Reference Manual

Jewelry Balances

JET

METTLER TOLEDO

Table of Contents

1 Introduction

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

This document is based on the software version V 3.52.

EULA

The software in this product is licensed under the METTLER TOLEDO End User License Agreement (EULA) for Software.

▶ www.mt.com/EULA

When using this product you agree to the terms of the EULA.

1.1 Further documents and information

▶ www.mt.com/jewelry

This document is available in other languages online.

▶ www.mt.com/jet-RM

Search for software downloads ▶ www.mt.com/labweighing-software-download

Search for documents ▶ www.mt.com/library

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

▶ www.mt.com/contact

1.2 Explanation of conventions and symbols used

Conventions and symbols

Key and/or button designations and display texts are shown in graphic or bold text, e.g., ⊞, **Language**.

📝 **Note**   For useful information about the product.

 Refers to an external document.

Elements of instructions

In this manual, step-by-step instructions are presented as follows. The action steps are numbered and can contain prerequisites, intermediate results and results, as shown in the example. Sequences with less than two steps are not numbered.

▪ Prerequisites that must be fulfilled before the individual steps can be executed.

1 Step 1

⇨ Intermediate result

2 Step 2

⇨ Result

1.3 Acronyms and abbreviations

Original term	Explanation
ASTM	American Society for Testing and Materials
EMC	Electromagnetic Compatibility
FACT	Fully Automatic Calibration Technology
FCC	Federal Communications Commission
GWP	Good Weighing Practice
ID	Identification
LPS	Limited Power Source
MT-SICS	METTLER TOLEDO Standard Interface Command Set
OIML	Organisation Internationale de Métrologie Légale (International Organization of Legal Metrology)
RM	Reference Manual
SNR	Serial Number
SOP	Standard Operating Procedure
UM	User Manual
USB	Universal Serial Bus
USP	United States Pharmacopeia

1.4 Compliance information

European Union

The instrument complies with the directives and standards listed on the EU Declaration of Conformity.

United States of America

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

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The FCC Supplier Declaration of Conformity is available online.

▶ http://www.mt.com/ComplianceSearch

2 Safety Information

Two documents named "User Manual" and "Reference Manual" are available for this instrument.

- The User Manual is printed and delivered with the instrument.
- The electronic Reference Manual contains a full description of the instrument and its use.
- Keep both documents for future reference.
- Include both documents if you transfer the instrument to other parties.

Only use the instrument according to the User Manual and the Reference Manual. If you do not use the instrument according to these documents or if the instrument is modified, the safety of the instrument may be impaired and Mettler-Toledo GmbH assumes no liability.

▶ www.mt.com/jet-RM

▶ www.mt.com/library

2.1 Definitions of signal words and warning symbols

Safety notes contain important information on safety issues. Ignoring the safety notes may lead to personal injury, damage to the instrument, malfunctions and false results. Safety notes are marked with the following signal words and warning symbols:

Signal words

DANGER	A hazardous situation with high risk, resulting in death or severe injury if not avoided.
WARNING	A hazardous situation with medium risk, possibly resulting in death or severe injury if not avoided.
CAUTION	A hazardous situation with low risk, resulting in minor or moderate injury if not avoided.
NOTICE	A hazardous situation with low risk, resulting in damage to the instrument, other material damage, malfunctions and erroneous results, or loss of data.

Warning symbols

 General hazard: read the User Manual or the Reference Manual for information about the hazards and the resulting measures.

 Electrical shock   Notice

2.2 Product specific safety notes

Intended use

This instrument is designed to be used by trained staff. The instrument is intended for weighing purposes.

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

Responsibilities of the instrument owner

The instrument owner is the person holding the legal title to the instrument and who uses the instrument or authorizes any person to use it, or the person who is deemed by law to be the operator of the instrument. The instrument owner is responsible for the safety of all users of the instrument and third parties.

Mettler-Toledo GmbH assumes that the instrument owner trains users to safely use the instrument in their workplace and deal with potential hazards. Mettler-Toledo GmbH assumes that the instrument owner provides the necessary protective gear.

Safety notes

⚠ WARNING

Death or serious injury due to electric shock

Contact with parts that carry a live current can lead to death or injury.

1   Only use the METTLER TOLEDO power cable and AC/DC adapter designed for your instrument.
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 the power plug for damage and replace them if damaged.

NOTICE

Damage to the instrument or malfunction due to the use of unsuitable parts

–   Only use parts from METTLER TOLEDO that are intended to be used with your instrument.

3 Design and Function

3.1 Overview balance

0.001 ct / 0.1 mg
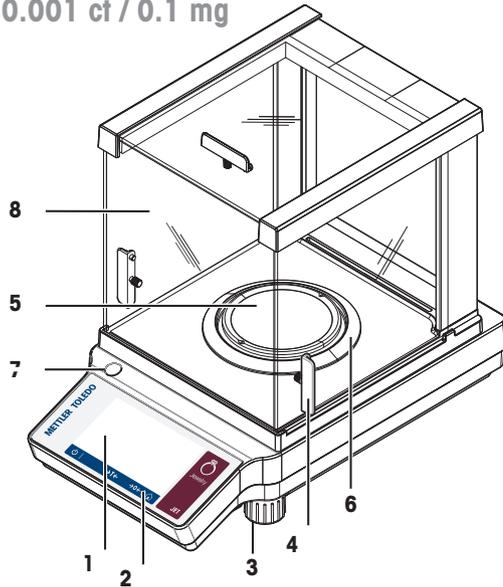
1 mg-10 mg
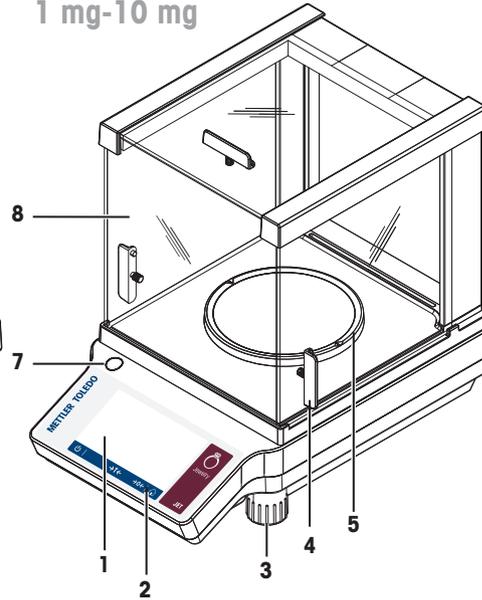
10 mg-100 mg
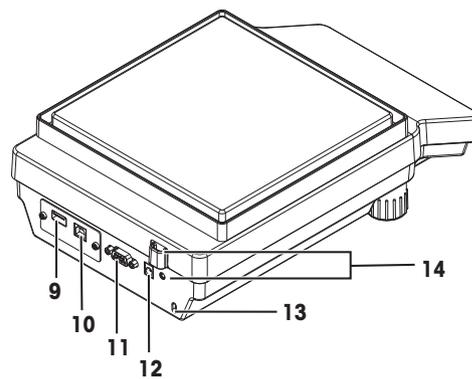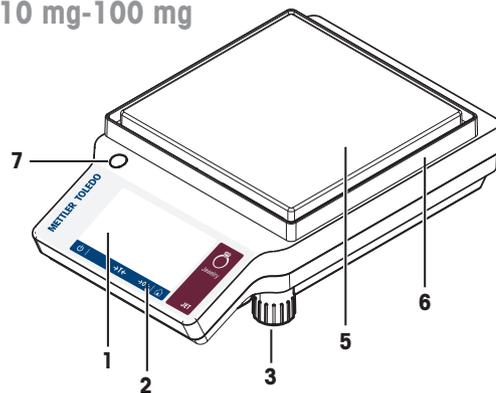
1	Touch screen (Capacitive color TFT)	**8**	Glass draft shield
2	Operating keys	**9**	USB-A port (host)
3	Leveling foot	**10**	USB-B port (device)
4	Handle for operation of the draft shield door	**11**	RS232 serial interface
5	Weighing pan	**12**	Socket for AC/DC adapter
6	Draft shield element	**13**	Kensington slot for anti-theft purposes
7	Level indicator	**14**	Legal for Trade sealing

3.2 Overview peripheral devices

USB-A port (host)   USB-B port (device)   RS232C serial interface
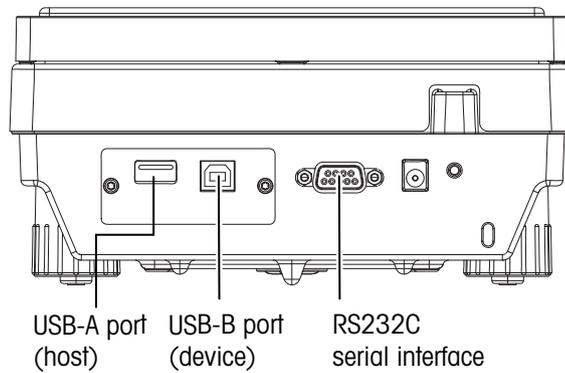
Interfaces and possible connectivity of peripheral devices:

USB-A port (host)	USB-B port (device)	RS232C
USB memory stick	PC	RS-P25
USB-P25 printer		Barcode reader
Barcode reader		RS 2nd display
		PC

3.3 Overview type plate

The balance type plate is located at the side of the balance and contains the following information (example illustration):
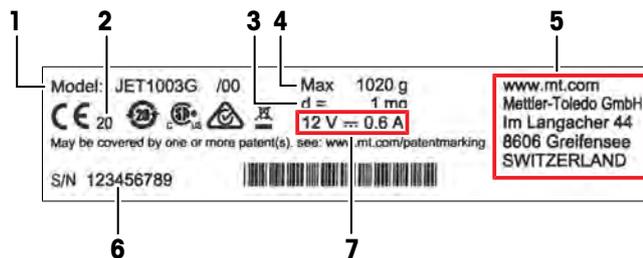
1	Model designation	2	Year of manufacture
3	Readability	4	Maximum capacity
5	Manufacturer	6	Serial number (SNR)
7	Power supply		

3.4 Overview operation keys
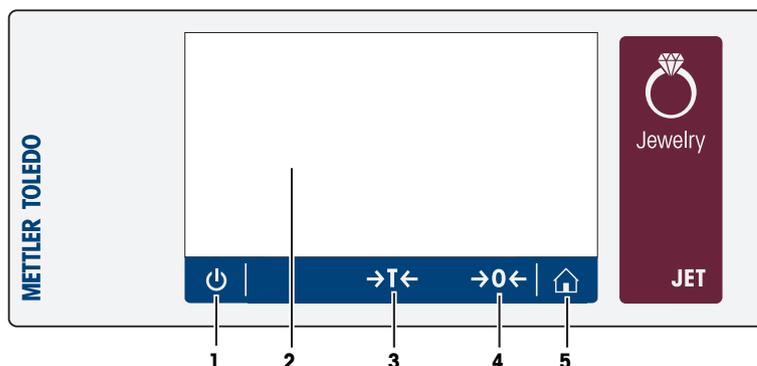
	Key	Name	Description
1	⏻	ON/OFF	Switches the balance on or off.
2		Capacitive color TFT touch screen	General navigation
3	→T←	Tare	Tares the balance.
4	→0←	Zero	Zeros the balance.
5	⌂	Home	Returns from any menu level, or other window to the application home screen.

3.5 User Interface

NOTICE

Damage to the touch screen due to pointed or sharp objects

– Operate the touch screen with your fingers.

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.

3.5.1 Main settings and activities at a glance

Depending on the application, the options available to be selected and their content may differ.

Application main configuration

Balance information

General settings

Activities
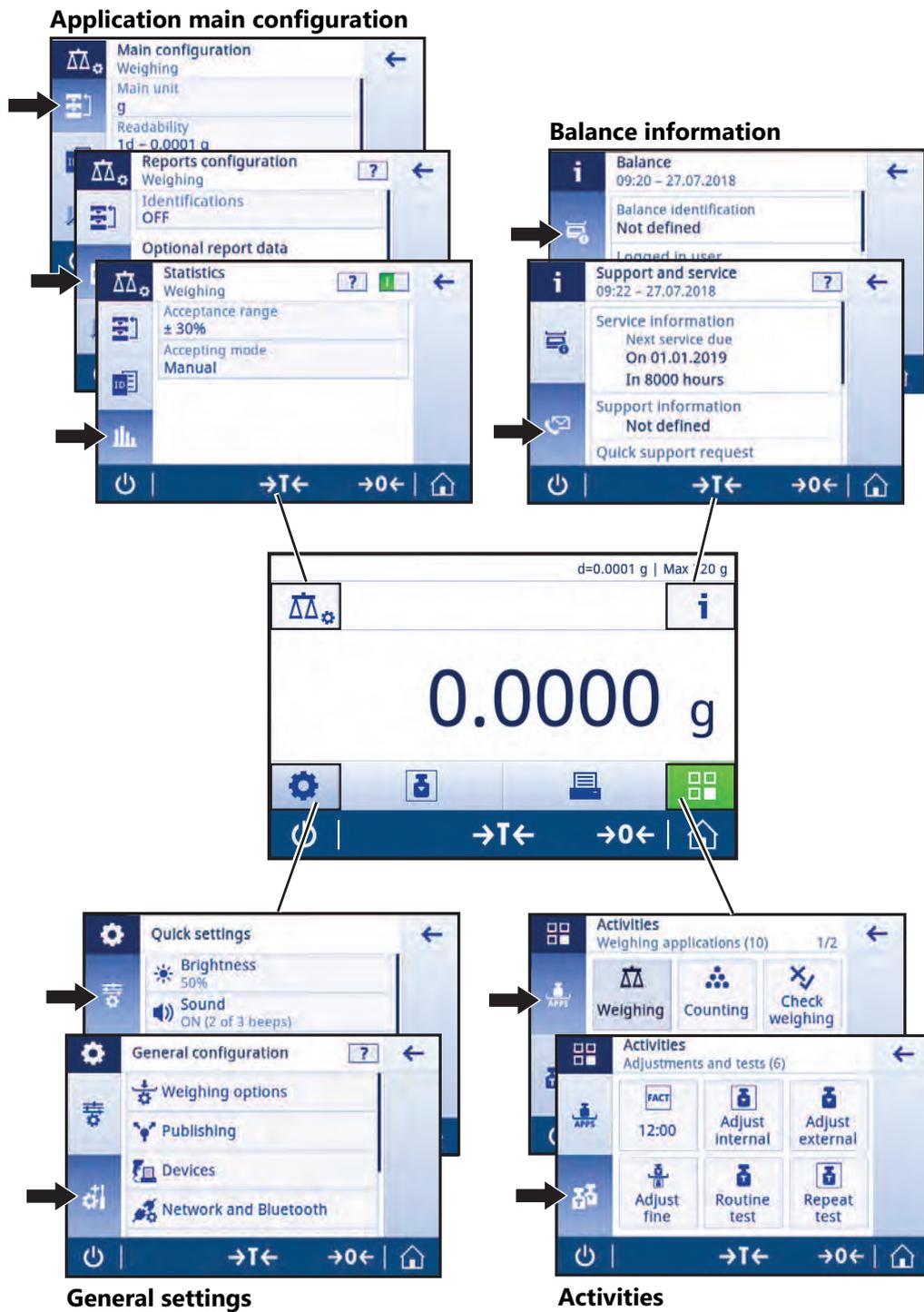
3.5.2 Touch screen navigation

To interact with the balance, use the screen and the operating keys at the bottom of the screen.

Opening an application

Due to its size, the display does not show all available applications at once. Scroll the applications by swiping the touchscreen horizontally.

