USER GUIDE

# AS 220.X7

Radwag

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# User manual

**IMMU-1671-06-08-26-EN**

# X7 Series

AS X7 Analytical Balances
PS X7 Precision Balances

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Thank you for choosing and purchasing a RADWAG balance.
The balance has been designed and manufactured to serve you for many years. Please read this Manual to make sure the device is reliable.

AUGUST 2026

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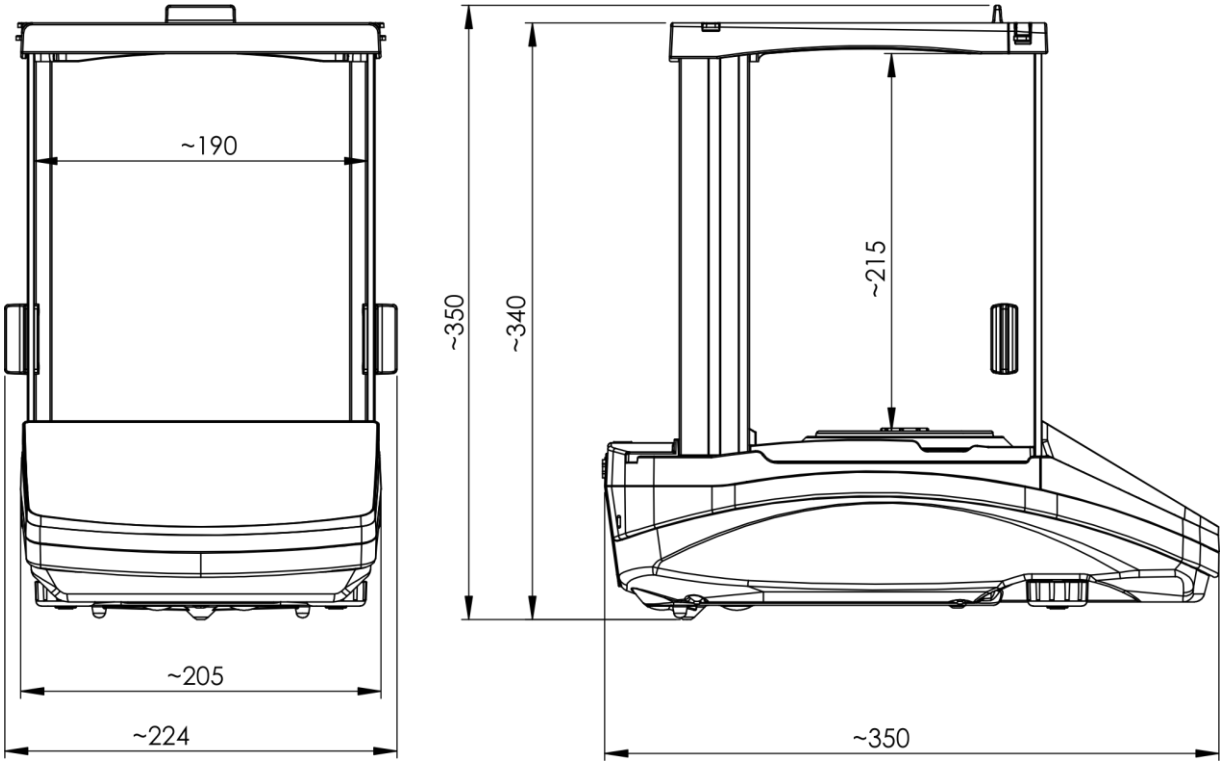
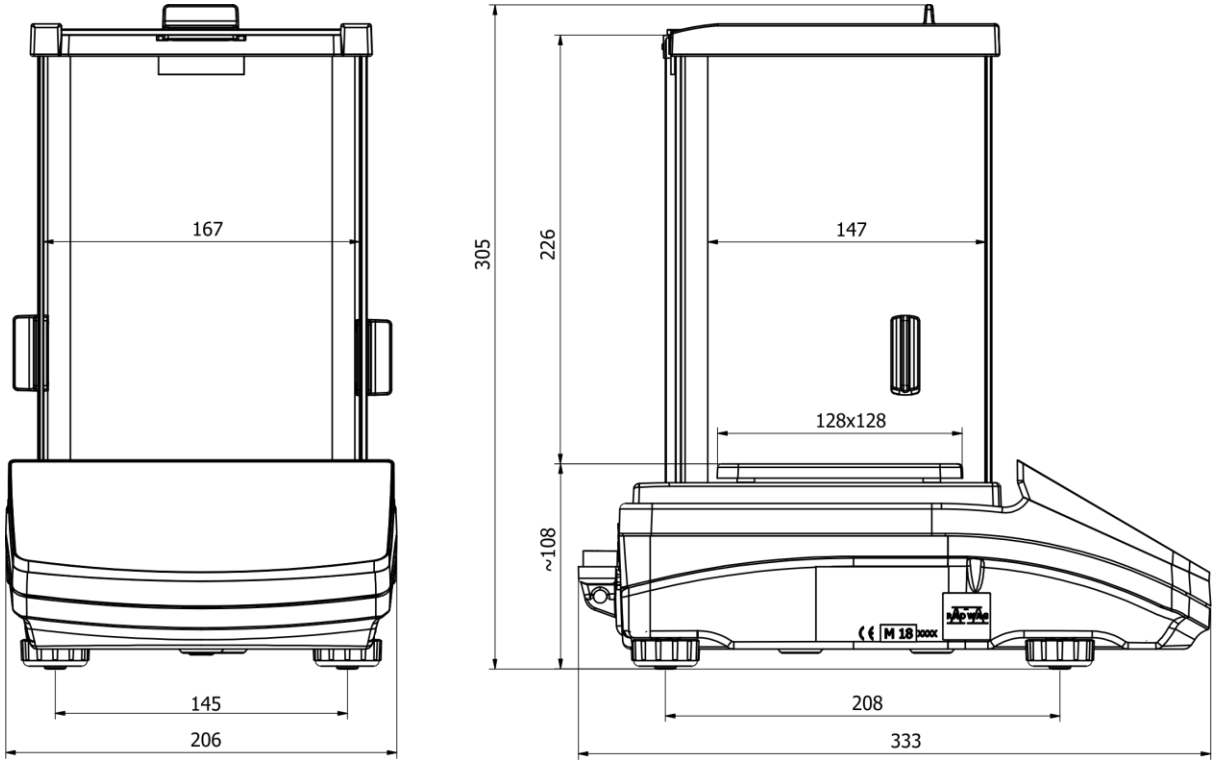
# 1. BASIC INFORMATION

## 1.1. Dimensions

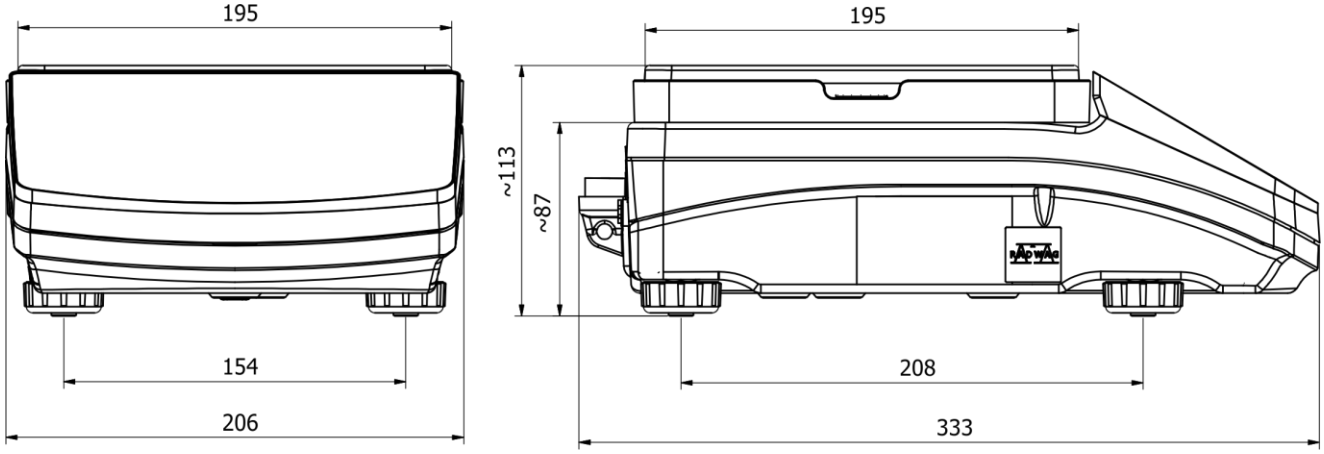
### AS X7 series



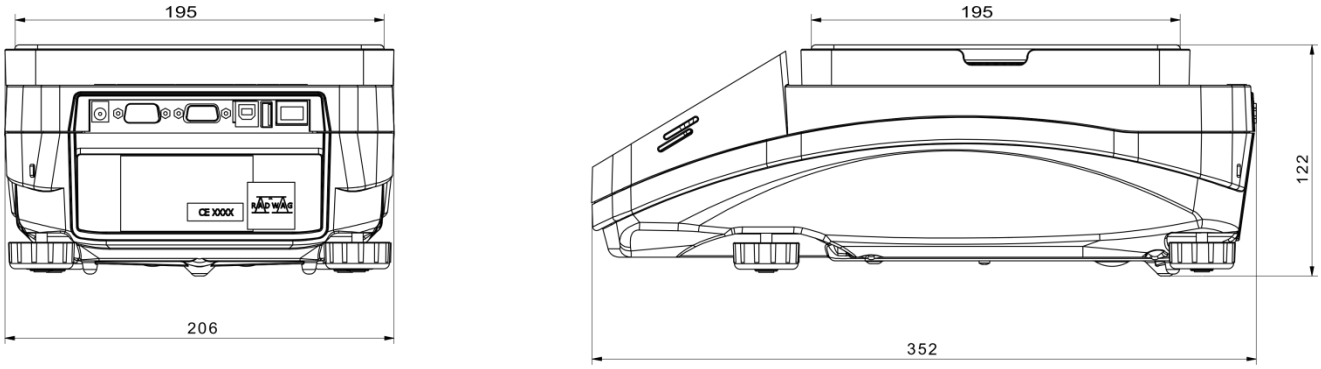

### PS X7 series; d=0.001g



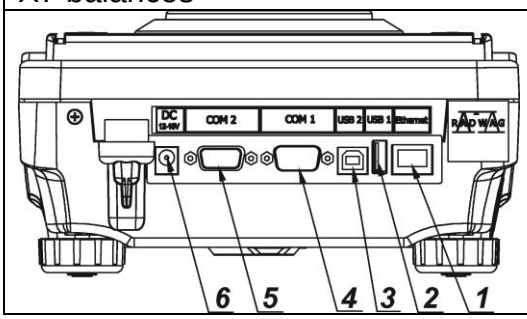

### PS X7 series; d=0.01g – version 1

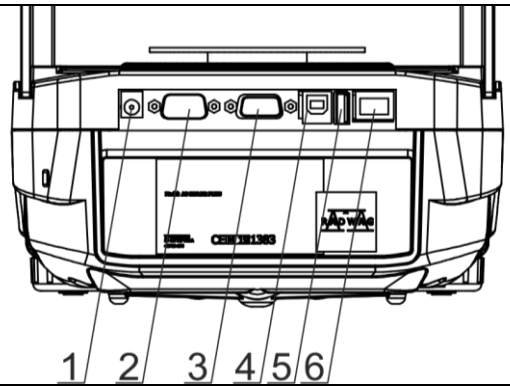



**PS X7 series; d=0.01g – version 2**




## 1.2. Description of ports

| X7 balances | |
|---|---|
|   | 1. RJ45 Ethernet port<br>2. USB 1 port, Type A<br>3. USB 2 port, Type B<br>4. COM 1 port<br>5. COM 2 port<br>6. Power port |

| AS X7 balances | |
|---|---|
|   | 1. Power port<br>2. DB9/M port (external buttons)<br>3. COM 1 port (e.g. printer)<br>4. USB 2 port, type B (e.g. computer)<br>5. USB 1 port, type A (e.g. computer keyboard)<br>6. RJ45 Ethernet port |

### 1.3. Wiring diagrams

***Note:***
*The „Balance – Ethernet" cable is a standard network cable, ending with a RJ45 connector on both sides.*

***P0108*** *Balance – computer cable (RS232)*

### 1.4. Intended use

X7 series balances are intended to perform precise measurements of load weights in laboratories.

### 1.5. Precautions

- Before you use the device, please read this Operating Manual carefully and use the product as designed.
- Do not use sharp tools (e.g. knife, screwdriver, etc.) to use the touch panel.
- Carefully position weights in question in the centre of the weighing pan.
- Load the weighing pan with items whose gross mass is lower than the maximum lifting capacity of the balance.
- Do not leave heavy weights on the weighing pan for a long time.
- In case of failure, disconnect the balance from the source of power supply immediately.
- The device that is scheduled for decommissioning must be disposed of in accordance with currently applicable rules of law.
- Do not use the balance in the ex-zones. The device is not intended for operation in hazardous areas.

### 1.6. Terms of guarantee

A. RADWAG undertakes to repair or replace the pieces that prove defective in terms of manufacture or structure.
B. It is allowed to specify defects of unclear origin and establish elimination methods only in cooperation with representatives of the manufacturer and user.
C. RADWAG shall not be held responsible for any damage or loss arising from unauthorised or incorrect manufacture or servicing.
D. The guarantee does not cover the following:
    - mechanical damage caused by wrong operation, as well as thermal and chemical damage, damage caused by atmospheric discharge, overvoltage in the power network or other random event,
    - damage when it is not used as designed,
    - damage when the service technician can identify aby violation or damage to the mark securing the structure before opening,
    - damage caused by liquids and natural wear,
    - damage arising from unsuitable adaptation or defect of the electric system,
    - damage arising from overloading of the measuring mechanism,

- maintenance works (balance cleaning).

E. The guarantee cover is lost when:
   - the unauthorised service centre has performed the repair,
   - the service technician can identify unauthorised interference into mechanical or electronic structure of the balance,
   - other version of the operating system has been installed,
   - the balance is devoid of company securing marks.

F. Detailed terms of the guarantee can be accessed in the service sheet.

### 1.7. Metrological parameters supervision

Metrological properties of the balance must be checked by the operator at specific predefined time intervals. The frequency of checking is determined by ambient conditions in which the balance is operating, types of weighing procedures and adopted quality supervision system.

### 1.8. Information in the operating manual

Read the operating manual carefully before you activate and start the balance, even if you are experienced in using such balances. The manual contains all information required for proper use of the device. Adherence to the guidelines is a guarantee of proper and reliable operation of the balance.

### 1.9. Staff training

The balance must be operated and supervised only by people who have been trained on the use and are experienced in using such devices.

## 2. TRANSPORT AND STORAGE

### 2.1. Delivery inspection

Inspect the packaging and device upon delivery and check for potential signs of outer damage. If the packaging is damaged, contact the manufacturer's representative.

### 2.2. Packaging

Keep all parts of the packaging in case you need to ship the balance in the future. Only the original packaging can be used to transport the balance. Before you pack the device, disconnect all cables and remove moving parts (e.g. weighing pan, covers, inserts). Put all parts of the balance into the original box and secure it against transport damage.

## 3. UNPACKING AND ASSEMBLY

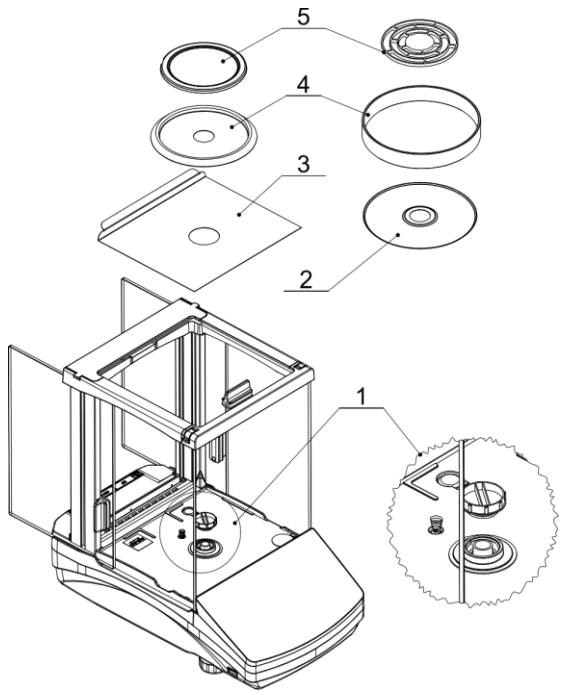
Slash the protective tape. Take the balance out of the original box. Remove all elements of the device from the accessories box.

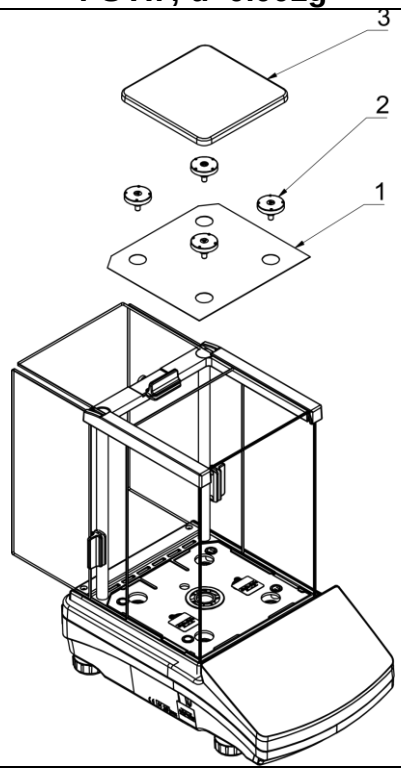
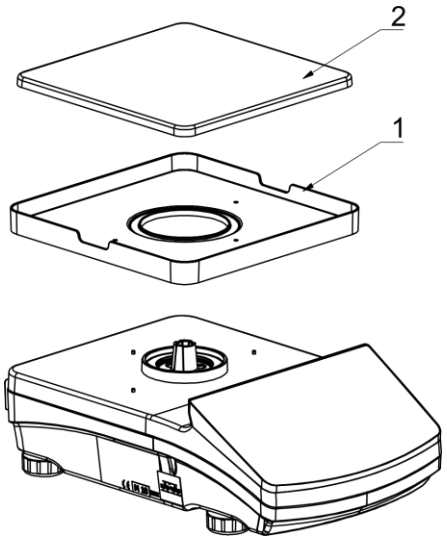
### 3.1. Place of installation, place of use

- use the balance in rooms that are free from vibrations and shocks, draughts and dust,
- the air temperature in the room must range from +10°C to +40°C, while relative humidity must not exceed 80%,
- while using the balance, potential room temperature fluctuations must be gradual and slow,
- the balance must be positioned on the wall bracket or stable table that is not exposed to vibrations, away from sources of heat,
- special attention must be paid to magnetic material weighing as a strong magnet is part of the balance.

### 3.2. List of standard delivery items

- Balance
- Lower cover of the weighing chamber (only AS balances)
- Centring ring (only AS balances with *d=0.01/0.1mg and d=1mg*)
- Full weighing pan, openwork weighing pan – only AS balances with *d=0.01/0.1mg and d=1mg*
- Weighing pan cover (only AS and PS balances with *d=0.001g*)
- Power cord.

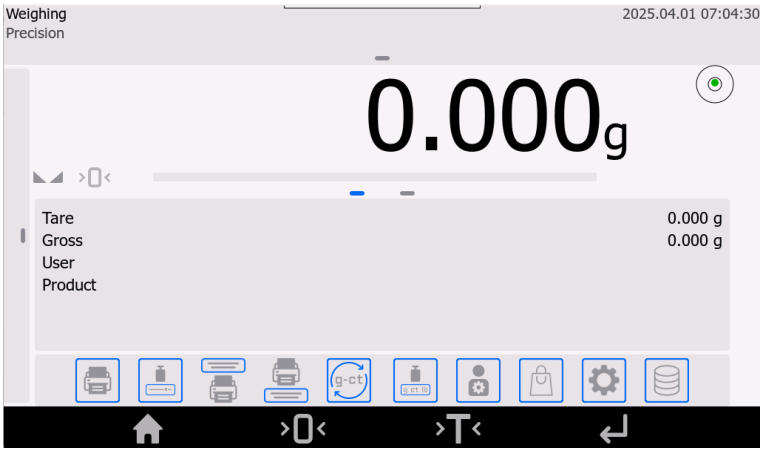
| **AS X7** | |
|---|---|
|  | • Remove the shipping protective piece (1) – gently press the protective piece and turn as showed by the <OPEN> arrow, then remove the protecting piece. Keep the protective piece to properly secure the balance for potential shipping.<br><br>Next install the remaining pieces as per the diagram above:<br>• lower cover of the weighing chamber (3),<br>• centring ring [with embossing facing upwards] (2),<br>• weighing pan cover (4),<br>• weighing pan (5).<br><br>**CAUTION!** AS balance with d=0,01/01mg *and d=1mg* is equipped with 2 weighing pans (standard and open-work). Remember to calibrate the balance upon changing the pan. |

| **PS X7; d=0.001g** | **PS X7; d=0.01g** |
|---|---|
|  |  |
| Install elements as per the diagram above:<br><br>weighing chamber cover (1); weighing pan shafts (2) and weighing pan (3). | Install elements as per the diagram above: weighing pan cover (1); weighing pan (2).<br>Put the weighing pan onto the outstanding shaft. The weighing pan has a protrusion at the bottom, and it should fit the socket in the shaft body. This is to assure stable and final determination of the position of the weighing pan in relation to the cover. |

### 3.3. Positioning

The balance must be positioned on the floor stably, resting on all its legs.

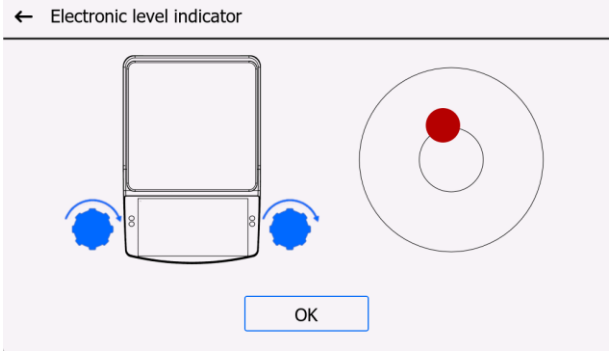
AS X7 series balances are equipped with the **Level Sensing System** that is responsible for supervising the level of the balance. This solution allows continuous inspection of the level while the balance is operating, which is signaled in the bottom right corner of the screen, in the quick access key bar.



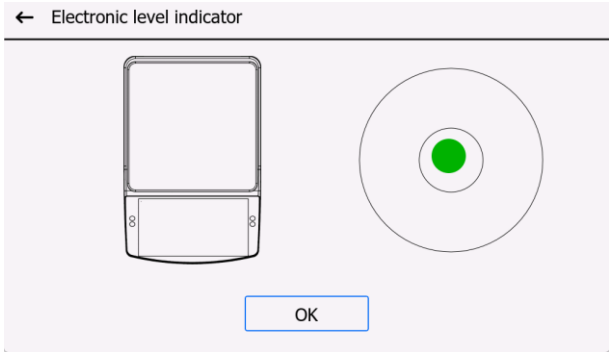

The task of the system is to supervise the balance level. In case the level changes, the system notifies of it in the screen: by changing the level indicator from - balance levelled correctly> into - balance not levelled and/or sounding the alarm, and by activating the balance level settings box.

**Balance levelling procedure:**

- Press level status key in the bottom right corner of the screen.
- The balance screen will show the level control panel. Leg pictograms with a suggested rotation direction can be seen in the level view.




- Level the balance by rotating its leg as suggested in the screen – the level point will move towards the center of the circle.
- When the point comes to the inner circle of the „level view", its color will turn from red to green. It means that the balance has been properly levelled.




Once the balance has been levelled, return to the home screen.

### 3.4. Balance cleaning

To safely clean the balance, take the steps in the following order:

1. Disassemble the weighing pan and other moving parts of the balance; depending on the type of the balance (see description in the section entitled „UNPACKING AND ASSEMBLY”). Take these actions very carefully in order not to damage the mechanism.
2. It is possible to disassemble glass cabinets for careful cleaning – see disassembly description below.

***Note:***
*If you clean the weighing pan while it is installed, you may damage the balance.*

***Cleaning ABS elements***
To clean dry surfaces, it is necessary to use clean cellulose or cotton cloths that do not leave streaks and do not dye. You can also use water and cleaning agent (soap, dishwashing liquid, window cleaner). For optimal cleaning, regularly press the cloth against the surface, wipe the cleaned area, and dry afterwards. You can repeat the cleaning procedure, if necessary. In case of stubborn dirt, such as glue, rubber, tar, polyurethane foam, etc., you can use special cleaning agents based on aliphatic hydrocarbons that do not solve the material. Before using the cleaning agent, it is recommended that you should conduct a fitness test. Do not use abrasive agents.

***Cleaning glass elements***

Depending on the type of dirt, a suitable solvent must be chosen. Never immerse glass in strong alkaline solutions because glass can be damaged by these solutions. It is forbidden to use abrasive agents.
In case of organic residues, acetone must be used. Only in a next step can you use water and detergent. With regard to non-organic residues, thinned acid solutions (soluble hydrochloric or nitric acid salts) or bases (mostly sodium, ammonium) are permitted.
ACIDS must be removed with basic solvents (sodium carbonate), while BASES with acidic solvents (mineral acids of various concentration).
In case of stubborn dirt, use a brush and detergent. Avoid the detergents with large and hard particles as they may scratch the glass.
At the end of the washing procedure, carefully rinse the glass with distilled water.
Always use soft brushes with a wooden or plastic grip to avoid scratching. Do not use wire brushes or wire-core brushes.
The rinsing procedure is required to make sure all soap, detergent and other cleaning agent residues are removed from glass products before they are reassembled in the product.
After initial cleaning, glass elements must be rinsed under running water, and distilled water afterwards.

It is not advisable to dry the glass with a paper towel or forced air stream because it may pollute glass elements with fibers or other contaminants, and eventually lead to erroneous weighing results.
For measuring glassware, do not use electric dryers.

As a rule, after washing, glass elements are positioned on the shelf for free drying.

***Cleaning stainless steel elements***

While cleaning stainless steel elements, follow the table below. The table shows types of pollutants and methods of eliminating them.

| | |
|---|---|
| Fingerprints | Wash with spirit or solvent.<br>Rinse with pure water and wipe it dry. |
| Oils, fats, greases | Wash with organic solvents and then clean with warm water with soap or soft detergent.<br>Rinse with pure water and wipe it dry. |
| Temperature stains and discolorations | Wash with a gentle abrasive cleaner, clean lightly according to the direction of the surface structure.<br>Rinse with clean water and wipe dry. |
| Strong discoloration | Clean lightly according to the direction of the surface structure.<br>Rinse with clean water and wipe dry. |
| Traces of rust | Moisten with oxalic acid solution and leave for about 15-20 minutes. Then wash with warm water and soap or soft detergent.<br>Rinse with pure water and wipe it dry. |
| Paints | Wash with paint solvent, and then wash with warm water and soap or soft detergent.<br>Rinse with pure water and wipe it dry. |
| Scratched surface | Gently polish with unwoven fabric (iron-free) as per surface structure direction, and then wash with a soft scouring detergent. Rinse with pure water and wipe it dry. |

***Cleaning powder-painted elements***

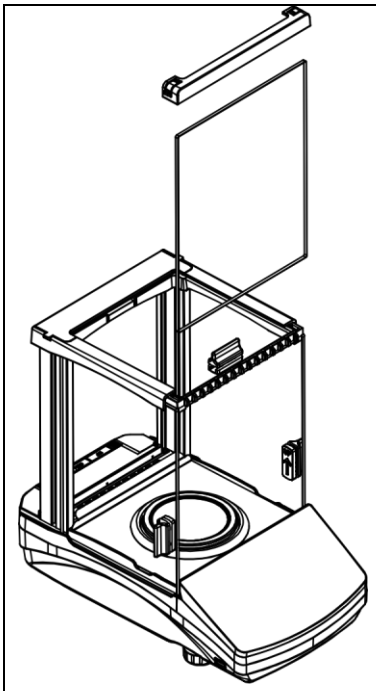
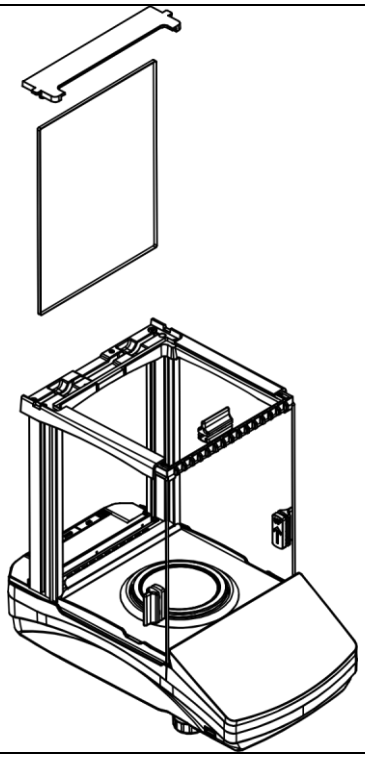
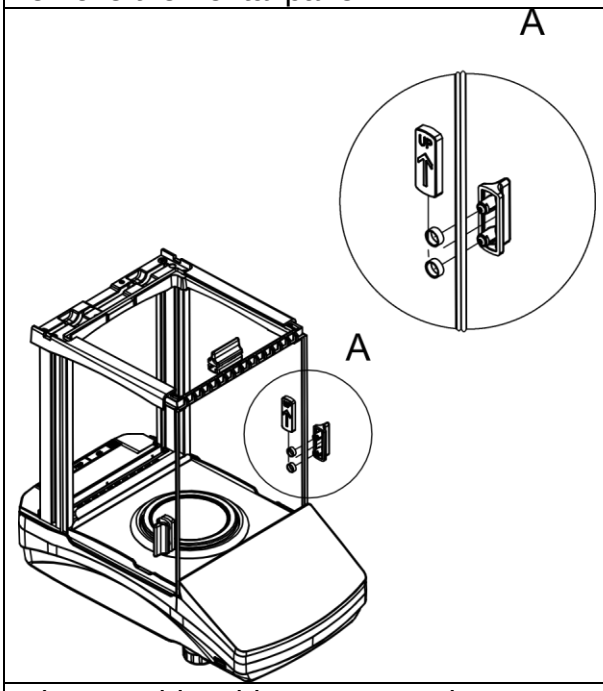
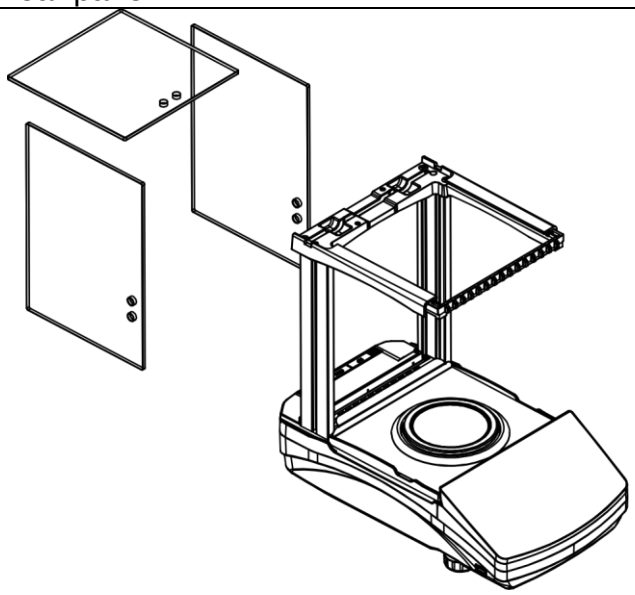
The first step is preliminary cleaning under running water or with a large-pore sponge and a large amount of water in order to remove loose and major dirt. Do not use abrasive agents.

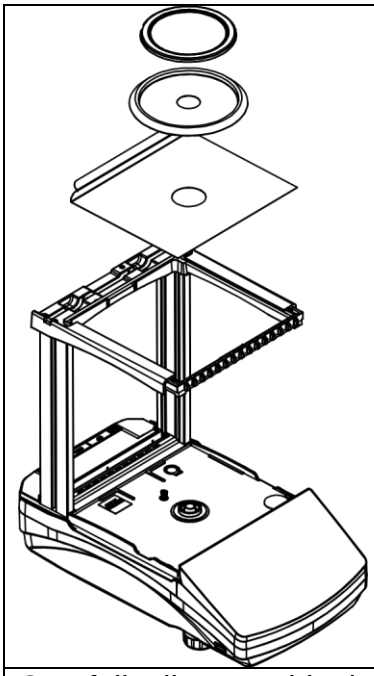
Next, using a suitable cloth and water-cleaning agent solution (e.g. soap, dishwashing liquid), clean the surface by applying a regular pressure of the cloth against the surface of elements. Do not use only a detergent to clean it dry as it may damage the coating. Use a large amount of water, or water together with a cleaning agent.

***Cleaning aluminum elements***

To clean aluminum, use products rich in natural acids. The following agents will be perfect: synthetic vinegar, lemon. It is forbidden to use abrasive agents. Avoid rough brushes that may easily scratch the surface of aluminum. A soft microfiber cloth will be the best choice. Polished surfaces must be cleaned by making circular movements. After removing dirt from the surface, polish the surface with a dry cloth to dry the surface off and make it shine. For easier cleaning of the AS balance glass cabinet, it is allowed to disassemble the cabinet panes as per the description below.

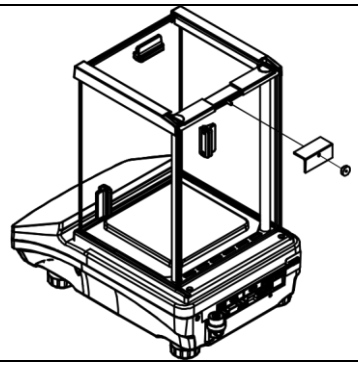
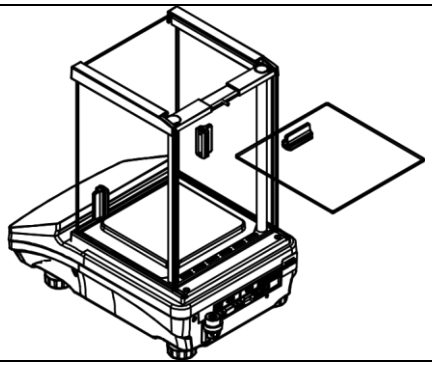
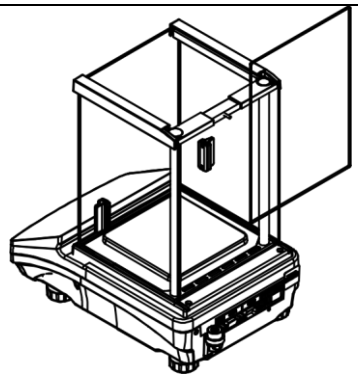
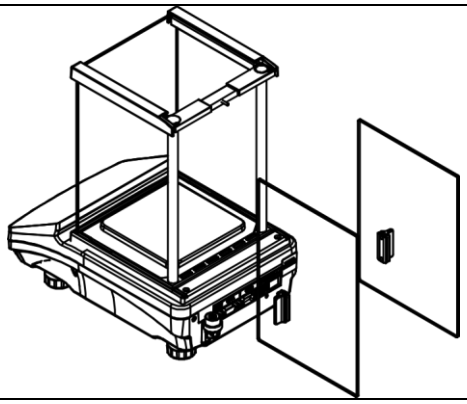
AS X7 series balances – cabinet disassembly order:

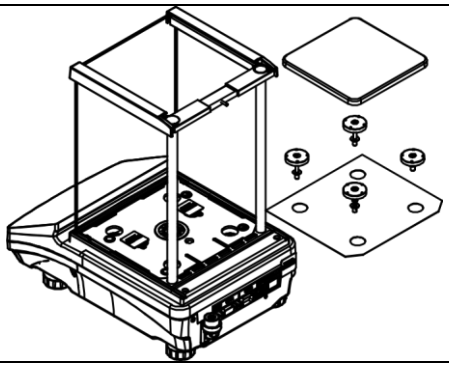
| | |
|---|---|
|  |  |
| Detach the frontal part of the frame and remove the frontal pane. | Detach the rear part of the frame and remove the rear pane. |
|  |  |
| Disassemble side panes and top pane holders. | Slide side panes and top pane. |

| | |
|---|---|
|  | |
| Carefully disassemble the weighing pan, its cover and lower plate. | |

When the cabinet and its panes have been disassembled in that way, you can clean them properly. All steps must be taken with care, making sure any pollutants and other minor pieces do not enter the interior of the balance through the hole in which the weighing pan was installed. Otherwise the balance may malfunction.

