USER GUIDE

PMV 50.5Y

Radwag

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User manual

IMMU-198-07-03-24-EN

Microwave Moisture Analyzer

PMV 50.5Y

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

MARCH 2024

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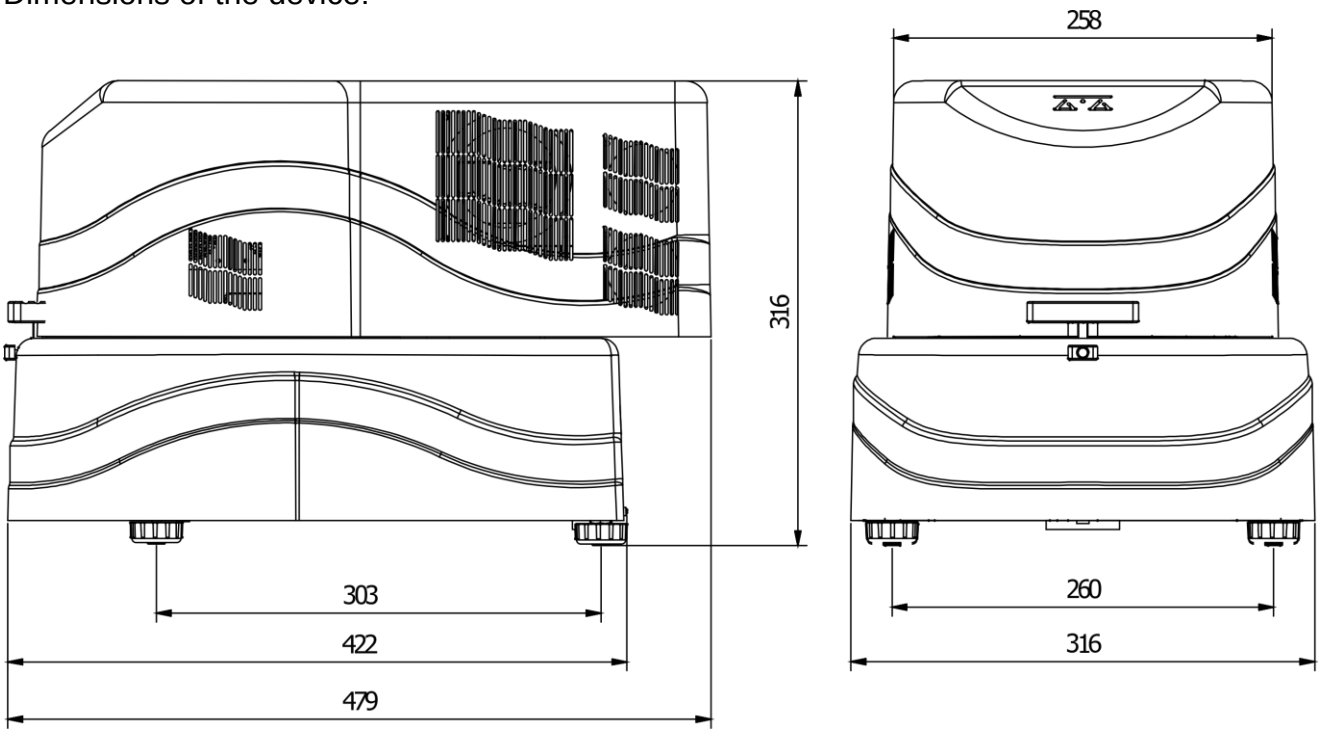
1. BASIC INFORMATION

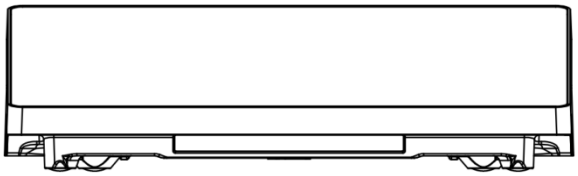
The microwave moisture analyzer is an alternative to halogen models whenever materials with a high content of water are dried. These are for example dairy produce, fish, meat, fruit products, syrups, creams, fluid resins, etc. Their major advantage is a substantially shorter drying time when compared to traditional moisture analyzers. It results from the use of microwaves for drying of samples. Microwaves cause the sample to heat thoroughly and not mainly from the side of the source of heat, which applies to halogen-rich moisture analyzers.
The drying chamber is home to a weighing pan used to measure the sample mass. The sample must be placed on a glass fiber filter and then positioned on the weighing pan. At the bottom of the chamber is a tip of the wave-guide where microwaves are emitted from. The beginning of the wave-guide is connected to a microwave generator. Depending on the sample mass and its chemical composition, a suitable drying mode must be chosen.
The average drying time depends on the type of substance and its mass, as well as ranges from 40 seconds to 5 minutes. For comparison, the drying time in halogen moisture analyzers ranges from 5 minutes to 40 minutes.

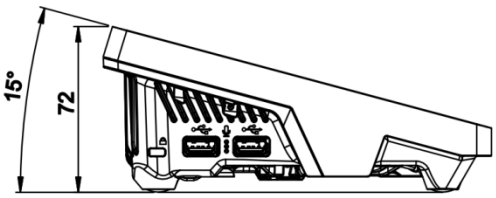
1.1 Dimensions

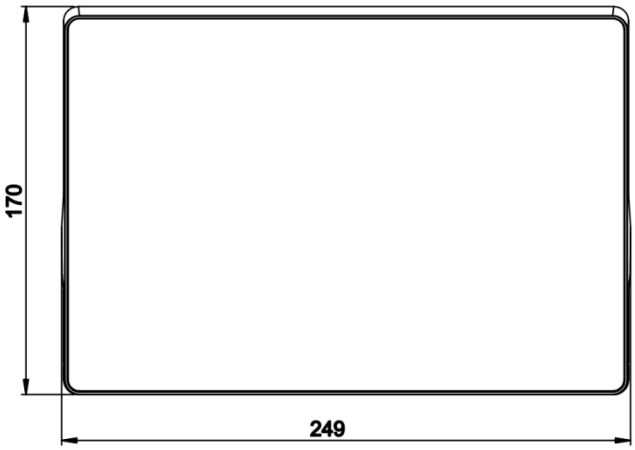
Dimensions of the device:



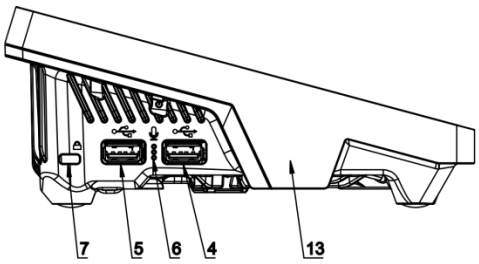
Dimensions of the measuring head:

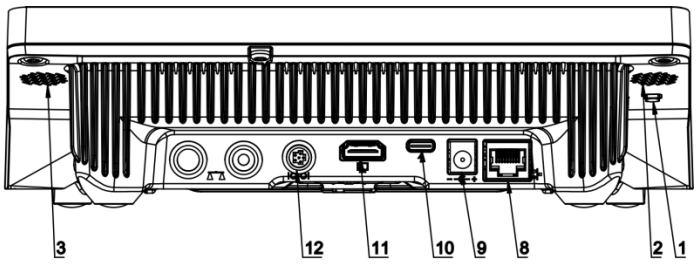




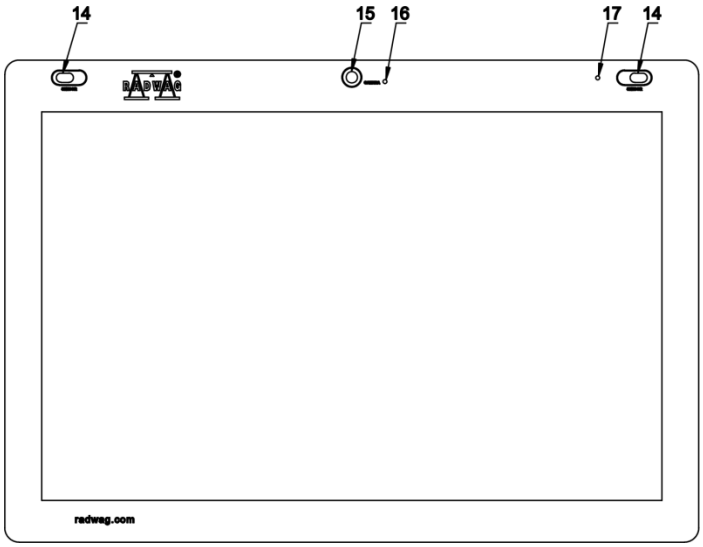


1.2 Description of connectors





Top view



1	Reboot or on/off key	***10***	Power port – USB C-type
2	Left speaker	***11***	HDMI port
3	Right speaker	***12***	Media box port
4	USB A-type port	***13***	RFID sensor
5	USB A-type port	***14***	Reflective sensor
6	Microphone	***15***	Camera
7	Kensington Lock	***16***	Camera LED light
8	Ethernet port	***17***	Signaling LED light
9	Power port		

2. TECHNICAL DATA

Maximum load [Max]	50 g
Readout accuracy [d]	0,1 mg
Tare range	-50 g
Working temperature	+10 - +40 °C
Relative air humidity	30% – 80%
Humidity readout accuracy	0,0001 %
Humidity repeatability	0,05% (sample of about 1 g)
Power supply	230V 50-60Hz AC
Display unit	10'' (touch screen)
Interface	USB-A ×2, USB-C, HDMI, Ethernet, Wi-Fi®, Hotspot
Maximum sample mass	50 g
Heating element	Microwave emitter
Drying termination variants	4 modes (timer, defined, automatic, manual)
Heating element power	800 W
Microwave emitter frequency	in ISM 2,4 GHz band
Sample carrier size	Glass fiber filter ø 90 mm
Device dimensions	670×510×570 mm
Net weight	20 kg
Gross weight	25 kg
Packaging dimensions	400 × 400 × 700 mm

3. BASIC INFORMATION ON SAFETY

3.1 Signal and warning symbol definitions

Any notes that apply to safety are supplied with special descriptions and warning symbols. They inform the operator about potential threats and warn him against danger.
Ignoring safety notes may lead to bodily injuries and damage to the moisture analyzer or its malfunctioning and erroneous measurement results.

3.1.1 Warning descriptions

WARNING	A medium-risk dangerous situation that may lead to serious bodily injuries or death.
CAUTION	A low-risk dangerous situation that may lead to damage to the device or its functions, data loss or minor or medium bodily injuries.
NOTE	Important information on the moisture analyzer.

3.1.2 Warning symbols

	Electric shock
	Acid/corrosion
	General danger
	Inflammables or explosives
	Toxic substances
	Hot surface
	Non-ionizing radiation

3.2 Safety principles

WARNING!
The use of the moisture analyzer at variance with safety principles and operating manual may pose a threat to health or life.

WARNING:
The rated voltage of the moisture analyzer is 230 VAC. For this reason use the product as per safety principles for low-voltage equipment. The moisture analyzer is supplied with a three-core power cable equipped with an earthing pin. If necessary, you can use an extension cord that meets relevant standards and is supplied with earthing. It is forbidden to disconnect the earthing device intentionally.

WARNING:
To avoid exposure to microwave energy, do not activate drying when the cover cannot be properly locked. When an item or dirt is between surfaces that seal the chamber, it must be removed. When the sealing surface, clasp or hinge of the chamber is damaged, contact the service center. Only a competent service technician is allowed to make repairs.

CAUTION:
The use venue must assure proper air circulation around the moisture analyzer (ca. 20 cm around the product and ca. 1 m above the device) to prevent accumulation of heat or the device from overheating.
Ventilating holes in the casing must not be covered, sealed or otherwise blocked.
Do not place inflammable substances on the moisture analyzer or in its immediate vicinity.
Be very careful while removing the sample. The sample, drying chamber, covers or weighing pan which the sample is placed on may be hot.
If maintenance (cleaning) works are required inside the chamber, deactivate the device and wait for all elements to cool down completely before you start performing them.
It is forbidden to make any modifications in the heating module.

Some types of samples require special care.
They can pose a threat to people and items. The operator is required to elaborate his own instructions for drying hazardous and inflammable substances. Responsibility for potential damage arising from use of the specific type of samples is always attributable to the moisture analyzer operator.

CAUTION:
Corrosion: Substances which emit corrosion-generating vapors (e.g. acids) while heating. This being the case, use small samples because steam may accumulate on cooler parts of the casing and corrode them.

WARNING:
Fire or explosion: Inflammable and explosive substances, solvent-rich substances, or substances that emit inflammable or explosive gases during heating. If the nature of the sample is doubtful, analyze the risk before you initiate the test. For such samples – use drying temperatures that are low enough to prevent flames or explosion. While testing, wear protective glasses and gloves. Samples must be small enough.

It is strictly forbidden to leave the device unattended while testing various samples!

WARNING:
Toxic or caustic substances: The substances that generate toxic gases or vapors while drying. They can irritate eyes, skin or respiratory tract, or cause diseases or even death, and can be dried in the fume hood only.

WARNING:
Moisture analyzers are equipped with a mechanism that locks/opens the drying chamber cover. For this reason it is necessary to remain careful while working with the device so that you can secure your palm against crushing while closing/opening the drying chamber cover.

WARNING:
In case of any signs of burning (smoke, burning sounds, flame), deactivate the device and wait for at least 10 minutes and then open the chamber when the aforesaid phenomena have subsided. If they persist or it is suspected that they are still existent, wait for another 10 minutes. If the phenomenon intensifies or persists for a long time and you are not able to stop it, immediately unplug the device and follow applicable fire prevention rules.

WARNING:
Any dangerous phenomena found in the device must be immediately reported to RADWAG service points.

Never use the product in the explosive atmosphere.
The moisture analyzer is not adapted to work in the explosive atmospheres.

3.3 Disposal

Disposal of the device and packaging must comply with applicable rules of law, in the specific area or in the specific country.

3.4 Intended use

The moisture analyzer serves to specify a relative humidity of small samples of various materials, specify a dry matter content of small samples of materials, and measure mass of weighed loads.
It assures quick and precise specification of water content in the sample in question, while a touch screen substantially facilitates operation and measurements. The moisture analyzer can be used to specify moisture content of various materials.
At the outset of the measurement the device specifies an exact mass of the sample located on the star-piece, and then the sample is quickly heated for evaporation of moisture in the material sample.
During evaporation, the moisture analyzer permanently checks the loss of the mass of the sample, constantly calculates the data supplied and displays results of the moisture on an ongoing basis.

In relation to conventional methods of testing moisture content in various materials, the use of the moisture analyzer considerably shortens the measuring time and makes testing easier.
The moisture analyzer allows setting numerous parameters which determine moisture determination (power, time, drying profiles, etc.).

3.5 Use conditions

Note!
It is obligatory to keep chamber contacting surfaces clean.
While testing, it is forbidden to open the drying chamber.

Remember that some materials exposed to heating can become hazardous (emergence of poisonous vapors, ignition or explosion risk).
The moisture analyzer must not be used for dynamic weighing. Even if small amounts of the product are removed or added to the material in question, the weighing result must be read only after the stability mark has been displayed ◣◢.
Do not place magnetic materials on the weighing pan of the moisture analyzer. It can result in damage to the measuring unit.
Avoid dynamic loading of the weighing pan and overloading of the moisture analyzer to the extent that its maximum loading capacity is exceeded. Remember that mass of the tare (e.g. container on the weighing pan) must be considered (removed from the moisture analyzer lifting capacity).

Never use the moisture analyzer in the explosive atmosphere!

The moisture analyzer is not adapted to working in ex zones.
It is disallowed to make any structural modifications to the moisture analyzer.

3.6 Safe use principles

The moisture analyzer meets all applicable safety principles, yet may pose a threat in extreme circumstances.
It is forbidden to open the housing of the device while drying. There are no internal parts that can be maintained, repaired or replaced by the operator. In case of problems, immediately contact the RADWAG service center or distributor.
Always use the device in accordance with this manual and strictly follow its guidelines on installation and configuration of the new device.
Using the moisture analyzer at variance with safety principles or operating manual may pose a threat to health or life. This is why it is necessary to get familiar with safety principles showed in the manual:

- Use the moisture analyzer only to determine moisture content in samples or to measure the mass of samples in question. Any other use of the moisture analyzer may endanger the operation or device.
- Before you switch the device on, make sure the supply voltage specified on the rating plate complies with voltage of the mains which the moisture analyzer is to be connected to.
- Secure the moisture analyzer against liquid spilling in view of potential electric shock, fire, generation of poisonous, caustic or explosive substances.

3.7 Guarantee

The guarantee does not cover the following:

- failure to follow guidelines included in the operating manual,
- using the moisture analyzer at variance with intended use,
- modifying the moisture analyzer or creating the device housing (damaged protective labels),
- mechanical damage and damaged caused by utilities, liquids, water and natural wear,
- wrong set-up or defect of the electric system,
- overload of the measuring mechanism.

3.8 Supervising metrological parameters of moisture analyzer

Metrological properties of the moisture analyzer must be checked by the operator at preset intervals. Checking frequency results from environmental factors of the moisture analyzer, type of weighing processes as well as quality supervision system.

3.9 Information in the manual

Please read the operating manual before you connect and activate the moisture analyzer; even if you are experienced in using products of this sort.

3.10 Employee safety

The moisture analyzer must be used and supervised only by people trained on the use and experienced in using devices of this kind.
To use moisture analyzers, it is necessary to read the operating manual in the first place. The manual must be kept for future reference.

It is forbidden to make any structural modifications to the device. Additional equipment that can be connected to the device and spare parts must be supplied by RADWAG or its authorized distributor.

3.10.1 Protective clothing

While working with the device, it is advisable to use protective clothing to secure oneself against potential dangers related to preparations and their ingredients.

The following must be used for testing:

- protective apron,
- protective glasses,
- protective gloves (for work with hazardous chemicals).

Before you use the aforementioned protective clothing, make sure they are suitable for specific preparations and are not damaged.

4. TRANSPORTATION AND STORAGE

4.1 Delivery check

It is necessary to inspect the delivered packaging and device shortly after the delivery and check them for potential external signs of damage.

4.2 Packaging

Keep all pieces of the packaging in order to use them for potential transportation of the moisture analyzer in the future. Only original packaging can be used for shipping. Before you pack the product, unplug the cables and remove moving parts (star piece). Pieces of the moisture analyzer must be placed in the original box and secured against damage during transportation.

4.3 Handling microwave moisture analyzer:

1. To handle the device, use gloves with an anti-skid surface.

2. Grab the base of the moisture analyzer with both hands (middle of its longer side), lift and move where required.

3. In case the device must be moved to a distant place, use the shipping box that is supplied with dedicated lifting spots.

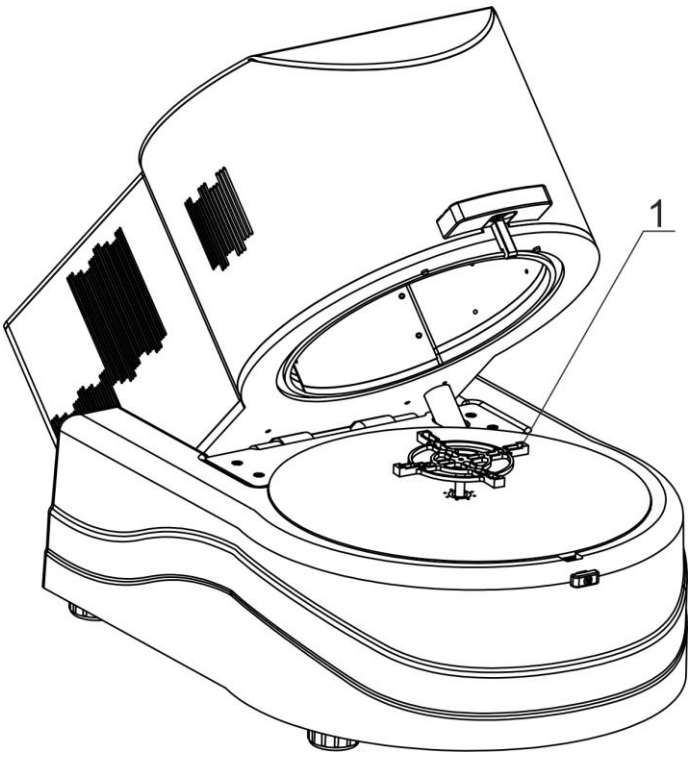
5. UNPACKING, INSTALLING AND CHECKING THE BALANCE

5.1 Installation venue, place of use

- Store and use the moisture analyzer in rooms that are free from vibrations and shocks, draughts and dust, situated at the height of up to 2000 above sea level.
- The place of use must guarantee proper air circulation around the moisture analyzer (ca. 20 cm around the product and ca. 1 m above the device).
- The air temperature in the room must range from +10 ºC to +40 ºC.
- The relative humidity must not exceed 80% at the temperature of up to 31 ºC, dropping linearly to 50% of relative humidity at the temperature of 40 ºC.
- Place the moisture analyzer on a wall bracket or stable table that is not subject to vibrations, away from sources of heat.
- It is forbidden to block ventilating holes because the moisture analyzer must not overheat and get damaged.
- Do not use the moisture analyzer near sources of heat and vapor as they may cause the product to malfunction or get damaged.
- Pay special attention to weighing of magnetic materials because a strong magnet is part of the moisture analyzer.