To open settings or applications, tap the application symbol, e.g., $\overline{\underline{\wedge\wedge}}$ **Weighing**.
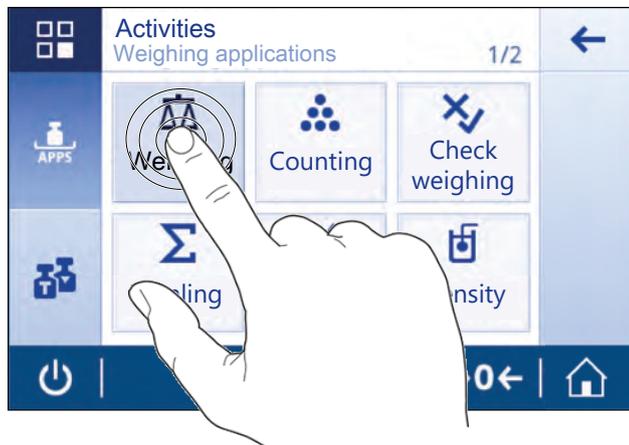
Scrolling

If not all content cannot be displayed on one page, it is indicated either by the page number (e.g. 1 / 2) or a blue scroll bar at right side of the screen. To scroll, swipe your finger across the screen, either horizontally (if page number is shown) or vertically (if blue scroll bar is shown).
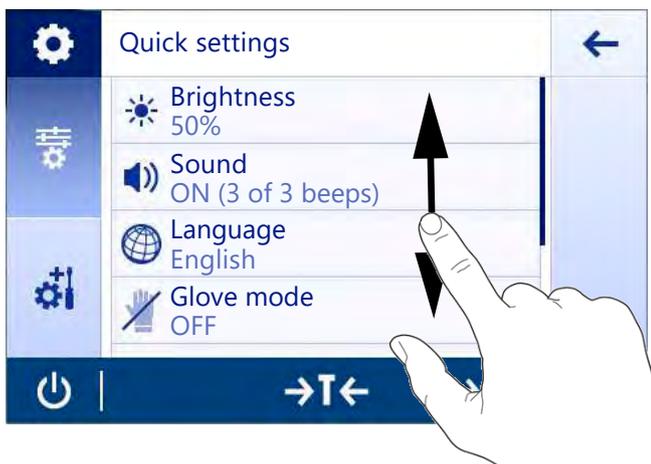
Using shortcuts

To simplify navigation on the 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.
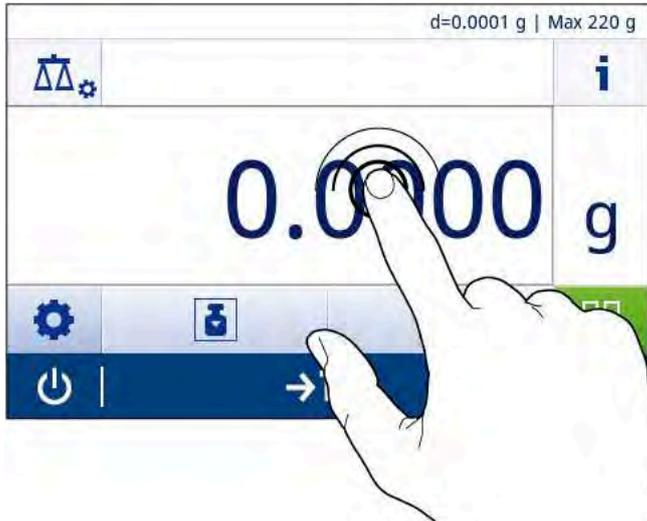
3.5.3 Application home screen

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 ⌂ in the lower right corner of the screen.
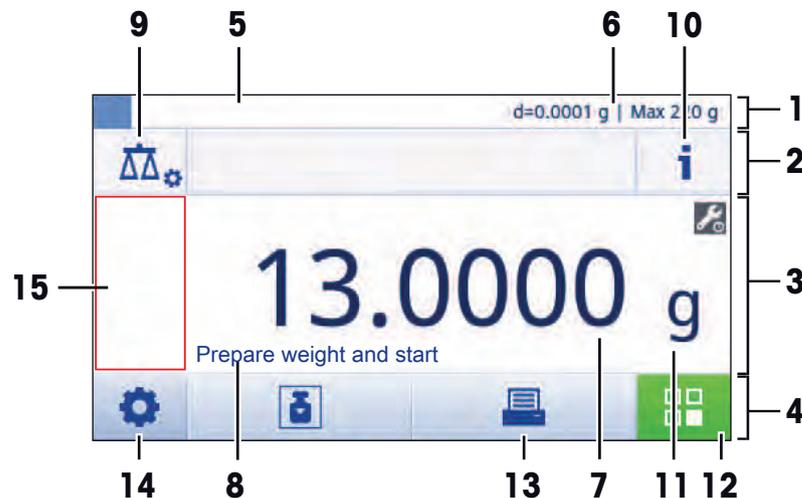
Information and work bars

	Name	Description
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	Description
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.

* For legal-for-trade approved balances: **Min** (minimum capacity) and **e** (verification of scale interval) are shown in the upper left corner.

Action buttons

	Name	Description
9	Activity configuration	To configure the current application, e.g., **Weighing**.
10	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 or transfers results and/or settings (printer required).
14	Settings	Configures balance and user settings/preferences (application independent).
15	Status information field	Displays information about the system status.

3.5.4 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 (e.g. the ID can be scanned via barcode reader to ensure that the sample is clearly assigned to the corresponding product). Additionally, it is possible to connect a USB keyboard to enter the information.
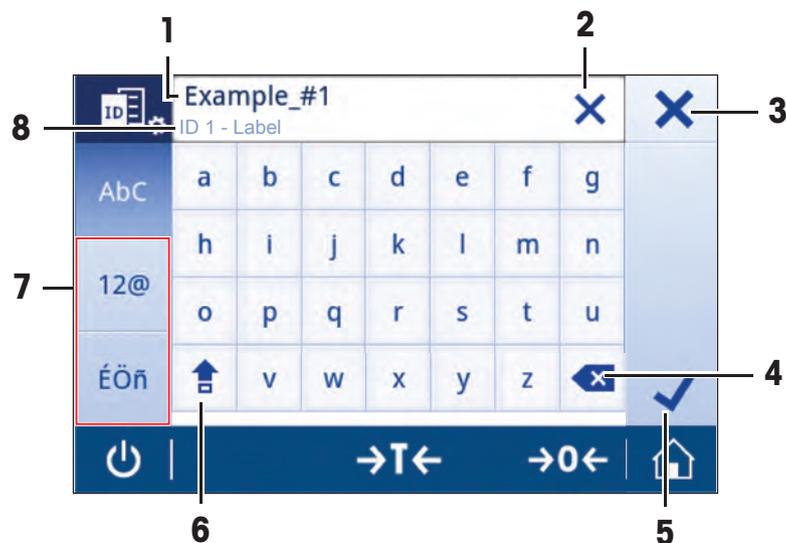
	Name	Description
1	Input field	Displays all characters that have been entered.
2	Delete all	Deletes all entered characters.
3	Discard	Discards the entered data and exits the dialog.
4	Delete	Deletes the last character.
5	Confirm	Confirms the data entered.
6	Shift	Switches between lower and upper case 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.

3.5.5 Balance information

Navigation: ℹ

Balance identification

The balance identification section contains identification data for hardware and software.

– Tap 🖳 to display **Balance identification**.

⇨ The display shows the **Balance identification** as defined by the user. See System settings and information about the software and hardware.

Balance support information

The balance support information section contains information about last and next service checks and provides support contact 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 (Quick Response) code. If you have a QR code reader application on your smart phone, scan the QR code on the balance screen. The smartphone will automatically create an email with all relevant service information.

Note

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.

4 Installation and Putting into Operation

> ⚠ **WARNING**
>
> **Risk of death or serious injury due to electric shock**
> The instrument must be disconnected from the power supply before performing all setup and assembly work.

4.1 Selecting the location

A balance is a sensitive precision instrument. The location where it is placed will have a profound effect on the accuracy of the weighing results.

Requirements of the location

Place indoors on stable table	Ensure sufficient spacing	Level the instrument	Provide adequate lighting
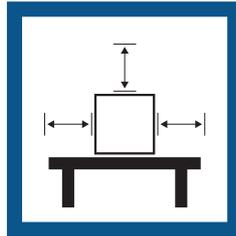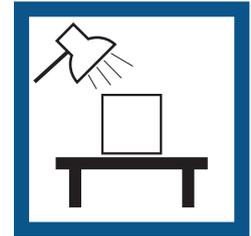
Avoid direct sunlight	Avoid vibrations	Avoid strong drafts	Avoid temperature fluctuations

Sufficient spacing for balances: > 15 cm all around the instrument

Take into account the environmental conditions. See "Technical Data".

4.2 Unpacking the balance

Check the package, the packaging elements and the delivered components for damages. If any components are damaged, please contact your METTLER TOLEDO service representative.

Retain all parts of the packaging. This packaging offers the best possible protection for transporting the balance.

4.3 Scope of delivery

Components		0.001 ct / 0.1 mg	1 mg / 10 mg with draft shield	10 mg / 100 mg without draft shield
Draft shield	170 mm	✓	✓	–
Draft shield element		✓	–	✓
Weighing pan	ø 90 mm	✓	–	–
	ø 120 mm	–	✓	–
	180 × 180 mm	–	–	✓
Pan support 90 ø		✓	–	–
Carat pan	S 80 ø × 20 mm	✓	–	–
	M 90 ø × 30 mm	✓	–	–
	L 90 ø × 45 mm	✓	–	–
Protective cover		✓	✓	✓
Universal AC/DC adapter		✓	✓	✓
User Manual		✓	✓	✓
Declaration of conformity		✓	✓	✓

4.4 Assembling the balance

⚠ **CAUTION**

Injury due to sharp objects or broken glass
Instrument components, e.g., glass, can break and lead to injuries.
– Always proceed with focus and care.

Balances with a readability of 0.001 ct / 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**).
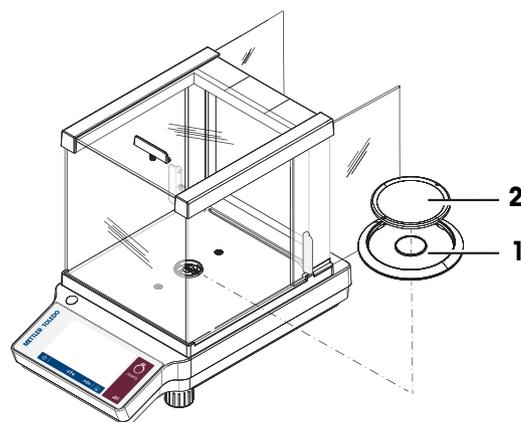
Balances with a readability of 1 mg / 10 mg

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**).
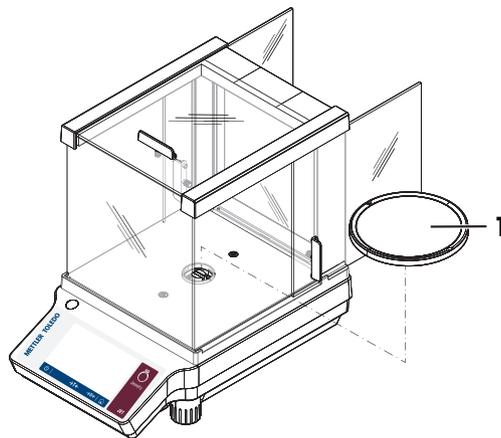
Balances with a readability of 10 mg / 100 mg

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

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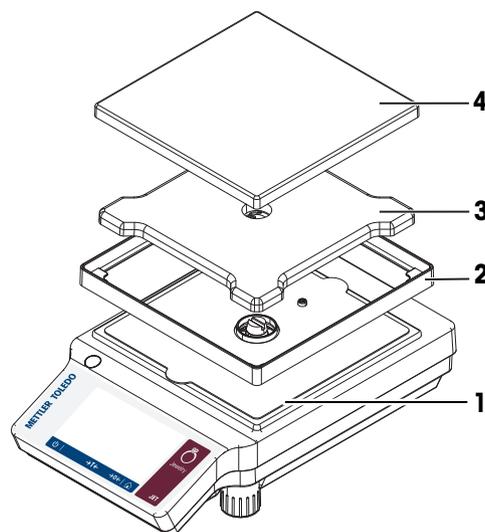
4.5 Installing protective cover

> **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.

Balances with draft shield	Balances without draft shield
Install the protective cover according to the illustrations below, using a flat-head screwdriver.	Install the protective cover according to the illustrations below, using a cross-recess screwdriver.
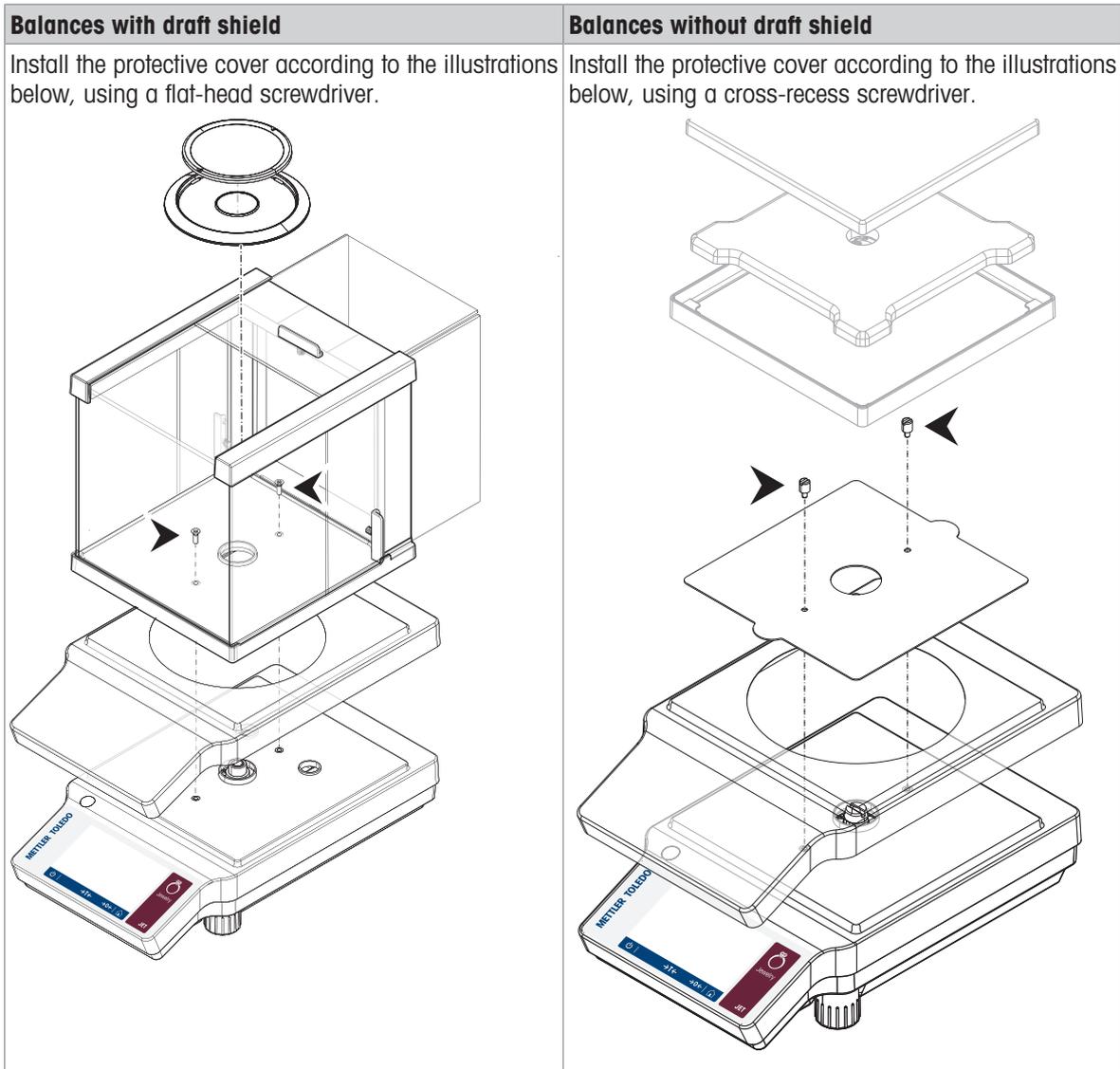
4.6 Putting into operation

4.6.1 Connecting the balance

⚠️ **WARNING**

Risk of electric shock

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

1. 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**
>
> **Damage 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.

1 Install the cables so that they cannot be damaged and do not interfere with the operation.

2 Insert the power cable in a grounded power outlet that is easily accessible.

3 Connect the AC/DC adapter (1) to the connection socket on the back of your balance.

4 Connect the power cable (2) to the power socket.

5 Screw the plug into the balance if applicable.
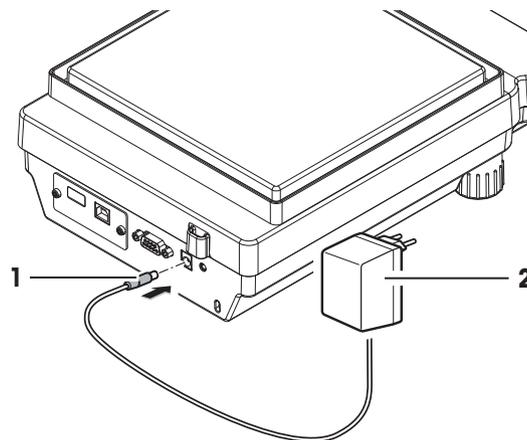
4.6.2 Switching on the balance

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 / 0.01 mg models).

▪ The balance is connected to the power supply.

▪ The balance is warmed up.

– Press ⏻.

⇨ After the start screen has disappeared, the application home screen will open.

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 start with the screen of the application last used before switching it off.

4.6.3 Changing the date and time

Navigation: ✿ > 🎛 Quick settings > 🕒 Date and Time

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

Tap 🕐 for **Time** and 📅 for **Date**. The format can be selected by tapping ⌄.
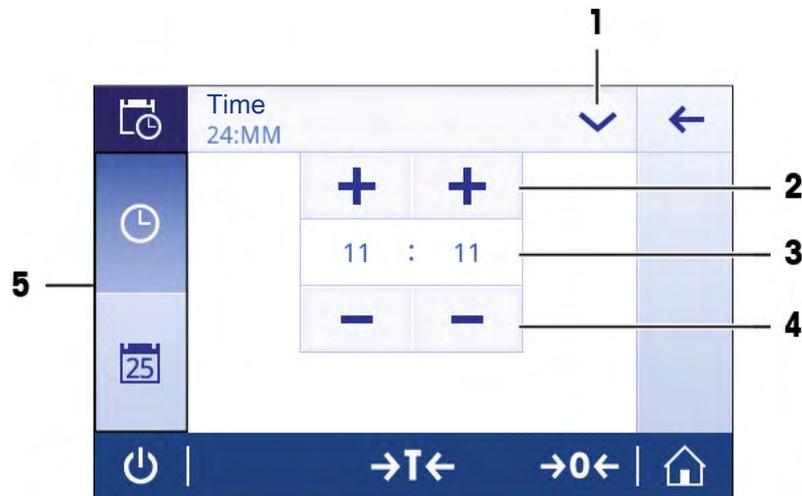
	Name	Description
1	Change date/time format	Various date/time formats can be selected.
2	Pick button	Increment.
3	Picker field	Displays the defined time/date.
4	Pick button	Decrement.
5	Selection tabs	Tabs of the selectable sub-categories.

4.6.4 Leveling the balance

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

Leveling intervals

Check and - if necessary - adjust the bubble level:

- when the balance is used for the first time.
- after moving the balance to a new location.
- at regular intervals.

Leveling procedure

The balances are leveled manually by turning the leveling feet at the bottom of the housing.

