 344 × 344 mm	210 × 344 × 344 mm
Weighing pan dimensions	ø 90 mm	ø 90 mm
Usable height of draft shield	238 mm	238 mm
Weight of balance	5.6 kg	5.3 kg
Weights for routine testing		
OIML CarePac	#11123002	#11123002
Weigh	ts 100 g F2, 5 g E2	100 g F2, 5 g E2
ASTM CarePac	#11123102	#11123102
Weigh	ts 100 g 1, 5 g 1	100 g 1, 5 g 1

	ME204T	ME204TE
Limit values		
Maximum capacity	220 g	220 g
Readability	0.1 mg	0.1 mg
Repeatability (at nominal load)	0.1 mg	0.1 mg
Linearity deviation	0.2 mg	0.2 mg
Sensitivity temperature drift	2 ppm/°C	2 ppm/°C
Typical values		
Repeatability (at nominal load)	0.08 mg	0.08 mg
Linearity deviation	0.06 mg	0.06 mg
Minimum sample weight (acc. to USP)	160 mg	160 mg
Minimum sample weight (U=1%, k=2)	16 mg	16 mg
Minimum sample weight OIML	10 mg	10 mg
Settling time	2 s	2 s
Adjustment	Int. Cal / FACT	Ext. Cal
Interfaces	1 × RS232 / 2 × USB	1 × RS232 / 2 × USB
Balance dimensions ( $w \times d \times h$ )	210 × 344 × 344 mm	210 × 344 × 344 mm
Weighing pan dimensions	ø 90 mm	ø 90 mm
Usable height of draft shield	238 mm	238 mm
Weight of balance	5.6 kg	5.3 kg
Weights for routine testing		
OIML CarePac	#11123001	#11123001
Weights	200 g F2, 10 g F1	200 g F2, 10 g F1
ASTM CarePac	#11123101	#11123101
Weights	200 g 1, 10 g 1	200 g 1, 10 g 1

# 11.2.2 Balances with a readability of 1 mg with draft shield

	ME103T	ME103TE
Limit values		
Maximum capacity	120 g	120 g
Readability	1 mg	1 mg
Repeatability (at nominal load)	1 mg	1 mg
Linearity deviation	2 mg	2 mg
Sensitivity temperature drift	3 ppm/°C	3 ppm/°C
Typical values		
Repeatability (at nominal load)	0.7 mg	0.7 mg
Linearity deviation	0.6 mg	0.6 mg
Minimum sample weight (acc. to USP)	1.4 g	1.4 g
Minimum sample weight (U=1%, k=2)	140 mg	140 mg
Minimum sample weight OIML	20 mg	20 mg
Settling time	1.5 s	1.5 s
Adjustment	Int. Cal / FACT	Ext.Cal
Interface	1 × RS232 / 2 × USB	1 × RS232 / 2 × USB
Balance dimensions ( $w \times d \times h$ )	210 × 319 × 289 mm	210 × 319 × 289 mm
Weighing pan dimensions	ø 120 mm	ø 120 mm
Usable height of draft shield	172.6 mm	172.6 mm
Weight of balance	4.5 kg	3.8 kg
Weights for routine testing		
OIML CarePac	#11123002	#11123002
Weigh	nts 100 g F2, 5 g E2	100 g F2, 5 g E2
ASTM CarePac	#11123102	#11123102
Weigh	nts 100 g 1, 5 g 1	100 g 1, 5 g 1

	ME203T	ME203TE	
Limit values			
Maximum capacity	220 g	220 g	
Readability	1 mg	1 mg	
Repeatability (at nominal load)	1 mg	1 mg	
Linearity deviation	2 mg	2 mg	
Sensitivity temperature drift	3 ppm/°C	3 ppm/°C	
Typical values			
Repeatability (at nominal load)	0.7 mg	0.7 mg	
Linearity deviation	0.6 mg	0.6 mg	
Minimum sample weight (acc. to USP)	1.4 g	1.4 g	
Minimum sample weight (U=1%, k=2)	140 mg	140 mg	
Minimum sample weight OIML	20 mg	20 mg	
Settling time	1.5 s	1.5 s	
Adjustment	Int. Cal / FACT	Ext.Cal	
Interface	1 × RS232 / 2 × USB	1 × RS232 / 2 × USB	
Balance dimensions ( $w \times d \times h$ )	210 × 319 × 289 mm	210 × 319 × 289 mm	
Weighing pan dimensions	ø 120 mm	ø 120 mm	
Usable height of draft shield	172.6 mm	172.6 mm	
Weight of balance	4.5 kg	3.8 kg	
Weights for routine testing			
OIML CarePac	#11123001	#11123001	
Weights	200 g F2, 10 g F1	200 g F2, 10 g F1	
ASTM CarePac	#11123101	#11123101	
Weights	200 g 1, 10 g 1	200 g 1, 10 g 1	