**PS X7 series balances with d=0.001g– cabinet disassembly order:**

| | |
|---|---|
|  |  |
| Unscrew the protecting nut and disassemble top pane protection. | Slide the top pane out of guides. |
|  |  |
| Remove the rear pane. | Slide side panes out. |

| | |
|---|---|
|  | |
| Carefully disassemble the weighing pan, its shafts and lower cover. | |

When the cabinet and its panes have been disassembled in that way, you can clean them properly. All steps must be taken with care, making sure any pollutants and other minor pieces do not enter the interior of the balance through the hole in which the weighing pan shafts were installed. Otherwise the balance may malfunction.
After cleaning, assemble the cabinet, taking all steps in a reversed order. Make sure side panes have been installed on the right side.

### 3.5. Mains supply connection

**The balance can be connected to the mains only using the original power cord (supplied). The power cord rated voltage (specified on its rating plate) must comply with the rated voltage of the mains.**
To supply power to the balance, insert a power plug into the mains socket and then insert the power connector into the port located at the back of the balance housing.
Once the power has been supplied, the balance screen test is initiated (all elements and pictograms are illuminated at this time). The program name and number will be showed afterwards. This is followed by ZERO indication in the screen (with the reading unit dependent upon the type of balance). Upon activation of the balance, the internal adjustment mechanism is tested (single placement and lifting of the internal adjustment mass). If the value is different than zero, press →0← key.

***Note:*** *If the balance is verified, the automatic adjustment/calibration will be performed shortly after activation.*

### 3.6. Temperature stabilization time

Before starting making measurements, wait for the balance to stabilize thermally. With regard to balances that had been stored at a way lower temperature (e.g. in winter) before being connected to the mains, the acclimatization and warming time ranges from 4 hours for PS and WLC variants, to 8 hours for AS balances. While the balance is stabilizing thermally, values displayed in the screen may change. It is advisable to make sure potential ambient temperature fluctuations in the place of using the device are minor and slow.

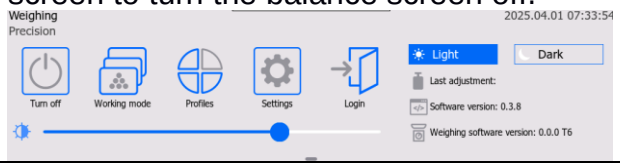
### 3.7. Connection of additional equipment

Only additional equipment that has been recommended by the balance manufacturer can be connected to the specific balance. Before you connect or change the additional equipment (i.e. printer, personal computer, USB keyboard or extra display unit), disconnect the balance from power supply. After connecting devices, resupply the power to the balance.

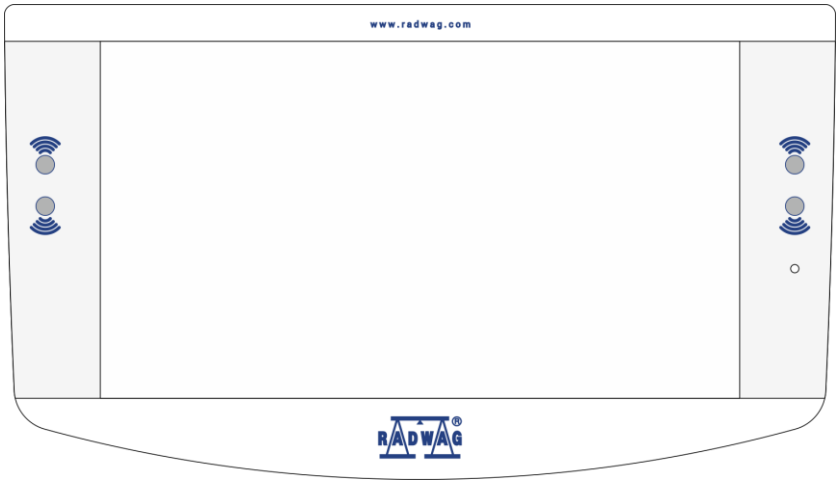
## 4. ACTIVATION

- Insert the power adapter into the mains socket, and then power cable plug into the port located at the back of the balance housing.
- If the balance fails to activate instantly (light on the right side of the facade glows, under the proximity sensor graphics and pictogram shows up in the screen - ), „double click” in any place of the touch screen.
- The start-up procedure will be initiated instantly.
- After the start-up procedure has ended, the home screen of the program will be displayed.
- When the balance is activated, the user is unlogged (no operator). To start working, please log in (logging procedure is described in further sections of the manual).

| | |
|---|---|
| | *Activate the balance without any load – with an empty weighing pan.*<br>*In verified balances, as per EN 45501 standard, the mass value below -20d must not be displayed. If the value drops below that value, the <Low mass> note is displayed in the home screen.*<br>*If this is the case, zero the balance by pressing →0← key.* |

| | |
|---|---|
| | Do not disconnect the balance from the mains during breaks between measuring series. It is advisable to press the OFF key on the right side of the screen to turn the balance screen off.<br>  <br> |
| | The screen disconnection status is signalled through a glowing light on the right side of the facade, under the proximity sensor graphics, and through a cyclical pictogram in the screen - . |
| | To activate the balance, „double click” in any place of the touch screen.<br>After the start-up procedure, the balance is ready for further weighing. |

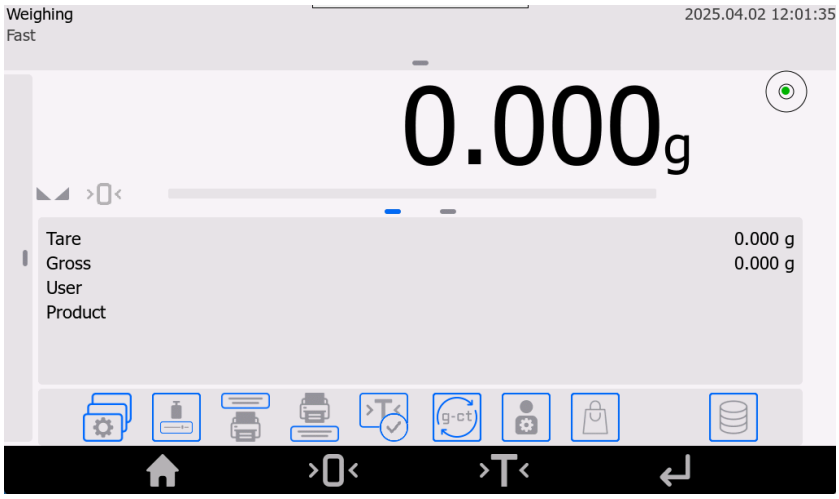
## 5. FACADE




| Key | Description |
|---|---|
| | Proximity sensors that you can freely program useful functions for. |
| | The LED light that informs you about inactive screen. |

## 6. WEIGHING WINDOW

| | |
|---|---|
| | *Some display views used in the manual are for reference only and do not reflect the real design of the display unit.* |



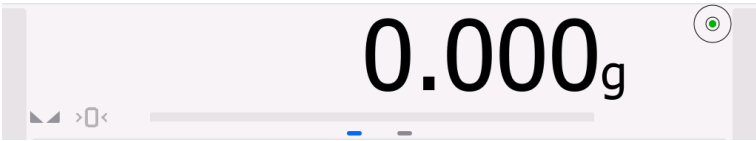

**The main window of the application can be divided into 5 sections:**

At the top of the screen you can access information on a currently used working mode (icon and name), information pictograms, metrological data and a key for selection of functions in the specific working mode.

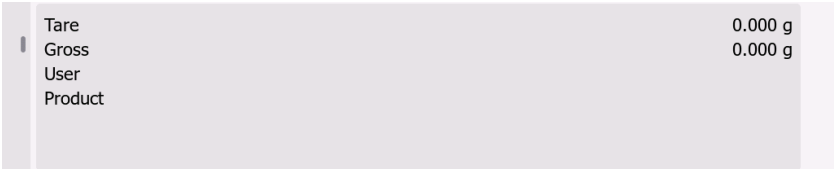
The following information can be displayed at the top of the screen:

| | |
|---|---|
| Weighing<br>Fast | Working mode name and active weighing profile name. |
| | Active wireless connection symbol. |
| | Active pendrive connection symbol. |
| | Connected PC keyboard symbol. |
| | Connected USB-based printer symbol. |
| | Active computer connection symbol. |

- Below is the weighing result widow.




- Below the display is the field that contains additional information related to currently taken actions and on-screen functional keys.




***Note:***
*The information included in this field is freely programmable. The method of defining is described in section 7.7 of the manual.*

- Below are on-screen functional keys:

***Note:***
*The balance operator can define on-screen functional keys. The method of defining is described section 7.6 of the manual.*

- Permanent functional keys can be accessed at the bottom of the screen:

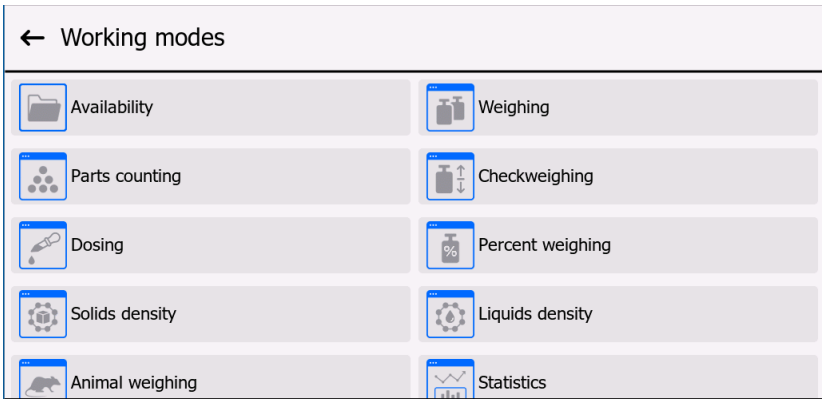
## 7. NAVIGATION IN THE MENU

Navigation in the program menu is intuitive and user-friendly. Thanks to a display with a touch panel, it is very easy to operate the program. When you press an on-screen key or field in the display, you activate the assigned operation or function.
The touch panel can also be operated using gloves.

### 7.1. Access to balance menu

To enter the balance menu, click <PARAMETERS> key. Every time you press the key in the information field or parameter name field in the menu, the background color changes. If the field in question is assigned any function or action, the procedure (e.g. calibration) will be initiated instantly or another parameter window or list of selectable settings will be displayed.

### 7.2. Relocation of a view in settings window



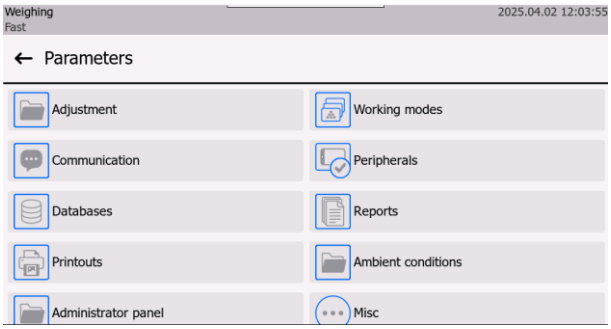

To move the view in the parameters window, press and hold any point in the window and move it upwards or downwards.

### 7.3. Edition keys

| | | | |
|---|---|---|---|
| | Enter main menu. | Clr | Clear edition box. |
| | Confirm changes. | | Export database (key is enabled after connecting the pendrive memory stick). |
| | Leave without changes. | | Import database (key is enabled after connecting the pendrive memory stick). |
| | Add item to database. | txt | Export specific report or database as a txt file (key is enabled after connecting the pendrive memory stick). |
| | Print item from database. | NAME | Search record in database by name. |
| | Return to previous menu. | CODE | Search record in database by code. |
| | | | Delete database content. |

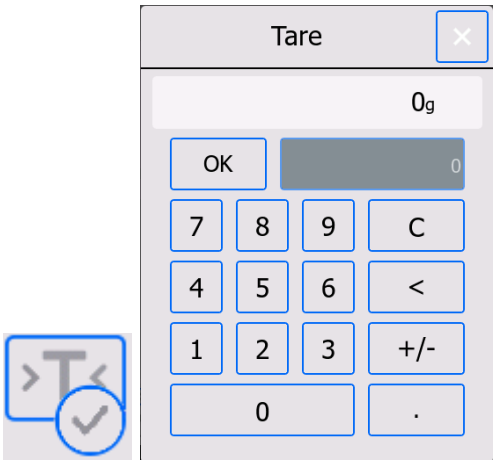
## 7.4. Activation of available functions

**Press quick-access key**,




*Enter parameter settings.*

**Press label**,




*Enter tare value*.

***Note:***
*To read about the method of declaring keys, please see section 7.6 of the manual.*

## 7.5. Return to Weighing Mode

Any changes entered into the balance memory are automatically saved in the menu after returning to the weighing mode.

Press ← key a few times so that the home screen is restored

Press key in the lower bar to instantly return to the home screen

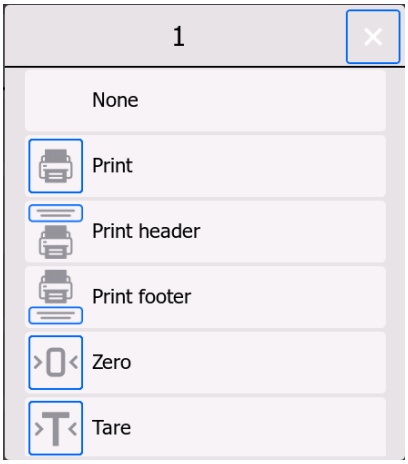
## 7.6. Quick-access keys, proximity sensors

| ← Buttons | | | |
|---|---|---|---|
| 1 | Working mode | 2 | Internal |
| 3 | Print header | 4 | Print footer |
| 5 | Set tare | 6 | Change unit |
| 7 | Users | 8 | Product |
| 9 | None | 10 | Databases |

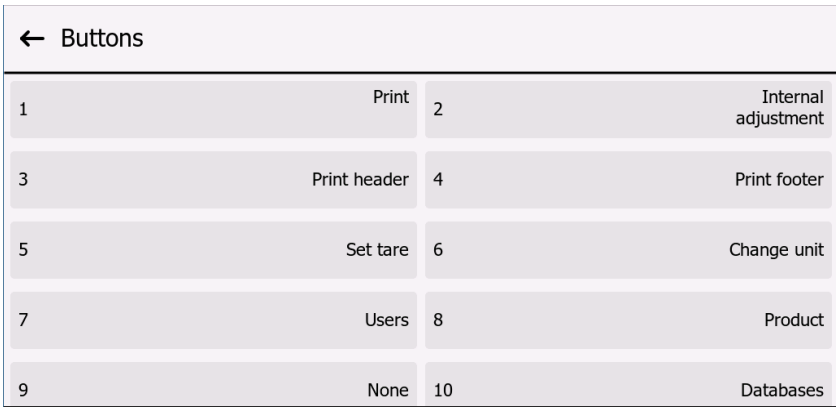
The operator can quickly return to the default arrangement of keys in the lower bar by pressing key in the top right corner of the screen.

The operator is allowed to define 10 keys that can be visible in the lower bar.
After assigning the function, a relevant icon shows up in the lower navigation bar of the home screen. Availability of keys depends on the working mode. Each working mode is assigned a programmed default key arrangement. To quickly restore the default arrangement, select <Default key arrangement> function.

To select a specific key, press the field describing the function. Once you have clicked it, a window with available keys will be displayed.




Click the key that you wish to select, the previous window will be displayed and the defined key function will change.



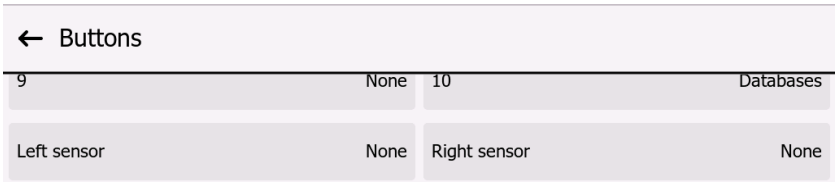

After returning to the home screen, the key you have selected will be available in the keys bar.

### 7.6.1. Proximity sensors

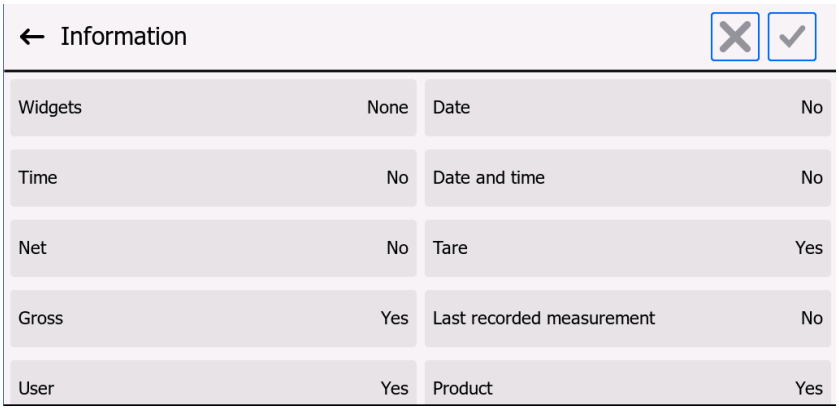
The balance is equipped with two proximity sensors that allow controlling the operation of the balance with no need to press keys on the facade or touch screen.

The program can recognize two movements near sensors:

1. Bringing the hand close to the left sensor <**Left proximity sensor>**.
2. Bringing the hand close to the right sensor <**Right proximity sensor**>.



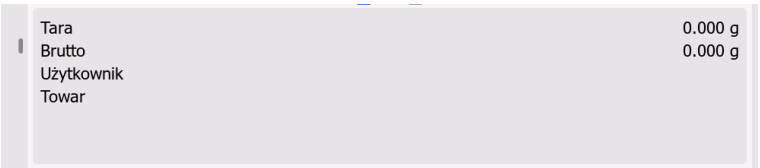

## 7.7. Information




The operator can quickly change selection of information to be displayed by using keys in the top right corner of the screen.

| | |
|---|---|
| | Unselect all information. |
| | Select all information. |
| | Restore default selection. |

The information related to the weighing procedure is showed on the left side of the central part of the screen.



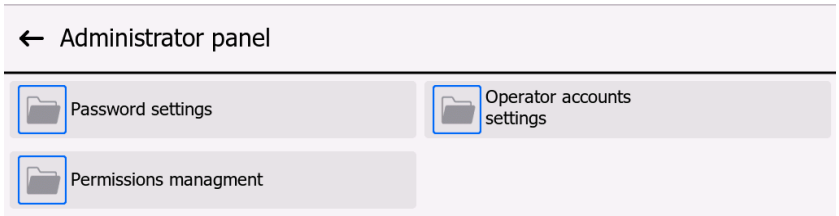

6 pieces of information are allowed there at the most. If more, the first 6 will be displayed.
For each information, two options are available:

- Yes – information is visible.
- No – information is invisible.

## 8. ADMINISTRATOR PANEL

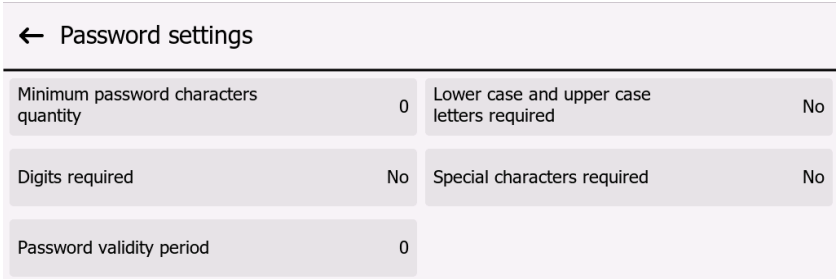
In this menu group, you can declare the range of actions that a user with a specific permission level can take, password protection level as well as unlogged user permission.

***NOTE: Only the operator with <Administrator> permission level is authorized to modify this menu.***



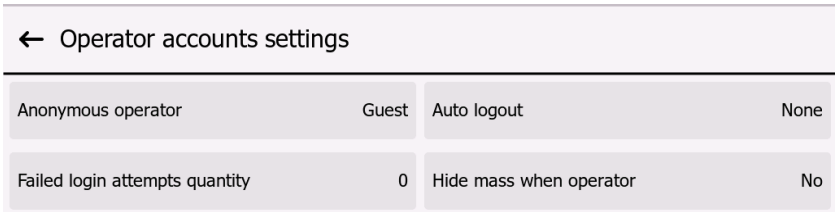

### 8.1. Password settings

The menu group allowing determination of password complexity for balance operators.




| | |
|---|---|
| Minimum password characters quantity | Specify the minimum number of characters in the operator's password. For '0" value, you can set any number of characters. |
| Lower- and upper-case letters required | Specify requirements regarding characters in operators' passwords. |
| Digits required | |
| Special characters required | |
| Password validity period | Specify the period of time, in days, after which you need to change the password.<br>For '0' value, the balance software does not require you to change the password. |

### 8.2. Operator accounts settings




**Unlogged user's permission**

The administrator can assign permission levels to the balance operator who has failed to log in (the so-called anonymous operator).

**Procedure:**
Enter the <Operator accounts settings> parameters group, select <Unlogged operator permission levels> and then choose one of the following variants: Guest, User, Advanced User, Administrator.

***Note:*** *If you set* ***<Guest>,*** *the unlogged operator will not be authorized to change any software settings.*

**Automatic logout**
This option allows you to activate automatic logout after a specific period of time, given in minutes, if the balance is not used.
By default this option (<None>) is inactive in the balance.

**Procedure:**
Enter the <Operator accounts settings> parameters group, select <Automatic logout> and then choose one of the following variants: none/3/5/15/30/60. Time is given in [min].

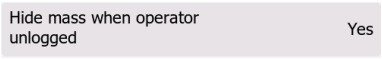
**Number of account-blocking login errors**
The option allows you to set the number of unsuccessful logging attempts taken by the operator. When the limit is exceeded, the access to the account will be blocked.
By default this option is disabled in the balance (<0> setting).

**Procedure:**
Go to the <Operator accounts settings> parameters group, select <Number of account-blocking login errors> and then enter the desired value.

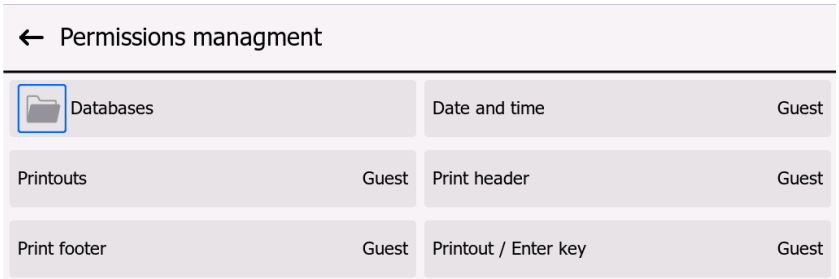
***Note:*** *when login errors occur (when the operator enters a wrong password) in the amount specified in this parameter, the specific operator's account will be blocked. This being the case, the administrator must intervene in order to unblock the account.*

**Hide mass when operator unlogged**
This option allows you to disable the mass display if the operator is not logged in.
By default this option is inactive in the balance.
By default this option is inactive in the balance (<None> item)

**Procedure:**
Go to <Hide mass when operator unlogged> and then switch the option into active.

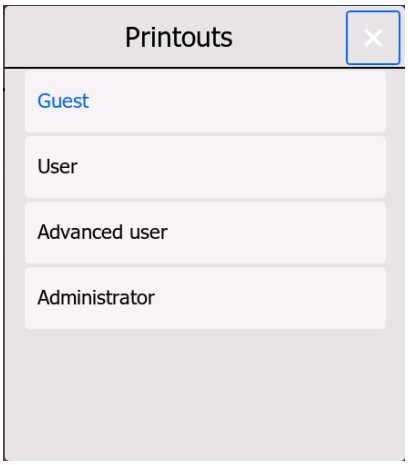



## 8.3. Permissions management

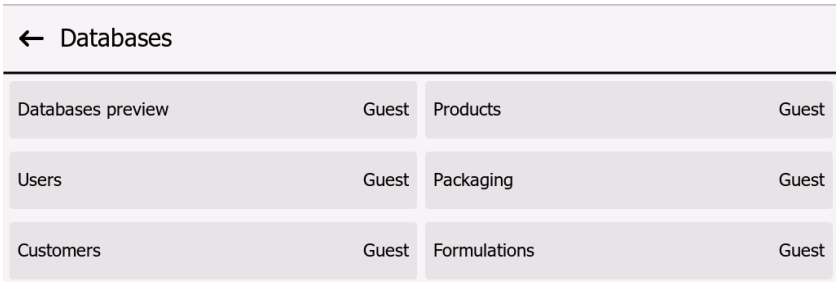



***Note:*** *if you switch the value of permission into* ***<Guest>*** *for particular parameters, the access to settings will be open (no need to log in).*

For each option, you can assign the permission level for edition.
The following settings are available:




**Databases**




Default settings of the balance allow the operator logged as **Administrator** to make changes to particular databases.

Depending on requirements, these permissions can be modified.
Similarly, you can change permissions for edition of other options available in this menu.

## 9. WEIGHING

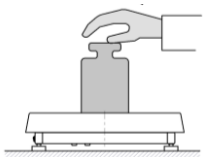
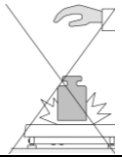
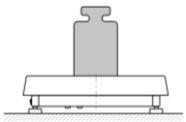
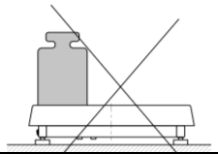
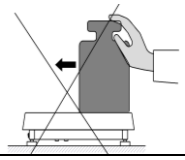
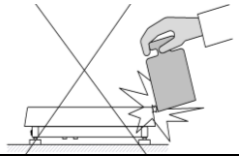
Place the weight in question on the weighing pan. When you can see ◣◢ marker on the left side of the screen, read the weighing result.
To save/print the weighing record, press <PRINT> key:

- for verified balances – only stable weighing result (◣◢),
- for non-verified balances – stable or unstable result (◣◢ is not displayed**)**; if the result is unstable, <?> mark is printed before the mass value.

### 9.1. Correct weighing principles

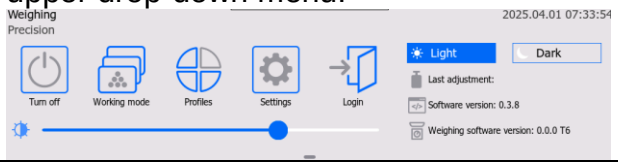
To assure long-lasting use and correct weight measurements, please follow the steps below:

- Activate the balance without any load on the weighing pan (permissible weighing pan load value upon activation is ±10% of the maximum lifting capacity).

| | | |
|---|---|---|
| Load the weighing pan in a calm way and without impacts: | **YES**  | **NO**  |
| Place the weight in the center of the weighing pan: | **YES**  | **NO**  |
| Avoid side loads of the weighing pan, particularly side impacts : | **NO**  | **NO**  |

Before you start measuring or in case of substantial changes to external conditions, calibrate the balance.

- Before measuring, it is advisable to repeatedly load the weighing pan with a weight whose mass is close to the maximum load limit. For balances with two „d" reading unit values, the initial loading of the weighing pan must be dependent upon the value of this unit.
  Example: For AS 82/220.X7.1 balances where $d_1$= 0,01mg and $d_2$=0,1mg, it is advisable to load the weighing pan in the following way: for measurements with $d_1$=0,01mg with mass of 50g and for measurements with $d_2$=0,1mg with mass of 200g.
- After unloading, make sure the unloaded balance shows the zero value - →0← symbol and make sure the measurement is stable - ◣◢ symbol; if not, press >0< key.
- Using **UNITS** key, set the weighing unit.

| | |
|---|---|
| | During breaks between series of measurements, do not disconnect the balance from the mains. It is advisable to turn the display off using the OFF key in the upper drop-down menu.   |
| | The display OFF status is signaled through a LED light on the right side of the facade, under the proximity sensor graphics and through a cyclical pictogram . |
| | To activate the balance, double click in any place of the touch screen.<br>Once the start-up procedure has ended, the balance will be ready for further weighing procedures. |

## 9.2. Logging

To gain full access to operator parameters and database edition, the balance operator must log in as **<Administrator>** every time the device is turned on.

**First Login:**

- While in the home screen, press key to open the operator base window with a list of available operators.
- Select **<Admin>** item to open the on-screen keypad with the operator password edition box.
- Enter **„1111”** password and press key to confirm.
- The home screen will be restored.
- After logging in, at first enter users and assign them with relevant permission levels (*procedures described in further sections of the manual, see section 27.3).*

While you are logging in again, select the operator from the list and enter the password to start working with permission for a specific operator.

**Logout:**

- While in the home screen, press key to open the operator base window.
- Press **<Logout>** item (*as item 1 in the operator list)*.
- The home screen will be restored.

**Permissions levels**

The weighing software offers 4 permission levels: *administrator, advanced user, user, guest.*

**The access to edition of operator parameters, databases and program functions, depending on permission level, is showed in the following table:**

| *Permission* | *Access level* |
|---|---|
| **Guest** | Basic permission level. |
| **User** | Access to parameter edition from the submenu: <Readout/Filter> and settings in <Miscellaneous> parameter group, aside from settings <Date and time>, <Permission levels> and <Software update>. The operator can start and perform all weighing procedures. He has an access to information preview functions in <Databases>, and can define universal variables. |
| **Advanced user** | Access to parameter edition from the submenu: <Readout>; <Working modes>; <Communication>; <Peripherals>; <Miscellaneous>, aside from settings: <Date and time>, <Permission levels> and <Software update>. The advanced operator can start and perform all weighing procedures. |
| **Administrator** | Access to all operator parameters, functions and database edition. |

## 9.3. Units

The UNITS parameters group allows you to change availability of mass units while working with the balance as well as to define two user's units. This is to make sure the work gets more comfortable and faster. It is possible to change the unit into other than [g] while weighing or while working in other modes. The exception is PART COUNTING AND PERCENT DEVIATION modes; it is not allowed to change the unit in these modes.

## 9.4. Weighing unit selection

To change the weighing unit, press the unit showed in the weighing window, next to the measurement result, or click key (if available in the information field). Once you have clicked the unit, another unit from the list of available units is activated. Another way is to use the available units list that is displayed when you click key (if available in the information field).

**Potential variants:**

| Unit | Denotation | Verified balance | Unit | Denotation | Verified balance |
|---|---|---|---|---|---|
| gram | [g] | yes | Taele (Taiwan) | [tlt] | no |
| miligram | [mg] | yes* | Taele (China) | [tlc] | no |
| kilogram | [kg] | yes* | Momme | [mom] | no |
| carat | [ct] | yes* | Grain | [gr] | no |
| pound | [lb] | no | Newton | [N] | no |
| ounce | [oz] | no | Tical | [ti] | no |
| troy ounce | [ozt] | no | baht | [baht] | no |
| pennyweight | [dwt] | no | tola | [tola] | no |
| Hong Kong tael | [tlh] | no | mesghal | [msg] | no |
| Singapore tael | [tls] | no | | | |

** - Unit availability depends on the balance type and lifting capacity.*

## 9.5. Availability of weighing units

The operator can declare weighing units to be available upon selection of temporary unit under key. The units whose availability parameter value has been set as <Yes> will be available for the operator in modes that allow changing units.

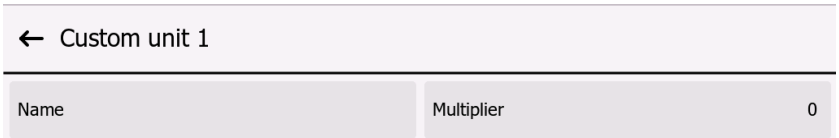
| | |
|---|---|
| ← Availability<br>g Yes · kg Yes<br>lb Yes · mg Yes<br>ct Yes · oz Yes<br>ozt Yes · dwt Yes<br>tlh Yes · tls Yes | The units for which <No> value has been set will not be available while working with the balance. |

## 9.6. Selection of start-up weighing unit

After selecting the start-up unit, the balance upon activation will enter modes in which it is possible to change units, with the unit set as start-up unit.
For <None> item, the balance activates with the adjustment unit.
What units can be selected is determined by the balance status – verified or non-verified balance.

## 9.7. Custom unit

You can declare two custom units. The value showed in the screen for the custom unit is the result of the weighed mass multiplied by the multiplier entered for the custom unit. You can freely name these units. The name may be 3 characters at the longest. By default, these names are marked as **[u1]** – custom unit 1 and **[u2]** – custom unit 2.




## 9.8. Zeroing

To zero the mass value, press key. The screen will show the zero mass and the following symbols: →0← and ◣◢.
Zeroing is tantamount to determination of a new zero point, treated by the balance as exact zero. Zeroing is allowed only in case of stable values displayed.

***Note:***
*Zeroing is possible only within **±2%** of the maximum load of the balance. If the zeroed value is higher than **±2%** of the maximum load, a relevant message will be displayed in the screen.*

## 9.9. Tarring

To determine the net mass, put the weight packaging and, when the value has stabilized, press key. The screen will show the zero mass and the following symbols: ***Net*** and . After removing the weight and packaging, the total value of tarred masses with a minus sign will be displayed. You can also assign the tare to the product in the database. If you do so, the balance will automatically import the tare value from the database when you select the product.

***Note:***
*Tarring negative values is not allowed. An attempt to tare a negative value will result in a relevant message. If this is the case, zero the balance and re-tare.*

**Manual tare entry**
**Procedure:**

- While in any working mode, press quick-access key.
- A numerical keypad will be displayed.
- Enter tare value and press OK key.
- The weighing mode will be restored and the entered tare value with „-" will be displayed.

**Tare deletion**

The tare value displayed in the screen can be deleted by pressing key on the balance facade or using the <Disable tare> programmable key.

**Procedure 1** – after removing the tarred weight from the weighing pan:

- Press key.
- NET marker will be deleted and a new zero point will be established.

**Procedure 2** – when the tarred weight is on the weighing pan:

- Press key.
- NET marker will be deleted and a new zero point will be established.
- When the tare value exceeds 2% of the maximum load, a relevant message will be displayed.

**Procedure 3** – when the tarred weight is on the weighing pan or after removing the tarred weight from the weighing pan:

- press < Disable tare> programmable key,
- NET marker will be deleted,
- tare value will be displayed,
- press < Restore tare> key to restore last used tare value.

**Selection of tare from PACKAGING BASE**
**Procedure:**

- In the open window, select <**PACKAGING**> item.
- A window with a list of entered tare values in the packaging base will be displayed.
- Select the packaging to be called.
- The weighing mode will be restored and the screen will show a tare value with „-" sign from the specific packaging.

or

- While in any working mode, press key (if available in the screen).
- A window with a list of entered tare values in the packaging base will be displayed.
- Select the packaging to be called.
- The weighing mode will be restored and the screen will show the specific tare value with a „-" sign from the specific packaging.

**AUTOTARE**
This function allows you to automatically tare the packaging while weighing products when packaging masses for each product are different. Read further to see the description of the function.

**Tare deletion**

To delete the tare value you have entered, press key on the balance facade or enter the tare with a value of 0.000g (see description above).

## 9.10. Weighing profile

To facilitate the use of the balance, there are default 4 profiles in the program. The settings have been selected and saved for these profiles so that weighing is optimal in relation to expectations and conditions.
The profile settings are related to settings for a specific working mode and are grouped in the parameter: *Setup/Working modes/Weighing/Readout*.
The description of these settings can be accessed in another section of the manual.

These are the following profiles:

- **User** – basic profile whose filter settings make sure that weighing is relatively fast and precise.
- **Fast** – this profile allows fast weighing of any masses, regardless of the working mode. Upon first activation, the balance loads with this profile by default. For this profile, parameters have been chosen so that the final measurement result is obtained as quickly as possible.
- **Fast dosing** – profile dedicated to dosing and allows quick mass dosage.
- **Precision** – profile dedicated to precise weighing of any masses, regardless of the working mode. This profile entails the longest weighing process, yet the final result is the most precise and accurate.