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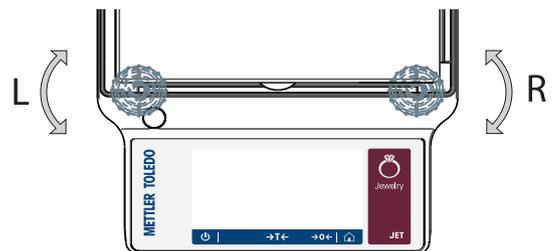
2 Align the balance horizontally.
3 Turn the two front leveling feet of the housing until the air bubble is in the middle of the glass.
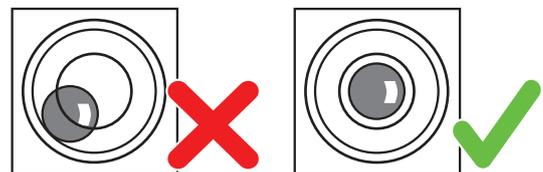
Example

Air bubble at 12 o'clock:		turn both feet clockwise.		L R
Air bubble at 3 o'clock:		turn left foot clockwise, right foot counter-clockwise.		L R
Air bubble at 6 o'clock:		turn both feet counterclockwise.		L R
Air bubble at 9 o'clock:		turn left foot counterclockwise, right foot clockwise.		L R

4.6.5 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.
- 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.

See also

- Activities - Adjustments and tests ▶ Page 66

4.7 Performing a simple weighing

Navigation: ▦ > ⚖ Activities - Weighing applications > ⚖ Weighing

4.7.1 Weighing

Zeroing

Use the →0← zeroing key before starting to weigh anything.

1 Unload the balance.
2 Press →0← to zero the balance.
⇨ All weight values are measured in relation to this zero point.

Taring

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 →T← to tare the balance.
   ⇨ **0.000 g** and **Net** appears in the display. **Net** indicates that all weight values displayed are net values.

Weighing

- 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.

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 "Publishing" and "Devices".

- ▪ 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 ⏻ until the dialog **Switch-off** appears.

2 Tap ✓ 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.

4.7.2 Changing the readability

Changing the readability

There are several readabilities available. The default readability (d) is model-specific.

1 Tap the weighing value.

2 Select the desired readability.

3 Confirm the selected readability by tapping ✓.

⇨ The readability has now been changed.
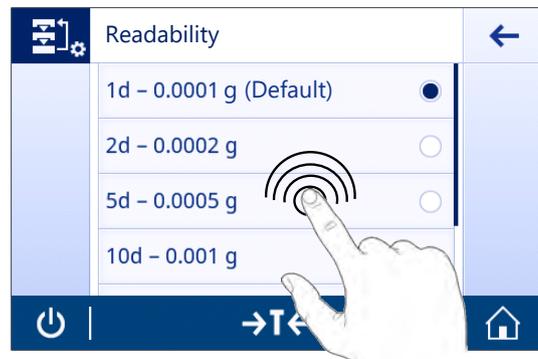
4.7.3 Switching weight units

Switching weight units

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

The weighing unit can be selected using the activity configuration or via shortcut. This example describes how to change the weighing unit via shortcut.

📝 Note

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

1 Tap the weighing unit.

⇨ The screen **Main unit** appears.

2 Select the desired weighing unit by tapping it.

3 Tap ✓ to confirm.

⇨ The weighing unit has now been changed.
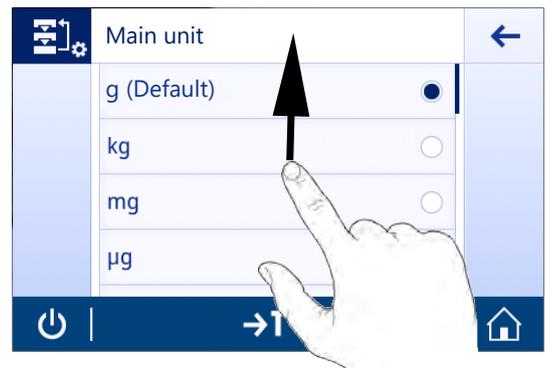
4.8 Weighing below the balance

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

1 Press and hold the ⏻ key.

2 Disconnect the balance from the AC/DC adapter.

3 Disconnect all interface cables.

1 If present, carefully remove all glass draft shields.

2 Remove the weighing pan, pan support and, if present, the draft shield element.

3 Carefully turn the balance onto its side.

4 Remove the weighing cap of the weighing hook. Keep it for later use.

5 Put the balance upright again and reinstall all components in reverse order.

⇨ You can now perform weighings under the balance.
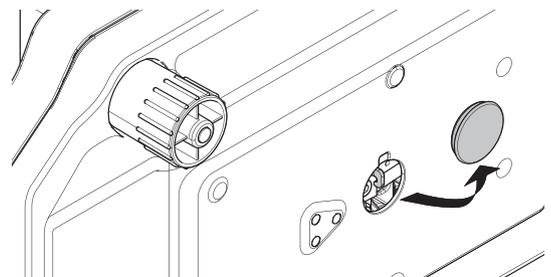
4.9 Transporting, packaging and storage

Preparing the balance for transport

⚠ CAUTION

Injury due to sharp objects or broken glass

Instrument components, e.g., glass, can break and lead to injuries.

– Always proceed with focus and care.

1　Press and hold the ⏻ key.

2　Disconnect the balance from the AC/DC adapter.

3　Disconnect all interface cables.

4.9.1　Transporting over short distances

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

1　Hold the balance with both hands as shown.

2　Carefully lift the balance and carry the balance in horizontal position to the new location.

If you wish to put the balance into operation, proceed as follows:

1　Connect in reverse order.

2　Level the balance.

3　Perform an internal adjustment.
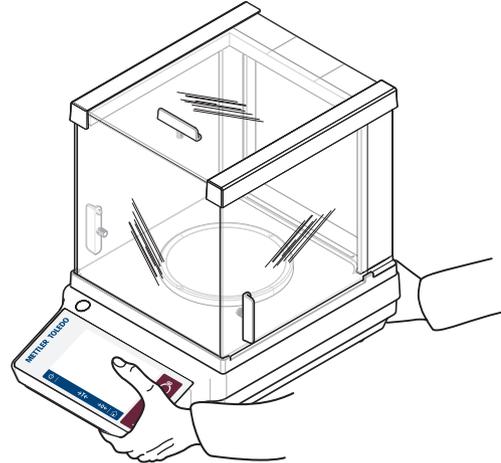
4.9.2　Transporting over long distances

To transport the balance over long distances, always use the original packaging.

See also

📄　Unpacking the balance ▶ Page 17

4.9.3　Packaging and storage

Packing

Store all parts of the packaging in a save place. The elements of the original packaging are developed specifically for the balance and its components to ensure maximum protection during transportation or storing.

Storing

Store the balance under following conditions:

- Indoor and in the original packaging.
- According to the environmental condition, see "Technical data".
- When storing for longer than six months, the rechargeable battery maybe down (date and time get lost).

5 General Settings

Navigation: ⚙

This section describes the procedure for adapting the balance to suit specific requirements. The settings apply to the entire weighing system and therefore to all applications.

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

- ⚖ **Quick settings**
- ⚙ **General configuration**

Printing settings

All settings and configuration data can be printed out.

▪ Printer is connected and configured.

1 Tap 🖨.

⇨ The screen **Print and export report** appears.

2 Select the settings, e.g., **Quick settings/Preferences** and **Weighing options** for printing and confirm with ✓.

⇨ A list of the selected settings will be printed.

Parameter	Description	Values
Print	Select the settings for printing.	Quick settings* I General configuration* I Publishing* I Devices and connectivity* I System settings* I Access protection* I ISO-Log

* Factory setting

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: ⚙ > ⚖ **Quick settings** > 📅 **Date and Time**

This menu item can be used to set the date and time. Tap 🕐 for **Time** and 📅 for **Date**. The format can be selected by tapping ⌄.

Parameter	Description	Values
Time format	Sets the time format.	24:MM* I 12:MM I 24.MM I 12.MM
Time	Sets the time. The time can be set with the pick buttons.	Hours I Minutes

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. The date can be set with the pick buttons.	Day | Month | Year

* Factory setting

5.1.2 Brightness

Navigation: ✿ > ☰ 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	Description	Values
Brightness	Sets the brightness of the display (in 10% increments).	10...100% (50%*)

* Factory setting

5.1.3 Sound

Navigation: ✿ > ☰ Quick settings > 🔊 Sound

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

The following options can be set:

Parameter	Description	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

* Factory setting

5.1.4 Language

Navigation: ✿ > ☰ 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	Description	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

Navigation: ✿ > 🏺 Quick settings > ✋ Glove mode

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

The following options can be set:

Parameter	Description	Values
Glove mode	Activates or deactivates the function **Glove mode**.	ON I OFF*

* Factory setting

5.1.6 Quick adjustment

Navigation: ✿ > 🏺 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	Description	Values
Quick adjustment	Activates or deactivates **Quick adjustment**.	ON* I OFF
	Starts the adjustment directly from work area.	Internal adjustment (model-specific) I External adjustment

5.1.7 Date/Time widget

Navigation: ✿ > 🏺 Quick settings > 🕥 Date/Time widget

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.

The following options can be set:

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

* Factory setting

5.2 General configuration

Navigation: ⚙ > ⚙ General configuration

The following options are available:

- ⚖ **Weighing options**
- 🌐 **Publishing**
- 🖧 **Devices and 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	Description	Values
Weighing mode	Sets the weighing mode. **Universal** = for all standard weighing applications. **Dosing** = for dosing liquid or powdery samples.	Universal* l Dosing

* 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	Description	Values
Environment	Sets the ambient conditions.	Stable l Standard* l Unstable l Very unstable

* 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 §legal for trade balances (except for some selected countries).

The following options can be set:

Parameter	Description	Values
Autozero	Activates or deactivates the automatic zero correction.	ON* l OFF

* Factory setting

5.2.1.4 Auto tare

Navigation: ✿ > ⚙ General configuration > ⚖ Weighing options > Auto tare

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

The following options can be set:

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

* Factory setting

5.2.1.5 Auto clear tare

Navigation: ✿ > ⚙ General configuration > ⚖ Weighing options > Auto clear tare

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

The following options can be set:

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

* Factory setting

5.2.1.6 Recall

Navigation: ✿ > ⚙ General configuration > ⚖ Weighing options > Recall

To retain and recall the last stable weight.

The following options can be set:

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

* Factory setting

5.2.2 Publishing

Navigation: ⚙ > ⚎| General configuration > ⋎ Publishing

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

The available options may vary depending on the peripheral device connected and configured in "Devices and connectivity". Not every option described is available for the selected peripheral device.

5.2.2.1 Publishing

5.2.2.1.1 Print

1. Tap **Print**.
   - ⇨ The screen **Print** appears.
2. If the selection is grayed out, enable changes to the factory settings by tapping the activation button (**1**) in the upper right corner.
   - ⇨ The button turns green and the settings are now changeable.
3. Tap the parameter you want to change, e.g., **Printer**.
4. Select the desired value, e.g., **USB printer**.
5. Tap ⌄ to confirm.
6. Tap ⬅ to return to the previous screen.

The following options can be set:

Parameter	Description	Values
ON* I OFF	Activates or deactivates the option.	
Printer	Defines to which printer the data will be sent. The printer is configured as set out in "Devices and connectivity". **Print to file** = save data to a USB stick.	Serial printer I USB printer I Print to file
Single values reports	Sets the behaviour of the printer for single values.	Manual, stable* I Manual, all values I Automatic, stable I Automatic, stable (zero included)
Workflow reports	Sets the workflow for the reports. **Automatic** = the report is printed at the end of the workflow automatically. **Manual** = the report is printed at will.	Automatic* I Manual
FACT report	Defines whether the FACT report is being printed automatically.	Automatic* I OFF

* Factory setting

See also

📄 Devices and connectivity ▶ Page 34

5.2.2.1.2 Send value

The values can either be transmitted via RS232 (Serial) or USB (USB-B) interface.

For more information about the different interfaces, see "Devices and connectivity".

The following options can be set:

Parameter	Description
ON* I OFF	Activates or deactivates the option.
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, see table relationship between readability and deviation below.
Automatic, continuous	**Send any stable or unstable weight automatically**

* Factory setting

Stability criteria: Relationship between readability and deviation

Readability	Min. deviation
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

See also

5.2.2.2 Advanced options

Navigation: ✿ > ⚙| **General configuration >** 'ᵧ' **Publishing > Advanced options**

The following options can be set:

Parameter	Description	Values
Adjustments/Tests – Reports configuration	Defines the **Header** and **Footer** for the adjustment and test reports.	Header I Footer
Autopublish	Activates or deactivates the publishing time interval.	ON I OFF*
	Sets the publishing time interval of single values. Please be aware that exporting a file to a USB memory stick or a FTP server takes some time and we therefore do not recommend to set this value in these cases below 10 seconds.	numerical values (1… 65535 seconds)
Commands options	Activates or deactivates the function **Print and tare**. The balance will tare automatically after publishing.	ON I OFF*

* Factory setting

5.2.3 Devices and connectivity

Navigation: ✿ > ⚙| General configuration > 🖧 Devices and connectivity

Add and configure the connections to peripheral devices.

Only one device set up per interface is possible. On creating a new device connection, the existing will be replaced. The last saved configuration of the replaced device will be used as default when the same device type is added again at a later time.

The following devices can be added and configured via the different interfaces.

Parameter	Description	Values
P-20	Connect to a Standard lab printer.	RS232
Printer	Connect to a custom printer.	RS232
Barcode reader	Connect to a barcode reader.	RS232
Host	Establish the Command host service to communicate with the balance via MT-SICS.	RS232	USB Device*
Second display	Connect a auxiliary weight display. 📝 **Note**: If you select **Second display** make sure that no other device is connected at RS232. Other devices could be damaged because of the voltage.	RS232
PC-Direct	Establishes a service to send the weight value to a PC. E.g., to Microsoft Excel by placing the cursor in the required cell. PC-Direct sends the weight value like a numeric keypad. Please make sure the NumLock is on. Via the USB device interface there is no additional software on the PC needed except a METTLER TOLEDO USB driver.	RS232	USB Device

Configuring devices and connections

1 Tap the connection you want to set a new device for, e.g., **RS232**.
   ⇨ The parameter selection for the corresponding connection appears.
2 Select the parameter you want to configure, e.g., **Baudrate**.
   ⇨ The screen for the corresponding parameter, e.g., **Baudrate** appears.
3 Select the desired parameter values.
4 Tap ✓ to return to the **RS232** screen.
5 If necessary, change the other settings.
6 Tap ✓ to return to the **Devices and connectivity** screen.

5.2.3.1 RS232 (Serial)

The following options can be set:

Parameter	Description
Device type	**P-20*** | **P-50** | **Printer** | **Host** | **PC-Direct** | **Second display** | **Barcode reader**
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**
Character set	**IBM/DOS** | **ANSI/WIN** | **UTF-8*** **UTF-8** = is a character encoding capable of encoding all possible characters, or code points, defined by unicode (device-specific).
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.
End of line	**<CR><LF>*** | **<CR>** | **<LF>** | **<TAB>** **<CR><LF>** = writes in the same column, e.g., in Excel. **<TAB>** = writes in the same row, e.g., in Excel.
Handshake	**Xon/Xoff*** | **RTS/CTS** | **None**
Stop bits	**1 bit*** | **2 bits**

* Factory setting

5.2.3.2 USB Device (USB B)

The following options can be set:

Parameter	Description
Device type	**Host*** | **PC-Direct**
Character set	**ANSI/WIN** | **UTF-8** Cannot be changed (device-specific).
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.
End of line	**<CR><LF>*** | **<CR>** | **<LF>** | **<TAB>** **<CR><LF>** = writes in the same column, e.g., in Excel. **<TAB>** = writes in the same row, e.g., in Excel.

* Factory setting

5.2.3.3 USB Host (USB A)

The following options can be set:

Parameter	Description
Device type	not selectable
Character set	**IBM/DOS** | **ANSI/WIN** | **UTF-8*** **UTF-8** = 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>**

* 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.

The following options can be set:

Parameter	Description	Values
Balance identification	Defines a balance identification. By default the balance identification consists of the balance model and the serial number.	Values can be defined individually.
Sleep mode	Activates or deactivates the screen saver.	ON* | OFF
	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	Activates or deactivates the display turns off.	ON | OFF*
	Determines when the display turns off. Tap the screen to end Backlight OFF 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**. By placing the sample on the weighing pan, the **Sleep mode** and/or **Backlight OFF** will be terminated.	ON* | OFF
Service due notification	Activates or deactivates the function **Service due notification**.	ON* | OFF

* 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	Description
Touch screen adjustment	The balance performs a screen adjustment.
Reset balance…	Resets the balance to factory settings.
Backup and restore balance settings…	Generates a backup of the current balance settings (excluding MinWeigh, service due notification and ISO-Log). To execute a backup, an external storage device (USB memory stick, FAT32) must be connected to the USB host (type A). Additionally, if an external storage device (USB memory stick, FAT32) is attached with a back-up file, it can be restored. We do not recommend to back-up/restore balance settings between approved and non-approved balance models.

📝 Note

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 and data > 🔒 Access protection

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

The following options can be set:

Parameter	Description	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.	1…9 (1-12 digits)

* 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 password?

If you have forgotten or lost your password, ask the user with administrator rights to provide you with a new password. If the administrator's password is not available either, please contact a METTLER TOLEDO representative. To provide all the required information, please tap on 🛈 on the balance home screen, then tap on ✉. Find the instructions by tapping the **?** icon.

5.2.6 ISO-Log

Navigation: ⚙ > ⚒ General configuration > ☰ ISO-Log

The ISO-Log provides detailed information about adjustments already performed, the intensity of use and settings. The ISO-log can store up to 999 events until the oldest one is overwritten by the newest.

The following options can be set:

Parameter	Description
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

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**
- ⊞ **Statistics**

6.1 Main configuration

Navigation (example): ⊞ > ⚖ **Activities - Weighing applications** > ⚖ **Weighing** > ⚖ₐ > ⊞] **Main configuration**

In this section, the current application can 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.

See also

6.2 Reports configuration

Navigation (example): ⊞ > ⚖ **Activities - Weighing applications >** ⚖ **Weighing >** ⚖ **>** 🆔 **Reports configuration**

In this section, the report content can be configured. By default only the weighing value and the weight unit is published. Any additional information can be configured by the user.

The available options are model and country-specific and may vary depending on the application. The report configuration is valid independently of the report type. As far as possible the same content is published as CSV or TXT file or when printed on the strip printer. However, each report type has certain limitations.