	ME303T	ME303TE
Limit values		
Maximum capacity	320 g	320 g
Readability	1 mg	1 mg
Repeatability (at nominal load)	1 mg	1 mg
Linearity deviation	2 mg	2 mg
Sensitivity temperature drift	3 ppm/°C	3 ppm/°C
Typical values		
Repeatability (at nominal load)	0.7 mg	0.7 mg
Linearity deviation	0.6 mg	0.6 mg
Minimum sample weight (acc. to USP)	1.4 g	1.4 g
Minimum sample weight (U=1%, k=2)	140 mg	140 mg
Minimum sample weight OIML	20 mg	20 mg
Settling time	1.5 s	1.5 s
Adjustment	Int. Cal / FACT	Ext. Cal
Interface	1 × RS232 / 2 × USB	1 × RS232 / 2 × USB
Balance dimensions ( $w \times d \times h$ )	210 × 319 × 289 mm	210 × 319 × 289 mm
Weighing pan dimensions	ø 120 mm	ø 120 mm
Usable height of draft shield	172.6 mm	172.6 mm
Weight of balance	4.5 kg	3.8 kg
Weights for routine testing		
OIML CarePac	#11123001	#11123001
Weigl	nts 200 g F2, 10 g F1	200 g F2, 10 g F1
ASTM CarePac	#11123101	#11123101
Weigl	nts 200 g 1, 10 g 1	200 g 1, 10 g 1

	ME403T	ME403TE
Limit values	WIE 4031	WILTOSIL
Maximum capacity	420 g	420 g
Readability	1 mg	1 mg
Repeatability (at nominal load)		1 mg
Linearity deviation	1 mg	
	2 mg	2 mg
Sensitivity temperature drift	3 ppm/°C	3 ppm/°C
Typical values		
Repeatability (at nominal load)	0.7 mg	0.7 mg
Linearity deviation	0.6 mg	0.6 mg
Minimum sample weight (acc. to USP)	1.4 g	1.4 g
Minimum sample weight (U=1%, k=2)	140 mg	140 mg
Minimum sample weight OIML	20 mg	20 mg
Settling time	1.5 s	1.5 s
Adjustment	Int. Cal / FACT	Ext. Cal
Interface	1 × RS232 / 2 × USB	1 × RS232 / 2 × USB
Balance dimensions ( $w \times d \times h$ )	210 × 319 × 289 mm	210 × 319 × 289 mm
Weighing pan dimensions	ø 120 mm	ø 120 mm
Usable height of draft shield	172.6 mm	172.6 mm
Weight of balance	4.5 kg	3.8 kg
Weights for routine testing		<u>'</u>
OIML CarePac	#11123000	#11123000
Weights	200 g F2, 20 g F1	200 g F2, 20 g F1
ASTM CarePac	#11123100	#11123100
Weights	200 g 1, 20 g 1	200 g 1, 20 g 1

	ME503T	ME503TE
Limit values		
Maximum capacity	520 g	520 g
Readability	1 mg	1 mg
Repeatability (at nominal load)	1 mg	1 mg
Linearity deviation	2 mg	2 mg
Sensitivity temperature drift	3 ppm/°C	3 ppm/°C
Typical values		
Repeatability (at nominal load)	0.7 mg	0.7 mg
Linearity deviation	0.6 mg	0.6 mg
Minimum sample weight (acc. to USP)	1.4 g	1.4 g
Minimum sample weight (U=1%, k=2)	140 mg	140 mg
Minimum sample weight OIML	20 mg	20 mg
Settling time	1.5 s	1.5 s
Adjustment	Int. Cal / FACT	Ext. Cal
Interface	1 × RS232 / 2 × USB	$1 \times RS232 / 2 \times USB$
Balance dimensions ( $w \times d \times h$ )	210 × 319 × 289 mm	$210 \times 319 \times 289 \text{ mm}$
Weighing pan dimensions	ø 120 mm	ø 120 mm
Usable height of draft shield	172.6 mm	172.6 mm
Weight of balance	4.5 kg	3.8 kg
Weights for routine testing		
OIML CarePac	#11123007	#11123007
Weigl	nts 500 g F2, 20 g F1	500 g F2, 20 g F1
ASTM CarePac	#11123107	#11123107
Weigl	nts 500 g 1, 20 g 1	500 g 1, 20 g 1