***Note**: the user may fully modify profile settings. Yet for user profile, other default profiles (Fast, Fast dosing and Precision) may be modified only to a limited extent.*

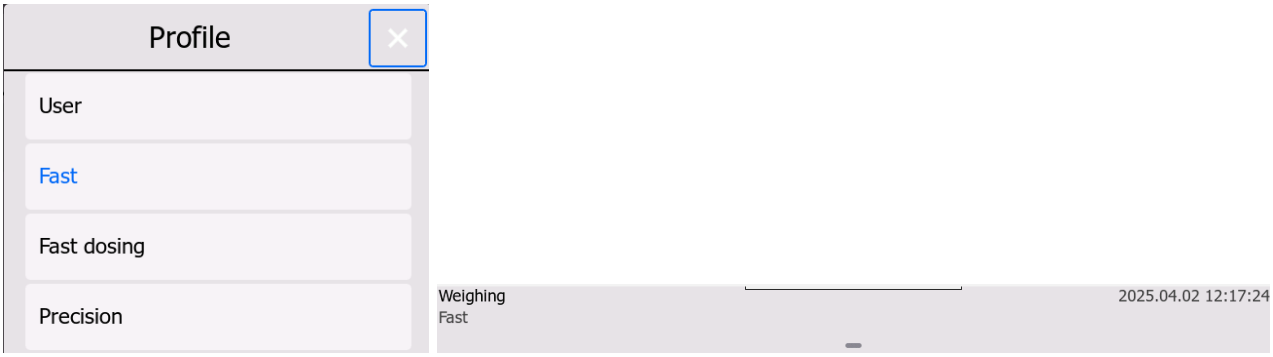
The name of a currently selected profile is displayed in the top bar of the screen. The profile can be selected for a working mode on a case-by-case basis. The balance can remember

the last used profile in every mode (together with operator's modifications) and activates the mode with such a profile when selected.

*Profile icon:*

| *Item* | *Description* |
|---|---|
| 1 | **User** profile |
| 2 | **Fast** profile |
| 3 | **Fast dosing** profile |
| 4 | **Precision** profile |

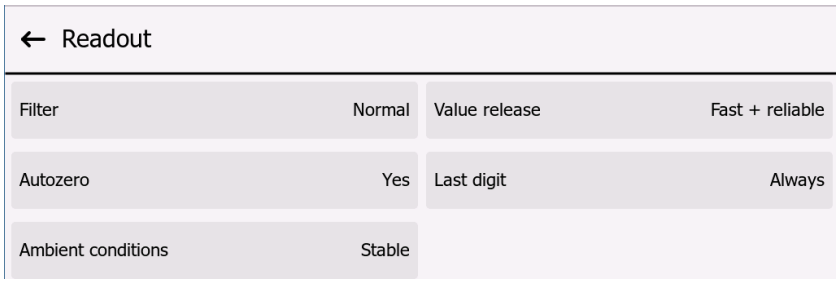
Profile selection method




## 9.11. Setting for <Weighing> mode – Readout

With the program, you can configure useful parameters (filters, result approval and autozero, last digit disability and other settings), for each working mode separately. Only for **User** profile, the user can fully change settings. With regard to other profiles (**Fast, Fast dosing, Precision**), it is not allowed to change **Filter and Result Approval** parameters, as they have been assigned as default values in these profiles.

It allows adapting the device and useful properties to user's needs and expectations or special requirements for a specific working mode (e.g. DOSING), thus assuring easy and fast work.



**Filtering settings (unavailable to Fast, Fast dosing, Precision profiles).**
Set the filter on the basis of working conditions. If conditions are ideal, set very fast (switch filter parameter value to <VERY FAST>). If conditions are unfavorable, (vibrations, draughts), switch to slow or very slow (switch the filter parameter value into <SLOW> or <VERY SLOW>).

The filter effectiveness varies depending on the weighing range. The filter operates less efficiently while “approaching” the target mass and becomes more effective once the mass is within the set filter operating range (<Filter operating range> parameter is available only in the service menu and is not accessible to the user).
Depending on the filter that has been set, the weighing time will be shorter (VERY FAST and FAST values) or longer (SLOW and VERY SLOW values).

**Note:**
*The higher the filtering degree, the longer the weighing time.*

**Result approval (unavailable to Fast, Fast dosing, Precision profiles)**
Since ambient conditions vary, to adapt the balance to them, you need to choose the result approval method: **FAST and PRECISE, FAST** or **PRECISE.** Depending on the option you have selected, the weighing time will be either shorter or longer.

**Autozero function**
To assure precise indications, the autozero function (Auto) has been adopted. The task of this function is automatic control and correction of the zero value. When the function is enabled, subsequent results are compared at predefined time intervals, e.g. every 1 second, when the weighing pan is unloaded and indications are close to zero. If these results differ by the value lower than the declared autozero range; e.g. 1 reading unit, the balance will instantly reset and stable result and zero value markers will be displayed: ◣◢ & -0-**,** respectively**.** When the autozero function is enabled, every measurement always starts from precise zero. There are however special cases in which this function hinders measuring. The example may be very slow placement of the weight on the weighing pan (e.g. adding a load). In such a case, the zero value correction unit may correct real weight mass values too.

**Last digit display**
Using this function, you can disable visibility of the last decimal place in the exposed weighing result. There are three variants in this function:

- **Always:** all digits are visible.
- **Never:** last result digit is disabled and is not displayed.
- **When stable:** last digit is displayed only when the result is stable.

**Ambient conditions**
This parameter refers to the surrounding and conditions in which the balance is operating.
This parameter offers 2 settings: <STABLE> and <UNSTABLE>. If you set STABLE, you will cause the balance to operate a way faster; i.e. the weighing time gets much shorter when compared to the UNSTABLE parameter. If the ambient conditions are unstable, it is advisable to change <AMBIENT CONDITIONS> parameter into <UNSTABLE>. By default this parameter is set as <STABLE>.

## 9.12. Proximity sensors

The balance is equipped with two proximity sensors that allow controlling the operation of the balance with no need to press keys on the facade or touch screen.
The program can recognize two motions near sensors:

1. Bringing the hand close to the left sensor <**Left proximity sensor>**.
2. Bringing the hand close to the right sensor <**Right proximity sensor**>.

For each gesture, you can assign one of available functions. The functions are identical, analogically to keys. After selecting the settings and returning to weighing, the program recognizes the gesture and performs the assigned action. To assure proper operation, remember to set proper sensitivity of proximity sensors (see description in further sections of the manual, section 10).

## 9.13. Autotare

The automatic tare function is useful if you wish to quickly determine net mass of weighed weights when each of them is assigned a different tare value.
When this function is enabled (<AUTOTARE> parameter value is set as <YES>), the working cycle of the balance is as follows:

- When the weighing pan is empty, press a zeroing key.
- Put the product packaging (packaging mass value must be higher than AUTO THRESHOLD value).
- Once the indication has stabilized, packaging mass will be automatically tarred (net marker will show up at the top of the screen).
- Put the product into the packaging.
- A product net mass will be displayed.
- Remove the product and its packaging.
- After exceeding the gross mass value that has been specified in <**AUTO THRESHOLD**> parameter, the balance will instantly delete the entered tare value (net marker at the top of the screen will vanish).
- Put the packaging of another product and when the indication has stabilized, the packaging mass will be automatically tarred (net marker will appear at the top of the screen).
- Put another product into the packaging.

To assure correct operation with AUTOTARE function, set the threshold value too.
**<AUTO THRESHOLD>** parameter is related to the following functions:

- automatic tare,
- automatic printout.

Next automatic tarring will be performed only when the balance „has dropped” below the gross mass value set in <**AUTO THRESHOLD>** parameter.

## 9.14. Printout mode

The function allows you to set the printout mode, i.e. ↵ key activity.
You can make a choice based on the following settings:

- <WHEN STABLE> - only the stable result together with <GLP PRINTOUT> parameter settings will be sent to the printer port. Press ↵ key when the result is unstable (no

◣◢ marker in the screen) to cause the program to send the result to the port only when the measurement stability condition is met.

- <EVERY> - press ↵ key to send the weighing result together with <GLP PRINTOUT> parameter settings to the printer port. Every result (stable and unstable) will be sent. In case of unstable result, <?> mark will accompany the result at the outset of the frame. ***This function is enabled only for non-verified balances***.
- <AUTO> - if you choose this option, you will enable automatic printout for measurements. Please remember that you need to set <AUTOPRINTOUT THRESHOLD> parameter as per your own needs, if you select this option.
- <AUTO WITH INTERVAL> - select this item to activate automatic printout and saving of indications, cyclically at a specific interval, in the WEIGHING base and ALIBII base. The aforesaid interval can be set in the time format (hh:mm:ss) in <INTERVAL> parameter. The lowest value that you can set is 00:00:01, i.e. 1 second.

***NOTE: Every result is printed and remembered (stable and unstable when the balance is non-verified, and only stable when the balance is verified).***
***The automatic operation with the interval is initiated upon activation of this option. Upon the first measurement, the first stable result that is higher than AUTO THRESHOLD value is printed and remembered. Further measurements are printed at the frequency of the INTERVAL. To end automatic operation with the interval, disable the option. After enabling the auto printout with interval option, PRINT key is inactive (no printout when pressed).***

**Automatic operation is as follows:**

- Press >0< key to zero the balance (◣◢ stable measurement and →0← zero markers will be displayed).
- Put the weight and the balance with send the first stable measurement to the printer port.
- Remove the weight from the weighing pan.
- Another measurement will be allowed when the indication in the screen before another measurement is lower than <AUTO THRESHOLD> parameter value (upon another measurement, zero is not required).

With regard to automatic operation, set the threshold value too. The measurement will be sent to the computer or printer if the mass value „drops” below the **<AUTO THRESHOLD>** value.
**<AUTO THRESHOLD>** parameter is related to the following functions: automatic tare, automatic operation, auto printout with interval.

### 9.15. Minimum weight

In the weighing mode settings, you can find <Minimum weight> function. Using this function is possible if you enter the minimum weight value and tare value. In the standard version of the device, these values are zero.
**Any actions related to determination of minimum weights and introduction of data can be taken only by RADWAG’s authorised employee or user with administrator’s permission level, if this action is available in the factory settings of the balance.**
If the user is to use this function, but there are no data on minimum weights in the balance menu, please seek help from the local representative of RADWAG.

In the place of installing the balance, as per requirements arising from the adopted quality assurance system, the authorized employee uses mass standards to determine minimum loads for specific packaging mass values. The obtained value is entered into the balance software - <Minimum weights>.
The balance program allows defining one tare value together with assigned minimum weight value.
Using <Minimum weight> function is a guarantee that weighing results fall within the tolerance limits as per requirements of the quality assurance system adopted in the specific company.
***Note:*** *This function is enabled in the weighing mode only.*

Available options:

- **MODE**
  **None** – the minimum weight function is disabled.
  **Block** – if you select this option, relevant icons will be displayed during a weighing procedure to inform the user if the mass is weighed below or above the minimum weight, and the program prevents measurement approval that is below the aforesaid value.
  **Warn** – if you select this option, relevant icons will be displayed during a weighing procedure to inform the user if the mass is weighed below or above the minimum weight. The user may approve the measurement that is below the aforesaid value.
- **TARE** – maximum tare value for which minimum weight applies (see description of examples below).
- **MINIMUM MASS –** minimum mass value that has been determined for a specific balance in the place of use on the basis of the specific method.

Example 1 for AS 220.X7 with d=0.0001 g:

| *Item* | *Tare value* | *Minimum weight* | *Description of action* |
|---|---|---|---|
| 2 | 10.0000 g | 1.0000 g | Minimum weight applies to all net masses that are weighed in the packaging whose weight ranges from 0.0001 g to 9.9999 g inclusive (<TARE> key is used). The program identifies such a setting in a way that the minimum weight applies only to weighing of samples in the packaging of any mass specified above. If tarring option is not used, or if tarred packaging weight is between 10.0000 g and Max limit of the balance, the program will disable the icon informing about the use of the minimum weight function. |

Example 2 for AS 220.X7 with d=0.0001 g:

| *Item* | *Tare value* | *Minimum weight* | *Description of action* |
|---|---|---|---|
| 1 | 220.0000 g | 0.5000 g | Minimum weight applies to all net masses that are weighed in the packaging whose weight corresponds to the full range of the balance (<TARE> key is used).<br>The program identifies such a setting in a way that the minimum weight applies only to weighing of samples in the packaging. If tarring option is not used, the program will disable the icon informing about the use of the minimum weight function. |

Example 3 for AS 220.X7 with d=0.0001 g:

| *Item* | *Tare value* | *Minimum weight* | *Description of action* |
|---|---|---|---|
| 1 | 0.0000 g | 0.2500 g | Minimum weight applies to all net masses that are weighed without the packaging (<TARE> key is not used). The program identifies such a setting in a way that the minimum weight applies only to weighing of samples without the packaging. If tarring option is used, the program will disable the icon informing about the use of the minimum weight function. |

The user can preview entered data but is not allowed to edit them.

**Weighing with <MINIMUM WEIGHT> function**

If the weighing procedure is going on and you want to learn whether the specific measurement is above the minimum weight for a specific weighing range, <Minimum weight> function must be enabled in the weighing mode settings.

**Procedure** *(Administrator only)***:**

1. Enter weighing mode settings.
2. Press <Minimum weight> field.
3. Press <Mode> field.
4. The window with selectable settings will be displayed. Select one of the following options:
   **Block** – select this option and relevant icons will be displayed during the weighing procedure to inform the user if the mass is weighed below or above the minimum weight, and the program prevents measurement approval that is below the aforesaid value.
   **Warn** – if you select this option, relevant icons will be displayed during a weighing procedure to inform the user if the mass is weighed below or above the minimum weight. The user may approve the measurement that is below the aforesaid value.
5. Select settings and return to the home screen.
6. An additional information icon will show up in the mass field of the home screen. The icon changes during a weighing procedure, showing the location of the mass of the weighed sample in relation to the value of the declared minimum weight.

| | |
|---|---|
| | |
| Mass below specific minimum weight value for specific tare range. | Mass above specific minimum weight value for specific tare range. |

Definition of icons for minimum weight function:

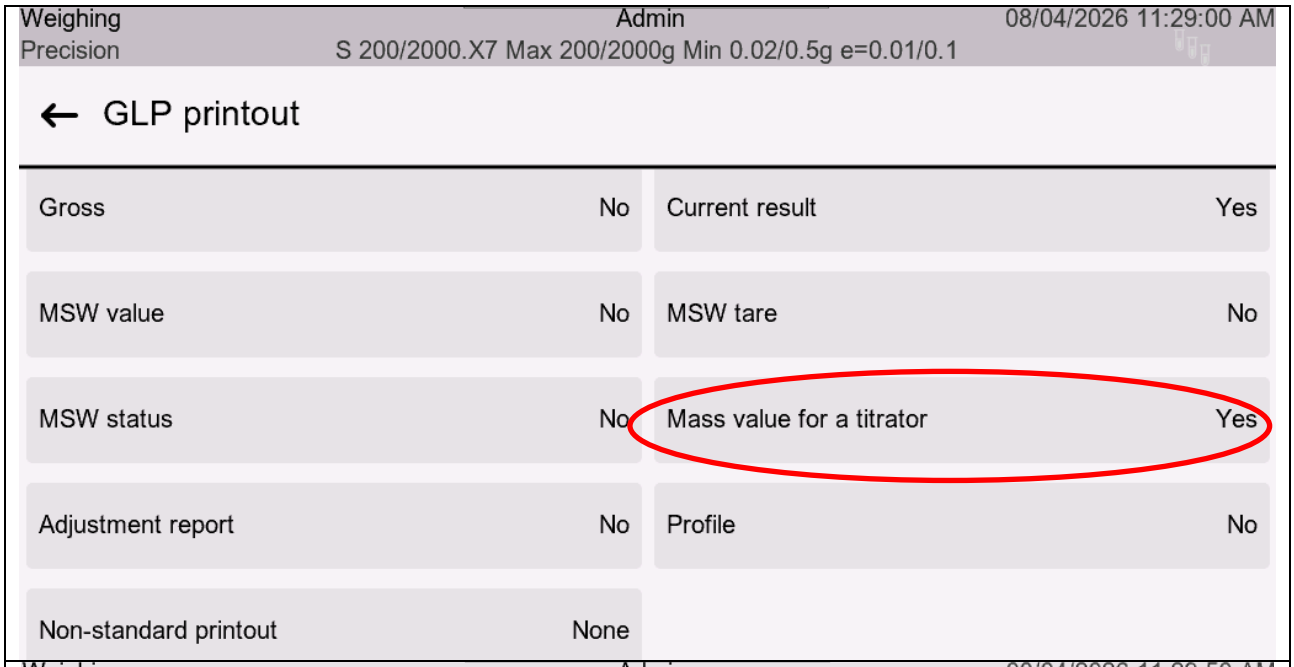
| | |
|---|---|
| | Mass below specific minimum weight value. |
| | Mass above or equal to specific minimum weight value. |

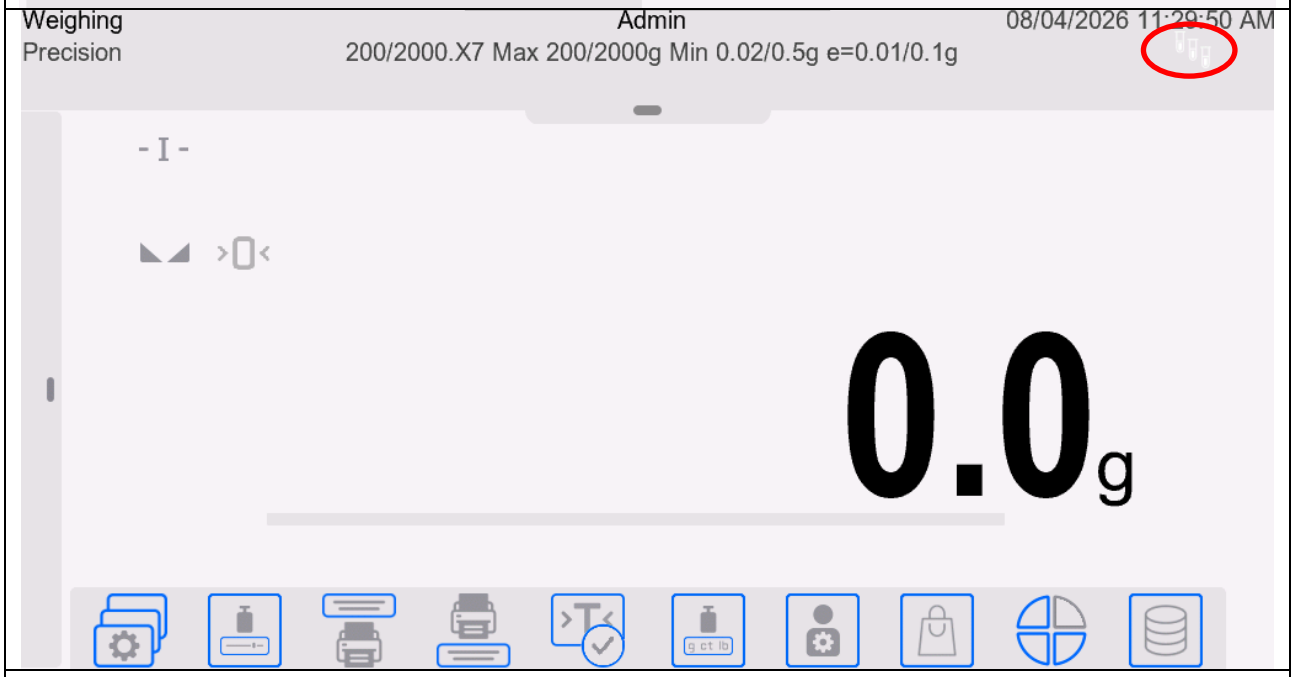
***Note:***

*If more than one reference tare values (and dedicated minimum weights) have been programmed, the indicated value is instantly transformed into the range that corresponds to the weight of the tarred container. Simultaneously the required minimum weight changes.*

## 9.16. Cooperation with TITRATORS

To ensure correct cooperation with TITRATORS, user needs to set <Mass value for a titrator> value to <Yes>, at the same time turning every other variable off.



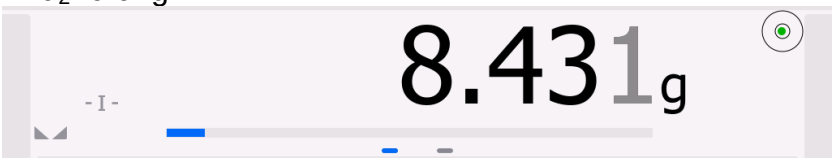

After turning the option on, an icon will appear in the main window top bar, informing the user about special mass printout, which will be accepted by TITRATORS.

## 9.17. Two-range balance weighing

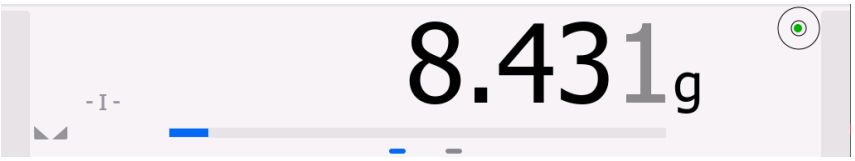
*(Applicable to the following balances PS 200/2000.X7)*

**Example for PS 200/2000.X7 balance**

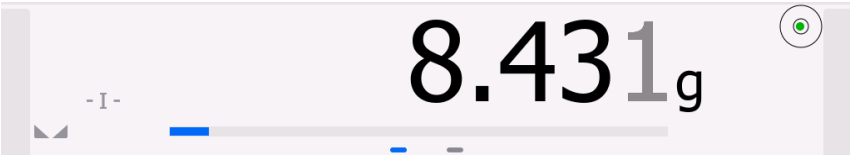
**PS 200/2000.X7** balance is a two-range device. The accuracy of the **range I** is $d_1$=0.001g, while **the range II -** $d_2$=0.01g.




Weighing with an accuracy of **range I** shifts into **range II** automatically after exceeding $Max_1$ 200g (with no operator's intervention). Once you have entered the weighing area with an accuracy of range II, you will see the symbol II on the right side of the screen and the second last digit will turn grey.

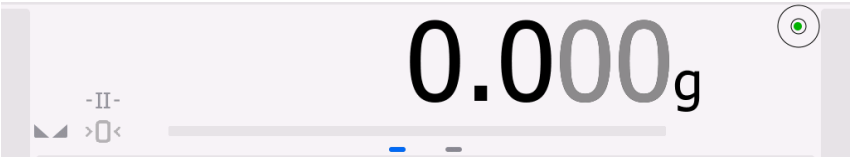



From that moment on, weighing will be performed with an accuracy of **range II.**

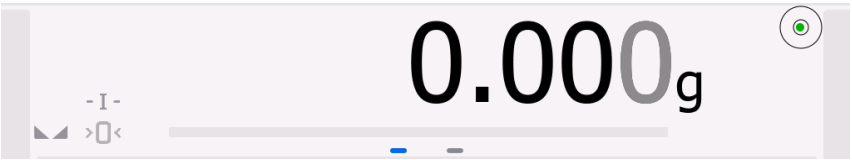



To return to weighing with an accuracy of **range I,** please do as follows:

- unload the weighing pan,




- when the value returns to zero and the following symbols appear: **→0←** and **◣◢**, press key.



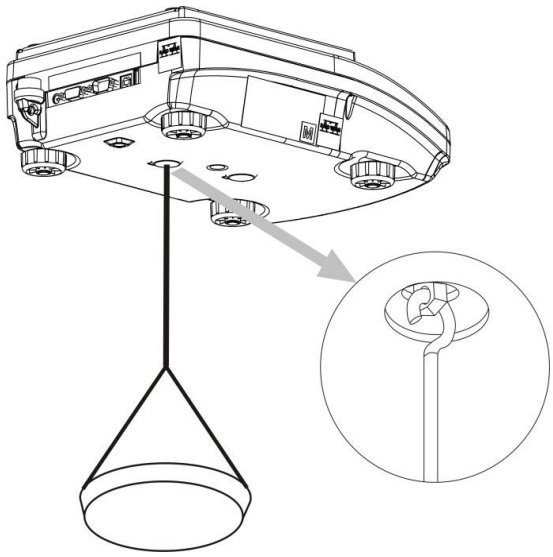

The balance will weigh again with an accuracy of $d_1$=0.001g, the symbol II will be disabled and the last digit will turn grey.

## 9.18. Weighing loads suspended under the balance

In their standard design, balances can weigh loads under the body. If such an arrangement is required, the device must be positioned above a certain level. To do so, you can use a frame that is additionally supplied.

Using this function, please follow the steps below:

- remove the plastic plug situated in the base of the balance,
- you will see a suspension unit in the hole – it is a factory-installed permanent system,
- in the suspension hole, attach a suitable hook (the hook is not part of the standard equipment) for suspension of the weight and links and weighing pans.
- put the weight on the weighing pan and weigh it,
- once weighing with suspension unit is finished, disassemble all previously installed pieces and put the plastic plug back on.



***Note:***
***Do not rotate, turn or bend the suspension unit, otherwise you may damage the mechanism.*** *Press →0← or →T← key to zero all masses of suspended indirect elements, such as hook, weighing pan, link, etc.*

## 10. OTHER PARAMETERS

You may set parameters influencing the operation of the balance. These parameters can be accessed in the **MISCELLANEOUS** group.
To change settings of particular parameters, just follow steps described in the section 7 of the manual.

### 10.1. Menu language

This parameter allows you to choose menu descriptions.
Available languages: POLISH, ENGLISH, GERMAN, FRENCH, ITALIAN, SPANISH, PORTUGUESE, CZECH, TURKISH, JAPANESE, CHINESE, KOREAN, RUSSIAN, HUNGARIAN, UKRAINIAN.

### 10.2. Permission levels

This parameter allows the unlogged user to select permission level and enter the menu.
Available permission levels: ADMINISTRATOR, ADVANCED USER, USER, GUEST.
Depending on the selected variant, the user will not be required to log in to enter and make changes to menu settings, to the extent permitted by the permission level (t*o see description of permission levels, go to section 9.2 of the manual*).

### 10.3. Extension module

This option allows you to enable the following:

- device compliance for FDA 21 CFR procedures,
- communication protocol extension in the balance,
- standard license (the so-called demo balance).

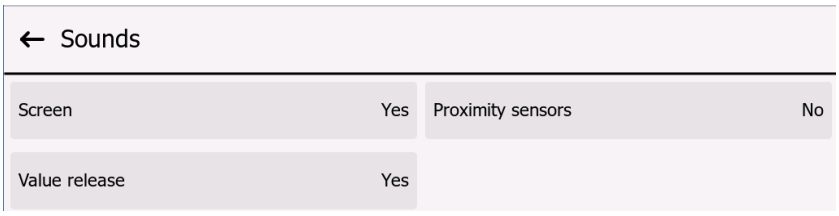
To enable it, you need to know the license number assigned to particular options. To obtain the number, please contact the device manufacturer and enter the <LICENSE> parameter value. It is a twelve-digit number, used at the manufacturer's to generate the password serving to activate a relevant extension module.

**Procedure:**
Enter <Miscellaneous> submenu, select <Extension module> parameter and follow messages in the screen.

### 10.4. Sounds

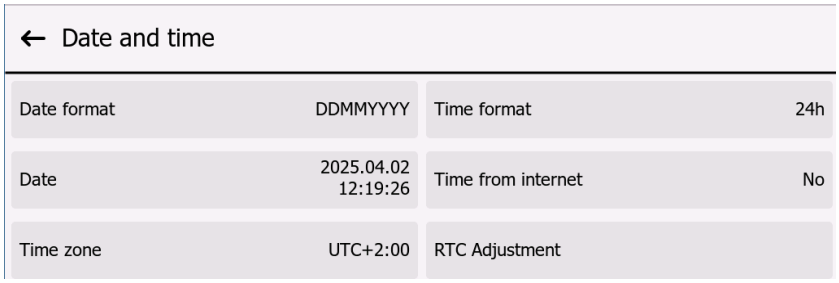
This parameter allows you to activate/deactivate sound signals that inform you about pressing any key on the facade, screen or reaction of proximity sensors.

How to set:



## 10.5. Date and time

The group of parameters responsible for date and time of the internal clock settings.

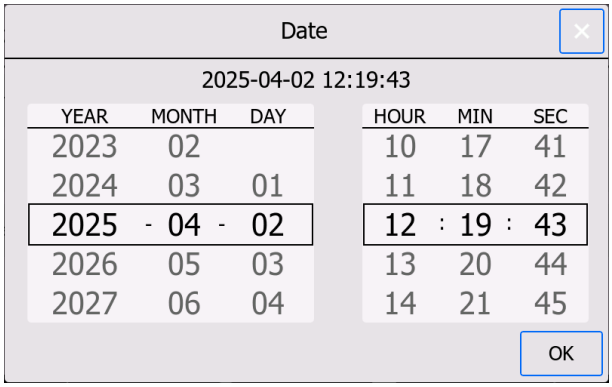



**Date format**
In this parameter, you can select the date format in the printout: [YYYY.MM.DD; YYYY.DD.MM; DD.MM.YYYY; MM.DD.YYYY; YYYY/MM/DD; YYYY/DD/MM; DD/MM/YYYY; MM/DD/YYYY; YYYY-MM-DD; YYYY-DD-MM; DD-MM-YYYY; MM-DD-YYYY; YYMMDD; YYDDMM; DDMMYY; MMDDYY; D.M.YY; D/M/YY; D.M.YYYY; DD.MM.YY; DD/MM/YY; DD-MM-YY; DD-MMM-YY; DD.MMM.YYYY; DD.MMM.YYYY; M/D/YY; M/D/YYYY; MM/DD/YY; YY-M-DD; YY/MM/DD; YY-MM-YY; YYYY-M-DD]; where: YYYY – year MM – month DD – day.

**Time format**
In this parameter, you can select the time format in the printout: [12h/24h].
If you set [**12h**] value in TIME parameter**,** the time will be displayed together with <**A**> or <**P**> letter. **A** represents hours before 12:00 (noon), while **P** refers to hours after 12:00 (noon). **AM** or **PM** letters will accompany the time in the printout.

**Date**
This parameter allows you to set the current date.

How to set:




**Time**
This parameter allows you to set the current time. You can change the time in the same way you change the date.

**Internet time**
This parameter allows you to enable Internet clock synchronization on the basis of the connection to the network via ETHERNET or WIFI and connection to the specific NTP server. When this option has been activated, the program updates the date and time as per the NTP server on an hourly basis.

***Synchronization*** *(the parameter is invisible if <Internet time> is disabled).*
Forced manual time synchronization as per specific NTP server.

**Time zone** *(the parameter is invisible if <Internet time> is disabled)*
Time zone setting for the place of operation of the balance.
*For Poland, please switch the zone to UTC+2.*

***NTP server address*** *(the parameter is invisible if <Internet time> is disabled)*
NTP server address setting for the place of operation of the balance.
*For Poland, switch the zone to 80.50.231.226.*

**RTC calibration**
This parameter allows to perform the internal clock calibration procedure. This option is accessible only to the operator with administrator's permission level and only if <Internet time> parameter is disabled.

The internal clock duty cycle is assigned to each balance by default. If you can notice that the time displayed is substantially erroneous, you may calibrate the clock on your own.

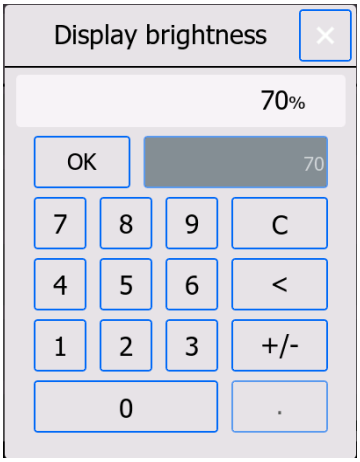
**Procedure**

1. **Set correct date and time in the balance as per the template, e.g. Internet time.**
2. Enable Setup/Miscellaneous/Date and time/RTC calibration.
3. **Enter current time as per template (as previously).**
4. Wait for at least 12 hours, over 24 hours at best.
5. Enable Setup/Miscellaneous/ Date and time/RTC calibration – activated on: 2024.02.28.
6. **Enter current time as per template (as previously).**
7. The RTC calibration summary window will be displayed.
8. The RTC calibration procedure has been completed successfully, close the window by pressing OK key and returning to the home screen. The program will instantly enter calculated corrections for the real time clock.

## 10.6. Screen brightness adjustment

This parameter allows you to set display brightness or turn it off completely.

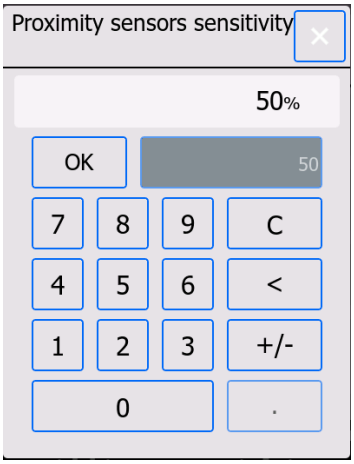
How to set:



## 10.7. Proximity sensor sensitivity adjustment

This parameter ranges from 0 to 100% and determines the distance at which sensors are to react. For lower values, sensors react at a smaller distance.

How to set:




## 10.8. Screen-saving

With <SCREENSAVING> parameter, you can set screen-saving operation when the balance fails to weigh anything (screen is saved on condition that the result displayed is stable).

**NONE** - screen-saving does not work, **0.5; 1; 2; 3; 5 –** time in minutes.
If the program can notice that the value in the screen is stable thanks to the time, the screen will be saved automatically. The screen will be activated if the value changes (stability mark will be disabled) or any key in the keypad is pressed. The screen-saving is operational also when the balance shows the menu.

## 10.9. Automatic shutdown

<AUTO SHUTDOWN> parameter allows you to set automatic shutdown of the screen (the same effect as when key is pressed). After the screen has been turned off, other components remain active, and the balance remains in a standby mode.

**NOTE** - shutdown does not work, **1; 2; 3; 5; 10**- time in minutes.
If the program can notice that the value in the screen is stable thanks to the time, the screen will shut down automatically.

When the screen is off, a LED light glows on the right side of the facade, under the proximity sensor graphics and pictogram repeatedly shows up. To start the balance, double click in any place of the touch screen. Once the start-up procedure has ended, the balance will be ready for further weighing procedures.

Balance shutdown does not work when a procedure has already been initiated or when the menu is active.

### 10.10. Restoration of operator's default settings

This parameter allows you to quickly restore default settings in the operator's menu.

### 10.11. Digit separator

This parameter allows you to select the decimal separator in the mass printout.

**Procedure:**

- Enter <Miscellaneous> submenu.
- Select <Digit separator> parameter and an edition box will be displayed.
- Select one of the following:
    - Dot (.)
    - Comma (,)

Once you have made a choice, you will return to the submenu window.

### 10.12. GLP autotest

The GLP Autotest is based on indication repeatability test during the internal weight application cycle, thereby determining the balance indication error relative to its maximum lifting capacity.
The <AUTOTEST> function was created to assist the operator both in evaluating the balance performance and in diagnosing the causes of weighing errors that exceed permissible values for a given type of balance.
AUTOTEST allows the operator to regularly optimize the balance settings in order to achieve the best repeatability parameters and weighing time in a specific working environment. The function also provides the ability to check these parameters at any time and to archive test results in the form of automatically generated test reports upon completion of the verification procedure. A maximum of 50 reports can be stored.

**The course of the procedure:**

- the internal weight is positioned twice, and then ten times, and the standard deviation is calculated for 10 measurements,
- the balance is calibrated,
- the report is printed out.

Aside from balance data, the test results include the error for the maximum load and indication repeatability value, expressed as a standard deviation.

