

AP-12

USER MANUAL

IMMU-1111-07-12-22-EN



www.radwag.com

Congratulations and thank you for selecting RADWAG product.
You have purchased a device that has been designed and manufactured to give you years of service.
Please read this user manual carefully, this shall guarantee reliable operation.

DECEMBER 2022

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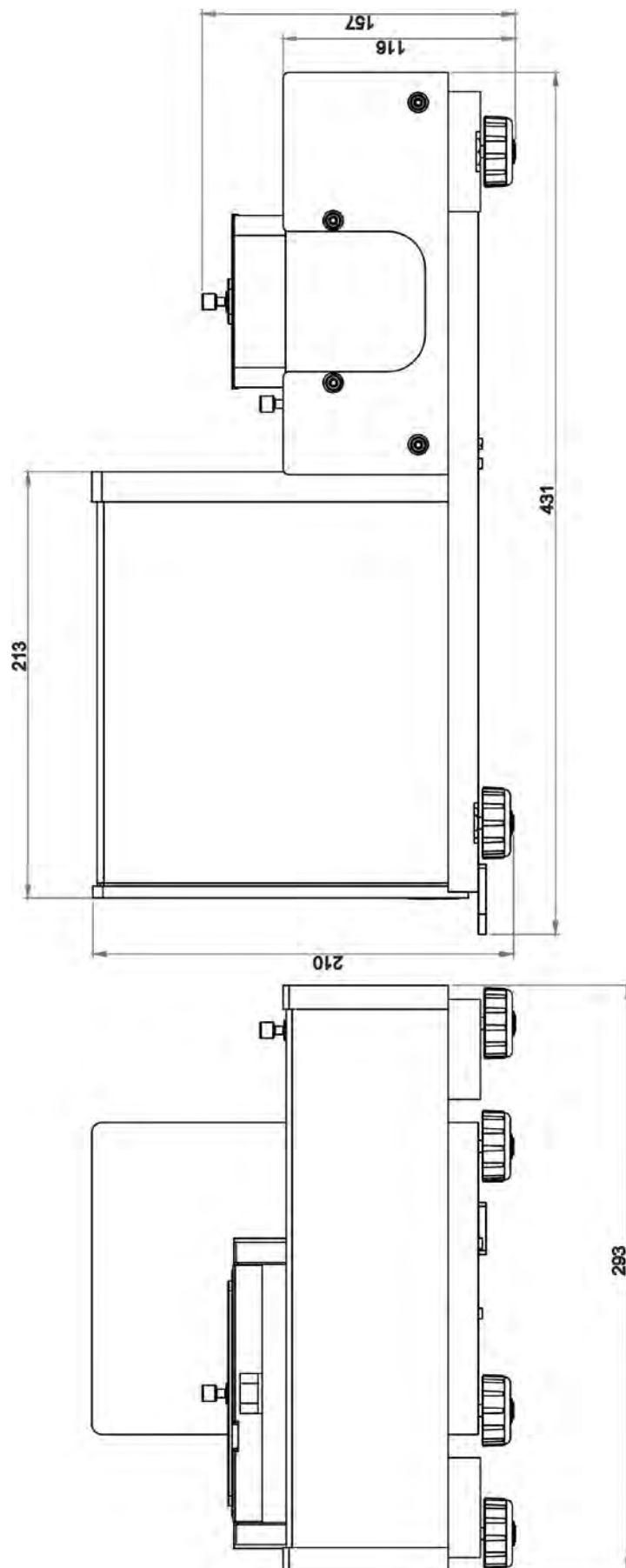
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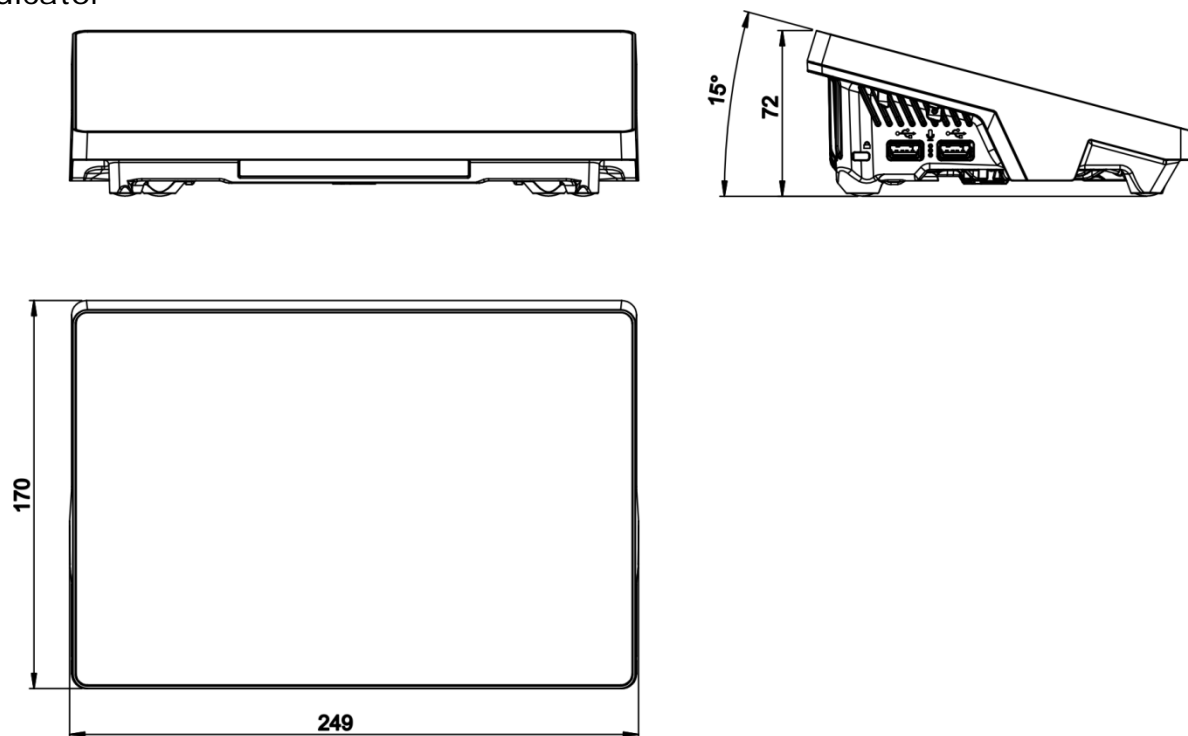
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1. GENERAL INFORMATION

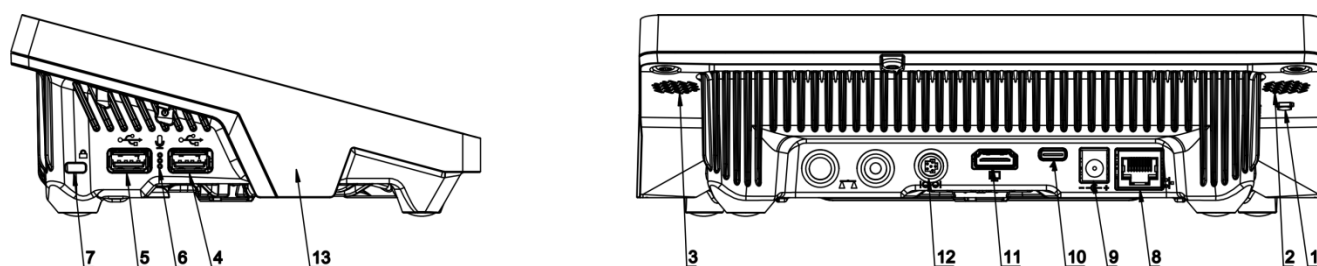
1.1. Dimensions



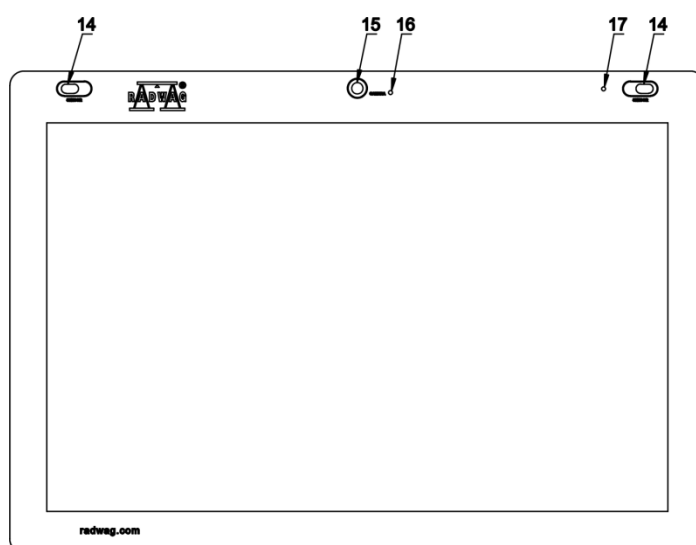
Indicator



1.2. Connectors



Top view



1	Button for hard restarting or switching the balance off/on.	10	Power supply socket – USB type C
2	Left speaker	11	HDMI socket
3	Right speaker	12	Media box socket
4	USB type A	13	RFID sensor
5	USB type A	14	Proximity sensors
6	Microphone	15	Camera
7	Kensington Lock	16	Camera diode
8	Ethernet socket	17	Signalling diode
9	Power supply socket		

1.3. Intended Use

The AP-12 is designed for pipette calibration.

1.4. Precautions

- Prior to the first use, carefully read this user manual. Use the device only as intended.
- Do not operate the touch panel using sharp-edged tools (knife, screwdriver, etc.).
- Load the weighing pan with loads of gross weight which does not exceed the maximum capacity.
- Mind not to leave heavy loads on the weighing pan for longer periods of time.
- In case of damage, immediately unplug the device from the mains.
- The balance to be decommissioned must be decommissioned in accordance with valid legal regulations.
- Do not use the balance in areas endangered with explosion. The balance is not intended to be operated in hazardous areas.

1.5. Warranty Conditions

- A. RADWAG is obliged to repair or exchange all elements that appear to be faulty by production or by construction.
- B. Defining defects of unclear origin and means of their elimination can only be realized with assistance of the manufacturer and user representatives.
- C. RADWAG does not bear any responsibility for damage or loss resulting from unauthorized or inadequate performing of production or service processes.
- D. The warranty does not cover:
 - mechanical damage caused by product exploitation other than intended, damage of thermal and chemical origin, and damage caused by lightning, overvoltage in the power grid or other random event,
 - damage caused by product exploitation other than intended, damage, when security seal stickers protecting balance housing against unauthorized access are removed or broken,
 - damage caused by liquids and natural wear, or by overloading the measuring mechanism,
 - damage caused by inappropriate setting or by electrical system failures,
 - inappropriate cleaning habits.
- E. Loss of warranty takes place if:
 - a repair is carried out outside RADWAG authorized service point,
 - service claims intrusion into mechanical or electronic construction by unauthorized people,
 - the balance does not feature security stickers.
- F. For detailed warranty conditions read the warranty certificate.

1.6. Supervision Over Metrological Parameters

Metrological parameters need to be verified at determined time intervals. The frequency of inspection is determined by the ambient conditions under which the balance is operated, the type of processes performed, and the quality management system used.

1.7. User Manual Significance

Even if you are experienced and have already worked with this type of balance, you are still obliged to read this user manual carefully prior to switching the device on. This user manual provides all the necessary operation-related information. Following the user manual guidelines guarantees correct weighing instrument performance.

1.8. Operator Training

The balance must be operated and supervised only by personnel who have been trained to use this type of weighing instrument.

2. TRANSPORT AND STORAGE

2.1. Delivery Check

Upon delivery, it is necessary to check the package and the device. Make sure that your package bears no signs of damage. Otherwise, contact the manufacturer's representative.

2.2. Packaging

Keep all package elements in case your device is transported in the future. Remember that only the original packaging can be used for shipping purposes. Prior to packing, uncouple any cables and remove any separable components (weighing pan, shields, inserts). The remaining components must be packed into their original packaging. This is to protect them against potential damage during transportation.

3. UNPACKING AND INSTALLATION

3.1. Workstation

- Operate the device in a workroom free of vibrations and shakes, where there are no air drafts nor dust.
- Make sure that the ambient temperature ranges between: $+10\text{ °C} \div +40\text{ °C}$,
- Make sure that the relative humidity is not higher than 80%.
- Make sure that in the course of balance operation, the room temperature changes slowly and gradually.
- Place the balance either on a robust-design table or on a wall bracket that is both distant from heat sources and insusceptible to vibrations.
- Should static electricity affect the weighing result, ground the balance's base. The grounding screw is located at the back of the balance base.
- Ultra-microbalances and other devices installed by RADWAG employees in their workplace cannot be relocated. Only authorized RADWAG employees can move the device to another location.

3.2. UNPACKING

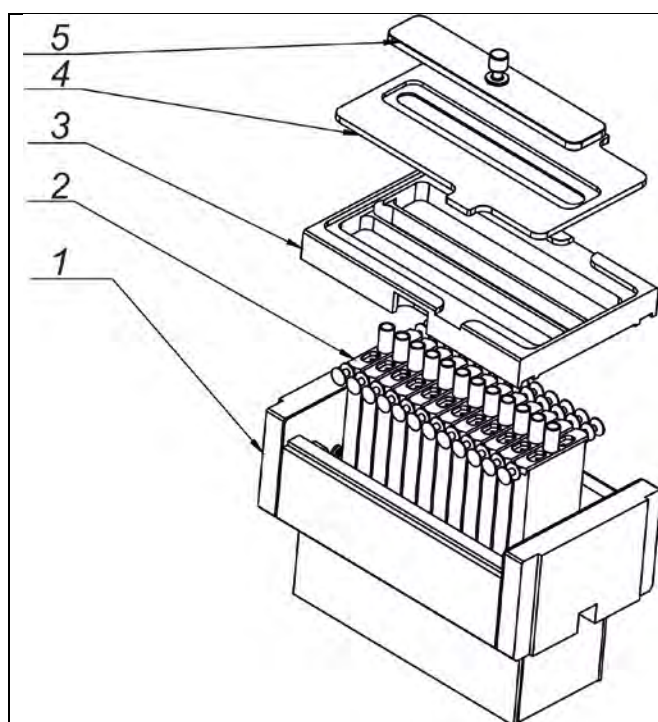
Cut the adhesive tape. Take the balance out of the packaging. Open the accessory box and take the balance components out of it.

3.3. Standard Delivery Components

- Balance
- Weighing pan with positioner
- Standard weighing pan Phi 25
- Magazine
- Transport cart
- Sensors cover
- Power supply

3.4. Unpacking and Start-Up

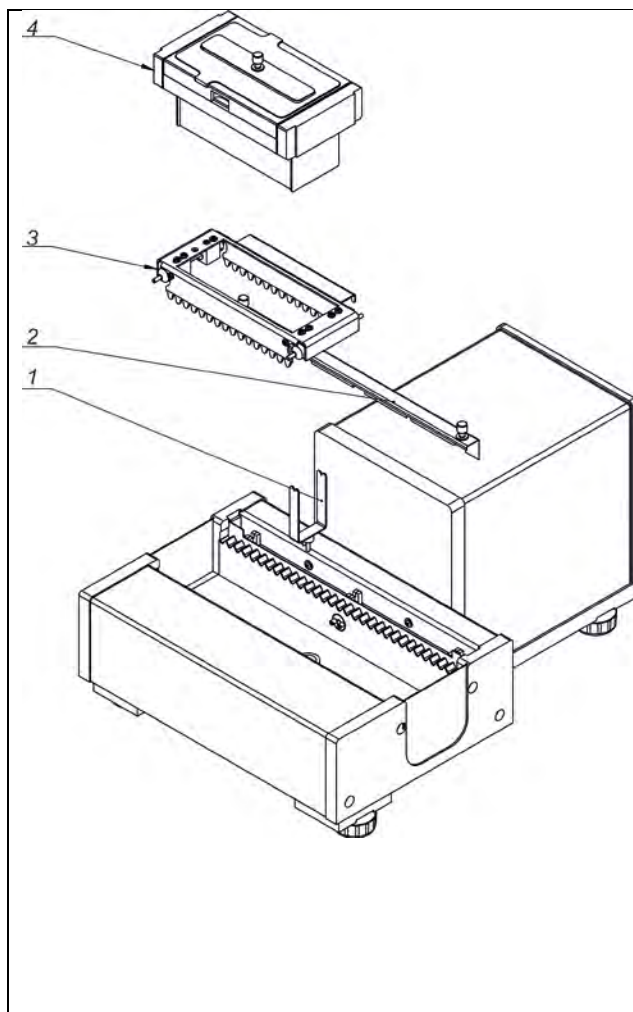
1. Take the balance and components out of the box.
2. Place the weighing part on the table and connect the indicator.
3. Assemble the magazine as shown in the diagram below.



Steps:

1. Place the liquid vials (2), 12 pieces, in the magazine housing (1).
2. Install the evaporation ring (3).
3. Install the cover of the evaporation ring (4).
4. Install the vial lid (5).

4. Insert the weighing pan and other components into the device's body.



Steps:

1. Remove the sensor cover (2) (pull upwards using the two handles).
2. Install the weighing pan (1). When installing the weighing pan, take care to ensure that it is properly positioned. The flattening on the weighing pan pin must be aligned with the flattening on the weighing pan seat (see figure below).



3. Install the transport cart (3) (the transport cart should be in the extreme right or left position).
4. Install the sensor cover.
5. Place the magazine (4) in the rectangular opening of the transport cart (3).

5. Turn on the balance by switching on the power supply. Then follow the standard procedures for the balance's initial startup (levelling, internal adjustment, etc.).
6. The balance is ready for operation.

CAUTION:

Be careful while installing the components so as not to cause any damage to the balance mechanism.

CAUTION:

The balance has two sockets for connecting the power supply. One socket is located on the indicator and the other is on the back of the weighing mechanism housing. The balance can be powered from both the indicator and mechanism sides of the balance, but not from both sides at the same time using two power supplies. Such a connection could harm the balance and power supplies.

3.4. Maintenance Activities

CAUTION:

Cleaning the weighing pan while still installed may cause damage of the measuring system.

1. Uninstall the weighing pan and other detachable components (the components differ depending on a balance type – see section: *UNPACKING AND INSTALLATION*). Be careful while installing the components so as not to cause any damage to the balance mechanism. Use tweezers to remove the microbalance weighing pan..

2. Use a handheld vacuum cleaner to remove dust from the weighing chamber (recommended for the microbalance).
3. In order to ease cleaning of some of the weighing instrument components, it is permissible to remove them following the below instruction.

Cleaning anti-draft chamber panes:

Select dissolvent depending on the type of contamination. Never soak the glass panes in alkaline solutions since they interact with glass and may cause damage. Do not use cleansers containing abrasive substances.

For organic dirt use acetone first, next use water or detergent. For other than organic dirt use diluted acid solutions (soluble salts of hydrochloric or nitric acid) or base solutions (ammonium or sodium base).

To remove ACIDS, use a protophilic solvent (sodium carbonate) To remove BASE, use a protogenic solvent (mineral acid of various concentrations).

In the case of heavy contamination, use a brush and detergent. Nnevertheless, avoid detergents containing large and hard molecules, which could potentially scratch glass panes.

At the end of the cleaning process, rinse the pane using distilled water.

Use a soft brush with a wooden or plastic handle exclusively to avoid the risk of scratches. Do not use a wire brush.

Rinsing is a necessary cleaning process stage, allowing us to remove remaining soap, detergents, and other cleansers from the panes prior to their reinstallation.

After the preliminary cleaning process stage, rinse the pane using running water first, distilled next.

Avoid drying the panes either using paper towel or forced air circulation since some fibres, grains, or contamination of other types could permeate into the panes, thus causing weighing errors.

We do not recommend using driers when drying measuring glass tools.

It is a common treatment to leave glass components on a rack to dry.

Cleaning powder-coated components:

For the preliminary cleaning process stage, you need running water or a wet sponge with large pores. This will help you to remove loose, heavy dirt.

Do not use cleansers containing abrasive substances.

Next, using a cloth and a cleanser-water solution (soap, dishwashing liquid), gently rub the surface.

Avoid using cleanser without water since it may result in damage to the cleaned surface. Please keep in mind that a large amount of water mixed with cleanser is a must.

Cleaning aluminium components:

While cleaning aluminium components, use products acidic by nature, e.g. spirit vinegar, lemon. Do not use cleansers containing abrasive substances. Avoid using hard brushes; this may cause scratches. It is recommended to use a microfibre cloth.

While polishing the surface, use circular movements. Use a clean, dry cloth to make the surface shine.

Cleaning stainless steel components

When cleaning stainless steel components, the following table should be followed, which lists the types of contamination and ways of removing it.

Fingerprints	Clean with alcohol or dilutant. Rinse with clean water and wipe dry.
Oils, fats, greases	Wash with organic solvents and then clean with warm water with soap or mild detergent. Rinse with clean water and wipe dry.
Temperature stains and discolorations	Wash with a gentle abrasive cleaner, clean lightly according to the direction of the surface structure. Rinse with clean water and wipe dry.
Strong discoloration	Clean lightly according to the direction of the surface structure. 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 with soap or mild detergent. Rinse with clean water and wipe dry.
Paints	Wash with paint solvent and then rinse with warm water with soap or mild detergent. Rinse with clean water and wipe dry.
Scratches on the surface	Gently polish the surface with a non-woven fabric (iron-free) according to the direction of the surface structure. Wash with a gentle abrasive cleaner. Rinse with clean water and wipe dry.

Cleaning ABS components

To clean dry surfaces and avoid smudging, use clean, non-colouring cloths made of cellulose or cotton. You can use a solution of water and detergent (soap, dishwashing detergent, glass cleaner). Gently rub the cleaned surface and let it dry. Repeat the cleaning process if necessary.

In the case of hard to remove contamination, e.g. residues of adhesive, rubber, resin, polyurethane foam, etc., you can use a special cleaning agent based on a mixture of aliphatic hydrocarbons that does not dissolve plastics. We recommend carrying out tests before using the cleanser on all surfaces. Do not use cleansers containing abrasive substances.

3.6. Connecting the Balance to the Mains

The weighing device can be connected to the mains only with a power supply that comes standard with the particular model. The nominal voltage of the power supply (specified on the power supply data plate) has to be compatible with the mains nominal voltage.

Connect the balance to the mains – connect the power adapter to the socket, then connect its connector to the interface located on the back of the balance housing or the indicator housing.

CAUTION: The balance has two sockets for connecting the power supply. One socket is located on the indicator and the other is on the back of the weighing mechanism housing. The balance can be powered from both the indicator and mechanism sides of the balance, but not from both sides at the same time using two power supplies. Such a connection could harm the balance and power supplies.

3.7. Temperature Stabilization Time

Prior to the measuring processes start, it is necessary to wait until the balance reaches thermal stabilisation.

Balances stored at much lower temperatures than the workroom temperature must be subjected to thermal stabilisation before being plugged into the mains. . The thermal stabilisation period takes about 12 hours. During the thermal stabilization, the indications on the screen can change. Temperature changes in the workroom should be minor and gradual.

Thermal stabilization also applies to the ambient conditions monitoring system and balance levelling.

3.8. Connecting Peripheral Equipment

Use only accessories and peripheral equipment recommended by the manufacturer. The balance must be unplugged from the mains before connecting or disconnecting any peripheral equipment (printer, PC, computer keyboard of USB type). Upon connecting the peripherals, plug the balance to the mains.

4. START-UP

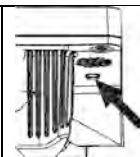
- After assembling the device, connect the power supply to the balance.

CAUTION: The balance has two sockets for connecting the power supply. One socket is located on the indicator and the other is on the back of the weighing mechanism housing. The balance can be powered from both the indicator and mechanism sides of the balance, but not from both sides at the same time using two power supplies. Such a connection could harm the balance and power supplies.

- The operating system and the RADWAG program are loaded. This is signalled by the blinking of the LED diodes located at the lower front of the indicator.
- Upon completing start-up, the home screen is displayed automatically.
- The balance runs with no users logged in. In order to start operation, it is necessary to log in (for detailed login procedure, read later sections of this user manual).

Caution: Prior to the balance start, make sure that there is no load on the weighing pan.

A hard reset is required if the program crashes during operation. To do so, press and hold the indicator's button for about 5 seconds. The program restarts and the device reboots.



5. PROGRAM STRUCTURE

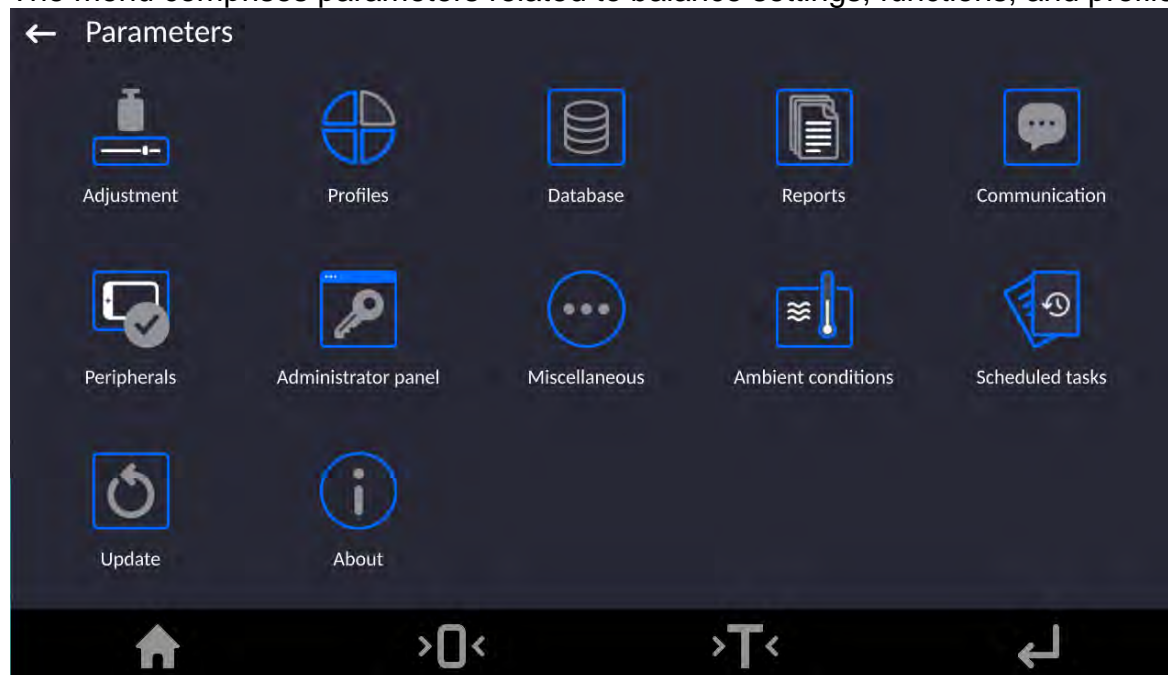
The program menu is divided into function groups. A function group is a group of interrelated parameters. For a detailed description of each group, read later sections of this service manual.

Function groups:



The main menu is accessed by pressing the button located in the bottom part of the display.

The menu comprises parameters related to balance settings, functions, and profiles.



6. WEIGHING RESULT WINDOW

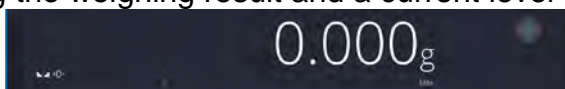


The home screen features 5 sections:

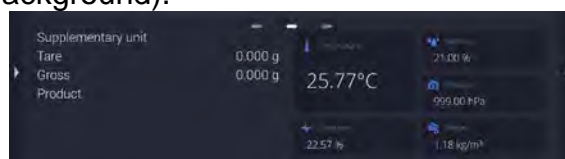
- Top section displaying data on active working mode, logged-in user, date, time, computer connection status.



- Section presenting the weighing result and a current level status.



- Section comprising the supplementary information on the currently performed operations (grey background).



CAUTION:

The data contained in this workspace is freely configurable. For detailed information, read section 12.4 of this user manual.

- Section comprising the on-screen function buttons:



CAUTION:

The operator can define the on-screen function buttons. For detailed information, read section 12.3 of this user manual.

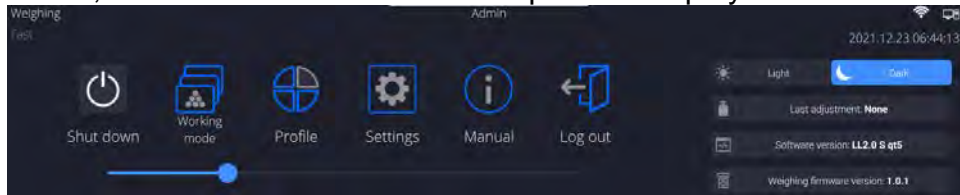
- Section comprising the on-screen function buttons:



7. LOG IN

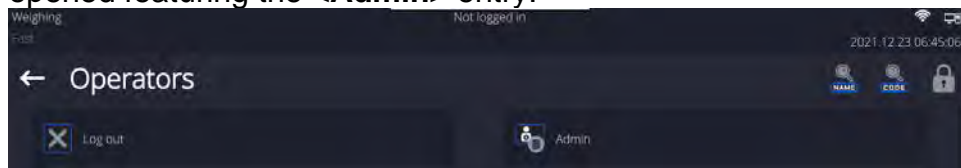
In order to access operator-related parameters and edit databases, you need to log in as an operator with **<Administrator>** permission level.

To do this, slide down the menu at the top of the display.



First Log in:

- Slide down the top menu, press the **<Log in>** field, the operators database window is opened featuring the **<Admin>** entry.



- Press the **<Admin>** entry.
- The home screen is displayed, the **<Not logged in>** sign is replaced by the **<Admin>** sign.

CAUTION: After first logging in, enter operators and assign appropriate permission levels and individual access passwords to them (for detailed procedure, read sections 10 and 16.2).

While logging in again, select an operator from the list and enter the password. The program initiates operation with the permission level set for the selected operator.

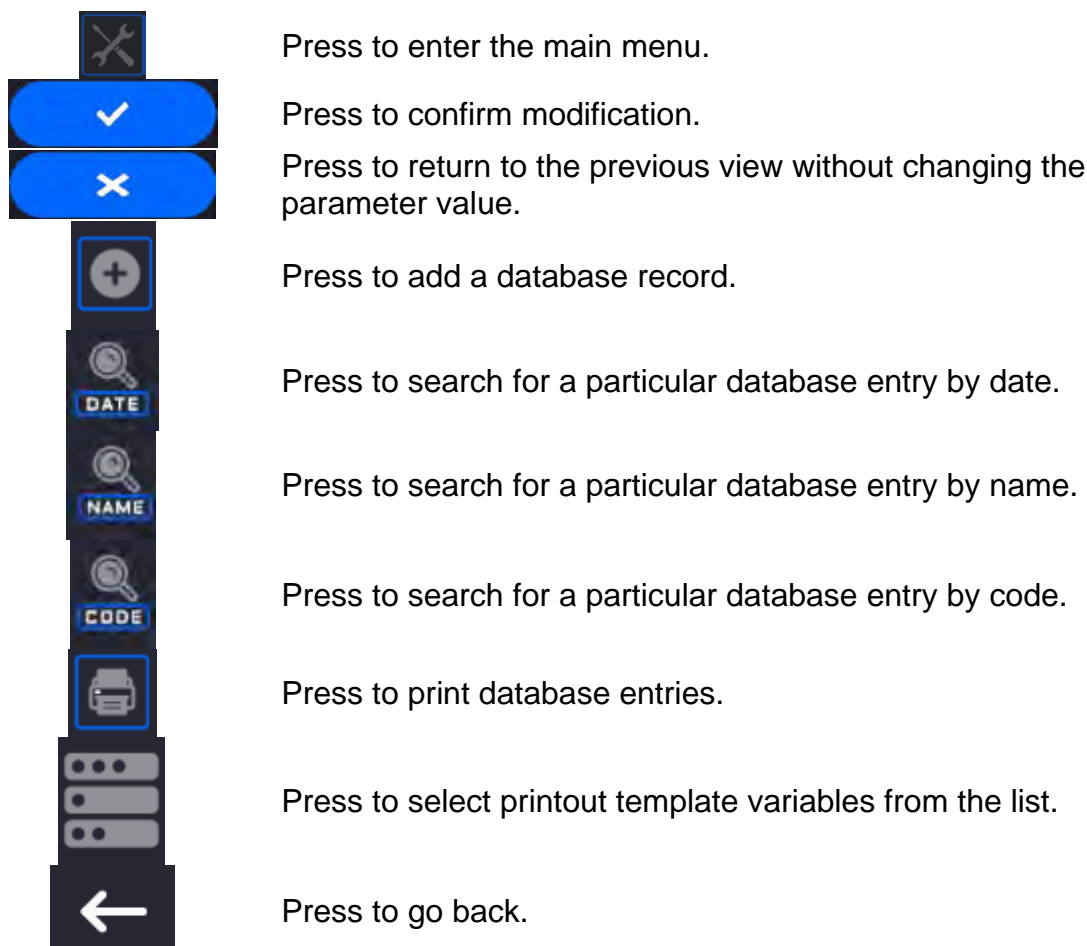
Log out operation:

- Slide down the top menu and press .
- When the top menu is swiped up to its initial position, the logged-in operator name is replaced with the message **<Not logged in>**.

8. OPERATING THE MENU

Operation of the program menu is intuitive. The touch panel makes the software operation easy. Pressing a function button or an area on the display initiates an assigned function or a process.

8.1. Operation Panel



8.2. Voice Commands

The balance software allows several operations to be performed using voice commands. These are as follows: taring, zeroing, printout/measurement record. The commands must be given in English and in the correct order. Below is the structure of the individual commands.

Tare: ellipsis [please] (tare | tar | terre) [the] device


Zero: ellipsis [please] zero [the] device

Print/Save: ellipsis [please] save [the] (mass | measurement | mass measurement)


How to say the command: black text is mandatory, green - may or may not be spoken, red - one of the texts is mandatory to be spoken

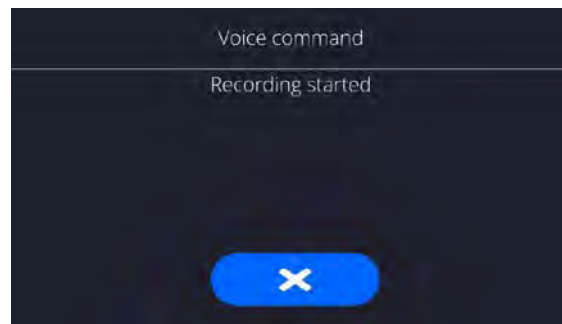
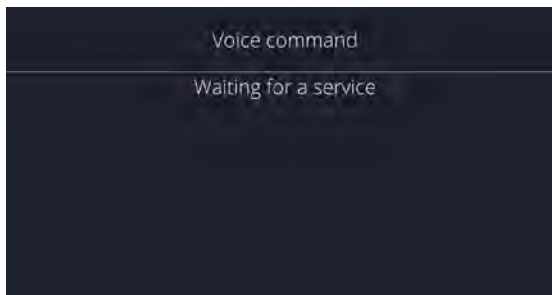
e.g: for the Print command: **ellipsis save mass.**

Procedure:

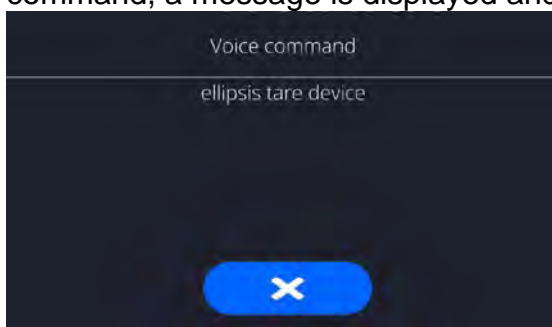
5. Place the  button for activating voice commands on the button bar (for how to add buttons, read further down this manual).