## 11.2.3 Balances with a readability of 10 mg / 100 mg

	ME1002T	ME1002TE
Limit values		
Maximum capacity	1200 g	1200 g
Readability	10 mg	10 mg
Repeatability (at nominal load)	10 mg	10 mg
Linearity deviation	20 mg	20 mg
Sensitivity temperature drift	3 ppm/°C	3 ppm/°C
Typical values		
Repeatability (at nominal load)	7 mg	7 mg
Linearity deviation	6 mg	6 mg
Minimum sample weight (acc. to USP)	14 g	14 g
Minimum sample weight (U=1%, k=2)	1.4 g	1.4 g
Minimum sample weight OIML	500 mg	500 mg
Settling time	1.5 s	1.5 s
Adjustment	Int. Cal / FACT	Ext. Cal
Interfaces	1 × RS232 / 2 × USB	1 × RS232 / 2 × USB
Balance dimensions ( $w \times d \times h$ )	200 × 319 × 100 mm	$200\times319\times100~\text{mm}$
Weighing pan dimensions	180 × 180 mm	180 × 180 mm
Weight of balance	3.7 kg	3 kg
Weights for routine testing		
OIML CarePac	#11123008	#11123008
Weights	1000 g F2, 50 g F2	1000 g F2, 50 g F2
ASTM CarePac	#11123108	#11123108
Weights	1000 g 1, 50 g 1	1000 g 1, 50 g 1

	ME2002T	ME2002TE
Limit values		
Maximum capacity	2.2 kg	2.2 kg
Readability	10 mg	10 mg
Repeatability (at nominal load)	10 mg	10 mg
Linearity deviation	20 mg	20 mg
Sensitivity temperature drift	3 ppm/°C	3 ppm/°C
Typical values		
Repeatability (at nominal load)	7 mg	7 mg
Linearity deviation	6 mg	6 mg
Minimum sample weight (acc. to USP)	14 g	14 g
Minimum sample weight (U=1%, k=2)	1.4 g	1.4 g
Minimum sample weight OIML	500 mg	500 mg
Settling time	1.5 s	1.5 s
Adjustment	Int. Cal / FACT	Ext. Cal
Interfaces	1 × RS232 / 2 × USB	1 × RS232 / 2 × USB
Balance dimensions ( $w \times d \times h$ )	200 × 319 × 100 mm	200 × 319 × 100 mm
Weighing pan dimensions	180 × 180 mm	180 × 180 mm
Weight of balance	3.7 kg	3 kg
Weights for routine testing		
OIML CarePac	#11123009	#11123009
Wei	ghts 2000 g F2, 100 g F2	2000 g F2, 100 g F2
ASTM CarePac	#11123109	#11123109
Wei	ghts 2000 g 1, 100 g 1	2000 g 1, 100 g 1

	ME3002T	ME3002TE
Limit values		
Maximum capacity	3.2 kg	3.2 kg
Readability	10 mg	10 mg
Repeatability (at nominal load)	10 mg	10 mg
Linearity deviation	20 mg	20 mg
Sensitivity temperature drift	3 ppm/°C	3 ppm/°C
Typical values		
Repeatability (at nominal load)	7 mg	7 mg
Linearity deviation	6 mg	6 mg
Minimum sample weight (acc. to USP)	14 g	14 g
Minimum sample weight (U=1%, k=2)	1.4 g	1.4 g
Minimum sample weight OIML	500 mg	500 mg
Settling time	1.5 s	1.5 s
Adjustment	Int. Cal / FACT	Ext. Cal
Interface	1 × RS232 / 2 × USB	1 × RS232 / 2 × USB
Balance dimensions (w $\times$ d $\times$ h)	200 × 319 × 100 mm	200 × 319 × 100 mm
Weighing pan dimensions	180 × 180 mm	180 × 180 mm
Weight of balance	3.7 kg	3 kg
Weights for routine testing		
OIML CarePac	#11123009	#11123009
Weights	2000 g F2, 100 g F2	2000 g F2, 100 g F2
ASTM CarePac	#11123109	#11123109
Weights	2000 g 1, 100 g 1	2000 g 1, 100 g 1