5.2 Unpacking

Carefully take the moisture analyzer out of the box, remove the foamed cover and gently position in the dedicated place of use. The device is complete and does not require you to take any preparatory actions for startup.



1. A star piece which filters with samples are positioned on.

5.3 Positioning

The moisture analyzer is equipped with an electronic level (no external level). Once you have run the program, enter the leveling procedure and level the moisture analyzer. The leveling method has been described further in the manual (point 15.3).

5.4 List of standard delivery elements

- Moisture analyzer.
- Star piece.
- Glass fiber filters ø 90 mm.
- Tweezers 125 mm straight
- Disposable pipette
- Sodium chloride sample 10% ±0,5% to specify correct operation of the device in the target workplace.
- Power cable.

5.5 Cleaning

Remember to disconnect the moisture analyzer from the supply voltage before you start cleaning it.
Cleaning the star piece while it is installed may lead to damage to the moisture analyzer mechanism. Therefore remove it from the bracket while cleaning.
Keep the device, and drying chamber in particular, clean because post-drying sample remains that adhere to it may damage the surface of chamber, which shortens the service time and may have a negative impact on distribution of microwaves inside the chamber.

Cleaning powder-coated pieces:

The first step should be preliminary cleaning under running water or using a large-pore sponge with a large amount of water in order to eliminate loose and major dirt.

Do not use abrasive preparations.

Next use a suitable cloth or water solution and cleaning agent (soap, dishwashing liquid) to clean the surface. Press the cloth to the surface regularly.

Never use a dry detergent only as it may cause the coating to get damaged. Use a large amount of water or water solution with a cleaning agent.

Cleaning aluminum pieces:

To clean aluminum, use products rich in natural acids. A synthetic vinegar and lemon will serve as perfect agents. It is forbidden to use preparations rich in abrasive substances. Do not use rough brushes for cleaning as they may easily scratch the aluminum surface. A soft microfiber cloth will be a perfect choice.

Clean polished surfaces by making circular movements. After removing dirt from the surface, polish the surface with a dry cloth to dry it off and make it shine.

Cleaning ABS pieces:

To clean dry surfaces, use clean cellulose or cotton clothes that do not leave streaks and do not color. You can also use a water solution and cleaning agent (soap, dishwashing liquid, window cleaner). While cleaning, regularly press the cloth against the floor, wipe the cleaned surface and dry off. Repeat cleaning if necessary.

In case of stubborn dirt, such as glue, gum, tar, polyurethane foam remains, etc., you can use special cleaning agents based on mixed aliphatic hydrocarbons that do not dissolve material. Before using the cleaning agents, it is advisable to conduct usefulness tests on all surfaces. Do not use preparations with abrasive substances.

5.6 Connection to network

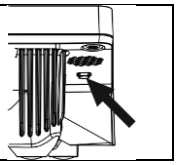
The moisture analyzer can be connected to the network only with the use of the original power cable (supplied). The rated voltage of the device (specified in the rating plate) must comply with the mains rated voltage.
The power cable can be connected to the port with a protective contact only. To supply power to the moisture analyzer, insert the contact of the power cable into the port at the back of the housing.

5.7 Connection of additional equipment

Before you connect or change the additional equipment (printer, PC), unplug the moisture analyzer. Only the additional equipment recommended by the moisture analyzer manufacturer can be connected. After connection, you can supply power to the moisture analyzer.

6. STARTUP

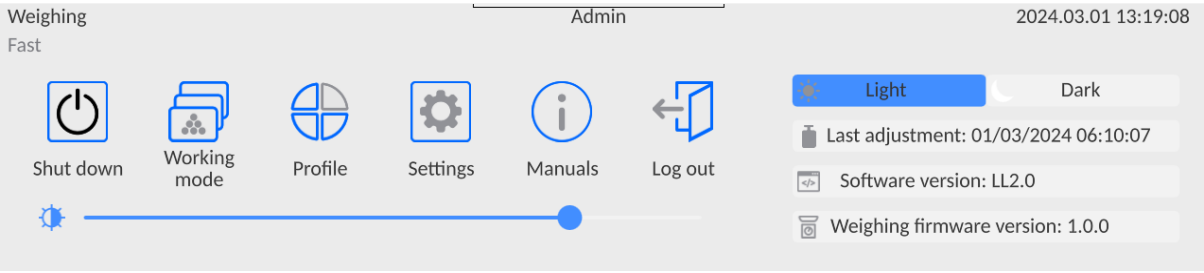
- After connecting the power cable to the mains socket, supply power through the main switch (on/off) located next to the power port at the back of the housing.
- The loading procedure of the operating system and RADWAG software will be initiated. While loading, a signaling light and LED lights located at the bottom frontal part of the reading head will be flashing.
- Once the startup procedure has finished, the home screen will be displayed.
- The balance activates and the user is not logged in (no operator). To start working, log in (login procedure is described further in the manual).

If the program crashes during operation, the so-called rebooting is required. To do so, press and hold the button in the balance head for about 5 seconds. *The program will be restarted and the device will reactivate.*	

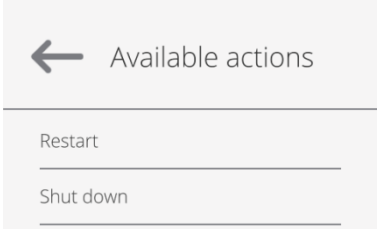
6.1 How to properly turn off the scale's power supply

Procedure:

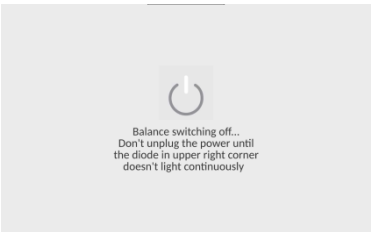
1. Expand the top scale menu



2. Press the <Off> button



3. Select <Off>, the message below will be displayed.



4. After closing the program, the LED in the upper right corner of the display will light up continuously.
5. Only then can you turn off the power using the main switch and disconnect the power cord from the device.

6.2 Moisture analyzer temperature stabilization time

Before you start measuring, wait for the device to be thermally stable (the ambient temperature of operation). This is the so-called own warm-up time. With regard to balances that were stored at a way lower temperatures (e.g. in winter) before connection to the network, the adjustment time is around 8 hours. Only after this time is it allowed to connect the device to the network. While the balance is in the thermal stabilization mode, values displayed may change. It is advisable to make sure temperature fluctuations in the place of using the moisture analyzer are minor and slow.

6.3 Emergencies

Problem	Potential cause	Solution
The moisture analyzer does not activate.	The power cable is damaged or improperly plugged in.	Unplug the power cable. Check the cable visually, pay attention to condition of plugs and insulation tightness. If no damage is found, connect again after ca. 10 seconds.
The drying mode does not start.	The cover is not properly locked.	Press the cover of the chamber against the base until you can hear a distinctive click.
Bars on the mass display.	If this lasts more than 15 seconds, it suggests a stable mass measurement signal arising from one of the following causes: mechanical vibrations of the floor, strong blasts of air, mechanical dirt near the weighing pan, substantial bending of the weighing pan, damage to the device.	

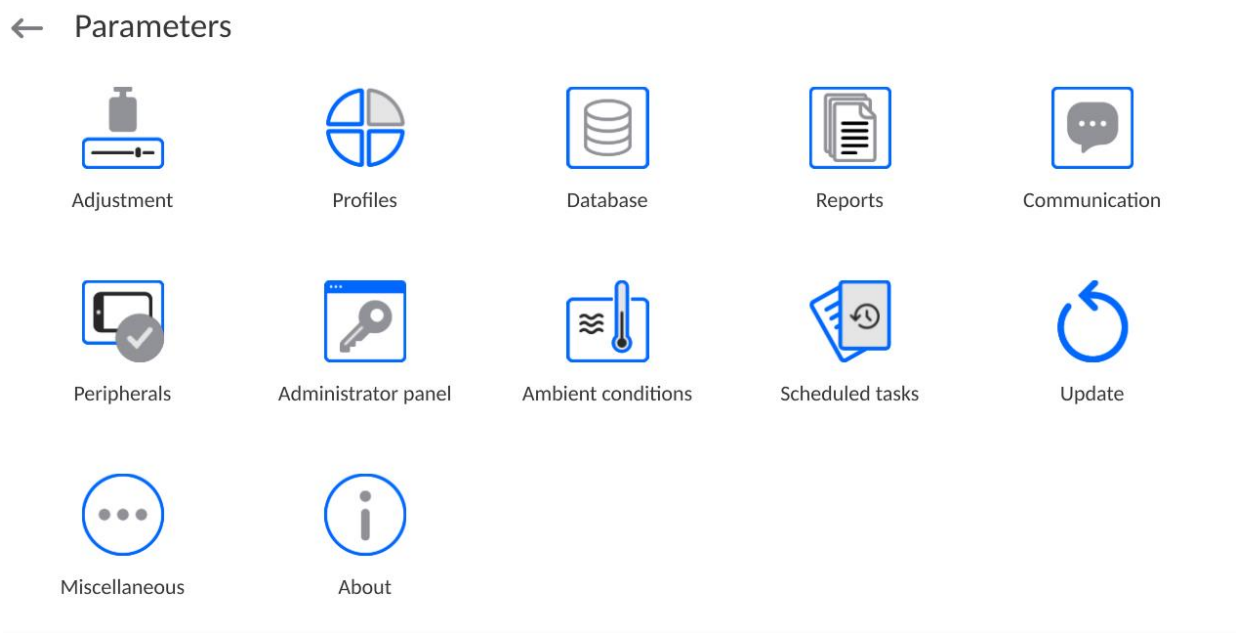
7. PROGRAM STRUCTURE

The main menu structure has been divided into function groups. Each group is home to parameters divided by themes. Description of each group can be found further in the manual.

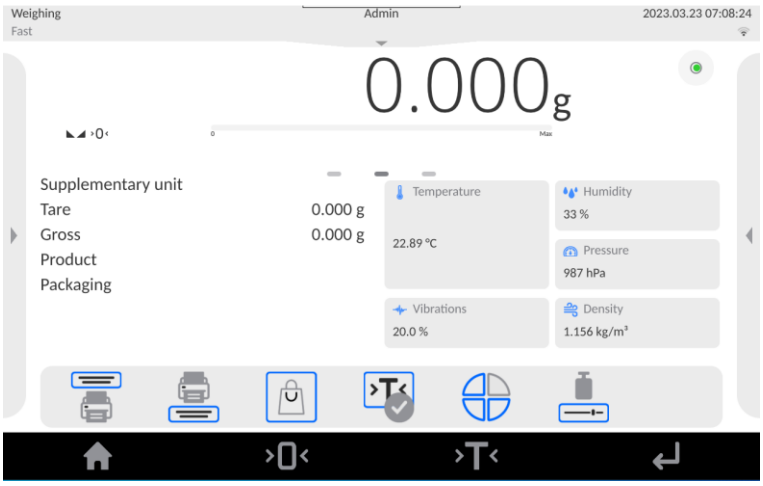
List of menu groups – Parameters

To gain access to the main menu, press the button in the bottom bar of the screen - .

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



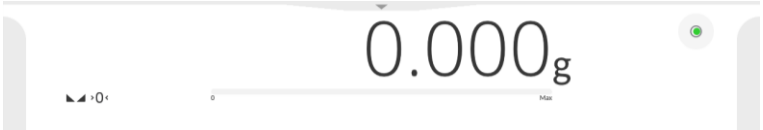
8. WEIGHING WINDOW



The main window can be divided into 5 fields:

- At the top of the screen you can see information on current working mode, logged operator, data, time, active PC connection.

- Below is the box with a weighing result and balance leveling status.



- The field includes additional information related to ongoing operations.

Note:
Information in this area is freely programmable. The method of defining is described in point 14.3 of the manual.

- On-screen function buttons can be found below:

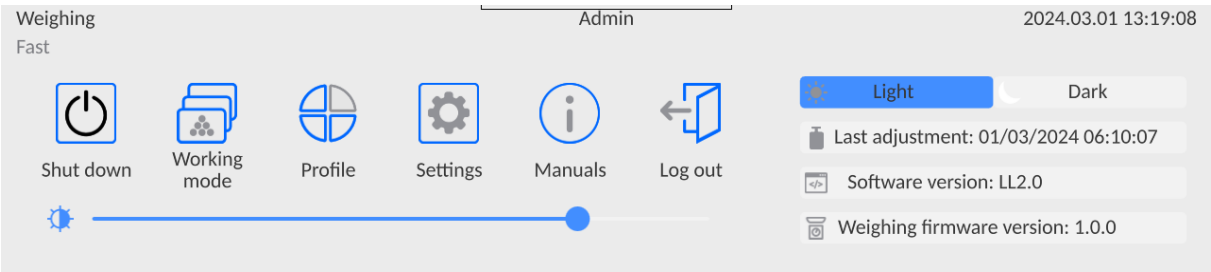
Note:
The operator can define on-screen function buttons. The method of defining is described in point 14.2 of the manual.

- Fixed function buttons are at the bottom of the screen:

9. LOGIN

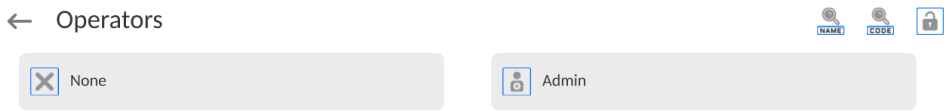
To gain full access to operator's parameters and be able to edit databases, the balance operator must log in as **<Administrator>.**

To do so, expand the menu at the top of the screen.



First login:

- Expand the top menu and press **<Log in>** field. You will see operator database window with **<Admin>** item.



By default this operator is not assigned an access password. Therefore the operator is automatically redirected into the home screen after selecting it.

NOTE: After the first login, the first step is to add operators and provide them with relevant permission levels and unique access passwords (procedures described further in the manual, see point 12 and 19.2).
In the another login, select operator and enter password to make the program operate with specific operator's permission level.

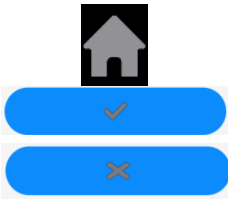
Logout:

- Expand the menu at the top of the screen and press .
- After collapsing the top menu in the top bar of the screen, you will see **<Not logged in>** inscription in the place of the name of logged operator.

10. NAVIGATION IN THE MENU

Navigation in the weighing program software menu is intuitive and uncomplicated. The touch panel makes the software operation easy. Pressing an on-screen button or an area on the screen initiates an assigned function or operation.

10.1 Keypad buttons



Press to enter the main menu.

Press to confirm modification.

Press to return to the previous view without changing the parameter value.

Press to add a database record.

Press to search for a particular database entry by date.

Press to search for a particular database entry by name.

Press to search for a particular database entry by code.

Press to print database entries.

Press to select printout template variables from the list.

Press to go back.

10.2 Voice commands

The balance software allows executing several functions through voice commands. These are the following: taring, zeroing, result printing/saving. Commands must be expressed in English, in a proper sequence. See below for the structure of particular commands.

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

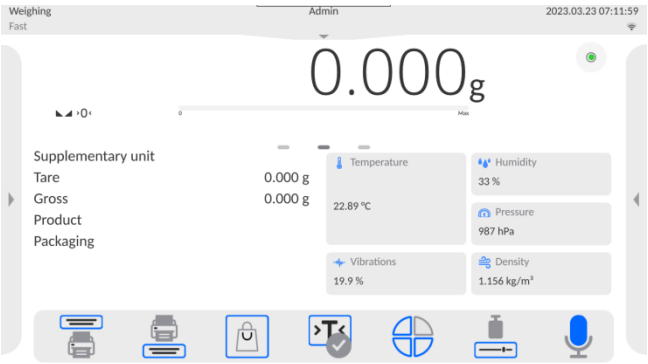
Zeroing: **ellipsis [please] zero [the] device**

Printing/Saving: **ellipsis [please] save [the] (mass | measurement | mass measurement)**

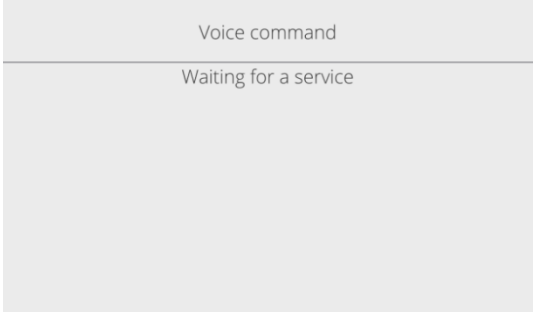
The method of expressing commands: black text obligatory, green – optional, red – one of them obligatory, *e.g. for Print command:* ***ellipsis save mass.***

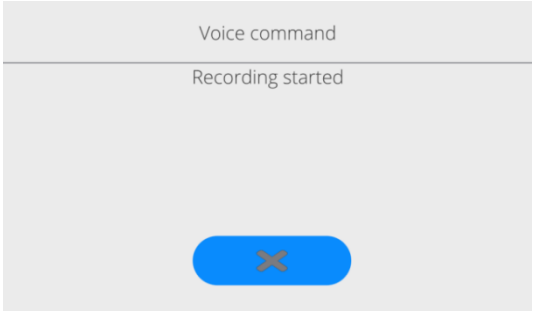
Procedure:

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

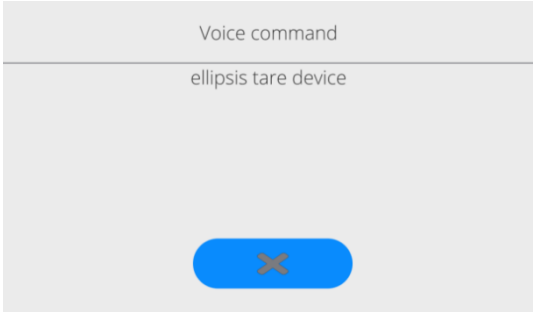


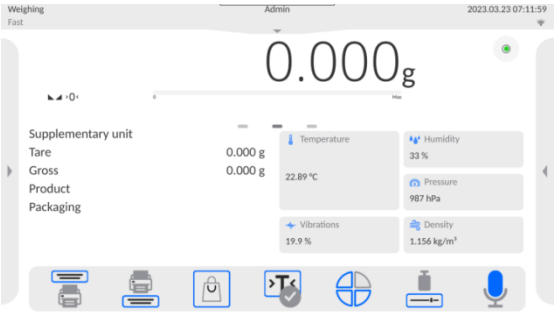
2. Press .
3. The voice command recognition procedure is initiated and the user is informed about it through the displayed messages.





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





10.3 Return to weighing

Modifications to the balance memory are automatically recorded upon return to the home screen.

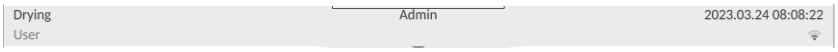
Procedure:

- Press repeatedly until you see the home screen.
- Press in the top bar to return to the home screen immediately.