6. Press .
7. The voice command recognition procedure is initiated and the user is informed about it through the displayed messages.





8. Say the command as described above.
9. If the command is spoken correctly and the balance program recognizes the command, a message is displayed and the command is automatically executed.



8.3. Return to Weighing

Modifications introduced into balance memory are automatically saved upon return to the home screen.

Procedure:


- Press the  button repeatedly, keep pressing it until you see the home screen.
- Press the  button (top bar), the home screen is displayed immediately.

9. ADJUSTMENT

The 5Y series balances feature an automatic internal adjustment system that ensures correct measurement accuracy. The <ADJUSTMENT> menu contains functions for controlling the operation of the adjustment process.

9.1. Internal Adjustment

Internal adjustment is carried out by means of an internal adjustment weight.

The  <Internal adjustment> button, when pressed, automatically triggers the adjustment process. Upon adjustment process completion, a respective message is displayed, informing the user about the process end and its status.





Caution: The balance adjustment procedure requires stable conditions (no air drafts or vibrations). In the course of adjustment, the weighing pan must be unloaded.

9.2. External Adjustment

External adjustment is carried out using external mass standards of the right accuracy and weight value, which value depends on the balance model and capacity. The process is carried out semi-automatically; successive process stages are signalled with prompts.

Caution: External adjustment is possible for balances that are not subject to conformity assessment (verification).

Procedure:

- Enter the <Adjustment> submenu, next select the <External adjustment> option.
- A message to remove weight is displayed. Unload the weighing pan and press the  button. The balance determines start mass, message: **Mass determination...** is displayed.
- Upon completing the start mass determination, a message ordering you to load the weighing pan is displayed. Load the weighing pan with a weight of the respective mass value and press the  button.
- For some balance types, the next message is displayed. Load the weighing pan with the weight of the subsequent mass value, and press the  button.
- Upon completing the procedure, unload the weighing pan and press the  button to confirm. Balance returns to the weighing process.

9.3. Adjustment Test

<Adjustment test> function enables comparing the result of an internal automatic adjustment with the value recorded in balance factory parameters. The comparison is used for determining drift of balance sensitivity over time.

9.4. Automatic Adjustment

Enter this menu to specify conditions that trigger the automatic adjustment. Options:

- None – automatic adjustment inactive.
- Time – adjustment takes place in time intervals declared in the <Automatic adjustment time> menu
- Temperature – adjustment is triggered by temperature change.
- Both – adjustment is triggered by both, temperature changes and time.

Caution: This parameter's settings can be modified only for balances that are not subject to the conformity assessment (verification).

9.5. Automatic Adjustment Time

The <Automatic adjustment time> parameter determines the time interval between successive automatic internal adjustments. The time interval is declared in hours and ranges between 1 and 12 hours.

To set the time interval for automatic adjustment:

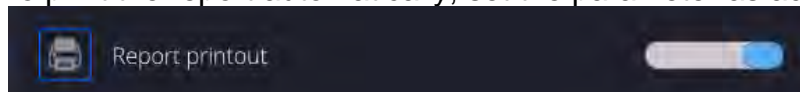
- enter the <Automatic adjustment time> parameter,
- using the displayed menu, select the appropriate time interval (given in hours), which is to elapse between the most recent adjustment and the activation of the following automatic internal adjustment.

Caution: This parameter's settings can be modified only for balances that are not subject to the conformity assessment (verification).

9.6. Report Printout

The <Report printout> parameter determines whether or not an adjustment report is to be automatically printed upon adjustment process completion.

To print the report automatically, set the parameter as active.



9.7. GLP Project

GLP is one of many methods for documenting work in accordance with an adopted quality system. Data selected for printing is printed on each release of an adjustment report.

Information and signs to be used in a GLP report:

adjustment (adjustment type)	working mode (working mode name)
date	time
balance type	balance S/N
operator	first and last name
level status	nominal mass
current mass	difference

nominal mass 2	current mass 2
difference 2	temperature
dashes	empty line
signature	non-standard printout

9.8. Adjustment History

It contains the 50 most recent balance adjustments. The record is carried out automatically. Each adjustment record comprises basic data on the completed process. This menu enables you to display the list of completed adjustment processes. Each report is printable. In order to print an adjustment report, enter the <Adjustment> submenu, next enter the <Adjustment history> parameter, and select the adjustment to be printed. Record details are



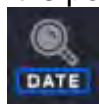
displayed, press <  > print button.

Caution: If 50 consecutive adjustments are saved, saving the 51st report will delete the oldest record in the list.

If an organization's internal procedures require complete documentation of all carried out adjustment processes, then the list of adjustment records must be printed and archived on a regular basis.

Searching for an adjustment record


It is possible to search for a specific completed adjustment record. To do that, press the <



> button and enter the date of the adjustment process that is to be found.

Exporting data on a completed adjustment process

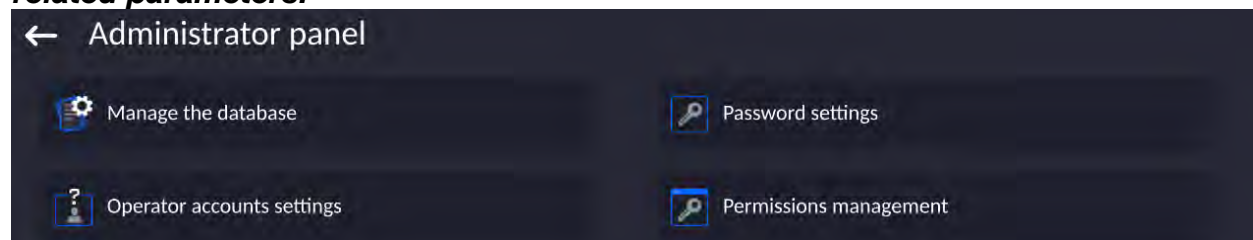


Connect a USB flash drive to the balance USB port. Press the <  > button located in the upper right corner of the display. The process is fully automatic and on its completion, a file with a **.db.** extension is saved to a USB flash drive connected to the USB port.

10. ADMINISTRATOR PANEL

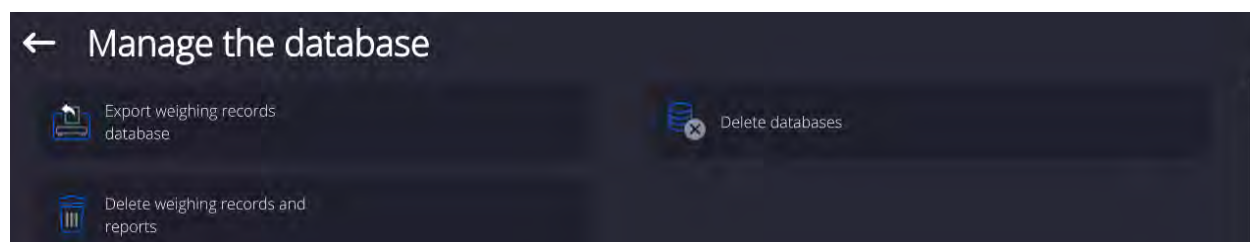
This menu enables to determine: activities to be carried out by an operator with certain permissions, password strength and permissions for unlogged operator.

CAUTION: Only operator with Administrator permissions can modify permission-related parameters.



10.1. Databases Management

Function allowing to manage databases data. It comprises three options: Export weighing database, Delete databases and Delete weighings and reports.

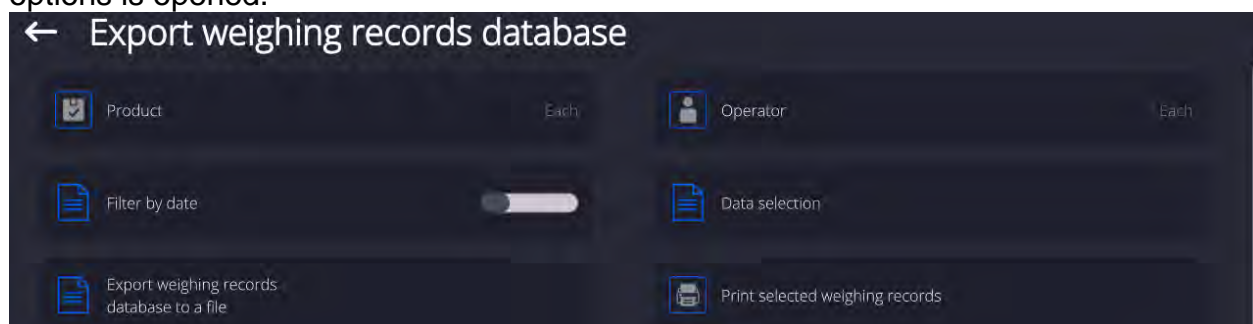


10.1.1. Export Weighing Database to a File

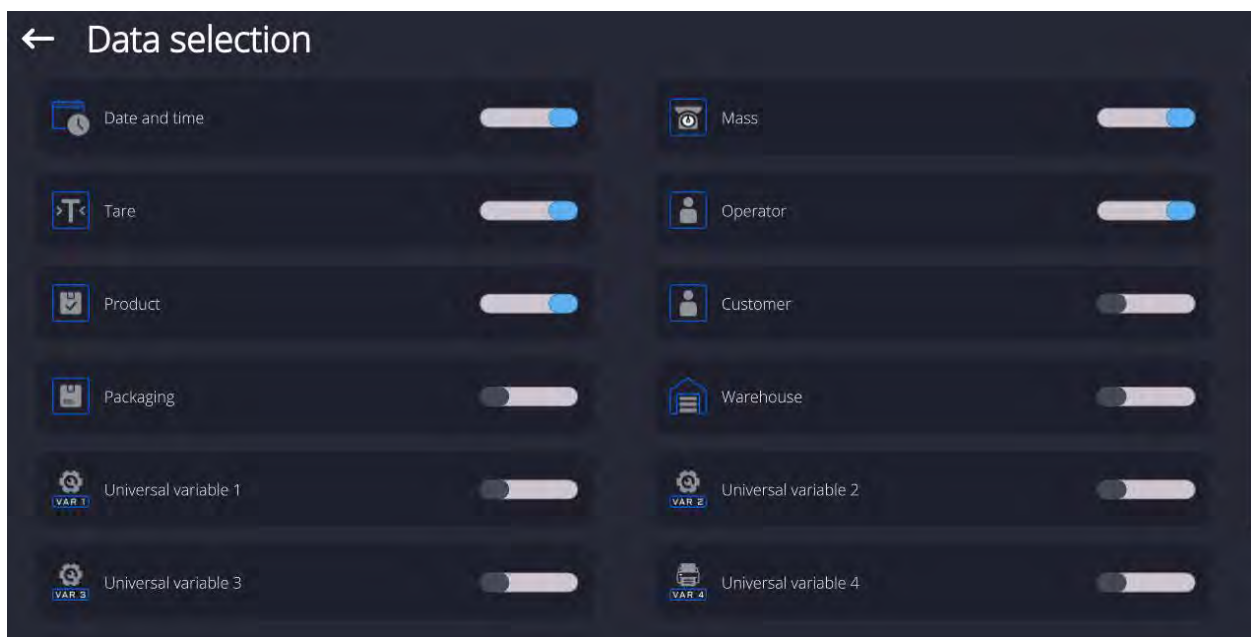
All measurements are saved to the <Weighing records> database and can be exported to a file using a USB flash drive.

Procedure:

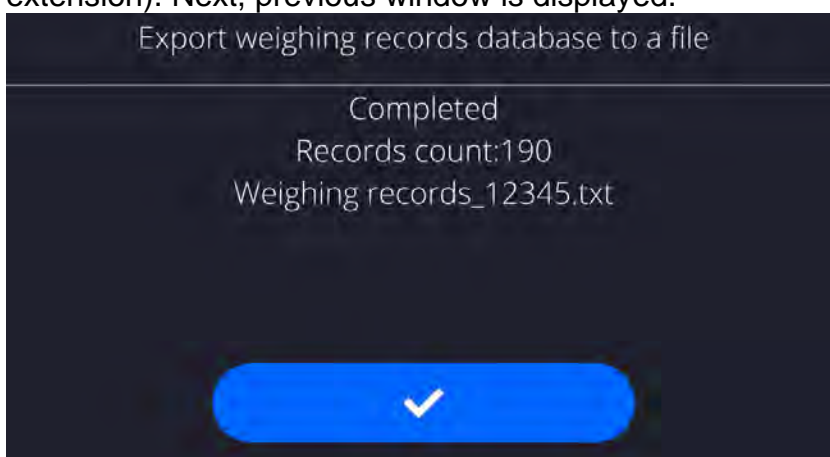
- Connect the USB flash drive to the USB port.
- Press <Export weighing records database to a file> entry; a window for setting export options is opened.



<Data selection> parameter allows you to specify which measurement-related data are to be exported.



- Set respective data and press <Export weighing records database to a file> entry; weighing database is automatically exported.
- Upon export completion, the message <Completed> is displayed along with information on the number of exported data and with the file name (*.txt extension). Next, previous window is displayed.



- You may return to the weighing procedure or proceed to other settings.

Caution: If balance software cannot identify the USB flash drive, then upon pressing <Export weighings database to a file> entry, <Operation failed> message is displayed.

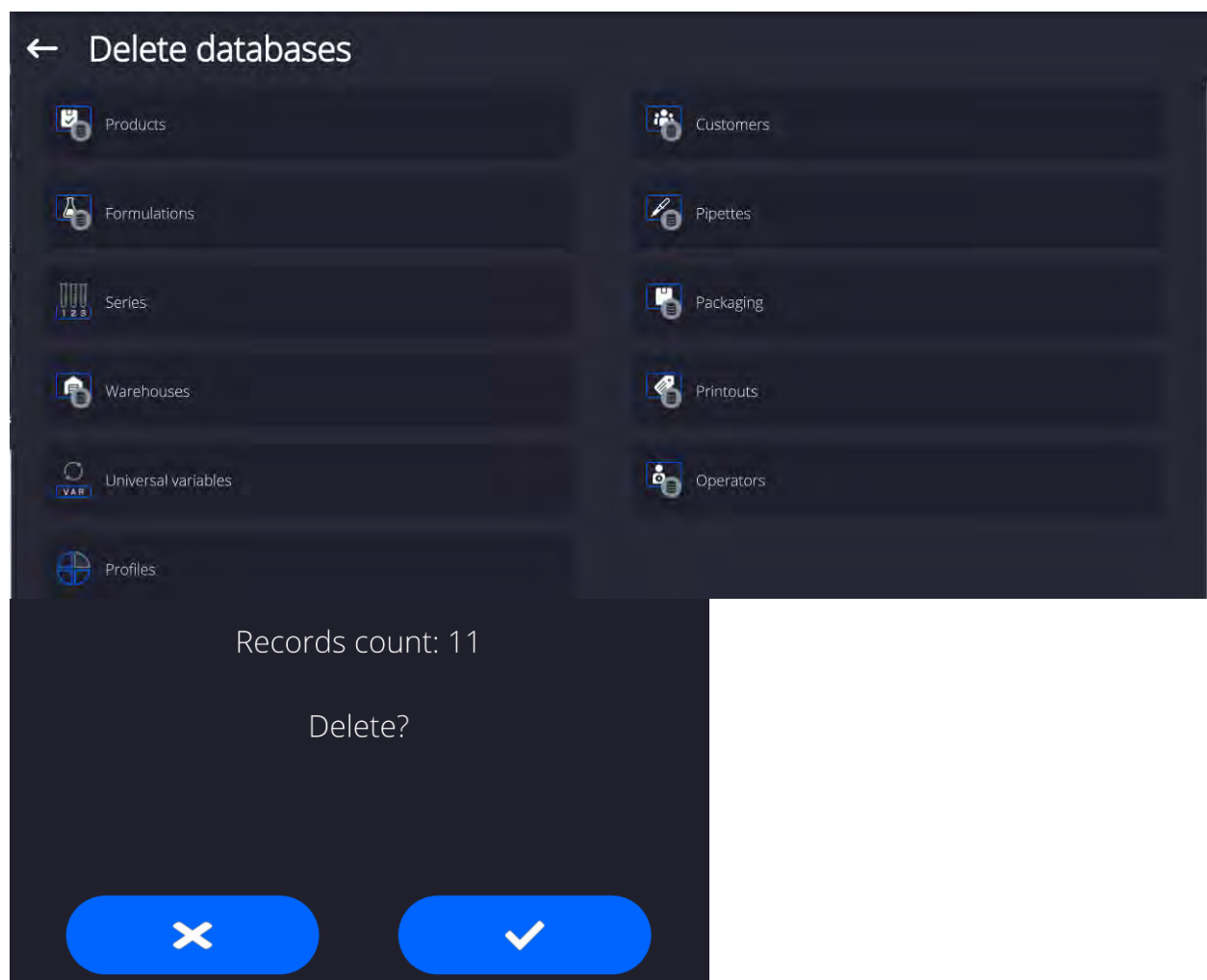
- A name of created file consists of database name and balance serial number, e.g. <Weighing data_364080.txt>.
- Unplug the USB flash drive from the USB port.

Template of a created file:

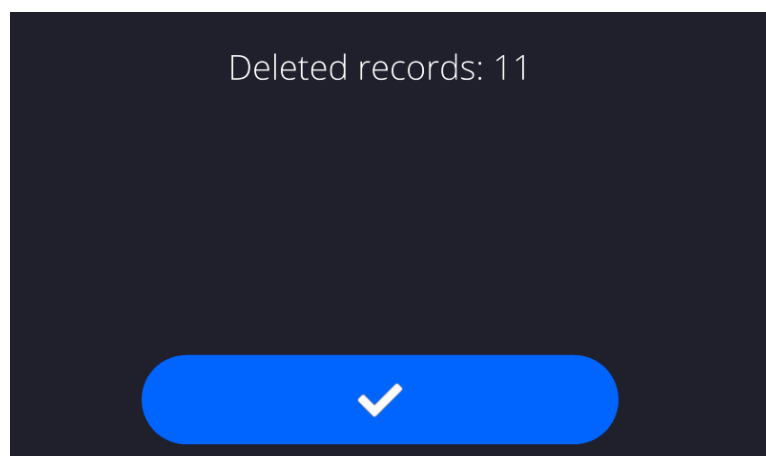
The file is created in the form of a table, columns of which are separated by <Tab>. This allows for direct export of the file to <Excel> spreadsheet document. The table contains the following data: date and time, mass and mass unit, tare and tare unit, serial number, operator name, customer name, packaging name, source warehouse name, target warehouse name, control result name.

10.1.2. Delete Databases

Function allowing to delete data of selected database. Procedure
Activate <Delete database> function; a window with database list is displayed.
Select a database, delete respective data.



Confirm, data is deleted, the following message is displayed:



Confirm, a previous window is displayed; you may continue weighing or proceed to other operations.

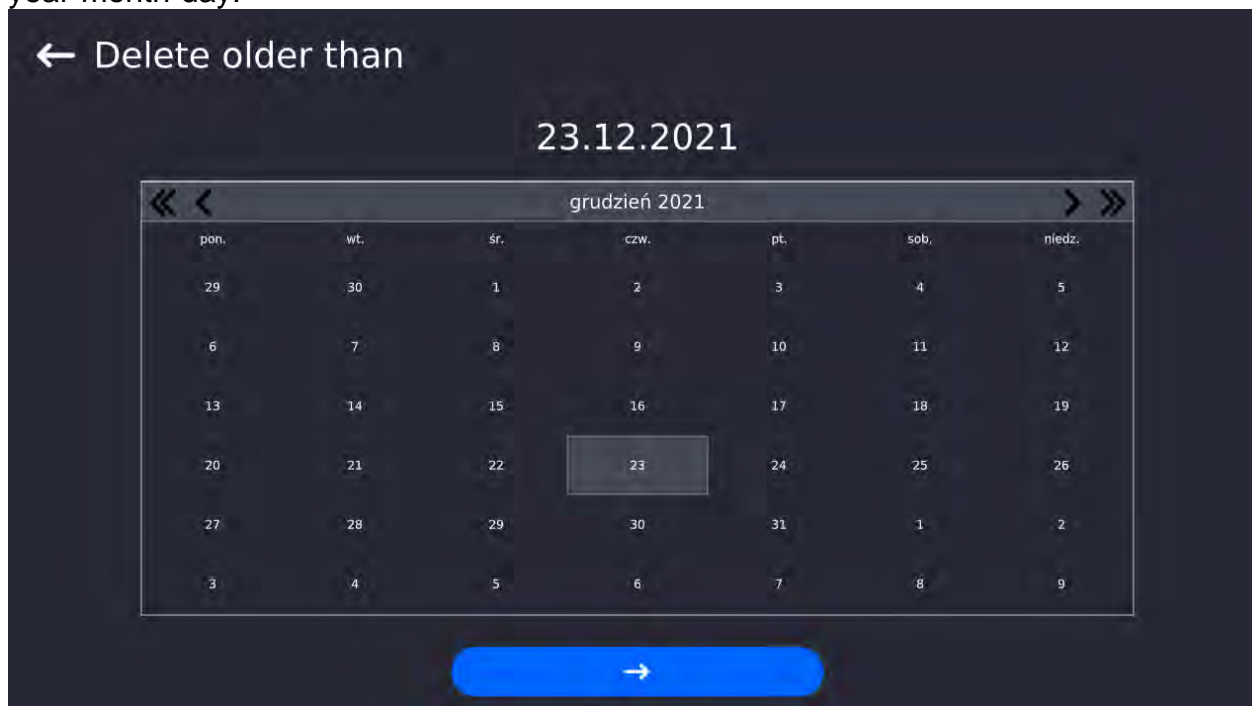
10.1.3. Delete Weighings and Reports

Function allowing to delete weighings and reports of a given database.

Procedure:

Activate <Delete weighing records and reports> parameter; a window with a numeric keyboard is displayed.

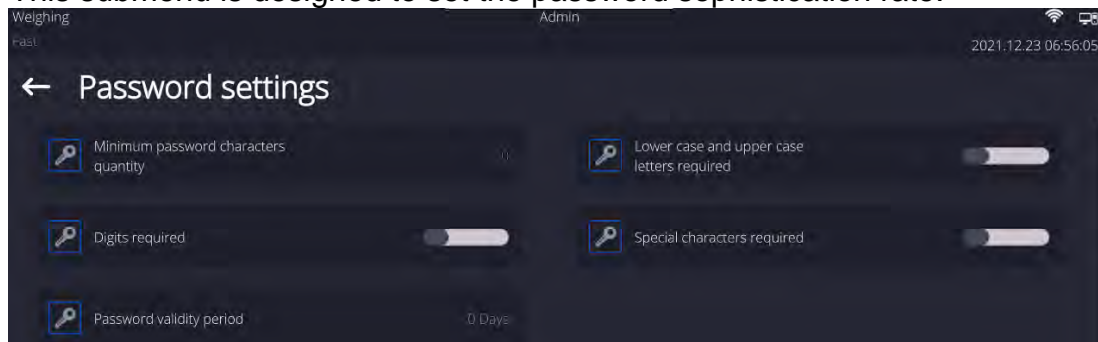
Enter a date specifying which data is to be removed. Date is given in the following form: year-month-day.



Confirm the date, all weighings and reports older than those specified by the date are removed. Quantity of deleted weighings and reports is displayed.

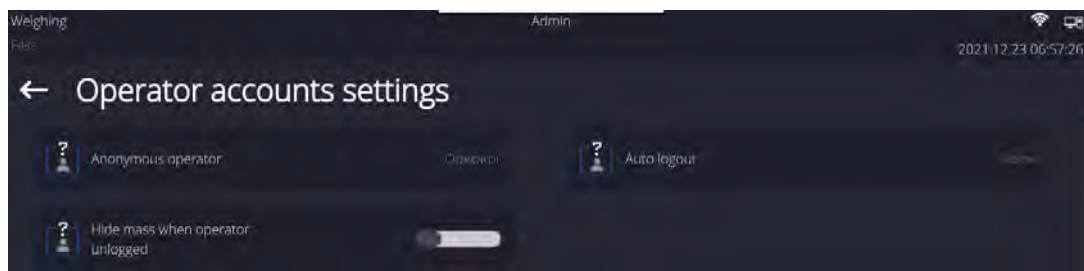
10.2. Password Settings

This submenu is designed to set the password sophistication rate.



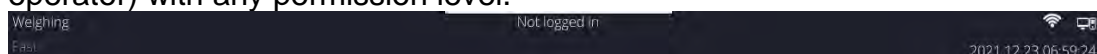
Minimum password characters quantity	Determining the quantity of characters in the operator's password. For the '0' value, set any quantity of characters.
Lower case and upper case letters required	Parameters specifying requirements regarding password character type and format.
Digits required	
Special characters required	
Password validity period	Determining the time interval in days after which the password has to be changed. For the '0' entry, password change is not required.

10.3. Operator Accounts Settings



Unlogged operator permissions

An Administrator can assign an unlogged balance operator (so called anonymous operator) with any permission level.



Procedure:

Enter the <Operator accounts settings> submenu, choose <Anonymous operator>, next set the respective permissions: Guest, Operator, Advanced Operator, Administrator.

Caution: An operator with the <Guest> permission level is not permitted to change program settings.

Auto logout

With the Auto logout function on, the operator is logged out automatically if the balance is not operated within a specified time interval, given in minutes.
By default, the function is disabled (<None> entry set).

Procedure:

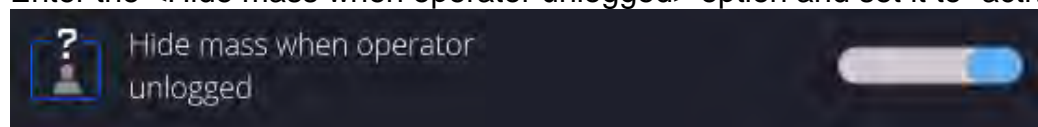
Enter the <Operator accounts settings> submenu, then select the <Auto logout> parameter and set its value to none/3/5/15/30/60. The time is given in [min].

Hide mass when operator unlogged

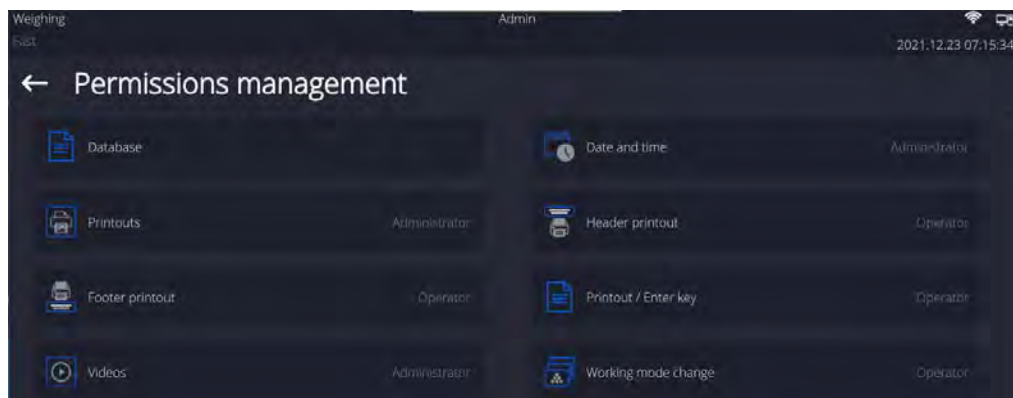
Option to disable the mass result display if the operator is not logged in. By default, the function is disabled.

Procedure:

Enter the <Hide mass when operator unlogged> option and set it to "active".

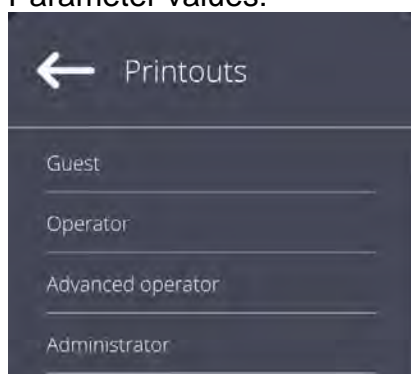


10.4. Permissions Management

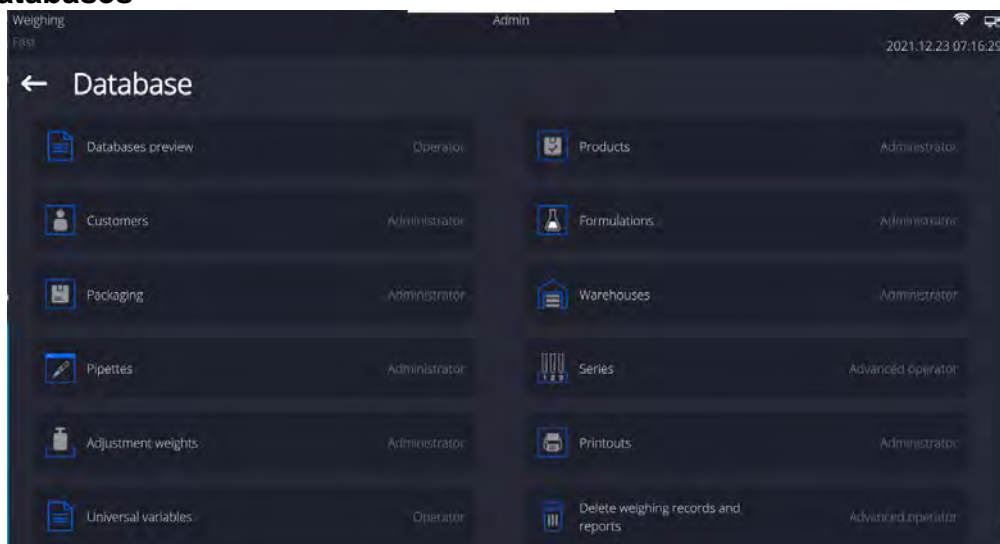


Caution: When the **<Guest>** option is set for individual parameters, their settings can be freely accessed (there is no need to log in).

Each option can be assigned a permission level to edit it.
Parameter values:



Databases



Default balance settings enable an operator who is logged in as an **Administrator** to modify the settings of particular databases. The values can be changed depending on the needs.

The editing permissions for the other options available in this menu can be changed on a similar basis.

11. PROFILES

A profile is a data pack that determines:

- a specific function operation, such as pipette calibration,
- data to be displayed during operation,
- function keys to be active,
- measuring units to be accessible,
- criteria determining speed of operation and measurement stability,

Balance software allows you to create numerous profiles This enables:

- designing an individual working environment by each operator,
- customized balance operation, i.e. activating selected function keys and information (improved operation performance).

For ease of operation, four default balance profiles have been designed. The profile settings provide an optimal weighing process for particular requirements and conditions.

Profile types:

- **Fast** – profile set to enable fast measurement of mass of any size regardless of the selected working mode. The fast profile gets activated automatically at the first balance start-up. For the Fast profile, the parameter settings enable obtaining the final result as fast as possible.
- **Fast dosing** – profile intended for dosing. It is set to enable fast dispensing of product. For this profile selected, the DOSING mode gets activated automatically,
- **Precision** – profile configured to allow precise measurement of masses of any size regardless of working mode. For this profile, the weighing process takes a lot of time, but this guarantees the most precise weighing result.
- **User** – basic profile, filter settings allow for quick and accurate measurement. For this profile selected, the WEIGHING mode gets activated automatically.

Caution: As an operator, you can modify all profile settings only for the User profile. When it comes to the remaining default profiles (Fast, Fast Dosing, and Precision), they can only be modified partially. Each additional profile you create can be modified in terms of all settings.




11.1. Creating a Profile

The Administrator can create new profiles by:

- Copying an already existing profile and modifying it,
- Creating a new profile.




Copying an existing profile

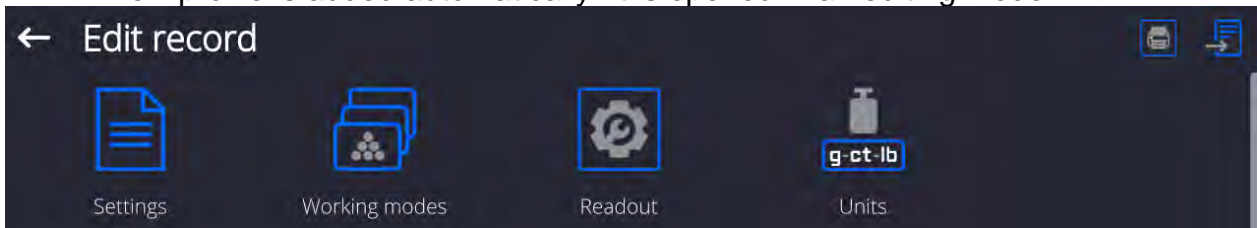
Procedure:

- Enter the main menu. To do it, press the  button.
- Enter the  <  > submenu.
- Press and hold the profile that is to be copied.
- A menu referring to the profile record is displayed. Select the <Copy> parameter.
- A new <Name copy> profile is created. The new profile settings and base profile settings are identical.
- Modify the necessary data (name, etc.).

Adding a new profile




Procedure:

- Enter the main menu. To do it, press the  button.
- Enter the  submenu.
- Press the  button.
- A new profile is added automatically. It is opened in an editing mode.



Deleting a profile

Procedure:

- Enter the main menu, to do it press  button.
- Enter  submenu.
- Press and hold the profile that is to be deleted.
- Menu referring to a profile record is displayed. Select <Delete> parameter.
- Message box: <Delete?> is displayed.
- Press  button to confirm, the profile gets deleted.

Caution: In order to operate profiles, it is necessary to log in as an Administrator.

11.2. Profile Structure

:A list of profile parameters:


Settings	Enter this menu to set an individual profile name (an alphanumeric order of characters), and to declare a default working mode (the selected mode is activated as default upon selecting the profile).
Working modes	Option to set specific functions for individual working modes. Mode submenus: <ul style="list-style-type: none">▪ Mode related settings▪ Buttons▪ Information▪ Printouts
Readout	Readout submenus: <ul style="list-style-type: none">▪ Filter▪ Value release▪ Autozero▪ Autozero: Dosing▪ Last digit▪ Last digits quantity

- Ambient conditions
- Units** Enter this menu to declare the start unit, the supplementary unit, 2 custom units; to enter the value of gravitational acceleration force in the balance's operation place; and to declare the availability of individual units.

11.2.1. Settings

Name

Upon entering this parameter, a message box with an on-screen keyboard is displayed.

Enter the name of a profile and press the  button to confirm. The name is assigned to the profile.

Default working mode

Upon entering this parameter, you can select a specific working mode that is to be set as the default. For the <None> value set, upon selecting the profile, the balance activates the most recently used working mode.

11.2.2. Working Modes

Upon entering the Working Modes parameter, a window containing all accessible working modes is displayed. Parameters are set for each working mode independently. A particular profile when activated, runs with a given set of parameters.

A list of parameters shared by all working modes:

- Settings:
specific parameters relating to a working mode, and universal settings such as: result control, tare mode, automatic footer printout, printout mode, printout.
- Quick access button functions:
declaring quick access buttons to be displayed.
- Information:
declaring information to be displayed.
- Printouts:
declaring the type of a printout or defining a non-standard printout.