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 **Reports configuration**. Usage and definition of the ID differ depending on the application for which the ID is used.

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 Label**.
8. Tap ✓ to confirm.
9. Define **ID Value**.
10. Tap ✓ to confirm.
    ⇨ The screen **ID 1** shows the definitions for **ID Label** and **ID Value**.
11. Tap ✓ to accept.
    ⇨ The screen **Header** appears.
12. Tap ✓ to confirm.
    ⇨ The screen **Reports configuration** appears.
13. Tap ✓ to confirm.
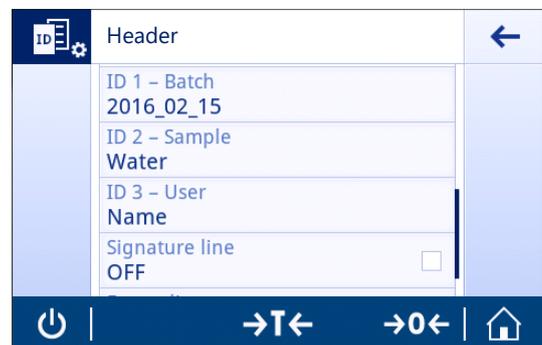
6.2.3 Workflow handling options

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. The value can either be defined via touch screen, by reading in the information with a barcode reader or by attaching an external keyboard to the balance. For more information please refer to "Devices and connectivity".

See also

📄 Devices and connectivity ▶ Page 34

6.2.4 Settings

Header

The following options can be set:

Parameter	Description	Values
Date, time	Defines if the date and time appears on the report.	ON I OFF*
Balance type	Defines if the balance type appears on the report.	ON I OFF*
Serial number (SNR)	Defines if the serial number appears on the report.	ON I OFF*
Balance ID	Defines if the balance ID ** appears on the report. ** Balance identification can be defined in the system settings.	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 appears on the report.	ON I OFF*
Empty lines	Defines the number of empty lines on the report (1…99).	ON I OFF*

* Factory setting

Sample

The following options can be set:

Parameter	Description	Values
ID 4	Defines if ID 4 (Sample ID) appears on the report.	ON I OFF*
Gross/Tare	Defines if **Gross/Tare** appears on the report.	ON I OFF*
Additional unit	Defines if an additional unit appears on the report.	ON I OFF*

* Factory setting

Footer

The following options can be set:

Parameter	Description	Values
Date, time	Defines if date and time is appears on the report.	ON I OFF*
Signature line	Defines if the signature line appears on the report.	ON I OFF*
Empty lines	Defines the number of empty lines on the report (1…99).	ON I OFF*

* Factory setting

6.3 Statistics

Navigation (example): ⊞ > ⚖ **Activities - Weighing applications** > ⟁ **Weighing** > ⟁ₐ > ᵢᵢᵢ **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 statistics are activated, the following options are available during the weighing process:

- Finish
- Pause
- Discard
- View result

Defining statistics

1 Open an application, e.g., **Weighing**.
2 Tap the main configuration symbol of the application, e.g., ⟁ₐ.
   ⇨ The main configuration screen appears.
3 Tap ᵢᵢᵢ.
   ⇨ The screen **Statistics** appears.
4 Activate the **Statistics**.
5 Define the available options.
6 Tap ✓ to confirm.

Statistics configuration

The following options can be set:

Parameter	Description	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.	Automatic l Manual*

* Factory setting

Stability criteria: Relationship between readability and deviation

Readability	Min. deviation
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

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 ✓ 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 and publish**.

   ⇨ The results are published according to the publishing configurations and the data are deleted.

   ⇨ The application home screen appears.

Discard

All results are deleted.

1   Tap ■.

   ⇨ A dialog screen appears.

2   Tap ✕ **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 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**
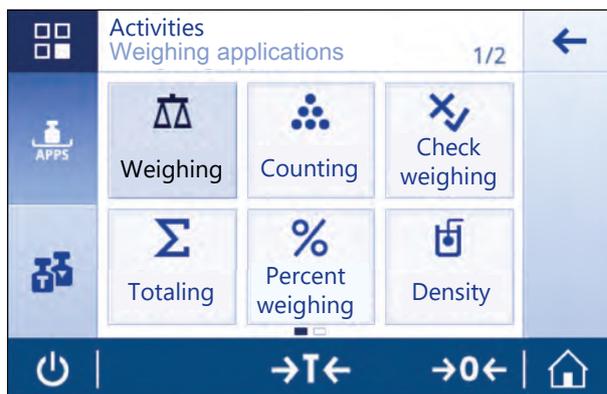
The landing screen does not show all applications. Scroll horizontally to reach the applications on the second page.

Activities - Weighing applications includes the following applications:

- ⚖️ **Weighing**, see [Weighing ▸ Page 46] and [Performing a simple weighing ▸ Page 23]
- ⚫ **Counting**, see [Counting ▸ Page 48]
- ✕ **Check weighing**, see [Density ▸ Page 63]
- Σ **Totaling**, see [Totaling ▸ Page 56]
- △ **Back-weighing**, see [Back-weighing ▸ Page 59]
- % **Percent weighing**, see Percent weighing
- 🗄 **Density**, see Density
- 🔧 **Factor weighing**, see Factor weighing

See also

📄 Check weighing ▸ Page 53

7.1.1 Weighing

Navigation

⊞ **Activities > ⚖ Activities - Weighing applications > ⚖ Weighing**

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

For more information about the basic weighing functions, see "Performing a simple weighing".

The statistics function can be activated; information on this topic can be found in [Statistics ▸ Page 43].

Weighing – Main configuration

Parameter	Description	Values
Main unit	Sets the main unit of the weighing process. The available units are model- and country-specific.	g* l kg l mg l µg l ct l N l lb l oz l ozt l GN l dwt l mom l msg l tlh l tls l tlt l tola l baht l lb:oz
Secondary infor-mation	Activates or deactivates the secondary information displayed on screen. **Additional unit*** Selects the secondary information displayed on screen. The available units are model- and country-specific. **Current tare** Current tare weight.	ON l OFF*
Readability	Defines the readability (d) of the weighing process. The available readabilities 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 tolerances	Defines the target weight and tolerances.	ON I OFF* Numerical value (depending on the balance type)
	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.	

* Factory setting

See also

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 [Statistics ▸ Page 43].

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
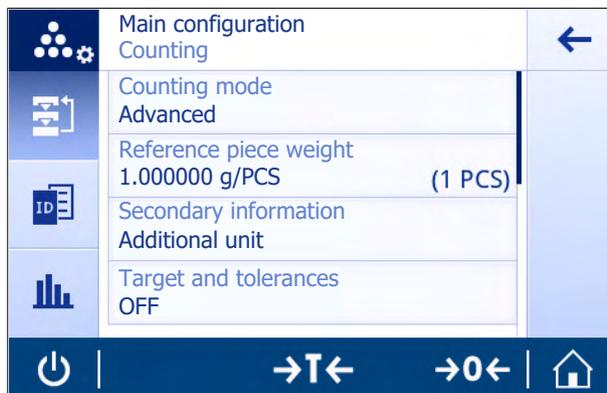
The following options can be set:

Parameter	Description	Values
Counting mode	Select the **Counting mode**.	Advanced* I Standard
Reference piece weight	Sets the number and weight of the reference piece(s).	1...999 (10*)

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 tolerances	Defines the target weight and tolerances.	ON I OFF* Numerical value (depending on the balance type)
	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.	

* Factory setting

Advanced mode options

The following options can be set:

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

* 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.

- Counting mode **Standard** is activated.

1 Tap **1 piece** in the work title bar.

   ⇨ A dialog screen appears.

2 Tap ✕ to delete the value.

3 Enter the number of reference pieces.

4 Tap ✓ to confirm.

   ⇨ The defined value for the option **Reference piece number** appears in the work title bar.
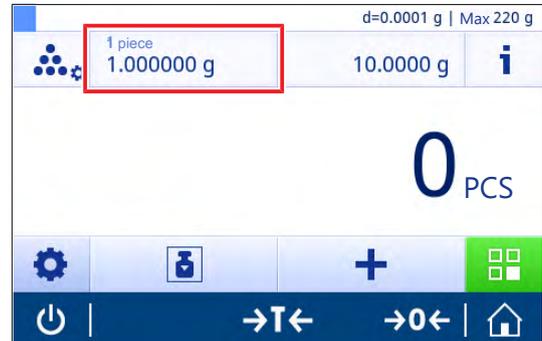
Defining the reference weight

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 ✕ to delete the value.

2 Enter the new reference weight.

3 Tap ✓ to confirm.

   ⇨ The reference piece weight has been defined.

4 Tap ✓ 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 ✓ to confirm.
    ⇨ The screen **Counting – Main configuration** appears.
5   Tap ✓ 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** in the work title bar.
3   Tap ✗ to delete the value.
4   Enter the number of reference pieces.
5   Tap ✓ 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 ✗ to delete the value.
3   Enter the new value.
4   Tap ✓ 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 [Statistics ▶ Page 43].

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	Description	Values
Target and tolerances	Defines the target weight and 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.	Target weight l Upper tolerance l Lower tolerance Numerical value (depending on the balance type)
Tolerance threshold	Defines the tolerance threshold. Values below the defined threshold are not checked.	1%…100% (1%*)
Within tolerance beeps	Activates or deactivates the acoustic signal. Gives an acoustic signal when the result is within tolerance.	ON l OFF*
Main unit	Sets the main unit of the weighing process. The available units are model- and country-specific.	g* l kg l mg l µg l ct l N l lb l oz l ozt l GN l dwt l mom l msg l tlh l tls l tlt l tola l baht l lb:oz
Readability	Defines the readability (d) of the weighing process. The available readabilities 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

* 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 ✕ to delete the value.
4 Enter the value of the target weight.
5 Tap ✓ to confirm.
   ⇨ The screen **Check weighing - Main configuration** appears.
6 Tap ✓ to confirm, and return to the application screen.

Defining the target weight by weighing

1 Tap ✕✓.
   ⇨ The screen **Check weighing - Main configuration** appears.
2 Tap **Target and tolerances**.
   ⇨ 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 ✓ to confirm.
   ⇨ The dialog screen **Target weight in g** appears.
6 Tap ✓ to confirm.
   ⇨ The screen **Check weighing - Main configuration** appears.
7 Tap ✓ to confirm, and return to the application screen.

Defining the lower and upper limits manually by entering a percentage value or 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 ⬆ **Upper tolerance limit** or tap ⬇ **Lower 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 ✕ to delete the value.
6 Enter the tolerance limit.
7 Tap ✓ to confirm.
   ⇨ The screen **Check weighing - Main configuration** appears.
8 Tap ✓ to confirm, and 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 ✗✓⚙.
  ⇨ 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 ✗ to delete the value.
5 Enter the value for the **Tolerance threshold**.
6 Tap ✓ to confirm.
  ⇨ The screen **Check weighing - Main configuration** appears.
7 Tap ✓ to confirm, and 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 ±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 ◯ disappears.
  ⇨ The value is out of tolerance, and the weighing-in aid bar and weighing value field are red.

Example: the defined target weight is still 100.0000 g and the tolerance limit is ±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 ◯ 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.
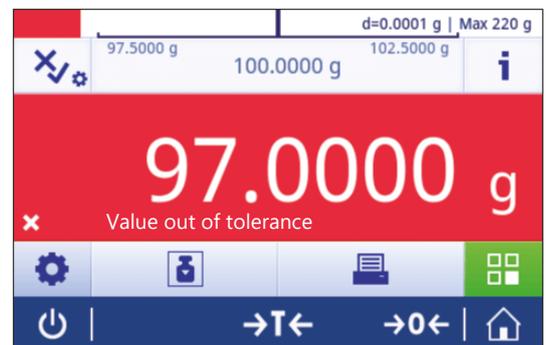
7.1.4 Totaling

Navigation: ⊞ **Activities** > 🐾 **Activities - Weighing applications** > Σ **Totaling**

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

The application allows the user to:

- 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	Description	Values
Accepting mode	Defines if a weight sample is added automatically to the result.	Automatic | Manual*
Main unit	Sets the main unit of the weighing process. The available units are model- and country-specific.	g* | kg | mg | µg | ct | N | lb | oz | ozt | GN | dwt | mom | msg | tlh | tls | tlt | tola | baht | lb:oz
Readability	Defines the readability (d) of the weighing process. The available readabilities are model-specific.	1d - 0.0001 g* | 2d - 0.0002 g | 5d - 0.0005 g | 10d - 0.001 g | 100d - 0.01 g | 1000d - 0.1 g

* Factory setting

Stability criteria: Relationship between readability and deviation

Readability	Min. deviation
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 →0← to zero the balance.

2   If using a container, place container on the weighing pan and press →T← to tare the balance.

3   Place the first sample on the weighing pan.

4   Wait until the unstability symbol ⭕ 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.
    ⇨   The work title bar shows the number of samples (2 samples) and the total weight of the samples, e.g.,
        $\sum$ = 30.0000 g.

The following options are available during the weighing process:

•   Finish and publish

•   Pause

•   View result

•   Discard

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 ✓ 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 and publish**.
    ⇨   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 ❚❚ **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 ❚▶.
    ⇨   The process can be continued.

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.

Discard

All results are deleted.

1. Tap ■.
   ⇨ A dialog screen appears.
2. Tap ✗ **Discard**.
   ⇨ All data are deleted.
   ⇨ The application home screen appears.

7.1.5 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 [Statistics ▸ Page 43].

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

- Finish
- Pause
- Discard
- View result

Back-weighing – Main configuration

The following options can be set:

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

* Factory setting

Stability criteria: Relationship between readability and deviation

Readability **Min. deviation**

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

Setting up the back-weighing application

1 Tap △.

   ⇨ 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 ✓.

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 ✓ 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 ✓ to confirm.

3 Remove the sample to continue.

4 Place the treated sample on the weighing pan.

   ⇨ The final weight appears in the value bar.

5 Tap ✓ 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.

7.1.6 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 [Statistics ▶ Page 43].

Percent weighing – Main configuration

The following options can be set:

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

* 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 %₀.

⇨ The screen **Percent weighing – Main configuration** appears.

2 Tap **Reference weight**.

⇨ The screen **Reference weight** appears.

3 Tap ⚖.

4 Press →0← to zero the balance.

5 Place the reference weight on the weighing pan.

6 Tap ✓ to confirm.

⇨ The screen **Reference weight** appears.

7 Tap ✓ to confirm.

8 Tap ✓ to return to the application screen.

Defining the reference weight manually

1 Tap %₀.

⇨ The screen **Percent weighing – Main configuration** appears.

2 Tap **Reference weight**.

⇨ The screen **Reference weight** appears.

3 Tap ✗ to delete the value.

4 Enter the value of the reference weight and confirm with ✓.

5 Tap ✓ to return to the application screen.

7.1.7 Density

Navigation: ⊞ Activities > ⛟ Activities - Weighing applications > 卣 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 [Statistics ▶ Page 43].

Density – Main configuration

The following options can be set:

Parameter	Description	Values
Method	Depending if the weight type is solid or liquid.	Solid* l Liquid
Auxiliary liquid	Select the auxiliary liquid.	H2O* l Ethanol l Free...
Sinker volume	This option is only available when **Liquid** is active.	(0.1…500.0 cm^3)
Main unit	Sets the main unit of the weighing process. The available units are model- and country-specific.	g* l kg l mg l μg l ct l N l lb l oz l ozt l GN l dwt l mom l msg l tlh l tls l tlt l tola l baht l lb:oz

* Factory setting

Determination of density of solids

1 Tap 卣 ⛟.
   ⇨ 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 **H2O** for distilled water, **Ethanol** or **Free...** for a freely definable auxiliary liquid.
5 Tap ✓ 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 **H2O**.
7 **Auxiliary liquid name** and **Density in g/cm3** must be defined for the option **Free...**.
8 Tap ✓ to confirm.
   ⇨ The screen **Density – Main configuration** appears.
9 Tap ✓ to return to the application 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 ✓ to confirm.
   ⇨ The dialog screen **Sample weight in liquid** appears.
4 Immerse solid in the liquid.
5 Tap ✓ to confirm.
   ⇨ The results are now displayed.
6 Tap 🖳 to publish the results according to the configurations.
7 Tap ✓ to return to the application 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 ✗ to delete the value.
7 Enter the volume of the sinker.
8 Tap ✓ to confirm.
   ⇨ The screen **Density – Main configuration** appears.
9 Tap ✓ to return to the application 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 ✓ to confirm.
   ⇨ The dialog screen **Sinker in liquid** appears.
4 Immerse the sinker.
5 Tap ✓ to confirm.
   ⇨ The results are now displayed.
6 Tap 🖳 to publish the results according to the configurations.
7 Tap ✓ to return to the application screen.

7.1.8 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 [Statistics ▶ Page 43].

Factor weighing – Main configuration

The following options can be set:

Parameter	Description	Values
Factor, step	Defines the factor and the step.	Factor I Step
Secondary information	Activates or deactivates the secondary information displayed on screen. **Additional unit*** Selects the secondary information displayed on screen. The available units are model- and country-specific. **Current tare** Current tare weight.	ON* I OFF
Target and tolerances	Defines the target weight and 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.	ON I OFF* Numerical value (depending on the balance type)

* Factory setting

Defining factor and step

1 Tap 🔢.

⇨ The screen **Factor weighing – Main configuration** appears.

2 Tap **Factor, step**.

⇨ The dialog screen **Factor – Multiplication** appears.

3 Tap ✕ to delete the value.

4 Define **Factor**.

5 Tap 🔀 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 ✓ to confirm.

⇨ The screen **Factor weighing – Main configuration** appears.

10 Tap ✓ to return to the application screen.

7.2 Activities - Adjustments and tests

Navigation: ⊞ > ⚎ **Activities - Adjustments and tests**

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.