	ME4001T	ME4001TE
Limit values		
Maximum capacity	4.2 kg	4.2 kg
Readability	100 mg	100 mg
Repeatability (at nominal load)	100 mg	100 mg
Linearity deviation	200 mg	200 mg
Sensitivity temperature drift	5 ppm/°C	5 ppm/°C
Typical values		
Repeatability (at nominal load)	70 mg	70 mg
Linearity deviation	70 mg	70 mg
Minimum sample weight (acc. to USP)	120 g	120 g
Minimum sample weight (U=1%, k=2)	12 g	12 g
Minimum sample weight OIML	5 g	5 g
Settling time	1 s	1 s
Adjustment	Int. Cal / FACT	Ext. Cal
Interface	1 × RS232 / 2 × USB	1 × RS232 / 2 × USB
Balance dimensions ( $w \times d \times h$ )	200 × 319 × 100 mm	$200 \times 319 \times 100 \text{ mm}$
Weighing pan dimensions	180 × 180 mm	180 × 180 mm
Weight of balance	3.7 kg	3 kg
Weights for routine testing		
OIML CarePac	#11123010	#11123010
Weight	2000 g F2, 200 g F2	2000 g F2, 200 g F2
ASTM CarePac	#11123110	#11123110
Weight	2000 g 4, 200 g 4	2000 g 4, 200 g 4

	ME4002T	ME4002TE
Limit values		
Maximum capacity	4.2 kg	4.2 kg
Readability	10 mg	10 mg
Repeatability (at nominal load)	10 mg	10 mg
Linearity deviation	20 mg	20 mg
Sensitivity temperature drift	3 ppm/°C	3 ppm/°C
Typical values		
Repeatability (at nominal load)	7 mg	7 mg
Linearity deviation	6 mg	6 mg
Minimum sample weight (acc. to USP)	14 g	14 g
Minimum sample weight (U=1%, k=2)	1.4 g	1.4 g
Minimum sample weight OIML	500 mg	500 mg
Settling time	1.5 s	1.5 s
Adjustment	Int. Cal / FACT	Ext. Cal
Interface	1 × RS232 / 2 × USB	1 × RS232 / 2 × USB
Balance dimensions (w $\times$ d $\times$ h)	200 × 319 × 100 mm	200 × 319 × 100 mm
Weighing pan dimensions	180 × 180 mm	180 × 180 mm
Weight of balance	3.7 kg	3 kg
Weights for routine testing		
OIML CarePac	#11123010	#11123010
Weights	2000 g F2, 200 g F2	2000 g F2, 200 g F2
ASTM CarePac	#11123110	#11123110
Weights	2000 g 4, 200 g 4	2000 g 4, 200 g 4

	ME5002T	ME5002TE
Limit values	'	
Maximum capacity	5.2 kg	5.2 kg
Readability	10 mg	10 mg
Repeatability (at nominal load)	10 mg	10 mg
Linearity deviation	20 mg	20 mg
Sensitivity temperature drift	3 ppm/°C	3 ppm/°C
Typical values		
Repeatability (at nominal load)	7 mg	7 mg
Linearity deviation	6 mg	6 mg
Minimum sample weight (acc. to USP)	14 g	14 g
Minimum sample weight (U=1%, k=2)	1.4 g	1.4 g
Minimum sample weight OIML	500 mg	500 mg
Settling time	1.5 s	1.5 s
Adjustment	Int. Cal / FACT	Ext. Cal
Interface	1 × RS232 / 2 × USB	1 × RS232 / 2 × USB
Balance dimensions ( $w \times d \times h$ )	200 × 319 × 100 mm	200 × 319 × 100 mm
Weighing pan dimensions	180 × 180 mm	180 × 180 mm
Weight of balance	3.7 kg	3 kg
Weights for routine testing		
OIML CarePac	#11123011	#11123011
Weigh	ts 5000 g F2, 200 g F2	5000 g F2, 200 g F2
ASTM CarePac	#11123111	#11123111
Weigh	ts 5000 g 4, 200 g 4	5000 g 4, 200 g 4