11.2.3. Readout

You can adjust the balance to ambient conditions (filter level) or to your own needs. The <Readout> menu contains the following elements:

FILTER (function disabled for Fast, Fast Dosing, Precision profiles)

Each measurement signal, before being displayed, is electronically processed in order to provide the correct parameters specific to a stable measurement result (ready to be read). You can determine the signal processing rate. There are five different filters:

Range:

- very fast, fast, average, slow, very slow.

While setting the filter, consider the actual operating conditions. In the case of very good operating conditions, select an average or fast filter. In the case of rough conditions, select slow or very slow filter.

CAUTION:

- For precision balances, it is recommended to select a very fast, fast or average filter ÷,

- *For analytical balances and microbalances, it is recommended to select an average, slow or very slow filter÷.*

Value release (option disabled for Fast, Fast Dosing, Precision profiles)

The parameter has been designed to determine when the stability marker is to be displayed.



There are three different settings:

- fast, fast and reliable, reliable.

Caution: Both parameters, filter and value release, determine how long it takes to obtain a stable result.

Autozero function

The function has been designed to enable automatic control and correction of zero indication.

If the function is enabled, the subsequent measurement results are compared to each other at constant time intervals. If the results differ less than the declared AUTOZERO range, e.g. 1 division, the balance is automatically zeroed, and the pictograms of stable indication –  and precise zero –  are displayed. The Active Autozero function means that each measurement starts with a precise zero. There are, however, some cases when this function can be a disturbing factor for the measuring process, e.g. very slow placing of a load on the weighing pan (load adding, e.g. pouring, filling). In such a case, the system correcting zero indication may also correct the actual indication of a load placed on the weighing pan.

Values:

- NO** - autozero function disabled.
- YES** - autozero function enabled.

Autozero function: Dosing (option disabled for Fast, Fast Dosing, Precision)

The function has been designed to enable/disable the autozero function for Dosing.

Options:

NO - autozero function disabled automatically when Dosing mode is run.
YES - autozero function enabled automatically when Dosing mode is run.

Last digit

The function has been designed to enable/disable visibility of the last decimal place of the measurement result. Values:

- **Always:** all digits are displayed.
- **Never:** last digit disabled.
- **When stable:** last digit displayed only when the result is stable.

Last digits quantity

This function enables declaring the number of hidden last digits of the result. The function has three settings and works in connection with the <Last digit> option:

- **1:** the last digit of the result.
- **2:** the last two digits of the result.
- **3:** the last three digits of the result.

Ambient conditions

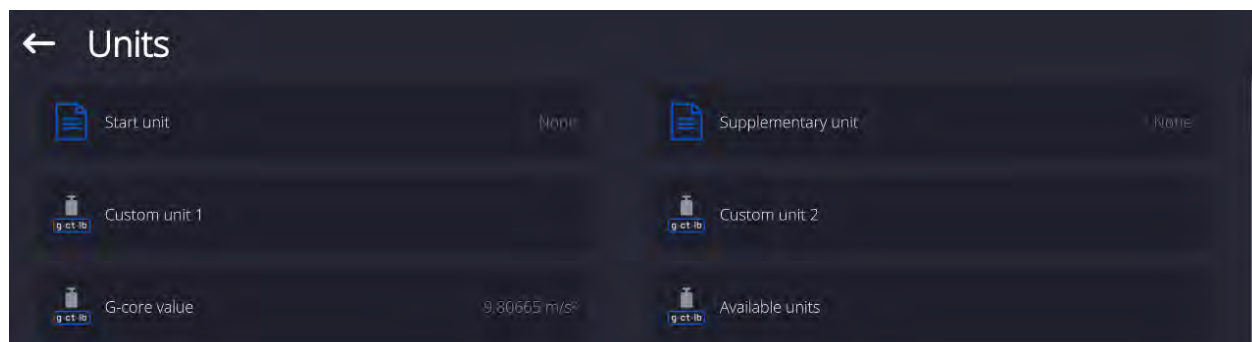
Parameter relating to the ambient and environmental conditions of the workstation. For unstable ambient conditions, it is advisable to set the parameter to the 'Unstable' value. By default, the parameter is set to Stable.

'Stable' value results with faster operation, i.e. weighing takes much less time than when the 'Unstable' value is set.

- **Unstable; Stable.**

11.2.4. Units

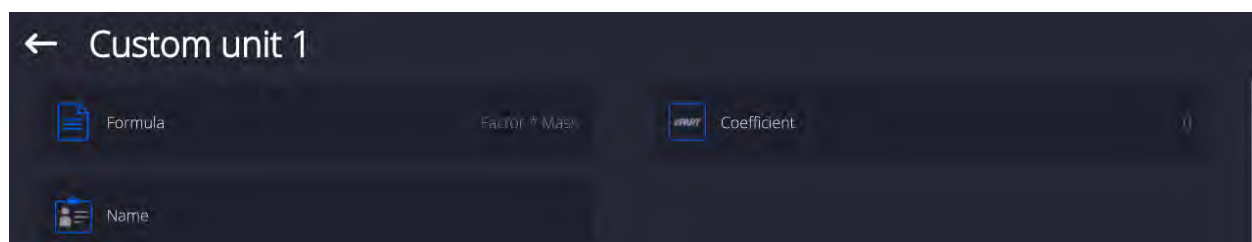
For a selected profile, you can declare a start unit, a supplementary unit, and two custom units.



The Units menu enables you to enter the value of the gravitational acceleration force characteristic for a particular place of use. It is therefore necessary that the balance be used to determine mass in [N].

Custom unit features:

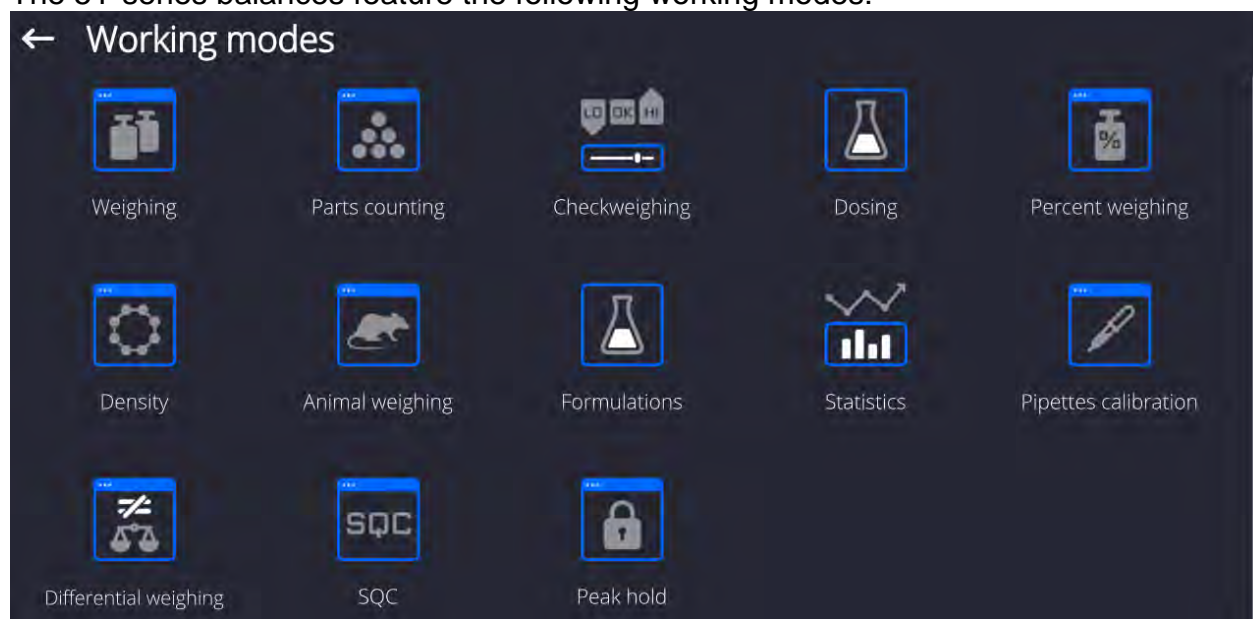
- Formula (*custom unit recalculation formula*): Coefficient * Mass or Coefficient / Mass.
- Coefficient (*coefficient for custom unit recalculation*)
- Name (*unique unit name to be displayed next to the result - max 3 characters*)



A newly designed custom unit name is added to the list of accessible measuring units (refers to non-verified balances exclusively).

12. WORKING MODES – General Information

The 5Y series balances feature the following working modes:



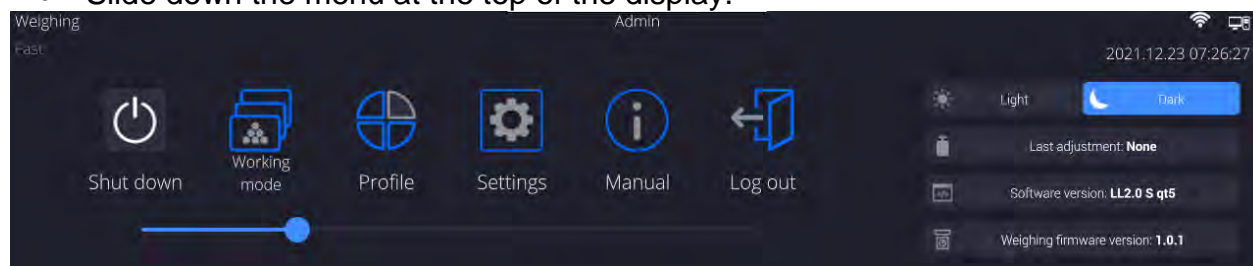
Weighing	Pipette Calibration
Means of operation: the weight of a load is determined through an indirect measurement. The balance measures the gravitational force that attracts the load. The obtained result is processed and displayed on the balance screen in a digital format.	Means of operation: calibration of pipettes in accordance with ISO 8655 standard procedure or with regard to user requirements.
Statistics	
Means of operation: carried out measurements are used to calculate statistical data such as Min, Max, deviation, etc.	

Particular working modes feature specific settings. The settings allow for adapting a mode operation to your individual needs. The specific settings are activated upon selecting a respective profile. For a detailed description of specific working mode settings, refer to the given working mode section.

12.1. Running Working Mode

To run a working mode other than the currently operated one:

- Slide down the menu at the top of the display.



- Press the <Working mode> option
- A list of all working modes is displayed.

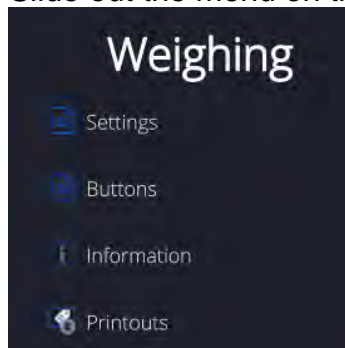
- Select the mode that is to be operated. The balance automatically starts the selected mode.

12.2. Working Mode Parameters

Each working mode has programmable parameters determining its functioning.

To access particular working mode parameters:

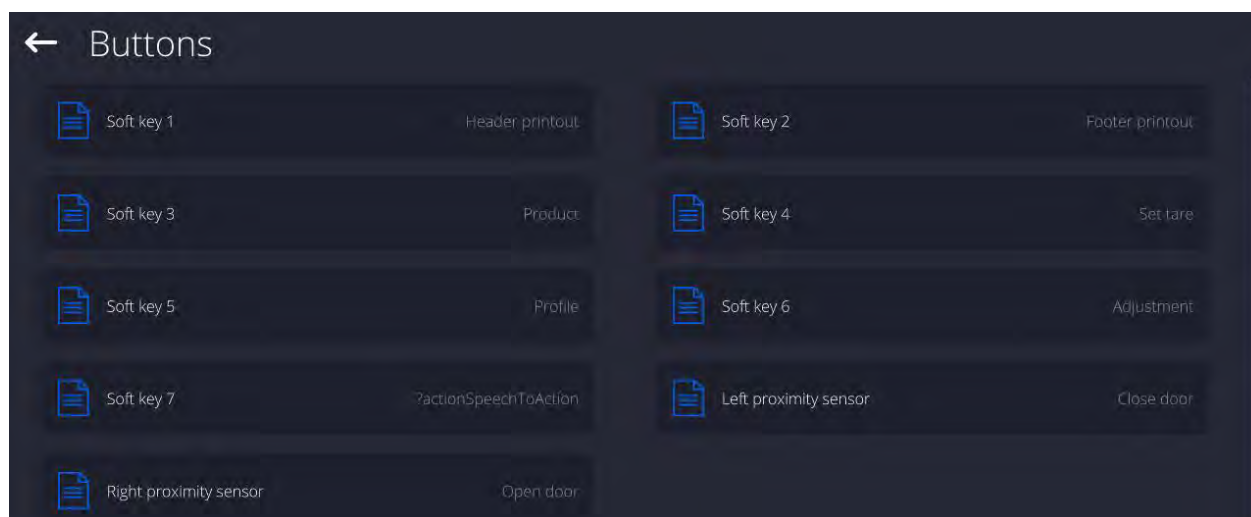
1. Slide out the menu on the left.



2. The following menu is displayed:
 - <Settings> - additional options.
 - <Buttons> - quick access buttons configuration.
 - <Information> - setting data that is to be displayed in the workspace.
 - <Printouts> - setting printout type and content.
 - <Profile> - choosing the profile to be used during operation.
3. Enter a particular submenu and select the component that is to be modified.

A description of the basic parameters of the <Settings> menu is to be found in section 14.6, *Additional Parameters of the Weighing Mode*. For detailed information on all but the basic parameters of particular working modes, read the given working mode section.

12.3. Quick Access Buttons, Proximity Sensors

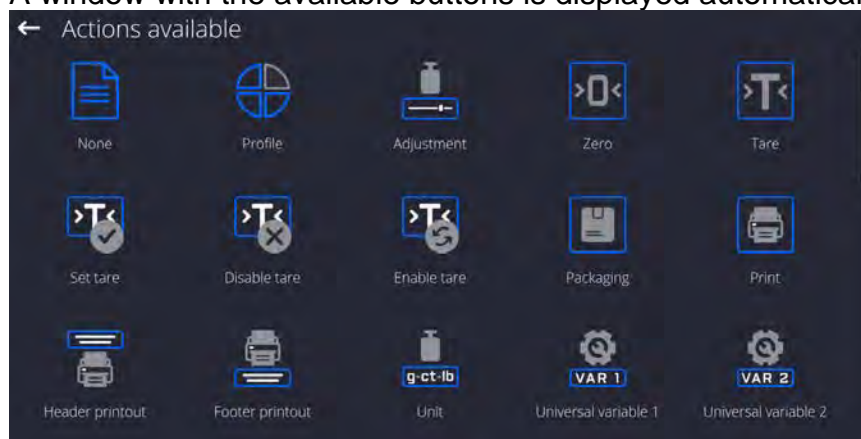


You can define up to 7 quick access buttons, which are to be displayed in the bottom bar. Upon assigning a function to a button, a corresponding pictogram is displayed in the bottom navigation bar of the home screen. Each working mode features a customized set of buttons. For a complete button list, read Annex B. These are so-called “quick access buttons” for triggering the most frequently performed operations.

Another way to add or change a button is to press and hold a field in the button bar for about 3 seconds.




A window with the available buttons is displayed automatically.



Press the respective button; the software returns to the home screen, and the selected button appears in the place where it was activated.



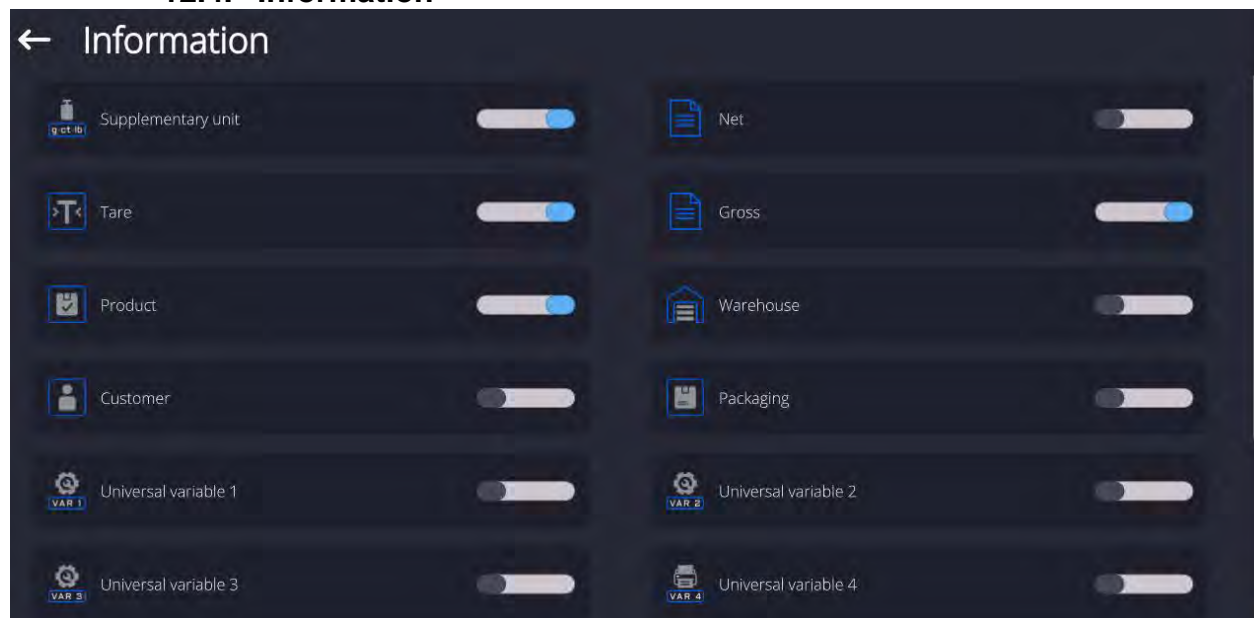
Caution: You can view the user manual saved to the balance memory. In order to take advantage of this function, add the Help  button to the tool bar.

12.3.1. Proximity Sensors

The balance is equipped with two proximity sensors, which enable touch-free control. The program detects four motions performed around the sensors:

1. Hand in a close vicinity to the <**Left proximity sensor**>.
2. Hand in a close vicinity to the right sensor <**Right proximity sensor**>.

12.4. Information





Information related to the weighing process is displayed on the left side of the display.

Supplementary unit	
Tare	0.000 g
Gross	0.000 g
Product	
Packaging	

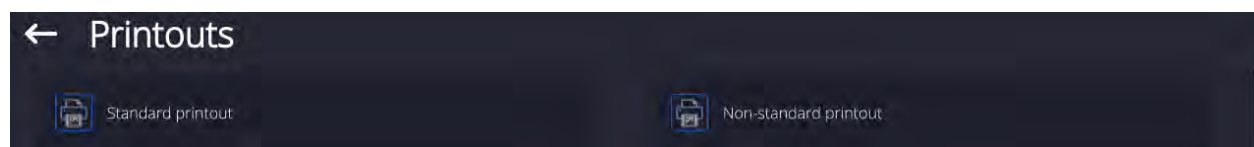
The workspace can contain up to six data. Mind that if you select more, only the first six of them are displayed.

Each parameter features two options:

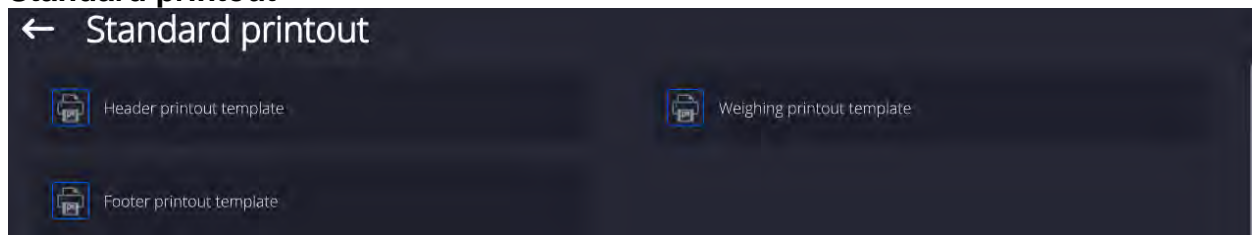
-  – data enabled.
-  – data disabled.



12.5. Printouts

The printout menu comprises two separate sections: standard printouts and non-standard printouts.



Standard printout






It comprises three internal sections containing different variables. For each variable, set  – variable printout enabled or  – variable printout disabled.


Procedure:

1. Select variables to be printed by pressing the name of a selected template (Header – GLP Printout – Footer).
2. If a printout is a non-standard one, create it.

<u>HEADER</u>	<u>WEIGHING</u>	<u>FOOTER</u>
<ul style="list-style-type: none"> – Dashes – Working mode – Date – Time – Balance type – Balance S/N – Operator – First and last name – Level status – Customer – Warehouse – Product – Packaging – Universal variable 1 ... 5 – Empty line – GLP report – Non-standard printout 	<ul style="list-style-type: none"> – N (measurement number) – Date – Time – Level status – Customer – Warehouse – Product – Packaging – Universal variable 1 ... 5 – Net – Tare – Gross – Current result – Supplementary unit – Mass – MW-Method – Reference tare – Minimum weight – Minimum sample status – Mass value for a titrator – ID – Non-standard printout 	<ul style="list-style-type: none"> – Working mode – Date – Time – Balance type – Balance S/N – Operator – First and last name – Level status – Customer – Warehouse – Product – Packaging – Universal variable 1 ... 5 – Dashes – Empty line – GLP report – Signature – Non-standard printout

HOW TO OPERATE PRINTOUTS

1. In order to print variables from the GLP PRINTOUT section, press the  button on the operation panel; only variables with the  attribute can be printed (see the above list).
2. Variables with the  attribute, present in the HEADER and FOOTER, are printed **ONLY** upon pressing **PRINT HEADER** and **PRINT FOOTER** pictograms. The pictograms have to be added to the bottom bar of the display as quick access buttons. (For detailed instruction on how to add quick access buttons to the bottom bar of the display, go to section 12.3)

	
Print header data	Print footer data

CAUTION:

Measuring units for mass indication:

- *Net – the main measuring unit (adjustment unit)*
- *Tare – the main measuring unit (adjustment unit)*
- *Gross – the main measuring unit (adjustment unit)*
- *Current result – currently displayed measuring unit*
- *Supplementary unit – supplementary measuring unit*
- *Mass – the main measuring unit (adjustment unit)*

Non-standard printout

Non-standard printouts may contain: TEXT and VARIABLES (acquired from the software during printout). Each non-standard printout is a separate project, featuring a specific name by which it is identified and saved to the database of printouts.

Procedure:

1. Press the <Non-standard printout> entry.



2. Press the <Add> button, window featuring Name/Code/Project data opens.
3. Set name and code of a printout.
4. Press the <Project> button.
5. Printout edit box with an on-screen keyboard is displayed.
6. Use the keyboard to design printout a template. The printout may contain text and variables.


CAUTION:


- *It is possible to add a printout by importing configured texts from flash drives connected to the balance's USB port.*
- *A printout name is ONLY a NAME, and it is not part of its content.*
- *For information on how to design a non-standard printout template, read section 16.10 Printouts.*



12.6. Profiles

The profiles function has been described in section 11 *Profiles*.

13. WEIGHING

Load the weighing pan. Wait for a stable indication (stability marker, ) and read the measurement result.

A record/printout of the measurement result is available upon pressing the  PRINT> key:

- for verified balances – only stable measurement results are saved or printed (stability marker  visible on the balance's display),
- for non-verified balances – stable and unstable measurement results are saved or printed (regardless of the stability marker  absence). For unstable measurement results, a question mark <?> is printed next to the mass value.

13.1. Weighing Unit Selection

The change of the weighing unit is carried out by pressing the weighing unit pictogram visible next to the measurement result. Upon pressing the weighing unit, a list of available units is displayed. Select the unit you need, the software automatically recalculates the indicated value.

Options:

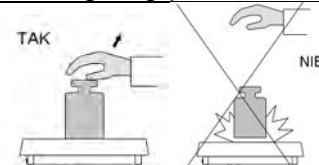
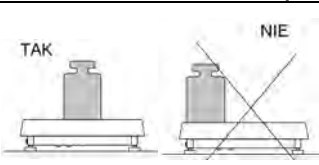
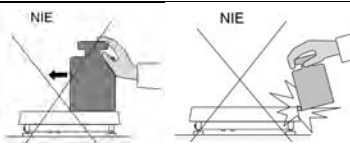
<i>unit</i>	<i>symbol</i>	<i>verified balance</i>	<i>Unit</i>	<i>symbol</i>	<i>verified balance</i>
gram	[g]	Yes	Taele Singapore	[tls]	No
milligram	[mg]	Yes	Taele Taiwan	[tlt]	No
carat	[ct]	Yes	Taele China	[tlc]	No
pound	[lb]	No	Momme	[mom]	No
ounce	[oz]	No	Grain	[gr]	No
ounce Troy	[ozt]	No	Tical	[ti]	No
pennyweight	[dwt]	No	Newton	[N]	No
Taele Hongkong	[tlh]	No	Mesghal	[msg]	No

For non-verified balances, all non-SI units are available.


13.2. Good Weighing Practice



To assure long-term operation and correct mass measurements, follow the rules presented below:

- Start the balance with no load on the weighing pan (permissible load value on the weighing pan at start is $\pm 5\%$ of the maximum capacity).



		
<p>Load the weighing pan steadily, avoiding shocks: Go to Setup/Misc./Vibrations detection parameter and enable control of weighing pan loading (for detailed information, read section 20.7).</p>	<p>Place the weighed loads centrally on the weighing pan.</p>	<p>Avoid side loading, in particular side shocks.</p>

Prior to weighing or in the case of ambient conditions changing, it is necessary to carry out balance adjustment.

- Prior to the measurement, it is recommended to load the weighing pan several times with mass close to the maximum capacity. In the case of instruments offering two reading units (d), the initial load of the weighing pan depends on the reading unit value.
Example: For the XA 82/220.5Y balances with $d_1 = 0.01\text{mg}$ and $d_2 = 0.1\text{mg}$, load the weighing pan as follows: 50 g weight for measurements with $d_1 = 0.01\text{mg}$ and 200 g weight for measurements with $d_2 = 0.1\text{mg}$.
- Make sure that the unloaded weighing instrument indicates zero ( pictogram)


and check whether the measurement is stable ( pictogram); if not, press the  button.





- Select the weighing unit: press the unit next to the result  or press the  w button at the bottom of the display.



Caution: In accordance with the EN 45501 standard, verified balances cannot display mass values below $-20e$. If the indication value is below $-20e$, **<Lo mass>** information is displayed.


Press  key to zero the balance.

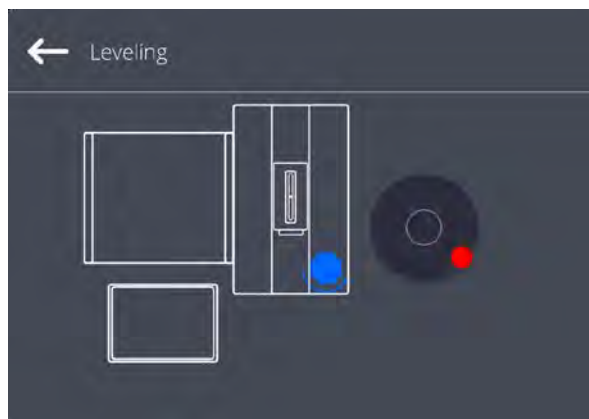
Do not unplug the balance from the mains between measurement series. It is recommended to switch off the display with the button in the upper slide-down menu of the balance.	
To start the balance, press the key on the indicator. Once the start-up procedure is complete, the balance is ready for subsequent weighings.	


13.3. Levelling

The balance is equipped with an AutoLEVEL System, which enables monitoring of the balance level. This solution enables continuous monitoring of the balance level during operation, which is signalled in the upper right corner of the display. The system monitors the balance level state. If the level changes, the system signals it by changing the position of the level indicator and/or by triggering an alarm and going to the balance levelling screen.

Levelling procedure

- Press the level status pictogram . It is displayed in the upper right corner of the operation panel.
- The control panel for the levelling function is displayed. Along with the level indicator, a balance view is presented.





- Level the balance by turning its feet left/right, follow the blinking pictograms,  – press to make the level marker move toward the centre of the circle.
- When the marker is in the centre, its colour changes from red to green, indicating that the balance is correctly levelled.

CAUTION:



The balance is equipped with an Automatic Level Control mechanism. For detailed information regarding the mechanism operation, refer to section 20.8 of this user manual.

13.4. Balance Zeroing

To zero mass indication, press the  key. The zero indication and the following pictograms are displayed: $\pm 0 \pm$ and . A zeroing operation means determining a new zero point, recognized by the balance as a precise zero. The balance can be zeroed only when the indication is stable.

Caution: *Indication can be zeroed only within $\pm 2\%$ range of the maximum capacity. If the zeroed value is above $\pm 2\%$ of the maximum capacity, then the software indicates a respective error message.*

13.5. Balance Taring


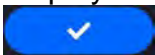
To determine the net weight value, load the weighing pan with a packaging, wait for a stable indication and press the  key. The zero indication and the following pictograms are displayed: **Net** and . Upon weighing pan unloading, the sum of tared masses with a minus sign is displayed. You can assign a tare value to a particular product stored in the database. In such a case, the assigned tare value is automatically acquired upon selection of the given product.

Caution: *Negative values cannot be tared. When you try to tare negative values, the weighing instrument responds with an error message. In such a case, zero the indication and repeat the taring procedure.*

Entering tare value manually

Procedure:




- Press the  quick access button. The button is available regardless of the working mode you operate.
- An on-screen numeric keyboard is displayed.
- Enter the tare value and press the  button.
- The balance returns to weighing mode. A tare value with a „—" sign is displayed.

Deleting Tare

The displayed tare value can be deleted by pressing the ZERO key on the operation panel, or by using the programmable <Deactivate tare> function button.


Procedure 1 - upon taking the tared load off the weighing pan:



- Press the  button,
- the <Net> marker gets deleted, a new zero point is determined.



Procedure 2 - with tared load resting on the weighing pan:



- Press  button,
- the <Net> marker gets deleted, a new zero point is determined.
- when the tare value exceeds 2% of the maximum capacity, an -Err- message is displayed in order to notify you that the operation cannot be completed.

Procedure 3 - when the tared load is on the weighing pan or upon taking the tared load off the weighing pan:



- press < Deactivate tare> programmable button,
- the NET marker is deleted,
- the display indicates the tare value,
- to restore the last tare value, press the < Restore tare> button.

13.6. Additional Parameters for a Weighing Process

Modification of the weighing functions enables programming of balance operation.

Procedure:

- Slide out the menu.
 - The following submenus are displayed: Settings, Buttons, Information, Printouts.
 - Enter a particular submenu and select the component that is to be modified.
- <Settings> - additional options related to the weighing mode,
<Keys> - defining quick access buttons,
<Information> - supplementary data on the weighing process displayed in an Info field,
<Printouts> - selecting printout type,

<SETTINGS> - weighing-process- related data such as:

– **Tare mode**

Available options:

- **SINGLE**

mass value saved to the balance memory on a single pressing of the TARE key. Subsequent pressing of the TARE key determines a new tare value. Selecting a product or packaging to which a tare value is assigned causes the automatic deletion of the previously assigned tare value.

- **CURRENT SUM**

total value of currently entered product and packaging tare values (result of selection of product and packaging from the database) with possibility to add tare value entered manually. When a new tare value for a product or packaging is set again, then the tare value entered manually gets deactivated.

- **TOTAL SUM**

total value of all entered tare values.

- **AUTOTARE**

Means of operation:

Each first stable measurement result is tared. The NET sign is displayed. Now you can determine the net mass of the weighed load. Upon unloading the weighing pan and autozeroing, the tare value is automatically deleted.

– **Automatic footer printout**

Available options:

MODE – None – manual footer printout,

Sum of measurements – footer is printed when the mass value entered in the <Threshold> parameter gets exceeded.

Measurements quantity – footer is printed when a pre-defined measurements quantity (a batch) set in the <Threshold> parameter is carried out.

THRESHOLD – setting the threshold value determining footer printout.

For the <Sum of measurements> parameter, the threshold value is determined in the measuring unit [g]. For the <Measurements quantity> parameter, the unit is not determined; the provided value specifies the carried out measurements quantity.

– **Printout / Release mode**

- **PRINT/RELEASE BUTTON (manual operation)**

Never – printout disabled.

First stable – first stable measurement is recorded.

Each stable – all stable measurements are recorded.

Each – printout of all measurements (stable and unstable), for verified balance, only stable measurements are printed out (as in <Each stable> setting).

- **AUTOMATIC MODE**

Never – printout disabled.

First stable - first stable measurement is recorded upon loading of the weighing pan with a load; the recording of the next stable measurement result takes place only if the following conditions are met: the weighing pan gets unloaded, measurement value lower than the value of the set threshold is displayed, a new load is placed on the weighing pan.

Last stable - last stable measurement, registered prior to unloading, is recorded.

The record takes place only if the following conditions are met: weighing pan gets unloaded, measurement value lower than the value of the set threshold is displayed.

- With interval – select this value to start the automatic printout and recording of indications to the WEIGHINGS database, carried out periodically at a predetermined time interval. The interval is set in [min] in <INTERVAL> parameter. The interval range is 1 s - 9 h 59 min 59 s.

Caution: *Each weighing result is printed and recorded (stable and unstable for a non-verified balance; stable for a verified balance).*

Automatic operation with an interval starts at the moment of switching the function on. The first stable weighing result of a value greater than the THRESHOLD value is printed and recorded as the first measurement. The following measurements are printed with the frequency set in the INTERVAL parameter. To stop the automatic operation with the interval, switch the option off.

- **THRESHOLD:**
Mass value obligatory for operation of automatic printout, set in grams.
- **INTERVAL**
Record frequency for automatic operation with an interval

– **Printout**

Printout type related to a working mode. A printout is activated by pressing the PRINT key on the balance operation panel.

Available options:

- **STANDARD PRINTOUT:** Enables declaring content of the following printouts: HEADER, GLP PRINTOUT, and FOOTER.
Select <YES> for the elements that are to be printed upon pressing the printout activating function key.
- **NON-STANDARD PRINTOUT:** Enables selecting one of the database-stored, non-standard printouts from a list in the <PRINTOUTS> menu, or designing a unique printout that is automatically added to the database.

Caution: *For detailed instruction, refer to section 13.5 of this user manual.*

13.7. Ambient Conditions - Vibrations

Vibrations are a major cause of errors. Since vibrations spread in all directions, vibration analyzers and meters must carry out measurements in three axes concurrently. The ambient conditions module implemented in the RADWAG balances of the 5Y series features such an option.

Analytical balances are precise weighing instruments; therefore, even insignificant oscillations influence their operation. Humans are most often unable to sense vibrations. In order to detect them, it is necessary to use special equipment. The vibration sensor, along with a module that analyses the influence of the vibrations on the measurement, informs the user in real time of the possibility of the occurrence of errors caused by high-frequency vibrations.

Usually, the vibrations are dampened with the use of anti-vibration tables. A signalling device, i.e. an ambient conditions module equipped with a vibration sensor, is used to support the process of vibration dampening. Such a device comes standard with each 5Y series balance. With the use of the said signalling device, it is possible to evaluate workstation conditions and, if necessary, to find a more convenient place of use. However, it is often impossible to find a place where no vibrations occur. The signalling device allows the operator to determine when and where to expect vibrations of the lowest frequency.