Activities - Adjustments and tests consists of the following elements:

- FACT **FACT**, see [Fully automatic adjustment (FACT) ▶ Page 66]
- ⚖ **Internal Adjustment**, see Internal adjustment
- ⚖ **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

7.2.1 Fully automatic adjustment (FACT)

Navigation: ⊞ **Activities** > ⚎ **Activities - Adjustments and tests** > FACT **FACT**

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 min. 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 (FACT)**.
   ⇨ The dialog screen **Fully automatic adjustment (FACT)** appears.

3 Select the time (hours : minutes) using the pick buttons.

4 Tap ✓ 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.

1 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**

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

Perform an internal adjustment manually

1 Unload the balance.

2 Tap ⚖ **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 ✓ 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**

Legal-for-trade

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

1 Tap ⚖ **Adjust external**.

⇨ The dialog screen **Adjustment weight** appears.

2 Tap ⚖ to define the adjustment weight according to the weight certificate.

3 Tap ✗ to delete the value.

4 Enter the new value and confirm with ✓.

5 Prepare the adjustment weight and tap ▶ to start the adjustment process.

6 Load the adjustment weight in the center of the weighing pan.

7 Unload the adjustment weight from the weighing pan.

⇨ When the external adjustment procedure is successfully completed, the result will appear.

8 Tap ✓ to confirm.

⇨ The screen **Activities - Adjustments and tests** appears.

9 Tap ← to return to the application screen.

7.2.4 Fine adjustment (model-dependent)

Navigation: ⊞ **>** ⛭ **Activities - Adjustments and tests >** ⚖ **Adjust fine**

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

- 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 ⚖ **Adjust fine**.

⇨ The dialog screen **Reference weight** appears.

2 Tap ✗ to delete the value.

3 Enter the weight value according to the certificate.

4 Tap ✓ 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 ✓ to confirm.
   ⇨ The screen **Activities - Adjustments and tests** appears.
9 Tap ← to return to the application screen.
Tap ↺ to reset the defined reference weight back to the default value.

7.2.5 Routine test

Navigation: ▦ **Activities** > ♟ **Activities - Adjustments and tests** > ♗ **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	Description	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) l OFF
Use tare container	Activates or deactivates the use of a tare vessel.	ON l OFF*

* Factory setting

Setting the test weight, control limits and warning limits

1 Tap ♗ ₐ.
   ⇨ The screen **Routine test – Main configuration** appears.
2 Tap **Test Weight**.
   ⇨ The dialog screen **Test weight in g** appears.
3 Tap ✗ to delete the value.
4 Enter the new value.
5 Tap ⊗.
   ⇨ The dialog screen **± Control limit in g** appears.
6 Tap ✗ to delete the value.
7 Enter the new value.
8 Tap ❶.
   ⇨ The dialog screen **± Warning limit in g** appears.
9 Tap ✗ to delete the value.
10 Enter the new value and confirm with ✓.
11 Activate or deactivate the option **Use tare container** if required.
12 Tap ✓ to confirm.
13 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 confirm.

5 Tap ← to return to the application screen.

7.2.6 Repeatability test

Navigation: ⊞ Activities > ⚇ Activities - Adjustments and tests > ⚖ Repeatability test

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 ⚖ₐ.

⇨ The dialog screen **Repeatability test - Repetitions** appears.

2 Tap ✗ to delete the value.

3 Enter the number of repetitions. The number must be between 5 and 100.

4 Tap ✓ to confirm the number of repetitions.

5 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 ✗.

⇨ After the test is finished, an overview with the test results appears on the screen.

6 Tap ✓ to confirm.

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 www.mt.com/labweighing-software-download. If you have any questions, please contact a METTLER TOLEDO representative.

📝 **Note**

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 connect PC to balance

Download USB driver

1 Connect to the internet.
2 Go to the site www.mt.com/labweighing-software-download.
3 Click **Download driver** in section **USB driver for laboratory balances**.
  ⇨ A pop-up window with interactions appears.
4 Click, e.g., **Open**.
  ⇨ The extract screen appears.
5 Extract the file **MT_Generic_USB_Serial_Port_Driver_SW_en_vx.xx.x.x.zip** to your specified location.
6 Right-click on the downloaded installation program
  MT_Generic_USB_Serial_Port_Driver_vx.xx.x.x_Setup.exe and select **Run as Administrator**.
7 If a safety warning appears, confirm windows to perform the installation.
8 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 RS232C 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 RS232C 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 RS232C or USB
- Administrator rights for installing the SerialPortToKeyboard software (if data transfer is via RS232C)
- Windows application, e.g., Excel
- Connection between balance and PC via RS232C or USB cable

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 ⛃ **General configuration and data**.
3 Tap ⚿ **Devices and connectivity**.
   ⇨ The screen **Devices and connectivity** appears.
4 Tap **USB Device** and confirm with ✓.
5 Select **PC-Direct** and confirm with ✓.
   ⇨ The screen **Connection type** appears.
6 If necessary, change the other settings, e.g., **End of line** and confirm with ✓.
7 Tap ✓ to confirm.
   ⇨ The screen **Devices and services** appears.
8 Tap ← to return to the previous screen.
9 Tap 🔱 **Publishing**.
   ⇨ The screen **Publishing** appears.
10 Tap **PC-Direct (USB Device)**.
11 Tap **Send value** - **PC-Direct**.
12 If the selection is grayed out, enable changes to the factory settings by tapping the activation button (**1**) in the upper right corner.
   ⇨ The screen **Send value** appears.
13 Select the transmission mode for single values and result values, e.g., **Manual, stable** and confirm with ✓.
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 sent to the cursor position of your application.

8.2.2 PC-Direct via RS232C

8.2.2.1 Installing SerialPortToKeyboard software

The operation of PC-Direct via serial port RS232C requires the installation of **SerialPortToKeyboard** on your host computer. The file **SerialPortToKeyboard** can be found on www.mt.com/labweighing-software-download. If you have any questions, please contact a METTLER TOLEDO representative.

Download SerialPortToKeyboard

1 Connect to the internet.
2 Go to the site www.mt.com/labweighing-software-download.
3 Click **Download Software and Instructions** in section **SerialPortToKeyboard software for Advanced and Standard level laboratory balances**.
   ⇨ A pop-up window with interactions appears.
4 Click, e.g., **Open**.
   ⇨ The extract screen appears.
5 Extract the file **SerialPortToKeyboard_V_x.xx_installer_and_instructions.zip** to your specified location.
6 Right-click on the downloaded installation program **SerialPortToKeyboard_V_x.xx.exe** and select **Run as Administrator**.
7 If a safety warning appears, confirm windows to perform the installation.
8 Click **Next** and follow the installer's instructions.

Checking operation

1 Start **SerialPortToKeyboard** (RS232C)
2 Start Excel (or another application) on the PC.
3 Activate a cell in Excel.

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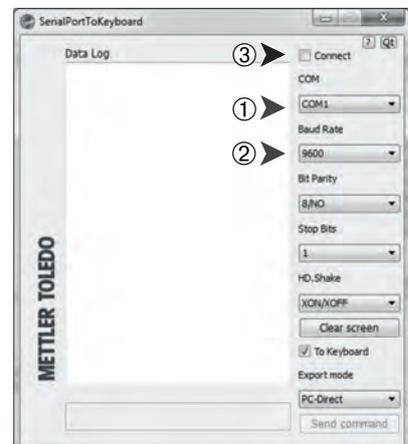
According to your selected **End of line** option, the displayed values will appear, e.g., in the column one after the other one in the different rows.

8.2.2.2 Settings on the balance

- The balance is connected to the PC via a RS232 cable.
1 Tap ⚙.
2 Tap ⚙ **General configuration**.
3 Tap 🖧 **Devices and connectivity**.
    ⇨ The screen **Devices and connectivity** appears.
4 Tap **RS232 (Serial)**.
5 Tap **Device type**.
6 Select **PC-Direct** and confirm with ✓.
    ⇨ The screen **RS232 (Serial)** appears.
7 If necessary, change the other settings, e.g., **End of line** and confirm with ✓.
8 Tap ✓ to confirm.
9 Tap ← to return to the previous screen.
10 Tap 💡 **Publishing**.
    ⇨ The screen **Publishing** appears.
11 Tap **Send value** – **PC-Direct (Serial)**.
    ⇨ The screen **Send value** appears.
12 Select the transmission mode for single values and result values, e.g., **Automatic, stable** and confirm with ✓.
13 Tap ✓ to confirm.
    ⇨ The screen **Publishing** appears.
14 Tap ← to return to the previous screen.
15 Place the sample on the weighing pan.
    ⇨ The next stable weight will be sent automatically to the cursor position of your application.

8.3 Collecting measurement results and balance details with EasyDirect Balance

EasyDirect Balance from METTLER TOLEDO is a PC software to collect, analyze, store and export measurement results and balance details from up to 10 balances. EasyDirect Balance supports all Advanced and Standard Level Laboratory Balances and many legacy models from METTLER TOLEDO. For more information and to download a trial version of the software, please refer to www.mt.com/EasyDirectBalance.

Connecting the balance to EasyDirect Balance

- The balance is connected to the PC via a RS232 cable.
- The correct driver for the RS232 cable is installed.
- EasyDirect Balance is installed on your PC.
1 Open EasyDirect Balance on your PC.
2 In the program, click the "Help"-button.
   ⇨ The EasyDirect Balance Reference Manual opens.
3 Search the EasyDirect Balance Reference Manual for your balance type.
4 Configure the settings on the balance as described.
5 Follow the instructions on how to add the balance to EasyDirect Balance.
   ⇨ The balance connects to EasyDirect Balance.

Collecting measurement results

- If the setting **Single values report** is set to **Automatic**, the weighing result is automatically sent to EasyDirect Balance.
- If the setting **Single values report** is set to **Manual**, tap ▤ to send your result to EasyDirect Balance.

Please be aware that the report configuration does not apply to EasyDirect Balance; all available data is sent according the details on the table "Data available to EasyDirect Balance".

Data available to EasyDirect Balance

		RS232
Balance details	Balance model	✓
	Balance ID	✓
	Balance serial number	✓
	Balance capacity	✓
	Balance readability	–
	Level status	–
	Adjustment status	–
	Service status	–
	Connection status	–
Measurement results	Gross/Tare/Net weight	✓
	Unit 1 and Unit 2 (incl. pcs, %)	✓
	Stability condition	✓
	Date and Time	✓
	Sample and task IDs	✓
	Target and tolerances	–
	User name	–
	Application specific results and parameters	–
Supported activities	Weighing	✓
	Counting	✓
	Percent weighing	✓
	Factor weighing	✓
	Check weighing	–
	Dynamic weighing	–
	Formulation	–
	Totaling	–
	Back-weighing	–
	Differential weighing	–
	Density	–
	Adjustments	–
	Routine test	–
	Repeatability test	–

8.4 Connect via USB to a printer and print weighing results

Prerequisite

- The printer is connected to the power supply.
- Printer is switched on.
- The printer is connected to the balance via USB cable. Do not connect the printer with the balance, before it is correctly powered on.

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

1 Tap ⚙.

2 Tap ⚏ **General configuration**.

3 Tap 🖧 **Devices and connectivity**.

   ⇨ The screen **Devices and connectivity** appears.

4 The connected USB device appears automatically.

5 Tap the connected printer, e.g., **P-20** and confirm with ✓.

6 Tap ✓ to confirm.

7 Tap ← to return to the previous screen.

   ⇨ The screen **Device/service type** appears.

8 Tap ← to return to the **General configuration** screen.

9 Tap 🎯 **Publishing**.

   ⇨ The screen **Publishing** appears.

10 Tap **Print**.

   ⇨ The screen **Print** appears.

11 Tap ⬚ **Single values reports**.

   ⇨ The screen **Single values reports** appears.

12 Select the transmission mode, e.g., **Automatic, stable** and confirm with ✓.

13 Tap ✓ to confirm.

14 Tap ← to return to the previous screen.

15 Place the sample on the weighing pan.

   ⇨ The next stable weight will be sent automatically.
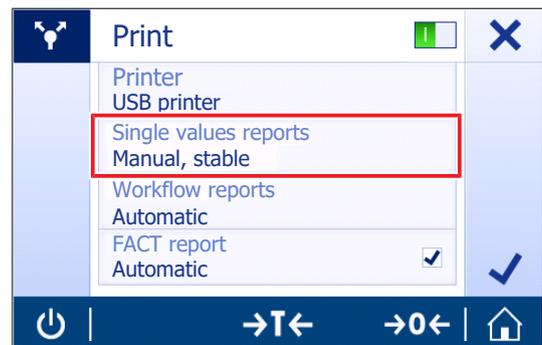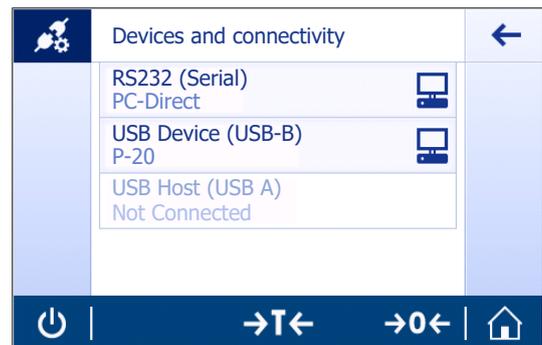
## 8.5 Connect via RS232 to a printer and print weighing results

Prerequisite

- The printer is connected to the power supply.
- Printer is switched on.
- The printer is connected to the balance via RS232 cable. Do not connect the printer with the balance, before it is correctly powered on.

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

1 Tap ⚙.

2 Tap 🗗 **General configuration**.

3 Tap 🛰 **Devices and connectivity**.

    ⇨ The screen **Devices and connectivity** appears.

4 Tap **RS232 (Serial)**.

5 Tap **Device type**.

6 Tap the connected printer, e.g., **P-20** and confirm with ✓.

7 Tap ✓ to confirm.

8 If necessary, change the other settings, e.g., **End of line** and confirm with ✓.

9 Tap ← to return to the **General configuration** screen.

10 Tap 📡 **Publishing**.

    ⇨ The screen **Publishing** appears.

11 Tap **Print**.

    ⇨ The screen **Print** appears.

12 Tap **Printer**.

13 Tap **Serial printer**.

14 Tap ✓ to confirm.

15 Tap **Single values reports**.

    ⇨ The screen **Single values reports** appears.

16 Select the transmission mode, e.g., **Automatic, stable** and confirm with ✓.

17 Tap ✓ to confirm.

18 Tap ← to return to the previous screen.

19 Place the sample on the weighing pan.

    ⇨ The next stable weight will be sent automatically.
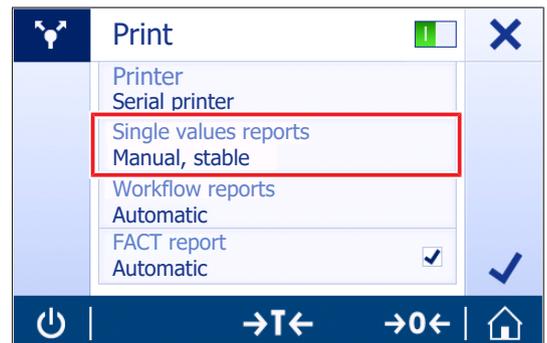
8.6 Connect a USB barcode reader and scan the barcode

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 documentation for information about the barcode reader settings.

The barcode reader must be configured as USB keyboard (with standard key encoding).

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 ⚙ **General configuration**.
3 Tap 🖧**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

1 Tap ▦.
2 Select an application, e.g., ⚖ **Weighing**
3 Tap ⚖ ⚙.
    ⇨ The screen **Weighing – Main configuration** appears.
4 Tap 🆔.
    ⇨ The screen **Weighing - reports configuration** appears.
5 Tap **Identifications**.
    ⇨ The screen **Identifications** appears.
6 Tap **ID 4**.
7 Activate **ID 4**.
8 Select **Input prompt** and confirm with ✓.
9 Tap ✓ to return to the previous screen.
10 Place the sample on the weighing pan.
11 Tap 🖨.
    ⇨ The screen **Sample ID** appears.
12 Scan the sample ID with the barcode reader.
    ⇨ The sample ID is entered on the **Sample ID** screen and the screen is then closed.

8.7 Export measurement results to a USB memory stick

Connect a USB memory stick (FAT32 formatted, high quality, if possible empty) to the USB host interface.

The USB memory stick appears automatically as a new device in the Menu > **General configuration** > **Devices**.

1 Tap ⚙.
2 Tap ⚡ **General configuration**.
3 Tap 📡 **Publishing**.
   ⇨ The screen **Publishing** appears.
4 Tap **Print**.
   ⇨ The screen **Print** appears.
5 Tap **Printer**.
6 Select **Print to file**.
7 Tap ✓ to confirm.
8 Tap **Single values reports**.
   ⇨ The screen **Single values reports** appears.
9 Select the transmission mode, e.g., **Automatic, stable** and confirm with ✓.
10 Tap ✓ to confirm.
   ⇨ The screen **Publishing** appears.
11 Tap ✓ to confirm.
12 Tap ← to return to the application screen.

View exported data

1 Connect memory stick to PC.
2 Open the METTLER TOLEDO folder and then the "Reports folder".
3 Open the file with your relevant measurement results.

8.8 Connect an auxiliary display

Use the RS232 connection cable to connect the auxiliary display to the balance.

Settings on the balance

> **NOTICE**
>
> **Damage to external device due to unsuitable voltage**
>
> Having another device than the auxiliary display connected via RS232 can damage the external device.
>
> – Make sure that no other device than the auxiliary display is connected to the RS232 interface of the balance.