## 11.3 Dimensions

## 11.3.1 Balances with a readability of 0.1 mg with draft shield high

### Models:

ME54T

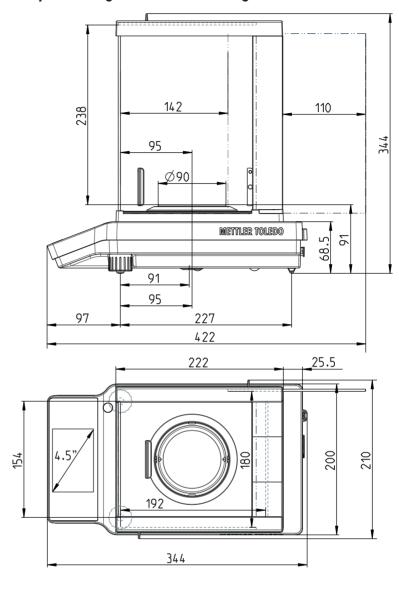
ME54TE

ME104T

ME104TE

ME204T

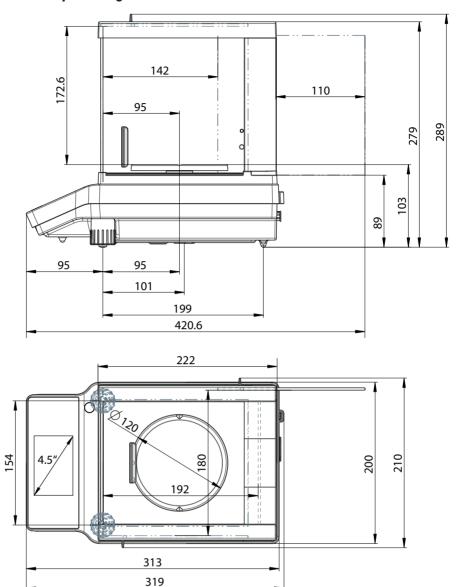
ME204TE



## 11.3.2 Balances with a readability of 1 mg with draft shield low



ME503TE



## 11.3.3 Balances with a readability of 10 mg / 100 mg

### Models:

ME1002T

ME1002TE

ME2002T

ME2002TE

ME3002T

ME3002TE

ME4001T

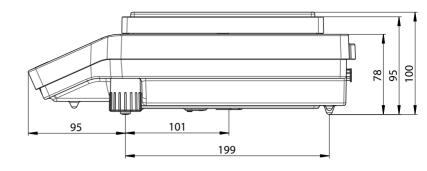
ME4001TE

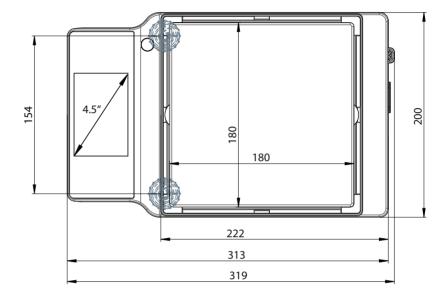
ME4002T

ME4002TE

ME5002T

ME5002TE

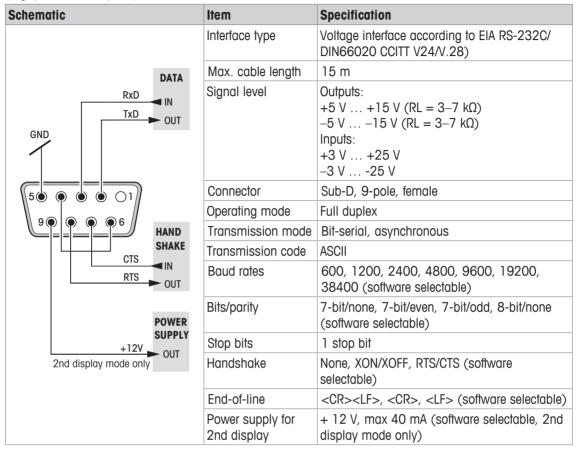




## 11.4 Interface specifications

### 11.4.1 RS232C interface

Each balance is equipped with an RS232C Interface as standard for the attachment of a peripheral device (e.g. printer or computer).



### 11.4.2 USB host

Each balance is equipped with a USB host as standard for the attachment of a peripheral device (e.g. printer, barcode reader).