**An exemplary report:**

*….....*
*------- Autotest GLP: Report -------*

| | |
|---|---|
| *Balance type* | *PS 3000.X7* |
| *Balance ID* | *400010* |
| *User* | *Admin* |
| *Software rev.* | *v.0.4.9* |
| *Date* | *2026.07.16* |
| *Time* | *09:17:16* |

*----------*

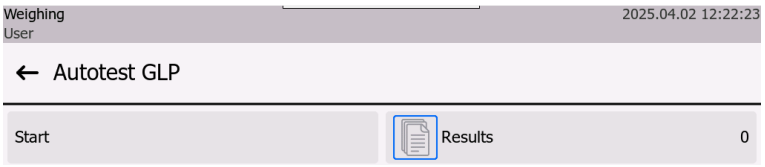
| | |
|---|---|
| *Number of measurements* | *10* |
| *Reading unit* | *0.001/0.01 g* |
| *Internal weight mass* | *1402.094 g* |
| *Filter* | *Average* |
| *Value release* | *Fast &Reliable* |

*----------*

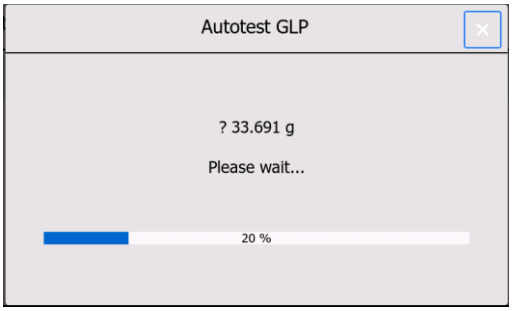
*Deviation for Max.* *-0.118 g*
*Repeatability* *0.0088 g*
*Signature*
*…….....*

**Procedure:**

Enter the <Miscellaneous> parameters group and enable <GLP AUTOTEST> parameter.

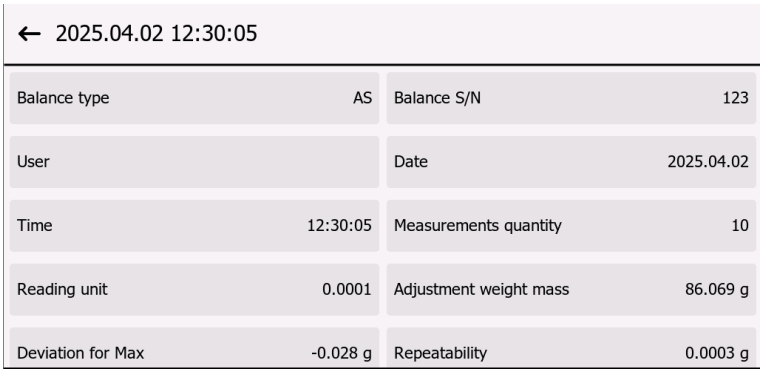



Press <Start> field. The program will initiate the GLP autotest procedure and it will be performed automatically.
An additional window shows the progress.




You may feel free to abort the procedure at any time by pressing key.
After the end of the procedure, the program will return to the parameter window, and the number of saved autotests will be increased by <1> in the <RESULTS> field.

To see detailed results, click <RESULTS> field and select the specific autotest.




In the <Details> window, you can print the report out: press the printer icon in the top bar.

## 11. ADJUSTMENT

To assure very high weighing accuracy, it is required to periodically send the mass standard corrective factor into the balance memory. It is the so-called balance adjustment.

**The adjustment must be performed:**

- before weighing is initiated,
- in case of longer breaks between series of measurements,
- in case the temperature in the balance has changed by more than 1°C or 2°C (AS balances) or 2°C (PS balances).

**Types of adjustment:**

- automatic internal adjustment,
- manual internal adjustment,
- adjustment with an external weight of a declared mass that cannot be modified or of any mass falling within the balance range, yet not lower than 30% of its maximum limit.

***Note:***
*With respect to verified balances (with internal adjustment), only automatic and manual internal adjustment is allowed. Please remember to perform adjustment only when there is no weight on the weighing pan! When a weight on the weighing pan is too heavy, the following message will be displayed in the lower row:* ***<OUT OF RANGE>.*** *This being the case, unload the weighing pan and repeat the adjustment. If necessary, it is possible to abort the adjustment procedure by pressing* key.

### 11.1. Internal adjustment

The internal adjustment uses mass built inside the balance. Using key, you automatically initiate the adjustment procedure. After its completion, a message on the end of the procedure and its status is displayed in the screen.

***Note:***
*The balance adjustment requires stable conditions (no air blows, no floor vibrations, etc.). The adjustment must be performed when the weighing pan is empty.*

### 11.2. External adjustment

The external adjustment is performed using an external standard of a suitable accuracy and mass dependent upon the type and lifting capacity of the balance. The procedure is semi-automatic and further stages are signaled through messages in the screen.

***Note:***
*The external adjustment is possible only with regard to balances that are not subject to compliance assessment (verification).*

**Course of the procedure:**

- Enter <Adjustment> submenu and enable <External adjustment> item.
- The following message will be displayed in the screen: <Remove mass>.
- Unload the weighing pan and press <OK> key. While determining the start mass, the following message will appear: **„Adjustment; Please wait…”.**
- After the end of the start mass determination procedure, <Put mass> message and a specific mass standard value assigned to the balance will be displayed.
- Following the message, put the specific mass on the weighing pan and press <OK> key.
- Once the procedure has been completed, <Remove mass> message will be showed.
- After unloading the weighing pan, <Adjustment> menu window will be restored.

## 11.3. Operator's adjustment

The operator's adjustment can be performed using any mass standard of the following value range: above 0.3 Max - Max. The adjustment procedure is analogical to external adjustment, yet preceded by emergence of the standard mass value declaration window.

***Note:*** *The operator's adjustment is allowed only in balances that are not subject to compliance assessment (verification).*

To initiate the procedure, enter <Adjustment> submenu and enable <Operator's adjustment> item, and follow the messages displayed in the screen.

## 11.4. Adjustment test

<Adjustment test> function is used to compare external adjustment results with the value entered in factory parameters. Such a comparison allows you to specify balance sensitivity drifts in time.

## 11.5. Automatic adjustment

In this menu, declare the factor determining the automatic adjustment start time. Available options:

- None – automatic adjustment is inactive,
- Time – adjustment is performed at time intervals declared in <Automatic adjustment time> menu (10.6),
- Temperature – adjustment is performed only in response to temperature change,
- Both – temperature change and time determine the time of initiating the automatic adjustment.

***Note:*** *It is possible to change parameters only in balances that are not subject to compliance assessment (verification).*

## 11.6. Automatic adjustment time

<Automatic adjustment time> parameter defines the time interval at which internal adjustment is to be performed automatically. This time is given in hours, ranging from 0.5 to 12 hours.
To set the automatic adjustment time, do as follows:

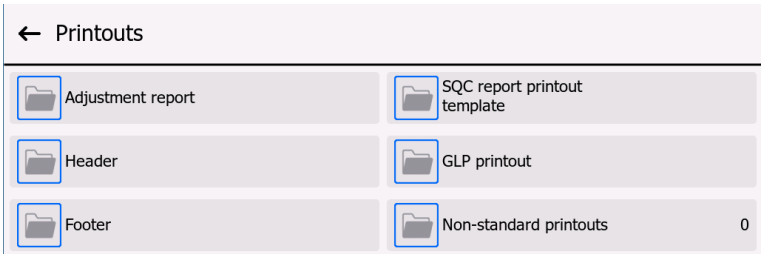
- press <Automatic adjustment time> key,
- in the menu, select the time (given in hours) that is to pass from the last adjustment until another internal adjustment procedure.

***Note:*** *It is possible to change parameter settings only in balances that are not subject to compliance assessment (verification).*

## 11.7. Report printout

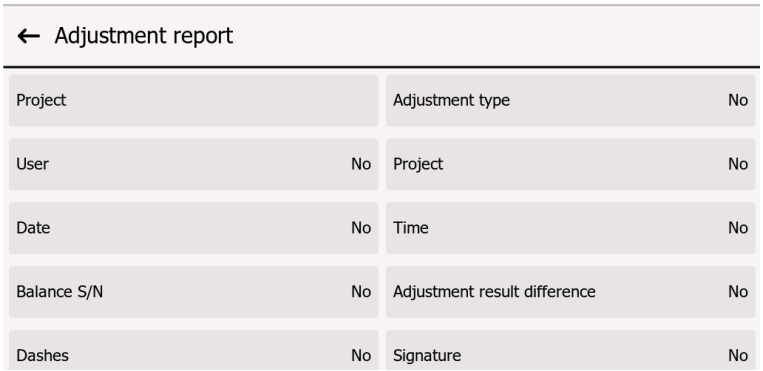
The adjustment report is generated automatically at the end of each adjustment or adjustment test, and sent to the communication port, selected for DEVICE/PRINTER (it is COM 1 port by default). The content of the report is declared in <PRINTOUTS / CALIBRATION REPORT> menu.
Description of declaring settings for this option can be accessed further in the manual, in the section dedicated to printouts.
The report can be printed in the printer connected to the balance or sent to the computer, and saved as a file for archiving purposes.

## 12. PRINTOUT CONTENT SETTINGS




### 12.1. Adjustment report

**ADJUSTMENT REPORT** is a group of parameters allowing you to declare the data that will be included in the adjustment report printout.




| *Variable name* | *Description of variable* |
|---|---|
| **PROJECT** | This item allows you to enter the project name (e.g. associated with specific type of weighing). The name may be up to 31 characters long. |
| **ADJ TYPE** | This item allows you to print the type of adjustment. |
| **USER** | This item allows you to print the name of logged operator. |
| **PROJECT** | This item allows you to print the project name (see: Project parameter). |
| **DATE** | This item allows you to print the adjustment date. |
| **TIME** | This item allows you to print the adjustment time. |
| **BALANCE S/N** | This item allows you to print the balance serial number. |
| **ADJUSTMENT RESULT DIFFERENCE** | This item allows you to print the difference between masses of the adjustment weight weighed during last adjustment and mass of currently weighed weight. |
| **DASHES** | This item allows you to print dashes that separate the printout date from the signature field. |
| **SIGNATURE** | This item allows you to print the adjustment performer signature field. |
| **NON-STANDARD PRINTOUT** | This item allows you to include one of 100 non-standard printouts in the printout.<br>You can select one of the following items: NONE/non-standard printout name.<br>The method of including non-standard printouts can be accessed further in the manual. |

**Project name introduction method**

For the parameters showed above, select either of the values:

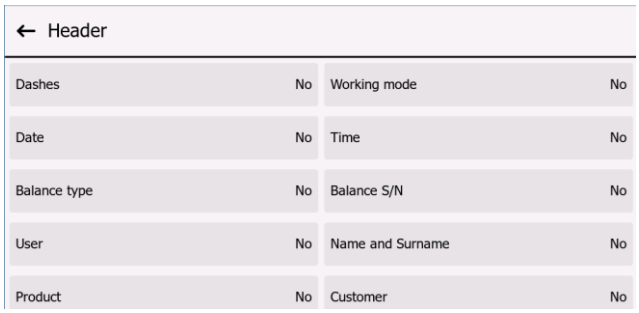
**NO –** do not print in the report
**YES –** print in the report

An exemplary report:

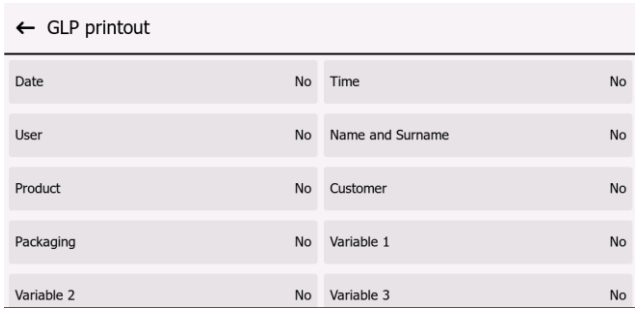
```
--------------Cal.  Report---------------
Calib. type                    Internal
User                            Admin
Project              Project name-1
Date                        04.06.2013
Time                      10:54:27 AM
Balance ID                     353870
Cal. differ.                   0.045 g
-----------------------------------------
Signature:

.........................................
```

## 12.2. Other printouts

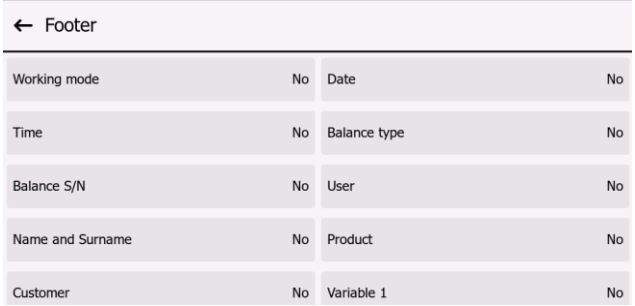
**HEADER** The group of parameters allowing you to declare data that will be included in the header printout.




**GLP PRINTOUT** The group of parameters allowing you to declare data that will be included in the measurement printout.




**FOOTER** The group of parameters allowing you to declare data that will be included in the footer printout.




### *The list of variables in printouts:*

| *Variable name* | *Variable description* | *Included in:* |
|---|---|---|
| **WORKING MODE** | This item allows you to print the working mode name. | Header<br>Footer |
| **BALANCE TYPE** | This item allows you to print the balance type. | Header<br>Footer |
| **BALANCE S/N** | This item allows you to print the balance serial number. | Header<br>Footer |
| **USER** | This item allows you to print the name of logged operator. | Header<br>GLP Printout<br>Footer |
| **PRODUCT** | This item allows you to print the name of currently selected product. | Header<br>GLP Printout<br>Footer |
| **CUSTOMER** | This item allows you to print the name of currently selected customer. | Header<br>GLP Printout<br>Footer |
| **PACKAGING** | This item allows you to print the name of currently selected packaging. | GLP Printout |
| **DATE** | This item allows you to print the printout date. | Header<br>GLP Printout<br>Footer |
| **TIME** | This item allows you to print the printout time. | Header<br>GLP Printout<br>Footer |
| **VARIABLE 1** | This item allows you to print the content of VARIABLE 1. | Header<br>GLP Printout<br>Footer |
| **VARIABLE 2** | This item allows you to print the content of VARIABLE 2. | Header<br>GLP Printout<br>Footer |
| **VARIABLE 3** | This item allows you to print the content of VARIABLE 3. | Header<br>GLP Printout<br>Footer |
| **VARIABLE 4** | This item allows you to print the content of VARIABLE 4. | Header<br>GLP Printout<br>Footer |
| **VARIABLE 5** | This item allows you to print the content of VARIABLE 5. | Header<br>GLP Printout<br>Footer |
| **NET** | This item allows you to print the value of NET mass in the basic (adjustment) unit. | GLP Printout |
| **TARE** | This item allows you to print the tare value in the current unit. | GLP Printout |
| **GROSS** | This item allows you to print the gross value in the current unit. | GLP Printout |
| **CURRENT RESULT** | This item allows you to print the current result (NET mass) of the measurement in **current unit.** | GLP Printout |

| | | |
|---|---|---|
| **ADJUSTMENT REPORT** | This item allows you to print the last adjustment report as per settings declared for the adjustment report printout (see section 12.1 of the manual). | Header<br>GLP Printout<br>Footer |
| **DASHES** | This item allows you to print dashes separating the printout data from the signature field. | Header<br>Footer |
| **EMPTY LINE** | This item allows you to print the empty separating line. | Header<br>Footer |
| **SIGNATURE** | This item allows you to print the adjustment performer signature field. | Footer |
| **PROFILE** | This item allows you to print the name of currently selected profile. | Header<br>GLP Printout<br>Footer |
| **NON-STANDARD PRINTOUT** | This item allows you to place one of 100 non-standard printouts in the printout.<br>You can select one of the following: NONE/non-standard printout name.<br>The method of including non-standard printouts can be accessed further in the manual. | Header<br>GLP Printout<br>Footer |

For parameters showed above, select either of the following:

**NO** - do not print
**YES** - print

Examples of printouts:

Header

```
----------------------------------------
Working modes                  Weighing
Date                         24.07.2013
Time                            7:37:30
ScaleType                            AS
Balance ID                     10353870
User                         ADMIN ENG
Product                          Tablet
```

GLP printout

```
Date                         04.06.2013
Time                       11:11:24 AM
Product                          NAZWA
     0.000 g
```

Footer

```
----------------------------------------
Date                         24.07.2013
Time                            7:41:10
User                         ADMIN ENG

Signature

.........................................
```

### 12.3. Non-standard printouts

The program allows you to enter 100 non-standard printouts. Each of them may be around 1900 characters long.

**The non-standard printout may contain the following:**

- variable data, depending on the working mode and operator's other needs (e.g. mass, date, etc.),
- fixed texts, entered into the operator's menu,
- non-standard printout may contain around 1900 characters.

### 12.3.1. Text entry

**The list of variables**:

| ***Symbol*** | ***Variable description*** |
|---|---|
| {0} | Standard printout in adjustment unit |
| {1} | Standard printout in current unit |
| {2} | Date |
| {3} | Time |
| {4} | Date and time |
| {5} | Working mode |
| {6} | Net mass in current unit |
| {7} | Net mass in adjustment unit |
| {8} | Gross mass in adjustment unit |
| {9} | Tare in adjustment unit |
| | |
| {10} | Current unit |
| {11} | Adjustment unit |
| {12} | Lower threshold |
| {13} | Upper threshold |
| | |
| {15} | Statistics: Number |
| {16} | Statistics: Total |
| {17} | Statistics: Mean |
| {18} | Statistics: Minimum |
| {19} | Statistics: Maximum |
| {20} | Statistics: SDVP |
| {21} | Statistics: D |
| {22} | Statistics: RDVP |
| {23} | Statistics: SDVS |
| {24} | Statistics: RDVS |
| | |
| {32} | Serial number |
| {35} | Part counting: Standard mass |
| {36} | Deviations: Reference mass |
| | |
| {45} | Target value |
| {46} | Tolerance |
| {49} | Part counting: Standard quantity |
| | |
| {50} | Product: Name |
| {51} | Product: Code |
| {52} | Product: EAN Code |
| {53} | Product: Mass |
| {54} | Product: Tare |
| | |
| {56} | Product: Minimum |
| {57} | Product: Maximum |
| | |
| {66} | Product: Tolerance |
| | |

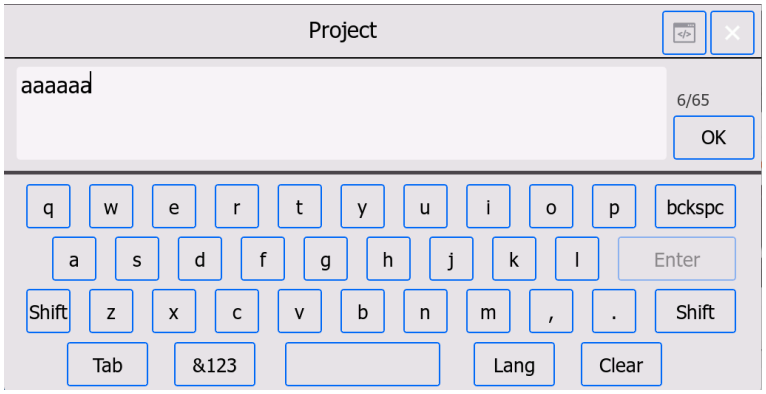
| | |
|---|---|
| {70} | Variable 1 |
| {71} | Variable 2 |
| {72} | Variable 3 |
| {73} | Variable 4 |
| {74} | Variable 5 |
| | |
| {75} | Operator: Name |
| {76} | Operator: Code |
| {77} | Operator: Permission |
| | |
| {80} | Packaging: Name |
| {81} | Packaging: Code |
| {82} | Packaging: Mass |
| | |
| {85} | Customer: Name |
| {86} | Customer: Code |
| {87} | Customer: NIP |
| {88} | Customer: Address |
| {89} | Customer: Postal code |
| {90} | Customer: City/town |
| | |
| {146} | Gross mass in current unit |
| {147} | Tare in current unit |
| | |
| {150} | Paper cut for EPSON printers |
| {151} | Page ejection for PCL printers |
| | |
| {155} | Integration with RADWAG CONNECT |

Every printout must contain around 1900 characters (letters, digits, special characters, spaces). The operator may use special characters to include variable data in his printouts, depending on his needs.

**Example:**
*„RADWAG”*
*DATE: <current measurement date>*
*TIME: <current measurement time>*
*PRODUCT MASS: <current mass indication>*

******SIGNATURE:.....*
*<current working mode>*

Enter printout content settings and design a printout using relevant variable data and text-formatting characters.




To cut the paper after printing from EPSON printer (if the printer is equipped with a cutter), enter the non-standard printout with variable {150} into the specific printout after which the paper is to be slashed (HEADER, GLP PRINTOUT or FOOTER), and this printout must be select for header settings, GLP printout or footer. (*Principles of entering control codes can be accessed in the section 26 of the manual).*
In this case, <SUFIX> command must be empty. Paper cut must occur after the FOOTER has been printed out.

Example of settings:

**How to enter texts**

- **using a keypad displayed in the screen**
- **using a USB computer keyboard**

You can connect the USB computer keyboard to the balance for easier and faster edition of printouts. To enter a text, go to a relevant menu item and enter the text using the keyboard.

## 12.4. Variables

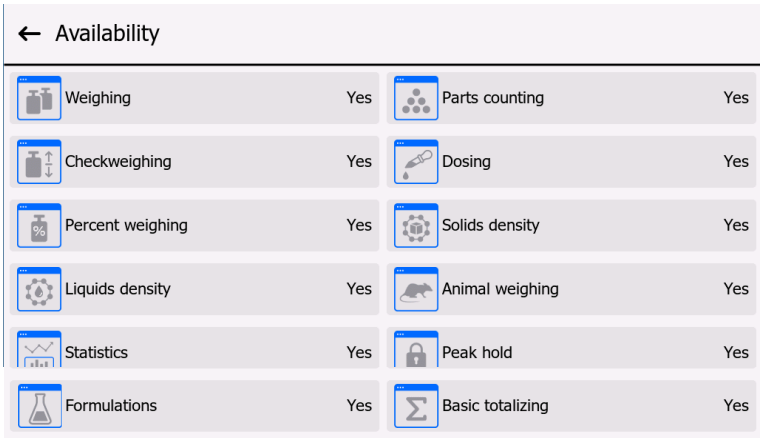
Variables are alphanumerical information that can be associated with printouts, product or other weighing-related information. For each variable, enter its content. Variables may be used to enter series number or batch number while weighing products. The program allows entering 5 variables. Each of them may include up to 31 characters.
To enter the content of variable, go to variable settings (parameter: VARIABLE 1, VARIABLE 2, VARIABLE 3, VARIABLE 4 or VARIABLE 5) and enter its content using directional keys (arrows) of the keypad or computer keyboard. The principles of entering texts are identical to the ones related to non-standard printouts.

## 13. WORKING MODES – GENERAL INFORMATION

X7 balances in their standard design offer the following working modes:

| |
|---|
| **Weighing**<br>Principle of operation: the mass of the weight is determined through an indirect measurement — the force with which the load is attracted by the Earth is measured. The obtained result is then converted into a digital value and displayed in the screen. |
| **Part counting**<br>Principle of operation: based on the known unit mass of an item, subsequent items can be counted. It is assumed that the unit mass has been determined with sufficient accuracy and that each item has the same mass. |
| **Checkweighing**<br>Principle of operation: sample mass control in preset thresholds, enter <LO> lower threshold value and <HI> upper threshold value. |
| **Dosing**<br>Principle of operation: enter the target mass the sample is to reach while pouring. |
| **Deviations**<br>Principle of operation: the percent control of the sample mass in relation to the standard (reference). In effect the information on how the test sample differs from the adopted standard is received. |
| **Solid density**<br>Principle of operation: based on the Archimedes law, density of solids is determined. The function requires additional set (optional equipment). |
| **Liquid density**<br>Principle of operation: based on the Archimedes law, density of liquids is determined. The function requires additional set (optional equipment). |
| **Animal weighing**<br>Principle of operation: mass is measured using special filters that supress animal movement, which allows obtaining correct measurement. |
| **Statistics**<br>Principle of operation: based on measurements, statistical values are determined, such as Min, Max, deviation, etc. |
| **Peak hold**<br>Principle of operation: the mass is held (locked) in the screen, maximum balance indication that reflects the highest pressure against the weighing pan. |
| **Formulations**<br>Principle of operation: using subsequent ingredients, you can make any mixture; the formulation must be programmed by entering masses of particular ingredients. |
| **Adding**<br>**I**s a function that allows summing net masses of weighed samples. |
| **SQC**<br>(Statistic Quality Control). This operating mode is useful during various types of product packaging processes to monitor and/or control the packaging process. It enables the detection of overfilled and underfilled packages. |
| **PGC**<br>Realizes control of packaged goods, in accordance to Law on Prepacked Goods.<br>(function unavailable in standard design) |

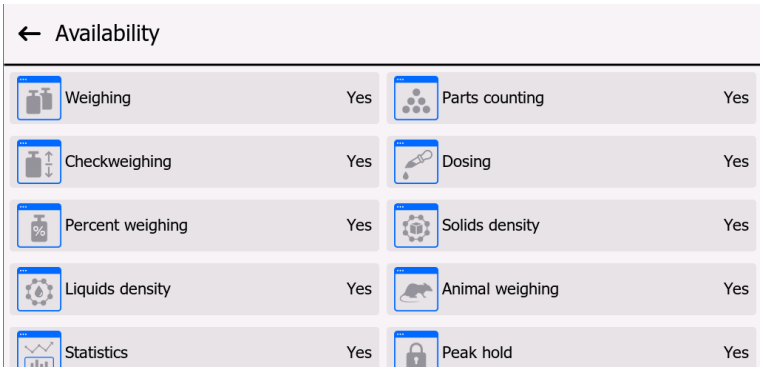
Special functions are available in settings of particular working modes. Thanks to them, you can adapt the operation of a working mode to specific needs. These settings can be called by selecting a suitable profile. A detailed description of these functions is given for each working mode.




## 13.1. Working mode availability settings

In this group of parameters, you can declare the functions that are to be available. You can disable functions that are not used while working with the balance by switching the availability parameter into <**NO**>.

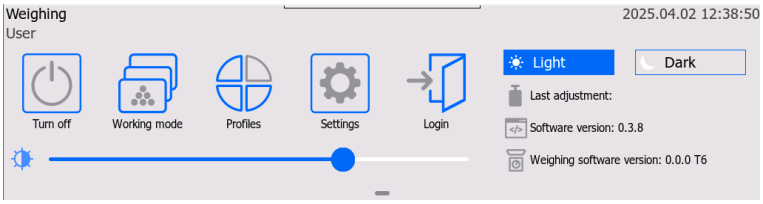
**Follow the diagram below:**

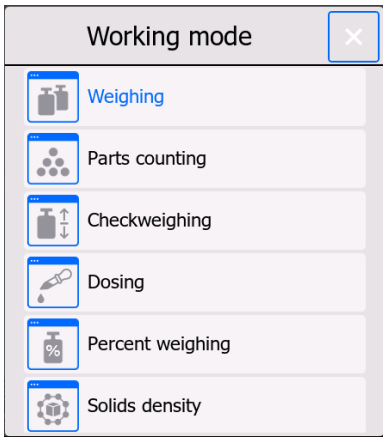



## 13.2. Working mode selection

To change the working mode, do as follows:

- press the currently used mode icon that is visible in the top left corner of the screen,




- a list of modes will be displayed,
- select the name of the mode that is to be used.

### 13.3. Working mode parameters

Each working mode is related to programmable parameters that determine its operation. The description of potential settings for WEIGHING mode can be accessed in the section 8 of the manual. Personalized settings for other modes can be accessed at the description of operation of the specific working mode.

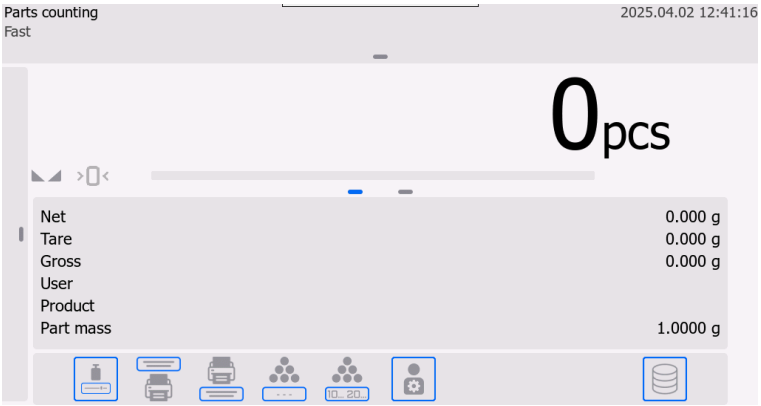
## 14. PARTS COUNTING

**<Parts counting>** working mode allows you to count minor items of identical mass. Counting is based on the known mass of a single item that:

- has been determined from a certain number of standard pieces,
- has been collected from the data on a specific product,
- has been manually entered as a numerical value.

**How to activate the working mode**

- Select <Part counting> mode and the home screen of this mode will be restored instantly.



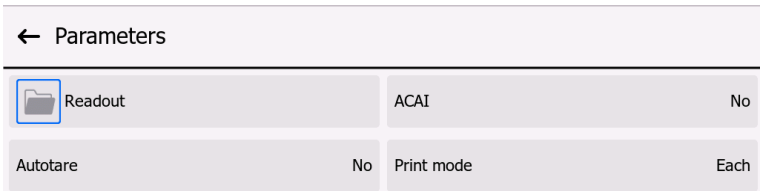

**Info field contains the following data:**

- Net
- Tare
- Gross
- User
- Product
- Part mass
- Keys: calibration, print header, print footer, enter part mass, determine part mass (based on standard of any quantity), user, databases.

### 14.1. Additional settings related to part counting

The settings allow adapting the working mode to own requirement. The access to these settings has been described below.

**Procedure**:




**ACAI**, Automatic Accuracy Correction:

- YES, part mass will be updated,
- NO, part mass will not be updated.

- After enabling the ACAI function, while determining the mass of the standard from the sample of substantial quantity, the following pictogram will be displayed in the top row of the screen: 10pcs ACAI.

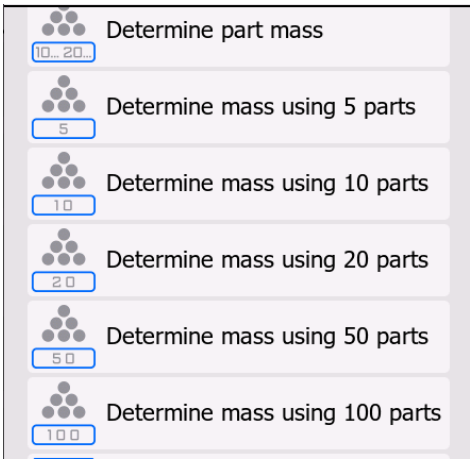
ACAI function operation principles:

1. Number of parts (after adding) on the weighing pan must be higher than before.
2. Number of parts (after adding) on the weighing pan must be lower than double the number displayed before adding.
3. Current number of parts must fall within ± 0,3 of tolerance from the total value.
4. Result must be stable.

The principles of using other settings have been specified in the section 9.11 Settings for <WEIGHING> mode.

## 14.2. Parts counting – quick access keys

Each mode offers a set of default keys that are displayed when you select a specific mode. This set can be modified by assigning other quick-access keys to on-screen keys. Such an operation requires a relevant permission level. The operator can also choose special keys that allow quick access to determination of mass of a single part.




## 14.3. Standard mass setting by entering a known part mass

**Procedure**:

- Press <--- Enter part mass> key to open <Standard mass> edition box with an on-screen keypad.
- Enter the desired value and press OK key to confirm. It will caused you to enter the <Part counting> working mode and a single part mass will be set automatically.

***Note:***
*If you enter the unit mass that is lower than 0.1 of the readout unit, the following message will be displayed:* ***<Value too low>.***

## 14.4. Standard mass setting by determining part mass

**Procedure**:

- Put the container on the weighing pan and tare it,
- Press <Determine part mass> key to open <Standard quantity> edition box and an on-screen keypad,
- Enter the desired value and press OK key to confirm. The following message will be displayed: **<Put pieces: xx>** (where **xx** – previously entered value).
- Put the declared number of pieces on the weighing pan and when the result is stable (symbol is displayed), confirm the mass by pressing key.
- The program will calculate the mass of a single part and enter <Part counting> mode instantly, providing the number of parts that are on the weighing pan in the screen (pcs).

***Note:***
*Please remember that:*

- *Total mass of all parts positioned on the weighing pan must not exceed the maximum weighing range of the balance.*
- *Total mass of all parts positioned on the weighing pan must not be lower than the value declared in <**Minimum reference mas>** parameter. If the aforesaid condition is not met, the following message will be displayed: **<Sample mass too low>.***
- *The mass of a single part must not be lower than **0.1 of the readout unit.** If the condition mentioned above is not met, the following message will be displayed: <**Part mass too low>.***

## 14.5. Collection of part mass from database

Every product in the database is specified through a series of identification data. One of them is mass that is used while counting parts.

**Procedure:**
While in <Part counting> mode, press <Product base> key and then select the desired product from the list.

**Entering standard mass into balance memory**
A standard mass for a single part must be entered into the product base in the following way:

- Press <Setup> key and then <Databases> item and go to the Product Base.
- In the Product Base, press <Products> key.
- Press the product name and make modifications in <Mass> [5] field.
- Return to <Part counting> mode>.

When there are no elements in the Database:

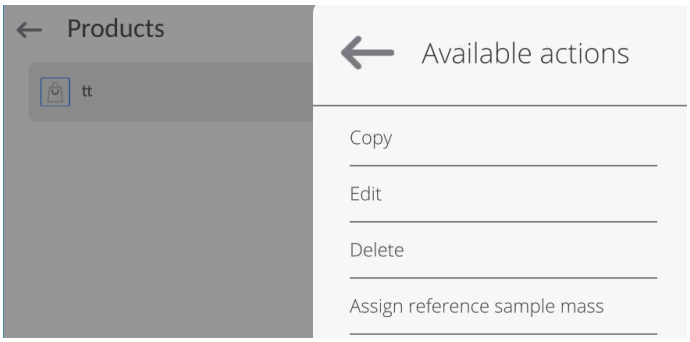
a) Press <Setup> key and then <Databases> key and go to Product Base.
b) In the Product Base, press <Add> key.
c) Fill in fields related to the product, including <Mass> [5] field.
d) Return to <Part counting> mode.

## 14.6. Part mass update in the database

You can assign the specific part unit mass to the product in the database. Such an action is taken when ACAI function is used (Automatic Accuracy Correction) in order to determine the unit mass with a high precision.

**Procedure 1:**

1. Determine the part unit mass.
2. Press <Product base> key.
3. Hold your finger on the name of the product whose unit mass must be updated.
4. A context menu will be displayed.
5. Select <**Assign standard>** item and the standard mass will be saved as <**Mass**> for a specific product.




**Procedure 2:**

1. Determine the part unit mass.
2. Press <Assign standard to product> item.
3. A new mass will be assigned to the specific product automatically.

## 14.7. Parts counting procedure

The first stage is to obtain information on part unit mass. Select one of the following:

- Enter the value for part unit mass (section 14.3) and then put parts on the weighing pan to see the quantity in the screen.
- Determine the part mass from the standard of certain quantity (section 14.4). The balance will also display 10 pcs ACAI active ACAI function marker (if connected). Put parts on the weighing pan to see their quantity in the screen.
- Collect the part unit mass from the database (section 14.5), select the product. Put parts on the weighing pan to see their quantity in the screen.

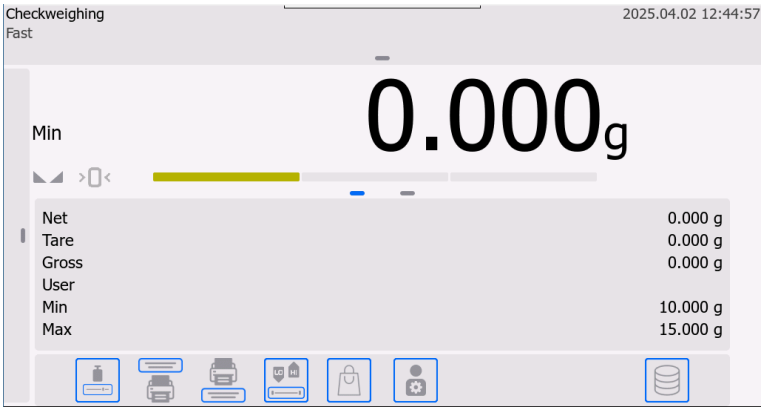
***Note:*** *All additional elements (packaging) must be tarred before the counting procedure has started.*

## 15. CHECKWEIGHING

**<Checkweighing>** working mode uses two thresholds (Lower and Upper) for sample mass control. As a rule it is assumed that the mass is correct when it falls between threshold values.