10.4 Drying mode window

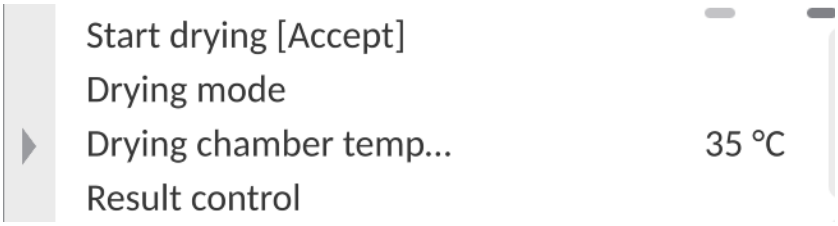
The home screen can be divided into 4 fields:

- The top part of the screen shows information on currently used working mode, logged operator, data, time, active PC connection and balance leveling status.



- Below is a box with weighing or drying result:

- Gray field includes extra information related to ongoing operations:



Note: *Information in this field are freely programmable.*
The method of defining is described in point 14.3 of the manual.

- The field contains information related to drying parameter settings and current mode of the device:

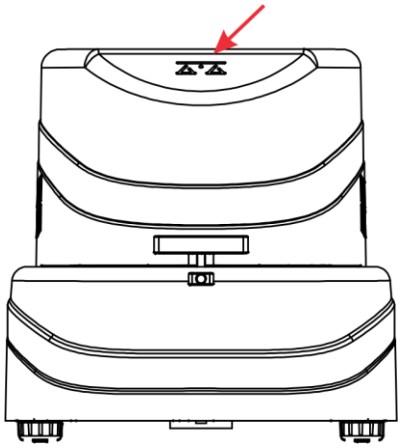
- Below are on-screen function buttons:

Note: *The balance operator can define on-screen function buttons. The method of defining is described in point 14.2 of the manual.*

- There are fixed function buttons at the bottom of the screen:

10.5 Moisture analyzer status signaling

The moisture analyzer is equipped with an optical supervision. It is an illuminated logo situated in the drying chamber cover.

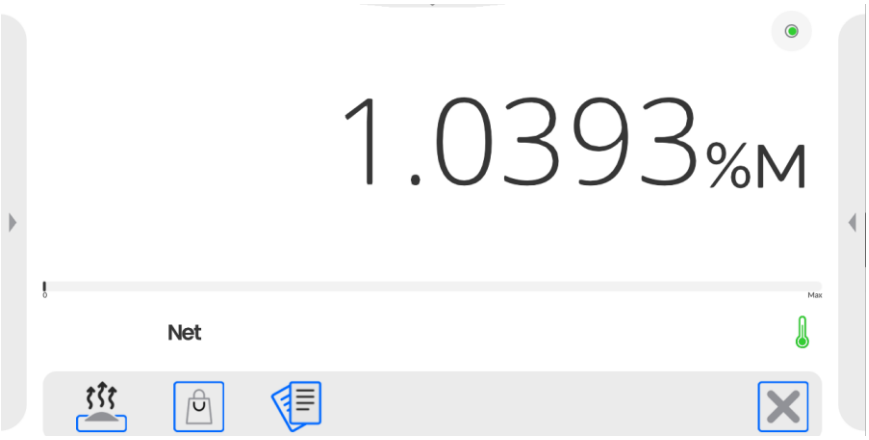


- Glowing green – moisture analyzer is connected and ready to work.
- Glowing red – drying is underway. It is forbidden to open the drying chamber.
- Flashing white – drying is finished. It is possible to open the drying chamber.

10.6 Drying result

The drying result is showed in the home screen. The operator can enlarge the result so that it is visible from a distance.

Procedure:
To enlarge the result, press the field with a result.



To restore a standard display format, press the white field of the result again. The previous view will be restored.

11. ADJUSTMENT

Moisture analyzers can be adjusted so that a suitable measuring accuracy is guaranteed. The access to adjustment control functions is available in <ADJUSTMENT> menu. This menu includes the following items:

11.1 External adjustment

External adjustment is performed with the use of external reference of a suitable precision and mass, dependent upon the type and lifting capacity of the balance. The procedure is semi-automatic and subsequent stages are signaled through display messages.

Note: *External adjustment is dedicated to balances that are not subject to compliance assessment.*

Procedure:

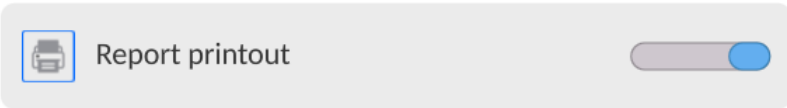
- Go to <Adjustment> submenu and press <External adjustment> item.
- The screen will show a relevant message. Unload the weighing pan and press . While determining the start mass, **Mass determination…** message will be displayed.
- Once the procedure is finished, the balance screen will show the next message; follow the message and put the required mass on the weighing pan and press .
- In some balance types, the display will show another message; follow the message and put another mass on the weighing pan and press .
- Once the procedure is finished, unload the weighing pan and press to confirm and return to weighing.

11.2 Operator's adjustment

The operator's adjustment can be performed with any reference whose mass falls within the following range: above 0.15 of the maximum lifting capacity and value of the maximum lifting capacity of the balance. The adjustment procedure is similar to external adjustment, yet there is a reference mass value window displayed before the procedure starts.
To start the procedure, enter <Adjustment> submenu and then <Operator's adjustment>. Next follow instructions displayed in the screen.

11.3 Report printout

<Report printout> parameter states if the adjustment report is to be printed out automatically after the end of the adjustment.
To activate the automatic report printout, set the active printout parameter.



11.4 GLP

GLP is one of methods of documenting work as per the adopted quality system. The information to be printed will be printed out together with every mass adjustment report.

The operator can use the following information and marks:

▪ adjustment (type of adjust.) ▪ working mode (working mode name) ▪ date, time ▪ operator	▪ balance type ▪ balance ID ▪ leveling ▪ mass nominal ▪ current mass ▪ difference	▪ temperature ▪ empty line ▪ dots ▪ signature ▪ non-standard printout

11.5 Adjustment history

It contains last 50 balance adjustments. The record is automatic. Every saved adjustment includes basic data on the procedure. You can display a list of saved adjustment from this menu. Every report can be printed out.
To print the adjustment report out, go to <Adjustment> submenu and then <Adjustment history> and select adjustment to be printed out. After details have been showed, press in the top bar.

Note: *If 50 subsequent adjustments are saved, the 51st report will overwrite the oldest one in the list.*

If internal procedures require a complete documentation for all adjustments, the list with records must be periodically printed out and archived.

Searching for adjustment

It is possible to look for information on adjustment: press DATE and enter adjustment date.

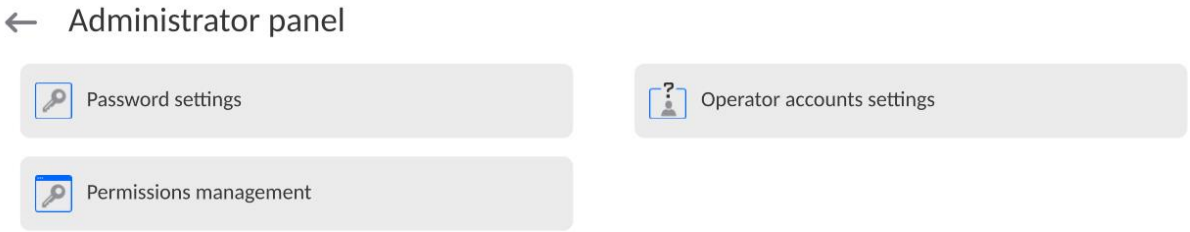
Exporting information on adjustments

To export information on specific adjustments, insert a USB memory carrier into the balance port. Next press in the top right corner of the screen. The procedure is automatic. Once the procedure is finished, a file with **.tdb** extension is saved. You can edit the file in the Excel or other text editor.

12. ADMINISTRATOR PANEL

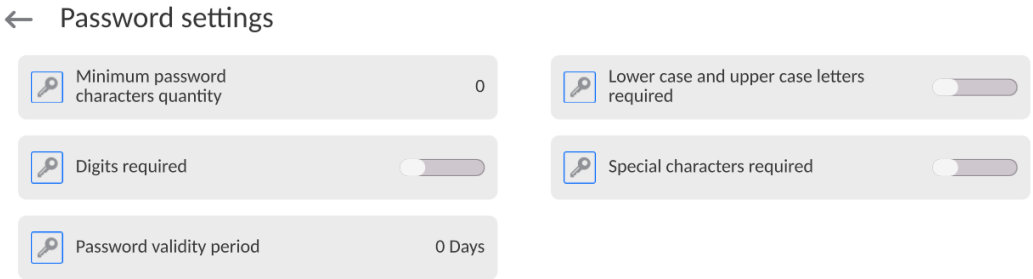
This menu group specifies the range of operations to be performed by the operator with a specific permission level, password protection degree and authorization for unlogged operator.

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



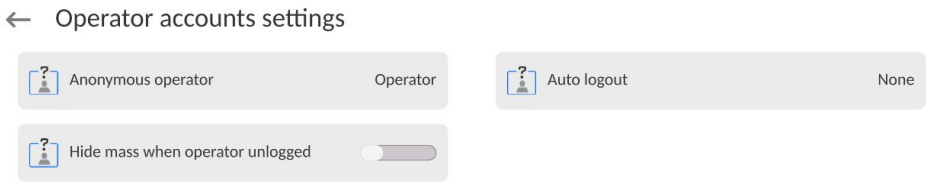
12.1 Password setting

The menu group specifying the password complexity for balance operators.



Password minimum length	Declare a minimum number of characters in the operator's password. For „0" value – you can set any number of characters.
Require lower- and upper-case letters	Declare requirements related to content of characters in operator's passwords.
Require digits	
Require special characters	
Password validity term	Declare period of time, in days, after which you need to change password. For '0' value, you are not required to change password.

12.2 Operator accounts settings



Permission of the unlogged operator
Administrator can assign permission level to a balance operator who has not logged in (the so-called anonymous operator).

Procedure:
Enter <Operator accounts settings> parameters, select <Unlogged operator permission> item and then choose of the following options: Guest, Operator, Advanced Operator, Administrator.

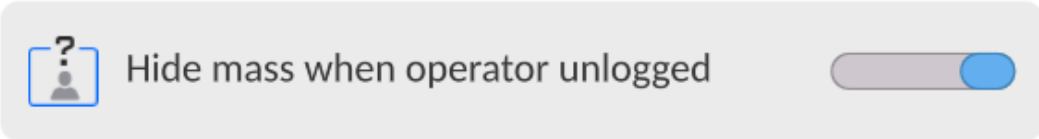
Note: *Selecting* ***<Guest>*** *will cause the unlogged operator not to have any authorization to change program settings.*

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

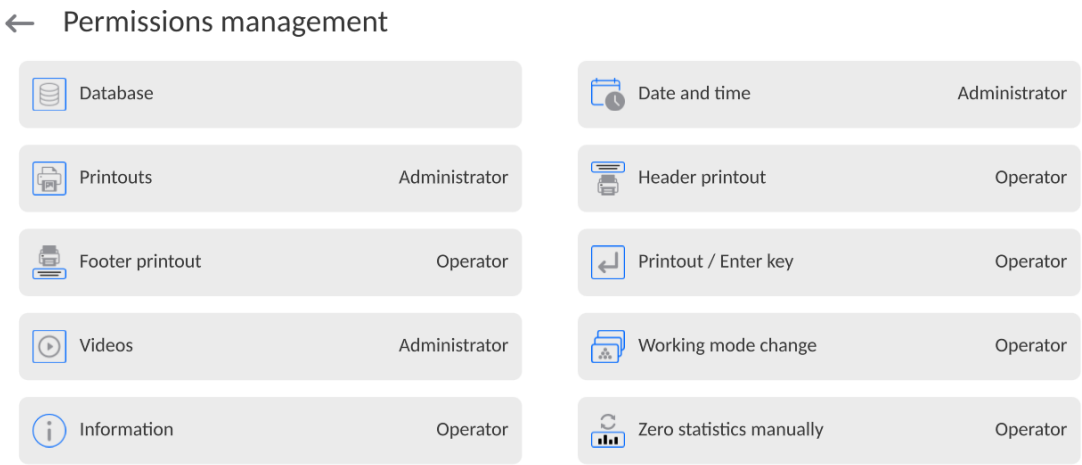
Procedure:
Go to <Operator accounts settings> parameters, select <Automatic logout> item and then choose of the following options: none/3/5/15/30/60. Time is given in [min].

Hide mass when operator unlogged
It allows you to disable mass display if the user is not logged in. By default this option is disabled in the balance.

Procedure:
Enter <Hide mass when operator unlogged> and then switch the value into active.

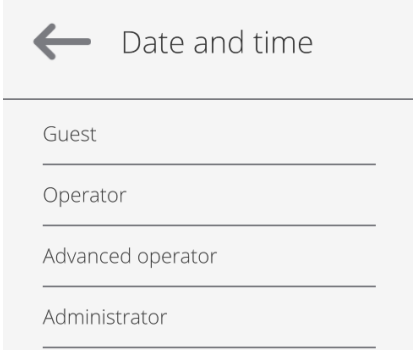


12.3 Permissions management

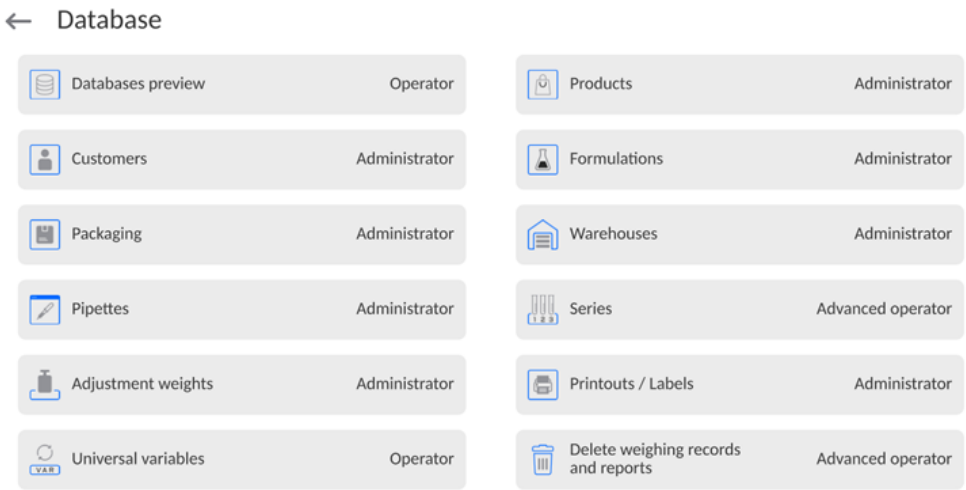


Note: *Selecting* ***<Guest>*** *value for particular parameters will cause the access to settings to be open (no need to log in).*

You can assign permission level to each option for edition.
Available settings:



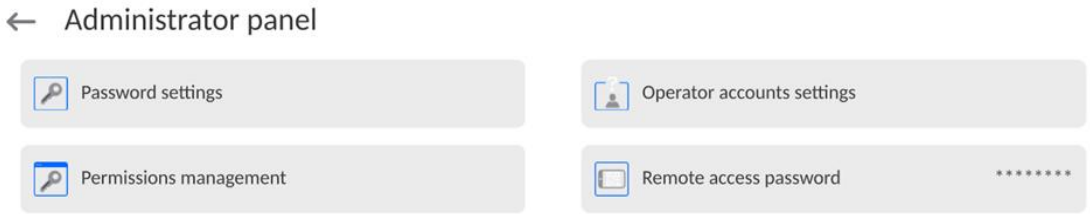
Databases



Default settings of the balance allow the operator with **Administrator** permission to change settings of particular databases. Depending on requirements, this permission can be modified.

Similarly you can change permission to edit other options in this menu.

12.4 Remote access password



The balance allows you to gain remote access, using connection between the balance and local Internet network that a PC is connected to. The **VNC Viewer** application can be used for this purpose.
A default access password in the program is a sequence of the following characters: **radwag1234.** If the operator does not wish to use the default password, he must enter its own unique access password in the relevant field.

Note: please remember a new password in order not to lose a remote access to the balance.

13. PROFILES

Profile is an information package that describes:

- operation of the function; e.g. parts counting, percent weighing %, etc.,
- what information is to be displayed during work,
- what buttons will be active,
- which units will be available,
- what criteria apply to balance working speed and result stabilization.

The balance program allows creating many profiles, which in reality means that:

- every operator can create his own customized working environment,
- it is possible to design mode of operation of the balance through these buttons and required information (work ergonomics).

For the sake of easier use of the balance, there are 4 default profiles for which settings have been selected and saved to make sure weighing is optimal for specific expectations and conditions.

The following profiles are available:

- **Fast** – profile for quick weighing of any masses, regardless of the working mode. Upon first startup, the balance loads this profile by default. For this profile parameters have been adapted to make sure the final measurement result is obtained as quickly as possible,
- **Fast dosing** – profile is dedicated to dosing and allows quick dosing of masses. Selection of this profile results in automatic switch into DOSING mode,
- **Precision** – profile is dedicated to precise weighing of any masses, regardless of the working mode. For this profile the weighing process is the longest but the final result is the most precise and accurate,
- **User** – basic profile for which filter settings are adapted to make sure weighing is relatively quick and precise. Selection of this profile results in automatic switch into the WEIGHING mode.

***Note**: the operator can fully modify profile settings only with regard to User profile. Other default profiles (Fast, Fast dosing and Precision) can be modified only to a limited extent. Every extra profile created by the operator can be fully modified too.*

13.1 Profile creation

The balance administrator can create new profiles by:

- copying them from an existing profile and then modifying it,
- creating a new profile.

Copying existing profile

Procedure:

- Enter main menu by pressing .
- Next go to submenu.
- Press and hold the button with profile that is to be copied.
- The menu will be displayed. Select <Copy> item in the menu.
- A profile named <Copy name> will be created. All settings will be identical to the basic profile.

- After copying, change data that must be modified: (name, etc.).

Adding new profile

Procedure:

- Enter main menu by pressing .
- Next go to submenu.
- Press .
- The new profile will be automatically added and will get editable.

Deleting profile

Procedure:

- Enter main menu by pressing .
- Next go to submenu.
- Press and hold the button with profile that is to be deleted.
- The menu will be displayed. Select <Delete> item from the list.
- Next the following message will be displayed: <Are you sure you want to delete?>.
- Press to confirm the message and the profile will be deleted.

Note: *Operations in the profiles are allowed after prior logging as Administrator.*

13.2 Profile structure

Each profile includes the following items:

Settings In this menu it is possible to assign a unique profile name (sequence of alphanumeric characters) and declare which mode is to be default (specific mode will always be activated upon selecting the profile).

Working modes This option allows you to set distinctive options for particular working modes. They contain such a submenu as:
- Mode-related extra settings
- Buttons
- Information
- Printouts

Readout It contains such a submenu as:
- Filter
- Result approval
- Autozero
- Autozero: Dosing
- Last digit

- Number of last digits
- Environment

Units In this menu it is possible to declare a starting unit, extra unit, 2 defined units and introduce gravitational acceleration values in the balance use area, as well as declare availability of particular units.

13.2.1 Settings

Name
Enter this option. A window with keyboard will be displayed in the screen. Enter the name of profile and press ✓ to confirm. The name will be assigned to the profile.

Default working mode
Enter this option to select specific working mode as a starting mode for a profile. In case of <None> option, choose the profile and the balance will activate the last mode.

13.2.2 Working modes

Enter this option to see a window with all available working modes. The operator can enter own settings for each of these modes. They will be called after selecting a profile.

The following parameters are available to each working mode:

- Settings:
  include specific working mode settings and universal settings, such as result control, tare mode, automatic footer printout, printout mode, printout.
- Quick access buttons functions:
  declaring buttons that will be visible in the lower part of the screen.
- Information:
  selection of information that is to be displayed in the gray information field.
- Printouts:
  selection of printout type or defining of non-standard printout.

13.2.3 Readout

The operator can adapt the balance to ambient conditions (filter degree) or own needs. <Readout> menu consists of the following elements:

FILTER (unavailable to the following profiles: Fast, Fast dosing, Precision)
Before being displayed, every measuring signal is electronically processed in order to assure correct parameters typical of the stable signal, that is ready for readout.
By choosing a relevant FILTER, the operator can influence processing to a certain extent.
Selection options:

- very fast, fast, medium, slow, very slow.