Schematic	Item	Specification	
	Standard	In conformity v	vith USB specifications revision
	Speed	Full-speed 12	Mbps (requires shielded cable)
	Power usage	Max. 500 mA	
1 2 3 4	Connector	Type A	
1 2 3 4	Pin assignment	1	VBUS (+5 V DC)
		2	D- (Data -)
		3	D+ (Data +)
		4	GND (Ground)
		Shell	Shield

### 11.4.3 USB device

Each balance is equipped with a USB device interface as standard for the attachment of a peripheral device (e.g. computer).



### **■** Note

This interface is not able to communicate with a printer.

Schematic		Item	Specification
	2 1	Standard	In conformity with USB specifications revision 1.1
	<del>''''</del> '	Speed	Full-speed 12 Mbps (requires shielded cable)
		Function	CDC (Communication Device Class) serial port emulation
l '	3 4	Power usage	Suspended device: Max 10 mA
		Connector	Туре В
1	VBUS (+5 VDC)		
2	D- (Data -)		
3	D+ (Data +)		
4	GND (Ground)		
Shield	Shield		

### 11.4.4 MT-SICS interface commands and functions

Many of the instruments and balances used have to be able to integrate into a complex computer or data acquisition system.

To easily integrate a balance into a system and utilize its capacity to the full extent, most balance functions are also available as corresponding commands via the data interface.

All new METTLER TOLEDO balances launched on the market support "METTLER TOLEDO Standard Interface Command Set" (MT-SICS). The commands available depend on the functionality of the balance.

For further information, please contact your METTLER TOLEDO representative.



Refer to the MT-SICS Reference Manual which can be downloaded from the Internet at

www.mt.com/library

# 12 Accessories and Spare Parts

## 12.1 Accessories

	Description	Part No.
Printers		
	RS-P25/01 (EMEA) printer with RS232 connection to instrument	11124300
	Paper roll (length: 20 m), set of 5 pcs	00072456
	Paper roll (length: 13 m), self-adhesive, set of 3 pcs	11600388
	Ribbon cartridge, black, set of 2 pcs	00065975
	RS-P25/02 (Asia-Pacific) printer with RS232C connection to instrument	11124310
	Paper roll, set of 5 pcs	00072456
	Paper roll, self-adhesive, set of 3 pcs	11600388
	Ribbon cartridge, black, set of 2 pcs	00065975
	RS-P25/03 (Northern America) printer with RS232 connection to instrument	11124320
	Paper roll (length: 20 m), set of 5 pcs	00072456
	Paper roll (length: 13 m), self-adhesive, set of 3 pcs	11600388
	Ribbon cartridge, black, set of 2 pcs	00065975
	RS-P26/01 (EMEA) printer with RS232 connection to instrument (with date and time)	11124303
	Paper roll (length: 20 m), set of 5 pcs	00072456
	Paper roll, self-adhesive (length: 13 m), set of 3 pcs	11600388
	Ribbon cartridge, black, set of 2 pcs	00065975
	RS-P26/02 (Asia-Pacific) printer with RS232C connection to instrument (with date and time)	11124313
	Paper roll, set of 5 pcs	00072456
	Paper roll, self-adhesive, set of 3 pcs	11600388
	Ribbon cartridge, black, set of 2 pcs	00065975
	RS-P26/03 (Northern America) printer with RS232 connection to instrument (with date and time)	11124323
	Paper roll (length: 20 m), set of 5 pcs	00072456
	Paper roll, self-adhesive (length: 13 m), set of 3 pcs	11600388
	Ribbon cartridge, black, set of 2 pcs	00065975