Due to the following 3 factors: specified values of free vibrations, resolution, and permissible weighing instrument errors, the analysis must be carried out with regard to the right effective value (rms value) and bandwidth. Such analysis is performed on each 5Y series balance in

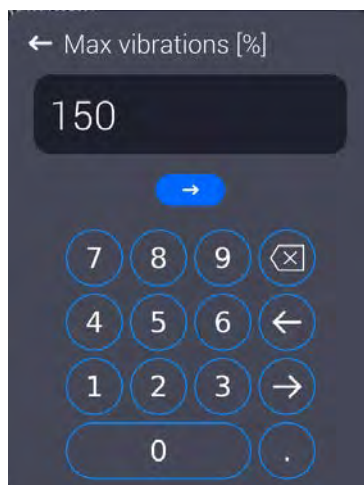
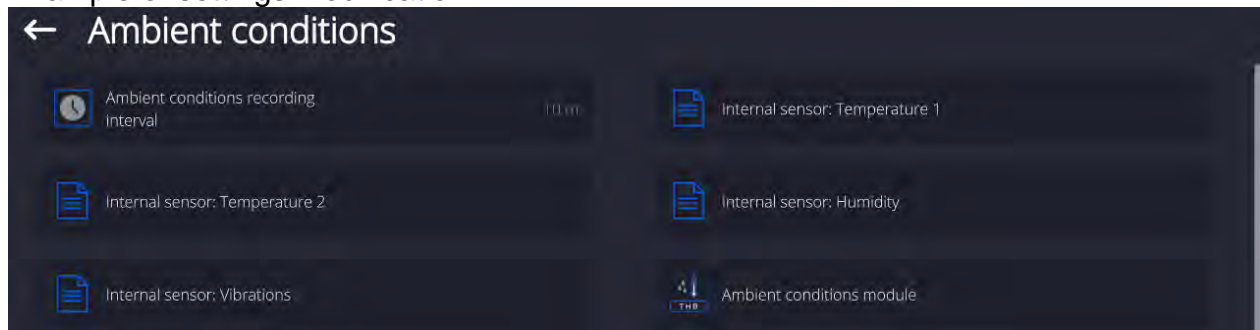
real time.

In the case of the module that is an integrated part of the balances manufactured by RADWAG, the filters analyse those frequencies to which the weighing devices are sensitive. In the case of balances, an effective value (rms value) measured from 3 axes and for a particular time interval is given. Such a value provides information on the amplitude and history of disturbances.

Radwag has designed an analysis method and selected permissible vibration thresholds respectively to make signalling device operation both effective and convenient (not troublesome). The balance screen displays the balance-registered vibration level in percent.

The vibration threshold cannot be changed, but the operator can modify settings in a way that ensures that alerts are displayed in the most convenient way, depending on the needs. By default, the set value is 100%.

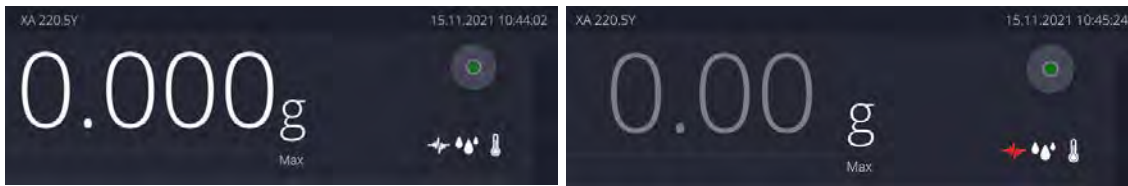
Example of settings modification:



For better understanding, analyse the following example (the values used below are exemplary ones; they were not taken from the balance).

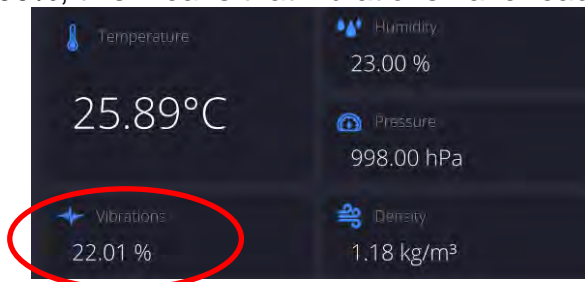
1. The assumed vibration threshold set by default on the 5Y series balance: 100 mm/s².
2. The max vibration value: 100% (threshold for alert – pictogram colour change, from green to red). Pictogram colour is green for vibrations within the 0 - 100 mm/s² range. For vibrations value of 101 mm/s², the pictogram changes to red.

3. The max vibration value: 150%. Pictogram colour is green for vibrations within the 0 - 150 mm/s² range. For vibration value of 151 mm/s², the pictogram changes to red.

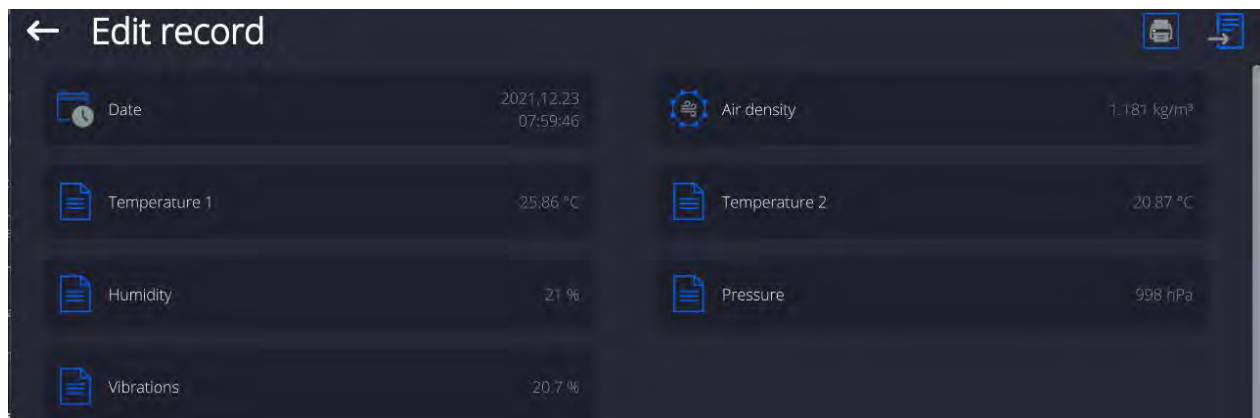


Vibrations are signalled by a respective pictogram displayed in the weighing result window.

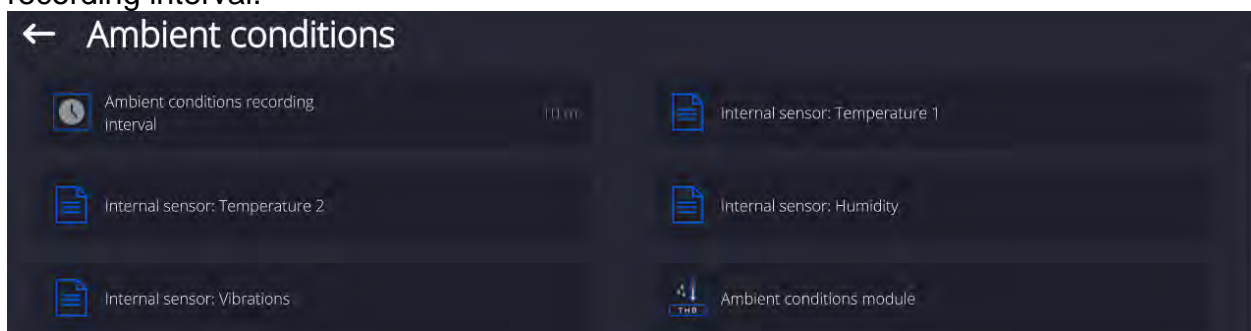
A window with the current sensor values is presented in the middle of the display on the right. The displayed vibration value (Vibrations) is the effective value registered within the most recent 2 seconds. This value is refreshed every 2 seconds. If the screen displays 100%, this means that vibrations have reached the threshold set by RADWAG.



Vibrations are recorded in the database. This allows you to analyse the history of ambient conditions quality.

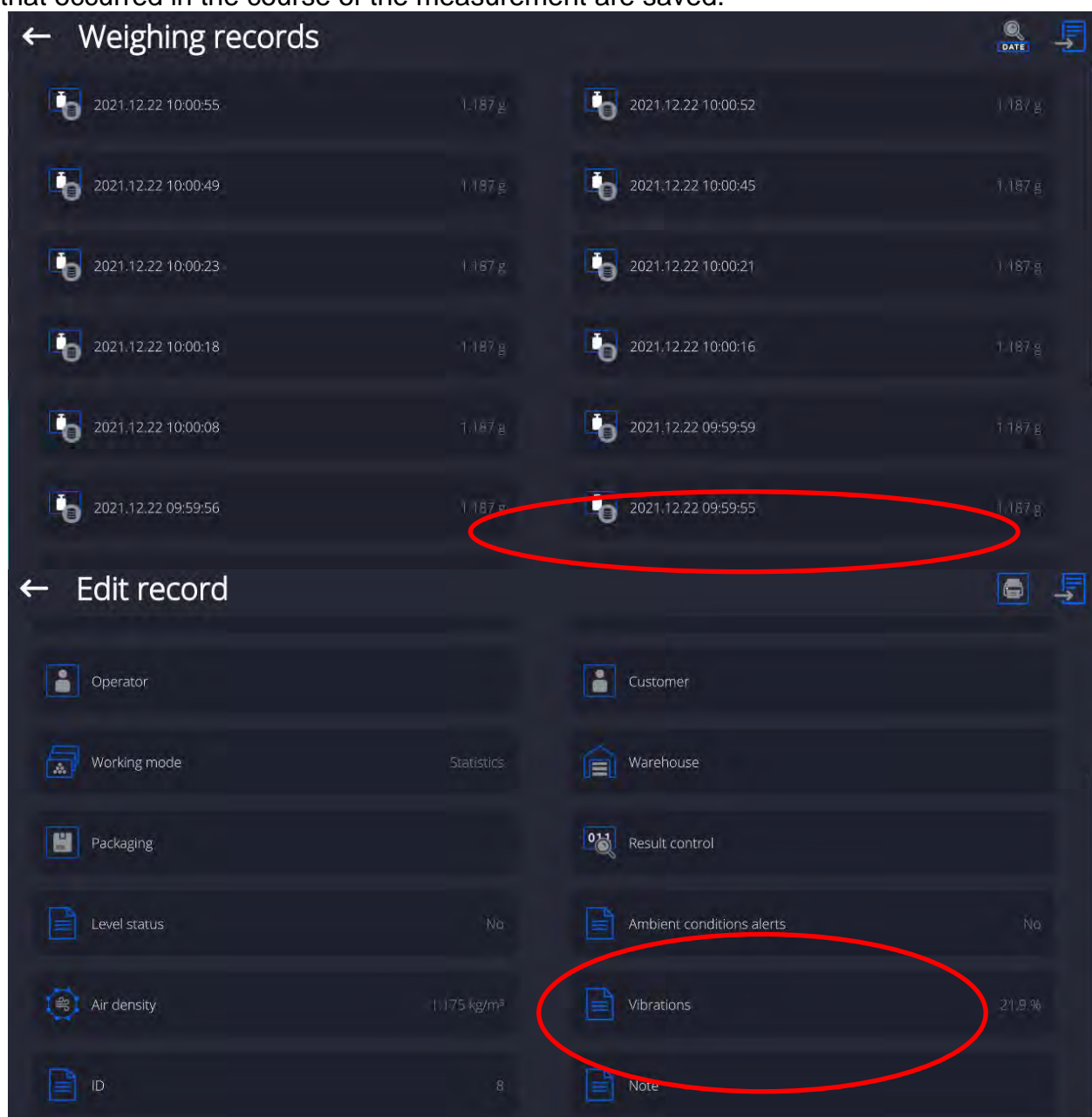


The effective value of vibrations registered by the balance over a declared time interval is saved (from the moment of the last record) – Setup/Ambient conditions/Ambient conditions recording interval.



By default, the interval is set to 10 min; this value may range between 1 - 60 min. Record analysis allows the user to select the optimal time of the day for the measurements to be carried out, i.e. time when the ambient conditions influence the vibrations the least. Remember that there are places where the most convenient working conditions occur after-hours.

Along with each measurement, data on ambient conditions alerts and the level of vibration that occurred in the course of the measurement are saved.

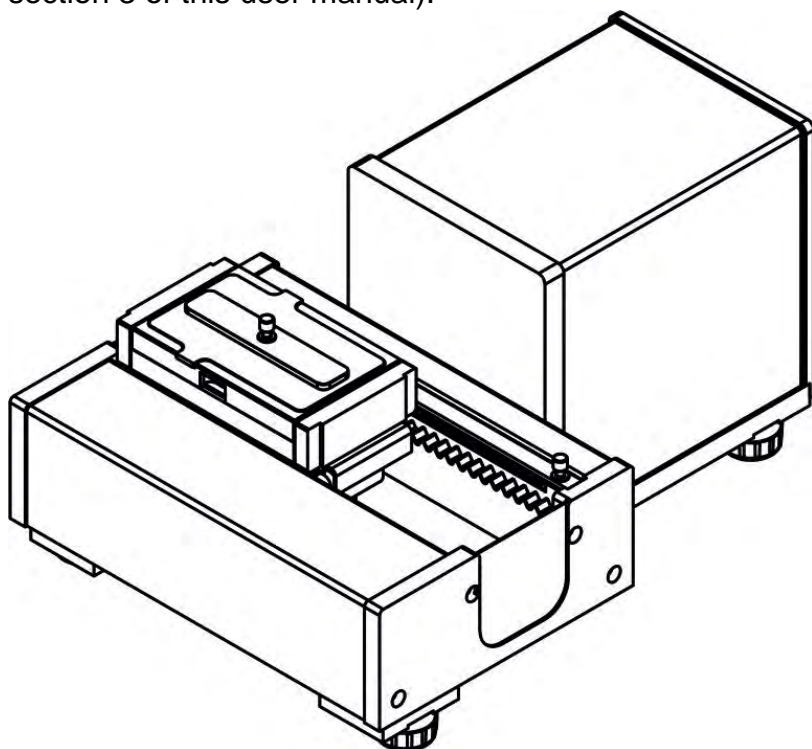


14. PIPETTE CALIBRATION

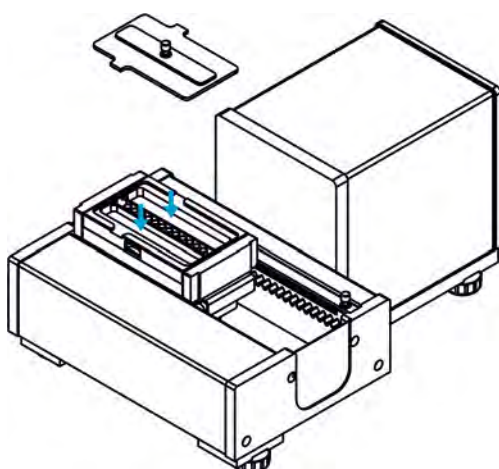
The balance enables pipette calibration using a dedicated program function or *PIPETTES* PC software (workstation for pipette calibration). Prior to the calibration start, it is necessary to install the set for pipette calibration. The set does not come standard with the balance. The assembly procedure is presented below.

AP-12.5Y balance with calibration kit for multichannel pipettes:

View of the assembled balance (a description of the balance preparation can be found in section 3 of this user manual).



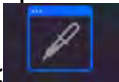
The evaporation ring minimizes measurement errors being a result of liquid evaporation occurring in the course of the weighing process.



Prior to pipette calibration, distilled water must be poured into the evaporation ring; the amount of water cannot exceed $\frac{2}{3}$ of the ring height. The set may be operated after about an hour – this period of time is required for humidity stabilisation. Remember to control the

level of distilled water – the surface of the vessel has to remain covered with it. Excess water may be removed by means of an automatic aspirator or an external pipette. In order to minimize changes in moisture content inside the weighing chamber, the liquid has to be dosed by means of a pipette through an opening located in the top cover/lid of the weighing chamber.

Now pipette calibration can be carried out.



The < Pipettes calibration > is a working mode allowing you to determine the errors in measurement of piston pipettes volume. The errors can be determined either with reference to the ISO 8655 standard or your own requirements.

In the case of a calibration carried out with reference to the ISO 8655 standard, the errors are automatically selected for a particular volume, as specified in the standard (refer to: table of errors, ISO 8655 standard).

Pipette calibration mode enables:

- calibrating pipettes of fixed-volume or variable-volume, and single- or multi-channel pipettes.
- creating pipettes database providing the following information: pipette name, code, tested volume, etc.
- calculating results on the basis of:
 - average volume of a pipette (channel)
 - systematic error e_s (accuracy error) ,
 - random error CV (repeatability error),
- carrying out automated measuring procedures conditioned by the pipette type,
- storing calibration results in a database (in the form of reports on the calibration process),
- printing reports on pipette calibration processes,
- exporting test reports.

During the procedure, the accuracy and repeatability errors are determined for the tested volume. In the case of pipettes with adjustable volume, the software enables declaring up to 5 volume values (from the total pipette's range) that are to be checked during the calibration process.

Use only distilled water for pipette calibration.

Ambient conditions crucial for high-accuracy calibration:

- The ambient temperature of the pipette, tip and liquid:
20°C ÷ 25°C, during weighing it must be stabilized within $\pm 0.5^\circ\text{C}$
- Relative humidity: 50 ÷ 75%.
- The pipette, tips and distilled water have to be subjected to temperature stabilization carried out directly in the weighing room. The standard recommends acclimatization for at least 2 hours.

While calibrating pipettes, **use the pipettes database** providing you with pipette-related data, parameters, tested volume, and error values determined for specific volumes.

Prior to the pipette calibration process, enter the pipettes database and provide pipette-related data and calibration criteria. In order to add a pipette, it is necessary to enter the database. For information on how to add a pipette to the pipettes database, read further down this user manual.

Pipettes Calibration mode screen



Button functions:



- press to select pipette for calibration from the database



- press to select pipette calibration order



- press to move the transport cart to a specific position. This option is only applicable when using the transport cart adapter (12 tubes).

After selecting the option, a window is displayed to indicate the position on which the tube transport cart is to be placed.



14.1. Adding Order

Adding an order is possible via the following program: **Radwag Web Editor - pipette calibration.**

Working with the program is intuitive and allows you to easily add data to the balance (e.g. operators, pipettes, orders), view reports, and print them.

The connection to the program is made using the balance IP for communication via ETHERNET, and the login and password for the operator of the balance.

14.2. Mode Related Settings

The supplementary settings enable you to adjust the working mode to your needs and requirements. To access the settings, follow the below procedure.

Procedure:

1. Press the grey workspace area.
2. The following submenus are displayed: Settings, Buttons, Information, Printouts, Profile.
3. Select the <Settings> menu.
4. The display indicates functions related to pipette calibration process.

Functions:

- **Measurements quantity:** intended for determining measurements quantity for tested pipette volume (valid for each tested volume in the case of a pipette with adjustable volume),
- **Request serial number:** YES/NO. YES – a window with an on-screen keyboard is displayed; use it to enter the serial number of a pipette.
- **Operation with adherence to ISO 8655:** YES/NO. YES – the software automatically takes error values accordant with recommendations of the ISO 8655 standard (if other error values have been defined for a particular pipette, then on selecting <Operation with adherence to ISO 8655> parameter, the specified error values are neglected and replaced by those from the ISO standard).
- **Upload ambient conditions parameters from THB sensor:** YES/NO. YES – the software automatically acquires and saves ambient conditions from a connected THB sensor at a right time. NO – you have to read ambient conditions (i.e. temperature, humidity and pressure) from external sensors and enter them manually both before and after calibration.
- **Automatic tarring** – option of automatic tarring of indication during calibration of single-channel pipettes, mind that this option must be off during cooperation with AP-12 robot.
- **Start-up weighing cycle quantity** – option allowing test run of the balance mechanism prior to performance of the calibration procedure. After providing a respective quantity value, the robot, prior to calibration procedure start, will place each probe on the weighing pan as many times as indicated by the parameter.
- **Result control, Tare mode, Automatic footer printout, Printout mode, Printout:** for information on how to operate these functions, read section 13.6 .

14.3. Pipettes Calibration – Quick Access Buttons

Each working mode features an automatically displayed set of default on-screen quick access buttons. The set can be modified, i.e. you can add out-of-list quick access buttons to it. Such operation requires particular permission level.

14.4. Adding a Pipette to Pipettes Database

The database of pipettes contains a list of pipette names and other data, including tested volumes and error values for a specific volume. When adding a pipette to the database, first specify its name, and then add the remaining data.

The software is intuitive, and you are guided by way of respective messages. The Pipettes database menu has been designed to enable adding formulations.

Procedure:

- Enter the <Databases> submenu and press the <Pipettes> button.



- Press the <Add> button to add a new pipette.

A new record is automatically added to the database, and it is opened in an editing mode. Enter the respective data.

A list of parameters defined for a pipette:

1. Name: press to enter pipette name.
2. Code: press to enter pipette code.
3. Model: press to enter model name.
4. Tip: press to enter tip name
5. Volume type: ADJUSTABLE/FIXED.
6. Nominal volume: pipette's nominal volume value.
7. Minimum volume: pipette's minimum volume value, for a fixed-volume pipette enter <0>;
8. Channels quantity: specify the number of pipette's channels, for a single channel pipette enter <1>;
9. Type: NONE/A/D1/D2. The pipette type adheres to standard guidelines. In the case of calibration carried out with reference to the ISO 8655 standard, the errors are automatically selected for a particular volume. Determining pipette type is crucial.
10. Tested volumes: press the "Tested volumes" field, a window with a list of calibrated volumes opens (in the case of a new pipette, the list is empty). Add volume to be tested, and define the error value for each tested volume:
Procedure:



- Press the <Add> button.
- An on-screen keyboard is displayed.
- Enter the tested volume value in [μl] and press the <→> button to confirm,
- A new record is automatically added. The record features recommended error values.
- In order to change error values, press a field with pipette volume

- each field can be edited; you can enter error values of your choice.

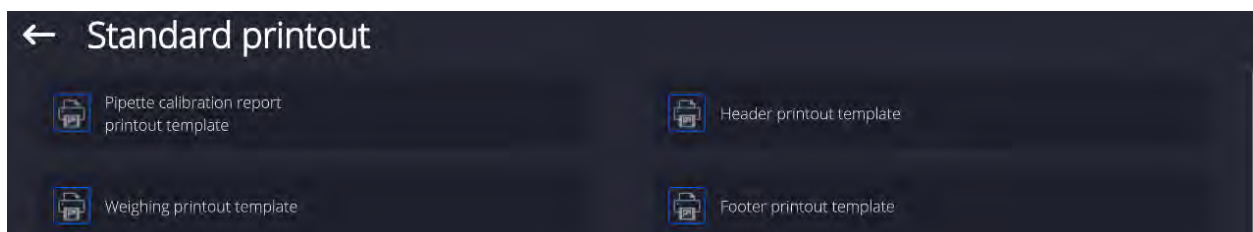
Caution: During calibration, the order of tested volumes corresponds to the order in which they are entered.

- Upon setting correct values, return to the home screen.

14.5. Printing Reports from the Balance

The printout option enables you to determine the content of a particular standard printout and to define a non-standard printout.

- **Standard printout** comprises four internal blocks, each containing different variables. Variable settings: YES - print; NO - do not print.



Settings for header, GLP, and footer printouts are specified in section 12.5. For settings of the pipette calibration report, read below.

Report content:

<ul style="list-style-type: none"> – Working mode – Operator – Customer – Pipette – Serial number – Channels quantity – Channel no. 	<ul style="list-style-type: none"> – Measurement quantity – Cooperation in accordance with ISO 8655 – Start date – End date – Dashes – Signature – Non-standard printout – Water temperature 	<ul style="list-style-type: none"> – Temperature – Humidity – Pressure – Z coefficient – Measurements and statistics – Statistics – Status – Empty line
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14.6. Pipet Calibration Using the Robot

Upon selection of either pipette or order for realization, the procedure will be performed automatically in accordance with messages displayed.

Keep in mind that prior to the calibration, test run will proceed as many times as set in <Test run cycle quantity> parameter.

Prior to the start and after completion of the calibration process, enter correct ambient conditions values indicated by the ambient conditions module.

14.7. Pipette Calibration Start-Up

In order to carry out the pipette calibration process, you need a special adapter. The adapter does not come standard with the balance.

The adapter facilitates piston pipette calibration and/or verification and is intended for the 5Y balances.

The adapter has been designed to minimize evaporation occurring in the course of liquid weighing. It comprises a mini weighing chamber, installed inside the weighing chamber of a balance, an evaporation ring, and a dedicated weighing pan, enabling to locate a measuring vessel in the very centre.

Application of the adapter prevents the risk of liquid evaporation during the calibration process. The compact dimensions of the adapter along with the use of the evaporation ring enable maintaining a high humidity rate inside the weighing chamber.

Carried out research has proved that the adapter eliminates or considerably reduces the liquid evaporation process. Eliminated/reduced liquid evaporation is a key factor while calibrating piston pipettes by means of a gravimetric method.

Selecting an appropriate adapter and balance is conditioned by the calibrated pipette type.

Prior to pipette calibration start, install the adapter inside the weighing chamber. Next, enter data regarding pipettes that are to be calibrated, including complete pipette characteristics and values of errors (see: Pipettes Database).

Now set the pipette calibration parameters:

- Measurements quantity


- Request a serial number (YES/NO).
- Operation with adherence to ISO 8655 (YES/NO).
- Upload ambient conditions parameters from THB sensor (YES/NO).

Caution: For parameters and settings overview, read section 14.2 of this user manual.


With all parameters set, you can start pipette calibration.

Pipette calibration procedure:




1. Press the  Select pipette> button.
2. A list of pipettes is displayed. Select a pipette to be calibrated.
3. The pipette calibration home screen is displayed. The selected pipette name is visible in the Info field.



4. Press the  Start> button in the bottom bar.
5. With <YES> value set for the <Request serial number> parameter, a window for entering the number opens. Enter the value and confirm.
6. A window for entering ambient conditions values is displayed. Read the temperature,





humidity, and pressure from external sensors and enter them; next, press the < Accept> button.

With <YES> value set for the <Upload ambient conditions parameters from THB sensor> parameter, the temperature, humidity, and pressure values are acquired automatically from the THB sensor; water temperature must be entered manually,



enter it and press < Accept> button to confirm.

7. The pipette calibration home screen is displayed. The tested volume and process status <In progress> are displayed in the Info field. The task bar displays prompts guiding you through the process - <C1/V1/N1 Sample weighing>. Where: C1 – channel number; V1 – volume number for the channel; N1 – measurement number for the tested volume.
8. Keep following the prompts until the calibration process is completed. Info field provides you with information on the on-going process (average volume, error values).
9. Upon confirmation of the last measurement, a window with ambient conditions parameters is displayed again. Enter the parameters and press the < Accept> button to confirm.
10. A report is generated automatically. The report is printed and recorded in the pipette calibration reports database (ambient conditions and water temperature values given on a report are average values from the process);
11. Press the  > button located in the bottom bar. For multichannel pipettes, you are asked whether the process should be continued for the remaining channels. Upon confirmation, the balance carries out the calibration process for the following channels. The settings remain unchanged.
12. You can start the following procedure for the same pipette or select another pipette from the pipettes database.

14.8. Performed Pipette Calibrations Report

Upon completing the calibration process, a report is generated. The report is saved to the <Pipette calibration reports> database. The files are named by the date and time (hour) of the calibration process performance.


Report example:

----- Pipettes Calibration -----		
Operator	Kowalski	
Customer	Nowak	
Pipette	p901\1k	
Serial no.	7777	
Channels quantity	1	
Channel no.	1	
Measurements quantity	10	
Operation with adherence to ISO 8655	Yes	
Start date	2012.03.15 07:50:44	
End date	2012.03.15 07:54:34	
Water temperature	22.15 °C	
Temperature	21 °C	
Humidity	48 %	
Pressure	1005 h Pa	
Z coefficient	1.00328	
----- Tested volume: 1000 µl -----		
1	0.998 g	1000.82389 µl
2	0.998 g	1000.82389 µl
.		
Average volume	1000.82389 µl	
Average [%]	100.08 %	
Systematic error	0.82389 µl	
Systematic error [%]	0.08239 %	
Permissible error	± 16 µl	
Random error	0 µl	
Random error [%]	0 %	
Permissible error	± 6 µl	
Status	Positive	

Signature	

15. STATISTICS





<  Statistics > is a working mode that enables acquiring data from a series of measurements and producing statistics using the acquired data. The settings of this function determine which data is displayed.

Statistics mode screen



15.1. Buttons and Information Settings

Buttons crucial for a series of measurements:

- <  PRINT > - press to trigger printout and to add measurement to statistics,
- <  Add to statistics > - press to add measurement to statistics, printout is not triggered.

You can define your own set of default keys and information that is to be displayed in the Info field.

15.2. Additional Settings for Statistics


To find out more about the remaining functions, refer to section 13.6 of this user manual, *Additional Parameters for a Weighing Process*.

15.3. Measurement Series Parameters

For each series of measurements, it is possible to overview the results, print a report, and delete the results of all statistics.

Procedure:



1. Press the <  > button (Statistics).
2. The following options are displayed: Result, Print, Delete last, Delete, Measurements graph, Probability distribution graph.
3. Select one of the available options:
 - **Result** – to preview statistics report,
 - **Print** – to print a report,

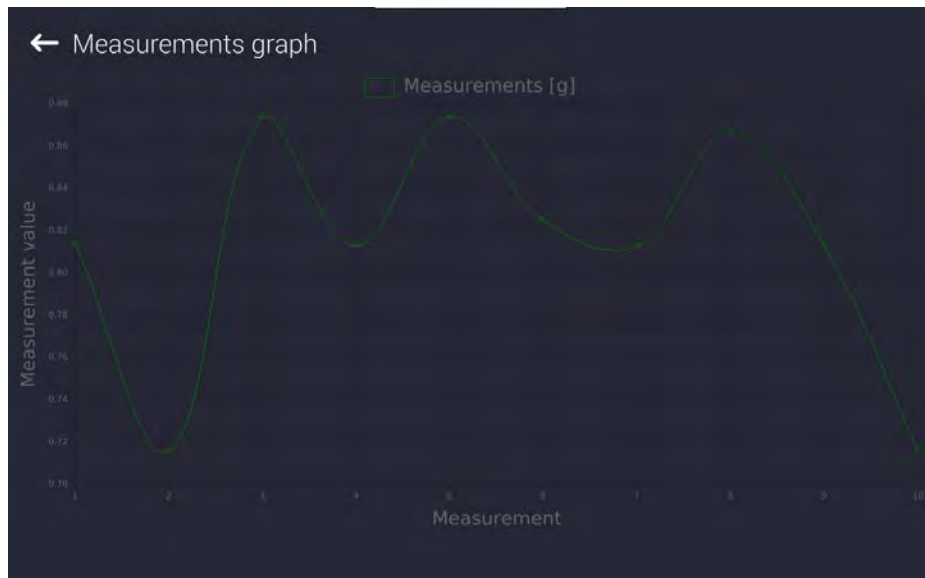
Example of a report:

```

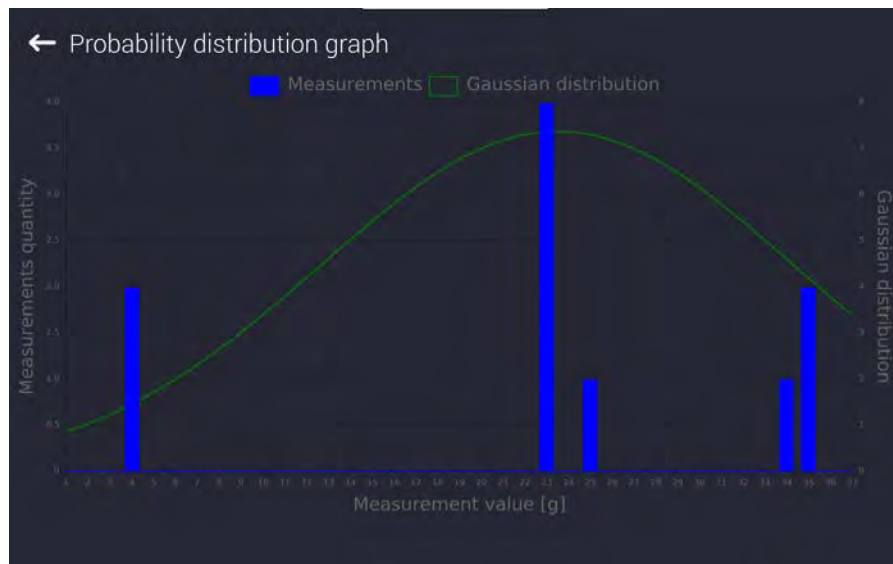
----- Statistics -----
N                      9
SUM                    455.600 g
X                      50.6222 g
MIN                    49.939 g
MAX                    51.380 g
D                      1.441 g
SDVP                   0.39605 g
SDVS                   0.38505 g
RDVP                   0.78 %
RDVS                   0.76 %
-----
  
```

$SDVP = \sqrt{\frac{\sum_{i=1}^n (X_i - \bar{X})^2}{n}}$	$SDVS = \sqrt{\frac{\sum_{i=1}^n (X_i - \bar{X})^2}{n - 1}}$
Where: SDVP - population standard deviation \bar{X} - measurement mean X_i - subsequent measurement n - measurement quantity	Where: SDVS - sample standard deviation \bar{X} - measurement mean X_i - subsequent measurement n - measurement quantity
$RDVP = \frac{SDVP}{\bar{X}} * 100\%$	$RDVS = \frac{SDVS}{\bar{X}} * 100\%$
Where: SDVP - population standard deviation \bar{X} - measurement mean	Where: SDVS - sample standard deviation \bar{X} - measurement mean

- **Delete last** – to cancel the last measurement,
- **Delete** – to delete all statistics data,
- **Measurements graph** – to make the software generate and display a graph with the distribution of measurements in mass/measurement coordinate system for completed measurement series (see the graph below).



- **Probability distribution graph**– to make the software generate and display a graph of probability distribution for completed measurement series (see the graph below). The bar graph demonstrates the number of identical results in a series.

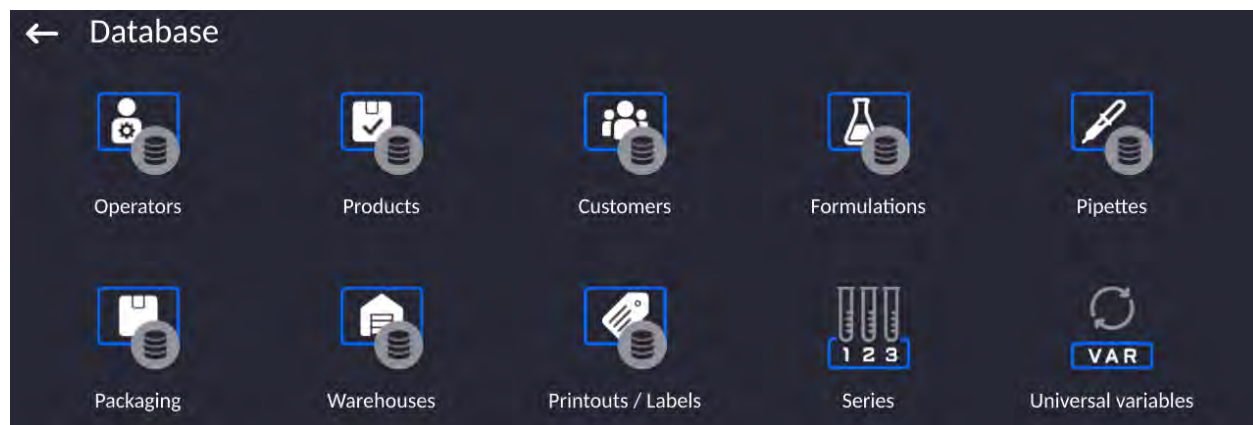


Graph buttons

←	Press to display the previous view.
---	-------------------------------------

16.DATABASES

The balance features the following databases:

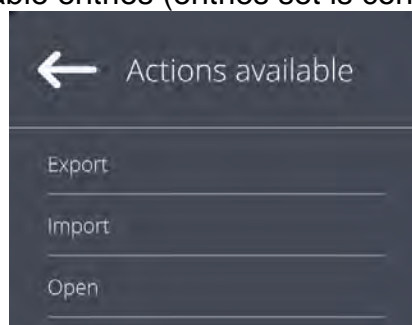


16.1. Database Operations

Databases can be operated only by an authorized personnel.