By choosing filtering level, it is necessary to consider real working conditions of the balance. With regard to very good conditions, you can set medium or fast filter, while for unfavorable – slow or very slow filter.

Note:

- *for precise balances, it is advisable to choose filters of the following scope: very fast ÷ medium,*
- *for analytical scales and microbalances, it is advisable to pick filters of the following scope: medium ÷ very slow.*

Result approval (unavailable to the following profiles: Fast, Fast dosing, Precision)
It determines the time when a measurement result stability sign is to be displayed.

One of 3 result approval options can be set:

- fast, fast + precise, precise.

Note: *How fast the stable result is obtained depends on the type of filter and specific result approval.*

Autozero function
The task of this function is to automatically control and correct the zero value of the balance. When this function is enabled, subsequent results are compared at regular time intervals. If these results differ by the value lower than the declared AUTOZERO scope, e.g. 1 reading unit, the balance will automatically zero and stable result markers – ◣◢ and zero result markers – →0← will be displayed. When AUTOZERO function is disabled, every measurement starts from a precise zero. There are special cases in which this function hinders measuring. The example can be a very slow placement of the load on the weighing pan (e.g. pouring the load on); in such a case the zero indication correction unit may correct the indication of the real load mass.
Available values: **NO** - autozero disabled.
YES - autozero enabled.

Autozero function: Dosing (unavailable to the following profiles: Fast, Fast dosing, Precision)
The task of this function is to set autozero function in dosing function by default.
Available values:
NO - autozero disabled automatically after entering Dosing mode.
YES - autozero enabled automatically after entering Dosing mode.

Last digit
Using this function, you can disable visibility of the last decimal place in the specific weighing result. Three settings are available here:

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

Number of last digits
Using this function, you can declare the number of hidden last digits of the result. This function offers three settings and works in connection with <Last digit> option:

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

Environment
This parameter refers to surrounding and working conditions of the balance. If ambient conditions are unstable, it is advisable to change the parameter into Unstable. By default this parameter is set as Stable.
Stable setting will cause the balance to work much faster. It means that weighing time is a way shorter when compared to the one in case of Unstable parameter.

- **Unstable; Stable.**

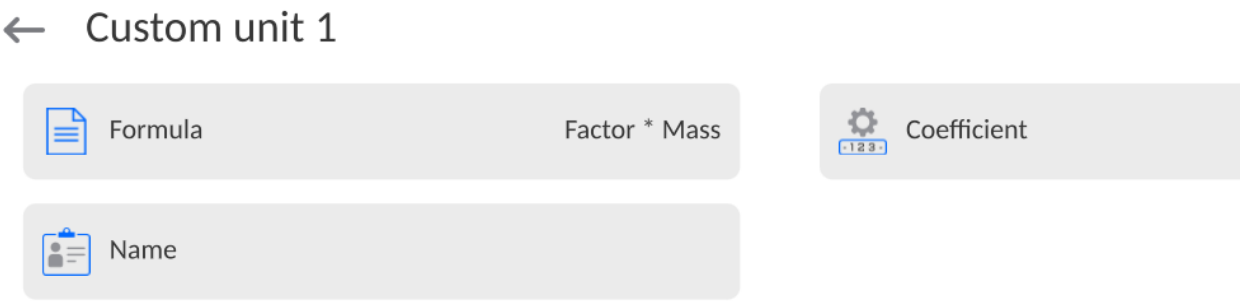
13.2.4 Units

The operator can declare a starting unit and additional unit as well as two defined units for a specific profile.

At this point it is also possible to enter gravitational acceleration values in the balance use venue. This is required for use of the mass indication in [N].

Defined unit has:

- Formula (defined unit conversion pattern): Factor * Mass or Factor / Mass.
- Factor (declaring factor for conversion of defined unit as per specific formula)
- Name (unique name of unit that is to be displayed next to result - *max. 3 characters)*



If this unit is designed, its name will be visible in the list of available units; option available to non-verified balances only.

14. WORKING MODES – general information

PMV moisture analyzers in a standard variant provide the following working modes:

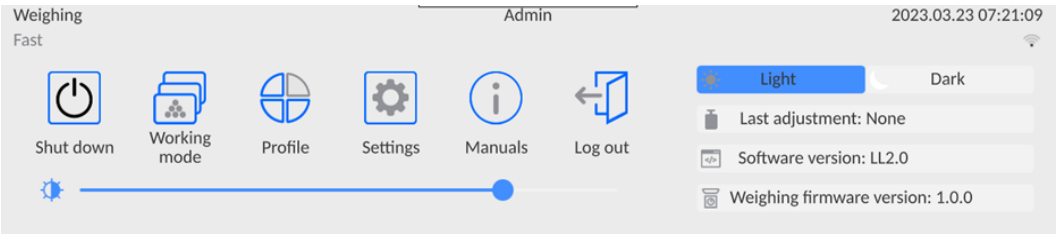
Weighing
Mode of operation: the weight of the load is determined through direct measurement, force used by the Earth to attract the load is measured. The result is processed into a digital form and displayed in the screen.

Drying
Mode of operation: determination of sample moisture by evaporation of all elements of the moisture from the sample placed inside the drying chamber. The result is automatically calculated and displayed on an ongoing basis by the moisture analyzer program on the basis of the sample mass at the beginning, during and at the end of the process.

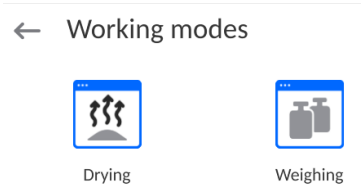
Special functions are available in <DRYING> mode settings. Thanks to them, you can adapt the operation of the mode to your specific needs. These settings can be called by selecting a relevant profile. A detailed description of the mode can be found further in the manual.

To change the working mode, do as follows:

- Expand the menu in the top part of the screen.



- Press <Working mode> item.
- You will see a list of modes.

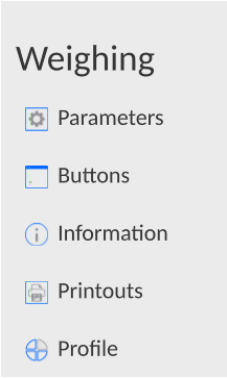


- Select the name of the mode to be used and the balance will activate the selected mode automatically.

14.1 Working mode parameters

Every working mode is related to programmable parameters that determine its operation. The parameters access procedure:

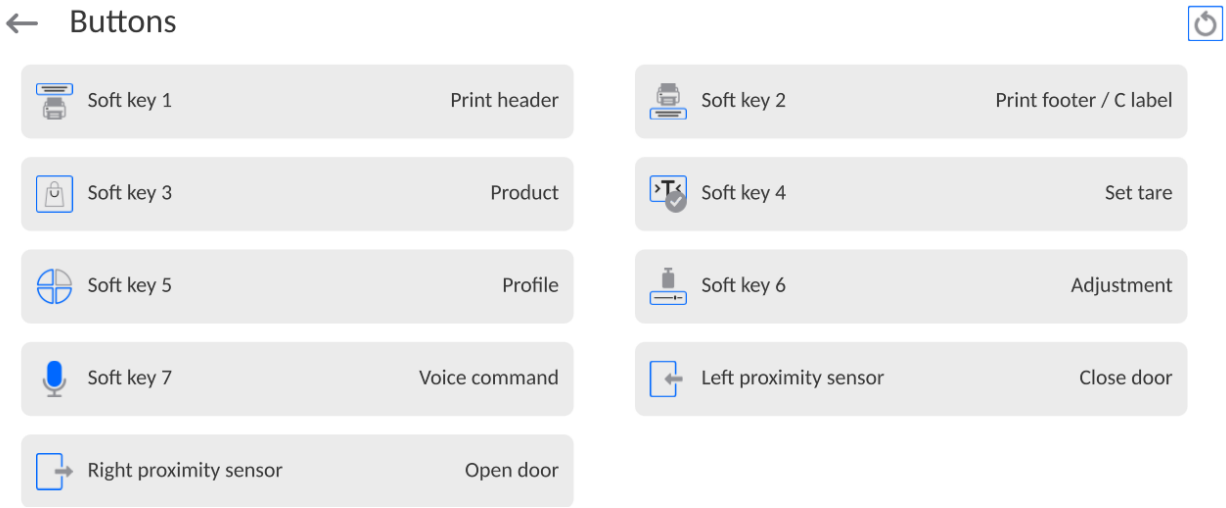
1. Expand the side left menu.



2. The following menu will be displayed in the screen:
   - <Parameters> - extra options related to the mode.
   - <Buttons> - define quick-access buttons.
   - <Information> - select information to be displayed in the Info field.
   - <Printouts> - select type and content of printout.
   - <Profile> - profile settings
3. Press relevant menu and select the item to be modified.

A description of basic parameters in the <Settings> menu can be accessed in the point 16.6 *Extra weighing parameters.* Other parameters related to specific modes are described as part of discussing these modes.

14.2 Quick-access buttons, proximity sensors



You can quickly return to the default buttons view in the lower bar of the screen. To do so, press button in the top right corner of the screen.

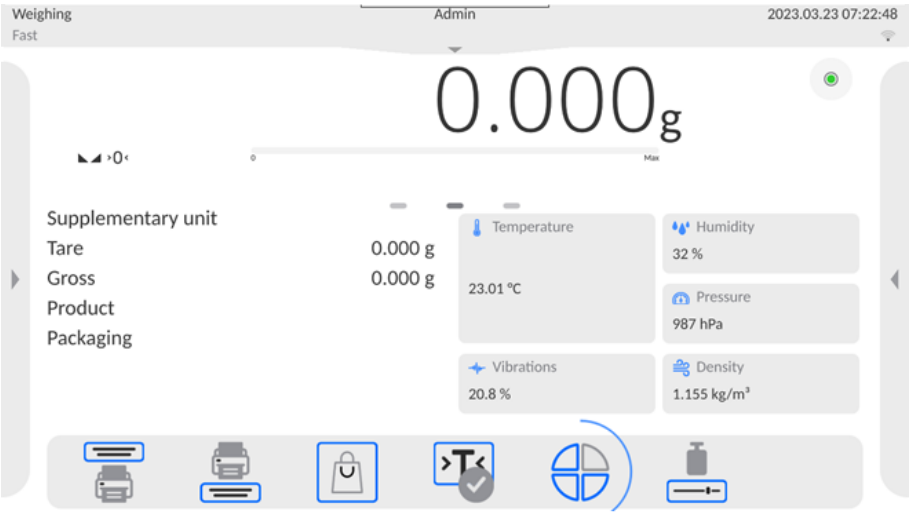
You can define 7 buttons that can be visible in the lower bar of the screen.

After assigning the function to the button, you will see a relevant icon in the lower bar of the

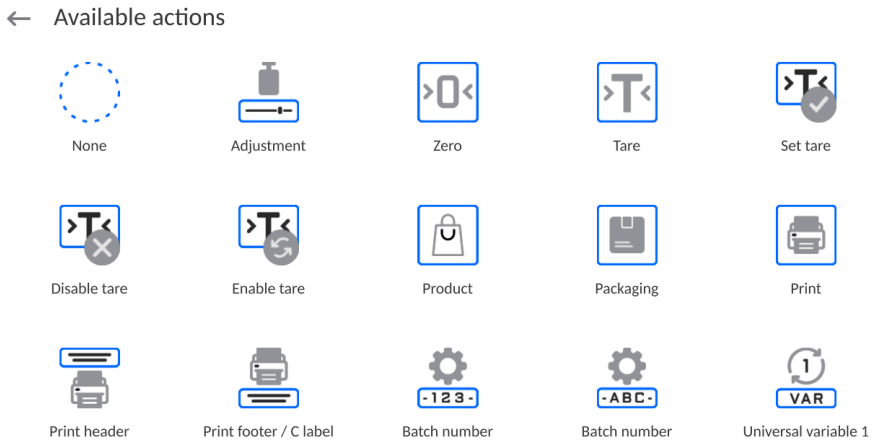
home screen. Availability of buttons depends on the working mode. A list of buttons can be found in the APPENDIX B to the manual. This is the so-called quick-access button for the most frequent operations.

A default buttons view is programmed for each working mode. To quickly restore the default buttons view, select <Default buttons view> function.

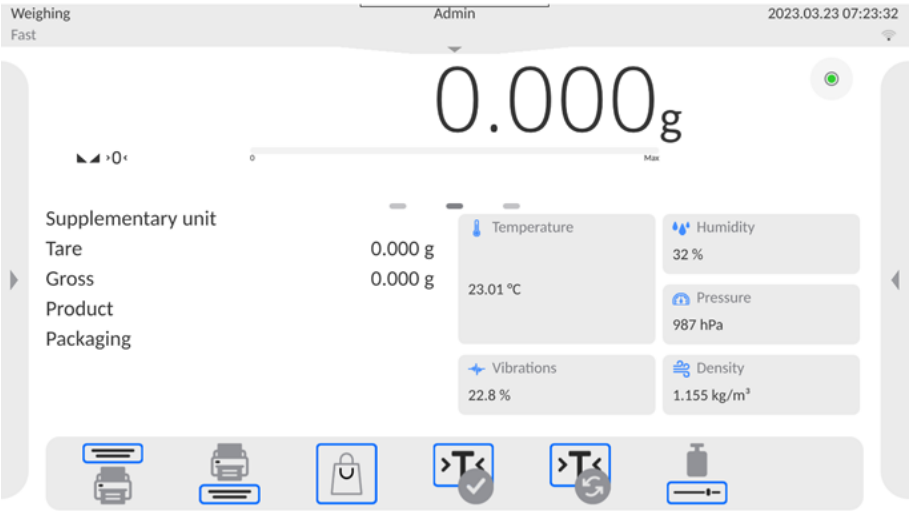
There is also another way of adding or changing the button. You can press and hold the field in the buttons field for about 3 seconds.



The program will automatically display the window with available buttons



Press the button to be added and the program will display the home screen. The activated field will show the button you have selected.



Note: *You can browse the operating manual saved in the balance memory. To use this function, set the* [?] *help button in the buttons bar.*

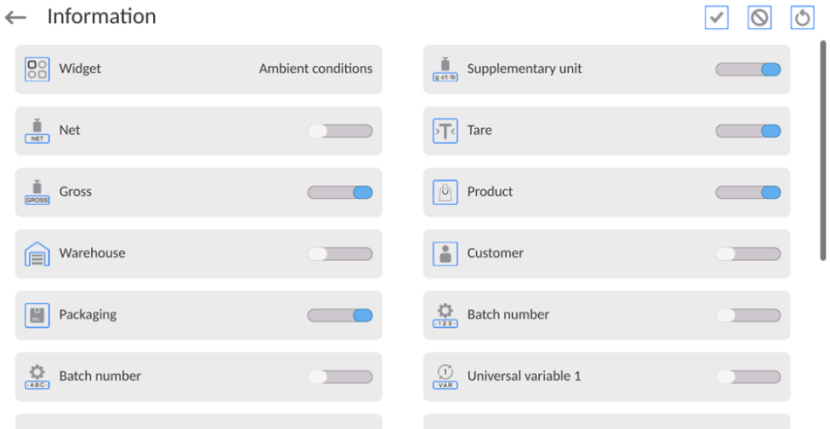
14.2.1 Proximity sensors

The balance is equipped with two proximity sensors that allow controlling the balance with no need to press buttons on the wall or touch screen.

The program detects four motion conditions near sensors:

1. Putting the palm close to the left sensor **<Left proximity sensor>**.
2. Putting the palm close the the right sensor <**Right proximity sensor**>.

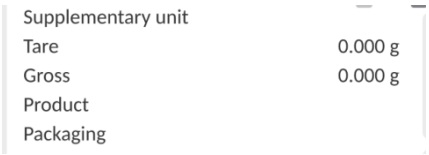
14.3 Information



You can quickly change selection of information to be displayed by using buttons in the top right corner of the screen.

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

Weighing information is showed on the left side of the central part of the screen.

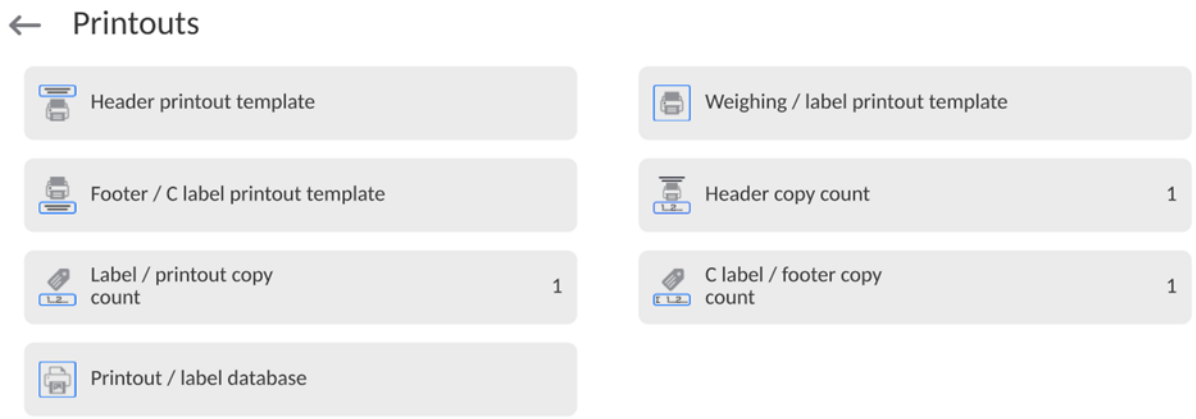


You can put 6 pieces of information at the most. If you put more, the first 6 will be showed.

Two options are available to each piece of information:
- – data enabled.
- – data disabled.

14.4 Printouts

The <Printouts> menu consists of three setting sections. The first section is standard printouts: <Header printout template>, <Weighing/label printout template>, <Footer/C label printout template>. The second section is non-standard printouts: <Printout/label base>. The third in turn is parameters that allow setting printed quantities: header, weighing and footer. Press once to call particular printouts.



Standard printout comprise 3 sections featuring numerous variables. Set for each variable that is to be enabled on the printout, set for each variable that is to be excluded from the printout.
To quickly change the settings press buttons located in the top right-hand corner.

	Press to deselect all marked variables.
	Press to select all marked variables.
	Press to restore default variables.

HEADER PRINTOUT TEMPLATE	WEIGHING/LABEL PRINTOUT TEMPLATE	FOOTER/C LABEL PRINTOUT TEMPLATE
– Non-standard printout – Dashes – Working mode – Date – Time – Balance type – Balance ID – Operator – First and last name – Leveling – Client – Warehouse – Product – Packaging – Universal variable 1…5 – Empty line – GLP report – Non-standard printout	– Non-standard printout – N (measurement number) – Date – Time – Leveling – Client – Warehouse – Product – Packaging – Series number – Batch number – Universal variable 1…5 – Net – Tare – Gross – Current result – Additional unit – Mass – MN-Method – Reference tare – Minimum sample – Minimum sample status – Mass value for titrator – ID – Non-standard printout	– Non-standard printout – Working mode – Date – Time – Balance type – Balance ID – Operator – First and last name – Leveling – Client – 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 of the GLP PRINTOUT section, press button on the operation panel; only variables with attribute can be printed (see the above list).
2. Variables with 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

Note:
Units for mass value printout:

- *Net – main (adjustment) unit*
- *Tare – main (adjustment) unit*
- *Gross – main (adjustment) unit*
- *Current result – currently displayed unit*
- *Extra unit – additional unit*
- *Mass – main (adjustment) unit*

Non-standard printout

The printout may include: TEXTS and VARIABLES (downloaded from the program upon printout). Each printout is a separate template, has its unique name for identification purposes and is saved in the database.

Procedure:

1. Press <Non-standard printout> field.
2. Press <Add> button to open another window with the following data: Name/Code/Template.
3. Assign name and code to the printout.
4. Press <Template> button.
5. The screen will show the keyboard field for edition of printout.
6. Using the keyboard, design the printout; the printout may include texts and variables.

Note:

- *You can add printouts from the external memory by importing already configured texts via USB port.*
- *Printout name is ONLY A NAME and does not represent its content.*
- *Method of designing non-standard printout is described in point 19.8 <Printouts>.*

14.5 Profiles

Description of this function can be found in point 14 - *Profiles*.

15. WEIGHING

Load the weighing pan. When ◣◢ marker is displayed on the left side of the screen, you can read the weighing value.