**How to activate the working mode**:

- Select <Checkweighing> mode and the home screen will be restored instantly.




**Info field contains the following data:**

- Bar graph with checkweighing thresholds
- Net
- Tare
- Gross
- User
- Min
- Max
- Keys: calibration, print header, print footer, enter checkweighing thresholds, product, user, databases.

### 15.1. Additional settings related to checkweighing

Settings allow you to adapt the working mode to own requirements. Principles of using them can be accessed in section 9.11 *Setting for <WEIGHING> mode.* You can put the bar graph in the information field area. Min and Max threshold values are displayed below the bar graph.

The additional function used only in <Checkweighing> mode is <Result control>.

**Result control**:

- Yes, function enabled: possible to save the measurement in the balance memory only when the mass value is between thresholds - <OK> marker is displayed,
- NO, result control function disabled, every measurement can be saved.

After enabling the function, if the mass value is out of the threshold range (lower than lower threshold or higher than higher threshold), when you try to save such a measurement in the base (by pressing PRINT key), <Sample mass out of range> message will be displayed and the measurement will not be recorded in the memory.

## 15.2. Checkweighing – quick access keys

Each mode is assigned a set of default keys that are displayed after selecting the mode. The set can be modified by assigning other quick-access keys to on-screen keys. Such an action requires a relevant permission level. The list of available keys can be accessed in the section 7.6 of the manual.

## 15.3. Use of checkweighing thresholds

To use checkweighing thresholds, follow one of the steps below:

- select Product for whom Lower and Upper Thresholds have been declared,
- enter the numerical value for thresholds after pressing key, or use keys; in this case thresholds are not related to any product.

**Procedure 1** – selection of product from the Product Base:

- Press Product Base key.
- Select the Product to be weighed from the list.
- Threshold values will be showed below the bar graph, in the Info field. The colors in the bar graph communicate the current mass status:
  - yellow: mass is lower than Lower Threshold,
  - green: mass is between Threshold Values,
  - red: mass is higher than Upper Threshold.

**Procedure 2** – manual entry of checkweighing thresholds:

- Press Checkweighing Threshold key.
- A numerical keypad box will be displayed to let you enter the Lower Threshold value.
- After entering the value, click OK key.
- A numerical keypad box will be displayed to let you enter the Upper Threshold value.
- After entering the value, click OK key.
- The home screen of the mode will be restored with entered threshold values.

***Note:*** *The upper threshold value must be higher than lower threshold value.*

If you want to change the value of one of the thresholds, use a key:

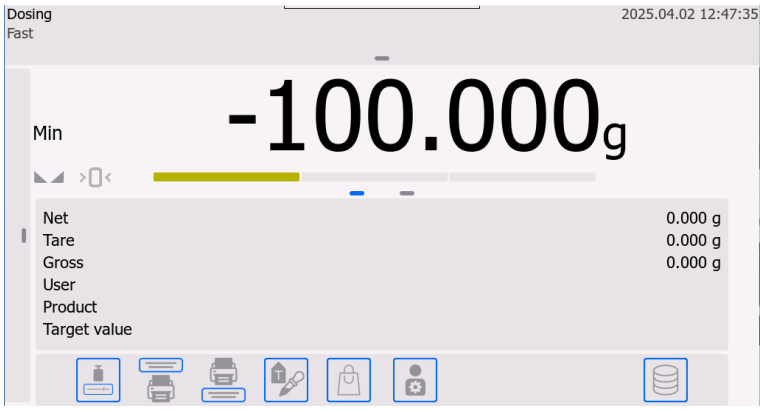
- Click the key to open the numerical keypad box in which you can enter the Lower Threshold value. After entering the value, click OK key. The home screen of the mode will be restored instantly.
- Click key to open the numerical keypad box and enter the Upper Threshold value. After entering the value, click OK key. The home screen of the mode will be restored instantly.

## 16. DOSING

<**Dosing**> working mode is concerned with weighing a sample until it reaches a specific target mass.

**How to activate the working mode:**

- Select <Deviations> mode and the home screen will be restored instantly.




**Info field contains the following data:**

- Bar graph
- Net
- Tare
- Gross
- User
- Product
- Target value
- Keys: calibration, print header, print footer, enter target value, product, user, databases

### 16.1. Additional settings related to dosing

These settings allow you to adapt the working mode to own requirements. The principles of using them can be accessed in the section 9.11 Settings for <WEIGHING> mode. You can put the bar graph in the information field area. The following values are displayed below the bar graph: target value and dosing tolerance.

### 16.2. Dosing – quick access keys

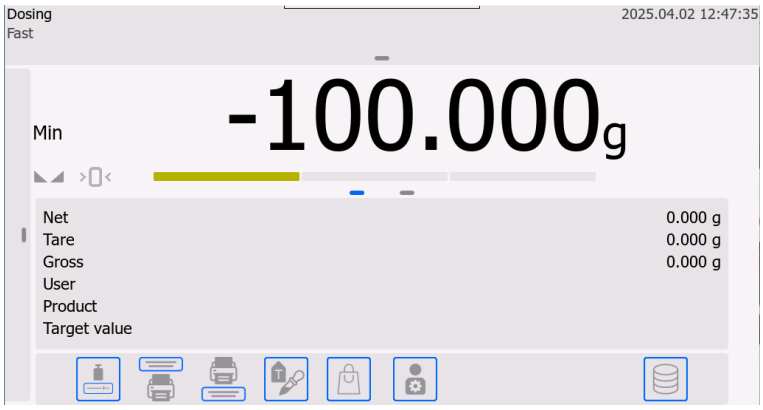
Each mode is assigned set of default keys that are displayed after selecting the mode. You can modify this set by assigning other quick-access keys to the on-screen keys. Such an action requires a specific permission level. The see a list of available keys, go to section 7.6 of the manual.

### 16.3. Use of product base in dosing

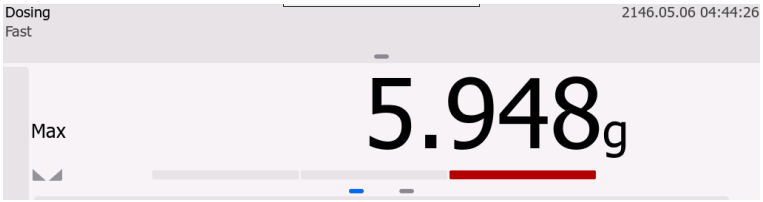
While weighing, you can use a target value assigned to the product and saved in the Product Base, define temporary own target values. The Mass field is the target value in the Product Base.

**PROCEDURE 1** – selection of product from Product Base

- Press Product Base key.
- Select the product to be weighed from the list.
- The target value and tolerance will be displayed in the bar graph instantly.
- The target value with a minus sign will be showed.




- The bar graph uses colors to communicate the current mass status:
  - Yellow: mass lower than Target Value - Tolerance
  - Green: mass within tolerance field; Target Value +/- Tolerance
  - Red: mass higher than Target Value + Tolerance




**PROCEDURE 2** – manual entry of target value

- Press <Target Value> key,
- A numerical keypad box will be displayed to let you enter the target value.
- After entering the value and confirming it, you will see another numerical keypad box, allowing you to enter the sample dosing tolerance value.
- Once you have entered the tolerance and approved it, the home screen will be restored.

## 17. DEVIATIONS FROM STANDARD MASS

As a result of **<Deviations>** procedure, the weighed load is compared to the reference mass. This operation is expressed in [%].

**How to activate the working mode:**

- Select <Deviations> mode and the home screen will be restored instantly.

**Info field contains the following data:**

- Net
- Gross
- Tare
- User
- Product
- Reference mass
- Keys: calibration, print header, print footer, enter reference mass, determine reference mass (set 100%), product, user, databases.

### 17.1. Additional settings related to deviations

These settings allow you to adapt the working mode to own requirements. The principles of using them can be accessed in the section 9.11 Settings for <WEIGHING> mode.

### 17.2. Deviations – quick-access keys

Each mode is assigned a set of defaults keys that are displayed after selecting the mode. The set can be modified by assigning other quick-access keys to on-screen keys. Such an action requires a relevant permission level. The list of available keys can be accessed in the section 7.6 of the manual.

### 17.3. Comparing sample with standard mass

To compare samples with a standard mass, follow one of the steps below:

- enter the standard mass, press <100% Enter reference mass> key,
- adopt the current mass positioned on the weighing pan as a standard, click <% Determine reference mass (set 100%)> key,
- select the product from the product base for whom mass parameter has been defined, press <Product> key.

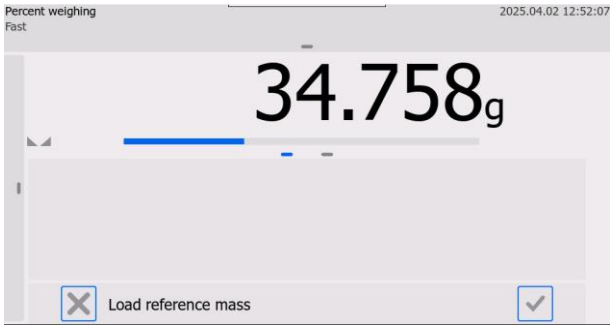
**PROCEDURE 1** – manual entry of reference mass

- Press <100% Enter reference mass> key.
- In the window, enter value and press OK key to confirm it.
- All weighed products will be compared to reference mass, and the difference expressed in [%] will be displayed in the screen.

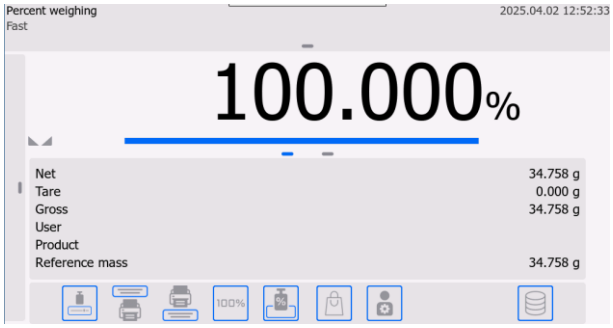
**PROCEDURE 2** – adoption of current mass as a standard

- Put the sample on the weighing pan.
- When the value has stabilized, press < Determine reference mass (set 100%)> key, the dialogue bar will be showed at the bottom of the screen. Follow the messages displayed in the bar.

- Put the weighed item on the weighing pan and press key when the value has stabilized.



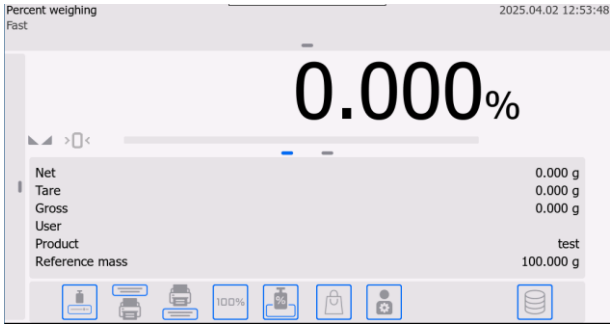

- 100.000% will be showed in the screen, the mass adopted as a standard has been entered into the reference mass field instantly.




- Unload the weighing pan.
- All subsequent samples will be compared to the reference mass and the display will show the difference expressed in [%] in relation to the reference mass.

**PROCEDURE 3** – selection of product from Product Base

- Press <Product> key and using the list in the screen, select the product to be weighed.
- Information related to reference mass and product will be updated in the Info field instantly.

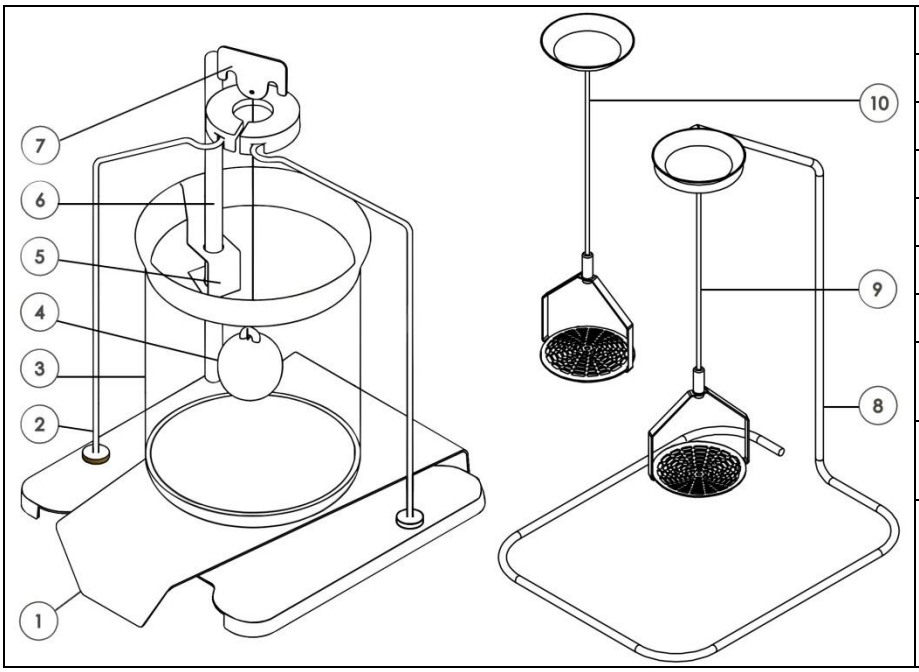



- The reference mass related to the product has been entered into the reference mass field automatically.
- 0.000% will be displayed in the screen (when the weighing pan is unloaded).
- All subsequent samples will be compared to the reference mass, and the screen will show the difference expressed in [%] in relation to the reference mass.

## 18. SOLID DENSITY

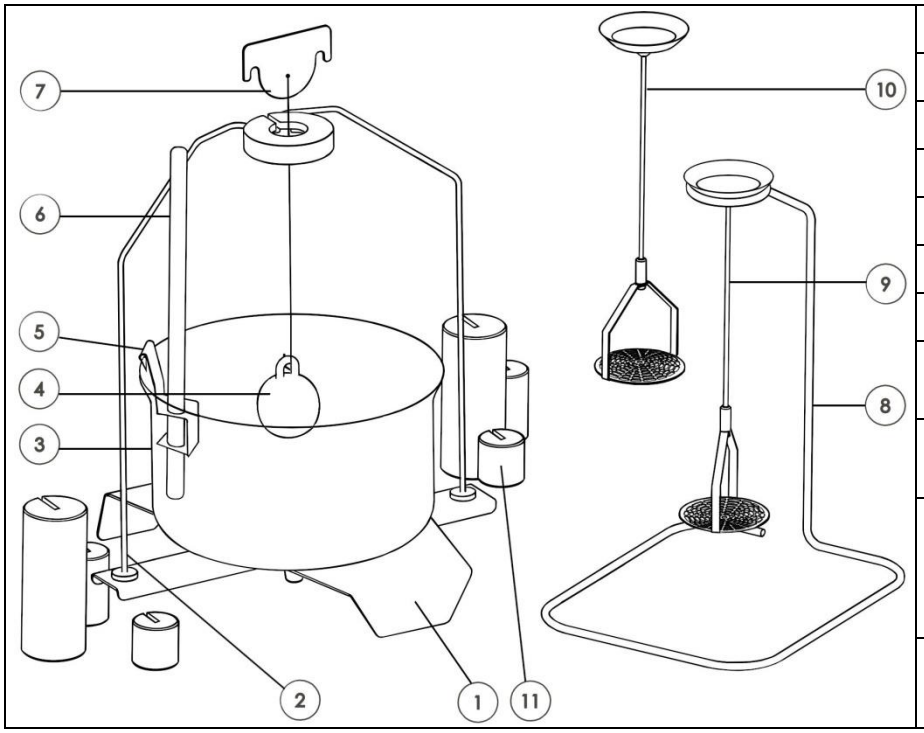
**<Solid density>** function allows you to determine material density on the basis of a representative sample.
Using the function requires an additional density determination set (optional equipment). This set is used to determine density of solids and liquids. To install the set, remove the weighing pan and anti-draft cover from the balance and mount the set there.

The set is suitable for PS balances with a 128x128-mm weighing pan



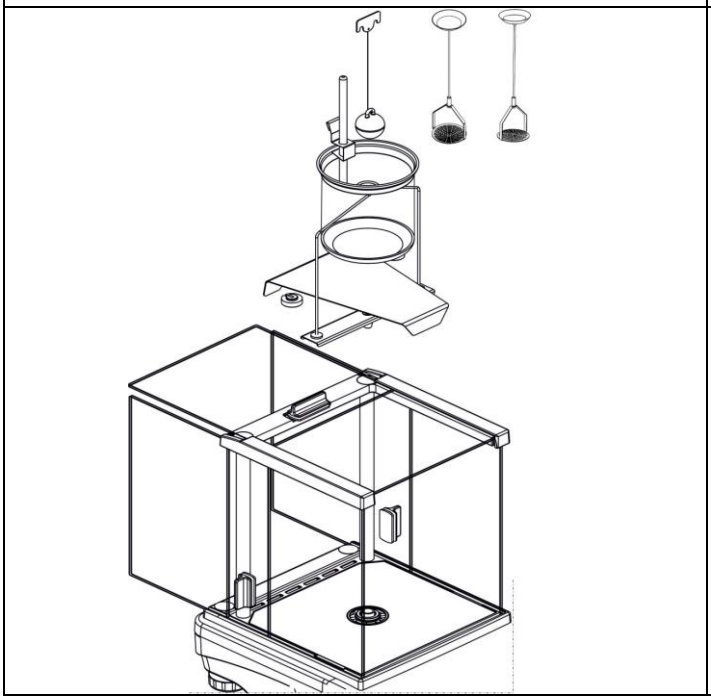
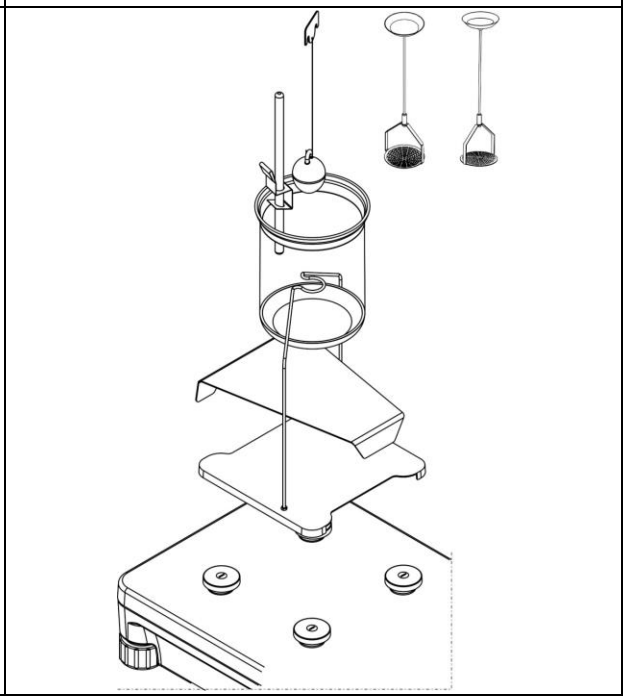

| | |
|---|---|
| **1** | Beaker base |
| **2** | Stand |
| **3** | Beaker |
| **4** | Sinker |
| **5** | Thermometer holder |
| **6** | Thermometer |
| **7** | Hanger |
| **8** | Additional stand for a set of pans or a sinker |
| **9** | Weighing pan for solids density determination |
| **10** | Weighing pan for density determination of solids with density lower that density of water |

The set dedicated to AS balances




| | |
|---|---|
| **1** | Beaker base |
| **2** | Stand |
| **3** | Beaker |
| **4** | Sinker |
| **5** | Thermometer holder |
| **6** | Thermometer |
| **7** | Hanger |
| **8** | Additional stand for a set of pans or a sinker |
| **9** | Weighing pan for solids density determination |
| **10** | Weighing pan for density determination of solids with density lower that density of water |
| **11** | Weights |

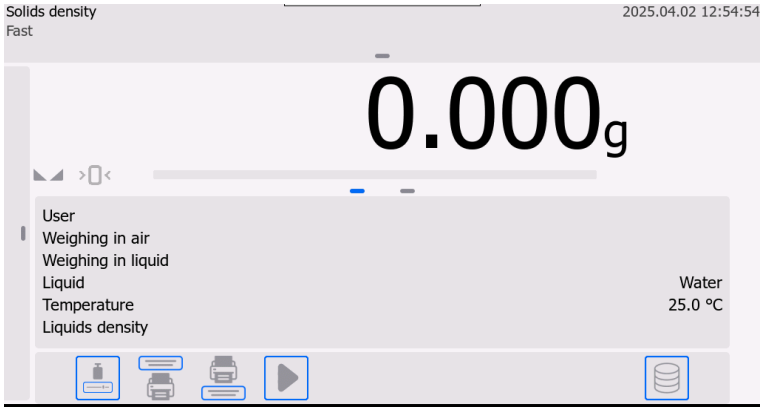
## Installation method:

| AS balances | PS balances |
|---|---|
|  |  |

***Note:***
*Keep parts of the set in the box.*
*Do not put weighing pans or a sinker on the table top; otherwise particular elements may get damaged.*
*If weighing pans or sinker are not used, they should be placed on the extra rack.*
*If you have installed the set, you will see -nuLL- message in the screen. When it happens, add weights (12). When the balance is prepared, you can use it to determine densities.*

## How to activate the working mode:

- Select <Solids density> mode and you will return to the home screen instantly.




**Info field** contains the following data**:**

- User
- Weighing in air
- Weighing in liquid
- Liquid
- Temperature
- Liquid density
- Keys: calibration, print header, print footer, start, databases.

## 18.1. Additional settings related to solids density

These settings allow you to adapt the working mode to your own requirements.

**Liquid**
This parameter allows you to select the type of liquid used to perform measurements: Water/Ethanol/Other.

**Liquid density**
This parameter allows you to enter the density of liquid used to perform measurements. This parameter is available only when you select OTHER liquid.

**Temperature**
This parameter allows you to enter the liquid temperature. Temperature value is required to make sure a relevant liquid density value is adopted for calculation of density. The program includes water and ethanol density tables with regard to temperature.

The principles of using other settings can be accessed in the section 9.11 Settings for WEIGHING mode.

## 18.2. Solids density – quick access keys

Each mode is assigned a set of default keys that are showed after selecting the mode. This set can be modified by assigning other quick-access keys to on-screen keys. Such an action requires a relevant permission level. The list of available keys can be accessed in the section 7.6 of the manual.

## 18.3. Solids density measurement

Before you initiate the procedure, set process-related parameters, such as:

- Type of liquid
  - Distilled water
  - Ethanol
  - Other liquid of known density
- Liquid temperature
  (enter it when distilled water or ethanol is used)
- Liquid density
  It is instantly set using Water or Ethanol after entering the temperature, or it must be entered manually using <Other> liquid.

Solids density is calculated on the basis of the following equation:

$$\rho = \frac{A}{A-B}\rho_o$$

ρ - sample density
A - sample mass in air
B - sample mass in liquid
$\rho_o$ - liquid density

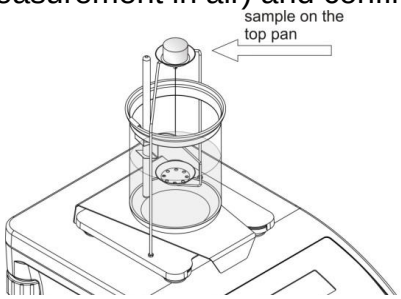
To determine the density, you need to weigh the sample in the air (on the upper weighing pan [4]) and weigh the same sample in the liquid (on the lower weighing pan [2]). The density result is displayed in the screen instantly after the procedure has ended.

**To perform the measurement, do as follows:**

1. Install the density determination set.
2. Enter <SOLIDS DENSITY> function.
3. Prepare sample for measurement.
4. Initiate the procedure by pressing < Start> key.
5. Select the liquid used to perform the test.
6. Enter the liquid temperature (the program always suggests the latest temperature).
7. If OTHER liquid is used, enter its density at the measurement temperature.
8. In the lower row, you will see the following message:

   Weighing in air. Load object

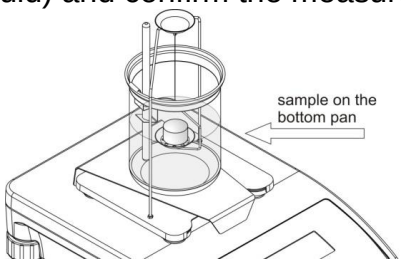
9. In the first step, place the sample on the upper weighing pan (sample mass measurement in air) and confirm the measurement when the value has stabilised.




10. In the lower row, you will see the following message:

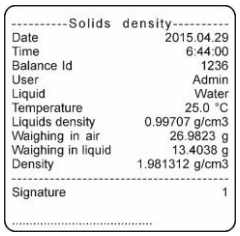
    Weighing in liquid. Load object

11. In the next step, place the sample on the lower weighing pan (sample mass measurement in
    liquid) and confirm the measurement when the value has stabilised.




12. After confirming the second measurement, the program will proceed to calculate the density of a specific solid, and this density will be displayed in the screen. In the lower row, you will see a relevant message and the measurement report will be sent to the specific printer port.

Result



----------Solids density----------

| | |
|---|---|
| Date | 2015.04.29 |
| Time | 6:44:00 |
| Balance Id | 1236 |
| User | Admin |
| Liquid | Water |
| Temperature | 25.0 °C |
| Liquids density | 0.99707 g/cm3 |
| Waighing in air | 26.9823 g |
| Waighing in liquid | 13.4038 g |
| Density | 1.981312 g/cm3 |
| Signature | 1 |

An exemplary report

The report can be reprinted by pressing key.

To finish the procedure, press key. The home screen of the function will be restored. You can start another measurement. The balance remembers the latest settings (liquid, temperature), which substantially accelerates initiation of the proper measurement procedure.

## 19. LIQUID DENSITY

**Liquid density** as a function allows you to determine density of any liquid. Using this function requires an additional density determination set (optional equipment). It is the same set used to determine density of solids (see description of the set above).

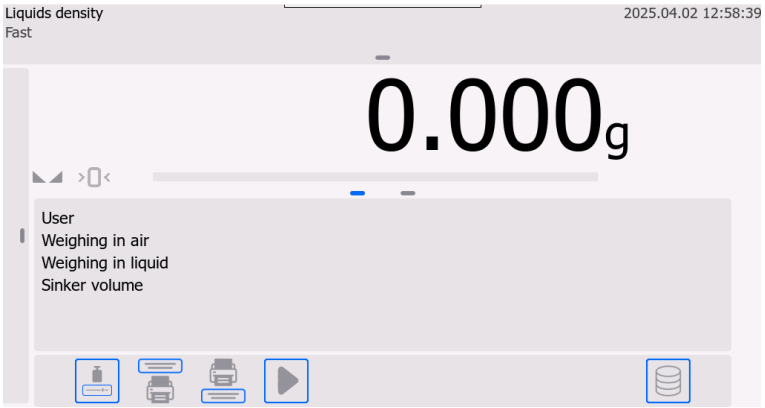
Liquid density is calculated using the following equation:

$$\rho = \frac{A - B}{V} + d$$

ρ - liquid density
A - sinker mass in air
B - sinker mass in liquid
V - float volume
d - air density (max 0,001 g/cm$^3$)

**How to activate the working mode:**

- Select <Liquid density> mode and the home screen will be restored instantly.




**Info field contains the following data:**

- User
- Weighing in air
- Weighing in liquid
- Sinker volume
- Keys: calibration, print header, print footer, start, databases.

### 19.1. Additional settings related to liquid density

These settings allow you to adapt the working mode to own requirements.

**Sinker volume**
This parameter allows you to enter the sinker volume.

The principles of using other settings can be accessed in the section 9.11 Settings for <WEIGHING> mode.

## 19.2. Solids density – quick access keys

Each mode is assigned a set of default keys that are showed after selecting a mode. This set can be modified by assigning other quick-access keys to on-screen keys. Such an action requires a relevant permission level. The list of available keys can be accessed in the section 7.6 of the manual.

## 19.3. Liquids density measurement

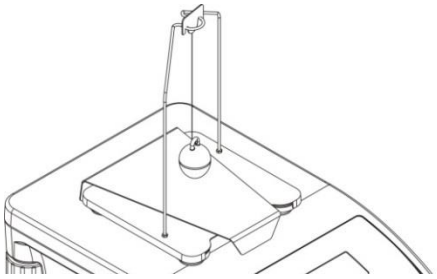
The basic component required for measuring liquid density is a glass sinker (9). Its volume is precisely declared in the hook. Before you initiate proper measurements, you need to enter this value into the balance memory. Liquid density measurement is concerned with weighing a glass sinker in the air and test liquid. The liquid density result is displayed in the screen automatically when the procedure has been completed.

**<u>To perform the measurement, follow the steps below</u>:**

1. Install the density determination set.
2. Enter <LIQUID DENSITY> function.
3. Prepare the sample for measurement (pour the test liquid into the beaker).
4. Initiate the procedure by pressing <Start> key.
5. Enter the sinker volume (the program always suggests the volume of latest sinker).
6. The following message will be displayed in the lower row:

   Weighing in air. Install sinker

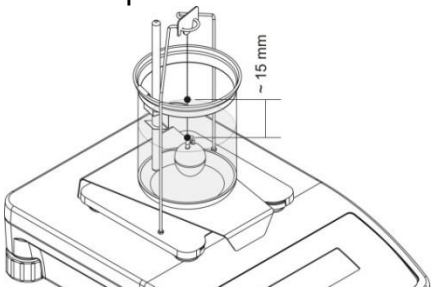
7. In the first step, place the sinker on the rack (sample mass measurement in the air) and confirm the measurement when the value has stabilized.



8. The following message will be displayed in the lower row:

   Weighing in liquid. Install sinker

9. In the next step, remove the sinker from the rack, and put the beaker with the test liquid on the base (the beaker must not touch the rack), gently hang the sinker on the rack (the sinker must be fully immersed in the test liquid) – sample mass measurement in the test liquid and confirm the measurement when the value has stabilized.




10. After confirming the second measurement, the program will calculate the test liquid density instantly. The value of the density will be displayed in the screen and the measurement report will be send to the specific printer port.

Result

```
-------------Liquids  density-------------
Date                          2015.04.29
Time                             6:57:04
Balance Idi                         1236
User                               Admin
Sinker volume              2.0000 cm3
Weighing in air               26.9808 g
Weighing in liquid            13.4032 g
Density                  6.788800 g/cm3
-----------------------------------------
Signature

.......................................
```

An exemplary report

The report can be reprinted after pressing key.

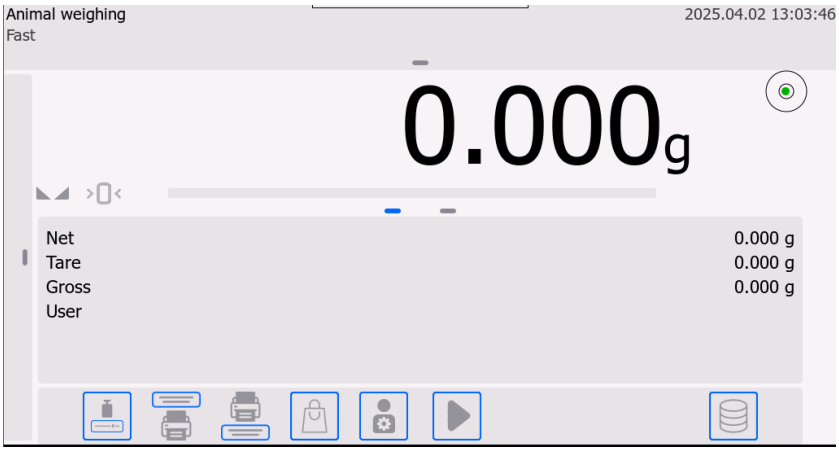
To finish the procedure, press key. The home screen of the function will be restored. You can start another measurement. The balance remembers the latest settings (i.e. sinker volume), which substantially accelerates initiation of the proper measurement procedure.

## 20. ANIMAL WEIGHING

**<Animal weighing>** working mode allows you to correctly weigh moving items. In this particular case, the object usually generates unstable measurements, which requires the use of other measuring signal filtering method.

**How to activate the working mode:**

- Select <Animal weighing> mode and the home screen will be restored instantly.




**Info field** contains the following data**:**

- Net
- Tare
- Gross
- User
- Keys: calibration, print header, print footer, product, user, process start, database.

### 20.1. Additional settings related to animal weighing

These settings allow you to adapt the working mode to own requirements.

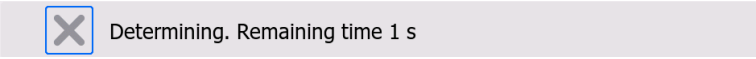
**Averaging time**

At this time measurements are analyzed. Based on the measurements, the measurement result is calculated. It is expressed in [s].

**Autostart**

It determines if measurements are manual (after pressing key) or automatic:
YES: automatic,
NO: manual.

<u>Principle of automatic operation:</u>
the item is measured instantly after you put it on the weighing pan, upon exceeding the threshold value (a relevant message is showed at the bottom of the screen).




The following message will be displayed after the measurement is completed:

and the final mass will be „held” in the screen.

Another item can be measured after you have removed the item from the weighing pan and after the mass on the weighing pan has dropped below the preset threshold (previously „held” value will be unlocked). Next put another item on the weighing pan. When the balance exceeds the preset threshold value, another measurement will be initiated.

**Auto threshold**

This value is expressed in mass units. To initiate the measurement, the mass value must be higher than threshold value.

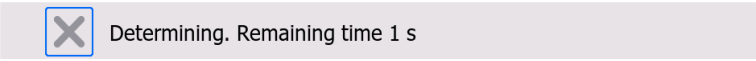
The principles of using other settings can be accessed in the section 9.11 Settings for <WEIGHING> mode.

## 20.2. Animal weighing – quick access keys

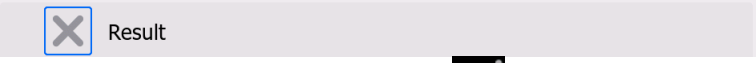
Each mode is assigned a set of default keys that are showed after selecting a mode. This set can be modified by assigning other quick-access keys to on-screen keys. Such an action requires a relevant permission level. The list of available keys can be accessed in the section 7.6 of the manual.

**ANIMAL WEIGHING PROCEDURE:**

- Set function parameters (averaging time, autostart, auto threshold).
- Put the item on the weighing pan and press key. If the automatic mode is active, determination procedure will be initiated upon exceeding the auto threshold mass.




- Once determination is finished, the „held” weighing result will be displayed in the screen and the mass will be printed out using the connected printer instantly.




- You can reprint the measurement by pressing key.
- To perform another measurement, press key and restart the procedure:
    - for manual mode – press key,
    - for automatic mode – remove the item and put another item on the weighing pan.

## 20.3. Animal weighing – statistics

Each measurement is saved in the memory along with a dedicated number. This function allows you to test items in series for which the program generates statistical calculations.
For each series of measurements, you can browse results, print the report out, delete all statistics results.
To make sure the use of statistics is easy, the following additional keys can be used**:**

- enter statistical result preview (for series),

- print results and delete them automatically (end of series).

**Procedure 1:**

1. Enter <Results> key.

| ← Results | | | |
|---|---|---|---|
| Number | 3 | Sum | 92.789000 |
| Average | 30.929667 | Min | 20.202000 |
| Max | 46.394000 | Difference | 26.192000 |
| SDVP | 11.205125 | RDVP | 36.227757 |
| SDVS | 13.723419 | RDVS | 44.369760 |

2. Measurement results will be displayed in the screen and the following options will be visible in the top bar: Delete, Print.
3. Select either:
   – - to print the report out,

*Example of report:*

```
-------------- Statistics --------------
Number                              9
Sum                        455.600 g
Average                     50.6222 g
Min                          49.939 g
Diff                         51.380 g
Difference                    1.441 g
SDVP                        0.39605 g
SDVS                        0.38505 g
RDVP                          0.78 %
RDVS                          0.82 %
----------------------------------------
```

   – - to delete all statistical data.