- The second display is connected to the balance.
1 Tap ⚙.
2 Tap ⚙ **General configuration**.
3 Tap 🖧 **Devices and connectivity**.
   ⇨ The screen **Devices and connectivity** appears.
4 Tap **RS232 (Serial)**.
5 Tap **Device type**.
6 Tap 🖥 **Second display**.
7 Tap ✓ to confirm.
8 Tap ← to return to the previous screen.
⇨ The weighing value is displayed on the auxiliary display.
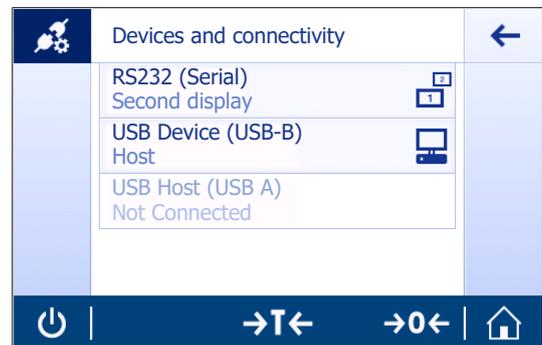
9 Maintenance

To guarantee the functionality of the balance and the accuracy of the weighing results, a number of maintenance actions must be performed by the user.

9.1 Maintenance tasks

Maintenance action	Recommended interval	Remarks
Performing an internal adjustment	• Daily • After cleaning • After leveling • After changing the location	see "Activities - Adjustments and tests"
Cleaning	• After every use • After changing the substance • Depending on the degree of pollution • Depending on your internal regulations (SOP)	see "Cleaning"
Performing routine test / repeatability test.	• After cleaning • After assembling the balance • Depending on your internal regulations (SOP)	see "Activities - Adjustments and tests"

See also

9.2 Cleaning

9.2.1 Disassembling balances with draft shield for cleaning

⚠ **CAUTION**

Injury due to sharp objects or broken glass

Instrument components, e.g., glass, can break and lead to injuries.

– Always proceed with focus and care.

1 On both side glass doors, unscrew the handles (**1**) and dismount them.
2 Push the side glass doors all the way back and dismount them.
3 On the top glass doors, unscrew the handle (**2**) and dismount it.
4 Push the top glass doors all the way back and dismount it.
5 Remove weighing pan (**3**).

After cleaning, reinstall all components in the reverse order. For balance mounting, refer to [Assembling the balance ▶ Page 18].
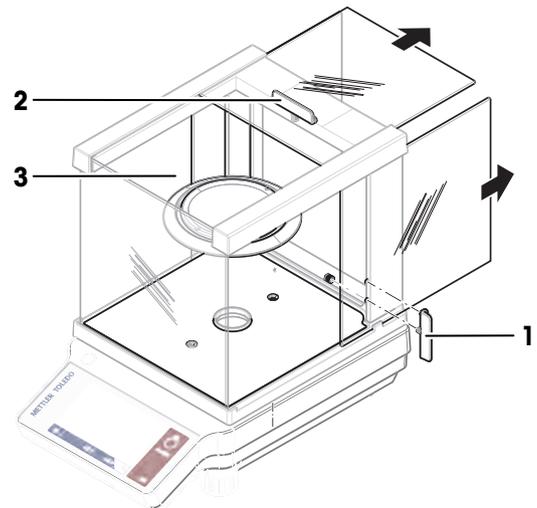
9.2.2 Cleaning the balance

⚠ **WARNING**

Death or serious injury due to electric shock

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

1 Disconnect the instrument from the power supply prior to cleaning and maintenance.
2 Prevent liquid from entering the instrument, terminal or AC/DC adapter.

ⓘ **NOTICE**

Damage due to improper cleaning

Improper cleaning can damage the load cell or other essential parts.

1 Do not use any cleaning agents other than the ones specified in the "Reference Manual" or "Cleaning Guide".
2 Do not spray or pour liquids on the instrument. Always use a moistened lint-free cloth or a tissue.
3 Always wipe out from inside to outside of the instrument.

Cleaning around the balance

– Remove any dirt or dust around the balance and avoid further contaminations.

Cleaning the removable parts

– Clean the removed part with a damp cloth or a tissue and a mild cleaning agent.

Cleaning the balance

1 Disconnect the balance from the AC/DC adapter.
2 Use a lint-free cloth moistened with a mild cleaning agent to clean the surface of the balance.
3 Remove powder or dust at first with a disposable tissue.
4 Remove sticky substances with a damp lint-free cloth and a mild solvent.

📝 **Note**

Useful details to avoid soiling the instrument are described in the Mettler-Toledo GmbH "SOP for Cleaning a Balance".

9.2.3 Putting into operation after cleaning

1 Reassemble the balance.
2 If applicable: Check smooth movement of the draft shield.
3 Press ⏻ to switch on the balance.
4 Warm up the balance. Wait 1h for the acclimatization, before starting the tests.
5 Check the level and level the balance if necessary.
6 Perform an internal adjustment.
7 Perform a routine test according to the internal regulations of your company. METTLER TOLEDO recommends to perform a repeatability test after cleaning the balance.
8 Press →0/T← to zero the balance.
⇨ The balance has been put into operation and is ready to use.

See also

10 Troubleshooting

Possible errors with their cause and remedy are described in the following chapter. If there are errors that cannot be corrected through these instructions, contact METTLER TOLEDO.

10.1 Error messages

Error message	Possible cause	Diagnostic	Remedy
NO STABILTY	Vibrations at the workplace.	Place beaker with tap water on the weighing table. Vibrations cause ripples on the water surface.	• Protect weighing location against vibrations (vibration absorber, etc.). • Set weighing parameters coarser (change **Environment** from **Stable** to **Standard** or even **Unstable**. • Find a different weighing location (by agreement with customer).
	Draft due to untight draft shield and /or open window.	Make sure draft shield or window is closed.	• Close draft shield or window. • Set weighing parameters coarser (change **Environment** from **Stable** to **Standard** or even **Unstable**.
	The location is not suitable for weighing.	–	Check and observe the requirements for the location, refer to "Selecting the location".
	Something is touching the weighing pan.	Check for touching parts or dirts.	Remove touching parts or clean the balance.
Adjustment aborted Weight out of range.	Wrong adjustment weight.	Check weight.	Place correct weight on the weighing pan.
EEPROM error.	Data in EEPROM damaged.	–	Please contact your METTLER TOLEDO-Support representative.
Wrong cell data.	Defect load cell data.	–	Please contact your METTLER TOLEDO-Support representative.
No standard adjustment.	–	–	Please contact your METTLER TOLEDO-Support representative.
Program memory defect.	–	–	Please contact your METTLER TOLEDO-Support representative.

Error message	Possible cause	Diagnostic	Remedy
Temperature sensor defect.	AC/DC adapter connected to power before connecting to the balance. Temperature sensor of load cell defect.	–	Remove the AC/DC adapter from the power and connect first to the balance before connecting to the power if persist please contact your METTLER TOLEDO-Support representative.
Wrong load cell brand.	Wrong load cell installed.	–	Please contact your METTLER TOLEDO-Support representative.
Wrong type data set.	Wrong type data set.	–	Please contact your METTLER TOLEDO-Support representative.
Memory full	Memory full.	–	Clear the memory by finishing all applications where a measurement is ongoing.
A problem occurred while starting the balance. Some data could not be read correctly from memory. Please proceed and check date and time settings. Please contact your MT-Support representative if the problem persists.	Some data could not be read correctly from memory.	Check date and time settings.	Please contact your METTLER TOLEDO-Support representative if the problem persists.
A problem occurred while starting the balance. Some data could not be read correctly from memory. The instrument will reset and restart. Please contact your MT-Support representative if the problem persists.	Some data could not be read correctly from memory.	–	Please contact your METTLER TOLEDO-Support representative.
Weight out of initial zero range	Wrong weighing pan. Pan is missing. Pan is not empty.	Check weighing pan.	Mount correct weighing pan or unload weighing pan.
Weight out of zero range	Zero range limit overrun or underrun.	–	Reduce / increase weight on weighing pan.
Weight out of tare range	Tare range limit overrun or underrun.	–	Reduce / increase weight on weighing pan.
Battery backup lost	Backup battery is empty. This battery ensures that the date and time are not lost when the balance is disconnected from power.	Connect the balance to the power supply for charging the battery (full capacity after 2 days of charging).	If battery cannot be recharged, contact your METTLER TOLEDO-Support representative.

Error message	Possible cause	Diagnostic	Remedy
USB device is not recognized when connected to balance	Fluctuation in the external electric grid.	–	Restart balance.
	Interference from power line.		

10.2 Error symptoms

Error symptom	Possible cause	Diagnostic	Remedy
Display is dark	Instrument is switched off.	–	Switch on the instrument.
	Power plug not connected.	Check	Connect power cable to power supply.
	Power supply not connected to balance.	Check	Connect power supply.
	Power supply is faulty.	Check/test	Replace power supply.
	Wrong power supply.	Check that input data on type plate match the power supply values.	Use proper power supply.
	Balance must be restarted.	–	Restart balance.
	Connector socket on balance is corroded or faulty.	Check	Please contact your METTLER TOLEDO-Support representative.
	Display is faulty.	Replace display.	Please contact your METTLER TOLEDO-Support representative.
Touch display is not responding	Touch display is faulty.	Replace display.	Please contact your METTLER TOLEDO-Support representative.
Touch display is partly not responding	Touch display is not correctly adjusted.	–	Perform touch screen adjustment. Reset balance (factory reset).
The value drifts into plus or minus	Room, environment not suitable.	–	**Environmental recommendations** • Windowless, non air-conditioned room, e.g., basement. • Only one person in the weighing room. • Sliding doors. Standard doors cause pressure changes. • No draft in weighing room (check with suspended threads). • No air conditioning (temperature oscillates, draft). • Acclimatize balance, take dummy measurements.

Error symptom	Possible cause	Diagnostic	Remedy
			• Instrument uninterruptedly connected to the power supply (24h per day).
	Direct sunlight or other heat source.	Is any sun shade (blinds, curtains, etc.) available?	Select location according to "Selecting the location" (customer responsibility).
	Weighing sample absorbs moisture or evaporates moisture.	• Is the weighing result with a test weight stable? • Sensitive weighing samples, e.g., paper, cardboard, wood, plastic, rubber, liquids.	• Use aids. • Cover weighing sample.
	Weighing sample is electrostatically charged.	• Is the weighing result with a test weight stable? • Sensitive weighing samples, e.g., plastic, powder, insulating materials.	• Increase air humidity in weighing chamber (45% - 50%). • Use ionizer.
	Weighing sample is hotter or colder than the air in the weighing chamber.	Weighing operation with test weight does not show this effect.	Bring weighing sample to room temperature before weighing.
	Instrument has not yet reached thermal equilibrium.	• Was there a power outage? • Was power supply disconnected?	• Acclimatize instrument for at least 1 hour. Depending on climatic conditions, extend this period accordingly. • Instrument switched on for at least 1 hour, refer to "General data"
Display shows overload or underload	The weight on the weighing pan exceeds the weighing capacity of the instrument.	Check weight.	Reduce the weight on the weighing pan.
	Wrong weighing pan.	Slightly lift or press weighing pan. The weight display appears.	Use proper weighing pan.
	No weighing pan.	–	Install weighing pan.
	Incorrect zero point at switch-on.	–	• Switch off balance. • Disconnect and reconnect power cable.

10.3 Status messages/Status icons

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

Icon	Status description	Diagnostic	Remedy
FACT	Automatic **FACT** adjustment is currently not possible.	Instrument is busy.	• Unload the balance. • Do not press any key for 2 minutes. The display stabilizes.
	Service due.	–	Please contact your METTLER TOLEDO-Support representative.

10.4 Putting into operation after fixing an error

After fixing an error, perform the following steps to put the balance into operation:

• Ensure that the balance is completely reassembled and cleaned.
• Reconnect the balance to the AC/DC adapter.

11 Technical Data

11.1 General data

Standard power supply

AC/DC adapter:	Input: 100 – 240 V AC ± 10%, 50 – 60 Hz, 0.5 A, 24 – 34 VA
	Output: 12 V DC, 1.0 A, LPS (Limited Power Source)
Polarity:	⊖—(●)—⊕
Balance power consumption:	12 V DC, 0.6 A
Mean sea level:	If the balance is used above 2000 m mean sea level, the optional power supply must be used.

Optional power supply

AC/DC adapter:	Input: 100 – 240 V AC ± 10%, 50 – 60 Hz, 0.8 A, 60 – 80 VA
	Output: 12 V DC, 2.5 A, LPS (Limited Power Source)
Cable for AC/DC adapter:	3-core, with country-specific plug
Polarity:	⊖—(●)—⊕
Balance power consumption:	12 V DC, 0.6 A
Mean sea level:	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:	Use only indoors in dry locations

Environmental conditions

Height above mean sea level:	Up to 2000 m (standard power supply)
	Up to 4000 m (optional power supply)
Ambient temperature:	Operating conditions for ordinary lab application: +10 °C to +30 °C (operability guaranteed between +5 °C and +40 °C)
Relative air humidity:	Max. 80% up to 31 °C, linearly decreasing 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: ABS
	Bottom housing: Die-cast aluminum, powder coated
Weighing 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 X2CrNiMo 17-12-2 (1.4404)
Draft shield:	ABS, glass
Protective cover:	PET
TFT touch screen surface:	Glass

11.2 Model-specific data

11.2.1 Carat balances with a readability of 0.001 ct / 0.1 mg with draft shield

	JET503C	JET703C
Limit Values		
Capacity	505 ct / 101 g	700 ct / 140 g
Nominal load	100 g	140 g
Readability	0.001 ct / 0.1 mg	0.001 ct / 0.1 mg
Repeatability (at nominal load)	0.1 mg	0.1 mg
Linearity deviation	0.2 mg	0.2 mg
Eccentricity deviation (at test load)	0.4 mg (50 g)	0.4 mg (50 g)
Sensitivity offset (at nominal load) [1]	1 mg	1 mg
Sensitivity temperature drift [2]	0.0002 %/°C	0.0002 %/°C
Typical values		
Repeatability (at nominal load)	0.08 mg	0.08 mg
Linearity deviation	0.06 mg	0.06 mg
Eccentricity deviation (at test load)	0.15 mg (50 g)	0.15 mg (50 g)
Sensitivity offset (at nominal load) [1]	0.6 mg	0.6 mg
Minimum weight (tolerance = 1%) [3]	16 mg	16 mg
Settling time	2 s	2 s
Adjustment	Internal / FACT	Internal / FACT
Dimensions & other specifications		
Balance dimensions (W × D × H)	210 × 344 × 279 mm	210 × 344 × 279 mm
Weighing pan dimensions (W × D)	ø 90 mm	ø 90 mm
Usable height of draft shield	173 mm	173 mm
Balance weight	4.6 kg	4.6 kg
Weights for routine testing		
Weights (OIML class)	5 g (F2)/ 100 g (F2)	5 g (F2)/ 100 g (F2)
Weights (ASTM class)	5 g (ASTM 1)/ 100 g (ASTM 1)	5 g (ASTM 1)/ 100 g (ASTM 1)

[1] after adjustment with internal weight

[2] in the temperature range 10 °C … 30 °C

[3] determined at 5% load, k = 2

	JET1103C	JET1603C
Limit Values		
Capacity	1100 ct / 220 g	1600 ct / 320 g
Nominal load	200 g	300 g
Readability	0.001 ct / 0.1 mg	0.001 ct / 0.1 mg
Repeatability (at nominal load)	0.1 mg	0.1 mg
Linearity deviation	0.2 mg	0.2 mg
Eccentricity deviation (at test load)	0.4 mg (100 g)	0.4 mg (100 g)
Sensitivity offset (at nominal load) [1]	1 mg	1 mg
Sensitivity temperature drift [2]	0.0002 %/°C	0.0002 %/°C
Typical values		
Repeatability (at nominal load)	0.08 mg	0.08 mg
Linearity deviation	0.06 mg	0.06 mg
Eccentricity deviation (at test load)	0.15 mg (100 g)	0.15 mg (100 g)
Sensitivity offset (at nominal load) [1]	0.2 mg	0.2 mg
Minimum weight (tolerance = 1%) [3]	16 mg	16 mg
Settling time	2 s	2 s
Adjustment	Internal / FACT	Internal / FACT
Dimensions & other specifications		
Balance dimensions (W × D × H)	210 × 344 × 279 mm	210 × 344 × 279 mm
Weighing pan dimensions (W × D)	ø 90 mm	ø 90 mm
Usable height of draft shield	173 mm	173 mm
Balance weight	4.6 kg	4.6 kg
Weights for routine testing		
Weights (OIML class)	10 g (F2)/ 200 g (F2)	10 g (F2)/ 200 g (F2)
Weights (ASTM class)	10 g (ASTM 1)/ 200 g (ASTM 1)	10 g (ASTM 1)/ 200 g (ASTM 1)

[1]   after adjustment with internal weight

[2]   in the temperature range 10 °C … 30 °C

[3]   determined at 5% load, k = 2

11.2.2 Gold balances with a readability of 1 mg with draft shield

	JET303G	JET603G	JET1003G
Limit Values			
Capacity	320 g	620 g	1020 g
Nominal load	300 g	600 g	1000 g
Readability	1 mg	1 mg	1 mg
Repeatability (at nominal load)	1 mg	1 mg	1 mg
Linearity deviation	2 mg	2 mg	2 mg
Eccentricity deviation (at test load)	4 mg (100 g)	4 mg (200 g)	4 mg (500 g)
Sensitivity offset (at nominal load) [1]	8 mg	8 mg	8 mg
Sensitivity temperature drift [2]	0.0003 %/°C	0.0003 %/°C	0.0003 %/°C
Typical values			
Repeatability	0.7 mg	0.7 mg	0.7 mg
Repeatability in fine range	–	–	–
Linearity deviation	0.6 mg	0.6 mg	0.6 mg
Eccentricity deviation (at test load)	1.5 mg (100 g)	1.5 mg (200 g)	1.5 mg (500 g)
Sensitivity offset (at nominal load) [1]	5 mg	5 mg	5 mg
Minimum weight (tolerance = 1%) [3]	140 mg	140 mg	140 mg
Settling time	1.5 s	1.5 s	1.5 s
Adjustment	Internal / FACT	Internal / FACT	Internal / FACT
Dimensions & other specifications			
Balance dimensions (W × D × H)	210 × 319 × 289 mm	210 × 319 × 289 mm	210 × 319 × 289 mm
Weighing pan dimensions (W × D)	ø 120 mm	ø 120 mm	ø 120 mm
Usable height of draft shield	170 mm	170 mm	170 mm
Balance weight	4.9 kg	4.9 kg	4.9 kg
Weights for routine testing			
Weights (OIML class)	10 g (F2)/ 200 g (F2)	20 g (F2)/ 500 g (F2)	50 g (F2)/ 1000 g (F2)
Weights (ASTM class)	10 g (ASTM 1)/ 200 g (ASTM 1)	20 g (ASTM 1)/ 500 g (ASTM 1)	50 g (ASTM 1)/ 1000 g (ASTM 1)