To save/print weighing, press <↵ PRINT> button:

- in verified balances – only stable weighing result (◣◢ marker),
- in non-verified balances – stable or unstable result (no marker displayed [◣◢]**)**, if the result is unstable, the <**?**> mark is printed before the mass.

15.1 Weighing unit selection

To change the weighing unit, press the unit in the balance window next to the measurement result. Click the unit to display a list of available units. Select one of them to make the program calculate the result to the value of selected unit.

Selection variants:

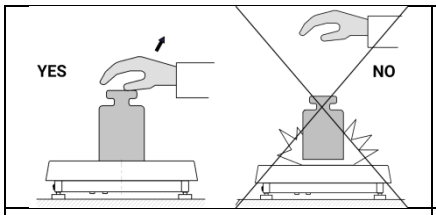
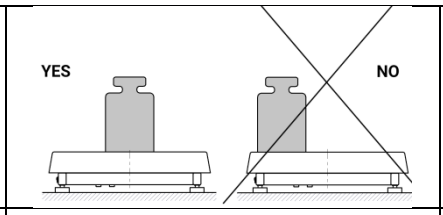
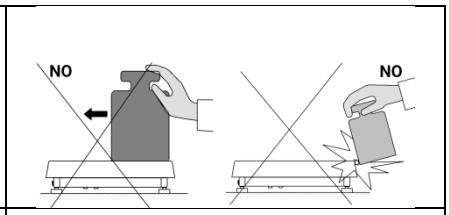
unit	*designation*	*verified balance*	*unit*	*designation*	*verified balance*
gram	[g]	yes	Taele Singapur	[tls]	no
milligram	[mg]	yes	Taele Tajwan	[tlt]	no
carat	[ct]	yes	Taele Chiny	[tlc]	no
pound	[lb]	no	Momme	[mom]	no
ounce	[oz]	no	Grain	[gr]	no
ounce troy	[ozt]	no	Tical	[ti]	no
pennyweight	[dwt]	no	Newton	[N]	no
Taele Hongkong	[tlh]	no	Mesghal	[msg]	no

All units are available in non-verified balances.

15.2 Correct weighing principles

To assure a long-term use and correct measurements of load masses, please do as follows:

- Start the balance without loading the weighing pan (permissible value of weighing pan load upon activation is ±5% of the maximum load).

		
Load the weighing pan gently and without impacts. Setup/Misc./Vibration detection parameter allows you to control loading (description in point 23.8).	Position loads in the center of the weighing pan	Avoid side loading of the weighing pan, especially side impact/strokes

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

- Before you start measuring, it is advisable to load the weighing pan a couple of times. To do so, use a mass of the load that corresponds to maximum load.
- After unloading the weighing pan, check if the balance shows zero - -0- and if the measurement result is stable - ◣◢; if not, press button.
- Select weighing unit: press unit next to mass displayed 0.0000g or button in the lower bar of the screen.

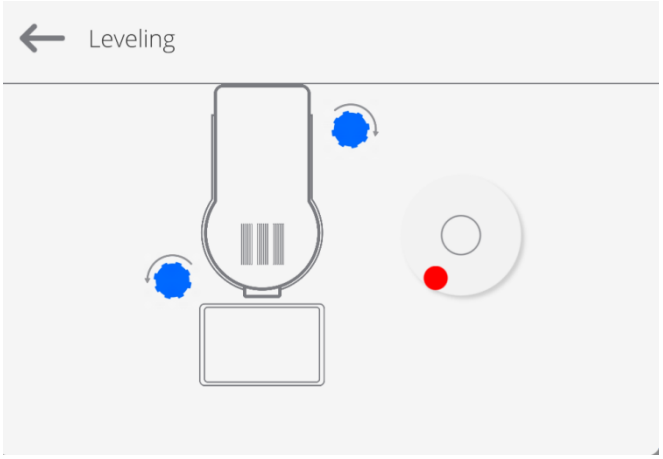
During intervals between measurements, do not unplug the balance. It is advisable to deactivate the balance screen using the button in the top menu of the balance.	
To start the balance, press the button in the reading head. Once the startup procedure is completed, the balance will be ready for weighing.	

15.3 Leveling

The balance is equipped with the **Level Sensing System,** system that monitors the level. Thanks to this solution, it is possible to continuously monitor the level while the balance is operating, which is signaled in the top right corner of the screen. The system supervises leveling. In case the level changes, the system informs the operator about it in the screen: by changing the position of the level indicator and/or by sounding the alarm and entering the balance leveling screen.

Leveling procedure:

- Press leveling icon in the top right corner of the screen.
- The screen will show the leveling function control panel. The balance view is displayed next to the level view.



- Level the balance by turning its legs as showed in the screen – level point will move into the center of the ring.
- When the point is in the inner ring of the 'level view', its color will turn from red into green – this means that leveling is correct.

Note:
The balance is equipped with the Automatic Level Control mechanism. The mode of operation is described in the point 22.8 of the manual.

15.4 Zeroing

In order to zero the mass value, press button. The screen will show the zero value of the mass and the following symbols will be displayed: →0← and . Zeroing is tantamount to determination of a new zero point which the balance treats as a precise zero. Zeroing is possible only in case of stable screen values.

Note: *Screen zeroing is possible only within* ***±2%*** *of the maximum load of the balance. If the zeroed value is higher than* ***±2%*** *of the maximum load, the screen will show an error message.*

15.5 Taring

In order to determine the net mass, place the load packaging, wait for the result to stabilize and press button. The screen will show the zero value of the mass and the following symbols will be displayed: ***Net* and** . After removing the load and packaging, the screen will show a value that is a total of tared masses with a minus sign. You can also assign the tare value to the product in the database. This being the case, after selecting the product, the balance will collect the tare value from the database automatically.

Note: *Taring negative values is disallowed. An attempt to tare the negative value will result in emergence of the error message. In such a case, zero the balance and retare.*

Entering tare manually

Procedure:

- In any working mode, press the quick-access button: .
- The numerical keypad will be displayed.
- Enter tare value and press button.
- The balance will return to weighing mode and the screen will show tare value with '-' sign.

Deleting tare

The tare value showed in the screen can be deleted by pressing ZERO button on the wall of the balance or using the programmable button: <Disable tare>.

Procedure 1 – after unloading the weighing pan:

- press button,
- NET marker will be deleted, a new zero point has been determined.

Procedure 2 – when tared load is on the weighing pan:

- press button,
- NET marker will be deleted, a new zero point has been determined,
- when tare value exceeds 2% of the maximum load, the screen will show -Err- message (unable to perform operation).

Procedure 3 – when tared load is on the weighing pan or after unloading the weighing pan:

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

15.6 Extra parameters related to weighing

By changing weighing function settings, you can program balance operating mode.

Procedure:

1. Expand side menu.
2. The menu will be displayed: Settings, Buttons, Information, Printouts.
3. Press relevant menu and select item that is to be modified.

<Parameters> menu – additional options related to weighing,
<Buttons> menu – define quick-access buttons,
<Information> menu – select information to be displayed in Info field,
<Printouts> menu – select type of printout,
<Profile> menu – settings for active profile.

<PARAMETERS> menu contains additional options related to weighing, such as:

– **Tare mode**

Available options:

- SINGLE:
  the value remembered after pressing TARE button once. Press again to determine a new tare value. Selection of product or packaging for which tare value is assigned will result in deletion of previous tare.
- TOTAL OF CURRENT:
  summing current input tare values for product and packaging (arising from selection of product and packaging from database). Possible to add manually entered tare value to the sum. Set tare value for product or packaging, the manually entered tare value will be disabled.
- TOTAL OF ALL:
  summing all values of tare entered.
- AUTOTARE:
  Mode of operation:
  When stable, every first measurement is tared. When the screen shows NET, it is possible to determine net mass. After the load is removed and balance goes back to the autozero zone, the program automatically deletes tare value.
- EVERY MEASUREMENT:
  possible to tare before every measurement in the series.

– **Automatic footer printout**

Available options:

- MODE – None – footer manual printout.
  Measurement total – the condition for printing footer will be exceeding mass valued entered in <Threshold> parameter.

Number of measurements – the condition for printing footer will be a specific number of measurements (series) in <Threshold> parameter.

- THRESHOLD – specification of the value of threshold that determines footer printout.
  For <Measurement total>, the value will be defined in the mass unit [g], and for <Number of measurements>, the value will be unnamed, specifying number of measurements.

– **Printout/enter mode**
  - PRINTOUT/ENTER BUTTON (manual control)
    Never – inactive printout.
    First stable – the first stable measurement is recorded.
    Every stable – all stable measurements are accepted.
    Every – printing all measurements (stable and unstable), in verified balances only stable results (as in <Every stable> setting)
  - AUTOMATIC MODE
    Never – inactive printout.
    First stable – the first stable measurement is recorded after loading the weighing pan, another stable measurement is recorder after unloading the weighing pan when value goes down below preset threshold value and when the weighing pan is loaded again.
    Last stable – the last stable measurement that occurred before unloading the weighing pan is recorded. It is recorded after unloading the weighing pan and when value goes down below the preset threshold.
    With interval – select this option to activate automatic printout and record in the base of WEIGHING RECORDS with cyclically determined interval. The interval is set in [min] in <INTERVAL> parameter. The interval setting ranges from 1 s to 9h 59min 59s.

NOTE: *Every result (stable and unstable when balance is non-verified, and only stable when balance is verified) is printed out and remembered.*
Automatic operation with interval starts when the option is enabled. The first stable result that is higher than THRESHOLD value is printed out and measured in the first place. Next measurements are printed out with a frequency of the INTERVAL. To finish automatic operation with interval, disable the option.

  - THRESHOLD:
    mass value for automatic printout, set in grams.
  - INTERVAL
    frequency of recording result for automatic operation with interval

– **Statistics**
it contains settings for statistical calculations during operation.
Available options:
  - Global: statistical calculations are performed for all further measurements, regardless of the product
  - Product: statistical calculations are performed for particular products.

16. DRYING – GENERAL INFO

<Drying> is a working mode that allows you to determine moisture content in a substance by drying a sample. After you have initiated the process, the device checks the mass loss of the sample located in the drying chamber and heated. Based on this, the program calculates the moisture content and displays the result in the home screen. The result is updated on an ongoing basis throughout the procedure and ends automatically once all conditions set by the operator have been met.

16.1 Preparation of samples for drying

This part of the manual includes information on how to obtain optimal measurement results during testing. Here are principles of selecting particular drying parameters, depending on the material in question.

16.1.1 Principle of checking moisture in the moisture analyzer

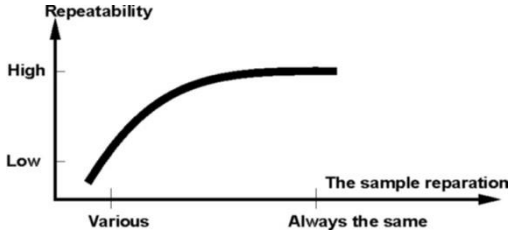
Measuring moisture content in the sample is based on the measurement of mass losses of the sample while it is heated (evaporated).
The RADWAG moisture analyzer is composed of two parts: a precise balance and drying chamber. When compared to traditional moisture determination methods, RADWAG moisture analyzers are faster and do not require additional mathematical calculations (moisture result is displayed on an ongoing basis). Irrespective of the moisture determination method, the measurement precision is essentially determined by sample preparation and selection of suitable testing parameters, such as:

- sample size,
- sample type,
- microwave power,
- drying time.

In reality precision of measurements is not as important as speed of obtaining results (engineering process control units). Thanks to heating the sample (e.g. via microwaves), the measurement is very fast. Measuring speed can be increased by optimal configuration of device parameters, depending on materials in question. The optimal microwave power and drying time depend on type and size of sample as well as expected measurement precision. **These parameters can be selected on the basis of sample measurements only.**

16.1.2 Sample collection and preparation

The nature, preparation and size of the sample are significant factors that influence measuring speed and precision. The method of collecting and preparing samples has a big impact on repeatability of measurements because the sample must be a representative part of the entire material in question.



The final result of the measurement widely depends on the precise and well-thought-out preparation of the sample. The prepared sample used for analysis must represent the entire

material in question. The sample preparation must specify the method of collecting samples, method of defragmenting it, size of particles after defragmentation, homogeneity and other. Preparation itself must be fast enough to prevent loss or absorption of moisture from the surrounding. Standards related to preparation of samples must be elaborated as per specific needs that depend on the material in question, consistency and size of the sample for testing.

Number of samples

Increase in the number of samples in testing entails increase in statistical measurement certainty. The number of samples depends on the material homogeneity, its purity, precision of measuring method and expected precision of results.

Mechanical defragmentation of material for measuring

The defragmentation method must be selected for the material in question. Hard and brittle materials can be cut. Grinding these materials could heat them and cause them to lose moisture, which would entail unreliable measuring results. If it is impossible to find other method than grinding to prepare the sample, potential moisture losses must be recordable.

Fats in the form of paste or melting substances

These substances must be tested with the use of glass fiber filters for increased active surface of evaporation, by splitting substances between fibers. The initial drying of the filter is required only for measurements which are expected to be highly precise.

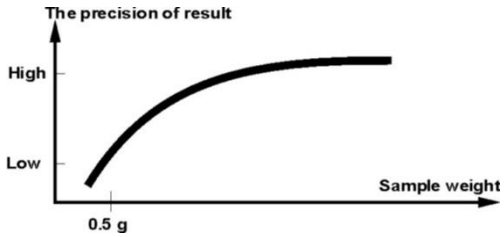
Fluid substances

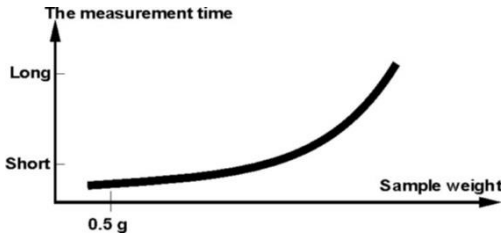
In such cases it is justified to use a glass fiber filter for shorter measuring time. The filter allows separating the liquid around fibers and enlarging the active evaporation surface. The initial drying of the filter is required only for measurements that are expected to be highly precise.

17. SELECTION OF DRYING PARAMETERS

17.1 Selection of optimal sample mass

The sample mass influences precision of measuring result and measuring time. When it comes to heavier samples, the amount of water for evaporation is increased, which results in longer measuring time. Short testing is possible in case of light samples but the mass must not be too low as it may prevent the measurement from being precise enough.





17.2 Impact of sample mass on repeatability of results

The sample mass has a substantial influence on repeatability of results obtained through the moisture analyzer.

Results are always subject to uncertainty related to sample and repeatability of the moisture analyzer.

17.3 Microwave power

The power has a major impact on drying time. Its content depends on the type of material. Too low power leads to partial evaporation of water (insufficient drying of the sample), and in effect unnecessarily long measuring time. Too high power causes the material burning effect (overheated sample, chemical decomposition).

When selecting power, pay attention to the following:

- assess moisture content in the sample,
- specify temperature of chemical decomposition of the material through experiments,
- compare results from the moisture analyzer with the one obtained through a traditional method.

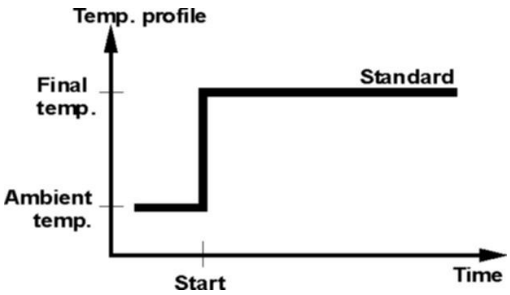
17.4 Selection of drying profile

The moisture analyzer program allows you to select one of four drying profiles:

- Standard
- Fast
- Mild
- Stepwise

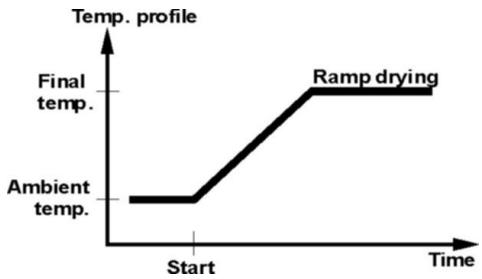
STANDARD profile

The Standard profile is the most commonly used drying profile. It allows the most precise determination of the moisture content.



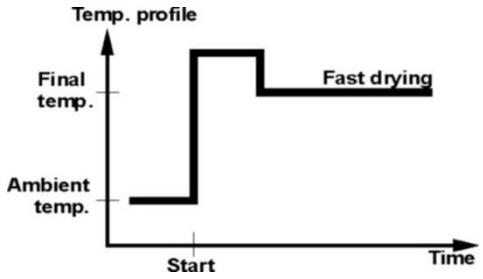
MILD profile

The Mild profile is intended for substances that are susceptible to dynamic heat generated by glowers that heat strongly at the early stage of the process. In this profile, decomposition of fragile substances is prevented by slightly raising the temperature in the specific time (time must be selected via experiments). This profile can be used for substances of skin structure.



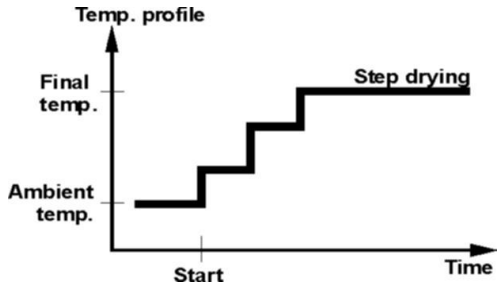
FAST profile

The Fast profile can be used for samples whose moisture content is a few dozen percent. In this profile, glowers generate heat strongly at the early stage of the process, which results in heating the chamber above the drying temperature (maximum temperature is higher by 30% than drying drying temperature). The overheating compensates heat losses during evaporation of the large amount of moisture at the early stage of testing.



STEPWISE profile

It is possible to define three temperatures. It is advisable to use the stepwise profile for substances with a moisture content of more than 15%. Temperatures and time of heating must be selected on the basis of experiments.



17.5 Selection of drying time

The drying time can be specified by selecting a suitable drying end criterion. This means that the moisture analyzer must register satisfaction of specific criteria (mass in time, time) to make sure the drying process ends automatically.

End of drying can occur after specific period of time, irrespective of the mass loss. It is used for substances that may decompose during testing and whose mass does not obtain a fixed value.

The second condition of ending may be lack of sample mass loss (fewer than 1 mg) in the specific time.

Automatic end

You can select a few types of drying ending. The ending can be:

- Automatic 1 (change of 1mg/10s).
- Automatic 2 (change of 1mg/25s).
- Automatic 3 (change of 1mg/60s).
- Automatic 4 (change of 1mg/90s).
- Automatic 5 (change of 1mg/120s).
- Time (max. time 99h 59min.).
- Manual (after pressing a button).
- Defined 1 (enter change of mass Δm 0,1-9,9mg and change of time Δt max 2,55sec.
- Defined 2 (enter change of moisture Δ%M in time of 60s).
- Test (allows selecting autodisabling parameters for sample).

Automatic end – freely definable criteria (mass/time)

Operator defines the value of limit mass loss and time in which this loss cannot exceed the set value. Once the balance reaches the set criterion, measuring ends automatically.

Automatic end – freely definable criteria (change of moisture)

Operator defines the value of limit moisture loss within 60 sec. Once the balance has reached the set criterion, the measuring ends automatically.

Manual end
Operator stops the measuring on his own by pressing STOP button.

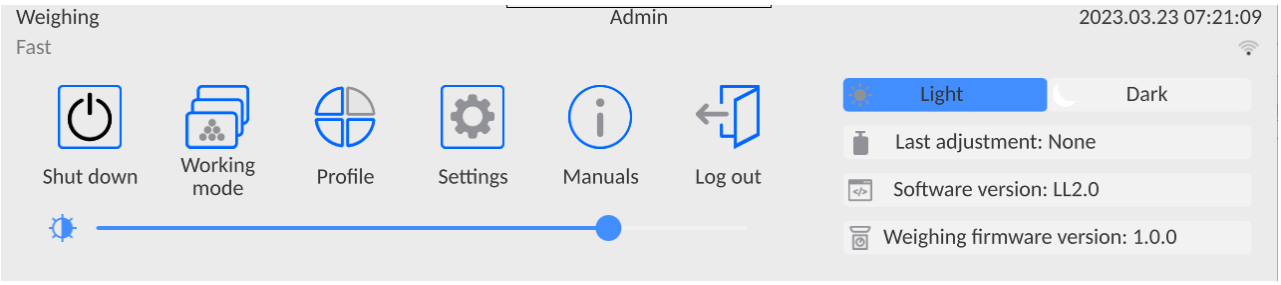
Time end
Measuring ends once a preset period of time expires, irrespective of result.