Procedure:

- Press and hold a respective database pictogram.
- Database menu is displayed.
- Select one of the available entries (entries set is conditioned by a database).



Entries:

- **EXPORT** - select to export data from a selected database to a USB flash drive. Plug the USB flash drive to a USB port; upon its detection, the software automatically starts a copying process. Upon completion of the copying process, a window with both, a file name to which data have been saved and message: <Completed> is displayed. Confirm completion.
- **IMPORT** – select to import data from a USB flash drive. Plug the USB flash drive to a USB port; upon its detection, a window with a list of saved files is displayed. Select file with data to be imported. The copying starts automatically. Upon completion of the process, message: <Completed> is displayed. Confirm completion.
- **OPEN** – select to enter a database (alternative method for database entering: single click on a given database field).

List of typical database operations:

1. Adding entry to a database.
2. Searching for a record in a database by name.
3. Searching for a record in a database by code.
4. Searching for a record in a database by date.

5. Exporting database content to a USB flash drive via USB port.
6. Printing data on a specific record in a database.

The above processes are initiated by dedicated buttons located on the top of the display. Follow the displayed commands.

16.2. OPERATORS


Operators database features list of users permissioned to operate the balance. The following data can be defined for each balance operator:

ID	Name
Code	Password
First and last name	Permissions
Active account	Language
Default profile	Card number
Theme	

CAUTION: Only a user with Administrator status can add new operators or delete operators from the database.

In order to add an operator:



- Enter <Operators> menu, press <  > button.
- Define all necessary data.

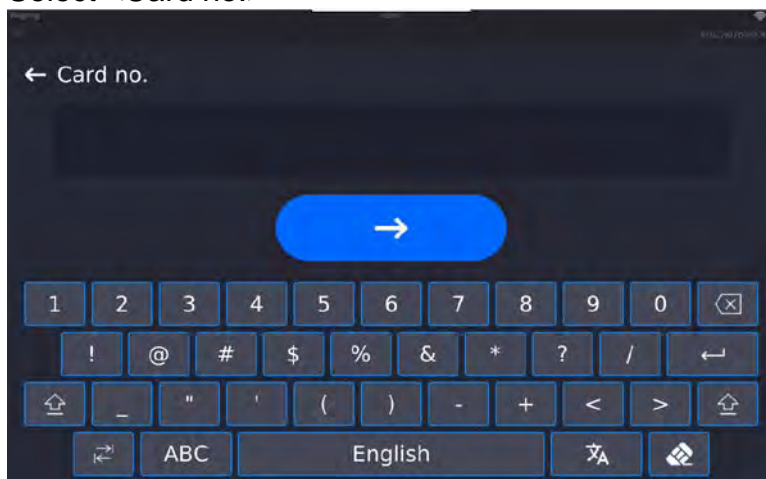
Caution: It is possible to search for an operator in a database of operators by code or name.

Log in using a transponder card:

Caution: The RFID reader mounted in the indicator operates at a frequency of 13.56MHz and complies with ISO/IEC 14443 Type A.

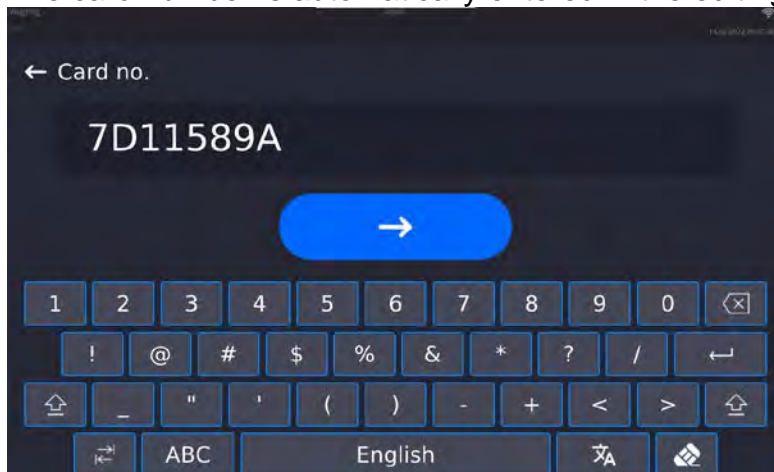
Only cards of this standard will be recognised by the reader.


- Enter Operator settings.
- Select <Card no.>



- Apply the card to the RFID reader.

- The card number is automatically entered in the editing field.



- Press  button, the card number is added to the operator settings.

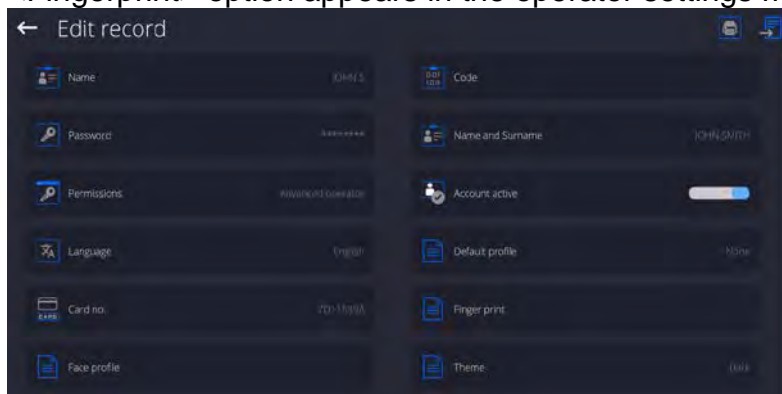


- Exit to the home screen. From now on, applying this card to the RFID reader will automatically log the user in.

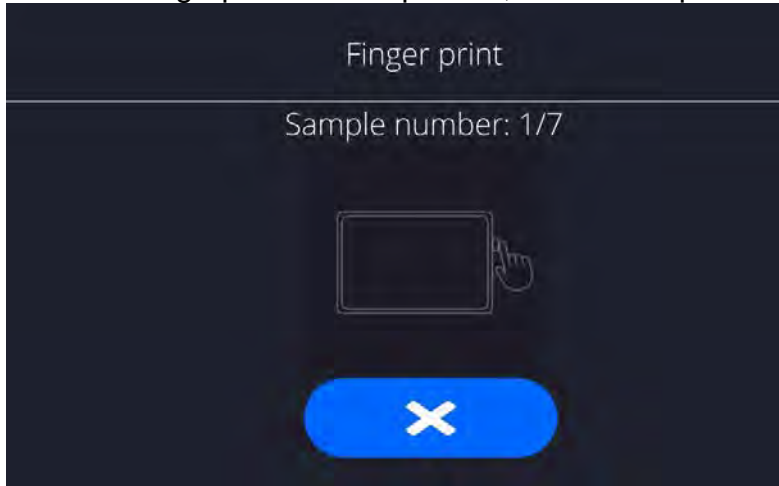
Log in using a fingerprint:

Caution: Only the fingerprint reader listed as a dedicated accessory for these balances can be connected to the balance. A list of accessories can be found on RADWAG website.

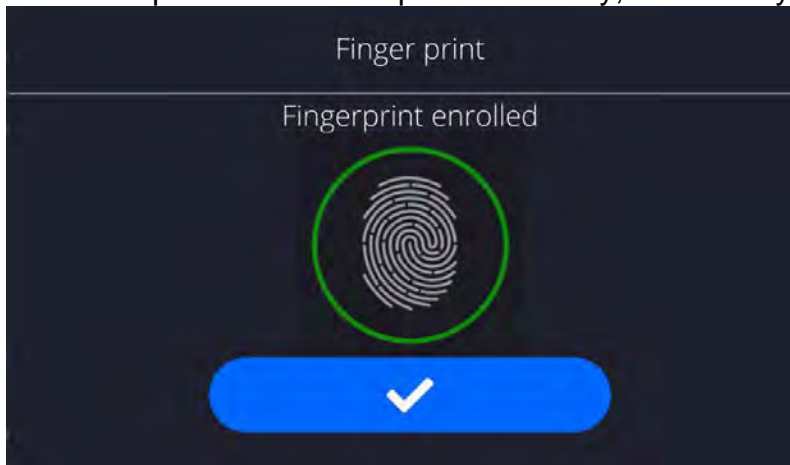
- When the fingerprint reader is connected to the USB type A socket, the <Fingerprint> option appears in the operator settings menu.




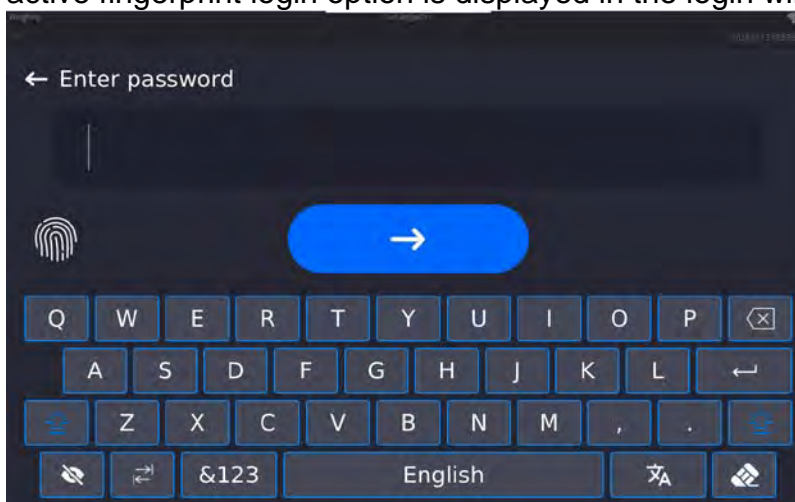
- To add a fingerprint for an operator, enter this option.



- Scan the fingerprint and repeat the procedure 7 times (as described in the message box).
- When the procedure is completed correctly, a summary window is displayed.



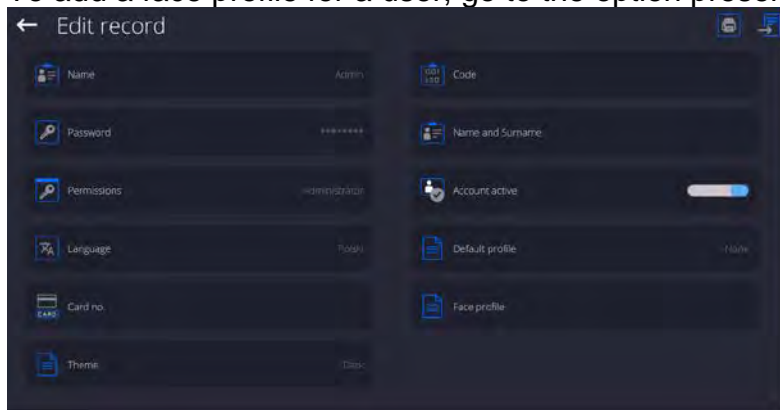
- Confirm the procedure by pressing  button.
- From now on, if a fingerprint reader is connected to the USB port, a pictogram of the active fingerprint login option is displayed in the login window.



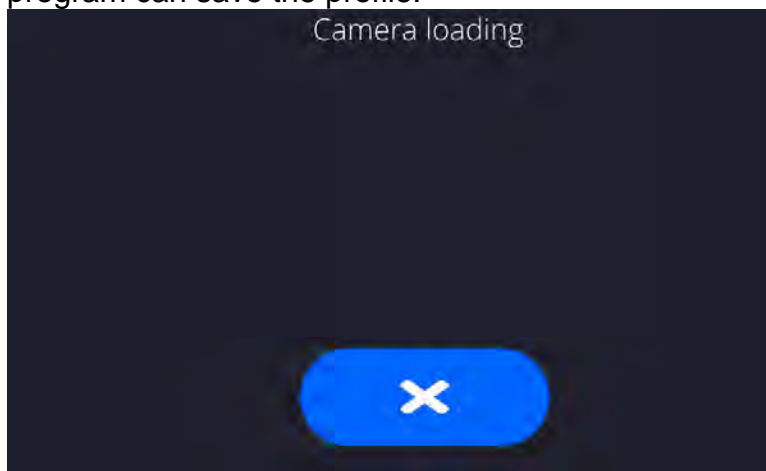
- After placing a finger on the reader and confirming the correctness of the fingerprint with the stored pattern, the pictogram briefly turns green, the user is automatically logged in, and the software switches to the home screen. The name of the logged-in user is displayed in the top bar of the window.
- If the scanned fingerprint does not match the stored pattern, the pictogram briefly turns red, the user is not logged in, and the software displays the login window.

Log in using a face profile:

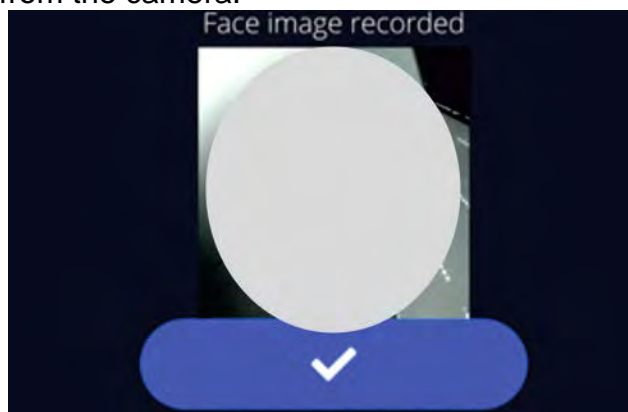
- To add a face profile for a user, go to the option presented below




- After starting the option, a message is displayed and the face profile is read; you must position yourself correctly in relation to the camera so that the program can save the profile.

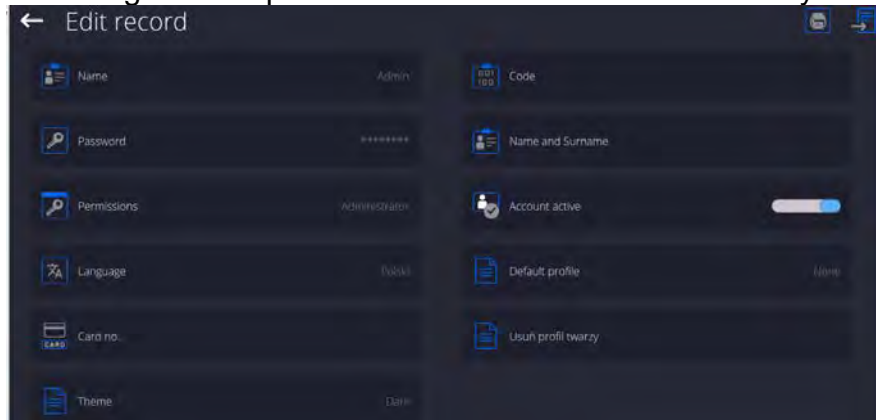


- Once the profile has been saved, a message is displayed along with a picture from the camera.

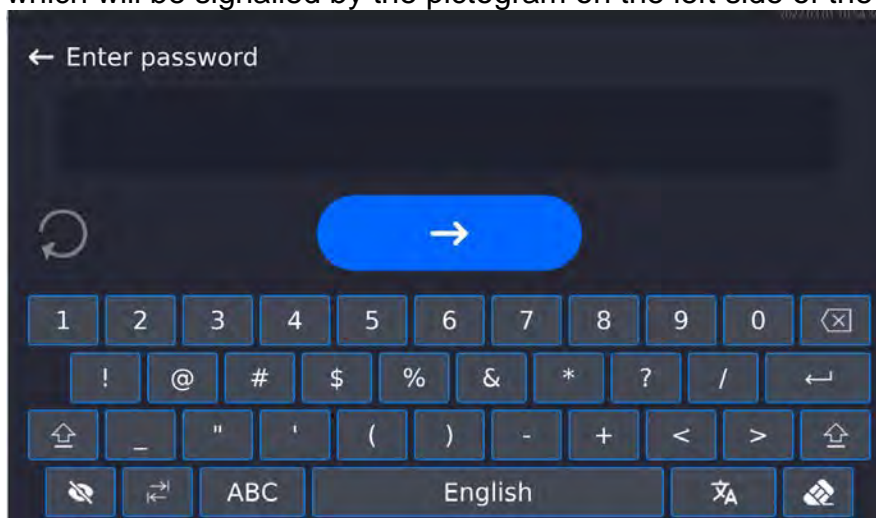


- Press  button to close the window.

- The option description in the user settings changes to <Delete face profile>, indicating that the profile is stored in the balance memory.



- From now on, if the user for whom the face profile was added logs in, after entering the logging window, the program will automatically read the profile, which will be signalled by the pictogram on the left side of the window



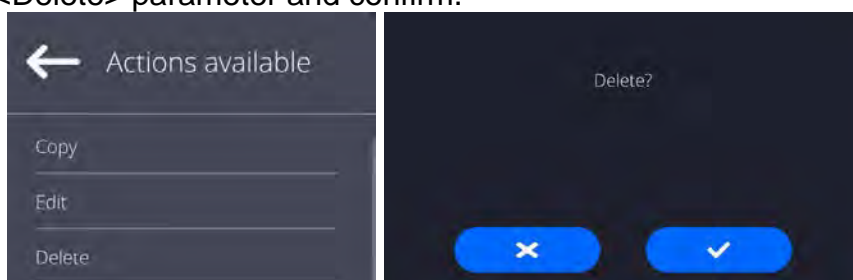
- The program automatically reads a photo of the user's face profile, and after the photo is read, the camera turns on (which is indicated by the lighting of a diode next to the camera) and compares the saved photo with the profile read by the camera. If these images match, the main program window will open and the name of the logged-in user is displayed in the top bar of the window.

Editing data on an operator:

- Press field with operator name.
- Data on a specific operator is displayed.
- Select and change necessary data.

To delete an operator:


- Press and hold operator name.
- Database menu is displayed.
- Select <Delete> parameter and confirm.



16.3. Products

<Products> database contains names of all products that are weighed, counted or controlled.

Procedure:

- Enter <Databases> submenu, press < Products> entry.
- Press  < Add> button to add a new product to the database, or
- Select the already existing product.

List of parameters defined for a product:

- | | |
|--|---|
| 1. ID | [Unique product number] |
| 2. Name | [Product name] |
| 3. Description | [Product description] |
| 4. Code | [Product code] |
| 5. EAN code | [Product EAN code] |
| 6. Mass | [Unit mass of a product] |
| 7. Dosing speed | [Option available for the <Mass control> mode; determines feeder dosing speed in [%] (0% - 100%).The value of dosing speed is conditioned by the size, shape and mass of dispensed parts (pills); it has to be determined by tests] |
| 8. Min | [Minimum mass for weighing the product using result control thresholds – LO. Value of <T1-> error for <Mass control> mode determined as percent of the nominal mass] |
| 9. Max | [Maximum mass for weighing the product using result control thresholds – HI. Value of <T1+> error in the <Mass control> working mode determined as percent of the nominal mass] |
| 10. Tolerance | [% value calculated versus mass (5), denoting measuring area in which the measurement is recognized as correct.] |
| 11. Tare | [Product's tare value, set automatically on selecting a product from the database] |
| 12. Price | [Unit price of a product] |
| 13. PGC mode | [Control mode: Non-destructive average tare, Non-destructive empty – full, Destructive full – empty, Destructive empty –full.)] |
| 14. Batch portion | [Measuring batch for control: Non-destructive empty - full, Destructive full – empty, Destructive empty –full.] |
| 15. Batch quantity | [Option available only for the <PGC> mode; specifies the quantity of controlled product batch] |
| 16. Interval of average tare determination | [Option available only for the <PGC> mode; specifies the minimum time interval needed for estimation of a packaging average tare; given in [h]; if the software detects that pre-set time interval has passed, it displays a message: <Estimate average tare>. The message has an |

		informative character and you can decide whether to carry out the process or not.]
17. Packages quantity		[Option available only for the <PGC> mode; specifies the number of packagings needed for estimation of the average tare]
18. Internal control		[Option available only for the <PGC> mode; allows for specification of internal control criteria accordant with company standards for a given product]
19. SQC		[Option available only for the <SQC> and <Mass control> modes; allows for specification of internal control criteria accordant with company standards for a given product]
20. Density		[Product density, used as a sample density for compensating air buoyancy] - [g/cm ³]
21. Shelf-life time in days		
22. Date		[Product date (constant)]
23. VAT		[VAT value related to a product]
24. Ingredients		[Field for inserting names of product's ingredients or for additional description regarding product's features, application, etc.]
25. Printout		[Template assigned to a product]

CAUTION: Remember to assign products to corresponding functions, as some of the data values are attributed according to their modes, e.g. thresholds in <Checkweighing> mode are set in [g], while thresholds in <Parts counting> mode are set in [pcs]. The values are selected automatically depending on which mode is enabled while entering a database.

16.4. Customers

Customers database contains name of Customers for whom the measurements are carried out.

Procedure:

- Enter <Databases> submenu and press <Customers> entry.
- Press <Add> button.
- Select the already existing customer.

List of parameters defined for a customer:

1. Customer name
2. Customer code [internal code identifying a customer]
3. TIN
4. Address
5. Postal code
6. City
7. Discount
8. Printout [type of printout, customer-related label]

16.5. Formulations

Formulations database stores all created recipes. The recipes can be carried out automatically.

Procedure:

- Enter <Databases> submenu and press <Formulations> entry.
- Press <Add> button to add a new formulation, or
- Select the already existing formulation.

List of parameters defined for series:

1. Name
2. Code
3. Ingredients
4. Ingredient quantity
5. Sum

16.6. Pipettes

Pipettes database contains data of pipettes that are to be calibrated.

Procedure:

- Enter <Databases> submenu and press <Pipettes> entry.
- Press <Add> button to add a new pipette, or
- Select the already existing pipette.

List of parameters defined for pipettes:

1. Name
2. Code
3. Model
4. Tip
5. Volume type
6. Nominal volume
7. Minimum volume
8. Channels quantity
9. Type
10. Tested volumes

16.7. Minimum Sample

Minimum sample database contains data concerning declared methods and minimum samples.

Caution: *Only authorized RADWAG personnel can add new minimum sample records or make changes in those stored in the database.*

Procedure:

- Enter <Databases> submenu and press <Minimum sample> entry.
- Press <Add> button to add a new minimum sample, or
- Select the already existing weight.

List of parameters defined for a minimum sample:

1. Name - name of a method used to determine minimum sample.
2. Code - method code.
3. Description - method overview.

4. Subsequent control - a field for entering expiry date of the minimum sample. Two weeks before the expiry date, a pictogram of a clock is displayed next to the status pictogram. The clock pictogram informs on elapsing validity date. Contact RADWAG representative to carry out necessary changes in minimum sample settings.
5. Thresholds – parameter for entering minimum sample data and range of packaging mass (tare) with applicable criteria:
Tare – maximum tare value, for which the minimum sample is obligatory.
 You can enter three characteristic quantities: 0.000g, optional mass value from weighing instrument's measuring range, and maximum capacity (see: examples below).
Minimum mass – value of the minimum sample determined for a particular weighing device on site using respective methods.

Example no. 1 XA 220.5Y balance with $d=0.0001$ g.

List of MS values determined for the following packaging values:

No.	Tare value	Minimum sample	Overview
1	0.0000 g	0.1000 g	Minimum sample refers to all net weight values when weighing is carried out without use of a tare container (<TARE> button NOT used).
2	10.0000 g	1.0000 g	Minimum sample refers to all net weight values when weighing is carried out using a tare container of mass ranging from 0.0001 g to 10.0000 g inclusive (<TARE> button used).
3	50.0000 g	2.5000 g	Minimum sample refers to all net weight values when weighing is carried out using a tare container of mass ranging from 10.0001 g to 50.0000 g inclusive (<TARE> button used).
4	200.0000 g	4.0000 g	Minimum sample refers to all net weight values when weighing is carried out using a tare container of mass ranging from 50.0001 g to 200.0000 g inclusive (<TARE> button used).

Example no. 2 XA 220.5Y balance:

No.	Tare value	Minimum sample	Overview
1	220.0000 g	0.5000 g	Minimum sample refers to all net weight values when weighing is carried out using a tare container of mass value comprised within the whole weighing range (<TARE> button used), and to all net weights that are weighed without a packaging (the <TARE> button not used).

Example no. 3 XA 220.5Y balance:

No.	Tare value	Minimum weight	Overview
1	0.0000 g	0.2500 g	Minimum sample refers to all net weight values when weighing is carried out without use of a tare container (<TARE> button NOT used). In case of such settings, the minimum sample is valid only when you weigh samples without use of tare containers. If taring function is used, then pictogram informing on use of minimum sample goes blank and the software carries out weighing with tare (no determined minimum sample).

You can preview the entered data, but you are not allowed to edit it.

16.8. Packaging

<Packaging> database contains a list of packages for which a name, code and mass value are specified. The tare value is automatically applied when a name of a packaging is selected from the database during weighing process. The tare value is displayed with minus sign.

Procedure:

- Enter <Databases> submenu and press <Packaging> entry.
- Press <Add> button to add a new packaging, or
- Select the already existing one, and insert data on the packaging.

Caution: *It is possible to use 'search record' option; you can search by name or by code.*

16.9. Warehouses

Depending on the organization of work, the warehouses database contains a list of places used for picking up a sample for weighing or a list of places to which a weighed sample was delivered. Each warehouse has to have its name, code and description specified. During the weighing process, and upon selecting the name of a warehouse, it is automatically assigned to the measurement result.

Procedure:

- Enter <Databases> submenu and press <Warehouses> entry.
- Press <Add> button to add a new warehouse, or
- Select the already existing warehouse.

Caution: *It is possible to use 'search record' option, you can search by name or by code.*

16.10. Printouts

Printouts database contains all NON-STANDARD printouts. Each printout features a name, code and a template.

Procedure:

- Enter <Databases> submenu and press <Printouts> entry.
- Press <Add> button to add a new printout, or
- Select the already existing record.

Caution: *It is possible to use 'search record' option; you can search by name or by code.*

Designing new printout template

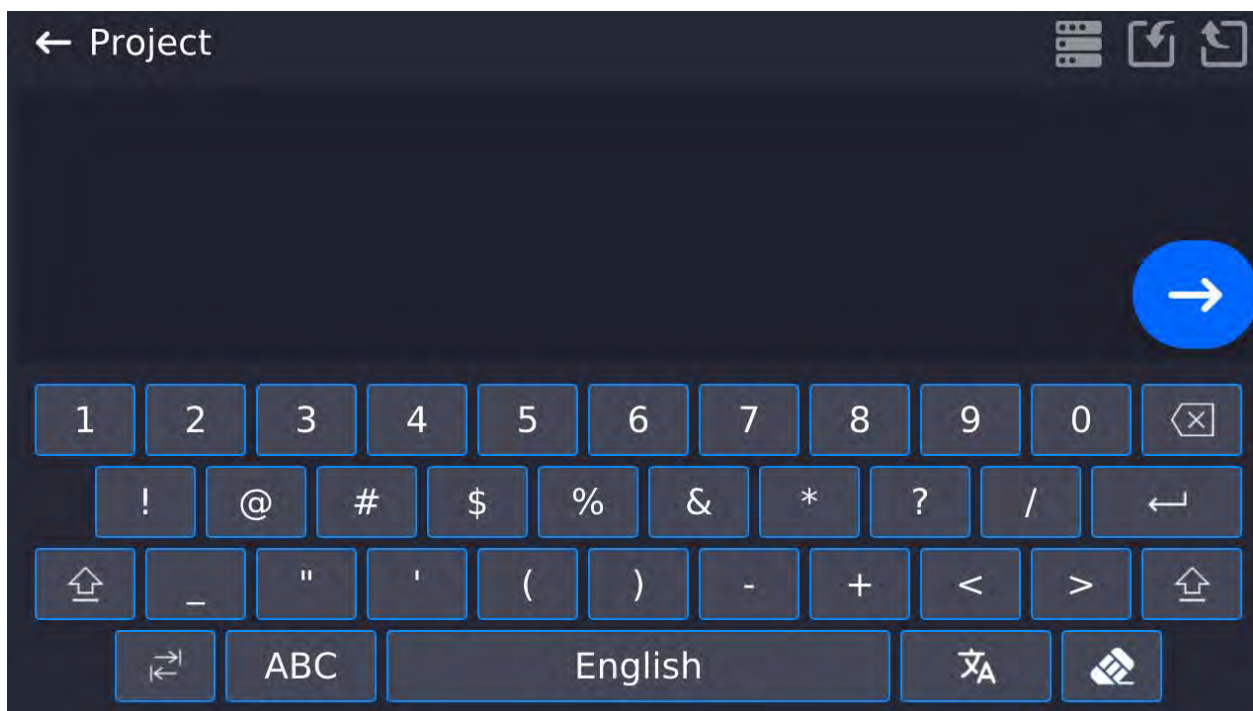
Procedure:

- Enter <Databases> submenu and press <Printouts> entry.
- Press <Add> button to create a new printout, or edit the already existing one.



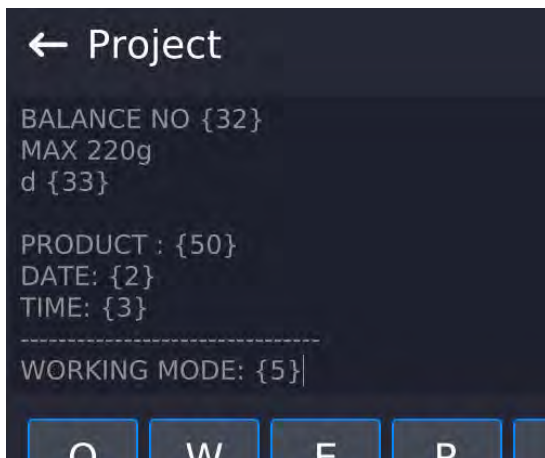
- Edit box opens, press <Project> entry.

- Respective box with an on-screen keyboard is displayed.
- Use the keyboard and create a printout template.



- Save the designed printout.

Example of Printout no. 1 – large edit box



Project

Balance no. 400015
Balance parameters:
Max = 220 g
d= 0.001 g

Product name:
Date: 2011.10.24
Time: 11:48:06

Working mode: Weighing

Net weight: 94.147


Carried out by: Admin

Printout template

Example of Printout no. 2 – printout from a file

All printout templates can be designed in a form of external files, that are imported to a balance; file extension: *.txt or *.lb. External file shall contain all constant and variable data. Upon importing, the content of a printout template can be modified.

Procedure:

- Design a *.txt or *.lb file in an optional editor.
- Copy the file to a USB flash drive.
- Connect the USB flash drive to the balance USB port.
- Press [4] < Download a printout from a file> button,

- Balance display shows data stored on the USB flash drive connected to the USB port.
- Select file with a printout template and press its name.
- The printout template is automatically copied to an editing field.

16.11. Universal Variables

Universal Variables are alphanumeric data which can be combined with printouts, products or other comparison-related information. Each variable has to have its name, code and value specified.

Procedure:

- Enter <Databases> submenu and press <Universal variables> entry.
- Press <Add> button to add new variable, or
- Select already existing universal variable, and modify the following fields: code, name, value.

Caution: It is possible to use 'search record' option; you can search by name or by code.

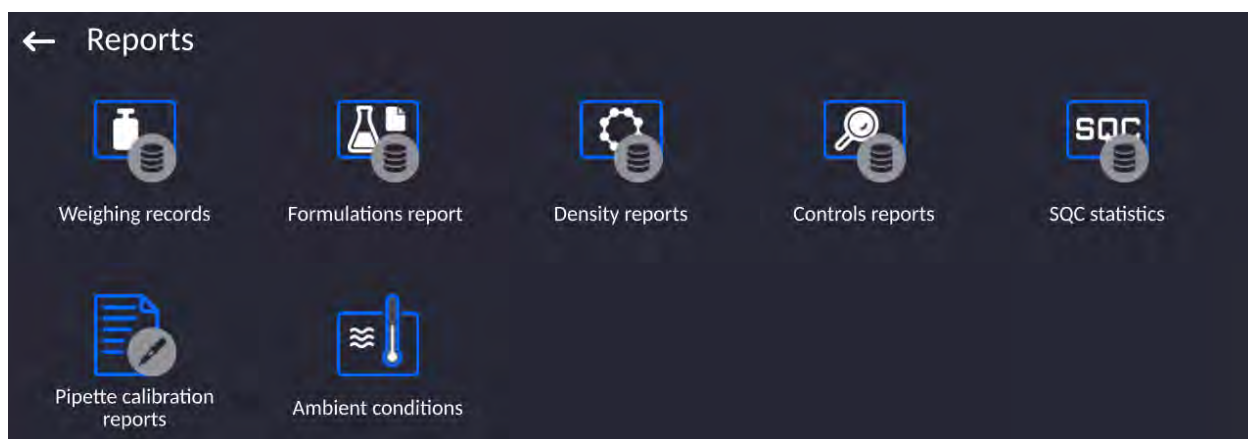
16.12. Pipette Calibration Order Database

Database of pipette calibration orders comprises calibration orders recorded for particular customers. This database allows preview of order status and, in the case of completed orders, also a calibration process report. It is possible to export such a report to a pendrive plugged to USB port of the indicator.

Caution: In order to add order you can use **Radwag Web Editor – pipette calibration app**.

17. REPORTS

The balance features the following reports:



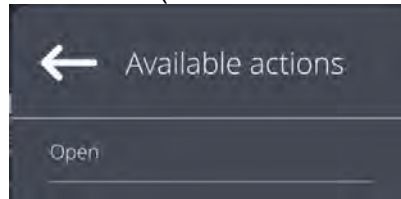
17.1. Reports Operations

Databases can be operated only by an authorized personnel.

Procedure:

- Press and hold a respective database pictogram.

- Database menu is displayed.
- Select one of the available entries (entries set is conditioned by a database).



Entries:

- OPEN – select to enter a database (alternative method for database entering: single click on a given database field).

List of typical database operations:

1. Searching for a record in a database by name.
2. Searching for a record in a database by code.
3. Searching for a record in a database by date.
4. Exporting database content to a USB flash drive via USB port.
5. Printing data on a specific record in a database.

The above processes are initiated by dedicated buttons located on the top of the display. Follow the displayed commands.

17.2. Weighings

Each weighing result sent from the weighing device to a printer is saved to the weighings database (read section *Result control*).

You can preview data of particular weighing records.

Procedure:

- Enter **<Databases>** submenu.
- Enter **<Weighings/Alibii>** database and select desired record.