**Procedure 2:**

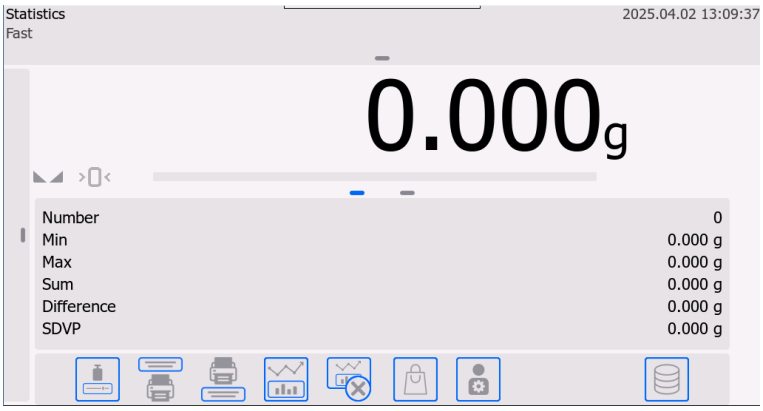
- Press <Finish> key to print statistical data and delete them instantly.

## 21. STATISTICS

**<Statistics>** allows you to collect data from a series of weighing and generate statistics on this basis. The range of statistical data depends on internal settings in the function.

**How to activate the working mode:**

- Select <Statistics> mode to return to the home screen instantly.




**Info field** contains the following data**:**

- Number (number of samples weighed in the series)
- Min (minimum value in the series)
- Max (maximum value in the series)
- Sum (total sample mass in the series)
- Difference (difference between Max and Min in the series)
- SDVP (population standard deviation)
- Keys: calibration, print header, print footer, results, finish, product, user, databases.

### 21.1. Additional settings related to statistics

These settings allow you to adapt the working mode to own requirements.
The principles of using settings can be accessed in the section 9.11 Settings for <WEIGHING> mode.

### 21.2. Statistics – quick access keys

Each mode is assigned a set of default keys that are showed after selecting a mode. This set can be modified by assigning other quick-access keys to on-screen keys. Such an action requires a relevant permission level. The list of available keys can be accessed in the section 7.6 of the manual.

### 21.3. Parameters related to a series of measurements

For each series of measurements, you can browse results, print the report out, delete all statistical results.

**Procedure 1:**

- Press < Results> key.

| ← Results | | | |
|---|---|---|---|
| Number | 9 | Sum | 116.998000 |
| Average | 12.999778 | Min | 9.362000 |
| Max | 18.528000 | Difference | 9.166000 |
| SDVP | 3.537909 | RDVP | 27.215148 |
| SDVS | 3.752519 | RDVS | 28.866024 |

- Measurement results will be displayed in the screen and the following items will be visible in the top bar: Delete, Print.
- Select either:
  - - to print the report out

```
-------------- Statistics --------------
Number                              9
Sum                       455.600 g
Average                   50.6222 g
Min                        49.939 g
Max                        51.380 g
Diff                        1.441 g
SDVP                      0.39605 g
SDVS                      0.38505 g
RDVP                         0.78 %
RDVS                         0.82 %
----------------------------------------
```

  - - to delete all statistical data.

**Procedure 2:**

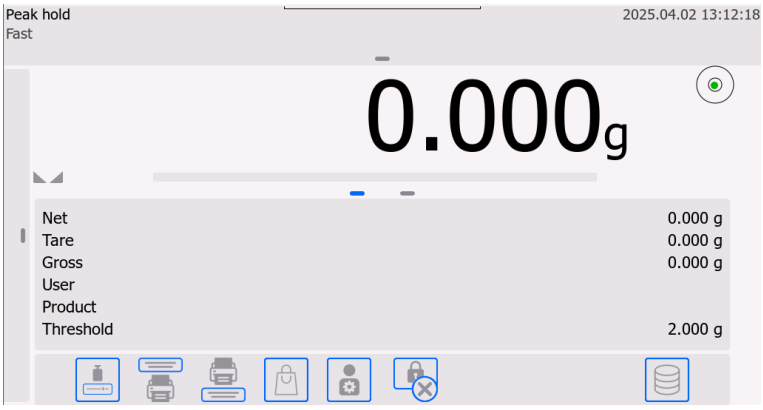
- Press < Finish> key to print statistical data and delete them instantly.

## 22. PEAK HOLD

Thanks to this function, you can hold the maximum pressure exerted on the weighing pan while loading the balance.
Aside from standard settings for this mode (described in the weighing mode), additional threshold value setting has been introduced.
This option is available in settings of the <PEAK HOLD> mode.

**How to activate the working mode:**

- Select <Peak Hold> mode and the home screen will be restored instantly.




**Info field contains the following data:**

- Net
- Tare
- Gross
- Product
- User
- Threshold
- Keys: calibration, print header, printer footer, product, user, delete, databases.

### 22.1. Additional settings related to Peak Hold mode

These settings allow you to adapt the working mode to own requirements.

**THRESHOLD** – determines the point at which the program starts monitoring the maximum pressure applied to the weighing pan.
It is important to set this threshold according to your needs before initiating the measurement process.

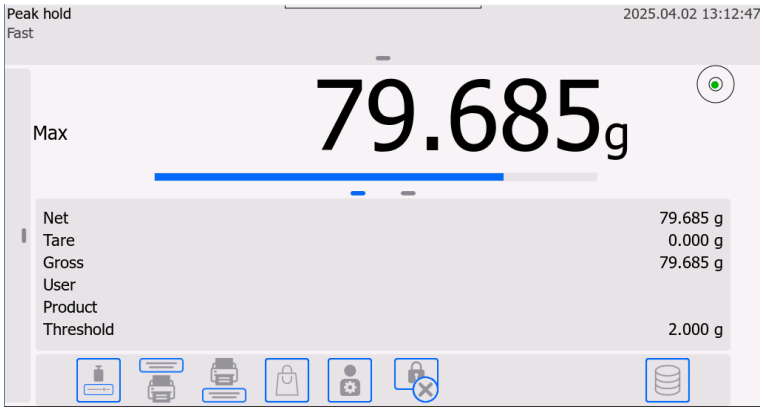
The principles of using other settings can be accessed in the section 9.11 Settings for <WEIGHING> mode.

### 22.2. Peak hold – quick access keys

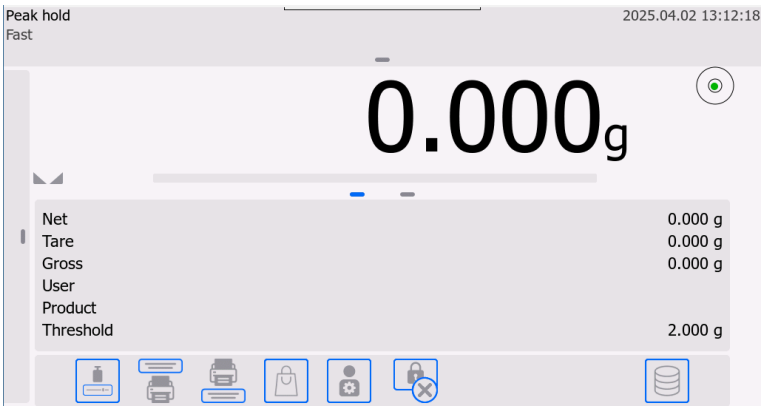
Each mode is assigned a set of default keys that are showed after selecting a mode. This set can be modified by assigning other quick-access keys to on-screen keys. Such an action requires a relevant permission level. The list of available keys can be accessed in the section 7.6 of the manual.

## 22.3. Principle of operation

- Enter <PEAK HOLD> mode
  The function becomes active after selecting the mode. To make sure its operation is correct, set the threshold in grams, specifying the point which when exceeded causes the function to start recording the maximum pressure.
- From now on, the balance keeps recording and holding each value that is above the threshold and is higher than previously held result. If the program detects any mass that is above the threshold, the highest value will be held in the main screen and <Max> pictogram will be displayed on the left side of the screen.




- You can print the result out by pressing key.
- Another maximum pressure testing procedure is initiated after you have unloaded the weighing pan and pressed key. You will return to the home screen of <PEAK HOLD> mode and <Max> pictogram on the left side will be deleted.



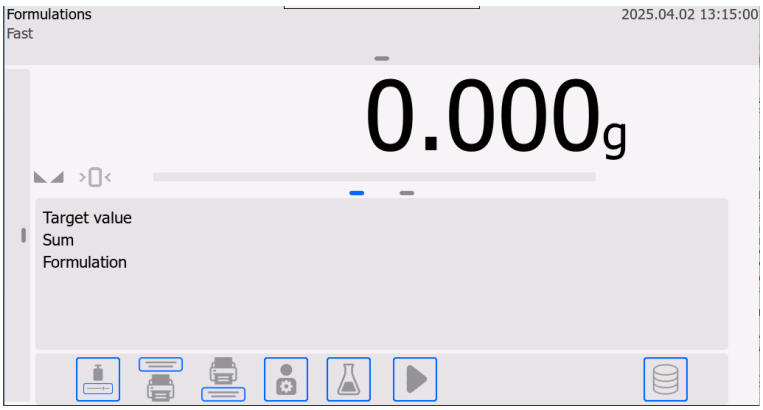
## 23. FORMULATIONS

**<Formulations>** working mode allows you to use numerous ingredients to prepare mixtures. The entire procedure is automatic.
While preparing mixtures, you can do the following:
**use formulations base** that contains formulations. In so doing the program can help you weigh particular ingredients using suitable messages displayed in the info field,
prepare mixtures without formulation base, when you control ingredients you weigh, their order and quantity.

If you wish to use the formulation base, you need to create a formulation in the first place and call it for use. Formulations can be created only in <Formulation Base> level. The description of this procedure has been described in this document.

**How to activate the working mode:**

- Select <**Formulations**> mode and the home screen will be restored instantly.




**Info field contains the following data:**

- Target value
- Sum
- Formulation
- Keys: calibration, print header, print footer, user, formulation, start, databases.

***Note:***
*The bar graph can be active (visible) in the information field. It is a graphic interpretation of the ingredient mass correctness, with regard to +/- tolerance.*

### 23.1. Additional settings related to formulations

These settings allow you to adapt the working mode to own requirements.

**Multiplier** – this item allows you to prepare multiple batches of mixtures as per the specific formulation in one weighing procedure:

- **YES**, after selecting the formulation for weighing, you will be asked about the value of multiplier used to multiply the mass of particular ingredients. The value of the multiplier you have entered will apply to all ingredients.
- **NO**, not possible to enter the multiplier, a default value is <1>.

## 23.2. Formulations – quick access keys

Each mode is assigned a set of default keys that are showed after selecting a mode. This set can be modified by assigning other quick-access keys to on-screen keys. Such an action requires a relevant permission level. The list of available keys can be accessed in the section 7.6 of the manual.

## 23.3. Introduction of formulation into formulation base

You can add the formulation to the base from the Database menu level.
You can introduce 100 formulations, composed of up to 25 ingredients each.
The formulation base consists of names of formulations and names of ingredients that form it; together with respective masses. The formulation may use a product that is recorded in the product base or product without the name. For each product, enter the mass specifying the quantity of the ingredient that is to be added to the mixture as well as tolerance adopted for the ingredient. These data allow displaying graphic information, using the bar graph, on the quantity of the weighed ingredient and precision of weighing (see description of the bar graph in DOSING mode).
While creating a formulation, you need to start from adding names of products used to form the formulation, and then add ingredients and their masses. The program is user-friendly and leads the operator through subsequent steps.
As you need to enter the name and mass for each ingredient, you are obligated to know the exact composition of the entire mixture.

**Procedure:**

- Enter <Databases> submenu and press <Formulations> field.
- Press <Add> key if you want to add a formulation.

A new item will be instantly added to the base and an edition box will be available. Enter all data related to a new formulation.

The list of data defined for formulations:

1. Name – click the name field to open a new window in which you have to enter a formulation name.
2. Code – possible to enter the formulation code (the same as with entering the name).
3. Ingredients – click the field to open a window with a list of ingredients used in the formulation (for a new formulation, the list is empty), add ingredients:
    - Press <Add> key.
    - A new item will be added to the base instantly and an edition box will be available. Enter all ingredient-related data,
    - Enter all data and return to the previous window by pressing ← key.
    - Enter other ingredients of the formulation.
4. Target value – the formulation target mass, sum of all ingredients masses, non-editable option, updated on an ongoing basis by the program after every single ingredient is added to the formulation.

Once you have entered all data, return to the home screen.

## 23.4. Use of formulations in weighing

Once you have enabled FORMULATION function, you can start preparing a mixture, depending on settings: after selecting the formulation from the formulation base or weigh the mixture manually.

You can prepare a mixture in the following ways:

- execute the formulation that is not defined in the formulation base – manually,
- execute the formulation that is recorded in the formulation base,
- execute the formulation that is recorded in the formulation base.

After selecting the formulation, weigh subsequent ingredients and when the value has stabilized, press key. Once you have pressed key to confirm, the mass of each ingredient is tarred, i.e. is adopted for the final mass of the mixture.

key deletes all operations related to creation of the mixture. Press it and select another formulation to be prepared.

**PROCEDURE 1** – Execution of the formulation that is not defined in the formulation base – manually. Follow the tips showed by the program:

- Place the container in which you will put ingredients on the weighing pan.
- Press Start key in the quick-access key bar.
- You will instantly enter the formulation selection box.
- Select <None> item.
- The home screen will be restored, the container mass will be tarred and the navigation bar will be displayed at the bottom of the screen. The messages in the bar will prove supportive for the operation.
- Place the desired quantity of the ingredient no. 1 in the container.
- Press key to confirm the procedure.
- The mass of ingredient 1 will be saved in the balance memory (mass of the weighed ingredient 1 will be displayed in the Sum field), and the value will be tarred.
- Follow previous steps, weigh all ingredients of the mixture.
- When you have weighed the last ingredient, press key.
- The following question will be displayed in the lower bar: **Weigh to reach specified weight?** . If you want to increase the mixture mass to reach the desired value, press key.
- In such a case the net mass of weighed ingredients will be displayed in the home screen and the relevant message will be displayed in the lower bar.
- Add a mixing mass to supplement the mixture.
- Press key to confirm and the mixture weighing procedure will be finished. The formulation report will be printed and saved in the base (the example of the report is showed in the further section of the manual), and the relevant message will be displayed in the lower bar: **Completed** .
- To perform further operations, press key.

**or:**

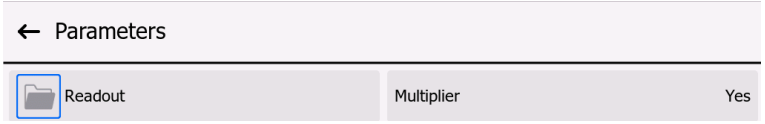
- After weighing the last ingredient, press key.
- The following question will be displayed in the lower bar: Weigh to reach specified weight? . If you do not want to increase the mixture mass to reach the desired value, press key again.
- The following question will be displayed in the lower bar: Confirm to finish .
- Press key to confirm and the mixture weighing procedure will be finished. The formulation report will be printed and saved in the base (the example of the report is showed in the further section of the manual), and the relevant message will be displayed in the lower bar: Completed .
- To perform further operations, press key.

**PROCEDURE 2** – Execution of the formulation that is recorded in the formulation base. It is the basic variant for mixture preparation.

- Follow the tips displayed by the program:
- Place the container in which you will put ingredients on the weighing pan.
- Press Start key in the quick-access keys bar.
- Select the formulation to be executed from the list of formulation.
- The home screen will be restored, the container mass will be tarred instantly. In <Formulation> field, the name of the specific formulation will be displayed, in <Target value> field, the total mass of the specific formula will be showed, while at the bottom of the screen you will see a navigation bar that shows operation-supporting messages. The bar also communicates names of particular mixture ingredients.
  At the top of the information field you can find a bar graph below which the mass of the ingredient to be weighed is showed. The color of the bar graph will be changing depending on the amount of the ingredient (description of bar graph operation can be accessed in the section dedicated to DOSING mode).
- Place the desired amount of the ingredient no. 1 in the container.
- Press key to confirm the procedure.
- The mass of ingredient 1 will be saved in the balance memory (mass of the weighed ingredient 1 will be displayed in the Sum field), and the value will be tarred.
- Follow previous steps, weigh all ingredients of the mixture.
- Once you have weighed the last ingredient, the mixture weighing procedure will be finished and the formulation report will be printed and saved in the base (the example of the report is showed in the further section of the manual). The relevant message will be displayed in the lower bar: Completed
- To perform further operations, press key.
- You can abort the procedure by pressing key.

**PROCEDURE 3** – Execution of multiple batches of formula that is recorded in the formulation base using <MULTIPLIER> item.
To use this option, switch <Multiplier> item into <YES> value in the mode settings.

**Procedure**:




After you have switched the item into <YES>, the program will always request you to enter the multiplier value used to multiply the mass of each ingredient.
Follow the tips displayed by the program:

- Put the container in which ingredients will be placed on the weighing pan.
- Press Start key in the quick-access keys bar.
- Select the formulation to be executed from the list of formulations.
- The numerical keypad window will be displayed to let you enter the multiplier.
- After you have entered the relevant multiplier, the home screen will be restored and the container mass will be tarred instantly. In <Formulation> field, the name of the specific formulation will be displayed, in <Target value> field, the total mass of the specific formulation multiplied by the specific multiplier will be showed, and at the bottom of the screen you will see a navigation bar in which operation-supporting messages will be presented. The names of particular mixture ingredients are also communicated in the bar.
  The mass of the ingredient in the bar graph field is also multiplied by the multiplier.
- Further actions are identical to the ones used for execution of the formulation without the multiplier.

### 23.5. Report on formulation executions

Every formulation execution procedure is followed by generation of the report. It is recorded in <**Formulation reports>** database. The name of the report file takes a form of a date and time of the procedure.

**Example of the report**:

*---------- Formulation Report ----------*

| | |
|---|---|
| *User* | *Nowak Jan* |
| *Formulation name* | *Test 1* |
| | |
| *Start date* | *2025.07.10 13:21:40* |
| *End date* | *2025.07.10 13:22:28* |
| | |
| *Ingredients quantity* | *5* |
| *Measurements quantity* | *5* |
| *---------- Ingredient 1 ----------* | |
| *Name* | *Product 01* |
| *Weight* | *19.994 g* |
| *---------- Ingredient 2 ----------* | |
| *Name* | *Product 02* |
| *Weight* | *49.993 g* |
| *---------- Ingredient 3 ----------* | |
| *Name* | *Product 03* |
| *Weight* | *9.999 g* |
| *---------- Ingredient 4 ----------* | |
| *Name* | *Product 04* |
| *Masa* | *1.001 g* |
| *---------- Ingredient 5 ----------* | |
| *Name* | *Product 05* |
| *Weight* | *19.995 g* |
| | |
| *Sum* | *100.982 g* |
| *Target value* | *101.000 g* |
| *Difference* | *-0.018 g* |
| | |
| *Status* | *Completed* |

*----------*

*Signature*

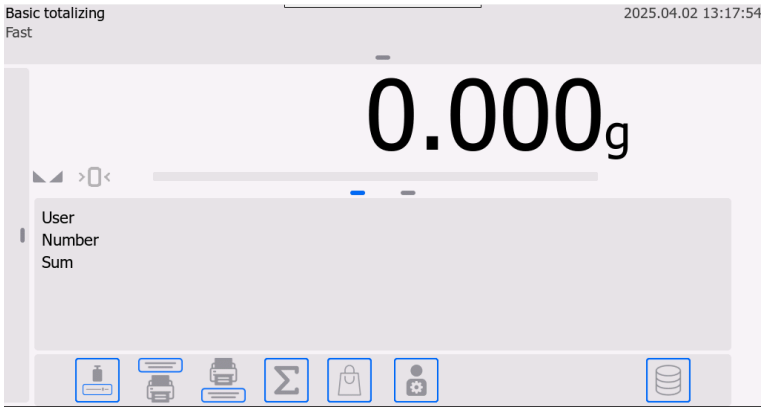
.....

## 24. ADDING

**<Adding>** function allows you to sum up net masses of samples you weigh.
The program allows you to sum up to 9999 ingredients in one cycle or the number of samples whose value of summed masses can be displayed in the screen (9 digits at the most).

**How to activate the working mode:**

- Select <Adding> mode to return to the home screen:




**Info field contains the following data:**

- User
- Number (number of samples weighed in the series)
- Sum (total mass of samples in the series)
- Keys: calibration, print header, print footer, results, product, user, databases.

### 24.1. Additional settings related to adding

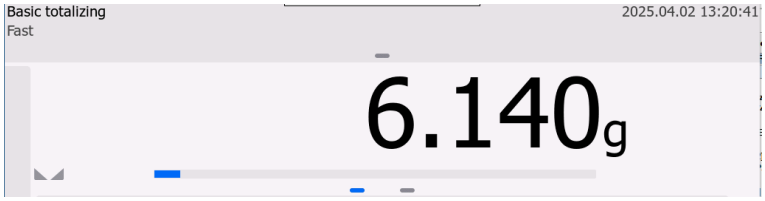
These settings allow you to adapt the working mode to own requirements. The principles of using the settings can be accessed in the section 9.11 Settings for <WEIGHING> mode.

### 24.2. Adding – quick access keys

Each mode is assigned a set of default keys that are showed after selecting a mode. This set can be modified by assigning other quick-access keys to on-screen keys. Such an action requires a relevant permission level. The list of available keys can be accessed in the section 7.6 of the manual.

### 24.3. Course of actions

- Enter <ADDING> mode. In the home screen, you will see data on the quantity of ingredients that have been added to the total sum and mass total.
- Put the first sample on the weighing pan. When the value has stabilized, press key to confirm the mass. The program will add the sample mass to the sum and data concerning the quantity of ingredients, and total sum will be updated in the lower row. The data on the saved measurement will be printed out instantly.

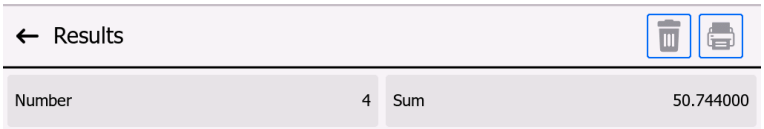



| | |
|---|---|
| 1. Net | 38.00 g |
| Tare | 0.000 g |
| Gross | 38.00 g |

- Next remove the weighed sample and put another one. When the value has stabilized, confirm the mass by pressing ↵ key.
- If you follow the above-mentioned steps, sum up all samples in the specific series of measurements.

When all samples have been summed up, finish the procedure by following the guidelines below:

Press Σ key.




The screen will show measurement results and the following options will be displayed in the top bar: Delete, Print.
Select either:

– - to print the summary and not to delete results. You may keep on adding masses after returning to the home screen
– - to delete the series of measurements and print the summary out.

Example of printout:

| | |
|---|---|
| 1. Net | 38.000 g |
| Tare | 0.000 g |
| Gross | 38.000 g |
| . | |
| . | |
| . | |
| 10. Net | 15.000 g |
| Tare | 0.000 g |
| Gross | 15.000 g |
| ----------Adding---------- | |
| Sum | 0.00 g |
| ---------- | |

*NOTE: upon the end of adding procedure, the summary is only printed out. Masses of particular samples are printed only when their masses have been confirmed.*

If samples are weighed in packaging, you need to place the packaging on the weighing pan and press →T← key once the value has stabilized. Only then can you weigh the sample.

***NOTE:*** *for ADDING mode, press* ↵ key *(used to confirm the weighed sample mass) to print the measurement data out. The following data may be printed out:* ***Measurement number, NET mass*** *(in adjustment unit),* ***TARE mass*** *(in current unit),* ***GROSS mass*** *(in current unit), and* ***current result*** *(in current unit). The data that are to be printed out must be set in GLP PRINTOUT parameter, see section 12.2. Other information (aside from the one listed above) such as USER, PRODUCT, DATE, TIME, VARIABLE 1, VARIABLE 2, CALIBRATION REPORT, NON-STANDARD PRINTOUT are not printed out in this mode, regardless of their status.*

## 25. STATISTICAL QUALITY CONTROL – SQC

The <Statistical Quality Control> mode is useful during various types of product packaging processes to monitor and/or control the packaging process. It enables the detection of overfilled and underfilled packages. If samples are weighed and the results are stored in the database, the program allows for trend analysis, which can be displayed in graph form.
The program allows user to perform a batch control consisting of up to 250 samples.
Each control performed is saved in the database under the <Reports / Control Reports> menu, and its results can be viewed at any time. For each batch, the following data are calculated and stored in the database: maximum, minimum, standard deviation, average values for each batch, etc.

The SQC control process can be performed manually (by pressing the button for each measurement) or automatically (measurements are automatically recorded once the reading for each sample has stabilized). The scales feature a module that performs statistical control based on a database containing a list of goods along with the declared errors for each one: <T4->;<T3->;<T2->;<T1->;<T1+>;<T2+>;<T3+>;<T4+>.

A control initiated from the scale in automatically terminated after the appropriate number of samples – as determined by the user in the SQC work mode settings – has been controlled. Upon completion of the control, a final report is generated, containing all necessary information regarding the control, and it can be printed on a connected printer. Control data is also automatically saved in the Control Reports database.

**The control cycle proceeds as follows:**

- User selection,
- Product selection,
- Start of the control,
- Collecting weight readings,
- Automatic completion of the control after weighing a specified number of samples,
- Printing the control report.

### 25.1. Procedure for starting the work mode

To start a control:

- An operator with necessary permissions to perform controls must be logged in.

***Note:***

1. *To start the control, a user with a permission level of at least **<User>** must be selected. If no user is logged in on the scale, the program will display the message: **<User not logged in>** when the control starts.*
2. *The login procedure and permissions are described in section 9.2 of the manual.*

- Enter the general parameters for the **<SQC>** work mode into the database; see section 25.2 for a description.
- Select the appropriate product (the corresponding button in the button with the control data entered correctly).

***Note:***
*The product data that must be entered before starting the control is listed in the table below. The SQC option is visible only if the currently used modem is in SQC mode. The other product settings are irrelevant when operating in SQC mode.*

| | |
|---|---|
| **Weight** | Nominal weight of the product. |
| **Tare** | Weight of the packaging in the calibration unit. |
| **SQC mode** | Full<br>Empty-Full<br>Full-Empty |
| **Batch** | If the SQC mode „Empty-Full" or "Full-Empty" is selected, set the appropriate value for the batch. |
| **SQC Unit** | g<br>mg<br>ml |
| **Density** | If the unit [ml] is selected, set the correct density value for the liquid to ensure accurate conversion of volume to mass. |
| **SQC** | |
| **Threshold mode** | Specify whether threshold values will be entered in mass units [g], or as a percentage if the nominal value of the goods. |
| **Threshold basis** | Specify which value should serve as the basis for calculating thresholds according to the declared error values. |
| **Batch size** | Specify the size of the controlled batch. |
| **Error value [T*X**-]** | The value of the T*X** error limit below the nominal mass. |
| **Error value [T*X**+]** | The value of the T*X** error limit above the nominal mass. |
| **Number of disqualifying samples [Qn-T*X**]** | Limit value for the number of T*X** errors below the nominal mass. |
| **Number of disqualifying samples [Qn+T*X**]** | Limit value for the number of T*X** errors above the nominal mass. |

** - Error values and the number of disqualified samples range from T1 to T4.*

***Note:***
*Editing products in the database is described in section 27.2 of the manual.*

- After returning to the **<SQC>** module's main window, press the on-screen button (start control) located at the bottom of the scale's display.
- The **<Batch Number>** edit field with an on-screen keyboard will appear automatically (only if <Yes> is selected for the <Ask for batch number> option in module settings.
- Enter the desired batch number for the goods being controlled and confirm by pressing the OK button.

***Note:*** *The user can stop the check at any time by pressing the on-screen function button (stop check), located at the bottom of the scale's display.*
*During the check, the other on-screen buttons, function buttons, and buttons on the scale's keypad are locked.*

### 25.2. Additional Settings related to SQC

These settings allow user to customize the work mode to suit user's specific requirements.

**The following setting are related to the SQC process:**

- **Request batch number**

  Setting this value to <Yes> will cause the program to prompt user to enter the product batch number before starting each control procedure.
  **Procedure:**
  Select the parameter <Request batch number>, after which a window will appear with the available settings: <No> - option disabled, <Yes> - option enabled.
  Select the desired value; once selected, the program will return to the previous window.

- **Batch number**

  A parameter that allows user to enter a number to identify the batch of goods being controlled.
  **Procedure:**
  Select the parameter <Batch number>, after which the <Batch number> edit field with an alphanumeric keyboard will be displayed. Enter the desired batch number confirm with the OK button.

- **Automatic tare**

  Setting the Autotare to <Yes> will automatically tare the scale reading after each measurement is confirmed during control. The control process is carried out without the need to remove loads after the measurement is recorded. Ensure that the total mass of the samples and the container does not exceed the scale's maximum capacity.
  **Procedure:**
  Select the parameter <Autotare>, after which a window with the available settings will appear: <No> - option disabled, <Yes> - option enabled.
  Select the desired value; once selected, the program will return to the previous window.

- **Print mode**

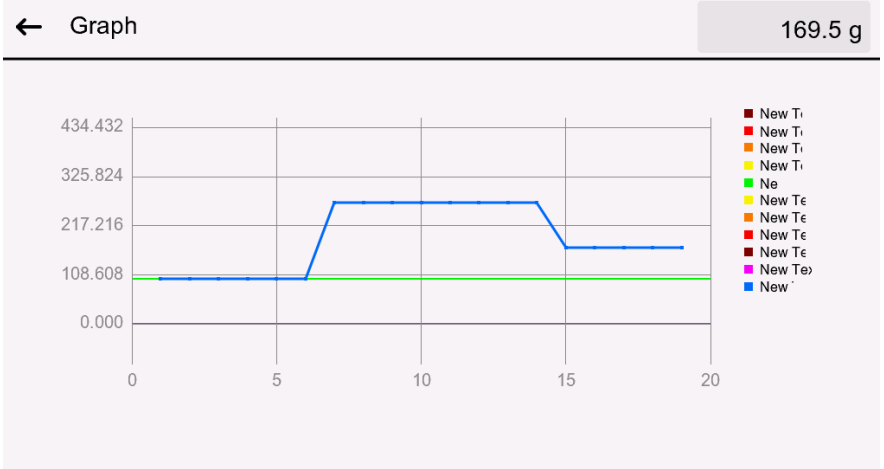
  For the <When stable> setting, the result is confirmed manually by pressing the icon in the bottom bar of the display. For the <Auto> setting, operation proceeds as described in section 9.14.

Instructions for using the remaining settings are provided in section 9.11, *Additional Weighing Parameters.*

### 25.3. Conducting the Control

Before starting the process, select the item to be controlled from the product database using the <Product> quick access button. Once the product has been selected, user can begin the control process. To do so, press the button on the bottom bar of the display. The program will automatically display a window with a keyboard for entering the batch number of the controlled product, if the option has been enabled. After that, program proceeds to the next steps of the process. During the control, the program analyzes the measurement results in real time and displays them in apropirate fields on the screen, informing the user of the control results.

Messages displayed during the control:




| | | |
|---|---|---|
| **Xavg** | - | Average mass of the controlled product. |
| **S** | - | Standard deviation for weighted samples. |
| **Min** | - | Minimal mass value of weighted samples. |
| **Max** | - | Maximal mass value of weighted samples. |
| **T1-** | - | Characteristics of **T1-** negative errors in the sample: **-0.100 g** – value of the **T1-** negative error, **Max** – disqualifying number of **T1-** negative errors, **n** – actual number of **T1-** negative errors. |
| **T2-** | - | Characteristics of **T2-** negative errors in the sample: **-0.200 g** – value of the **T2-** negative error, **Max** – disqualifying number of **T2-** negative errors, **n** – actual number of **T2-** negative errors. |
| **T1+** | - | Characteristics of **T1-** positive errors in the sample: **0.050 g** – value of the **T1+** positive error, **Max** – disqualifying number of **T1+** positive errors, **n** – actual number of **T1+** positive errors. |
| **T2+** | - | Characteristics of **T2+** positive errors in the sample: **0.100 g** – value of the **T2+** positive error, **Max** – disqualifying number of **T2+** positive errors, **n** – actual number of **T2+** positive errors. |
| **Load full 1/10** | - | Instructions regarding the process flow. |
| | - | Switch between: number data / chart. |
| | - | A button to display information about the control and the measurement results from the current control. |
| | - | Confirm measurements. |
| | - | Abort control. |

**Control status**

The control status is accompanied by a corresponding graphical indicator (background color) that informs the user when the threshold values for the number of defects have been exceeded. The values and number of defects are entered by the user for the goods being controlled.

| | |
|---|---|
| T1+ : | 0.050 g |
| Max: 3 | n: 2 |
| T2+ : | 0.100 g |
| Max: 1 | n: 2 |

- The orange color warns that if another **T1+** error occurs, the test result will be negative,
- The color red indicates that a **T2+** error has occurred, resulting in a negative test result.

Once the control is complete, a summary (report) of the process is generated, and the control results are automatically saved in the scale's database.

***Note:*** *A template and example of an audit report are described in section 25.4 of the manual.*

## 25.4. Control report

*Example design of SQC control report.*

| | |
|---|---|
| *Report number* | *S/22/08/2026/11/11* |
| --- | --- |
| *Scale type* | *AS* |
| *Max scope* | *220 g* |
| *Scale indication* | *0.001 g* |
| *Start date* | *22.08.2026 11:09:47* |
| *End date* | *22.08.2026 11:11:03* |
| *Name and Surname* | *BBB CCC* |
| *Product* | *AAA* |
| *Density* | *1.000 g/cm$^3$* |
| *Batch number* | *XX111* |
| *Nominal mass* | *0.700 g* |
| *Tare* | *0.000 g* |
| *Error value [T4-]* | *0.400 g* |
| *Error value [T3-]* | *0.300 g* |
| *Error value [T2-]* | *0.200 g* |
| *Error value [T1-]* | *0.100 g* |
| *Error value [T1+]* | *0.050 g* |
| *Error value [T2+]* | *0.100 g* |
| *Error value [T3+]* | *0.150 g* |
| *Error value [T4+]* | *0.200 g* |
| *Batch count* | *100* |
| *Measurements count* | *10* |
| *Error count [T4-]* | *0* |
| *Error count [T3-]* | *0* |
| *Error count [T2-]* | *0* |
| *Error count [T1-]* | *0* |
| *Error count [T1+]* | *2* |
| *Error count [T2+]* | *1* |
| *Error count [T3+]* | *1* |
| *Error count [T4+]* | *0* |
| *Statistics* | |
| *Min* | *0.658 g* |
| *Max* | *0.874 g* |
| *Spread* | *0.216 g* |
| *Average* | *0.73500 g* |
| *Sum* | *7.350 g* |
| *Standard Deviation* | *0.079 g* |
| *RDVP* | *10.747 %* |
| *SQC mode* | *Full* |
| *Method* | *SQC* |
| *Result* | *Positive* |

*Measurements*

| | |
|---|---|
| *1.* | *0.874 g* |
| *2.* | *0.812 g* |
| *3.* | *0.659 g* |
| *4.* | *0.703 g* |
| *5.* | *0.659 g* |
| *6.* | *0.799 g* |
| *7.* | *0.658 g* |
| *8.* | *0.798 g* |
| *9.* | *0.672 g* |
| *10.* | *0.716 g* |
| *Tare: Statistics* | |
| *Tare: Min* | *0.000 g* |
| *Tare: Max* | *0.000 g* |
| *Tare: Average* | *0.000 g* |
| *Tare: Sum* | *0.000 g* |
| *Tare: Measurements* | *0.000 g* |
| *1.* | *0.000 g* |
| *2.* | *0.000 g* |
| *3.* | *0.000 g* |
| *4.* | *0.000 g* |
| *5.* | *0.000 g* |
| *6.* | *0.000 g* |
| *7.* | *0.000 g* |
| *8.* | *0.000 g* |
| *9.* | *0.000 g* |
| *10.* | *0.000 g* |

*----------*

*Signature*

*.....*

**Report template:**

User in **<Printouts/SQC report printout template>** can edit report template. Variables for which the parameter is set to <Yes> will be printed.