18. DRYING PROCESS

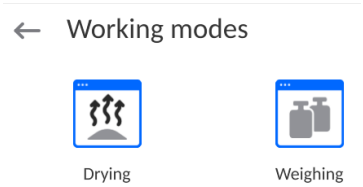
18.1 Activation of working mode

To change the working mode:

- Expand the menu in the top part of the screen.



- Press <Working mode> item.
- The display will show a list of modes.

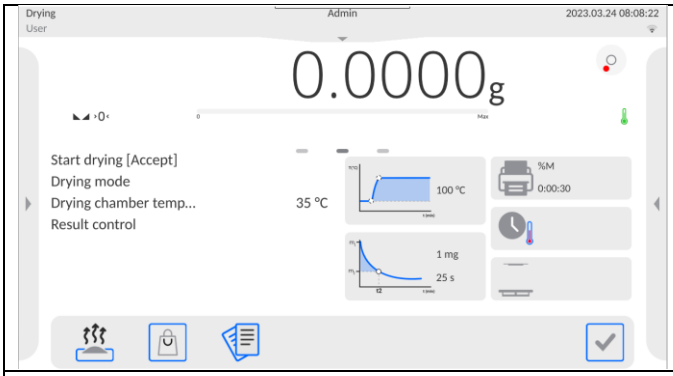


- Select <Drying> mode name and the specific mode will be activated automatically.

Info field includes the following information:

- Drying program,
- Product.

After selecting Drying mode, the following buttons will be available:

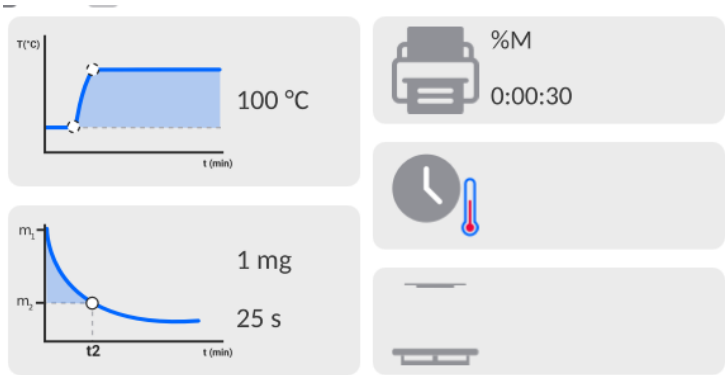
	1. Program database – access to drying program database. 2. Product database – access to product database. 3. Drying program information 4. Drying start.
1 2 3 4	

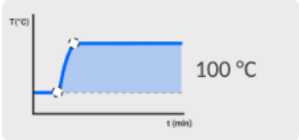
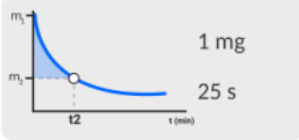
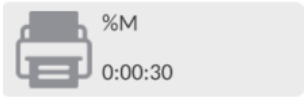
18.2 Drying parameters setting

Drying parameters can be set in the following way.

18.2.1 Using fields in the home screen

This options allows you to quickly set particular drying parameters, with no need to go deeper into the menu. You can access drying parameters by clicking an active field in the screen.
Three fields are available:

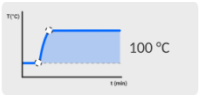


1	Field that allows you to set drying profile and profile-related parameters (depending on profile type).	
2	Field that allows you to set drying finishing method together with its parameters (depending on finishing type).	
3	Field that allows you to set the nature of data that are displayed and printed out while drying and time interval between subsequent moisture value printouts.	

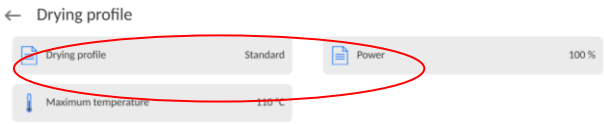
Note:
This option is disabled when you have chosen any drying program, from the program database.

DRYING PROFILE

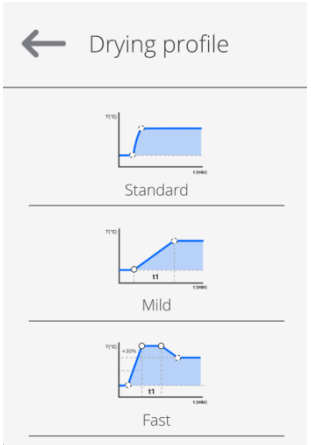
To enter selection and profile settings, click the field dedicated to profiles in the screen.



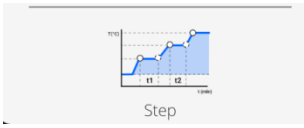
Click to see a profile selection window. To change profile, click the field with profile name.



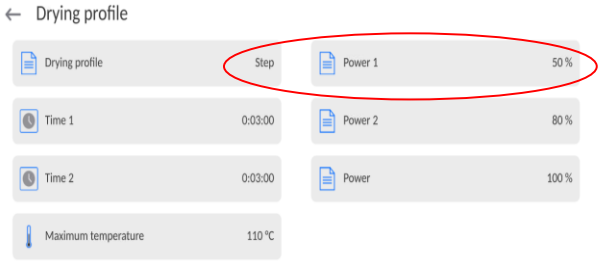
The profile type selection window will be displayed.



Select relevant profile.

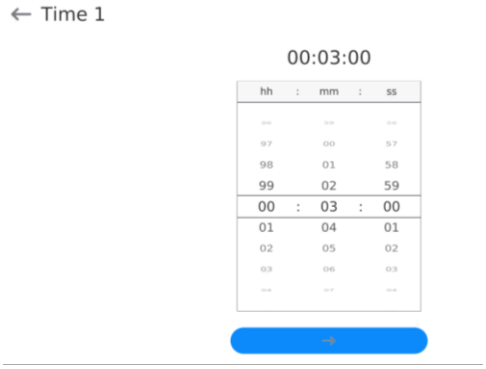


The device will display previous window. Data that show up in the window will be related to the profile selected. To adjust the profile parameters to your needs, click the name of data to be edited.

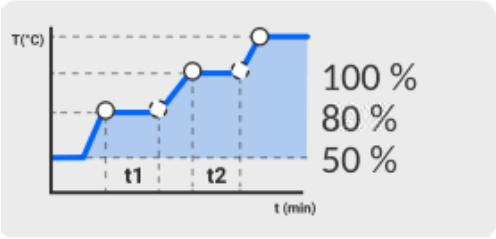


Example of microwave power edition window
Enter power using a numerical keyboard and confirm.

Example of drying time edition window
Enter heating time at specific temperature for particular thresholds using a numerical keyboard and confirm.



After setting data, go back to Drying main mode. The profile window will show a hint with selected profile and set powers.



Example of maximum temperature edition window

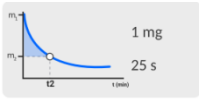
Enter maximum temperature to be achieved by the sample during drying using a numerical keyboard and confirm. Select the temperature so that the sample does not get destroyed, which could result in wrong evaluation of its moisture.

Note:

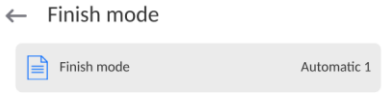
For a fast and stepwise profile, enter heating time at elevation temperature (fast profile) or particular thresholds (stepwise profile). This time starts running when the moisture analyzer reaches the temperature for a specific threshold.

FINISHING METHOD

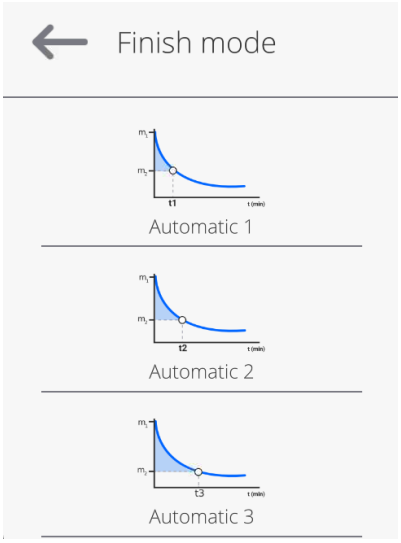
To enter selection and settings of finishing method, click the field dedicated to these settings in the screen.



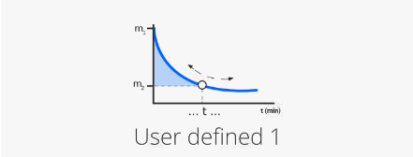
Click to see drying finishing selection window. To change the setting, click the name field.



The finishing method type selection window will be displayed. Use buttons with arrows to select the setting.

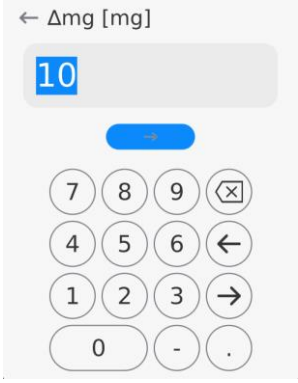


Select relevant finishing method.

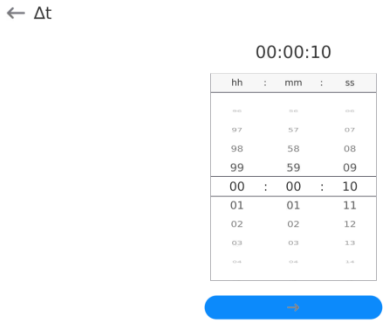


The device will display the previous window. Data that shows up in the window will be related to selected setting. To adjust parameters to your needs, click the name of data to be edited.

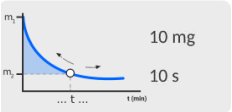
Example of mass change edition window
Enter mass value using numerical keyboard and confirm.



Time interval edition window
Enter time value using numerical keyboard and confirm.

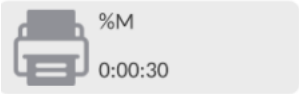


After setting data, go back to Drying mode home screen. The box will show hints with settings for the drying finishing mode.

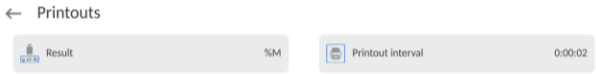


PRINTOUT

To enter selection and setting of data on measurement printout, click the field dedicated to settings in the screen.



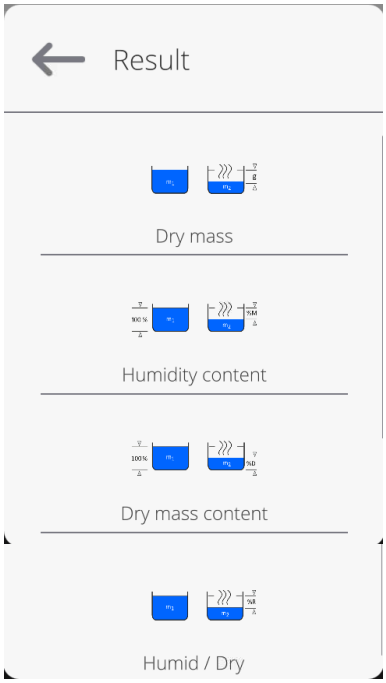
Click to see the option settings box. To change settings, click the <Result> field.



The unit selection window will be displayed. Using buttons with arrows, select your setting. Settings:

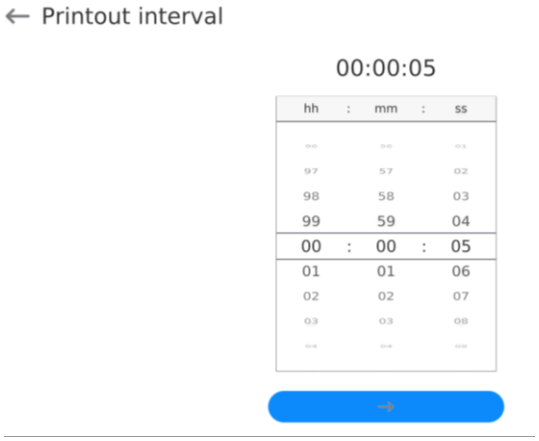
%M; %D; %R; m [g].

Select relevant profile.

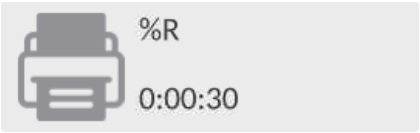


Example of time change edition window

Enter time value using the numerical keyboard and confirm.



After setting data, go back to Drying mode home screen. The printout window will show hints with selected printout settings.



18.2.2 Using <Parameters> menu

Enter settings to define all drying parameters and main data on measurement printout (type of data and time interval between printout of subsequent measurements). Data are defined from one menu window.

Procedure:

1. Press gray information field.
2. The screen will show: Settings, Buttons, Information, Printouts, Profile.
3. Press <Settings> menu.
4. The screen will show functions related to checkweighing, such as:
   - **Drying profile** [sample heating method],
   - **Finishing method** [drying end criteria],
   - **Result** [moisture unit which drying starts with],
   - **Printout time** [time intervals between subsequent measurement data printouts],
   - **Start mass control** [enabling/disabling of start sample mass condition with declared tolerance of this mass (mass and sample tolerance is set in the product base)],
   - **Autotare** [enabling/disabling of automatic single-use weighing pan mass taring while activating drying],
   - **Print measurements** [printing moisture determination indirect measurements with a frequency defined in <Measurement time> parameter].

The method of setting particular parameters is identical to the one of previous option. The only difference is possibility of declaring settings for start sample mass control.
The parameters specifies a need to use the sample for testing moisture of a specific mass.

For START MASS CONTROL, you can choose one of three variants:
None – disabled option, the mass of prepared sample is not checked by the program.
Optional – enabled option, the screen displays a bargraph showing a graphic location of the sample mass in relation to mass value saved in the product database as a sample mass and tolerance value for this mass. Before using the option, add the product with data on sample mass and checkweighing tolerance in the product database. After selecting this option, the moisture analyzer program will support the operator through relevant messages on how to place a suitable amount of material on the weighing pan. If the operator chooses to do otherwise, the device will start drying even if the mass is not within the mass tolerance for a specific product.
Obligatory – enabled option, the screen displays a bargraph showing a graphic location of the sample mass in relation to mass value saved in the product database as a sample mass and tolerance value for this mass. Before using the option, add the product together with data on sample mass and checkweighing tolerance in the product database. After selecting this option, the moisture analyzer program will support the operator through relevant messages on how to place the suitable amount of material on the weighing pan. For this option, the program will not start drying until the operator puts the suitable amount of sample on the weighing pan; the sample mass must be within the mass tolerance for a specific product.

You can execute this option in two ways:

1. For any product use quick-access buttons: <**Checkweighing thresholds**> or <**Target value**>.
2. In connection with a specific product in the **<Database>.**

Choosing the first variant, enter threshold values or target mass and mass percent tolerance using quick-access buttons.
In case of selecting the second option, enter mass value and tolerance field in <Product database> in a specific product data area.

SETTING SAMPLE MASS TOLERANCE FIELD:
MIN and MAX THRESHOLDS: the program acknowledges element mass as correct if the mass ranges between preset MIN and MAX thresholds (data in product database).
TOLERANCE: the program acknowledges element mass as correct if the mass falls within the assumed total mass percent tolerance range (±%) - (data in product database).
Before drying is initiated, declare the minimum and maximum mass of the sample that is to be placed on the weighing pan or target mass and percent tolerance of this mass to start the procedure.

1. It is possible to define Min/Max threshold values in the Data Base while editing Product or by pressing quick access button: <Checkweighing thresholds>.

   Procedure:
   - Press gray Info field and then press <Buttons> field.
   - Assign <Checkweighing Thresholds> option to one of on-screen buttons.
   - Return to drying.
   - Press <Checkweighing Thresholds> option and enter value for Min and Max Threshold, go back to drying.
   - Even since <PREPARE SAMPLE> comes up, a glowing LCD strip in the lower part of the head will be active. It uses colors to show current mass.
   - Yellow: current mass lower than Min Threshold.
   - Green: current mass within threshold range.
   - Red: current mass higher than Max Threshold.

2. To define values for the target mass, use Quick Access Button: <Target Value>.

   Procedure:
   - Press gray Info field and then press <Buttons> field.
   - Assign <Target Value> option to one of on-screen buttons.
   - Go back to drying.
   - Press <Target Value> and enter mass to be achieved.
   - Next enter tolerance in target mass percent +- (possible range: 0-100%).
   - Ever since <PREPARE SAMPLE> comes up, a glowing LCD strip in the lower part of the head will be active. It uses colors to show current mass.
   - Yellow: current mass lower than Min Threshold.
   - Green: current mass within threshold range.
   - Red: current mass higher than Max Threshold.

Note:
Checkweighing and target mass functions can operate simultaneously while drying. This being the case, the role of sample mass tolerance is taken over by Min and Max thresholds. After selecting the product (from database) that has been assigned target mass values and Min and Max thresholds, the program prioritizes Min and Max threshold masses during start mass control. These values can be modified before drying by using quick-access buttons. New values are temporary values and are not recorded in the database for the specific product.

18.2.3 Using program database

The drying procedure can be performed as per the program saved in <Drying program database>.

Entering program into Drying Program Database
The program database contains saved drying programs that can be called before initiation of sample testing. The program adding procedure is simple and intuitive. The operator is provided with support during steps through relevant messages.

Procedure:

- Go to <Data Base> submenu and press <Drying program database> field.
- Press <Add> button if a new program is to be added.

The program will add a new item to the database and start editing it automatically. Enter all data on the new program.

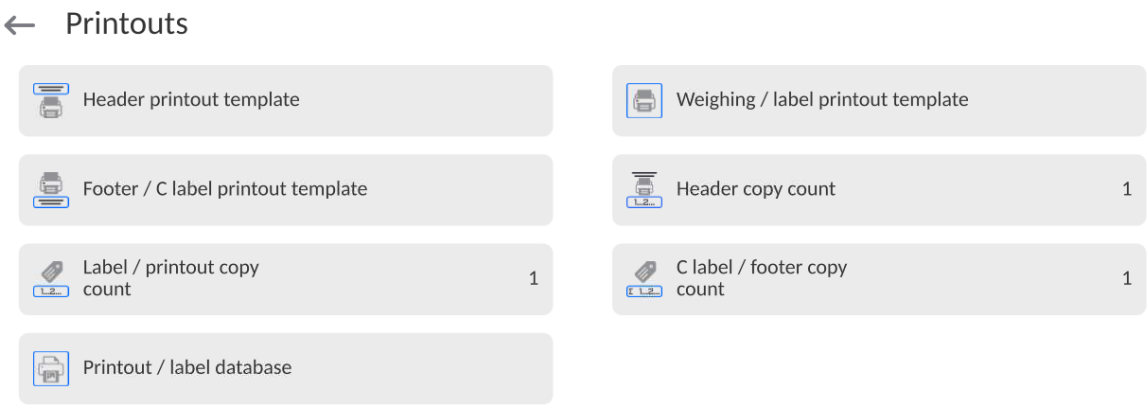
The list of information defined for program:

1. **Name**: click the name field to open a new window in which you have to enter program name.
2. **Code**: enter program code here.
3. **Drying profile**: click the field to open the window with suggested drying program. Following steps from previous points, select relevant profile and enter profile data (drying power, time, max. temperature of the sample).
4. **Finishing method**: press the field to open a window with suggested finishing method. Follow steps from previous points to select relevant method and enter related data (mass, time).
5. **Result**: click to open a window with suggested unit. Follow steps from previous points to select relevant unit.
6. **Printout time:** click the field to open a window with numerical keyboard. Follow steps from previous points to enter interval time between subsequent measurement printouts while drying.
7. **Start mass control**: click to open a window with a list of options to choose. Select one of the following variants: **None, Optional, Obligatory.** The program will go back to program data window.
8. **Sample-related equipment**: click to open a window with keyboard in which you can enter equipment required for proper drying procedure, e.g. glass fiber filter.
9. **Sample preparation**: click to open a window with keyboard in which you can enter description of collecting and preparing sample and distributing it on the weighing pan.
10. **Recommended sample size:** click to open a window with keyboard in which you can enter recommended sample size adapted during testing.