[1]   after adjustment with internal weight

[2]   in the temperature range 10 °C … 30 °C

[3]   determined at 5% load, k = 2

Gold balances with a readability of 10 mg with draft shield

	JET602G/AED	JET1002G/AED
Limit Values		
Capacity	620 g	1020 g
Nominal load	600 g	1000 g
Readability	10 mg	10 mg
Repeatability (at nominal load)	5 mg	5 mg
Linearity deviation	5 mg	5 mg
Eccentricity deviation (at test load)	10 mg (200 g)	10 mg (500 g)
Sensitivity offset (at nominal load) [1]	12 mg	10 mg
Sensitivity temperature drift [2]	0.0003 %/°C	0.0003 %/°C
Typical values		
Repeatability	4 mg	4 mg
Linearity deviation	4 mg	4 mg
Eccentricity deviation (at test load)	4 mg (200 g)	4 mg (500 g)
Sensitivity offset (at nominal load) [1]	8 mg	8 mg
Minimum weight (tolerance = 1%) [3]	800 mg	800 mg
Settling time	1.5 s	1.5 s
Adjustment	Internal / FACT	Internal / FACT
Dimensions & other specifications		
Balance dimensions (W × D × H)	210 × 319 × 289 mm	210 × 319 × 289 mm
Weighing pan dimensions (W × D)	ø 120 mm	ø 120 mm
Usable height of draft shield	170 mm	170 mm
Balance weight	4.9 kg	4.9 kg
Weights for routine testing		
Weights (OIML class)	20 g (F2) / 500 g (F2)	50 g (F2) / 1000 g (F2)
Weights (ASTM class)	20 g (ASTM 1) / 500 g (ASTM 1)	50 g (ASTM 1) / 1000 g (ASTM 1)

[1] after adjustment with internal weight

[2] in the temperature range 10 °C … 30 °C

[3] determined at 5% load, k = 2

11.2.3 Gold balances with a readability of 10 mg and 100 mg

	JET1002G	JET2002G	JET3002G
Limit Values			
Capacity	1200 g	2200 g	3200 g
Nominal load	1200 g	2000 g	3000 g
Readability	10 mg	10 mg	10 mg
Repeatability (at nominal load)	10 mg	10 mg	10 mg
Linearity deviation	20 mg	20 mg	20 mg
Eccentricity deviation (at test load)	40 mg (500 g)	40 mg (1000 g)	40 mg (1000 g)
Sensitivity offset (at nominal load) [1]	80 mg	80 mg	80 mg
Sensitivity temperature drift [2]	0.0003 %/°C	0.0003 %/°C	0.0003 %/°C
Typical values			
Repeatability	7 mg	7 mg	7 mg
Linearity deviation	6 mg	6 mg	6 mg
Eccentricity deviation (at test load)	15 mg (500 g)	15 mg (1000 g)	15 mg (1000 g)
Sensitivity offset (at nominal load) [1]	80 mg	80 mg	80 mg
Minimum weight (tolerance = 1%) [3]	1.4 g	1.4 g	1.4 g
Settling time	1 s	1 s	1.5 s
Adjustment	Internal / FACT	Internal / FACT	Internal / FACT
Dimensions & other specifications			
Balance dimensions (W × D × H)	200 × 319 × 100 mm	200 × 319 × 100 mm	200 × 319 × 100 mm
Weighing pan dimensions (W × D)	180 × 180 mm	180 × 180 mm	180 × 180 mm
Usable height of draft shield	-	-	-
Balance weight	3.8 kg	3.8 kg	3.8 kg
Weights for routine testing			
Weights (OIML class)	50 g (F2)/ 1000 g (F2)	100 g (F2)/ 2000 g (F2)	100 g (F2)/ 2000 g (F2)
Weights (ASTM class)	50 g (ASTM 4)/ 1000 g (ASTM 4)	100 g (ASTM 4)/ 2000 g (ASTM 4)	100 g (ASTM 4)/ 2000 g (ASTM 4)

[1]   after adjustment with internal weight

[2]   in the temperature range 10 °C … 30 °C

[3]   determined at 5% load, k = 2

	JET4002G	JET6002G	JET12002G
Limit Values			
Capacity	4200 g	6200 g	12200 g
Nominal load	4000 g	6000 g	10000 g
Readability	10 mg	10 mg	10 mg
Repeatability (at nominal load)	10 mg	10 mg	10 mg
Linearity deviation	20 mg	20 mg [4]	20 mg
Eccentricity deviation (at test load)	40 mg (2000 g)	60 mg (2000 g)	70 mg (5000 g)
Sensitivity offset (at nominal load) [1]	80 mg	80 mg	80 mg
Sensitivity temperature drift [2]	0.0003 %/°C	0.0003 %/°C	0.0003 %/°C
Typical values			
Repeatability	7 mg	7 mg	7 mg
Linearity deviation	6 mg	6 mg [4]	6 mg
Eccentricity deviation (at test load)	15 mg (2000 g)	20 mg (2000 g)	25 mg (5000 g)
Sensitivity offset (at nominal load) [1]	24 mg	36 mg	48 mg
Minimum weight (tolerance = 1%) [3]	1.4 g	1.4 g	1.4 g
Settling time	1.5 s	1.5 s	1.5 s
Adjustment	Internal / FACT	Internal / FACT	Internal / FACT
Dimensions & other specifications			
Balance dimensions (W × D × H)	200 × 319 × 100 mm	200 × 319 × 100 mm	200 × 319 × 100 mm
Weighing pan dimensions (W × D)	180 × 180 mm	180 × 180 mm	180 × 180 mm
Usable height of draft shield	–	–	–
Balance weight	3.8 kg	3.8 kg	3.8 kg
Weights for routine testing			
Weights (OIML class)	200 g (F2)/ 2000 g (F2)	200 g (F2)/ 5000 g (F2)	500 g (F2)/ 10 000 g (F2)
Weights (ASTM class)	200 g (ASTM 4)/ 2000 g (ASTM 4)	200 g (ASTM 4)/ 5000 g (ASTM 4)	500 g (ASTM 4)/ 10 000 g (ASTM 4)

[1]   after adjustment with internal weight

[2]   in the temperature range 10 °C … 30 °C

[3]   determined at 5% load, k = 2

[4]   up to nominal weight

	JET6001G
Limit Values	
Capacity	6200 g
Nominal load	6000 g
Readability	100 mg
Repeatability (at nominal load)	100 mg
Linearity deviation	200 mg
Eccentricity deviation (at test load)	400 mg (2000 g)
Sensitivity offset (at nominal load) [1]	480 mg
Sensitivity temperature drift [2]	0.0005 %/°C
Typical values	
Repeatability	70 mg
Linearity deviation	60 mg
Eccentricity deviation (at test load)	100 mg (2000 g)
Sensitivity offset (at nominal load) [1]	300 mg
Minimum weight (tolerance = 1%) [3]	14 g
Settling time	1 s
Adjustment	Internal / FACT
Dimensions & other specifications	
Balance dimensions (W × D × H)	200 × 319 × 100 mm
Weighing pan dimensions (W × D)	180 × 180 mm
Usable height of draft shield	–
Balance weight	3.8 kg
Weights for routine testing	
Weights (OIML class)	200 g (F2) / 5000 g (F2)
Weights (ASTM class)	200 g (ASTM 4) / 5000 g (ASTM 4)

[1] after adjustment with internal weight

[2] in the temperature range 10 °C … 30 °C

[3] determined at 5% load, k = 2

	JET2001G/AED	JET3001G/AED	JET6001G/AED
Limit Values			
Capacity	2200 g	3200 g	6200 g
Nominal load	2000 g	3000 g	6000 g
Readability	100 mg	100 mg	100 mg
Repeatability (at nominal load)	50 mg	50 mg	50 mg
Linearity deviation	50 mg	50 mg	50 mg
Eccentricity deviation (at test load)	100 mg (1000 g)	100 mg (1000 g)	100 mg (2000 g)
Sensitivity offset (at nominal load) [1]	80 mg	100 mg	150 mg
Sensitivity temperature drift [2]	0.0003 %/°C	0.0003 %/°C	0.0003 %/°C
Typical values			
Repeatability	40 mg	40 mg	40 mg
Linearity deviation	40 mg	40 mg	40 mg
Eccentricity deviation (at test load)	40 mg (1000 g)	40 mg (1000 g)	40 mg (2000 g)
Sensitivity offset (at nominal load) [1]	50 mg	60 mg	80 mg
Minimum weight (tolerance = 1%) [3]	8 g	8 g	8 g
Settling time	1 s	1.5 s	1.5 s
Adjustment	Internal / FACT	Internal / FACT	Internal / FACT
Dimensions & other specifications			
Balance dimensions (W × D × H)	200 × 319 × 100 mm	200 × 319 × 100 mm	200 × 319 × 100 mm
Weighing pan dimensions (W × D)	180 × 180 mm	180 × 180 mm	180 × 180 mm
Usable height of draft shield	-	-	-
Balance weight	3.8 kg	3.8 kg	3.8 kg
Weights for routine testing			
Weights (OIML class)	100 g (F2)/ 2000 g (F2)	100 g (F2)/ 2000 g (F2)	200 g (F2)/ 5000 g (F2)
Weights (ASTM class)	100 g (ASTM 4)/ 2000 g (ASTM 4)	100 g (ASTM 4)/ 2000 g (ASTM 4)	200 g (ASTM 4)/ 5000 g (ASTM 4)

[1]   after adjustment with internal weight

[2]   in the temperature range 10 °C … 30 °C

[3]   determined at 5% load, k = 2

11.3 Dimensions

11.3.1 Carat balances with a readability of 0.001 ct / 0.1 mg

Models: JET503C, JET703C, JET1103C, JET1603C
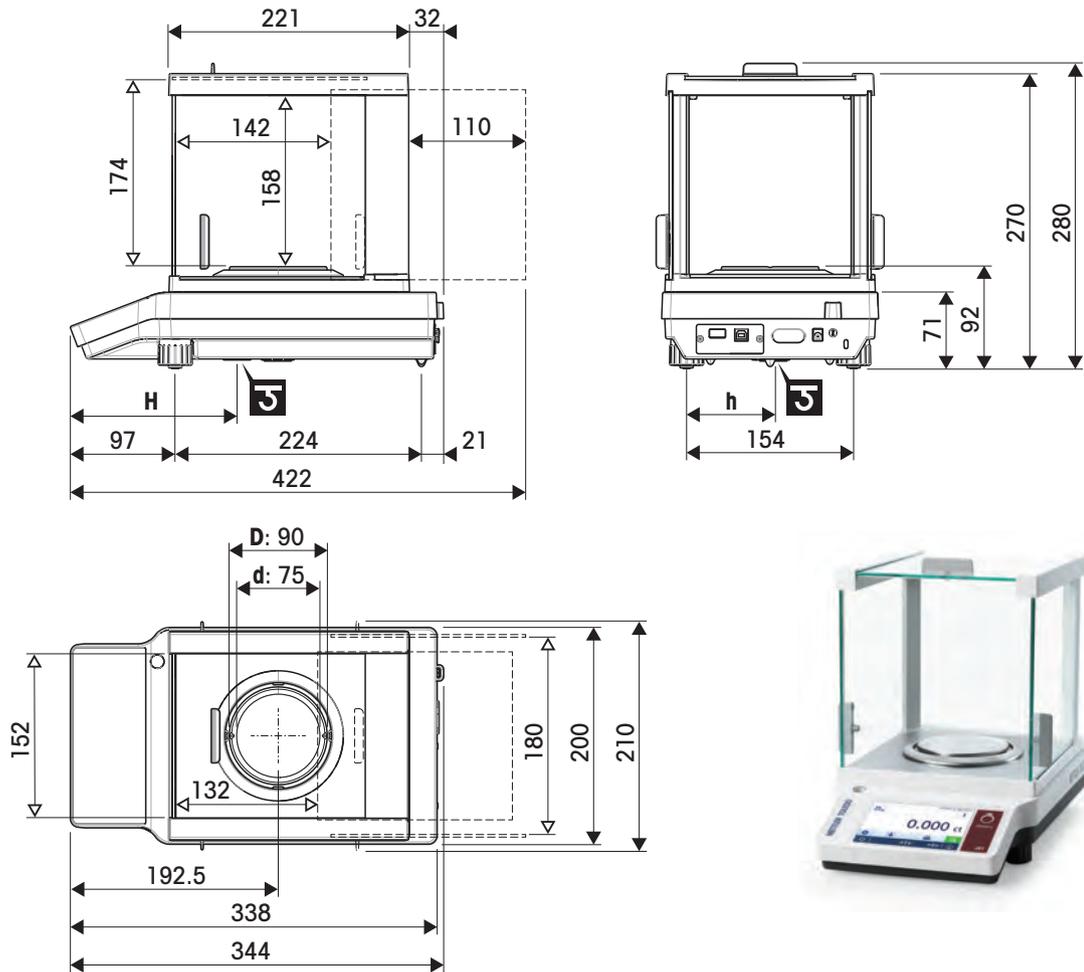
	Outer dimensions [mm]	
	Clear dimensions [mm]	
D	Outer diameter of the weighing pan.	
d	Diameter of the flat area of the weighing pan	
↻	Position of the weighing hook axle	
H	JET503C, JET703C, JET1103C	192 mm
	JET1603C	154 mm
h	JET503C, JET703C, JET1103C	74 mm
	JET1603C	81 mm

11.3.2 Gold balances with a readability of 1 mg / 10 mg

Models: JET303G, JET603G, JET1003G, JET602G/AED, JET1002G/AED
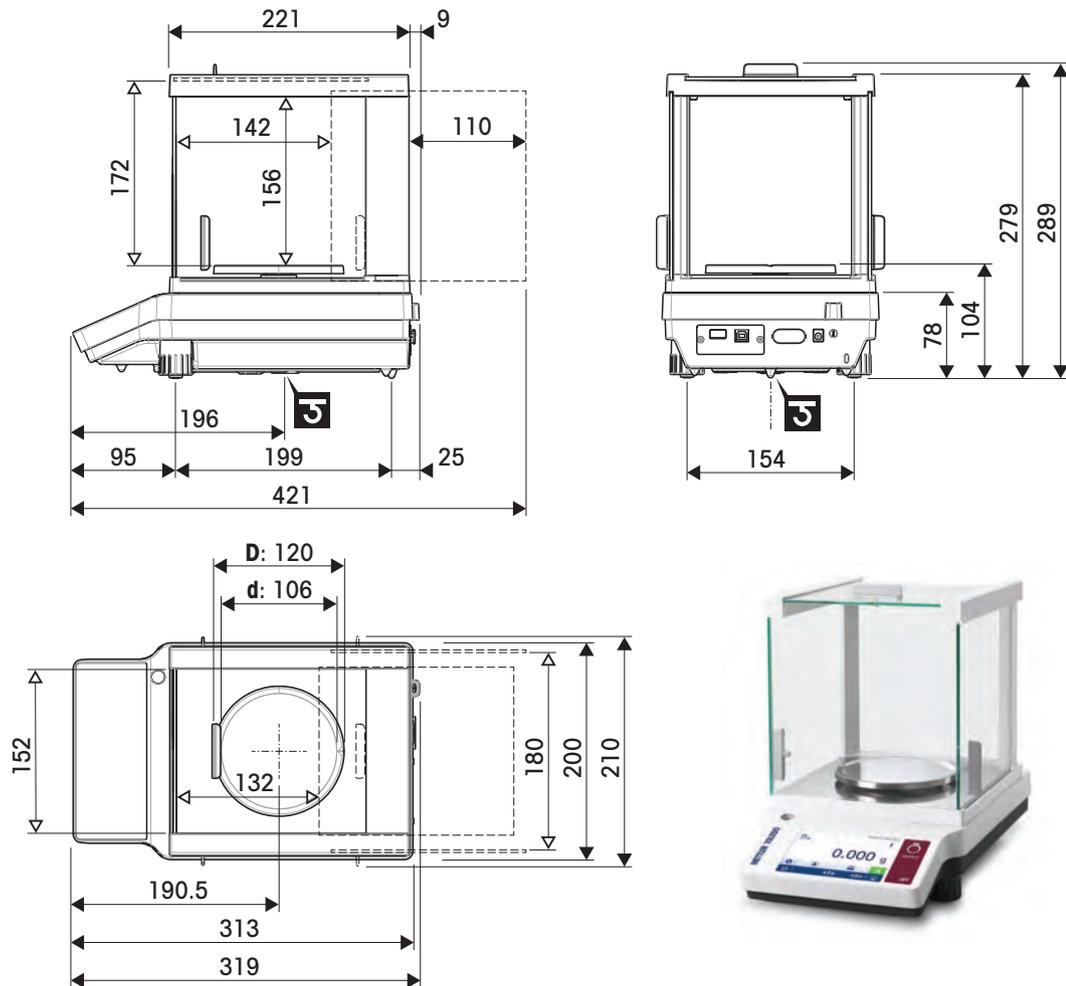
← →		Outer dimensions [mm]
◁ ▷		Clear dimensions [mm]
D		Outer diameter of the weighing pan.
d		Diameter of the flat area of the weighing pan
⟲		Position of the weighing hook axle