RS-P28/01 (EMEA) printer with RS232 connection to instrument (with date, time and applications)	11124304
Paper roll (length: 20 m), set of 5 pcs	00072456
Paper roll, self-adhesive (length: 13 m), set of 3 pcs	11600388
Ribbon cartridge, black, set of 2 pcs	00065975
RS-P28/02 (Asia-Pacific) printer with RS232C connection to instrument (with date, time and applications	11124314
Paper roll, set of 5 pcs	00072456
Paper roll, self-adhesive, set of 3 pcs	11600388
Ribbon cartridge, black, set of 2 pcs	00065975
RS-P28/03 (Northern America) printer with RS232 connection to instrument (with date, time and applications)	11124324
Paper roll (length: 20 m), set of 5 pcs	00072456
Paper roll, self-adhesive (length: 13 m), set of 3 pcs	11600388
Ribbon cartridge, black, set of 2 pcs	00065975
USB-P25/01 (EMEA) printer with USB connection to instrument	11124301
Paper roll (length: 20 m), set of 5 pcs	00072456
Paper roll (length: 13 m), self-adhesive, set of 3 pcs	11600388
Ribbon cartridge, black, set of 2 pcs	00065975
USB-P25/02 (Asia-Pacific) printer with USB connection to instrument	11124311
Paper roll (length: 20 m), set of 5 pcs	00072456
Paper roll (length: 13 m), self-adhesive, set of 3 pcs	11600388
Ribbon cartridge, black, set of 2 pcs	00065975
USB-P25/03 (Northern America) printer with USB connection to instrument	11124321
Paper roll (length: 20 m), set of 5 pcs	00072456
Paper roll (length: 13 m), self-adhesive, set of 3 pcs	11600388
Ribbon cartridge, black, set of 2 pcs	00065975
P-52RUE dot matrix printer RS232C, USB and Ethernet connections, simple print-outs.	30237920
Paper roll, set of 5 pcs	00072456
Paper roll, self-adhesive, set of 3 pcs	11600388
Ribbon cartridge, black, set of 2 pcs	00065975



P-56RUE INERMAI PRINIER WITH RS232, USB and einerner	30094673
connections, simple print-outs, date and time	
Paper roll, white (length: 27 m), set of 10 pcs	30094723
Paper roll, white, self-adhesive (length: 13 m),	30094724



P-58RUE thermal printer with RS232, USB and ethernet connections, simple print-outs, date and time, label printing, balance applications: statistics, formulation, totaling,

set of 10 pcs

Paper roll, white (length: 27 m), set of 10 pcs

Paper roll, white, self-adhesive (length: 13 m),
set of 10 pcs

Paper roll, white, self-adhesive labels (550

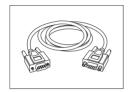
30094724

30094725

30094725

30094725

### Cables for RS232 interface



RS9 - RS9 (m/f): connection cable for PC, length = 1 m 11101051



RS9 – RS25 (m/f): connection cable for PC, length = 2 m 11101052

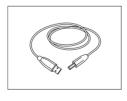


RS232 - USB converter cable — cable with converter to connect a balance (RS232) to a USB port

64088427

30094674

### Cables for USB interface



USB (A - B) connection cable for PC, length = 1 m

30241476

### Cable replacement (wireless)



Bluetooth RS232 serial adapter ADP-BT-S for wireless connection between balance and PC (Bluetooth interface required). Compatible with printers P-50 and the following balance models (SW V2.20 or higher required): JP, JS, MS, MS-S, MS-L, ML, MS-TS, ML-T, ME-T, PHS, PL-E.

30086494

- 1 Bluetooth RS232 serial adapter (slave)
- 1 MT-DB9 male to female connector
- 1 MT-DB9 male to male connector

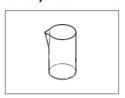


Bluetooth RS232 serial adapter set ADP-BT-P for wireless connection between printer and balance. Compatible with printers P-50 and the following balance models (SW V2.20 or higher required): JP, JS, MS, MS-S, MS-L, ML, MS-TS, ML-T, ME-T, PHS, PL-E.

30086495

- 2 Bluetooth RS232 serial adapter paired (slave/master)
- 1 MT-DB9 male to female connector
- 1 MT-DB9 male to male connector

### **Density determination**



Glass beaker, height 100 mm, ø 60 mm

00238166



Sinker for density of liquids in conjunction with density kit

Calibrated (sinker + certificate)

Recalibrated (new certificate)

00210260 00210672

00210674



Calibrated thermometer with certificate

11132685



Density kit ME-DNY-4 for balances with readability of 0.1 mg

30029886

### Weighing pans



Set of weighing pan ø 160 mm with pan support for balances with readability of 10 mg and 100 mg using draft shield

30042896

### **Draft shields**



Draft shield low with sliding doors, usable heigh 170 mm.