## 26. PACKAGED GOODS CONTROL

*(function unavailable in standard design)*

The **<PGC>** work mode performs control of pre-packaged goods (single-station) based on a database containing a list of goods and operators. An control initiated at the scale is automatically completed after the specified number of packages (sample) has been control.

Based on the collected data, it is possible to assess the quality of the pre-packaged goods produced:

- in terms of compliance with the PGC Act of May 7th 2009, on Pre-packaged Goods (Journal of Laws No. 91, Item 740), directive 76/211/EEC, and the WELMEC 6.4 guideline (statutory control),
- in terms of compliance with the company's quality control system (internal control).

**The control cycle proceeds according to the following sequence:**

- selection of the operator,
- selection of the product,
- start of the control,
- taking weight readings,
- automatic completion of the control after a specified number of packages have been weighed,
- printing of the control report.

### 26.1. Procedure for starting the work mode

**Procedure:**

- Select the <**PGC**> mode, program will automatically go to the main screen,

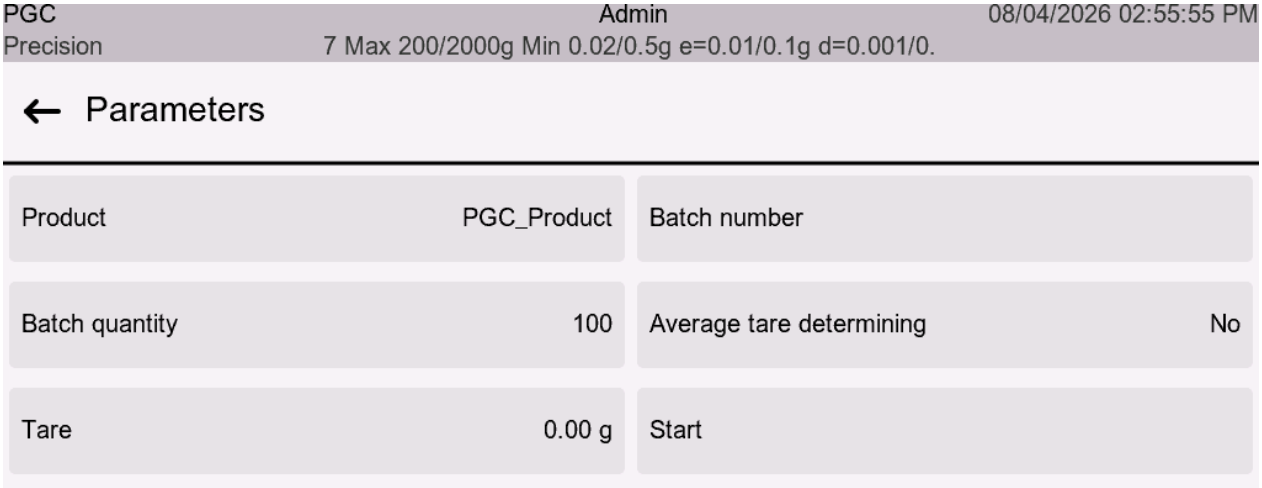
- At the same time, buttons specific to this work mode will appear in the button bar, such as:

Start control.

## 26.2. Control settings window

***Note:***
*Before opening the control settings window, you must log in as described in the manual ("LOGIN").*

When you press the button, the control settings window will open in the <**PGC**> mode's initial window:

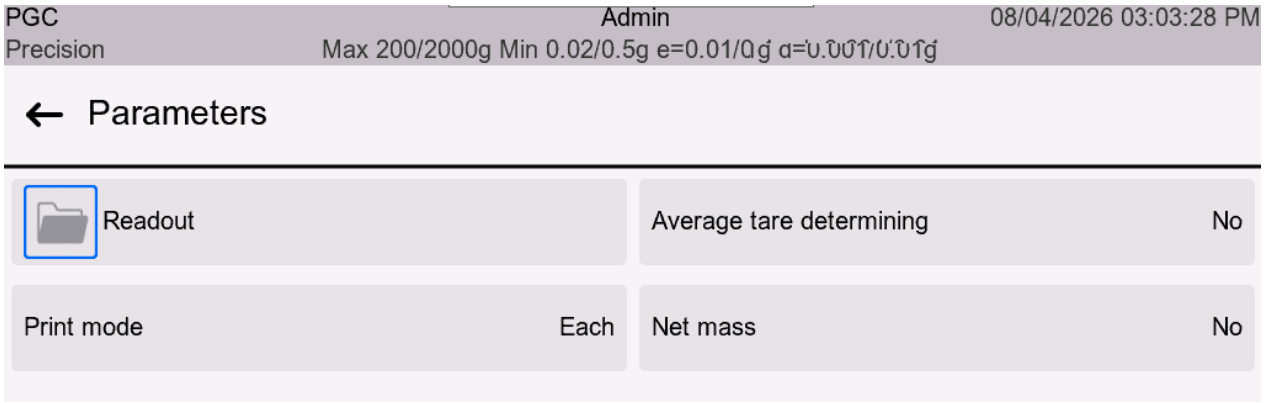



**Where:**

| | |
|---|---|
| **Product** | Select product form database |
| **Batch number** | Input field for batch number |
| **Batch quantity** | Input field for batch quantity number |
| **Average tare determining** | Select the option to calculate the average tare before starting the actual control |
| **Packaging quantity** | Field for entering the number of packages to calculate the average tare. The minimum number is 10 |
| **Start** | Start the control |

## 26.3. Parameter settings for PGC work mode

Local parameters for <**PGC**> work mode are available after clicking the button in the bottom bar:



| | |
|---|---|
| Readout | Detailed description in the instruction manual section: **SETTINGS FOR <WEIGHING> MODE - READING**. |
| Average tare determining | Enable or disable the option to calculate the average tare value before starting the control. |
| Print mode | Select the operating mode. For the <When Stable> setting, the result is confirmed manually by pressing the icon in the bottom display bar. For the <Auto> setting, operation proceeds as described in section 9.14. |
| Net mass | A parameter that allows you to change the type of weight displayed in the main window during the weighing process. |

### 26.4. Editing product for control

Product editing is conducted in submenu.

**Procedure:**

- Enter the submenu.
- Go to <**Products**> and select desired record.

**List of data defined for the audit:**

| Data Name | Description |
|---|---|
| **Name** | Item name. |
| **Code** | Item code. |
| **EAN** | Item EAN code. |
| **Mass** | Nominal weight of the item. |
| **Tare** | Item tare weight (set automatically when selecting an item from the database). |
| **PGC Mode** | Control type: Non-destructive Average Tare, Non-destructive Empty-Full, Destructive Full-Empty, Destructive Empty-Full. |
| **Batch portion** | Measurement series for control: Non-destructive Empty-Full, Destructive Full-Empty, Destructive Empty-Full. |
| **PGC Unit** | Unit of measure for the product: [g] or [ml]. |
| **Batch quantity** | Declaration of the number of units in the controlled batch. |
| **Tare Average determination interval** | Time interval in [h] specifying how often the average tare weight for a given product should be determined. |
| **Packages quantity** | Declaration of the number of packages subject to the average tare weight determination process (for Non-Destructive Average Tare control). |
| **Tare Average coefficient** | Acceptance threshold factor for the standard deviation of the average tare. The range for entering this factor is from 0.10 to 0.25. |
| **Density** | Density of the product (the range of values entered must be between 0.1 g/cm³ and 5 g/cm³). |
| **Internal Control** | Submenu for defining internal criteria for the control (see the table below). |

- **List of data for internal criteria:**

| | |
|---|---|
| **Internal Control** | Enable/disable internal control criteria.<YES> <NO> |
| **Sample Size** | Sample size value for the product. |
| **Error Value [T1-]** | Value of the negative limit error **T1-**, entered in the units of mass specified for the product. Measurements below the value **Qn-[T1-]** will be considered defective. |
| **Error Value [T1+]** | The value of the positive limit error **T1+**, entered in the units of mass specified for the product. Measurements above the value **Qn+[T1+]** will be considered defective. |
| **Number of Rejected Samples Qn – [2T1-]** | The number of negative errors **2T1-** in the tested sample that disqualify the control. |
| **Number of Rejected Samples Qn – [T1-]** | Number of negative errors **T1-** in the tested sample that disqualify the control. |
| **Number of disqualified samples Qn + [T1+]** | Number of positive errors **T1+** in the tested sample that disqualify the control. |
| **Number of disqualified samples Qn + [2T1+]** | Number of positive errors **2T1+** in the tested sample that disqualify the control. |
| **Mean limit** | Mode for calculating the mean limit value (fixed or automatic). |
| **Mean limit [-]** | Mean (negative) limit value for the test sample (applies to the mean limit value set as “fixed”). |
| **Mean limit [+]** | Mean (positive) limit value for the test sample (applies to the mean limit value set as “fixed”). |
| **Coefficient value [-Wk]** | Standard deviation multiplier for the mean limit value (negative), determined in automatic mode |
| **Coefficient value [+Wk]** | Standard deviation multiplier for the mean limit value (positive), determined in automatic mode. |

In addition to the options listed above, there are other options available for the product that can be used in other scale operating modes (e.g., WEIGHING – Min, Max, etc.)

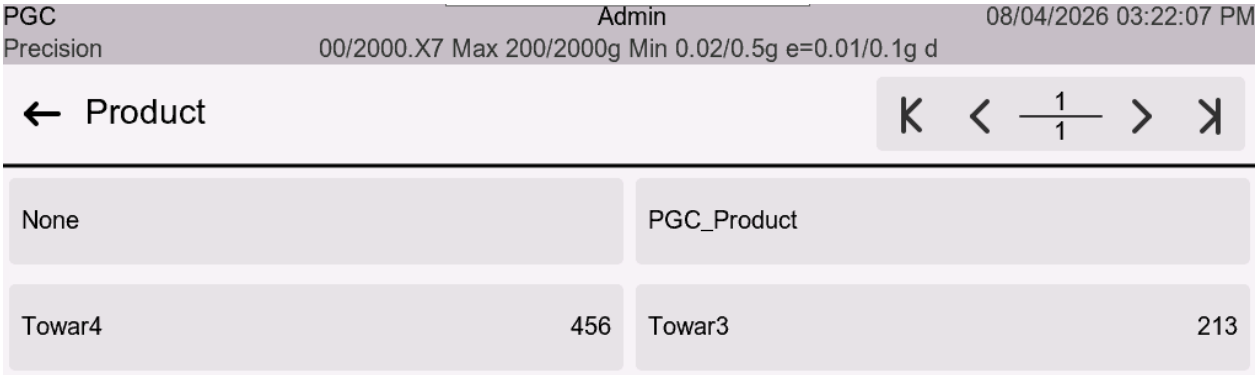
### 26.5. Conducting the control

**To start the control:**

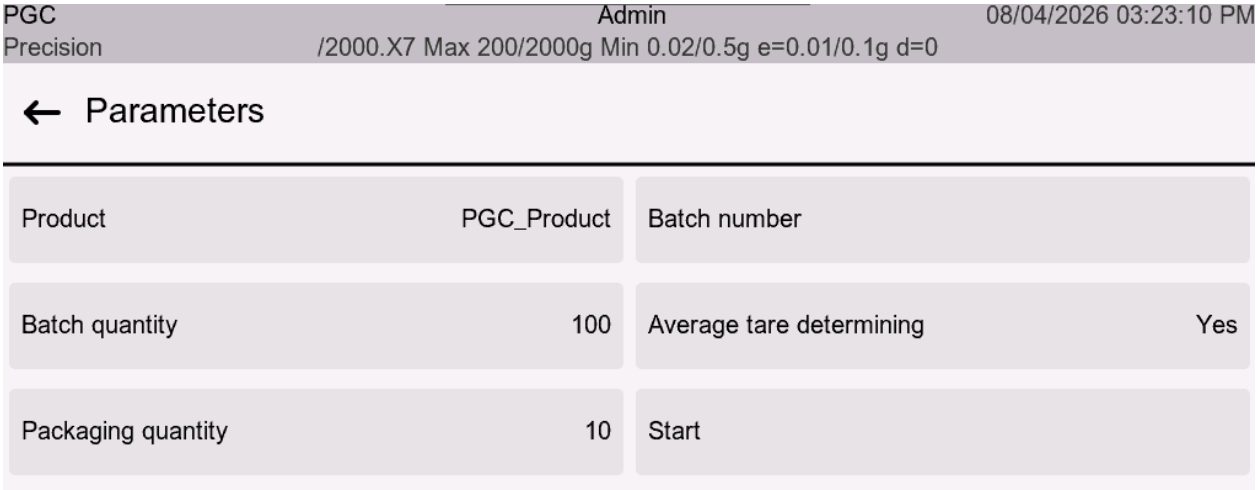
- Operator should be signed in with rights to conduct controls.

***Note:*** *The procedure for logging in and setting permissions for device users is described in the section of the manual on logging in.*

- Select the appropriate item with the control details entered correctly:



- Next, enter the general parameters for the control into the scale's memory.




Batch number – for identifying batches of controlled goods.
Batch size – based on this number, the program will select the appropriate sample size for testing.
The option to calculate the average tariff and the number of packages required to calculate it, which must be at least 10.

- Remove the load from the scale pan.
- Press the <**START**> button located at the bottom of the settings window. The program will switch to the main goods controlled window, where the controlled data will be displayed.

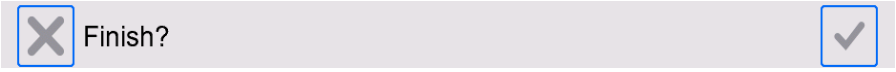
**Note:** If, before starting the control, the user:

- Has not removed the load from the weighing pan or the other conditions for zeroing have not been met (e.g., no stable weighing result), the scale will display an error message; in this case, remove the load from the weighing pan and wait until the conditions for zeroing the scale are met.
- Have not logged in, or the logged-in operator does not have the necessary permissions to perform the control, the scale will display the message: **<No permissions>**.
- Have not selected an item from the database, the scale will display the message: **<No item selected>**.

### 26.6. Abort control procedure

Once the check has started, the user can interrupt it at any time by pressing the function button (stop check) located on the bottom bar.

When you press the button (stop check), the following message will appear:




Pressing the button will return you to the ongoing inspection. Pressing the button will end the inspection and return you to the **PGC** working mode settings window.
At the same time, an inspection report with the status <**Aborted**> will be saved in the <**Control Reports**> database.

## 26.7. Procedure for Resuming an Interrupted Control in case of a Power Outage

The program saves control results in real time, which protects the user from data loss (during the control) in event of a power outage on the scale. If the scale's power is turned off during a weighing process, the software allows you to resume the interrupted weighing process once power is restored.

***Note:***
***Be sure to remove any load from the weighing pan before turning the scale back on. The scale should always be started with an empty weighing pan.***

During the scale start-up procedure, the program checks whether there is a started control in memory. If there is, a window will appear at the end of the start-up procedure asking if the program should proceed to the started control.

Pressing the <**Cancel**> button will end the interrupted check and proceed to weighing. Pressing the <**OK**> button will resume the interrupted check from the point where it was interrupted.

## 26.8. Performing a Non-Destructive Control in Average Tare Mode

Before starting the control, the user can determine the average tare by weighing the packages. This option is available after activation the <**Average Tare Determining**> function in the **PGC** work mode settings window.

The following window is displayed during tare verification:

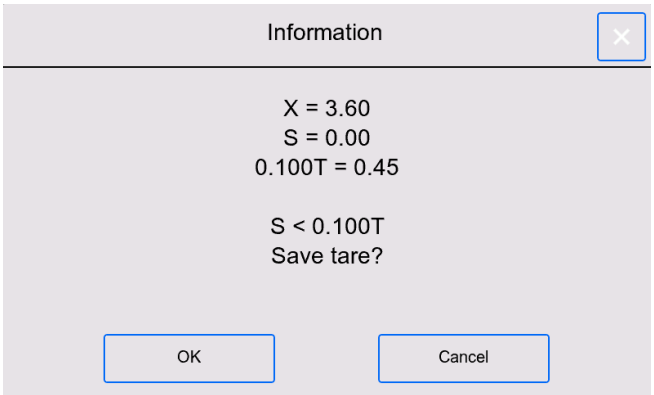
**Where:**

| | | |
|---|---|---|
| ATC | - | Value of average tare coefficient [g]. |
| $X_{avg\ op}$ | - | Average packaging mass in [g]. |

| | | |
|---|---|---|
| s | - | Standard deviation. |
| **T** | - | Characteristics of **T** negative errors in the sample. |
| **2T** | - | Characteristics of **2T** negative errors in the sample. |
| **Net** | - | Net mass of controlled packaging. |
| **Tare** | - | Packaging Tare. |
| **Load Empty** | - | Instructions regarding the process flow, including the total number of packages to be weighted. |
| | - | Button that displays information about control. |
| | - | Confirm measurements. |
| | - | Abort process. |

***Note:***
*In order for goods to be inspected using the **Non-Destructive Average Tare** control method, in accordance with the Act, the standard deviation "**S**" of the package weight – determined from at least **10** measurements – must fall within the range of **0.1** to **0.25** of the maximum permissible negative error **T** for the nominal package weigh. This range is set separately for each product in the <**Products**> database.*

When user will make last mass determining measurement, program will display a summary, and the report of the process will be saved automatically in scale's database.




Clicking the <**Cancel**> button will proceed to the control without saving the newly determined average package weight in the product data and will use the tare value that was assigned to this product in the database. Pressing the <**OK**> button will proceed to the control and simulataneously save the newly determined average package weight in the product data and apply this value during the current control.

During the control, the program analyzers the measurement results in real time and displays them in the appropirate fields on the screen, informing the user of the control results.

**Where:**

| | |
|---|---|
| **$Q_n$** | Nominal value of controlled product. |
| **$x_{śr}$** | Average mass of controlled product. |
| **Lim $_{xśr}$** | Value of disqualifying average. |
| **T** | Characteristics of negative **T** errors in the sample: **-4.5g** - value of the negative **T** error, **Max** - disqualifying number of negative **T** errors, **n** - actual number of negative **T** errors. |
| **2T** | Characteristics of negative **2T** errors in the sample: **-9g** - value of the negative **2T** error, **Max** - disqualifying number of negative **2T** errors, **n** - actual number of negative **2T** errors. |
| **Net** | Net mass of controlled product. |
| **Tare** | Packaging tare. |
| **Load full** | Process flow instruction with the total number of measurements for a given batch. |
| | Switching display between number data and chart. |
| | Button to display information about the inspection or the measurement results from the current inspection. |
| | Confirm measurements. |
| | Abort control. |

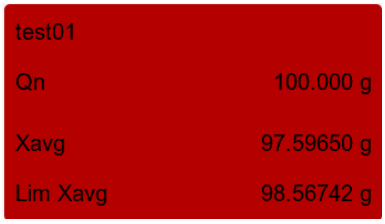
- **Control status**
  Control status is supplied with corresponding graphical representation:
  - **Positive,** standard display colours,
  - **Negative (allowing the control of second sample),**

In case of Negative (allowing the control of second sample), corresponding fields of the display will turn the background colour to orange where the values exceed over the limits.

Orange color warns, that if the next **T** error occurrence will happen, the control result will be negative.

  - **Negative**.

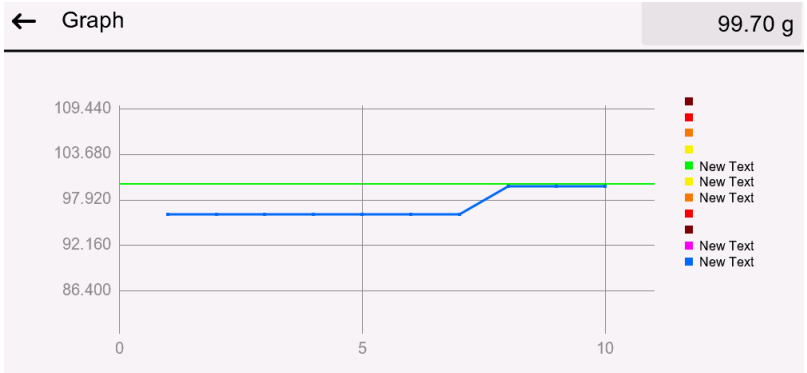
In case of Negative status, corresponding fields of the display will turn the background colour to red where the values exceed over the limits.




Average mass of controlled product is under the average disqualifying value.

- **Switching displays**

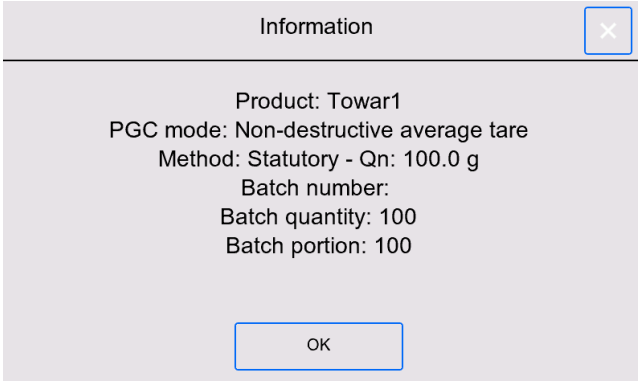
After pressing button, a chart with measurements outcomes will appear:



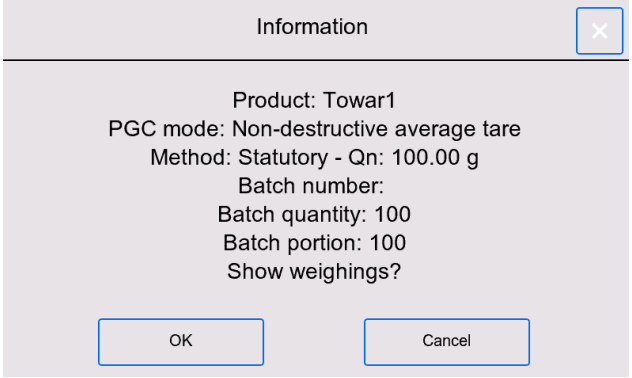

To go back from the chart view, user needs to press button.

- **Information about control**

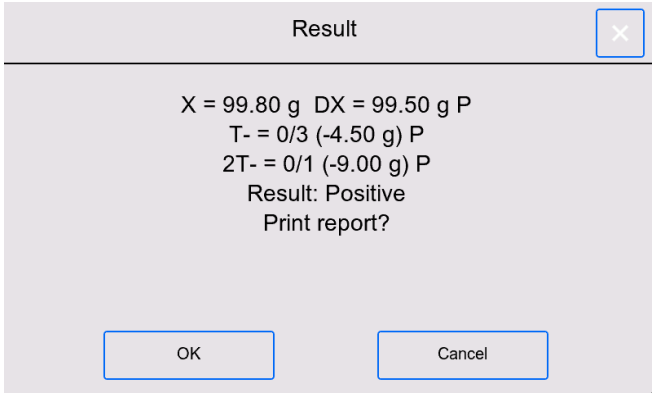
After pressing button, a window containing control settings will appear:




If the control is in ongoing state, window will look like this:

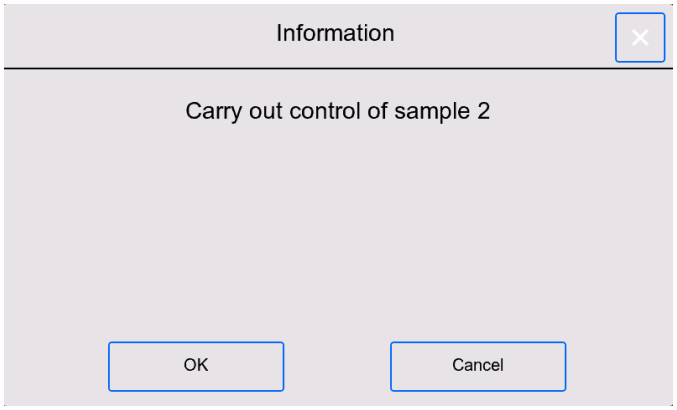



After finishing the control, a summary of the process will be generated, and the control report will be saved automatically in scale's memory:




Pressing the <**OK**> button will cause to print the report on a printer connected to th scale. On the other hand, pressing <**Cancel**> will return user to the main <**PGC**> work mode window without printing the report.

If, during the control, the number of negative errors **T** reaches a level at which, in accordance with the Act, a second sample from the lot must be inspected, then upon completion of the measurement of sample 1, the program will display message indicating that a second sample must be taken from the lot and controlled.




Click the <**OK**> button to confirm the message; this will updae the descriptions in the control window and the acceptable error limits. Once the control of the second sample is complete, the program will generate a summary of the control, and user will be able to print the report on the printer connected to the scale.

***Note:*** *A template and example of the report for determining the average tare and for packaged goods control are described later in this manual.*

### 26.9. Conducting a Non-Destrictive Empty-Full Control

For the **Empty-Full Non-Destructive** control mode, the user sets the measurement **batch** in the product data. Based on the set batch, the program prompts the user to first weigh the empty packages, then the same packages after they have been filled, following this weighing sequence:

**Where:**

| | |
|---|---|
| **T** | Characteristics of negative **T** errors in the sample: **-4.5g** - value of the negative **T** error, **Max** - disqualifying number of negative **T** errors, **n** - actual number of negative **T** errors. |
| **2T** | Characteristics of negative **2T** errors in the sample: **-9g** - value of the negative **2T** error, **Max** - disqualifying number of negative **2T** errors, **n** - actual number of negative **2T** errors. |
| **Net** | Net mass of controlled product. |
| **Tare** | Packaging tare. |
| **Load full** | Process flow instruction with the total number of measurements for a given batch.<br>1 / 30 – measurements in a batch<br>(1 / 1) – amount of batches in whole control |
| | Switching display between number data and chart. |
| | Button to display information about the inspection or the measurement results from the current inspection. |
| | Confirm measurements. |
| | Abort control. |

***Note:***
*Be sure to weigh the empty packages and the goods in their packaging in the correct order. Only then will the program correctly calculate the net weight of the goods in a specific package.*

After a completed control a report will be generated, and the conducted control will be saved automatically in the scale's memory.

***Note:*** *Template and sample report from control is described later in this manual.*

### 26.10. Conducting Destructive Empty-Full Control

For statutory **Destructive** control, regardless of the product batch size exceeding 100 units, the sample size accepted by the program for testing is 20 units. The remaining conditions for evaluating test results are determined in accordance with the Act. After selecting a product from the list with the options set for destructive control, specifying a measurement **batch**, and starting the control, the program will display messages to facilitate the control process (similar to the inspections described above).

Depending on the selected mode, the program specifies the order in which products are weighed: **empty-full** or **full-empty**.

***Note:***
*Be sure to maintain the correct order when weighing goods with packaging and empty packaging. Only then will the program correctly calculate the net weight of the goods contained in a specific package.*

After the control is complete, a summary of the process is generated, and the control will be automatically saved in the scale's memory.

***Note:*** *Template and example of the inspection report are described later in this manual.*

### 26.11. Conducting Controls based on internal criteria

Select the appropriate product with correctly entered data regarding internal control (see previous sections of the manual).
After entering the general work mode parameters into the scale's memory, start the process by pressing the <**Start**> button located at the bottom of the settings window.
During the control, the program continuously analyses the measurement results and displays them in the appropriate fields on the screen informing the user of the control results:

**Where:**

| | |
|---|---|
| **$Q_n$** | Nominal value of controlled product. |
| **$x_{śr}$** | Average mass of controlled product. |
| **Lim $_{xśr}$** | Value of disqualifying average. |
| **T** | Characteristics of negative **T** errors in the sample: **-4.5g** - value of the negative **T** error, **Max** - disqualifying number of negative **T** errors, **n** - actual number of negative **T** errors. |
| **2T** | Characteristics of negative **2T** errors in the sample: **-9g** - value of the negative **2T** error, **Max** - disqualifying number of negative **2T** errors, **n** - actual number of negative **2T** errors. |
| **Net** | Net mass of controlled product. |
| **Tare** | Packaging tare. |
| **Load full** | Process flow instruction with the total number of measurements for a given batch. |

| | |
|---|---|
| | Switching display between number data and chart. |
| | Button to display information about the inspection or the measurement results from the current inspection. |
| | Confirm measurements. |
| | Abort control. |

After the control is complete, a summary of the process is generated, and the control will be automatically saved in the scale's memory.

***Note:*** *Template and example of the inspection report are described later in this manual.*

### 26.12. Reports

*Example report on calculating the average tare*

| | |
|---|---|
| Report number | U/29/07/2026/13/16/T |
| --- | |
| Scale type | PS X7 |
| Max scope | 360 g |
| Scale's indication | 0.001 g |
| Scale Id | 13 |
| Date | 29.07.2026 |
| Product | 13:16:27 |
| Tare | test01 |
| Average Tare coefficient | 5.005 g |
| Average tare limit | 0.1000 g |
| Measurement count | 0.450000 g |
| Standard deviation | 10 |
| Method | 0.006713 g |
| | Statutory |
| Result | |
| | Positive |
| Measurements | |
| 1. 5.000 g | |
| 2. 5.000 g | |
| 3. 5.000 g | |
| 4. 5.000 g | |
| 5. 5.000 g | |
| 6. 5.000 g | |
| 7. 5.000 g | |
| 8. 5.000 g | |
| 9. 5.000 g | |
| 10. 5.000 g | |
| --- | |
| Signature | |
| …… | |

*Example report from PGC control*

| | |
|---|---|
| Report number | U/29/07/2026/13/10 |
| --- | |
| Scale type | PS X7 |
| Max scope | 360 g |
| Scale's indication | 0.001 g |
| Scale Id | 13 |
| Start date | 29.07.2026 13:09:17 |
| End date | 29.07.2026 13:10:05 |
| User | Admin |
| Product | test01 |
| Density | 1.0000 g/cm$^3$ |
| Batch number | |
| Nominal mass | 100.000 g |
| Tare | 0.0000 g |
| Error value [T1-] | 4.500 g |
| Error value [2T1-] | 9.000 g |
| Batch quantity | 100 |
| Measurements count | 30 |
| Error count [T1] | 0 |
| Error count [2T1-] | 0 |
| Error count [T1+] | 0 |
| Error count [2T1+] | 0 |
| Min | 100.001 g |
| Max | 100.424 g |
| Average | 100.11900 g |
| Sum | 3003.570 g |
| Average limit [-] | 99.90586 g |
| Standard deviation | 0.187 g |
| PGC Mode | Non-Destructive Average Tare |
| Method | Statutory |
| Result | Positive |
| ----------Measurements---------- | |
| 1. 100.001 g | |
| 2. 100.001 g | |
| 30. 100.014 g | |
| --- | |
| Signature | |
| …… | |

| | |
|---|---|
| **Report template:**<br>In the <**Printouts/Average Tare Report Template**> submenu, the scale user can edit the goods control report template. Variables for which the value <**Yes**> has been set will be printed. | **Report template:**<br>In the <**Printouts/ PGC Report Printout Template**> submenu, the scale user can edit the goods inspection report template. Variables for which the value <**Yes**> has been set will be printed. Please note that this is where the user specifies whether measurements are to be printed; the content of each measurement is defined in the <**Printouts/GLP Printout**> group. |

# 27. DATABASES

The software offers the following databases :

- Products (5 000 products)
- Users (100 users)
- Packaging (100 packaging types)
- Customers (1 000 customers)
- Formulations (100 formulations consisting of 25 ingredients maximally)
- Formulations reports (500 reports)
- Ambient Conditions (10 000 records)
- Weighings (50 000 records)
- Alibi (512 000 records)

***Note:***
*If integration with E2R program is enabled, the balance operator cannot edit some databases. Any changes in these bases are allowed only in the computer program.*

## 27.1. Operations in databases

The program allows you to take the following actions: add a new record, export data saved in bases, import data to particular bases, delete one of the records in the base, delete the entire base content, print data saved in the record. What operations are allowed depends on the operator's permission.

**ADDING A NEW RECORD**
To add a new record, do as follows:

- After entering the base, press (Add) icon in the top bar.
- Define required fields for a newly created record (the content of data depends on the type of database).
- After returning to the base window, the record you have added will be displayed in the list.

**EXPORTING**
To export the base content, do as follows:

- Insert the pendrive stick into the USB port.
- Enter the base that is to be exported.
- Press icon in the top bar.
- The program will instantly record data exported from the balance in a relevant file on the pendrive, which will be communicated via messages showed in the display.
- The file name will depend on the exported base.

| ***Database*** | ***File name and extension*** |
|---|---|
| User database | Users.csv |
| Product database | Products.csv |
| Packaging database | Packaging.csv |
| Customer database | Customers.csv |
| Formulation database | Formulations.csv |
| Non-standard printouts | CustomPrints.csv |

## IMPORTING

To import the base content, do as follows:

- Save the file with the content of the database that is to be imported on the pendrive. Remember that you can only import the files that have been previously exported to another balance, that have relevant names and extension – see table below.
- Insert the pendrive memory stick into the USB port.
- Enter the base that is to be imported.
- Press icon in the top bar.
- The program will instantly read the relevant file from the pendrive and the data included in the file will be imported to the balance, which is communicated via messages showed in the screen.

## EXPORTING A SPECIFIC REPORT OR REPORT BASE

To save data on the pendrive stick, do as follows:

- Insert the pendrive memory stick into the USB port.
- Enter the report base or specific weighing record or report, etc. that is to be saved.
- Press icon in the top bar.
- The program will instantly save the data on the pendrive stick as a *.txt file for single report and as a *.csv for reports database.

## DELETING A RECORD

To delete a record, do as follows:

- Press and hold the name.
- The following question will be displayed: <Are you sure you want to delete?>. Select OK item.
- The selected record will be removed from the list.

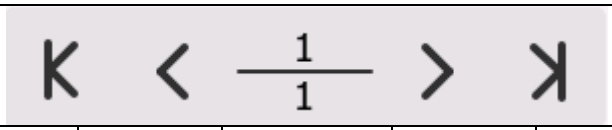
## DELETING BASE CONTENT

To delete the entire base content, do as follows:

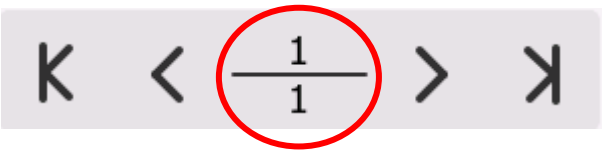
- Enter the specific base and press icon (delete all) in the top bar.
- The following question will be displayed: <Are you sure you want to delete all records?>. Select OK item.
- The base content will be deleted.

## RECORD SEARCH

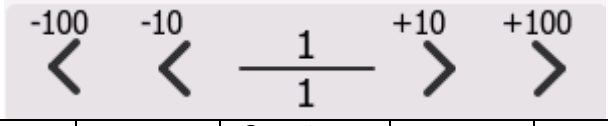
Individual databases and reports may contain many records, which are divided into pages. Each page contains 50 records. To facilitate searching through the content, it is now possible to jump to a specific number of pages in the preview.




| Jump to page number 1 | Jump one page to the left | Current page ---------- number of pages | Jump one page to the right | Jump to the last page |
|---|---|---|---|---|




After clicking on the selected field, the functionality of the buttons will change, as described below:




| | | | | |
|---|---|---|---|---|
| Jump 100 pages to the left | Jump 10 pages to the left | Current page ---------- number of pages | Jump 10 pages to the right | Jump 100 pages to the right |

## 27.2. Products

The product base contains names of all elements that may be weighed, counted, controlled.

The list of information defined for the product:

1. Name
2. Code [Product code]
3. EAN [Product EAN code]
4. Mass [Product nominal/unit mass]
5. Tare [Product tare value, set automatically upon selection of product from base]
6. Min [Lower threshold while weighing a product in WEIGHING mode]
7. Max [Upper threshold while weighing a product in WEIGHING mode]
8. Tolerance [% value counted in relation to mass, shows the field in which the measurement is considered as correct in DOSING mode]

***Note:***
*Remember to make sure products are assigned to relevant modes.*
*It is because some data have values adapted to these modes; e.g. mass in <Deviations> mode is adopted as a reference mass, while mass for <Part counting> mode is adopted as a part mass. Therefore, using the same product for various modes, the mass in data for the product will be associated with various data in these modes.*

## 27.3. Users

The user base contains a list of operators that may use the balance.