11.3.3 Gold balances with a readability of 10 mg and 100 mg

Models: JET1002G, JET3002G, JET4002G, JET6002G, JET12002G, JET6001G, JET2001G/AED, JET3001G/AED, JET6001G/AED
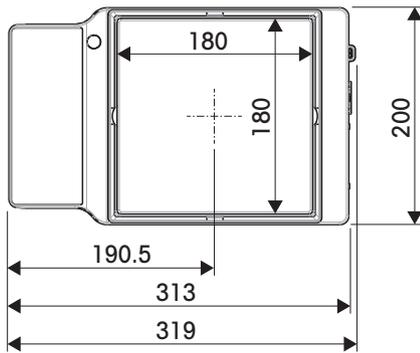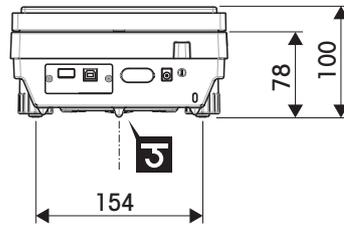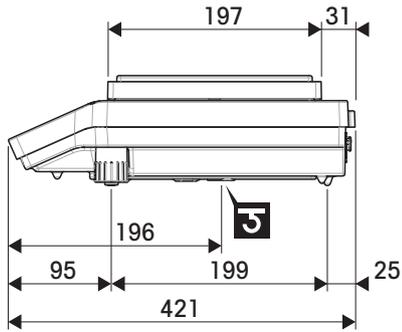
◄──────►	Outer dimensions [mm]
⟳	Position of the weighing hook axle

11.4 Interface specifications

11.4.1 RS232C interface

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

Schematic	Item	Specification
	Interface type	Voltage interface according to EIA RS232C/DIN66020 CCITT V24/V.28)
	Max. cable length	15 m
	Signal level	Outputs: +5 V … +15 V (RL = 3–7 kΩ) −5 V … −15 V (RL = 3–7 kΩ) Inputs: +3 V … +25 V −3 V … -25 V
	Connector	Sub-D, 9-pole, female
	Operating mode	Full duplex
	Transmission mode	Bit-serial, asynchronous
	Transmission code	ASCII
	Baud rates	600, 1200, 2400, 4800, 9600, 19200, 38400 (software selectable)
	Bits/parity	7-bit/none, 7-bit/even, 7-bit/odd, 8-bit/none (software selectable)
	Stop bits	1 stop bit
	Handshake	None, XON/XOFF, RTS/CTS (software selectable)
	End-of-line	<CR><LF>, <CR>, <LF> (software selectable)
	Power supply for 2nd display	+ 12 V, max 40 mA (software selectable, 2nd display mode only)

11.4.2 USB-A port
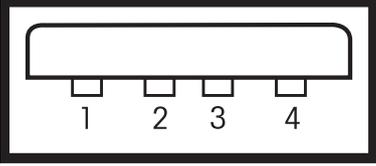
Schematic	Item	Specification	
	Standard	In conformity with USB specifications revision 2.0	
	Speed	Full-speed 12 Mbps (requires shielded cable)	
	Power usage	Max. 500 mA	
	Connector	Type A	
	Pin assignment	1	VBUS (+5 V DC)
		2	D- (Data -)
		3	D+ (Data +)
		4	GND (Ground)
		Shell	Shield

11.4.3 USB-B port

Schematic	Item	Specification
	Standard	In conformity with USB specifications revision 2.0
	Speed	Full-speed 12 Mbps (requires shielded cable)
	Function	CDC (Communication Device Class) serial port emulation
	Power usage	Suspended device: Max 10 mA
	Connector	Type B

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

Accessories are additional components that could help you in your workflow.

Description	Part No.

Printers

	USB-P25/11 printer with USB connection to balance (with date, time and applications)	30398875
	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

Carat pans
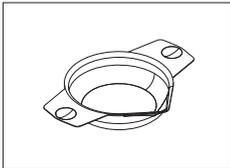
	Carat pan S, ø 80 mm / height 20 mm (set of 10 units)	12102645
	Carat pan M, ø 90 mm / heigh 30 mm (set of 10 units)	12102646
	Carat pan L, ø 90 mm / heigh 45 mm (set of 10 units)	12102647
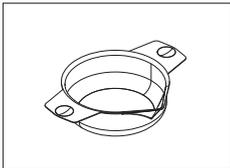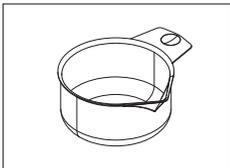
Cables for RS232C interfaces

	USB-RS232 cable (to connect a balance via RS232C to a USB port)	64088427

Cables for USB interface

	USB 2.0 High-speed cable to connect balance with PC (USB A to USB B), length = 1 m	30241476

Density determination

| | Density Kit Advanced & Standard for balance models with a readability of 0.1 mg / 1 mg | 30535760 |

Auxiliary displays

| | RS232 auxiliary display AD-RS-J7 | 12122380 |

Dust covers
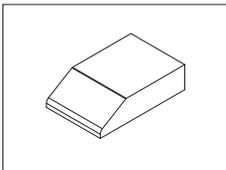
| | Dust cover for models without draft shield | 30029051 |

| | Dust cover for models with draft shield low (170 mm) | 30029050 |
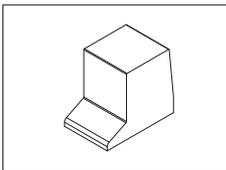
Anti-theft devices

| | Anti-theft cable with lock | 11600361 |

Software

EasyDirect Balance is an application software to collect, analyze, store and export balance measurement and device data on PC.

EasyDirect Balance

| License EasyDirect Balance for 10 Instruments | 30540473 |
| License EasyDirect Balance for 3 Instruments | 30539323 |

Power supplies
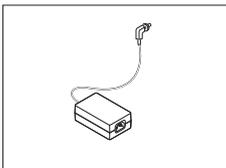
| | AC/DC adapter (without power cable) 100–240 V AC, 0.8 A, 50/60 Hz, 12 V DC 2.5 A | 11107909 |
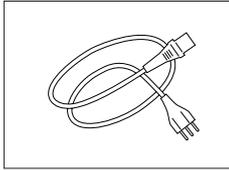
Country-specific 3-Pin power cable with grounding conductor.

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

Spare parts are parts that are delivered with the original instrument but that can be replaced, if needed, without the help of a service technician.

12.2.1 Balances with a readability of 0.001 ct / 0.1 mg with draft shield
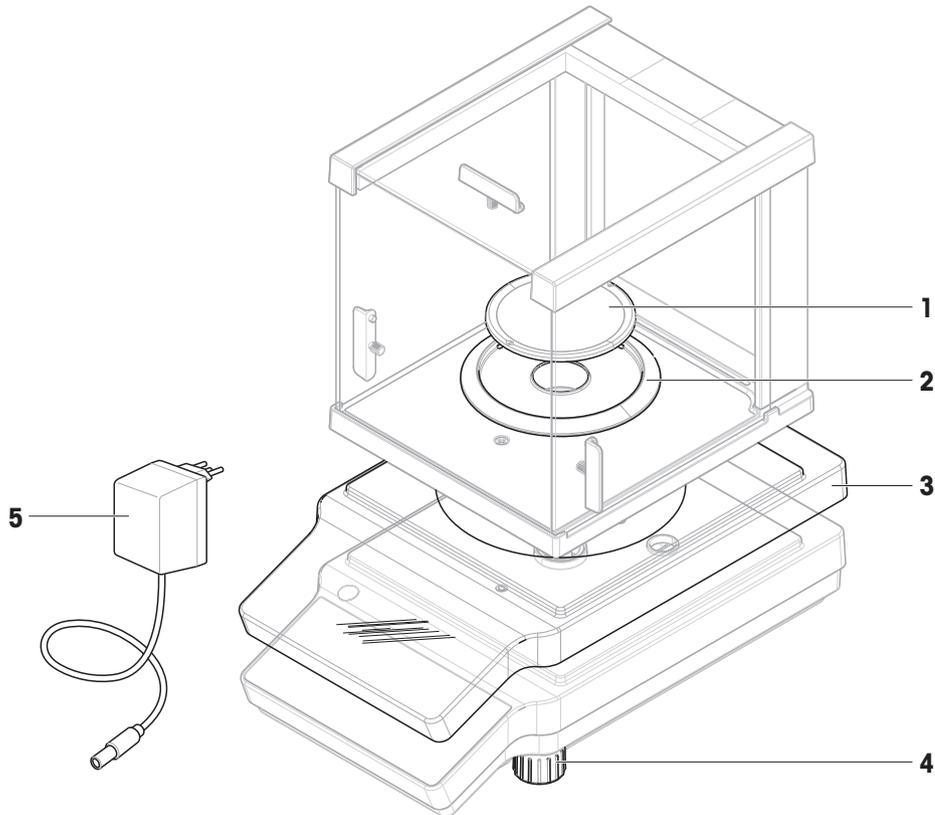
	Order no.	Designation	Remarks
1	30037737	Weighing pan Ø 90 mm	Including: Pan support
2	12122043	Draft protection ring	For weighing pan Ø 90 mm
3	30241549	Protective cover	–
4	30037744	Leveling foot	Including: 2 leveling feet
5	11120270	AC/DC adapter universal	Including: Plug for all countries

12.2.2 Balances with a readability of 0.001 ct / 0.1 mg with draft shield and pan support
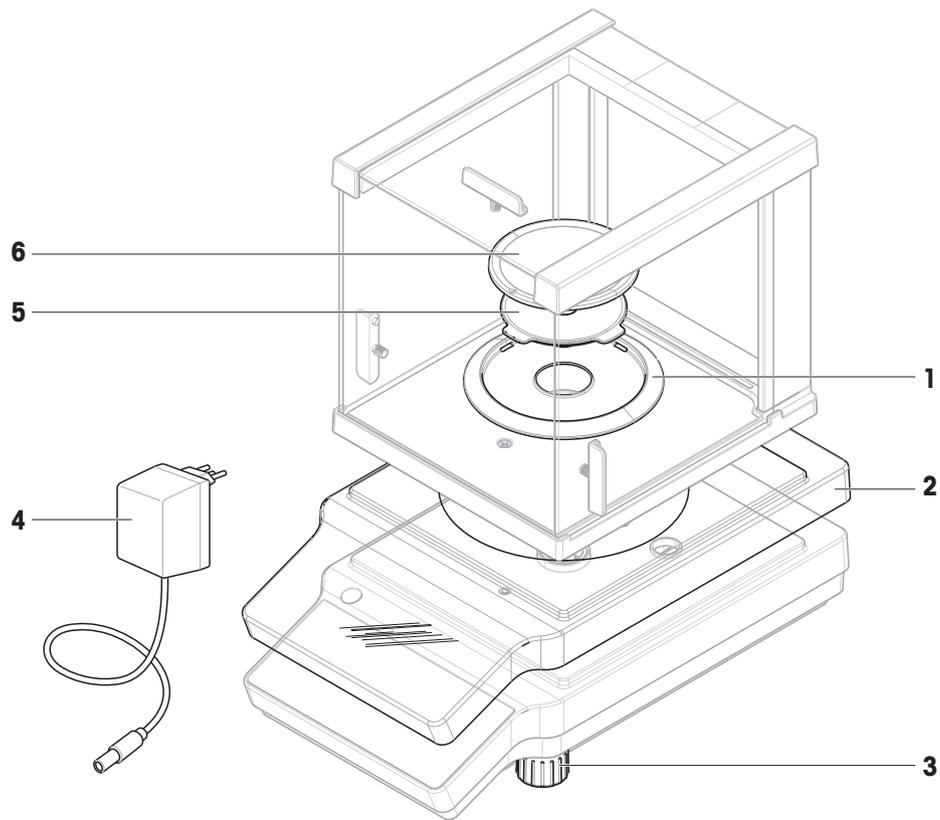
	Order no.	Designation	Remarks
1	12122043	Draft protection ring	For weighing pan Ø 90 mm
2	30241549	Protective cover	–
3	30037744	Leveling foot	Including: 2 leveling feet
4	11120270	AC/DC adapter universal	Including: Plug for all countries
5	30535716	Pan support ø 90 mm	–
6	12122010	Weighing pan Ø 90 mm	Excluding: Pan support

12.2.3 Balances with a readability of 1 mg / 10 mg with draft shield
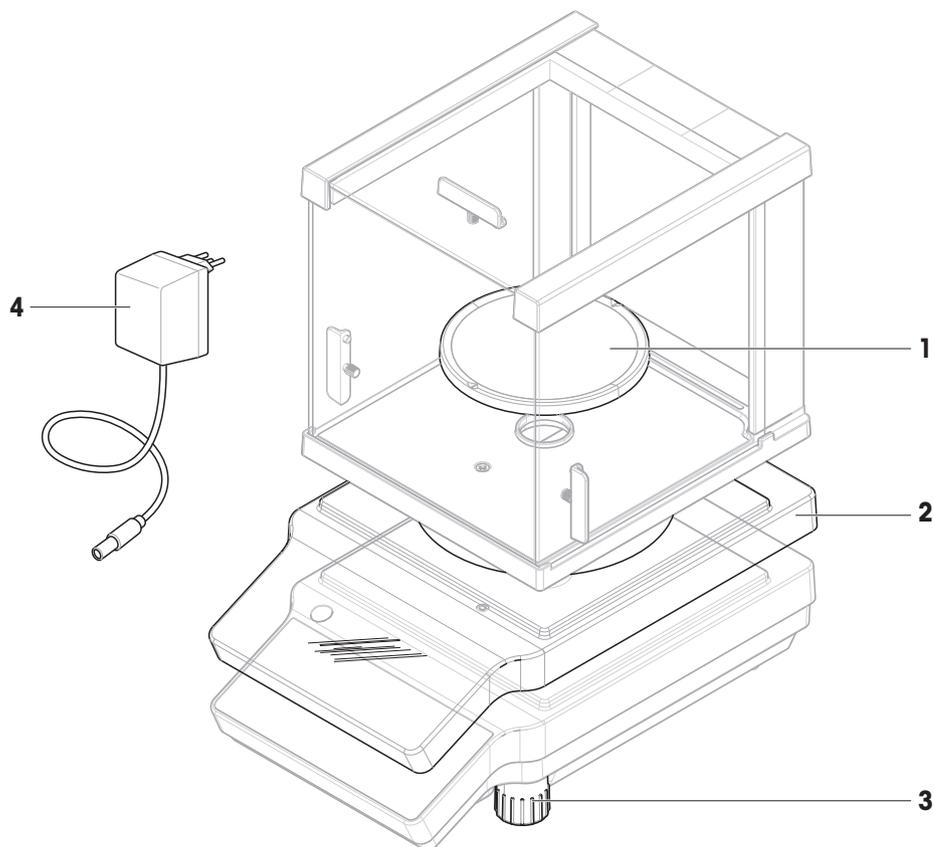
	Order no.	Designation	Remarks
1	30042889	Weighing pan Ø 120 mm	Including: Pan support
2	30241560	Protective cover	–
3	30037744	Leveling foot	Including: 2 leveling feet
4	11120270	AC/DC adapter universal	Including: Plug for all countries

12.2.4 Balances with a readability of 10 mg / 100 mg with square weighing pan and draft shield element
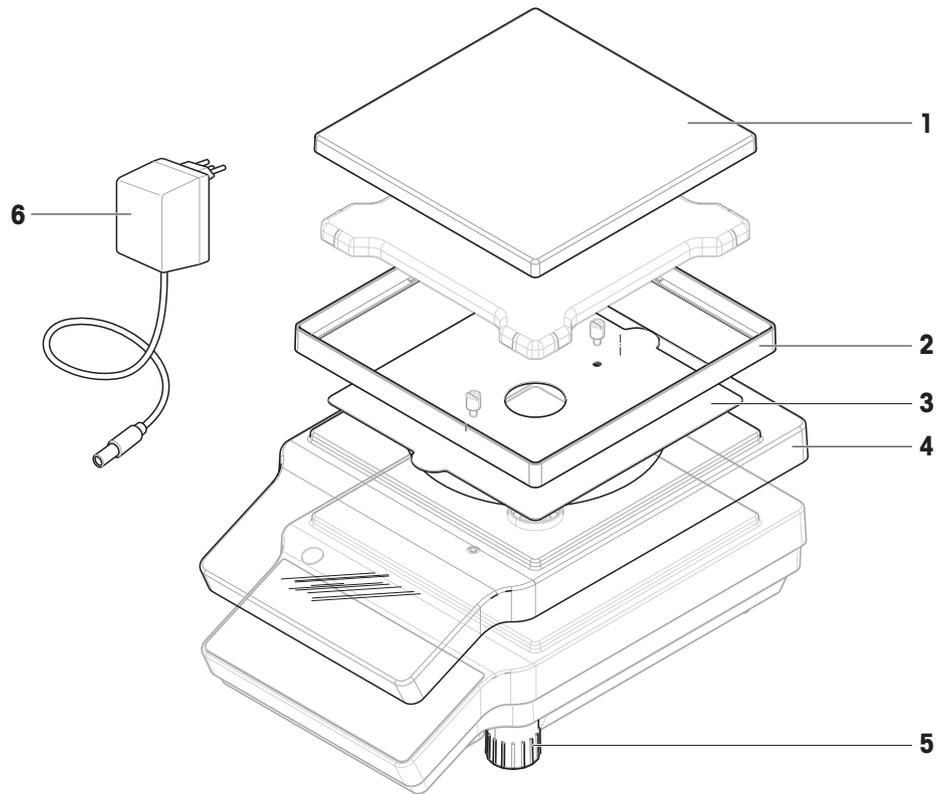
	Order no.	Designation	Remarks
1	30535713	Weighing pan 180 x 180 mm	Excluding: Pan support
2	30042897	Draft protection frame 180 x180 mm	–
3	30042901	Bottom plate	Excluding: Screws
4	30241560	Protective cover	–
5	30037744	Leveling foot	Including: 2 leveling feet
6	11120270	AC/DC adapter universal	Including: Plug for all countries

13 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, the content of this regulation must also be related.

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GWP®
Good Weighing Practice™

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

▶ **www.mt.com/GWP**

www.mt.com/jewelry

For more information

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