30042884

- for balances 0.1 mg or 1 mg
- for balances 10 mg or 100 mg, weighing pan ø 160 mm is needed (#30042896)

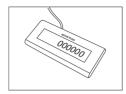


Draft shield high with sliding doors, usable heigh 235 mm

30037731

- for balances 10 mg or 1 mg
- for balances 10 mg or 100 mg, weighing pan ø 160 mm is needed (#30042896)

### **Auxiliary displays**



RS232 auxiliary display AD-RS-M7

12122381

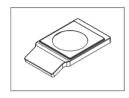
### **Pan protections**



Protective foils, 175x175 mm, set of 20 pcs, pan protection for weighing pan 180x180 mm

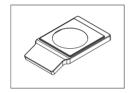
30113802

### **Protective covers**



Protective cover for models with readability of 0.01 mg  $^{\prime}$  0.1 mg

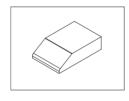
30241549



Protective cover for models with readability of 1 mg ...0.1 g

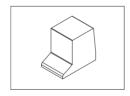
30241560

### **Dust covers**



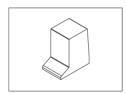
Dust cover for models without draft shield

30029051



Dust cover for models with draft shield low (170 mm)

30029050



Dust cover for models with draft shield high (235 mm)

30029049

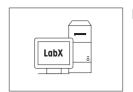
### **Anti-theft devices**



Steel cable with lock

11600361

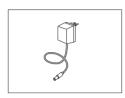
### Software



LabX direct balance (simple data transfer)

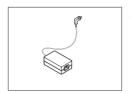
11120340

### **Various**



AC/DC universal adapter (EU, USA, AU, UK) 100-240 VAC, 50/60 Hz, 0.5 A, 12 VDC 1 A

11120270



AC/DC adapter (without power cable) 100–240 V AC, 0.8 A, 50/60 Hz, 12 V DC 2.5 A

11107909



Country-specific 3-Pin power cable with grounding conductor.

Power cable AU	00088751
Power cable BR	30015268
Power cable CH	00087920
Power cable CN	30047293
Power cable DK	00087452
Power cable EU	00087925
Power cable GB	00089405
Power cable IL	00225297
Power cable IN	11600569
Power cable IT	00087457
Power cable JP	11107881
Power cable TH, PE	11107880
Power cable US	00088668
Power cable ZA	00089728

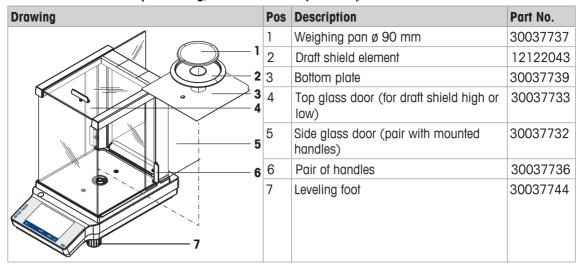
### **Adjustment weights**



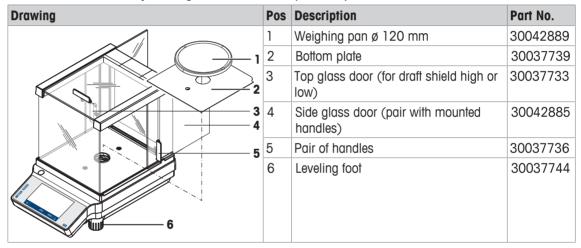
OIML / ASTM Weights (with calibration certificate) see http://www.mt.com/weights

## 12.2 Spare parts

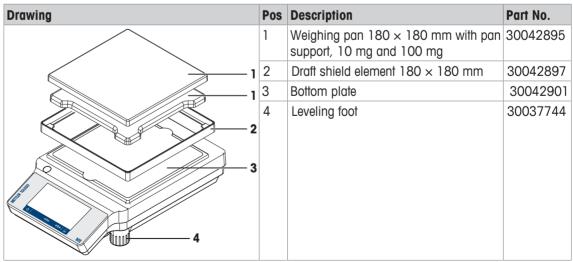
### Balances with readability of 0.1 mg, with draft shield (235 mm)



### Balances with readability of 1 mg, with draft shield (170 mm)



### Balances with readability of 10 mg and 100 mg with square weighing pan and draft shield element



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Good Weighing Practice<sup>™</sup>

GWP® is the global weighing standard, ensuring consistent accuracy of weighing processes, applicable to all equipment from any manufacturer It helps to:

- Choose the appropriate balance or scale
- Calibrate and operate your weighing equipment with security
- Comply with quality and compliance standards in laboratory and manufacturing

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www.mt.com/bal	ances
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For more information

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