The following data can be defined for every operator:

1. Name
2. First and last name
3. Code
4. Password
5. Permissions level
6. Language

### 27.4. Packaging

It is a list of packaging for which you need to enter a name, code and mass value. While weighing, when you select the name, the tare value will be called instantly. The value with a minus sign will be displayed in the screen.

The list of data defined for packaging:

1. Name
2. Code [internal ID code for packaging]
3. Tare [packaging mass]

### 27.5. Customers

The customer base contains name of recipients who weighing is performed for.

The list of data defined for customers:

1. Name
2. Code [internal ID code for customer]
3. NIP [*taxpayer's ID*
4. Street
5. Postal code
6. City/town

### 27.6. Formulations

The formulation base contains formulations that can be instantly executed by weighing ingredients.

The list of data defined for formulations:

1. Name
2. Code
3. Ingredients
4. Target value

## 28. REPORTS

Databases: WEIGHING RECORDS and ALIBII bases cannot be imported. ALIBII base cannot be deleted either. The content of these databases can only be exported and saved in the pendrive memory stick. The names of files containing exported data include a serial number and relevant extension (see table below).

| ***Database*** | ***File name and extension*** |
|---|---|
| Formulation reports | ReportsFormulations.csv/.txt |
| Control reports | ControlReports.csv/.txt |
| Average tares | AverageTare.csv/.txt |
| Alibi | Alibi.csv/.txt |
| Ambient conditions | EnvironmentCircs.csv |
| Weighings | Weighings.csv/.txt |
| Adjustment records | CalibrationReports.csv/.txt |

To read the content of files, you need to use a special computer program by RADWAG, called ALIBI Reader. You can download it from www.radwag.pl.

The AMBIENT CONDITIONS database is for reference only. You can check ambient conditions and their history by previewing records. The data saved in particular records can be printed out by pressing icon in the top bar. The name of records include a date and time of saving data into the memory.

### 28.1. Alibi

Every weighing result sent from the balance to the printer or computer is saved in Alibi database. You can preview data for particular weighing records.

**Procedure:**

- Enter **<Reports>** submenu.
- Enter **<Alibi>** database and press the desired item.

The list of data in the database for a specific weighing record:

1. Weighing date
2. Weighing time
3. Weighing result
4. Mass
5. Tare value
6. User
7. Product name

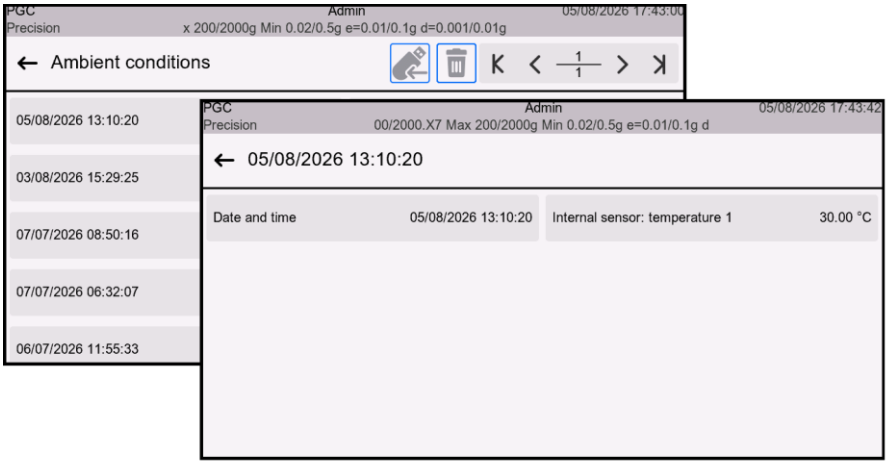
### 28.2. Ambient conditions

This section contains data related to environmental parameters. Depending on the balance configuration, it may include temperature, humidity, atmospheric pressure. When the THB module has been connected to the balance, its indications will be recorded too.

**Procedure:**

- Enter <**Reports**> submenu and press <**Ambient conditions**> field.
- Press the record field, if invisible, scroll the list of records.

- The name of the record consists of the date and time.




***Note:***
*The record is saved with environmental data in the so-called loop – if measurement no. 10 001 is saved, the measurement no. 1 is deleted from the memory instantly*.

***It is not possible to delete records saved in the memory.***

## 28.3. Weighing record

Every weighing result, sent from the balance to the printer or computer, is saved in the weighing record base. You can preview data from particular weighing records.

**Procedure:**

- Enter **<Reports>** submenu.
- Enter **<Weighing records>** database and press the desired item.

The list of data in the database for the specific weighing record:

1. Weighing date
2. Weighing time
3. Weighing result
4. Mass
5. Tare value
6. User
7. Product name
8. Customer, client name
9. Packaging, name of tare used while weighing a product
10. Working mode name
11. Result control; information on where the result was (field):
    MIN – below threshold (possibly only when <Result control – NO>)
    OK – between thresholds
    MAX – above threshold (possibly only when <Result control – NO>)
12. Variable 1
13. Variable 2
14. Variable 3
15. Variable 4
16. Variable 5
17. Profile
18. Balance levelled

## 29. COMMUNICATION

COMMUNICATION menu can be accessed in the Parameters menu. To gain access to this menu, press key. The balance can communicate with a peripheral (external device) through the following ports:

- COM 1 (RS232)
- COM 2 (RS232)
- USB 1, type A
- USB 2, type B
- Ethernet
- Wi-Fi.

To configure ports, go to <Communication> parameters group.

To enter <Communication> submenu, press key and then select „Communication" parameters group.

### 29.1. RS232 ports setting

**Procedure:**

- Select communication port, either <COM1> or <COM2>.
- Set relevant values.

For RS 232 port settings, the program offers the following transmission parameters:

- Transmission rate - 2400, 4800, 9600, 19200, 38400, 57600, 115200 bit/s
- Parity - None, Even, Odd
- Data bits - 7, 8
- Stop bits - 1, 2

### 29.2. Ethernet port settings

**Procedure:**

Select <Ethernet> communication port and set relevant values:

- DHCP - Yes – No
- IP Address - 192.168.0.2
- Subnet mask - 255.255.255.0
- Default gateway - 192.168.0.1

***Note:***
*The settings above are for reference only. Transmission parameters must be selected as per settings of the local network.*

Return to the weighing mode and restart the device.

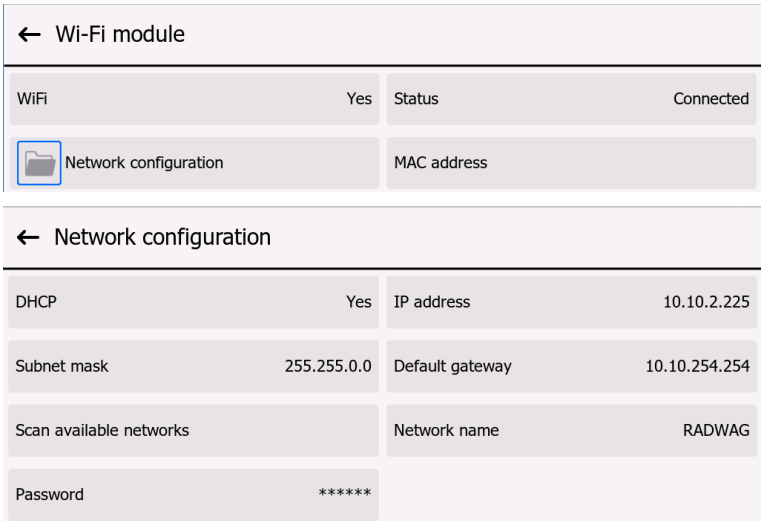
### 29.3. Wi-Fi port settings

***Note:***

1. *Select transmission parameters as per settings of the local network.*
2. *To make sure the computer can communicate using Wi-Fi port correctly, switch the computer port parameter into <WIFI> in the balance: <PERIPHERALS / COMPUTER / PORT / WIFI> and Wi-Fi parameters as per the description below.*

If the balance is equipped with the Wi-Fi module, the following pictogram will be displayed in the top bar of the screen:

*Examples of settings for Wi-Fi port*:




***Note:***
*The settings above are for reference only. Transmission parameters must be selected as per settings of the local network.*

**Procedure:**

- Select <WIFI> communication port.
- Next enter <NETWORK CONFIGURATION> parameter and set a relevant value for DHCP parameter:
  To switch DHCP into NO, manually enter such data as <IP>; <MASK>; <DEFAULT GATEWAY>.
  If you switch DHCP into YES, the program will automatically read and display the data assigned by the Wi-Fi router that the balance is connected to.
- Next enter <SEARCHING FOR NETWORK> parameter and enable the network searching procedure by pressing <SEARCHING FOR NETWORK> parameter field. The searching procedure will be initiated, when it is finished, the list of available networks with their signal strength and channel number will be displayed.
- Select the network of your interest.
- In the window, enter the network access password if the specific network is secured.
- The program will restore <NETWORK CONFIGURATION> window and the connection procedure will be initiated instantly.
- Return to the previous window by pressing ← key. In <STATUS> parameter, you will see <CONNECTING> inscription, which means that the balance is trying to connect to the network on the basis of entered settings.
- If the balance has connected to the network, the status inscription will turn into <CONNECTED> and a relevant pictogram will be showed at the top of the screen (see description of pictograms above).

- If the balance cannot connect to the network for a long time (<CONNECTING> item), it means that you have most probably enter wrong network parameters (password or other). If this is the case, make sure set values are correct and reconnect.
- If you still fail, contact the RADWAG'S service center.

The selected network and connection parameters are remembered by the program and, every time you activate the balance, the program connects to the network as per the parameters you have set.
To disconnect from the network, disable communication: COMMUNICATION/WIFI/WIFI-NO.

### 29.4. USB ports

USB port type A is used to do the following:

- connect the pendrive memory stick that should be equipped with <**FAT file system**>,
- connect the balance to the PCL printer,
- connect EPSON TM-T20 printer with a USB port.

The pendrive memory can be used to print measurement data out (switch <PRINTER/PORT parameter into <PENDRIVE> value), see description in the section 29 of the manual. Additionally you can also copy databases (see section 27) and operator parameter settings between balances. After inserting the pendrive memory stick into the USB port, Export/Import parameters group will open. In this group, the authorized operator may feel free to use the following variants:

- Export: databases, operator parameters
- Import: databases, operator parameters

While exporting, the program saves files with the content of particular bases and parameters on the pendrive stick. When the data have been exported, you can import any X7 balance.

Using the PCL printer, please remember that printer drivers print the page if it is full; it means that the page is printed only after you have pressed the PRINT key a few or a dozen times (depending on the size of printout).
You can obtain the printout every time you press the PRINT key if you set <0C> control code as SUFFIX – eject page (*description of the function can be accessed in the section 29 Printer).*

USB 2 port type B is used to do the following:

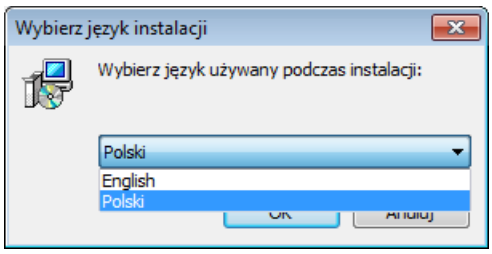
- connect the balance to the computer.

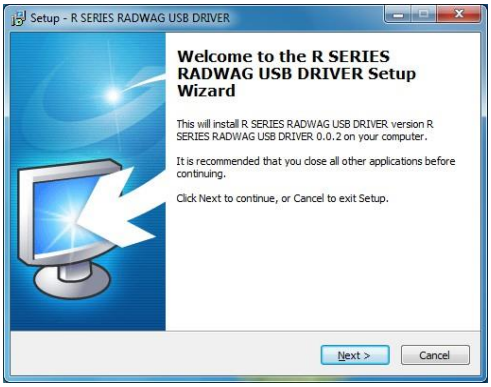
To connect the balance to the computer, install COM virtual port in the computer.
To do so, download the driver installer from www.radwag.com:
*RADWAG USB DRIVER x.x.x.exe*.

**Order of actions:**

1. Run the driver installer

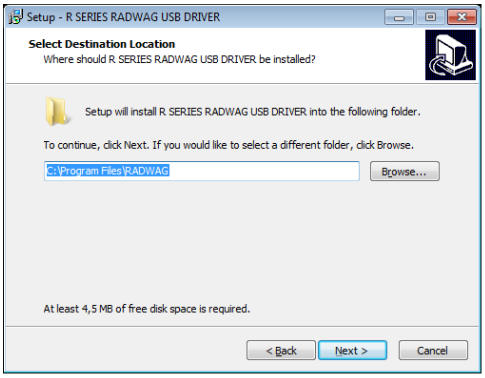
**Installer welcome window:** Select the language.





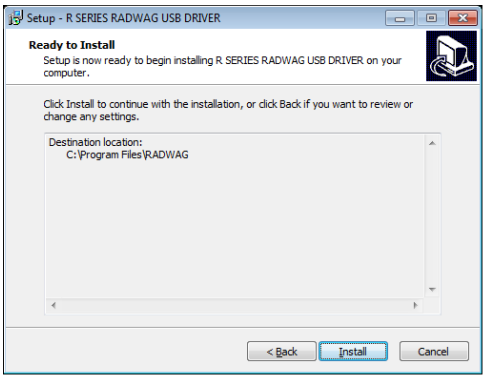

To continue, press **„Next”** key.

**Installation path selection window:**

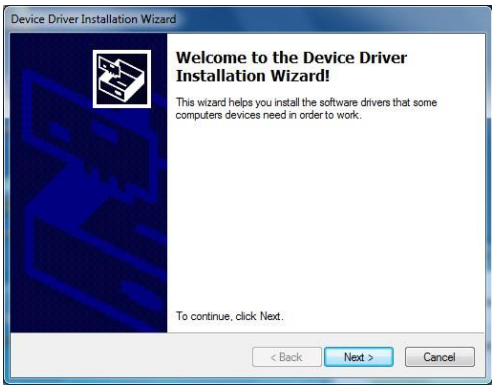


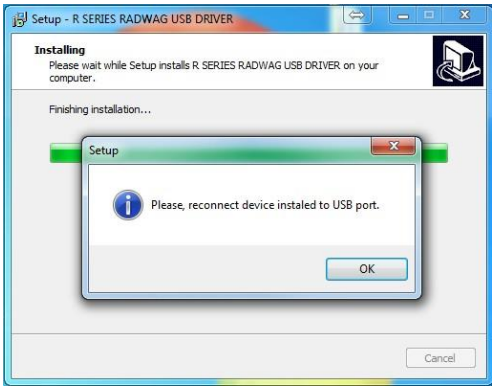

In this window, select the program location, and then press **„Next”** key.

**Ready for installation window:**




To initiate the installation procedure, press **„Install”** key and follow the tips below by pressing relevant keys displayed in respective boxes.

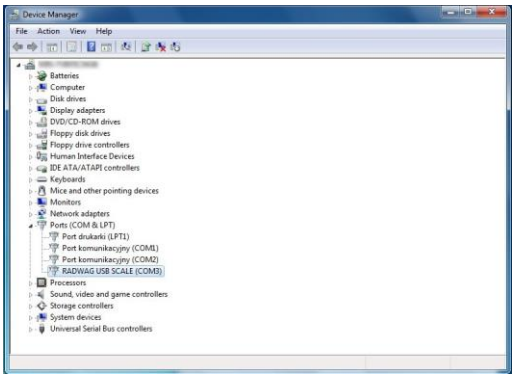





2.


After you have installed the driver, connect the balance to the computer using a USB A/B cable whose length is up to 1.8m (if the balance has previously been connected to the computer, disconnect and reconnect the USB cable).

3. The system will detect a new USB device and start searching for a dedicated driver instantly.

4. 


Check computer properties for the virtual COM number.

*In this particular case, it is STMicroelectronics Virtual COM Port (COM8)*.

5. Set balance parameters: in COMPUTER/PORT, switch into USB.
6. Run the program used to read measurements made using the balance.
7. Set communication parameters in the program – selection of COM port (in this case – COM8), assigned while installing drivers.
8. Start integration.

## 30. PERIPHERALS

PERIPHERALS menu contains the parameters menu. To gain access to this menu, press key. The menu includes a list of peripherals that may be integrated with the balance.

### 30.1. Computer

In <Computer> submenu, configure settings.

**Procedure:**

- Press key and then <Peripherals/Computer> fields.
- Set balance parameters related to integration with the computer.
- Select computer port:
  - available items: none, COM 1, COM 2, USB, Ethernet, Wi-Fi, USB Free Link

*NOTE: To change the port from USB to USB Free Link, at first select other port (e.g. none, COM1, etc.), and then select USB Free Link port. While you are switching back to USB port, the change procedure is similar to the one described above.*

**USB FREE LINK** – USB port type B that the computer is connected to. This tool is used to enter data for peripherals, serving as a keyboard. After you have modified the non-standard printout and sent a relevant command from the computer or have pressed the ENTER key in the keyboard, the data from the non-standard printout are directly sent from the balance to such software as Excel, Word, Notebook and many other.
For assurance of correct integration with software, select <USB FREE LINK> port and configure settings for this port:

SPREADSHEET
- value YES (.) – compatible with Excel programs, where a dot **(.)** is used as the decimal separator when transmitting the mass value.
- value YES (,) – compatible with Excel programs, where a comma **(,)** is used as the decimal separator when transmitting the mass value.
- value NO – compatible with other programs (the mass value is transmitted as text.

DELAY – if, during communication with a program such as Excel, transmitted data are being "lost" (due to auto-fill or auto-formatting features of the software), the parameter value should be set to <2>. If issues persist, the parameter value should be increased. The operator can adjust the parameter within a range from 0 (fastest data transmission) to 9 (slowest data transmission, approximately 10 characters per second).

For the Free Link printout (keyboard emulator), all languages using the American (US English) "QWERTY" keyboard layout are supported. These are languages that do not use special characters.
Additionally the following language are supported:

- Polish, for the "Polish (Programmer)" keyboard layout. In the balance printer options, the Windows-1250 code page (Central European, Latin-2) must be selected. Added Polish diacritical characters: ą, ć, ę, ł, ń, ó, ś, ż, ź.
- German, for the "German (Germany)" keyboard layout. In the balance printer options, the Windows-1252 code page (Western European, Latin-1) must be

selected. Added special characters such as: ä, ö, ü, ß. The keyboard layout is changed to "QWERTZ", with the distinctive 'ß' character located to the right of the zero key.

- French, for the "French (France)" keyboard layout. In the balance printer options, the Windows-1252 code page (Western European, Latin-1) must be selected. Added special characters such as: é, è, ç, à, ù. The keyboard layout is changed to "AZERTY".

***Note!***
*In the Free Link printout, you can obtain characters available only in the keyboard.*
*Upper-case letters and special characters obtained through the combination of keys with „Shift" key pressed are entered too.*
*In Polish and German, basic special characters have been added. These characters were obtained through combination of keys with „Alt" key pressed.*
*Other special characters in the Free Link printout are not supported.*

- Port settings
  - settings related to specific port which the computer is connected to.

    *NOTE:*
    *For Ethernet and WiFi ports, the Timeout parameter will be visible. It represents the time delay at which the program waits for disconnection from the device, from the moment the last command from this device was received.*
    *Timeout parameter value is entered in milliseconds [ms].*

- Address
  - setting of the address of the balance that the computer is connected to.

- Weighing printout template
  - You can design your own printout to the computer using the printout template box. The principles of creating printouts can be accessed in the section 12.3.

- Continuous transmission – this parameter allows you to enable or disable the continuous transmission of the weighing result. It is possible to set one of three options:
  - continuous transmission in the adjustment unit: regardless of what mass unit is currently selected, the transmission of balance indications is in the main unit (adjustment unit,
  - continuous transmission in the current unit: transmission of indications is in the currently used unit and changes dynamically as the unit in the screen changes (Units key),
  - continuous transmission is disabled <NONE>,

  ***Note:*** *Continuous transmission can also be enabled/disabled by sending a relevant command from the computer (see: COMMUNICATION PROTOCOL).*

- Interval
  This parameter allows you to set printout frequency for continuous transmission. The printout frequency can be set in seconds, with an accuracy of 0.1 sec. You can set any time value ranging from 1000 to 0.1 second.
  This setting applies to continuous transmission in the adjustment unit and in the current unit as well as for continuous transmission activated via the computer command.

### 30.2. Printer

In <PRINTER> submenu, you can select the device port which data will be sent to after you press ↵ key in the keyboard. The content of data is set in <PRINTOUTS/GLP PRINTOUT> parameter.

**Procedure:**

- Press key.
- Enter <PERIPHERALS> menu.
- Next enter <PRINTER> menu group.
  - Set parameters related to integration with printer: <PORT>, which the printout is to be sent to after pressing key(when printer is connected); available options:

*NOTE: To change the port from USB to USB Free Link, at first you need to select other port (e.g. none, COM1, etc.), and then select USB Free Link port. If you switch back to USB port, the procedure is similar to the one above.*

- **COM 1** or **COM 2** RS 232 port to which the printer is connected.
- **USB** – USB 1 type A port, used to connect a PCL printer or receipt printer
- **Ethernet** – a port that can transmit data to a special RADWAG program or any terminal opened on a computer connected to the balance via a network.
- **PENDRIVE** – USB 1 type A port used to connect a pendrive memory stick. For this option, the file format must be specified. The operator can choose to save data in the following formats:
  - *.txt format (a text file that can be opened using a standard notepad on a computer),
  - *.csv (.) format (a file that can be opened in Excel, where the decimal separator is a **dot (.)**),
  - *.csv (,) format (a file that can be opened in Excel, where the decimal separator is a **comma (,)**).
- **WIFI** – a Wi-Fi port that can transmit data to a special RADWAG program or any terminal opened on a computer connected to the balance via Wi-Fi. It can also connect to a printer equipped with a Wi-Fi port or a network printer.
- **USB PC** – USB 2 type B port, used to connect a computer with a running RADWAG program or any terminal.
- **USB FREE LINK** – USB type B port connected to a computer. This tool allows for data entry, acting as a peripheral device functioning like a keyboard. After proper configuration of the custom printout and sending a command from the computer or pressing the ENTER key on the balance keypad, data from the custom printout is directly entered into software like Excel, Word, Notepad, and many others.
- To ensure proper communication with computer programs, after selecting the **<USB FREE LINK>** port, configure the following settings:

| | |
|---|---|
| SPREADSHEET | – value YES (.) – compatible with Excel programs, where a dot **(.)** is used as the decimal separator when transmitting the mass value.<br>– value YES (,) – compatible with Excel programs, where a comma **(,)** is used as the decimal separator when transmitting the mass value.<br>– value NO – compatible with other programs (the mass value is transmitted as text. |
| DELAY | – if, during communication with a program such as Excel, transmitted data are being "lost" (due to auto-fill or auto-formatting features of the software), the parameter value should be set to <2>. If issues persist, the parameter value should be increased. The operator can adjust the parameter within a range from 0 (fastest data transmission) to 9 (slowest data transmission, approximately 10 characters per second). |

For the Free Link printout (keyboard emulator), all languages using the American (US English) "QWERTY" keyboard layout are supported. These are languages that do not use special characters:

- Polish, for the "Polish (Programmer)" keyboard layout. In the balance printer options, the Windows-1250 code page (Central European, Latin-2) must be selected. Added Polish diacritical characters: ą, ć, ę, ł, ń, ó, ś, ż, ź.
- German, for the "German (Germany)" keyboard layout. In the balance printer options, the Windows-1252 code page (Western European, Latin-1) must be selected. Added special characters such as: ä, ö, ü, ß. The keyboard layout is changed to "QWERTZ", with the distinctive 'ß' character located to the right of the zero key.
- French, for the "French (France)" keyboard layout. In the balance printer options, the Windows-1252 code page (Western European, Latin-1) must be selected. Added special characters such as: é, è, ç, à, ù. The keyboard layout is changed to "AZERTY".

  ***Note!***
  *In the Free Link printout, you can obtain characters available only in the keyboard.*
  *Upper-case letters and special characters obtained through the combination of keys with „Shift" key pressed are entered too. In Polish and German, basic special characters have been added. These characters were obtained through combination of keys with „Alt" key pressed. Other special characters in the Free Link printout are not supported.*

*The measurement printout template is described in the section related to printouts.*

Additionally you can enter (send) a relevant control code (in a hexadecimal format) to the printer at the outset of the printout - <PREFIX> parameter and at the end of the printout - <SUFFIX> parameter. By sending these codes, you can (globally) control information or activities taken at the beginning and/or end of each printout send by the balance to the printer.
This function will be most frequently used to initially send information about the code page of the printout sent by the balance and finally send the command allowing the paper cut in EPSON printers (if the printer is equipped with a cutter).
Settings for <PREFIX> and <SUFFIX> parameters apply to all printouts sent by the balance; e.g. adjustment reports, density, statistics, etc, and printouts: header, GLP printout, footer.

***Note:***
*Please remember that entering the paper cut in <SUFFIX> parameter (control code) will cause the relevant code to be sent after each printout. If the operator wants one printout to be composed (entirely) of HEADER, GLP PRINTOUT AND FOOTER, and printout to be cut after printing the FOOTER, the paper cut command must be inserted only for FOOTER settings as a non-standard printout in which a variable <{150}> (paper cut for EPSON printer) will be included. This being the case, <SUFFIX> command must be empty.*

To make sure the balance is integrated with the printer properly (proper printout of letters with diacritical characters for a specific interface language), select relevant transmission rate; the one applicable to the printer (see printer settings) and assure compliance of the code page of the printout with the printer code page. The compliance of the code page can be obtained in two ways:

- by setting a relevant code page in printer settings (see printer manual) – the same as the printout code page that the balance is working with for particular menu languages:

| *Code page* | *Language* |
|---|---|
| **1250** | POLISH, CZECH, HUNGARIAN |
| **1251 or 866** | RUSSIAN |
| **1252** | ENGLISH, GERMAN, SPANISH, FRENCH, ITALIAN |
| **1254** | TURKISH |
| **1256** | ARABIC |

- by sending a control code from the balance. The code sets a relevant printer code page before the printout instantly (the same as the printout code page applicable to the balance) before any data are printed out (only if the printer allows so – see printer manual).

**NOTE: CODES MUST BE ENTERED IN A HEXADECIMAL FORM!**
*Examples of balance settings for correct integration (Polish characters printout) with the printer connected to the RS232 port*:

1. ***With dot matrix printer EPSON TM-U220D***
   *The communication parameters of the port which the printer is connected to:*
   - *transmission rate – 9600 bit/s*
   - *parity – none*

   *Printer parameters in PERIPHERALS group:*
   - *port – COM 1 or COM 2 (the one that the printer is connected to)*
   - *code page – **852***
2. ***With thermal printer EPSON TM-T20***
   *The communication parameters of the port which the printer is connected to:*
   - *transmission rate – 38400 bit/s*
   - *parity – none*

   *Printer parameters in PERIPHERALS group:*
   - *port – COM 1 or COM 2 (the one that the printer is connected to)*
   - *code page – **1250***
   - *prefix – **1B742D***

   *or printer parameters in PERIPHERALS group:*
   - *port – COM 1 or COM 2 (the one that the printer is connected to)*
   - *code page – **852***
   - *prefix – **1B7412***

If there are other characters (in verified balances) in the printout, in the place of last digit markers, they you need to enter the UK mark table code: 1B5203 aside from the code page code in <CONTROL CODES> parameter. This being the case, setting <CONTROL CODES> parameter will take the following form: *prefix* – ***1B7412*1B5203.**

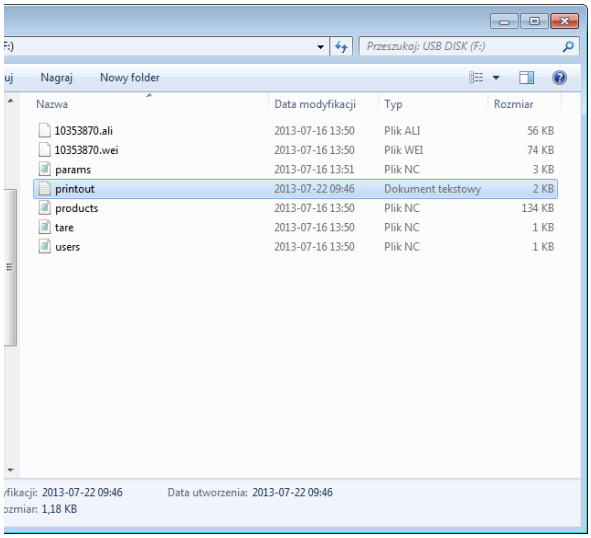
Control codes for exemplary code pages:

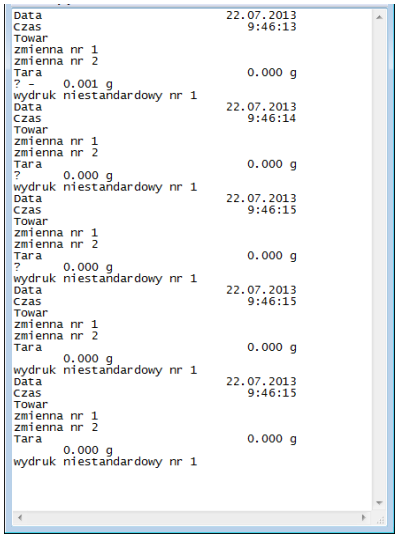
| *Control code* | *Page or other command* |
|---|---|
| 1B7412 | Code page 852 |
| 1B7411 | Code page 866 |
| 1B742D | Code page 1250 |
| 1B742E | Code page 1251 |
| 1B7410 | Code page 1252 |
| 1B7430 | Code page 1254 |
| 1B7432 | Code page 1256 |
| 1B7433 | Code page 1257 |
| 1B5203 | UK mark table |
| 1B5202 | DE mark table |
| 1D564108 | Paper cut |
| 0C | Page ejection in PCL printer |

## 30.3. Recording measurement data on pendrive

The program allows you to save measurement data in the pendrive memory.
To perform such an operation, follow the steps below:

- Insert the pendrive stick into the USB 1 port, type A.
- Set <PENDRIVE> item in <PERIPHERALS/PRINTER/PORT> parameter.
- Set the file format as either *.txt or *.csv.
- Return to the weighing mode.
- From now on, every time you press key, you will save measurement data (compliant with settings for GLP PRINTOUT) in the *.txt or *.csv file that will be created by the program instantly. The name of the file will take the following form: *printout.txt or printout.csv*.
- To make sure the data in the file are remembered, before you remove the pendrive from the USB port, wait for about 10 seconds after you have saved the last measurement. Next connect the pendrive to the computer and read the file using a notebook or Excel.




The data can be printed out using any printer connected to the computer. In the same file, you can save further data. The program will add data to the file on the pendrive, you can keep on saving measurements in the same file (previously created).

***Note:*** *The pendrive must be supplied with* ***<FAT file system>.***

## 30.4. Extra display unit

<EXTRA DISPLAY UNIT> submenu contains balance settings for integration with the WD-6 external display unit.

**Procedure:**

- Press key.
- Enter <PERIPHERALS> menu.
- Next enter <EXTRA DISPLAY UNIT> menu group.
- Set balance parameters related to integration with the extra display unit:
  <PORT> - selection of the port that the extra display unit is to be connected to
  - available options: NONE, COM 1, COM.

***Note:***
*The balance can be integrated with the RADWAG's extra display unit.*
*To assure correct integration with the extra display unit, set the communication speed into 115200 bit/s for the port that the extra display unit is connected to.*

The extra display unit has a lower row in which additional information may be displayed. It can be such texts and data as date, tare, etc. (variable data from the balance). The content of displayed data is set in the balance.

**Procedure:**

- Press key.
- Enter <PERIPHERALS> menu.
- Next enter <EXTRA DISPLAY UNIT> menu group.
- Enter <LOWER ROW TEMPLATE> parameter and you will see a keypad box. Enter the data to be displayed.

  If you intend to display a text, enter it and confirm by pressing OK key. The text may contain up to 19 characters. If it is to be one of variables, enter it as per principles, e.g. {3} – time. The list of available variables can be accessed in the section 11.4 of the manual.

## 31. AMBIENT CONDITIONS

The group of parameters in which you can enable readout of ambient conditions from the THB 3/5 ambient conditions module, and define temperature and humidity limit values and their fluctuations for 1 hour. The values that have been entered specify information display (via relevant icons), whether the values read from the sensors correspond to the permitted limits.

Sensor settings:

- Ambient conditions recording interval [min]: this parameter specifies the frequency of recording data from the sensors in the base and frequency of refreshing icons that show the ambient conditions status.

## 32. COMMUNICATION PROTOCOL

| | |
|---|---|
| ⚠ | ***To see a detailed description of the protocol for communication between the balance and computer, read „CBCP-07".*** |

### 32.1. Manual / automatic printout

You can generate printouts manually or automatically:

- Manual printout: press ↵ key when the value has stabilized.
- The automatic printout is generated automatically, as per settings, as for automatic printout (see section 12).

The content of printout depends on the settings for <Standard printout> - <Weighing printout template> (see section 12).

Mass printout format:

| 1 | 2 | 3 | 4 -12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|
| Stability mark | space | mark | mass | space | unit | | | CR | LF |

| | |
|---|---|
| Stability mark | [space] if stable |
| | [?] if unstable |
| | [!] if air buoyancy compensation is enabled |
| | [^] if upper range limit is exceeded |
| | [v] if lower range limit is exceeded |
| Character | [space] for positive values or |
| | [-] for negative values |
| Mass | 9 marks with a dot and right alignment |
| Unit | 3 marks with left alignment |

**Example:**

_ _ _ _ _ _ **1 8 3 2 . 0 _ g _ _ CR LF** – printout generated from the balance after pressing ↵ key for settings for <Weighing printout template>:

| | | | |
|---|---|---|---|
| N (number of measurements) | **NO** | Universal variable 1 … 5 | **NO** |
| Date | **NO** | Net | **NO** |
| Time | **NO** | Tare | **NO** |
| Levelling | **NO** | Gross | **NO** |
| Customer | **NO** | Current result | **NO** |
| Warehouse | **NO** | Additional unit | **NO** |
| Product | **NO** | Mass | **YES** |
| Packaging | **NO** | Non-standard printout | **NO** |

## 33. PERIPHERALS

The balance may be integrated with the following devices:

- computer,
- EPSON receipt printer,
- PCL printer,
- any peripheral device supporting ASCII protocol.

## 34. ERROR MESSAGES

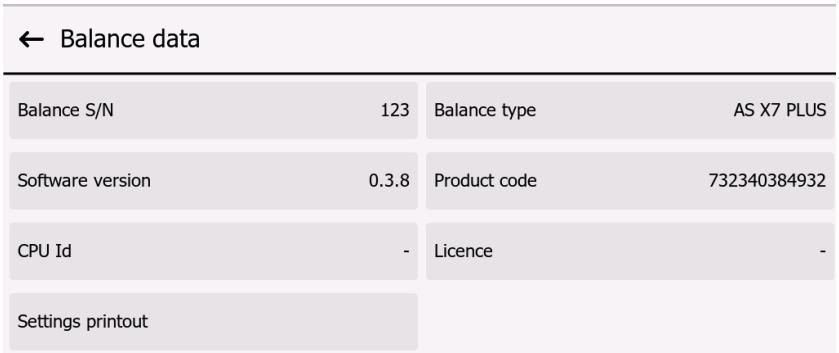
| | |
|---|---|
| Max weighing threshold exceeded<br>Unload the weighing pan | Display capacity out of range<br>Unload the weighing pan |
| Min weighing threshold exceeded<br>Install weighing pan | Zeoring out of range<br>Press tarring button or restart the balance |
| Start mass out of range<br>Install weighing pan | Zeoring/tarring time out of range<br>Weighing indication unstable |
| Tarring out of range<br>Press zeoring button or restart the balance | |

## 35. ADDITIONAL EQUIPMENT

| Type | Name |
|---|---|
| P0151 | RS232 cable for printer |
| RTP-UEW80 or RTP-RU80 | Receipt printer |
| | PCL printer |
| SAL | Anti-vibration table for AS and PS series balances |
| | PC USB keyboard |

## 36. BALANCE DATA

This menu contains information on the balance and program. These parameters are for reference only.




Select <Settings printout> parameter to send the balance settings (all parameters) to the printer port.