List of parameters defined for a weighing record:

1. Measurement date.
2. Measurement result.
3. Tare value.
4. Stable/unstable measurement marking.
5. Air buoyancy control on/off marking.
6. Product name.
7. Operator.
8. Customer, customer name.
9. Working mode name.
10. Warehouse, source warehouse name.
11. Packaging, name of tare applied during product weighing.
12. Result control, information regarding range within which the weighed product is placed:
 - MIN – below LOW threshold (possible only if <Result control> is set to <NO> value),
 - OK – between the LOW and HIGH thresholds,
 - MAX – above HIGH threshold (possible only if <Result control> is set to <NO> value).

13. Weighing platform no., field with number of a weighing instrument by means of which a measurement was carried out.
14. Level status, information on level status maintained during the measurement .
15. Ambient conditions alerts, information regarding stability of temperature and humidity during the measurement.

17.3. Control Reports

Each product control carried out using the SQC or PGC mode is sent to a printer or saved to <**Controls reports**> database. Each control saved to the database features specific number assigned at the moment of control completion.

Control number format:

X / y y / M M / d d / H H / m m, where:

X – control type, marked as follows:

U – control regulated by the act,

Z – control completed by an operator,

W – control regulated by an internal criteria for PGC or SQC mode

yy - year of control end,

MM - month of control end,

dd - day of control end,

HH - hour of control end,

mm - minute of control end,

You can preview data on each control.

Procedure:

- Enter <**Databases**> submenu, follow the procedure described in section 29 of this user manual.
- Enter < **Controls reports**> database and press respective record.

List of parameters defined for control:

- | | |
|---------------------------|---|
| 1. Batch number | [batch number of controlled product] |
| 2. Result | [control status (result)] |
| 3. Start date | [control start date] |
| 4. End date | [control end date] |
| 5. Product | [name of controlled product] |
| 6. Operator | [name of an operator carrying out control] |
| 7. Average | [average value from carried out measurements] |
| 8. Average limit | [average disqualifying value] |
| 9. Standard deviation | [average standard deviation] |
| 10. Batch quantity | [quantity of a batch; value for which the software accepts the size of tested sample in accordance with the regulation] |
| 11. Measurements quantity | [quantity of carried out measurements] |
| 12. Method | [control method
(regulated by the act or by internal criteria)] |

For SQC mode controls, the data comprise the following values.

Each report on completed product control is sent to a printer and saved to the <**Controls reports**> database. Each control saved to the database features a specific number assigned at the moment of control completion.


Control number format:

y y / M M / d d / H H / m m / s s, where:

yy - year of control end,
MM - month of control end,
dd - day of control end,
HH - hour of control end,
mm - minute of control end,
ss - second of control end.

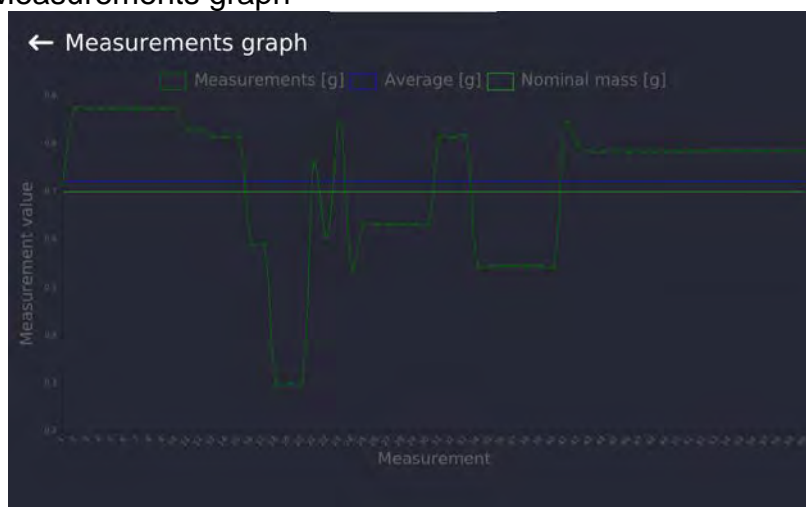
You can preview data on each control.

Procedure:

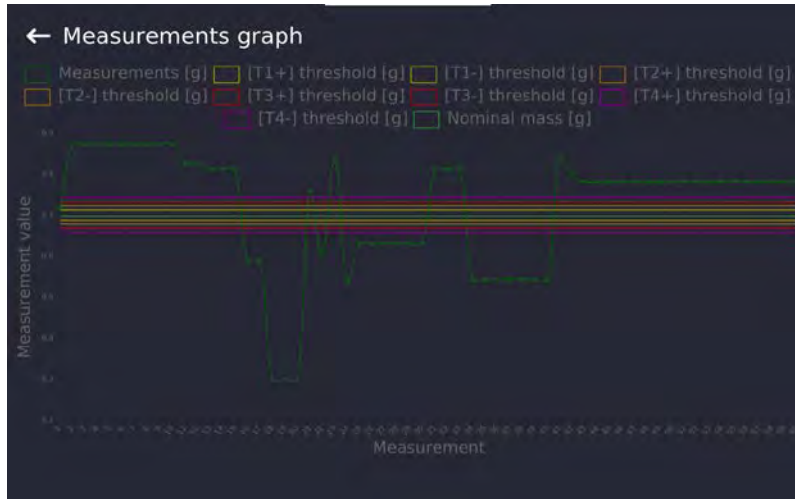
- Enter  **Databases**> submenu, follow the procedure described in section 29 of this user manual.
- Enter < **Controls reports**> database and press respective record.

List of parameters defined for control:

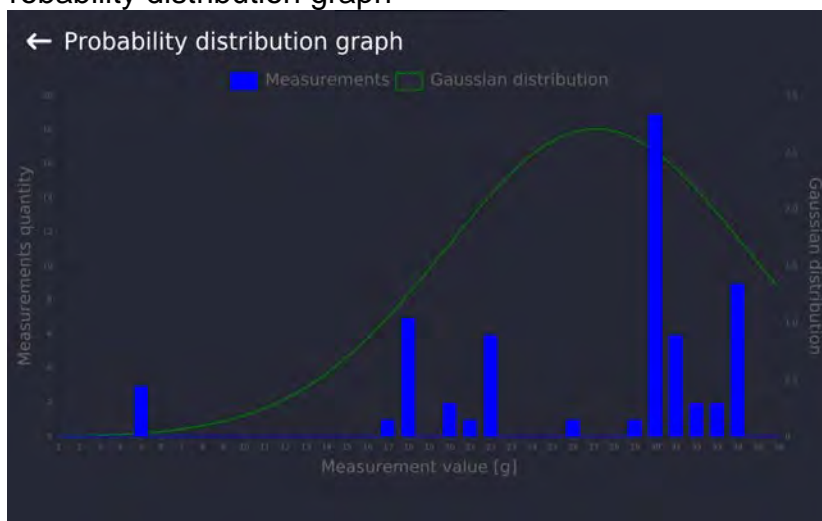
- | | |
|---------------------------|---|
| 1. Batch number | [batch number of controlled product] |
| 2. Result | [control status (result)] |
| 3. Start date | [control start date] |
| 4. End date | [control end date] |
| 5. Product | [name of controlled product] |
| 6. Operator | [name of an operator carrying out control] |
| 7. Average | [average value from carried out measurements] |
| 8. Average limit | [average disqualifying value] |
| 9. Standard deviation | [average standard deviation] |
| 10. Batch quantity | [quantity of a batch; value for which the software accepts the size of tested sample in accordance with the regulation] |
| 11. Measurements quantity | [quantity of carried out measurements] |
| 12. Method | [control method
(regulated by the act, by internal criteria or by SQC)] |
| 13. Measurements graph | |



14. Measurements graph with thresholds:



15. Probability distribution graph



17.4. SQC Statistics

SQC Statistics database enables you to list and compare all measurements performed for a particular product. For each product it is possible to preview reports on particular controls, generate a graph presenting the course of measurements obtained for all tests of the given product, printout and export data.

Procedure:

- Enter <Databases> submenu and press <SQC Statistics> entry.
- Select product for which tests history is to be generated.
- Specify data that is to be searched (lot number, start date and end date).
- Display list of reports on controls that meet the specified criteria (product, performance date): <Control reports>.
- Generate measurement graph.

To generate measurement graph:

- Enter <Databases> submenu.
- Press <SQC Statistics> entry.
- Select product for which tests history is to be generated.
- Specify data that is to be searched (lot number, start date and end date).
- Select <All-in-one report> option.
- Select <Measurements graph> option.

The program generates and displays (in a coordinate system) a graph presenting the results of product drying processes: Result/Measurement number.

Graph example:



17.5. Pipette Calibration Reports

Pipette reports provide information about carried out pipettes calibrations. In the case of multichannel pipettes, reports are generated for each channel separately. Each report can be previewed, searched by date or exported, and printed out.

Procedure:

- Enter <Databases> submenu and press <Pipette calibration reports> entry.
- Select report, if not visible, scroll using navigation buttons.
- Report is named by date and time; e.g. 2012.03.12 11:12:15.

Caution: *It is possible to use <Search report> option.*

List of pipette calibration reports data:

1. Pipette [pipette name]
2. Serial no. [serial no. entered during calibration]
3. Channel no.
4. Start date
5. End date
6. Operator [name of an operator carrying out calibration]
7. Customer [customer name]
8. Measurements quantity [quantity of measurements for each tested volume]
9. Operation with adherence to ISO 8655 [information if errors comply with the standard]
10. Status values [information whether errors are below permissible accepted for the tested volume]

11. Temperature	[average temperature value during the process]
12. Humidity	[average humidity value during the process]
13. Pressure	[average pressure value during the process]
14. Water temperature	[average water temperature during the process]
15. Z coefficient	[coefficient value for given temperature]

17.6. Series

Series database contains series data and sample measurements.

Procedure:

- Enter <Databases> submenu and press <Series> entry.
- Press <Add> button to add a new series, or
- Select the already existing series.

List of parameters defined for series:

1. Name
2. Code
3. Customer
4. Samples
5. Samples quantity

17.7. Ambient Conditions

<Ambient conditions> database contains parameters related to ambient conditions. Depending on the balance type, the ambient conditions report can provide values of temperature, humidity, atmospheric pressure. If the given balance is connected to a THB sensor, then its indications are recorded to the database too.

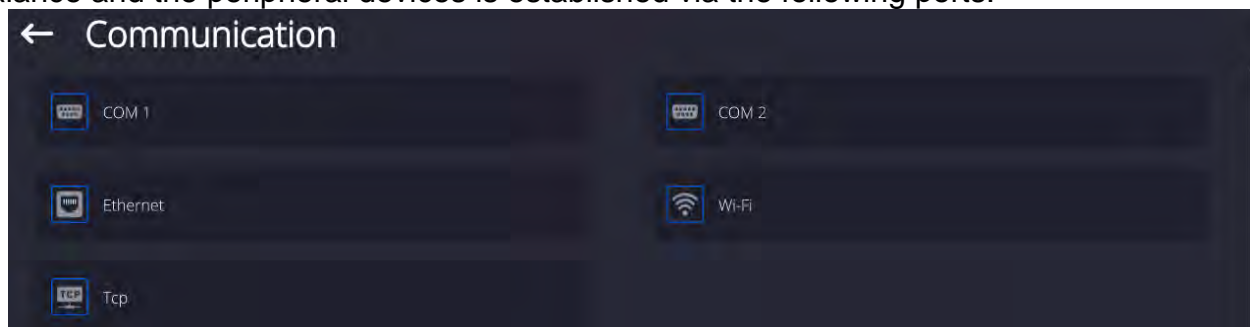
Procedure:

- Enter <Databases> submenu and press <Ambient conditions> entry.
- Select report, if not visible, scroll using navigation buttons.
- Report is named by date and time.

Caution: *It is possible to use 'search report' option.*

18. COMMUNICATION

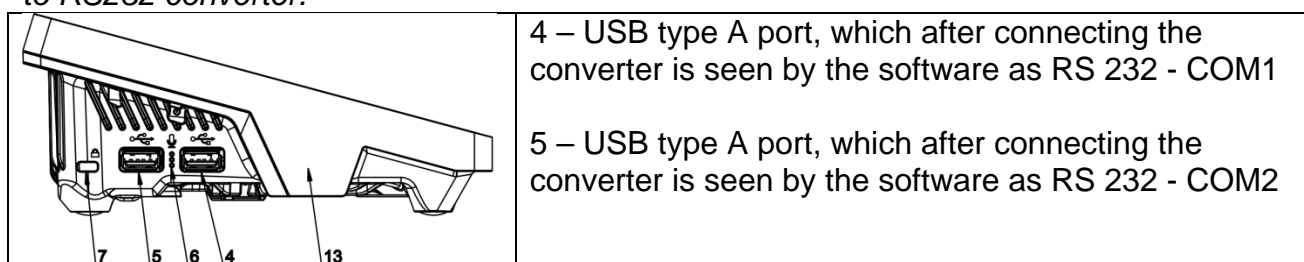
The Communication menu is located in the Parameters menu. To access the Parameters menu, press the Setup key or the <Setup> quick access button. Communication between the balance and the peripheral devices is established via the following ports:



The parameters of each port can be configured depending on the needs.

18.1. RS232 Ports Settings

CAUTION: To ensure correct interaction with external devices via RS 232 ports, use a USB to RS232 converter.



4 – USB type A port, which after connecting the converter is seen by the software as RS 232 - COM1

5 – USB type A port, which after connecting the converter is seen by the software as RS 232 - COM2

Procedure:

- Select communication port: <COM1> or <COM2>.
- Set respective parameters.

Transmission parameters for RS 232 ports:


- Baud rate: 4800, 9600, 19200, 38400, 57600, 115200 bit/s
- Data bits: 5, 6, 7, 8
- Stop bits: None, 1, 1.5, 2
- Parity: None, Odd, Even, Marker, Space

18.2. ETHERNET Port Settings

Procedure:

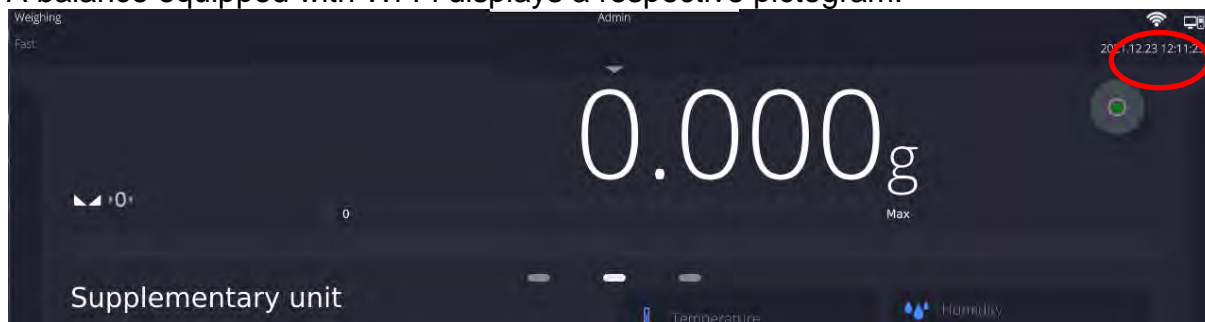
- Select the <Ethernet> port. Set the respective parameters:
- DHCP: Yes – No
- IP Address: 192.168.0.2
- Subnet mask: 255.255.255.0
- Default gate: 192.168.0.1

Caution: The above-presented values serve informational purposes only. Set the transmission parameters in accordance with your local network.

Press the  button, the message <Restart balance to implement changes> is displayed. Return to the weighing procedure and restart the balance.

18.3. Wi-Fi Settings


A balance equipped with Wi-Fi displays a respective pictogram:



Procedure:

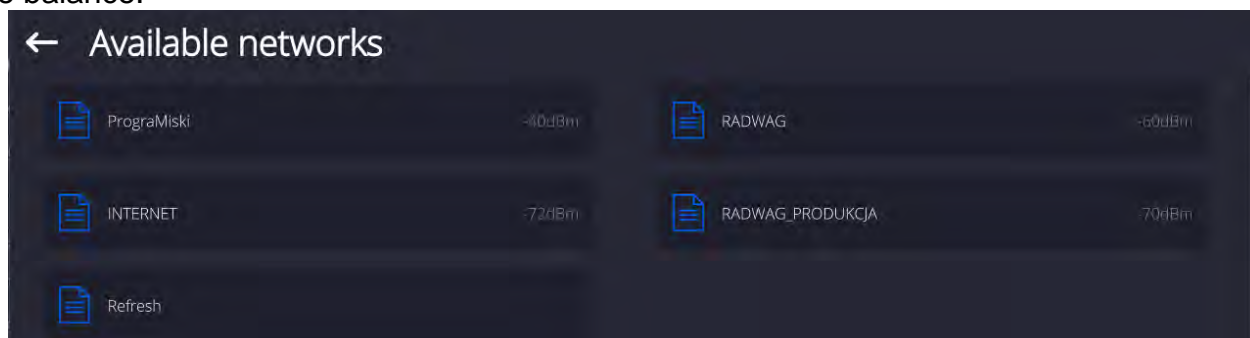
- Select <Wi-Fi> communication interface. Set respective parameters:
- DHCP: Yes – No
- IP Address: 10.10.9.155
- Subnet mask: 255.255.255.0
- Default gate: 10.10.8.244

Caution: The above-presented values serve informational purposes only. Set the transmission parameters in accordance with your local network.

Press the  button, the message
<Restart balance to implement changes> is displayed.

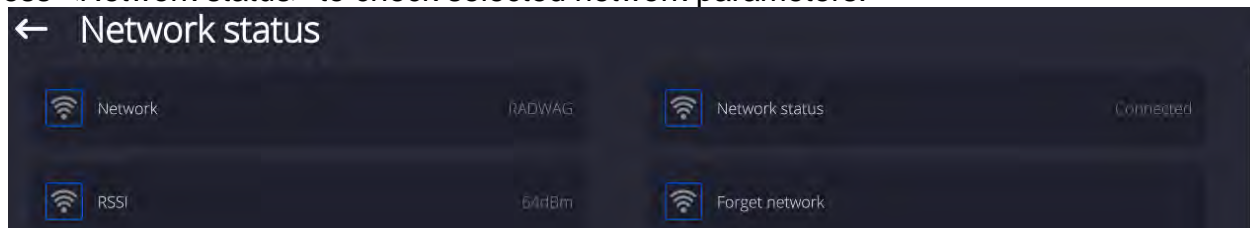
Return to the weighing procedure and restart the balance.

You may use the <Available networks> parameter to view the list of networks detected by the balance:



A pictogram with a padlock means that the password is required. Press <Refresh> to search for available networks.

Press <Network status> to check selected network parameters.



The selected network and connection parameters are saved to the balance memory. The program connects to the network in accordance with the memory-saved parameters each time the balance is switched on. To change this, select the <Forget network> option. The previously selected network gets disconnected.

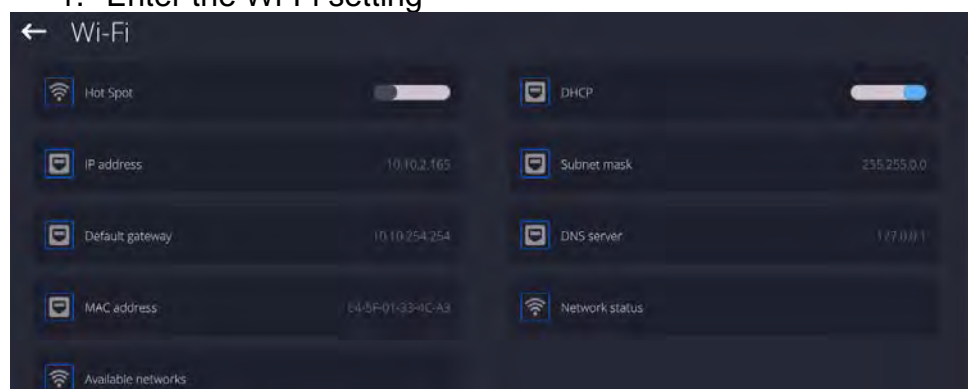
18.3.1. Hot Spot - General Information

Hot Spot - an open access point allowing wireless connection with the balance by another device - laptop, tablet, or phone, using a wireless network based on the Wi-Fi standard.

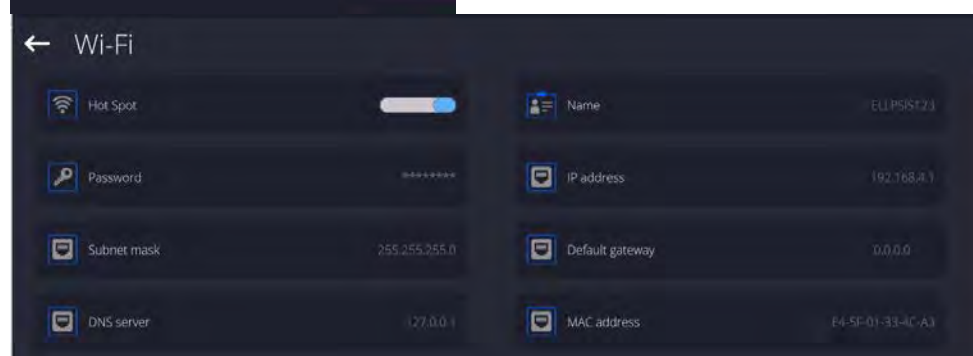
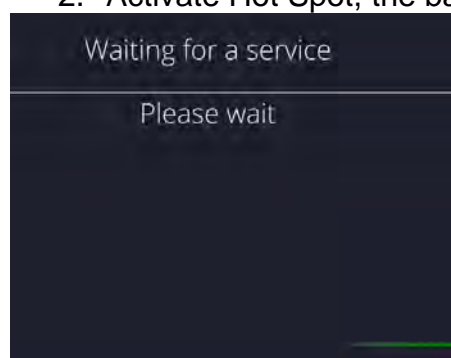
The owner of the Hot Spot decides for himself how, to whom and under what conditions he is going to make his link available by logging in, which requires having an individual user name and password (these data are given while starting the service and are stored in the memory of the balance).

18.3.2. Hot Spot Activation

1. Enter the Wi-Fi setting



2. Activate Hot Spot, the balance will switch to the service settings after a moment.



3. Enter an individual name and password for access (password must be at least 8 characters long).

← Name

ELLPSIS123

→

1 2 3 4 5 6 7 8 9 0 [X]

! @ # \$ % & * ? / [↵]

[↵] _ " ' () - + < > [↵]

[↵] ABC English [A] [Globe]

Waiting for a service

Please wait

← New password

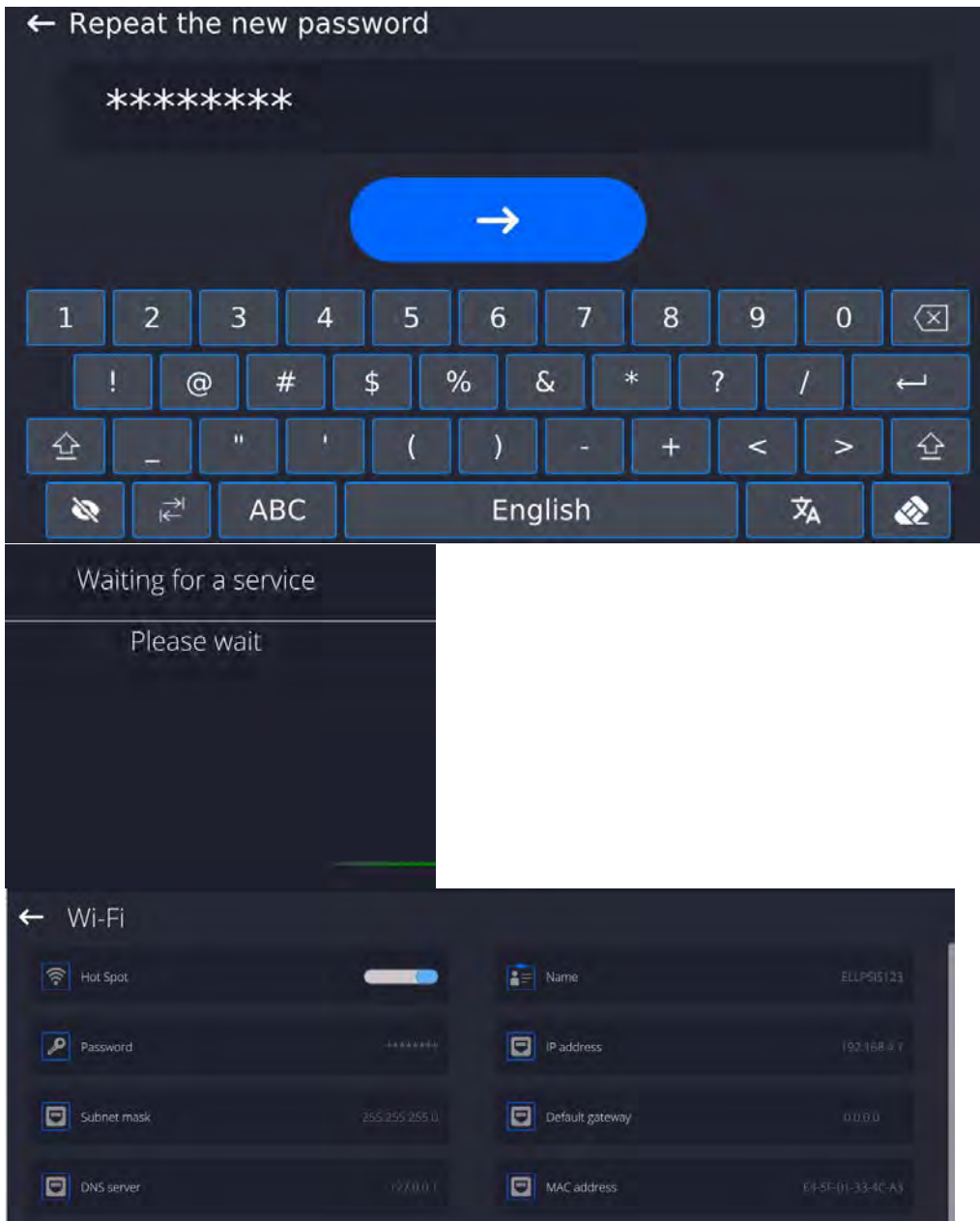
→

1 2 3 4 5 6 7 8 9 0 [X]

! @ # \$ % & * ? / [↵]

[↵] _ " ' () - + < > [↵]

[Globe] [↵] ABC English [A] [Globe]




4. From now on, the Hot Spot service will be active, and the created subnetwork will be visible to other smartphone devices under the name assigned above, and you will be able to connect to it using the assigned password.

18.4. TCP Settings

TCP (*Transmission Control Protocol*) is a stream protocol, operating in customer-server mode, enabling communication between two computers. TCP operates in client – server mode. You can establish a connection on the specified server port.


Procedure:

- Enter the <Communication> parameters.
- Select <TCP / Port>; a <Port> window with an on-screen keyboard is opened.
- Insert the required port number and press the  button to confirm.

19. PERIPHERALS

The <Peripherals> menu is located in the <Parameters> menu. To access the Peripherals menu, press the Setup key or the < Setup> quick access button. The peripherals menu provides a list of devices that can cooperate with the balance.

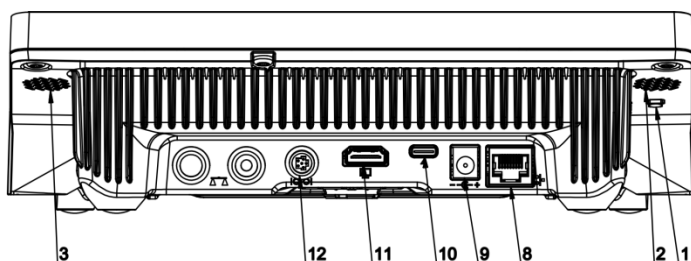
19.1. Computer

Active balance-computer connection is signalled by the  pictogram (top bar of the home screen). Carry out configuration using the <Computer> submenu.

Procedure:

- Press Setup and select <Peripherals/ Computer>.
- Set balance-computer operation parameters:
 - Computer port
Available options: none, COM 1, COM 2, TCP, USB Free Link

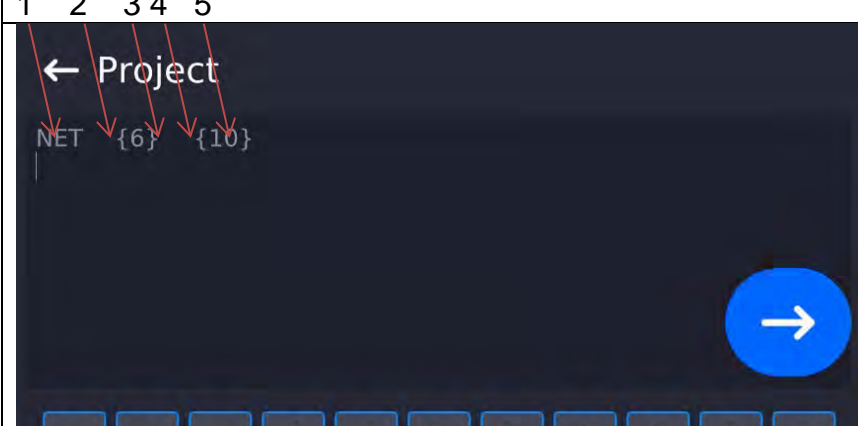
USB FREE LINK - USB type C port (socket no. 10 on the back of the indicator), to which the computer is connected using a USB type A/type C cable.



Tool for entering data; it functions as a keyboard. Upon proper modification of the standard or non-standard printout and sending a proper command from the computer, or upon pressing the ENTER key located on the operation panel, the data from the non-standard printout is entered directly into computer programs, e.g. Excel, Word, Notepad, etc.

To ensure proper operation with an Excel-type program, the non-standard printout must be properly configured by inserting the print formatting characters, such as Tab, Enter, and language-specific diacritics, into the designed printout. Also remember to set the correct decimal separator (full stop or comma) that the Excel-type program will accept. It can be set in: *Setup/Misc./Decimal point*.

Below is an example of a printout template and the resulting printout in Excel:

1	2	3	4	5	
					1 – fixed text 2 – tab key (skip to the next column) 3 – variable {6}, net weight in an adjustment unit 4 – tab key (skip to the next column) 5 – variable {10}, mass unit

Y39 fx							
	A	B	C	D	E	F	G
1							
2							
3				NETTO:	1,1235 g		
4				NETTO:	1,1455 g		
5				NETTO:	1,1258 g		
6				NETTO:	1,1325 g		

- Address
give the address of the balance connected to the computer,
- Continuous transmission
Available options: NO, YES (*printout format is conditioned by the set weighing printout template – see the parameter below*),
- Interval:
Parameter for setting the frequency of printouts for continuous transmission. The frequency of printouts is set in seconds, wherein the accuracy is 0.1s. Time values range between 0.1 and 1000 s. The interval setting is valid for continuous transmission activated using a balance and a computer.
- Weighing printout template
Parameter enables printout customization that is to be carried out in a window with a printout template (*for detailed information about creating printouts, refer to section 16.10 of this user manual*).
- E2R System
E2R is a supervision and control system designed to monitor all weighing processes carried out on a balance; with the E2R system activated, some databases can be operated using a computer exclusively (access to specified functions and options using the balance is not possible).

Caution: The E2R system can only be activated by the balance manufacturer or by authorized personnel.

Turn the continuous transmission off to provide correct cooperation with the E2R system.

19.2. Printer

The <Printer> submenu allows you to:

- set port for establishing communication with a printer,
- define the printer's code page (default: 1250),
- define control codes for a PCL6 (*Printer Command Language*) capable printer or an EPSON receipt printer.

Caution: Codes must be entered in hexadecimal form!

- define printout templates.

To ensure correct balance-printer operation (correct printout of diacritical signs of a given language), the respective baud rate, obligatory for a given printer, must be chosen (see the printer settings). Additionally, the code page of a sent printout must be in accordance with the code page of a printer.

There are two methods for obtaining code page accordance:

- by setting the right code page in the printer settings (read the printer manual) – respective to the printout code page set in the balance; or

- by sending a control code, from the balance to the printer, which automatically sets the right code page (respective to the code page set in the balance) before the data printout – it is possible only for printers equipped with this option.

Exemplary balance settings for correct operation (printout of Polish signs) with an EPSON thermal printer connected to the RS232 port:

1. EPSON TM-U220x Dot matrix printer

Communication parameters for the port to which the printer is connected:

- *baud rate* – 9600 bit/s
- *data bits* – 8
- *stop bits* – 1
- *parity* – none

Printer parameters set for PERIPHERALS group:

- *port* – COM 1 or COM 2 (the one to which the printer is connected)
- *code page* – **852**
- *control codes* – **1B7412**

2. EPSON TM-T20

Communication parameters for the port to which the printer is connected:

- *baud rate* – 38400 bit/s
- *data bits* – 8
- *stop bits* – 1
- *parity* – none

Printer parameters set for PERIPHERALS group:

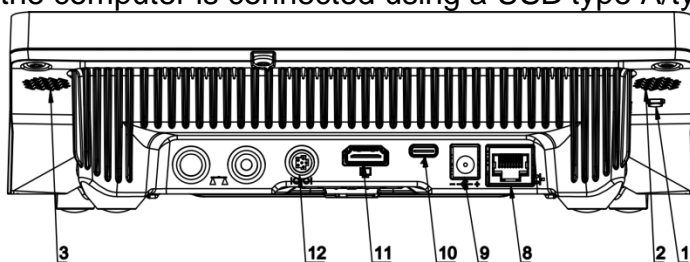
- *port* – COM 1 or COM 2 (the one to which the printer is connected)
- *code page* – **1250**
- *control codes* – **1B742D**

Printer parameters set for PERIPHERALS group:

- *port* – COM 1 or COM 2 (the one to which the printer is connected)
- *code page* – 852
- *control codes* – **1B7412**

If there are any unexpected signs on the printout in the place of the last digit (for verified balances), then the <CONTROL CODES> parameter must incorporate, apart from the code page, the code of the UK signs chart: **1B5203**. In such a case, the <CONTROL CODES> parameter is set as follows: control codes – **1B74121B5203**.

USB FREE LINK - USB type C port (socket no. 10 on the back of the indicator), to which the computer is connected using a USB type A/type C cable.



Tool for entering data; it functions as a keyboard. Upon proper modification of the standard or non-standard printout and sending a proper command from the computer, or upon pressing the ENTER key located on the operation panel, the data from the non-

standard printout is entered directly into computer programs, e.g. Excel, Word, Notepad, etc.

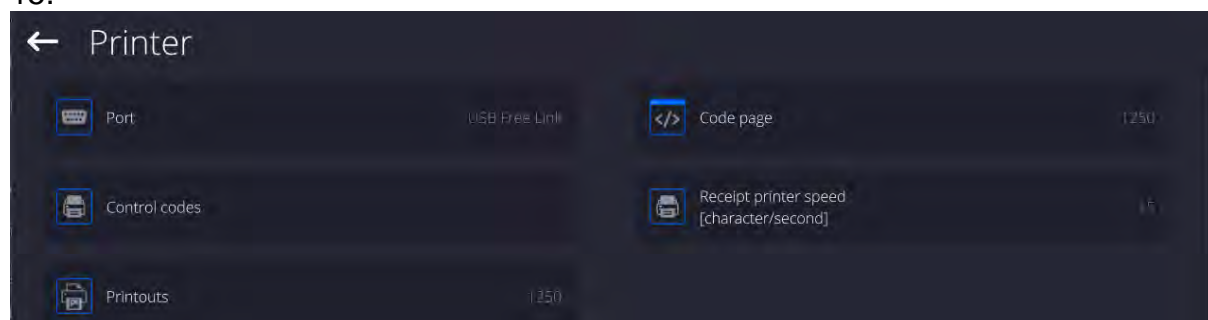
To ensure proper operation with an Excel-type program, the non-standard printout must be properly configured by inserting the print formatting characters, such as Tab, Enter, and language-specific diacritics, into the designed printout. Also remember to set the correct decimal separator (full stop or comma) that the Excel-type program will accept. It can be set in: *Setup/Misc./Decimal point*.