After entering data on the program, you must go back to the home screen.

18.3 Printouts in drying mode

<Printouts> menu consists of three setting units. The first unit is standard printouts: <Header printout template>, <Weighing / label printout template>, <Footer / C label printout template>, the second is non-standard printouts: <Printout / label database> and third – parameters allowing you to set printed quantities: header, weighing and footer by pressing a call button.



Standard printouts consist of three units with various variables. For each variable, set – to print it out or – not to print it out.
You can quickly change selections of printable variables using buttons in the top right corner of the screen.

	Unselect all variables.
	Select all variables
	Restore default selection of variables.

Procedure:

1. Press field with the template name to be edited (Header – Weighing – Footer) and select variables that are to be printed out.
2. If a non-standard printout has been selected, create it.

The drying process is related to drying report. The report contains all printout data for header, weighing and footer. This means that every report printed while drying and saved in the report database takes the form assigned by the operator.

Note: *Data for each measurement in the report must be set in <Weighing printout template>. Every time the report is printed out, the data with <YES> option in <Weighing printout template> will be printed out.*

Content of particular printouts:

HEADER PRINTOUT TEMPLATE	WEIGHING / LABEL PRINTOUT TEMPLATE	FOOTER/ C LABEL PRINTOUT TEMPLATE
– Non-standard printout	– Non-standard printout	– Non-standard printout
– Dashes	– Dashes	– Dashes
– Working mode	– Date and time	– Working mode
– Start date	– Drying time	– Status
– Start time	– Product	– End date
– Balance type	– Current result	– End time
– Balance ID	– Drying time and result	– Drying time
– Operator	– Moisture content	– Balance type
– First and last name	– Dry matter content	– Balance ID
– Product	– Moisture/Dry	– Operator
– Drying program	– Net	– First and last name

– Drying profile – Drying profile parameters – Finishing method – Finishing method parameters – Unit – Printout time – Series number – Batch number – Universal variable 1 … 5 – Start mass – Empty line – GLP report – Non-standard printout	– Tare – Gross – Additional unit – Mass – Set temperature – Current temperature – Empty line – Non-standard printout	– Product – Series number – Batch number – Universal variable 1 … 5 – End mass – Result control – Current result – Drying result bias – Corrected result – Moisture content – Dry matter content – Moisture/dry matter – Dashes – Empty line – GLP report – Signature – Non-standard printout

18.4 Report on drying processes

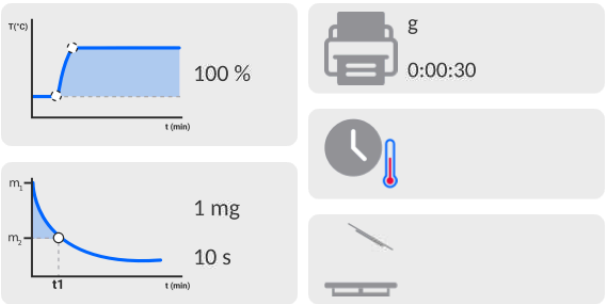
After each drying process, a process report is generated. It is saved in the <**Drying reports>** database. The report file name takes a form of a date and time of the process.

Example report:

```
----------------------------------------
Start date                  2012.06.25
Start time                    14:41:55
Operator                         Admin
Product                            Tea
Drying program
Drying profile                  Standard
Finishing method            Automatic 3
Start mass                  ? 0.386 g
0:00:30                     1.295 %M
0:01:00                     0.777 %M
.
.
0:06:00                     1.295 %M
----------------------------------------
Status                         Finished
End date                    2012.06.25
End time                      14:48:05
Drying time                   0:06:10
End mass                      0.381 g
Current result              1.295 %M
Signature……
……..
----------------------------------------
```

18.5 Drying method

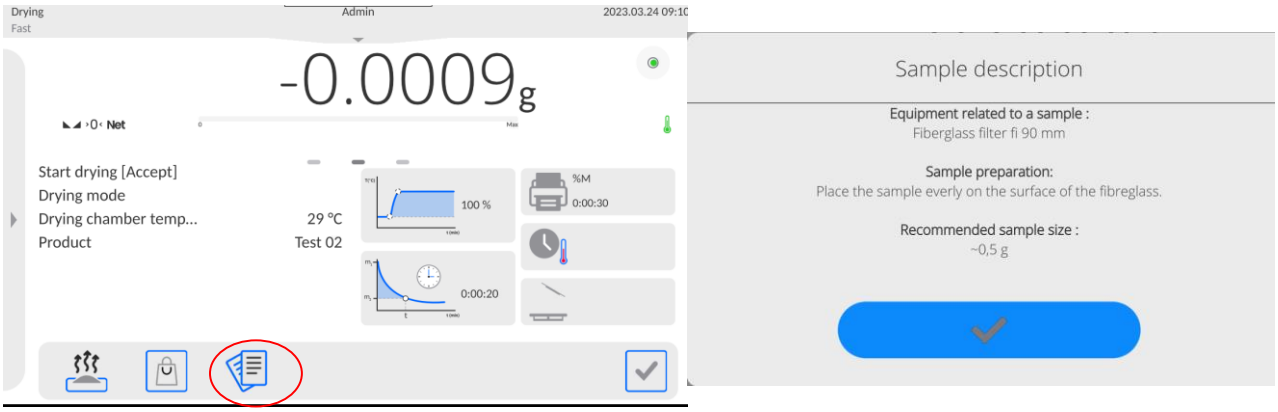
In the lower part of the screen you can see select drying settings, showed in the form of fields with pictograms.



If parameters are not correct, they must be changed so that they can correspond to drying parameters of the sample to be tested.
The method of setting parameters is described in the previous point of the manual.
If the drying program from the database is to be used, do as follows:

- Enter <Data Base> submenu and press <Drying program database>.
- Select drying program by pressing its name. The moisture analyzer will display the home screen again, and the name of selected program will be displayed in the information field. Parameters for selected program will be showed in the drying parameters fields.
- After selecting the program, you cannot change setpoints for particular drying parameters. It is possible only when no drying program has been selected.
- An additional option that can be used is displaying (for specific drying program) descriptions concerned with additional equipment, sample preparation and recommended sample size.

To use the option, press <Sample description> button in the button bar. Press the button to display the window with descriptions entered in the drying program.



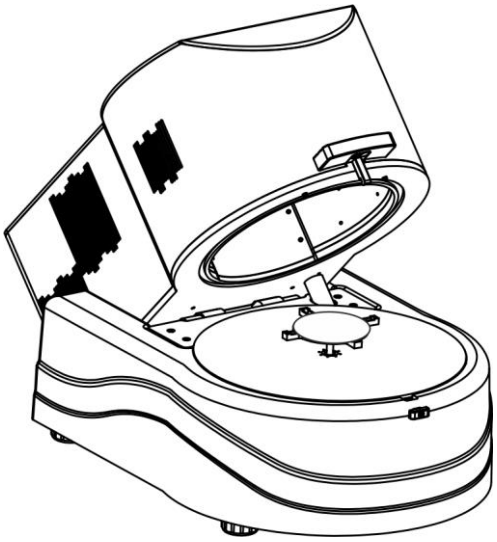
Note:
The option is available only after selecting the program from <Drying program database>.

If parameters are correct, you can start testing.

To start drying, press button.
The program of the moisture analyzer will display further messages to help you use the device. Follow them. This way you can prepare the sample correctly and conduct the moisture determination process in the specific material properly.

The program will display the message to make the operator prepare the weighing pan/

Place the filter on the star piece.

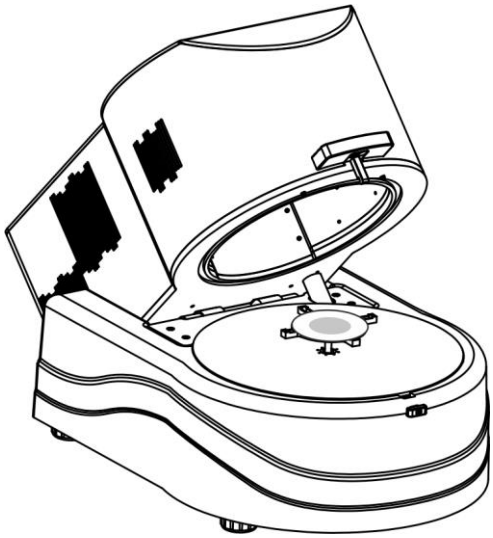


The screen will show the weighing pan mass. In order to assure stable results, it is essential to close the drying chamber during taring.

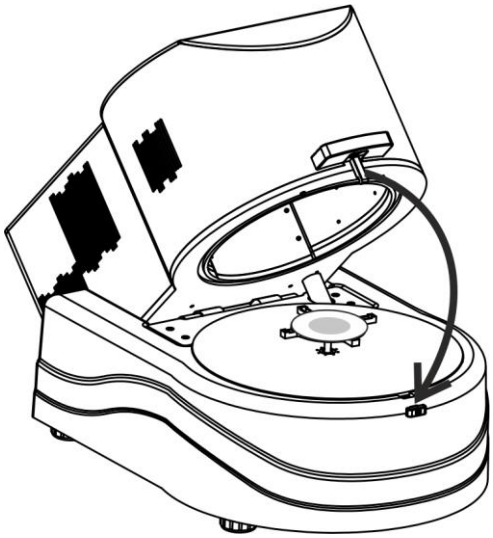
Press button to tare the weighing pan mass into the memory of the moisture analyzer. The mass value will be ZERO and another message will pop up.

NOTE:
If AUTOTARE option is enabled, remember to place the single-use weighing pan on the star piece before the drying process starts, and then press . The weighing pan mass will be automatically tared and the program will display <Prepare sample> message.

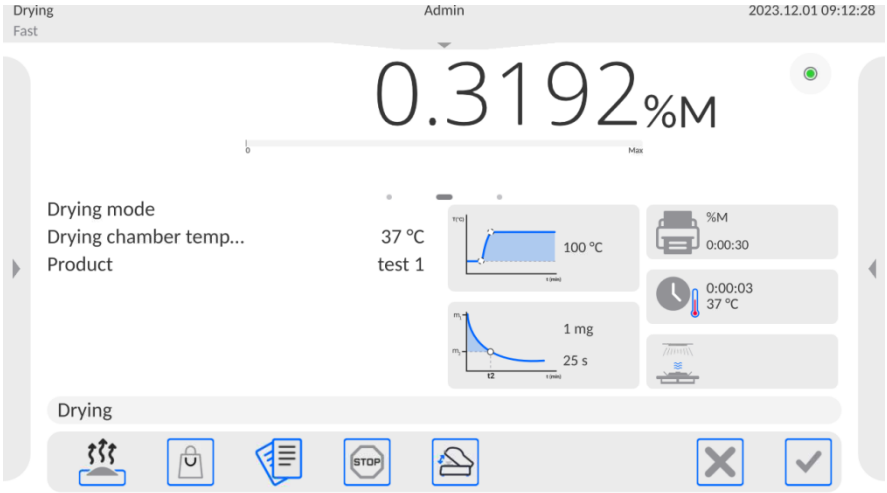
If <START MASS CONTROL> option is enabled, the glowing LCD strip will active. The strip uses colors to signal size of the sample mass in relation to data on Min and Max thresholds of the sample.
Load the sample. Sample mass must be selected on the basis of previous experiences and properties of the material in question.



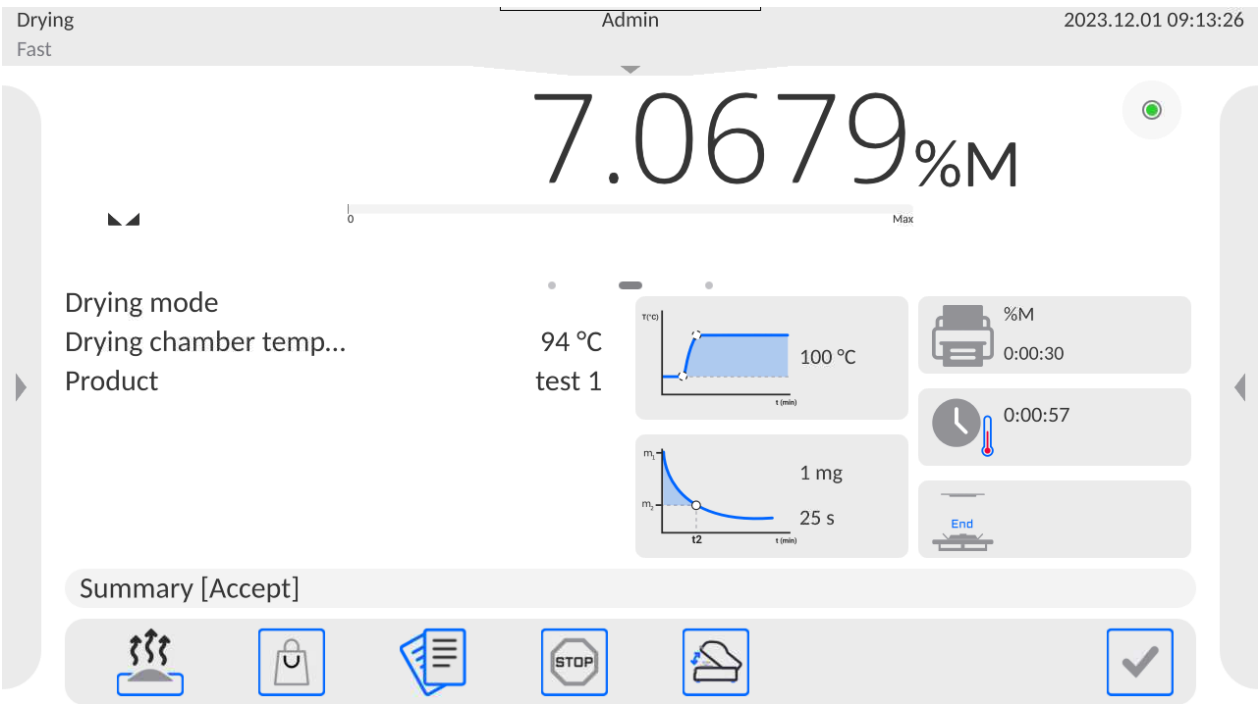
Once the result has stabilized (a pictogram in the screen will show up), close the drying chamber.



Drying will start automatically. The screen will show information on testing and the moisture analyzer will automatically conduct the drying procedure as per preset parameters, make required mass measurements and calculations arising from changes to the mass and eventually the printout header will be sent to the specific communication port (as per printout options chosen).



While drying, the screen shows current measurement results and information on the process itself (testing time, chamber temperature, etc.).
While drying, measurements are sent to the communication port automatically (as per present printout options).
Throughout the procedure, you can change the moisture unit. To do so, click the unit field and wait for a list of available units to show up. Then select the one that is to be displayed. After selecting the unit, the program will calculate the value and display it in the screen automatically.
You can feel free to abort the procedure at any time by pressing a STOP button.
Once the drying process is finished, the testing summary will be displayed and the final moisture result will be held.
The printout footer will also be sent to the communication port (as per preset printout options).

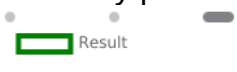


To finish the process, press button and the moisture analyzer will go back to the home screen.
After removing the dried sample from the drying chamber, you can proceed to further measurements. Please remember that instant initiation of another sample drying may distort results due to evaporation of sample moisture in the hot chamber before the drying starts. This is why it is advisable to have a break and let the drying chamber cool down before another measurement.

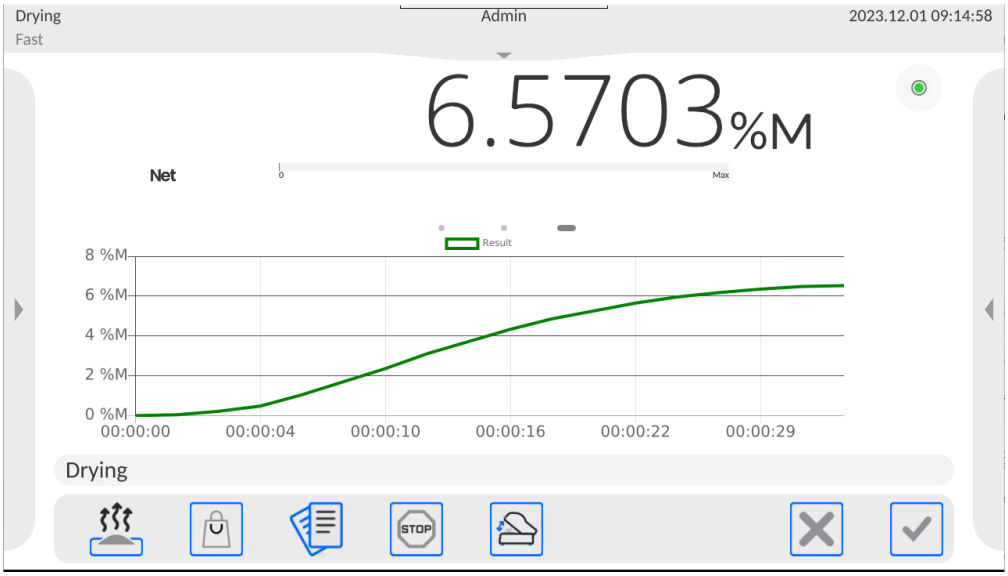
18.6 Drying diagram

You can preview drying throughout the test or after you have entered <Drying reports>.

Drying diagram preview

To display the diagram while drying is underway, change the view window by pressing the right marker of the page displayed 

.



The drying diagram and process data will be displayed. The diagram is drawn in real time. It allows monitoring the process on an ongoing basis. To monitor the diagram for various units, before you display the diagram – set the moisture unit in the first place and then go to the diagram.

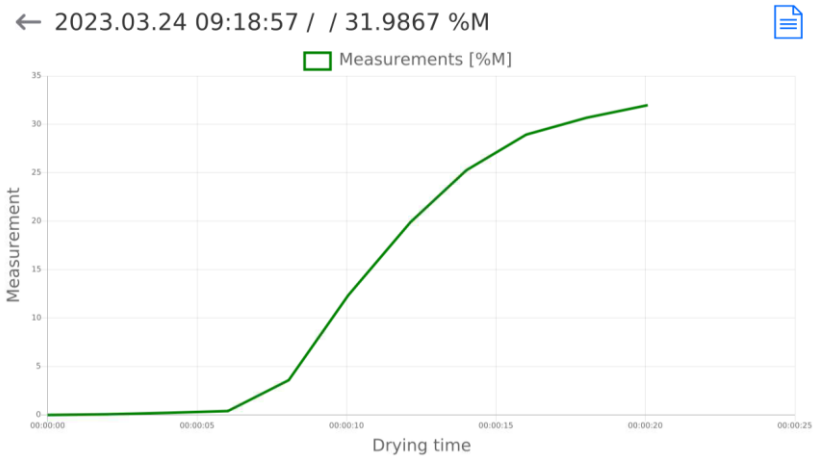
To return to the home screen, click the central marker of the page displayed .

Diagram preview in drying report database

Procedure:

- Enter <Data Base> submenu.
- Next press <Drying reports> field.
- Select the report on the process by clicking the name of this report (name takes a form of a data and time of the test).
- Click <Diagram> option.