Below is an example of a printout template and the resulting printout in Excel:

1 – fixed text
 2 – tab key (skip to the next column)
 3 – variable {6}, net weight in an adjustment unit
 4 – tab key (skip to the next column)
 5 – variable {10}, mass unit

	A	B	C	D	E	F	G
1							
2							
3				NETTO:	1,1235 g		
4				NETTO:	1,1455 g		
5				NETTO:	1,1258 g		
6				NETTO:	1,1325 g		

If data with a high information content, such as the SQC report, is to be printed using Free Link, it is imperative that the parameter <Receipt printer speed [character/second]> is set to 15.



A printout template describes how to print information from databases.

The template can be modified. In order to check the format of a printout template, print the data related to e.g. product parameters. To do it, go to the <Products/Edit product> submenu and press the printer pictogram.

Default values for particular templates:

Product printout template:

{50}

Operator printout template:	{51}
	{75}
	{76}
Customer printout template:	{85}
	{86}
Warehouse printout template:	{130}
	{131}
Packaging printout template:	{80}
	{81}
	{82}
Ambient conditions printout template:	{275}
	IS T1: {278} °C
	IS T2: {279} °C
	THB T: {276} °C
	THB H: {277} %
Formulation printout template:	{165}
	{169}
Pipette printout template:	{310}
	{311}

19.3. Barcode Scanner

The balance enables operation with a barcode scanner. The barcode scanner is used to facilitate quick search for database records:

- Products,
- Operators,
- Customers,
- Packages,
- Warehouses,
- Formulations,
- Pipettes,
- Series in a differential weighing,
- Universal variables.

To configure barcode scanner enter:

„Setup / Peripherals/ Barcode scanner“.

19.3.1. Barcode Scanner Port

Procedure:

- Enter the **<Peripherals>** parameter and go to the **„Barcode scanner / Port“** parameter. Select the respective option.

Port for balance-scanner communication:



- USB

19.3.2. Prefix/Suffix

You can edit **<Prefix>** and **<Suffix>** to synchronize the balance program with the barcode scanner.

Caution: In the RADWAG-adopted standard, the prefix is 01 sign (byte) hexadecimal format, and the suffix is 0D sign (byte) hexadecimal format. For a detailed description of the balance-barcode scanner communication, read **ANNEX E** of this user manual.

Procedure:

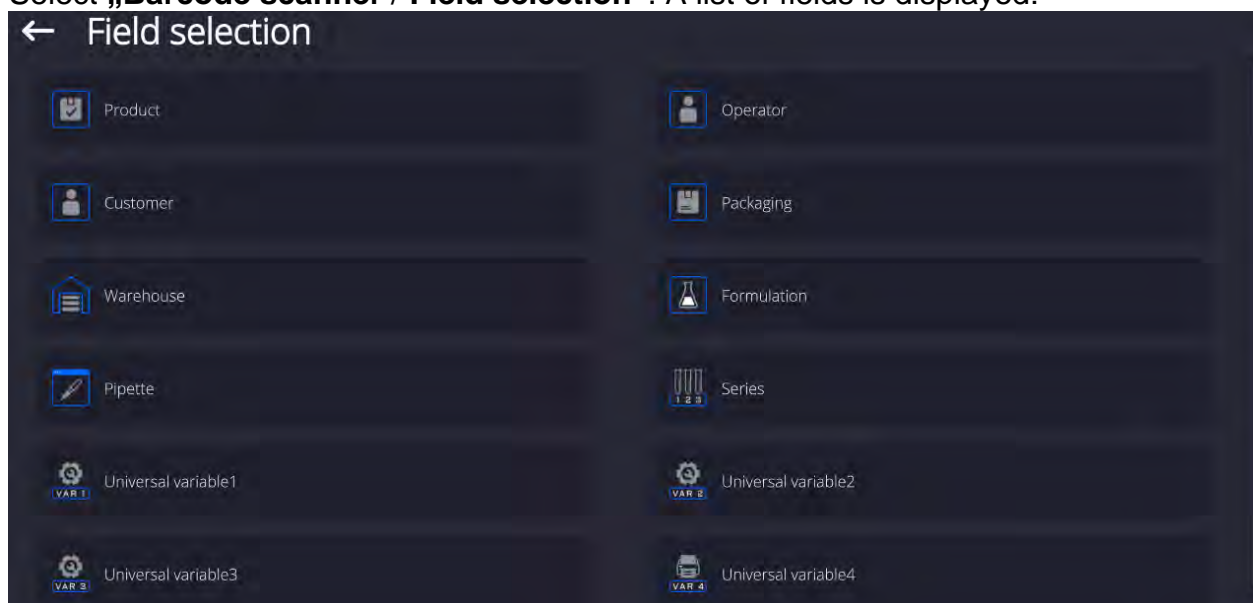
- Enter the **<Barcode scanner>** submenu,
- Select the **<Prefix>** parameter and enter the hexadecimal value using the on-screen keyboard. Press the  button to confirm.
- Select **<Suffix>** parameter and enter the hexadecimal value using the on-screen keyboard. Press the  button to confirm.

19.3.3.Field Selection

Parameter for specifying for which field the search is to be carried out in particular databases.

Procedure:

- Enter the **<Peripherals>** submenu,
- Select „**Barcode scanner / Field selection**”. A list of fields is displayed:



- Select one item from the list. The following parameters may be edited:

Filtering	Parameter allowing you to declare search criteria (see table below)
Offset	Parameter allowing you to set the first significant code's character; characters preceding the first significant character are skipped during comparison search.
Code length	Parameter allowing you to set the number of code's characters to be taken into account during search procedure.
Start marker	Parameter allowing you to declare the starting point of scanned code, taken into account during the search.
End marker	Parameter allowing you to declare the ending point of scanned code, taken into account during the search.

Ignore marker	Parameter allowing you to determine whether start and end markers are to be referred to or skipped during comparison of a scanned code with the code saved to the balance.
----------------------	--

Filtering criteria conditioned by field type:

Field Selection	Filtering
Product	None, Name, Code, EAN code
Operator	None, Name, Code,
Customer	None, Name, Code,
Packaging	None, Name, Code,
Warehouse	None, Name, Code,
Formulation	None, Name, Code,
Pipette	None, Name, Code,
Series	None, Name, Code,
Universal variables	None, Active

19.3.4.Test

The **<Test>** parameter allows you to verify if the operation of a barcode scanner connected to a balance is correct.

Procedure:

- Enter the **<Barcode scanner>** submenu,
- Select the **<Test>** parameter; the **<Test>** edit box is displayed. It features ASCII and HEX fields.
- The code is scanned and entered into the ASCII and HEX fields; next, the test result is displayed in the bottom part.

When:

- **<Prefix>** and **<Suffix>** declared in the balance settings comply with the **<Prefix>** and **<Suffix>** of the scanned code, the test result is **<Positive>**,
- **<Prefix>** and **<Suffix>** declared in the balance settings do not comply with the **<Prefix>** and **<Suffix>** of the scanned code, the test result is **<Negative>**,

19.4. Ambient Conditions Module

An ambient conditions module (THB) can be connected to the balance via UDP or USB ports. In order to ensure correct interaction, the correct connection port of the ambient conditions module must be selected.

20. MISCELLANEOUS PARAMETERS

This menu contains parameters facilitating balance operation language, date–time, beep sound, display adjustment, and level control. To enter the <Misc.> submenu, press Setup and then press <Misc.>.

20.1. Interface Language

Procedure:

Enter the <Misc.> submenu.

Select the <Language> parameter and set the language.

Available languages: Polish, English, German, French, Spanish, Korean, Turkish, Chinese, Italian, Czech, Romanian, Hungarian, Russian, Serbian.

20.2. Date and Time

You can set the date, time, and their formats.

There are two ways to edit date and time settings:

- Press the **<Date and time>** entry (home screen's top bar).
- Go to **<Setup / Misc./ Date and time>**.

Enter the date and time settings; an on-screen keyboard is displayed. Set the date and time: year, month, day, hour, minute; confirm the changes.

← Date and time

23.12.2021 12:13:59

« < grudzień 2021 > »

pon.	wt.	śr.	czw.	pt.	sob.	niedz.
29	30	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

hh	:	mm	:	ss
09	:	10	:	56
10	:	11	:	57
11	:	12	:	58
12	:	13	:	59
13	:	14	:	00
14	:	15	:	01
15	:	16	:	02
16	:	17	:	03

→

Additional functions of the **<Setup / Misc./ Date and time>** submenu:

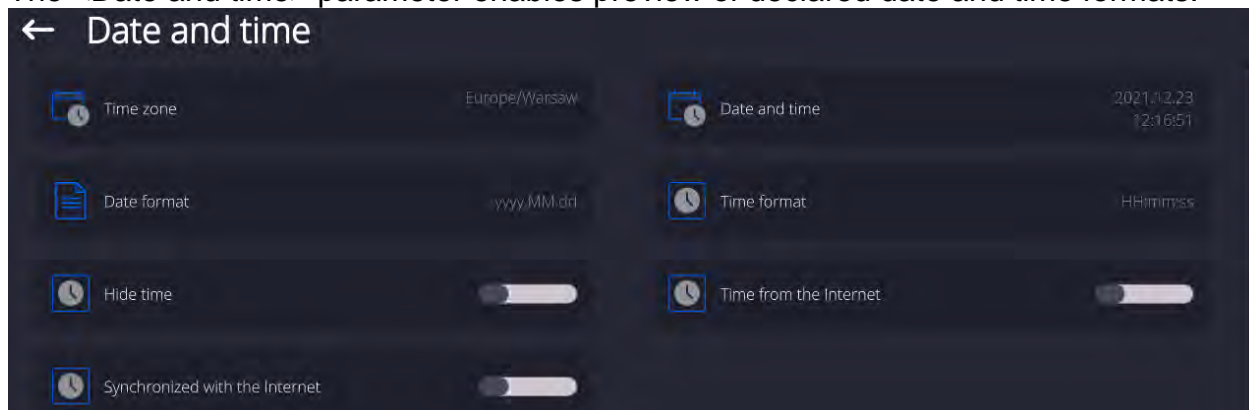
Name	Value	Overview
Time zone	Europe, Warsaw	Parameter value: name of time zone/country. Particular name contains information regarding summer/winter time change.
Date and time	2016.04.04 08:00:00	Enter this parameter to set an internal clock and date.

Date format	yyyy.MM.dd *	Enter this parameter to select date format. Options: d.M.yy, d/M/yy, d.M.yyyy, dd.MM.yy, dd/MM/yy, dd-MM-yy, dd.MM.yyyy, dd/MM/yyyy, dd-MMM-yy, dd.MMM.yyyy, M/d/yy, M/d/yyyy, MM/dd/yy, MM/dd/yyyy, yy-M-dd, yy/MM/dd, yy-MM-dd, yyyy-M-dd, yyyy.MM.dd, yyyy-MM-dd.
Time format	HH:mm:ss **	Enter this parameter to select time format. Options: H.mm.ss, H:mm:ss, H-mm-ss, HH.mm.ss, HH:mm:ss, HH-mm-ss, H.mm.ss tt, H:mm:ss tt, H-mm-ss tt, HH.mm.ss tt, HH:mm:ss tt, HH-mm-ss tt, h.mm.ss tt, h:mm:ss tt, h-mm-ss tt, hh.mm.ss tt, hh:mm:ss tt, hh-mm-ss tt
Hide time	No	Enabling/disabling date and time preview on the home screen.
Time from the Internet	Yes	Enter this parameter to update time and date of a network-connected balance with the network time and date.
Synchronized with the Internet	Yes	Parameter informing whether the time and date values are in sync with the network data.

*) - For date format: y – year, M – month, d – day

**) - For time format: H – hour, m – minute, s – second

The <Date and time> parameter enables preview of declared date and time formats.



Caution: The <Date and time> parameter can be accessed only by an operator with appropriate permissions. The administrator can change the permission level in the <Permissions> menu.

20.3. Extension Module

The extension module allows you to:

- activate compliance with FDA 21 CFR procedures,
- run communication protocol extension, and
- disable standard licence (demo balance mode).

A license number is required for a particular option release in order to run the mode. You must contact the manufacturer if you want to get the number.

Procedure:

Enter the <Misc.> submenu, select <Extension modules> and follow the prompts.

20.4. Sound

Procedure:

Enter the <Misc.> submenu, select <Sound> and set the appropriate option:

Printout confirmation sound	– Yes/No
Touch panel sound	– Yes/No
Sensors	– Yes/No
Volume	– range 0 - 100%

20.5. Sleep Mode

You can turn on display sleep mode.

Procedure:

Press Setup, then press the < Misc./Display sleep mode> submenu.

Select one of the following options: [None; 1; 2; 3; 5; 10; 15]. Digits stand for minutes. The software returns to the previous menu.

CAUTION:

The display turns to sleep mode only when the balance is not operated (the indication on the screen remains the same). Upon mass change, or pressing any key on the panel, the balance returns to weighing.

20.6. Display Brightness

Display brightness influences the duration of operation of a battery-powered balance. The brighter the screen, the shorter the operation time. To make the balance work longer, reduce the screen brightness.

Procedure:


Press Setup, then press the < Misc./Display brightness> submenu.

Enter the desired value: [0% - 100%]. The display brightness changes automatically, the previous menu is displayed.

20.7. Vibration Detection

The program detects incorrect loading of the weighing pan with the sample. Incorrect loading can lead to increased indication errors. Activation of the 'Vibration detection' function is signalled by the display of a respective pictogram in the weighing result window.



If an incorrectly carried out loading is detected, the pictogram turns red . The measurement result may be affected by a greater error.

Procedure:

- Enter the <Misc.> submenu.
- Select the <Vibrations detection> parameter.
- Select one of the available options:
 - Yes – function on
 - No – function off

20.8. Level Control

The balance is equipped with an Automatic Level Control mechanism.

You can define its operation for non-verified devices.

In the case of verified instruments, the settings are hidden and the balance operates in accordance with factory settings, i.e. <Active with lock>. The weighing process is possible only if the balance is properly levelled.

Procedure:

- Enter the <Misc.> submenu.
- Select the <Level control> parameter, an edit box is displayed.
- Select one of the available options:
 - None– level indicator not displayed, the balance does not control the level status,
 - Active – level indicator displayed, the level status is signalled by colour (green→ level status OK, red→ levelling required).
 - Active with lock – level indicator displayed, the level status is signalled by colour (green→ level status OK, red → levelling required). For the red level indicator, the 'no Level' alert is displayed and the weighing function is blocked.

Caution: For detailed information on levelling, read section 13.3 of this user manual.

20.9. Decimal Point

Parameter allowing you to set punctuation mark for a printout.

Procedure:

- Enter the <Misc.> submenu.
- Select the <Decimal point> parameter, an edit box is displayed.
- Select one of the available options:
 - Dot
 - Coma

The submenu screen is displayed.

20.10. Proximity Sensors Sensitivity

Parameter allowing you to change the sensitivity of the proximity sensors; the values range between 0 - 9.

By default, it is 5 - 7.

Procedure:

- Enter the <Misc.> submenu.
- Select the <Proximity sensors sensitivity> parameter, an edit box is displayed.
- Select one of the available options. The menu screen is displayed.

20.11. Autotest

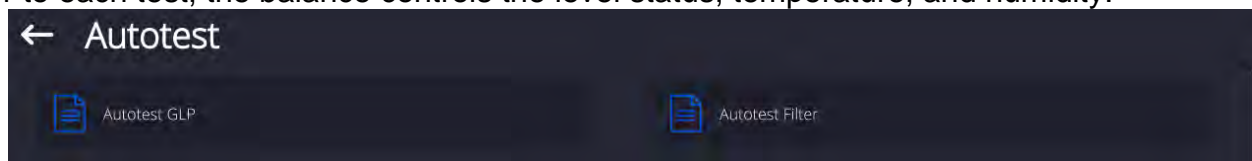
The <AUTOTEST> function has been designed to help you assess balance operation and to diagnose the cause of weighing errors (exceeding the maximum permissible values).

AUTOTEST facilitates systematic optimisation of balance settings, which is necessary to maintain the best possible repeatability and weighing time at the workstation. The function allows you to monitor the parameters at an optional moment and save records from carried out tests.

There are two modules:

AUTOTEST FILTER; AUTOTEST GLP.

Prior to each test, the balance controls the level status, temperature, and humidity.



AUTOTEST FILTER

The procedure consists of loading and unloading of the internal weight for all possible 'Filter' and 'Value release' settings; the test requires 10 repetitions. It controls 2 parameters: 'Repeatability' and 'Stabilization time'.

The test takes approximately 1 hour. Upon completion, information regarding the results is obtained.

Optimal settings for particular ambient conditions are provided.

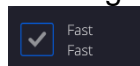
The Autotest Filter enables:

- to achieve the highest measurement repeatability and the shortest measurement time while maintaining an acceptable repeatability value;
- test results are stored in the balance memory until it is turned off,
- test results printout,
- direct and fast selection of optimal parameters.

Upon completing the autotest, a summary with the results is displayed.

Information regarding filter settings is provided automatically via respective pictograms:

- settings providing the fastest measurement (the shortest measurement time).
- settings providing the most accurate measurement (the lowest possible value of deviation for 10 measurements).
- settings providing optimal measurement (the lowest value of time and deviation product).



- current settings for filters.

Measurement results:

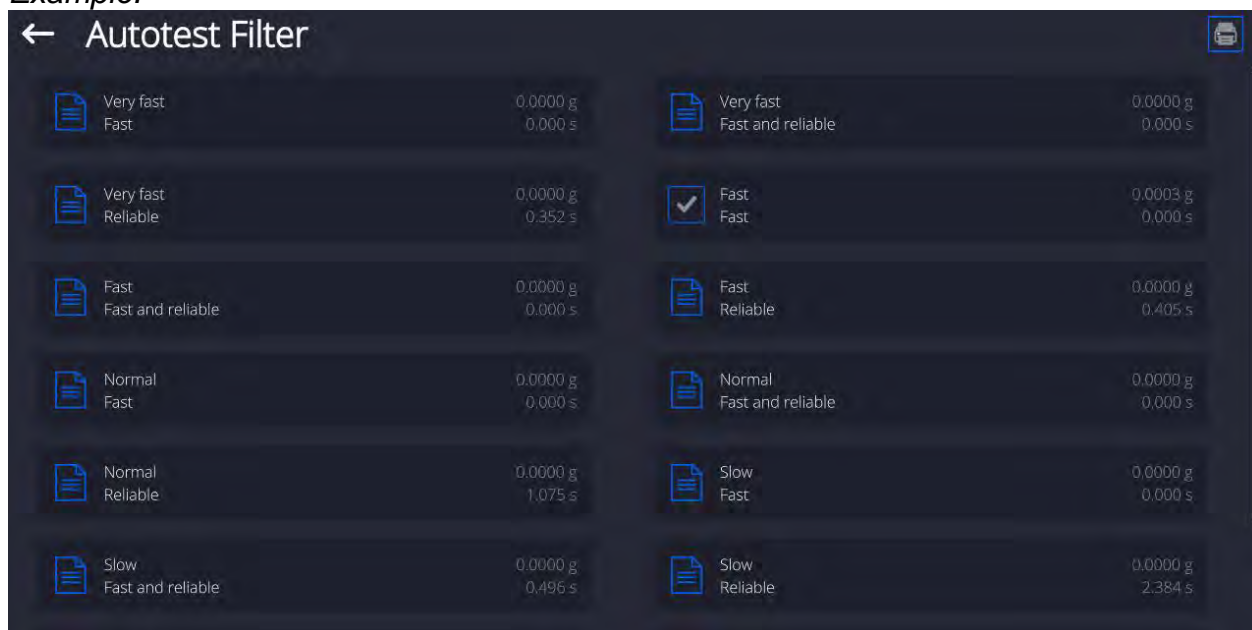
*Filter type.

*<Value release> parameter value.

*Repeatability of indications expressed as standard deviation.

*Average time of measurement stabilization.

Example:



Report example:

----- Autotest Filter: Report -----

Balance type XA 5Y
Balance S/N 442566
Operator Hubert
Software ver. NL 1.6.5 S
Date 2015.05.07
Time 09:34:48

Reading unit 0.0001/0.0001 g
Internal weight mass 148.9390 g
Temperature: Start 25.26 °C
Temperature: Stop 25.66 °C

Filter Very fast
Value release Fast
Repeatability 0.0042 g
Stabilization time 4.505 s

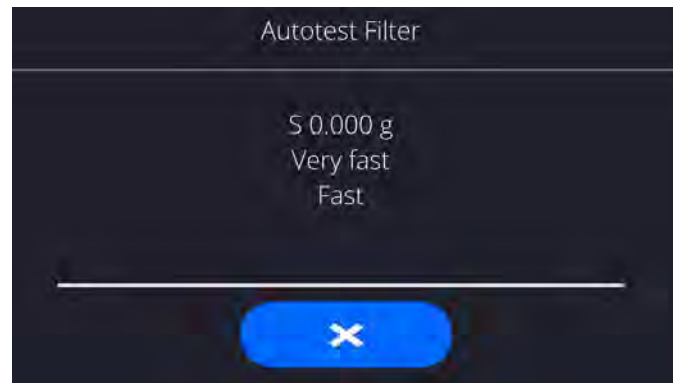
Filter Very slow
Value release Reliable
Repeatability 0.0207 g
Stabilization time 5.015 s

Signature

.....

Procedure:

Upon the 'Autotest Filter' function activation, the process starts automatically. A progress bar is displayed. Upon process completion, a summary is displayed and the current filter settings are provided. The report can be printed.



You can abort the process at any moment. To do that, press the <X> button.

AUTOTEST GLP

The Autotest GLP is a test of the repeatability of internal weight loading and the determination of indication error, which error is referred to the balance maximum capacity.

Procedure:

- load the internal weight twice, next load the internal weight ten times,
- adjust the balance,
- calculate and record the value of the standard deviation.
- for a balance with an automatic door, the door opening and closing test is carried out.

Autotest GLP function enables:

Report display and printout,

Record of a report containing basic data, ambient condition values and test results.

Test results:

*Deviation for maximum capacity.

*Value of repeatability expressed as standard deviation.

*Door test result (positive / negative).

Report example:

----- Autotest GLP: Report -----

Balance type	XA 5Y
Balance S/N	400010
Operator	Admin
Software ver.	LLx.x S
Date	2021.01.16
Time	09:17:16

Measurements quantity	10
Reading unit	0.0001 g
Internal weight mass	140.094 g
Filter	Average
Value release	Fast and precise

Deviation for Max.	-0.0118 g
Repeatability	0.00088 g

Signature

.....
Procedure:

Press the test name, a message box is displayed.

Do one of the following:

- Start the subsequent AUTOTEST GLP process,
- Preview completed autotest results and export all saved test results as a *.csv file,
- Delete all saved test results.

You can abort the process at any moment by pressing the <X> button.

The results of completed autotests are displayed in a table (each line containing the date and time of the autotest procedure as well as its result).

To preview particular autotest data, press the respective table line.

In order to print the result of a single autotest, enter its details (see above) and generate a printout by pressing the <Print> key located on the top of the display.

Autotest results can be exported by pressing the <Export> entry in the window with all saved reports. Data is sent to a USB flash drive, connected to the balance USB port, as a *.csv file.

20.12. Start-Up Logo

(option enabled only for authorized operators)

The parameter enables you to change the logo that is displayed at the moment of balance start-up.

20.13. Export of System Events

(option enabled only for authorized operators)

The parameter enables you to generate a special type of file that is automatically saved to a USB flash drive when it is plugged into the USB port. The file helps the RADWAG service diagnose the cause of problems occurring during balance operation.

Procedure:

- Plug a USB flash drive to the balance USB port.
- Enter the <Misc.> submenu.
- Select the <Export system events> parameter.
- The software generates a file and automatically saves it on the USB flash drive.
- The generated file has to be sent to RADWAG.

20.14. Text-To-Speech Conversion

The parameter enables the processing of group names and menu parameters into speech emitted from the indicator speakers.

The emitted voice is only in English.

21. SCHEDULED TASKS

This parameter provides settings for planning a cyclic performance of particular operations, e.g. balance adjustment or display of prompts.

21.1. Adjustment

The screenshot shows the 'Edit record' screen for Scheduled adjustments. It features a dark blue background with white text and icons. The screen is divided into several sections: a top bar with a back arrow and 'Edit record' title; a main area with fields for Name, Code, Planned operation (set to 'Automatic adjustment'), Active (a toggle switch), First operation date and time (2021.12.23 12:56:46), Interval (24 h), and a Message field. There are also icons for adding, deleting, and saving records.

The <Scheduled adjustments> parameter allows you to precisely specify the time for adjustment performance and the interval between successive adjustments. The parameter is not connected with automatic adjustment and its criteria (time, temperature). You can schedule when internal and external adjustments are to be performed. In order to design a schedule for external adjustment, it is necessary to record mass standards for adjustment performance into the balance memory.

Procedure:

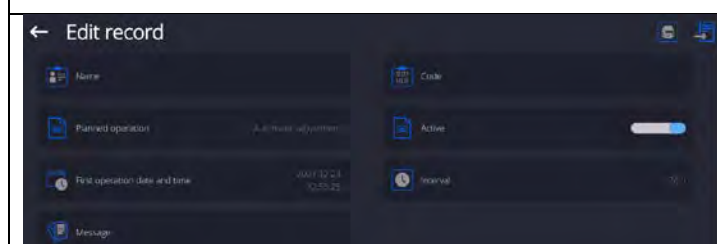
Enter mass standard data for external adjustment performance; to do it:


Enter the operator menu, select the <Adjustment> submenu and find the <Adjustment weights> parameter.

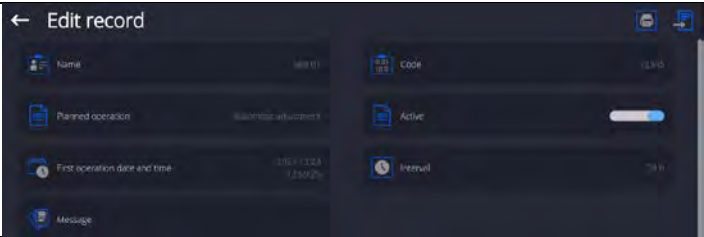
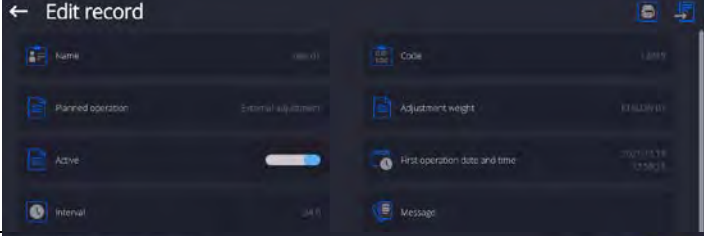

The screenshot shows the 'Edit record' screen for Adjustment weights. It features a dark blue background with white text and icons. The screen is divided into several sections: a top bar with a back arrow and 'Edit record' title; a main area with fields for Name (ETALON 01), Code (12/12/12), Class (E2), Serial number (123456), Mass (100 g), and Set number (KP-01). There are also icons for adding, deleting, and saving records.



Enter the operator menu, select the <Scheduled tasks> parameter. A window opens in which an authorised user (Administrator) can add entries with scheduled adjustments.



In order to add a new entry, press the  button, wait for a window with data on the scheduled adjustment to open.



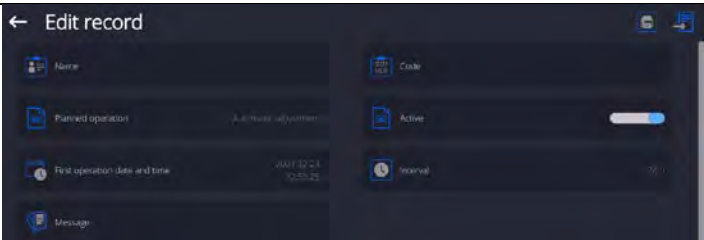
	Select task: automatic adjustment (internal or external).
	For the automatic adjustment option, enter data on the adjustment and its schedule.
	For the external adjustment option, enter data on the adjustment, the mass standard used for the adjustment performance, and its schedule.
	When all the necessary data has been introduced, return to the previous window. The window features a newly added entry.

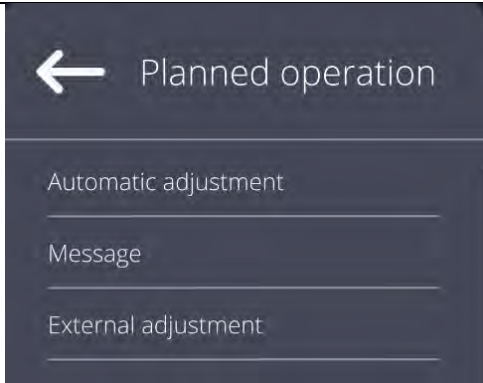
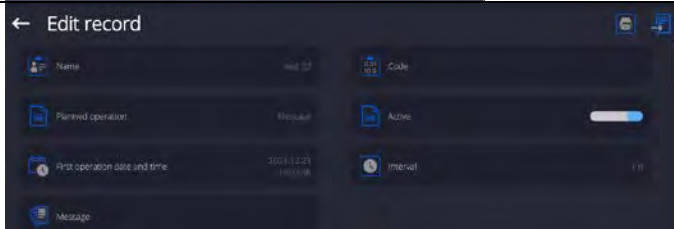
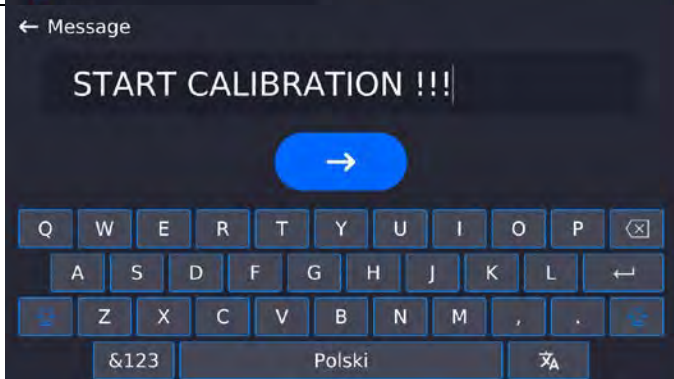

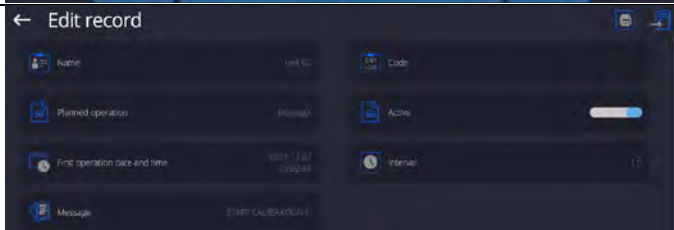
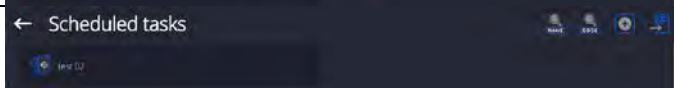
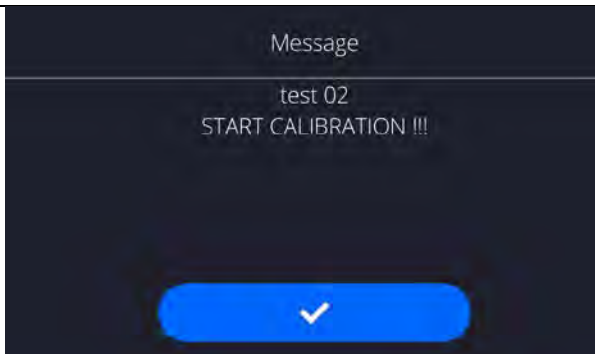

Upon entering all the data, exit the menu.

Now all the adjustments are carried out automatically as scheduled and at specified time intervals.

21.2. Message

This parameter allows you to declare a precise time and time interval for the display of a special prompt informing the user of the necessity to take a particular action.

	Enter the operator menu, next enter the <Scheduled tasks> submenu. In order to add an operation, press the <  > button placed in the toolbar.
	The <Edit record> box is displayed, press the <Scheduled tasks> field. The <Scheduled tasks> box is displayed.

		Select the <Message> option.
		The message settings box is displayed. Set the frequency of message display (first display, time interval), then select the <Message> parameter and enter the message text.
		Press the <  > button to confirm.
		A previous window is displayed.
		In the <Scheduled tasks> box, a newly added operation is displayed. Go to the home screen.
		When the message display criterion is met (time), the message box is displayed automatically. Press the <  > button, the message box gets closed, perform the operation.



22. UPDATE

The update function allows for the updating of:

- User-related area: APPLICATION.
- main board (administrator exclusively).

An update takes place automatically by loading data from a USB flash drive connected to the balance USB port.

Procedure:

- Prepare a USB flash drive with the update file. Required file extension: *.lab4.
- Connect the USB flash drive to the indicator's USB port.
- Log in as an Administrator.
- Press the  button to enter the menu.
- Select the <Update>  option.
- Select the <Application> field.
- The display previews the content of the USB flash drive; search for the update file and press its name.
- The balance is automatically restarted, and the balance application is automatically updated.
- If the balance does not restart, force it to restart by turning it off and on again.

The update of the main board file is analogous; required file extensions: *.cm4mbu.

23. ABOUT (system info)

The 'About' menu provides information on the balance and balance program. Most parameters in this menu are for informational purposes only.



The <Ambient conditions> parameter displays a preview of the current ambient conditions: temperature, humidity, pressure (if the balance features ambient conditions sensors).

The <Print settings> parameter enables you to send all parameters to a printer port.

24. COMMUNICATION PROTOCOL

GENERAL INFORMATION

- A. A character-based communication protocol (balance-indicator) is designed for establishing communication between a RADWAG balance and a peripheral device via the RS-232C interface.
- B. The protocol consists of commands sent from a peripheral device to the balance and responses from the balance.
- C. Responses are sent from the balance each time a command is received.
- D. The commands, forming the communication protocol, enable obtaining data on balance status and facilitate influencing balance operation, e.g.: acquiring measurement results from the balance, zeroing, etc.

24.1. List of Commands

Command	Command overview
Z	Zero balance
T	Tare balance
OT	Give tare value
UT	Set tare
S	Send stable measurement result in basic measuring unit
SI	Immediately send measurement result in basic measuring unit
SIA	Immediately send measurement results from all weighing platforms in basic measuring units
SU	Send stable measurement result in current measuring unit
SUI	Immediately send measurement result in current measuring unit
C1	Switch on continuous transmission in basic measuring unit
C0	Switch off continuous transmission in basic measuring unit
CU1	Switch on continuous transmission in current measuring unit
CU0	Switch off continuous transmission in current measuring unit
NB	Give balance serial number
PROFILES	Set balance profile
PRG	Give profile name
LOGIN	User logging
LOGOUT	User logout
SS	Value release
IC	Internal adjustment performance
IC1	Disable automatic internal adjustment of the balance
IC0	Enable automatic internal adjustment of the balance
K1	Lock balance keypad
K0	Unlock balance keypad
BP	Activate sound signal
OMI	Give available working modes

OMS	Set working mode
OMG	Give current working mode
PC	Send all implemented commands
BN	Give balance type
FS	Give max capacity
RV	Give program version
A	Set AUTOZERO function
EV	Set ambient conditions state
EVG	Give set ambient conditions
FIS	Set filter
FIG	Give set filter
ARS	Set value release
ARG	Give set value release
LDS	Set last digit
UI	Give accessible units
US	Set unit
UG	Give current unit
LS	Give balance level status

Caution: Each command must end with CR LF characters.

24.2. Response Format

On receipt of a command, the indicator responds as follows:

XX_A CR LF	command understood and in progress
XX_D CR LF	command carried out (appears only after the XX_A command)
XX_I CR LF	command understood but not accessible at this moment
XX _ ^ CR LF	command understood but max threshold is exceeded
XX _ v CR LF	command understood but min threshold is exceeded
XX _ OK CR LF	command carried out
ES_CR LF	command not recognised
XX _ E CR LF	time limit exceeded while waiting for a stable measurement result (time limit is a characteristic balance parameter)

XX - stands for a name of a sent command
 _ - space

COMMANDS OVERVIEW

Zero balance

Format: **Z CR LF**

Response options:

- Z_A CR LF - command understood and in progress
- Z_D CR LF - command carried out
- Z_A CR LF - command understood and in progress
- Z_^ CR LF - command understood but zeroing range is exceeded
- Z_A CR LF - command understood and in progress
- Z_E CR LF - time limit exceeded while waiting for a stable measurement result
- Z_I CR LF - command understood but not accessible at this moment

Tare balance

Format: **T CR LF**

Response options:

- T_A CR LF - command understood and in progress
- T_D CR LF - command carried out
- T_A CR LF - command understood and in progress
- T_v CR LF - command understood but taring range is exceeded
- T_A CR LF - command understood and in progress
- T_E CR LF - time limit exceeded while waiting for a stable measurement result
- T_I CR LF - command understood but not accessible at this moment

Give tare value

Format: **OT CR LF**

Response: **OT_TARE CR LF** - command carried out

Response format:

1	2	3	4-12	13	14	15	16	17	18	19
O	T	space	tare	space	unit			space	CR	LF

Tare - 9 characters, right justification

Unit - 3 characters, left justification

CAUTION:

Tare value is always given in an adjustment unit.

Set tare

Format: **UT_TARE CR LF**, where **TARE** - tare value

Response options:

- UT_OK CR LF - command carried out
- UT_I CR LF - command understood but not accessible at this moment
- ES CR LF - command not recognised (tare format incorrect)

CAUTION:

Use dot in tare format as decimal point.

Send stable measurement result in basic measuring unit

Format: **S CR LF**

Response options:

- S_A CR LF - command understood and in progress
- S_E CR LF - time limit exceeded while waiting for a stable measurement result

S_I CR LF - command understood but not accessible at this moment

MASS FRAME - response: mass value in a basic measuring unit

Response format:

1	2-3	4	5	6	7-15	16	17	18	19	20	21
S	space	stability marker	space	character	mass	space	unit			CR	LF

Example:

S CR LF - command sent from a computer

S _ A CR LF - command understood and in progress

S _ _ _ _ - _ _ _ _ _ 8 . 5 _ g _ _ CR LF - command carried out, response: mass value in a basic measuring unit

where: _ - space

Immediately send measurement result in basic measuring unit

Format: **SI CR LF**

Response options:

SI_I CR LF - command understood but not accessible at this moment

MASS FRAME - command carried out, immediate response: mass value in a basic measuring unit

Response format:

1	2	3	4	5	6	7-15	16	17	18	19	20	21
S	I	space	stability marker	space	character	mass	space	unit			CR	LF

Example:

S I CR LF - command sent from a computer

S I _ ? _ _ _ _ _ 1 8 . 5 _ k g _ CR LF - command carried out, immediate response: mass value in a basic measuring unit

where: _ - space

Send stable measurement result in current measuring unit

Format: **SU CR LF**

Response options:

SU_A CR LF - command understood and in progress

SU_E CR LF - time limit exceeded while waiting for a stable measurement result

SU_I CR LF - command understood but not accessible at this moment

MASS FRAME - response: mass value in a basic measuring unit

Response format:

1	2	3	4	5	6	7-15	16	17	18	19	20	21
S	U	space	stability marker	space	character	mass	space	unit			CR	LF

Example:

S U CR LF - command sent from a computer

S U _ A CR LF - command understood and in progress

S U _ _ _ - _ _ 1 7 2 . 1 3 5 _ N _ _ CR LF - command carried out, response: mass value in the current measuring unit.

where: _ - space

Immediately send measurement result in current measuring unit

Format: **SUI CR LF**

Response options:

SUI_I CR LF - command understood but not accessible at this moment

MASS FRAME - command carried out, immediate response: mass value in a basic measuring unit

Response format:

1	2	3	4	5	6	7-15	16	17	18	19	20	21
S	U	I	stability marker	space	character	mass	space	unit			CR	LF

Example:

S U I CR LF - command sent from a computer

S U I ? _ - _ _ _ 5 8 . 2 3 7 _ k g _ CR LF - command carried out, immediate response: mass value in a basic measuring unit

where: _ - space

Switch on continuous transmission in basic measuring unit

Format: **C1 CR LF**

Response options:

C1_I CR LF - command understood but not accessible at this moment

C1_A CR LF - command understood and in progress

MASS FRAME - response: mass value in a basic measuring unit

Response format:

1	2	3	4	5	6	7-15	16	17	18	19	20	21
S	I	space	stability marker	space	character	mass	space	unit			CR	LF

Switch off continuous transmission in basic measuring unit

Format: **C0 CR LF**

Response options:

C0_I CR LF - command understood but not accessible at this moment

C0_A CR LF - command understood and carried out

Switch on continuous transmission in current measuring unit

Format: **CU1 CR LF**

Response options:

CU1_I CR LF - command understood but not accessible at this moment

CU1_A CR LF - command understood and in progress

MASS FRAME - response: mass value in the current measuring unit

Response format:

1	2	3	4	5	6	7-15	16	17	18	19	20	21
S	U	I	stability marker	space	character	mass	space	unit			CR	LF

Switch off continuous transmission in current measuring unit

Format: **CU0 CR LF**

Response options:

CU0_I CR LF - command understood but not accessible at this moment

CU0_A CR LF - command understood and carried out

Value release

Format: **SS CR LF**

Response options:

SS_OK CR LF - command understood and in progress

Command's function is similar to function of PRINT key located on the balance panel.

Internal adjustment

Format: **IC CR LF**

Response options:

IC_A CR LF - command understood and in progress

IC_D CR LF - adjustment completed

IC_A CR LF - command understood and in progress

IC_E CR LF - time limit exceeded while waiting for a stable measurement result

IC_I CR LF - command understood but not accessible at this moment

Disable automatic internal adjustment of the balance

Format: **IC1 CR LF**

Response options:

IC1_I CR LF - command understood but not accessible at this moment

IC1_E CR LF - operation disabled, e.g. for verified balance

IC1_OK CR LF - command carried out

Operation is disabled for verified balances.

For non-verified balances, the command disables internal adjustment until it is enabled via the IC0 command or until the balance is turned off. The command does not modify settings specifying the adjustment start.

Enable automatic internal adjustment of the balance

Format: **IC0 CR LF**

Response options:

IC0_I CR LF - command understood but not accessible at this moment

IC0_OK CR LF - command carried out

Operation is disabled for verified balances.

Give balance serial number

Format: **NB CR LF**

Response options:

NB_A_ "x" CR LF - command understood, response: serial number

NB_I CR LF - command understood but not accessible at this moment

x - balance serial number (in between inverted commas)

Example:

Command: NB CR LF - return serial number

Response: NB_A_ "1234567" - balance serial number: "1234567"

Lock balance keypad

Format: **K1 CR LF**

Response options:

K1_I CR LF - command understood but not accessible at this moment

K1_OK CR LF - command carried out

The command locks the balance keypad (proximity sensors, touch panel) until the moment of turning the balance off or until sending the K0 command.

Unlock balance keypad

Format: **K0 CR LF**

Response options:

K0_I CR LF - command understood but not accessible at this moment

K0_OK CR LF - command carried out

Give available working modes

Command overview:

Command returns accessible working modes.

Format: **OMI <CR><LF>**

Response options:

OMI <CR><LF>

n_ "Mode name" <CR><LF>

: - command carried out, response: accessible working modes

n_ "Mode name" <CR><LF>

OK <CR><LF>

OMI_I <CR><LF> - command understood but not accessible at this moment

Mode name - parameter, working mode name, inserted in between inverted commas. The name takes the form given on a particular balance display. It is provided in the currently selected language.

n - parameter, decimal value determining the working mode number.

n →

- 1 – Weighing
- 2 – Parts Counting
- 3 – Percent Weighing
- 4 – Dosing
- 5 – Formulations
- 6 – Animal Weighing
- 8 – Solids Density
- 9 – Liquids Density
- 10 – Peak Hold
- 12 – Checkweighing
- 13 – Statistics

Caution:

Working mode numbering is identical for each kind of balance or scale. The numbers are assigned to working mode names.

Some balances give only the number as a response.

Example 1:

Command:	OMI <CR><LF>	- give available working modes
Response:	OMI <CR><LF>	
	2_ "Parts counting" <CR><LF>	- response: accessible working modes
	4_ "Dosing" <CR><LF>	mode number + name
	12_ "Checkweighing" <CR><LF>	
	OK <CR><LF>	- command carried out

Example 2:

Command:	OMI <CR><LF>	- give available working modes
Response:	OMI <CR><LF>	
	2 <CR><LF>	- response: accessible working modes
	4 <CR><LF>	

12 <CR><LF>

OK <CR><LF> - command carried out

Set working mode

Command overview:

Command sets particular working mode.

Format: **OMS_n** <CR><LF>

Response options:

OMS_OK <CR><LF> - command carried out

OMS_E <CR><LF> - error in the course of command execution, no parameter or incorrect format

OMS_I <CR><LF> - command understood but not accessible at this moment

n - parameter, decimal value determining the working mode number. To see detailed description go to OMI command.

Example:

Command: OMS_13<CR><LF> - set Statistics mode

Response: OMS_OK<CR><LF> - Statistics mode set

Give current working mode

Command overview:

The command returns the current working mode for a given balance.

Format: **OMG** <CR><LF>

Response options:

OMG_n_OK <CR><LF> - command carried out, response: current working mode

OMG_I <CR><LF> - command understood but not accessible at this moment

n - parameter, decimal value determining the working mode number. To see detailed description go to OMI command.

Example:

Command: OMG<CR><LF> - return current working mode

Response: OMG_13_OK<CR><LF> - Statistics mode operated

Give accessible units

Command overview:

The command returns units available for a particular balance and for the current working mode.

Format: **UI** <CR><LF>

Response options:

UI_ "x₁,x₂, ... x_n" _OK<CR><LF> - command carried out, response: accessible units

UI_I <CR><LF> - command understood but not accessible at this moment

x - unit symbols, separated by means of commas.

x → g, mg, ct, lb, oz, ozt, dwt, tlh, tls, tlt, tlc, mom, gr, ti, N, baht, tola, u1, u2

Example:

Command: UI <CR><LF> - return available units

Response: UI_ "g, mg, ct" _OK<CR><LF> - response: available units

Set current unit

Command overview:

Command sets current unit for a particular device.

Format: **US_x <CR><LF>**

Response options:


US_x_OK <CR><LF> - command carried out, response: currently set unit

US_E <CR><LF> - error in the course of command execution, no parameter or incorrect format

US_I <CR><LF> - command understood but not accessible at this moment

x - parameter, unit symbols: g, mg, ct, lb, oz, ozt, dwt, tlh, tls, tlt, tlc, mom, gr, ti, N, baht, tola, msg, u1, u2, next.

Caution:

If x=next, the command swaps to the next available unit on the list (it simulates either the "" button pressing or the pressing of the unit field displayed in the mass window).

Example:

Command: US_mg<CR><LF> - set „mg” unit

Response: US_mg_OK<CR><LF> - „mg” set as a current unit

Give current unit

Command overview:

Command returns current unit.

Format: **UG <CR><LF>**

Response options:

UG_x_OK<CR><LF> - command carried out, response: currently set unit

UG_I <CR><LF> - command understood but not accessible at this moment

x - parameter, unit symbols

Example:

Command: UG<CR><LF> - return current unit

Response: UG_ct_OK<CR><LF> - currently set unit is „ct”

Activate sound signal

Command overview:

Command activates the BEEP sound signal for a specified amount of time.

Format: **BP_TIME <CR><LF>**

Response options:

BP_OK <CR><LF> - command carried out, BEEP activated

BP_E” <CR><LF> - no parameter or incorrect format

BP_I <CR><LF> - command understood but not accessible at this moment

TIME - parameter, a decimal value specifying how long the sound should last, expressed in [ms]. The recommended range is <50 ÷ 5000>.

If a value greater than the permissible high limit is given, then the BEEP sound is operated for the maximum permissible amount of time.

Example:

Command: BP_350<CR><LF> BP_350<CR><LF> - activate BEEP for 350 ms

Response: BP_OK<CR><LF> - BEEP activated

CAUTION:

The BEEP sound activated via BP command is inhibited if, in the course of its activation, the sound gets activated by means of another device: keypad, touch panel, proximity sensors.

Send all implemented commands

Format: **PC CR LF**

Command: **PC CR LF**

- send all implemented commands

Response: **PC_A_"Z,T,S,SI..."**

- command carried out, all implemented commands have been sent.

Give balance type

Format: **BN <CR><LF>**

Response options:

BN_A_"x" <CR><LF> - command understood, response: balance type

BN_I <CR><LF> - command understood but not accessible at this moment

x - balance series (inserted in between inverted commas), with general balance type in front.

Example:

Command: **BN <CR><LF>** - give balance type

Response: **BN_A_"AS"** - balance type - "XA 5Y"

Give max capacity

Format: **FS <CR><LF>**

Response options:

FS_A_"x" <CR><LF> - command understood, response: Max capacity

FS_I <CR><LF> - command understood but not accessible at this moment

x - Max capacity value (in between inverted commas).

Example:

Command: **FS <CR><LF>** - return Max capacity

Response: **FS_A_"220.0000"** - Max capacity: "220 g".

Give program version

Format: **RV <CR><LF>**

Response options:

RV_A_"x" <CR><LF> - command understood, response: program version

RV_I <CR><LF> - command understood but not accessible at this moment

x - program version (in between inverted commas).

Example:

Command: **RV <CR><LF>** - return program version

Response: **RV_A_" 1.1.1"** - program version - "1.1.1"

Set AUTOZERO function

Format: **A_n <CR><LF>**

Response options:

A_OK <CR><LF> - command carried out

A_E <CR><LF> - error in the course of command execution, no parameter or incorrect format

A_I <CR><LF> - command understood but not accessible at this moment

n - parameter, decimal value determining autozero settings:

n → 0 – autozero off

1 – autozero on

CAUTION:

The command changes settings for the current working mode.

Example:

Command: A_1<CR><LF> - turn autozero function on

Response: A_OK<CR><LF> - autozero on

The AUTOZERO function operates until it is turned off by the A0 command.

Set ambient conditions state

Format: EV_n <CR><LF>

Response options:

EV_OK <CR><LF> - command carried out

EV_E <CR><LF> - error in the course of command execution, no parameter or incorrect format

EV_I <CR><LF> - command understood but not accessible at this moment

n - parameter, decimal value determining ambient conditions state.

n → 0 – unstable ambient conditions

1 – stable ambient conditions

CAUTION:

The command changes settings for the current working mode.

Example:

Command: EV_1<CR><LF> - set value 'stable' for ambient conditions option

Response: EV_OK<CR><LF> - value 'stable' set for ambient conditions option

The <AMBIENT CONDITIONS> parameter is set to <STABLE> until command EV 0 changes it to <UNSTABLE>.

Give set ambient conditions

Command overview:

Information on the currently set ambient conditions state is returned.

Format: EVG <CR><LF>

Response options:

EVG_x_OK<CR><LF> - command carried out, response: currently set ambient conditions state

EVG_I <CR><LF> - command understood but not accessible at this moment

x - parameter, the currently set ambient conditions state symbol

Example:

Command: EVG<CR><LF> - send set ambient conditions

Response: EVG_0_OK<CR><LF> - currently set ambient conditions state symbol

Set Filter

Format: FIS_n <CR><LF>

Response options:

FIS_OK <CR><LF> - command carried out

FIS_E <CR><LF> - error in the course of command execution, no parameter or incorrect format

FIS_I <CR><LF> - command understood but not accessible at this moment

n - parameter, a decimal value determining the filter number.

n → 1 – very fast

2 – fast

3 – average

- 4 – slow
- 5 – very slow

CAUTION:

The numbering is assigned to a particular filter name, and it is identical for all balance types. If for a particular balance type, filter settings are assigned to a working mode, the command changes the current mode's settings.

Example:

Command: FIS_3<CR><LF> - set average filter
 Response: FIS_OK<CR><LF> - average filter set

Give set filter

Command overview:

Information on the currently set filter is returned.

Format: **FIG <CR><LF>**

Response options:

FIG_x_OK<CR><LF> - command carried out, response: currently set filter

FIG_I <CR><LF> - command understood but not accessible at this moment

x - parameter, the currently set filter symbol

Example:

Command: FIG<CR><LF> - give current filter
 Response: FIG_2_OK<CR><LF> - average filter set

Set value release

Format: **ARS_n <CR><LF>**

Response options:

ARS_OK <CR><LF> - command carried out

ARS_E <CR><LF> - error in the course of command execution, no parameter or incorrect format

ARS_I <CR><LF> - command understood but not accessible at this moment

n - parameter, decimal value determining value release options.

- n → 1 – fast
- 2 – fast + reliable
- 3 – reliable

CAUTION:

The numbering is assigned to a particular value release option, and it is identical for all balance types.

If for a particular balance type, value release settings are assigned to a working mode, the command changes the current mode's settings.

Example:

Command: ARS_2<CR><LF> - set value release parameter to fast+reliable option
 Response: ARS_OK<CR><LF> - fast+reliable option set

Give set value release

Command overview:

Information on currently set value release option.

Format: **ARG <CR><LF>**

Response options:

ARG_x_OK<CR><LF> - command carried out, set value release option is sent

ARG_I <CR><LF> - command understood but not accessible at this moment

x - parameter, a decimal value determining the value release options

Example:

Command: ARG<CR><LF> - send currently set value release option

Response: ARG_2_OK<CR><LF> - currently set value release option:
fast+reliable

Set last digit

Format: **LDS_n <CR><LF>**

Response options:

LDS_OK <CR><LF> - command carried out

LDS_E <CR><LF> - error in the course of command execution, no parameter or incorrect format

LDS_I <CR><LF> - command understood but not accessible at this moment

n - parameter, a decimal value determining the last digit settings.

n → 1 – always

2 – never

3 – when stable

CAUTION:

The numbering is assigned to a particular last digit option, and it is identical for all balance types.

If for a particular balance type, value release settings are assigned to a working mode, the command changes the current mode's settings.

Example:

Command: LDS_1<CR><LF> - set last digit option to value <Always>

Response: LDS_OK<CR><LF> - <Always> value set

User login

Format: **LOGIN_Name, Password CR LF**

Where: _ - space (enter name and password in a form provided by the balance – *lower-case letters and upper-case letters*).

Response options:

LOGIN OK CR LF - command understood, new operator logged in

LOGIN ERROR CR LF - command understood, an error in name or password occurred, log in failed

ES CR LF - command not recognized (format error)

User logout

Format: **LOGOUT CR LF**

Response options:

LOGOUT OK CR LF - command understood, operator is logged out

ES CR LF - command not recognized (format error)

Give profile name

Format: **PRG CR LF**

Response options:

PRG_A_”x” CR LF - command understood, response: profile name

PRG_I CR LF - command understood but not accessible at this moment

x - profile name (in between inverted commas).

Example:

Command: **PRG** CR LF - give profile name

Response: **PRG _A_**"Fast" – profile name – "Fast"

Set balance profile

Format: **PROFILE_Name** CR LF

Where: _ - space (enter name in a form provided by the balance – lower-case letters, upper-case letters and spaces, e.g. Fast; Fast dosing, User, Precision).

Response options:

PROFILE OK CR LF - command understood, new PROFILE set

LOGIN ERROR CR LF - command understood, an error in PROFILE name, log in failed

ES CR LF - command not recognized (format error)

Give accessible units

Command overview:

Command returns units available for a particular balance and for the current working mode.

Format: **UI <CR><LF>**

Response options:

UI_"x₁,x₂, ... x_n"_OK<CR><LF> - command carried out, response: accessible units

UI_I <CR><LF> - command understood but not accessible at this moment

x - unit symbols, separated by means of commas

x → g, mg, ct, lb, oz, ozt, dwt, tlh, tls, tlt, tlc, mom, gr, ti, N, baht, tola, u1, u2

Example:

Command: **UI** <CR><LF> - return available units

Response: **UI_**"g, mg, ct"_OK<CR><LF> - response: available units

Set current unit

Command overview:

Command sets current unit for a particular device.

Format: **US_x** <CR><LF>

Response options:

US_ x_OK <CR><LF> - command carried out, response: currently set unit

US_E <CR><LF> - error in the course of command execution, no parameter or incorrect format

US_I <CR><LF> - command understood but not accessible at this moment

x - parameter, unit symbols: g, mg, ct, lb, oz, ozt, dwt, tlh, tls, tlt, tlc, mom, gr, ti, N, baht, tola, msg, u1, u2, next

Caution:

If x=next, the command swaps to the next unit available on the list (it simulates either the 'unit' button pressing or the pressing of the unit field displayed in the mass window).

Example:

Command: **US_mg**<CR><LF> - set „mg” unit

Response: **US_mg_OK**<CR><LF> - „mg” set as a current unit

Give current unit

Command overview:

Command returns current unit.

Format: **UG <CR><LF>**

Response options:

UG_x_OK<CR><LF> - command carried out, response: currently set unit

UG_I <CR><LF> - command understood but not accessible at this moment

x - parameter, unit symbols

Example:

Command: UG<CR><LF> - return current unit

Response: UG_ct_OK<CR><LF> - currently set unit is „ct”

Give balance level status

Command overview:

The command responds with the current balance level status.

Format: **LS<CR><LF>**

Response options:

LS_n_<CR><LF> - command carried out, response: level status

LS_I <CR><LF> - command understood but not accessible at this moment

n – parameter, a decimal value determining the level status.

n → 0 – not-levelled balance


1 – levelled balance

Command: LS<CR><LF> - give balance level status

Response: LS_1_OK<CR><LF> - balance levelled

24.3. Manual Printout / Automatic Printout

It is possible to generate printouts either manually or automatically.

- Manual printout: wait for a stable indication and press  button.
- An automatic printout is generated automatically in accordance with the parameters set for the automatic printout (read section 12.5).

The content of a printout depends on the settings of the <Standard printout> parameter and the <Weighing printout template> (read section 12.5).

Mass printout format:

1	2	3	4 -12	13	14	15	16	17	18
stability marker	space	character	mass	space	unit			CR	LF

Stability marker	[space] if stable [?] if unstable [!] if air buoyancy compensation function is on [^] if high limit is out of range [v] if low limit is out of range
Character	[space] for positive values [-] for negative values
Mass	9 characters with decimal point, right justification
Unit	3 characters, left justification

Example:

_____ 1 8 3 2 . 0 _ g _ _ CR LF - a printout generated,
with reference to the <Weighing printout template> settings, from the balance upon

pressing the  key:

N (measurements quantity)	NO	Universal variable 1 ... 5	NO
Date	NO	Net	NO
Time	NO	Tare	NO
Level status	NO	Gross	NO
Customer	NO	Current result	NO
Warehouse	NO	Supplementary unit	NO
Product	NO	Mass	YES
Packaging	NO	Non-standard printout	NO

25. PERIPHERAL DEVICES

The 5Y series balance can operate with the following peripheral devices:

- computer,
- EPSON receipt printer,
- PCL6-capable printer (*Printer Command Language*),
- barcode scanner,
- fingerprint reader,
- peripheral device operating using the ASCII communication protocol.

Caution: Only accessories listed on the RADWAG website can be connected to the balance.

26.ERROR MESSAGES

Max weighing threshold exceeded
Unload the weighing pan

Min weighing threshold exceeded
Install weighing pan

Zeroing out of range
Press tarring button or restart the balance

Display capacity out of range
Unload the weighing pan

Tarring out of range
Press zeroing button or restart the balance

Start mass out of range
Install weighing pan

Zeroing/tarring time out of range
Weighing indication unstable

-no level- Balance not levelled

-Err 100- Weighing module restart

In process An ongoing process in the course of which the indication may be unstable
(automatic feeder – the process of feeding a pill, or mass comparator – the process of load change)

27.ADDITIONAL EQUIPMENT

Type	Name
EPSON	Receipt printer
	PCL6-capable printers (<i>Printer Command Language</i>) - connected via the USB port
LS2208	Barcode scanner
SAL	Anti-vibration table for the XA series balances
	PC keyboard

28. ANNEX A - Printout Variables

28.1. Variables

CAUTION:

Each defined variable must be inserted in between curly brackets: {x}, where x – variable number.

A list of variables defining non-standard printout templates and data displayed in the workspace:

Symbol	Description
{0}	Standard printout in an adjustment unit
{1}	Standard printout in the current unit
{2}	Date
{3}	Time
{4}	Date and time
{5}	Working mode
{6}	Net weight in the current unit
{7}	Net weight in an adjustment unit
{8}	Gross weight in an adjustment unit
{9}	Tare in an adjustment unit
{10}	Current unit
{11}	Adjustment unit
{15}	Statistics: Number
{16}	Statistics: Sum
{17}	Statistics: Average
{18}	Statistics: Minimum
{19}	Statistics: Maximum
{20}	Statistics: SDV
{21}	Statistics: D
{22}	Statistics: RDV
{26}	Result control
{27}	Value
{28}	Level status
{30}	Gross value
{31}	Weighing platform no.
{32}	Serial number
{33}	Reading unit

{34}	Range
{38}	Universal variable: Name
{39}	Universal variable: Value
{40}	Parts counting: Reference sample quantity
{43}	Net weight in a supplementary unit
{44}	Supplementary unit
{48}	Balance type
{50}	Product: Name
{51}	Product: Code
{52}	Product: EAN code
{53}	Product: Mass
{54}	Product: Tare
{55}	Product: Price
{56}	Product: Minimum
{57}	Product: Maximum
{59}	Product: Shelf-life time in days
{60}	Product: VAT
{61}	Product: Date
{62}	Product: Expiry date
{63}	Product: Density
{64}	Product: Ingredients
{65}	Product: Description
{66}	Product: Tolerance
{75}	Operator: Name
{76}	Operator: Code
{77}	Operator: Permissions
{80}	Packaging: Name
{81}	Packaging: Code
{82}	Packaging: Mass
{85}	Customer: Name
{86}	Customer: Code
{87}	Customer: TIN

{88}	Customer: Address
{89}	Customer: Postal code
{90}	Customer: City
{91}	Customer: Discount
{130}	Warehouse: Name
{131}	Warehouse: Code
{132}	Warehouse: Description
{143}	Hex
{144}	Hex UTF-8
{145}	Additional display: WD6
{146}	Gross weight value in current unit
{147}	Tare in current unit
{150}	Epson printer: Paper crop
{151}	PCL6 printer Form feed
{155}	Cooperation with RADWAG CONNECT
{210}	Adjustment history: Adjustment type
{211}	Adjustment history: Nominal mass
{212}	Adjustment history: Current mass
{213}	Adjustment history: Difference
{214}	Adjustment history: Temperature
{215}	Adjustment history: Level status
{216}	Adjustment history: Weighing platform no.
{219}	Adjustment history: Date and time of recently performed adjustment
{275}	Ambient conditions report: Date and time
{276}	Ambient conditions report: THB Temperature
{277}	Ambient conditions report: THB humidity
{278}	Ambient conditions report: Temperature 1
{279}	Ambient conditions report: Temperature 2
{280}	Ambient conditions report: THB pressure
{281}	Ambient conditions report: Air density
{282}	Ambient conditions report: Humidity

{283}	Ambient conditions report: Pressure
{310}	Pipettes: Name
{311}	Pipettes: Code
{312}	Pipettes: Model
{313}	Pipettes Tips
{314}	Pipettes: Nominal volume
{315}	Pipettes: Minimum volume
{316}	Pipettes: Channels quantity
{317}	Pipettes: Type
{318}	Pipettes: Volume type
{319}	Pipettes: Tested volumes
{325}	Pipette calibration report: Serial number
{326}	Pipette calibration report: Start date
{327}	Pipette calibration report: End date
{328}	Pipette calibration report: Measurement quantity
{329}	Pipette calibration report: Cooperation in accordance with ISO 8655
{330}	Pipette calibration report: Status
{331}	Pipette calibration report: Temperature
{332}	Pipette calibration report: Humidity
{333}	Pipette calibration report: Pressure
{334}	Pipette calibration report: Water temperature
{335}	Pipette calibration report: Z coefficient
{336}	Pipette calibration report: Statistics
{337}	Pipette calibration report: Measurements and statistics
{338}	Pipette calibration report: Channel no.
{340}	Pipette calibration report: Average volume
{341}	Pipette calibration report: Systematic error
{342}	Pipette calibration report: Random error
{343}	Pipette calibration report: Tested volume
{344}	Pipette calibration report: Systematic error [%]
{345}	Pipette calibration report: Random error [%]

28.2. Variables Formatting

You can format numeric variables, text variables, and dates which are to be printed or displayed in the grey workspace.

Formatting types:

- variables with the left justification,
- variables with the right justification,
- determining the quantity of characters for printing / displaying,
- determining the quantity of decimal places for numeric variables,
- converting the format of the date and hour,
- converting numeric variables into an EAN13 code
- converting numeric variables and dates into an EAN128 code



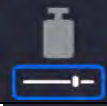








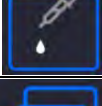



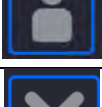


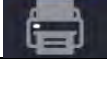

Special formatting characters:





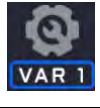




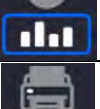


Character	Overview	Example
,	Sign separating a variable from the format item	{7,10} - Net weight value of a fixed length (10 characters), given in an adjustment unit, right justification.
-	Either minus sign or left justification.	{7,-10} - Net weight value of a fixed length (10 characters), given in an adjustment unit, left justification.
:	Either sign proceeding format item or time separator (inserted between hour, minute and second).	{7:0.000} - Net weight value given in an adjustment unit, always with three decimal places; {3:hh:mm:ss} – Current time in format: hour : minute : second.
.	The first dot is recognized as a separator of integer digit from decimal fraction digit. All but first dots are ignored.	{55:0.00} - Product's unit price always with two decimal places; {17:0.0000} – Measurements average, always with four decimal places;
F	Either sign formatting digits to a string of “-ddd.ddd...” format (where: d - single digit, minus - for negative values only) or determination of decimal places quantity.	{7:F2} -Net weight value given in an adjustment unit, always with two decimal places. {7,9:F2} -Net weight value of a fixed length (9 characters), given in an adjustment unit, always with two decimal places, right justification.
V	Formatting mass and quantities being derivatives of mass in EAN13 code.	{7:V6.3} - Net mass in the form of an EAN13 code (6-character code) with three decimal places.
T	Formatting mass and quantities being derivatives of mass in EAN128 code.	{7:T6.3} -Net mass in the form of an EAN128 code with three decimal places.
/	Date separator separating days, months and years.	{2:yy/MM/dd} - Current date in format: year - month - day, where yy stand for two less meaningful characters of a year;
\	Sign “escape” deleting a formatting function from the following sign, so that it is recognized as text	{2:yyVMMVdd} – Current date in format: year / month / day. {2:yy\:MM\:dd} - Current date in format: year : month : day. Should „\” be used as a literal, insert \\\.

Formatted variables application:

CODE	OVERVIEW
{7:V6.3}	Net weight value given in the form of an EAN 13 code (6-character code)
{7:V7.3}	Net weight value given in the form of an EAN 13 code (7-character code)
{27:V6.3}	Net amount due in the form of an EAN 13 code (6-character code)
{27:V7.3}	Net amount due in the form of an EAN 13 code (7-character code)
{7:T6.3}	Net weight value in an EAN 128 code
{8:T6.3}	Gross weight value in an EAN 128 code
{55:T6.2}	Product price in an EAN 128 code
{2:yyMMdd}	Date in an EAN 128 code
{61:yyMMdd}	Product date in an EAN 128 code
{62:yyMMdd}	Product expiry date in an EAN 128 code

29. ANNEX B - Programmable Buttons List

Pictogram	Name	Pictogram	Name
	Profile		Parameters
	Adjustment		Products
	Zero		Warehouses
	Tare		Customers
	Tare setting		Help
	Disable tare		Pipettes
	Enable tare		Working mode
	Packaging		Operator
	Print		Abort
	Header printout		Accept

	Footer printout		Disable last digit display
	Units		Disable display of last two digits
	Edit universal variable 1		Disable display of last three digits
	Edit universal variable 2		Statistics
	Edit universal variable 3		Add to statistics
	Edit universal variable 4		Edit universal variable 5

30. ANNEX D - ZEBRA Printer Setting

Baud rate **9600 b/sec**
 Parity control **none**
 Bits **8 bit**
 Stop bits **1 bit**

Information regarding RS 232, printed on a printout:
 Serial port : **96, N, 8, 1**

The procedure for printing information printout and resetting the printer parameters is to be found in the ZEBRA printer manual.

31. ANNEX E - Barcode Scanner Settings

1. RADWAG balances communicate with barcode scanners via USB interface and simplex transmission (one-way direction) without handshake. For this purpose, use of the second line of the cable is sufficient. Used scanners should be equipped with a RS232 interface. Both hardware and software handshake must be disabled.
2. Transmission parameters can be set for both weighing devices and scanners. For both devices, the following parameters must be met: baud rate, data bits quantity, parity control, stop bits quantity, e.g. 9600,8,N,1 – baud rate 9600 bit/s, data 8-bits, no parity control, 1 stop bit.
3. Barcode scanners can send additional information apart from the expected barcode, e.g. symbology (type of barcode). Due to the fact that RADWAG devices and software do not use such information, it is advisable to disable it.
4. Some RADWAG systems can omit unnecessary information by using parameters that mark the beginning and the length of the code required for analysis.

5. A special protocol is required in order the code to be received by RADWAG equipment. It is required to program an appropriate *prefix* and *suffix*. In RADWAG-adopted standard, the prefix is 01 sign (byte) hexadecimal format, the suffix is 0D sign (byte) hexadecimal format.
6. Most barcode scanners allow to enable/disable different symbologies (barcode types).
7. Programming of scanners is performed by reading special barcodes.

Barcode with required prefix and suffix in hexadecimal format	Barcode without required – fixes in ASCII format	Code type
01 30 30 32 31 30 31 32 36 0D	00210126	EAN-8
01 30 31 32 33 34 35 36 37 38 39 0D	0123456789	CODE 2 OF 5
01 43 4F 44 45 20 33 39 20 54 45 53 54 0D	CODE 39 Test	CODE 39
01 31 31 30 31 32 33 34 35 36 37 38 39 31 0D	1101234567891	EAN-13
01 43 6F 64 65 20 31 32 38 20 54 65 73 74 0D	CODE 128 Test	CODE 128



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ADVANCED WEIGHING TECHNOLOGIES