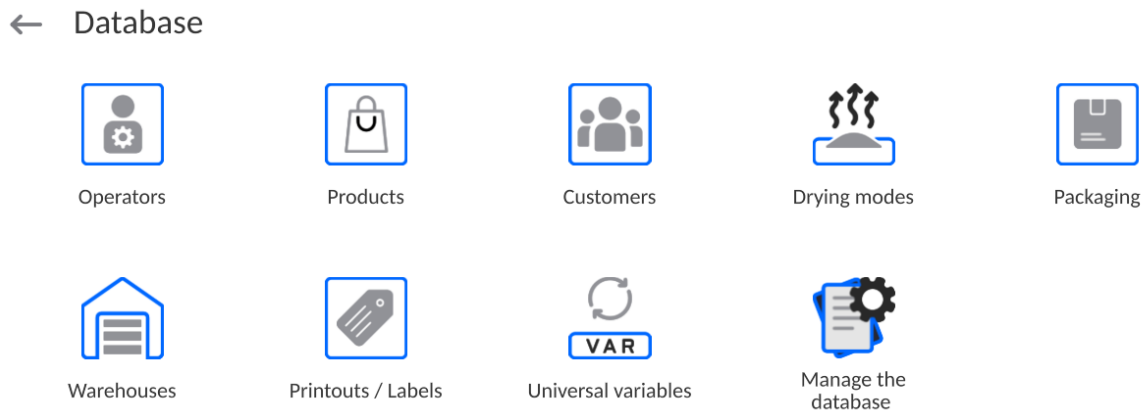
The drying diagram will be generated and displayed in the system of coordinates – moisture unit/measurement for the moisture testing.
The example diagram view can be found below:



	Saving a diagram as **.png* file on the external data carrier connected to USB port.

19. DATABASES

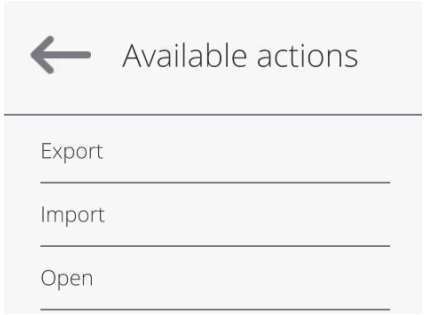
The weighing software offers the following databases:



19.1 Operations to be performed in databases

Operations in databases are only available to the permitted operator.
To edit Databases, do as follows:

- Press and hold the field with database icon.
- The menu related to this item will be displayed in the screen.
- Select one of available options (available options depend on the type of database).



Description of options:

- EXPORT – allows you to export data saved in the database in an external memory, e.g. pendrive. Before choosing the option, connect the memory into any USB port. If the memory is detected, a copying procedure starts automatically. After the end of copying, a window will be displayed together with the <Done> message and name of file in which data from the database have been saved. Confirm the procedure.
- IMPORT – allows you to import data from an external memory, e.g. pendrive. Before choosing the option, connect the memory to any USB port. If memory is detected, a window with saved files will be displayed. Specify the file with data to be imported. After selecting the file, a copying procedure starts automatically. After the end of copying, the window with <Done> message is displayed. Confirm the procedure.
- OPEN – allows you to enter the specific database (identical to single click of base field).

After entering a specific database, the following operations can be performed (depending on type of database):

1. Adding item to database.
2. Searching item in database by name.

3. Searching item in database by code.
4. Searching item in database by date.
5. Exporting data from database into USB mass memory.
6. Printing information on record in database.

The aforesaid actions are triggered through buttons in the top right corner of the screen. Follow messages showed in the screen.

19.2 Operators

The menu contains a list of operators allowed to use the balance.
You can define the following information for each operator:

Name	Code
Password	First and last name
Permission	Active account
Language	Default profile
Card number	Fingerprint *(visible only after connecting the fingerprint scanner)*
Face profile	Motif

NOTE: Only Administrator can add new operators or delete them from the database.

To add a new operator, do as follows:

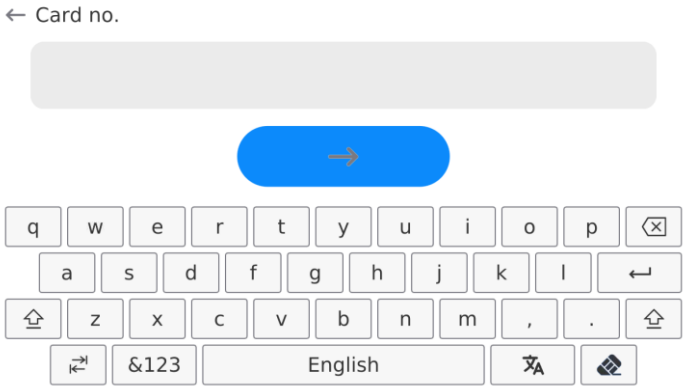
- In <Operators> menu, press <Add> button.
- Define fields for a newly created operator.

Note: *You can browse the operator database by code or operator name.*

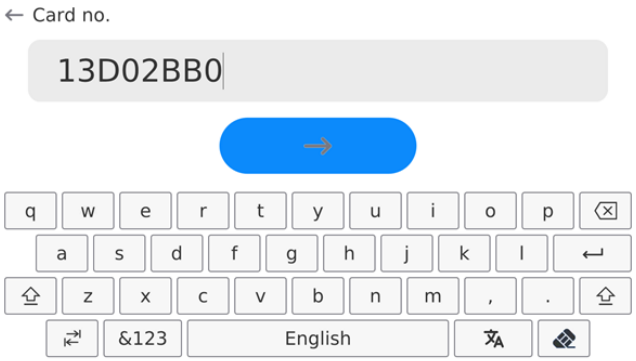
Logging via transponder card:

Note: *A RFID scanner fixed in the head operates at the frequency of 13,56 MHz and complies with ISO/IEC 14443 Type A.*
Only cards of this standard are recognized by the scanner.

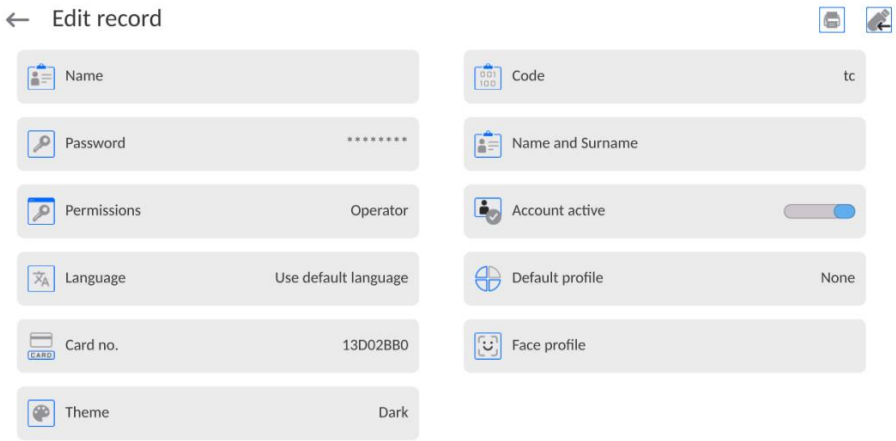
- Enter Operator settings.
- Select <Card no.>.



- 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.

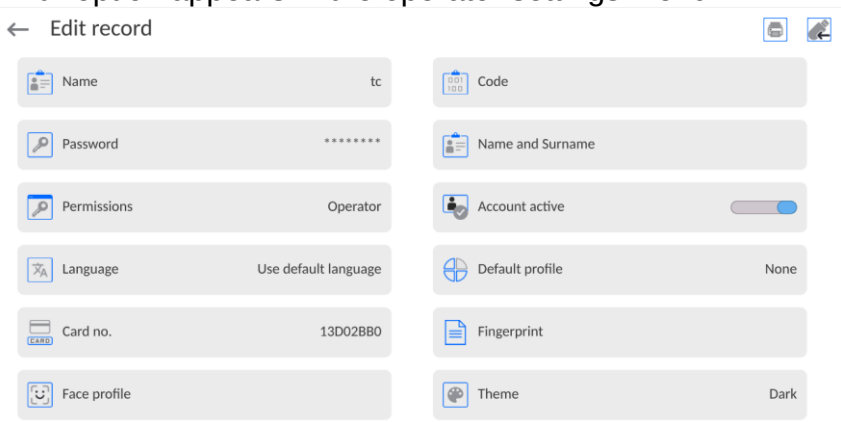


- Exit to the home screen. From now on, applying this card to the RFID reader will automatically log the user in.

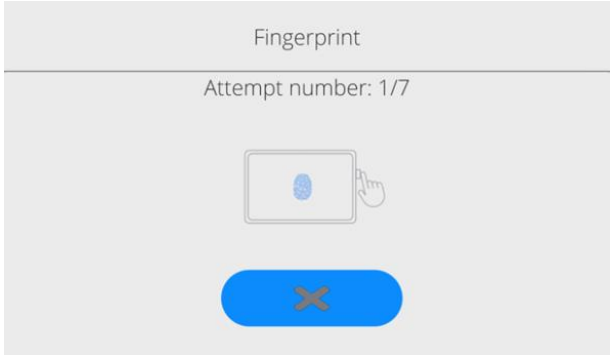
Log in using a fingerprint:

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.*

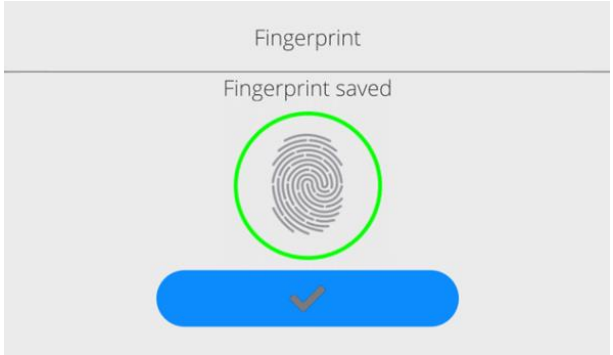
- When the fingerprint reader is connected to the USB type A socket, the <Fingerprint> option appears in the operator settings menu.



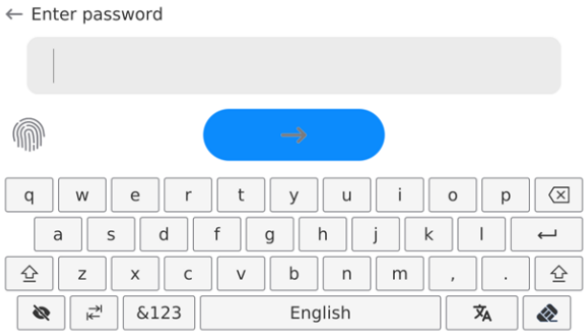
- To add a fingerprint for an operator, enter this option.



- 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.



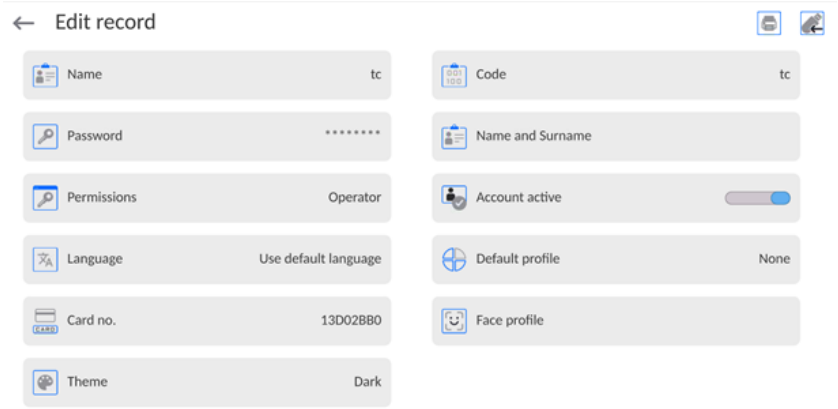
- Confirm the procedure by pressing button.
- From now on, if a fingerprint reader is connected to the USB port, a pictogram of the active fingerprint login option is displayed in the login window.



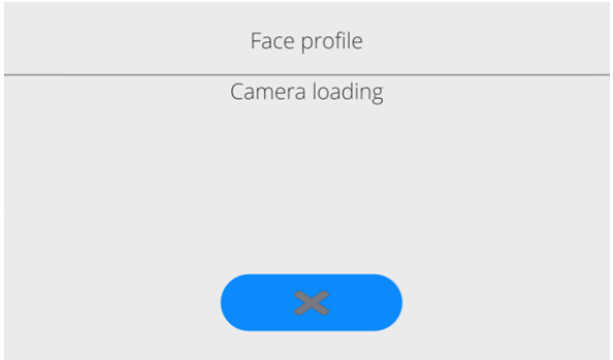
- After placing a finger on the reader and confirming the correctness of the fingerprint with the stored pattern, the pictogram briefly turns green, the user is automatically logged in, and the software switches to the home screen. The name of the logged-in user is displayed in the top bar of the window.
- 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:

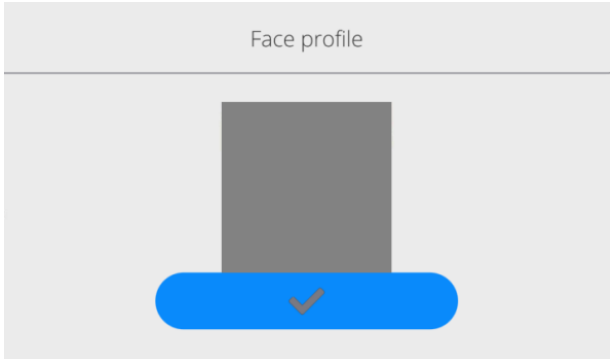
- To add a face profile for a user, go to the option presented below



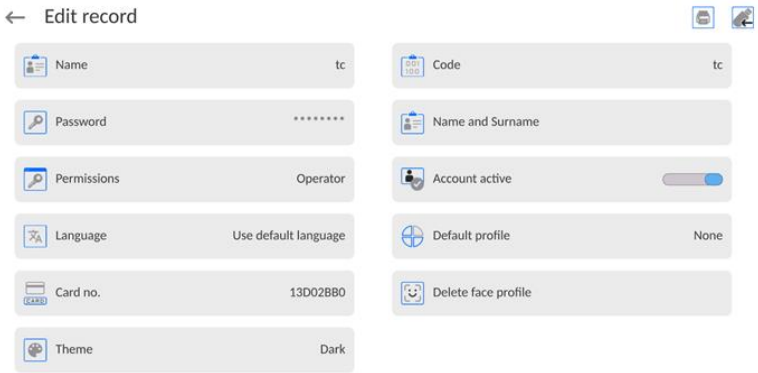
- After starting the option, a message is displayed and the face profile is read; you must position yourself correctly in relation to the camera so that the program can save the profile.



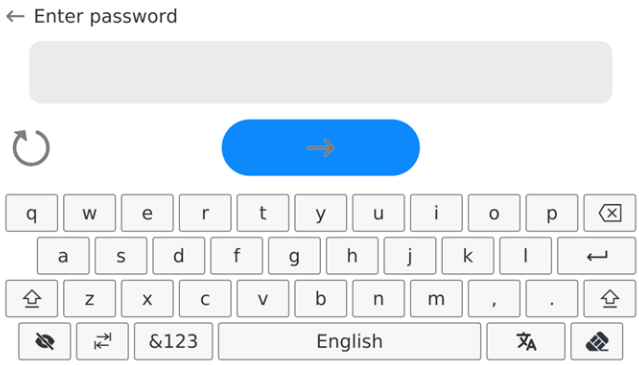
- Once the profile has been saved, a message is displayed along with a picture from the camera.



- Press button to close the widow.
- 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.



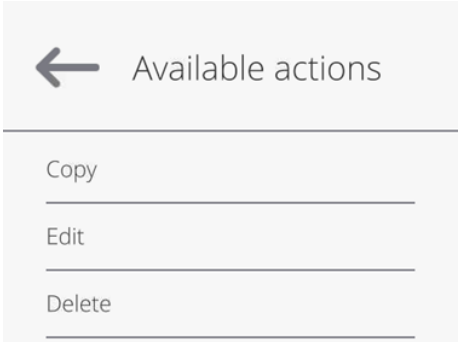
- The program automatically reads a photo of the user's face profile, and after the photo is read, the camera turns on (which is indicated by the lighting of a diode next to the camera) and compares the saved photo with the profile read by the camera. If these images match, the main program window will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

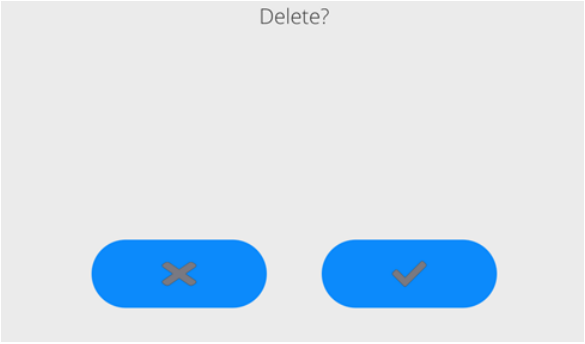
Editing data on an operator:

- 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.





19.3 Products

The product database contains names of all items that can be weighed or dried.

Procedure:

- Enter <Data Base> submenu and press <Products> item.
- Press < Add> button if you aim to add a new product.
- If the product already exists, press the product name field.

A list of information defined for the product:

1. Name
2. Description
3. Product code
4. EAN code
5. Mass [product unit mass]
6. Min [minimum start mass of the sample that can be acknowledged as correct when the <START MASS CONTROL – LO] option is enabled
7. Max [maximum start mass of the sample that can be acknowledged as correct when the <START MASS CONTROL – HI] option is enabled
8. Tolerance [%value counted in relation to nominal mass (5), shows the area in which mass can be acknowledged as correct when the <START MASS CONTROL] option is enabled
9. Tare [product tare valued, set automatically while selecting product from the base]
10. Price [product unit price]
11. Density [product density used while compensating air uplift pressure as a sample density] - [g/cm^3]
12. Validity days [fixed product date]
13. Date
14. VAT [VAT tax related to product]
15. Ingredients [edition field for entering name of ingredients which the product consists of, e.g. when it is a mixture or additional description on properties or use]
16. Printout [printout template assigned to product]

19.4 Clients

The Clients database contains names of recipients that measurements are made for.

Procedure:

- Enter <Data Base> submenu and press <Clients> field.
- Press <Add> button.
- If the Client field already exists, press the client name field.

A list of information related to clients:

1. Client name
2. Client code [internal code for identification purposes]
3. NIP [taxpayer's ID]
4. Address
5. Postal code
6. City/town
7. Discount
8. Printout [type of printout, label related to client]

19.5 Drying programs

The drying program database contains drying parameters as per which you can dry products.

Procedure:

- Enter <Data Base> submenu and press <Drying programs> field.
- Press <Add> button if you aim to add a new program.
- If the program already exists, press the name field to edit.

A list of information defined for drying programs:

1. Name
2. Code
3. Drying profile
4. Finishing method
5. Result
6. Printout time
7. Start mass control
8. Sample-related equipment
9. Sample preparation
10. Recommended sample size

Parameters from 8 to 10 inform the operator about additional requirements related to the product (e.g. a need to use a glass fiber filter, use of specific sample mass and method of preparing sample for drying purposes). These descriptions are available when you press one of the quick-access buttons: <Sample description>, after selecting a specific drying program.

19.6 Packaging

It is a list of packaging for which you need to enter a name, code and mass value. While weighing and after selecting the name, the tare value will be called automatically. It will be displayed with a minus sign.

Procedure:

- Enter <Data Bases> submenu and press <Packaging>.
- Press <Add> button if you aim to add a new packaging.
- If the packaging already exists, press the name field, enter information related to packaging.

Note: *You can search by name or code.*

19.7 Warehouses

Depending on the organization of work, Warehouses contain a list of places from which a sample was collected for weighing/drying, or places which the sample was delivered to. For each warehouse, enter name, code and description.
While weighing/drying and after selecting a name of the warehouse, it will be automatically assigned to the result.

Procedure:

- Enter <Data Bases> submenu and press <Warehouses> field.
- Press <Add> button if you aim to add a new warehouse.
- If the warehouse already exists, press the name field, enter identification data.

Note: *You can search by name or code.*

19.8 Printouts / Labels

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

Procedure:

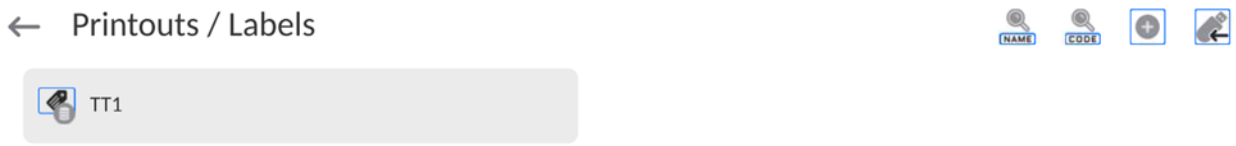
- Enter <Databases> submenu and press <Printouts> entry.
- Press <Add> button to add a new printout, or
- Select the already existing record.

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

Designing new printout template

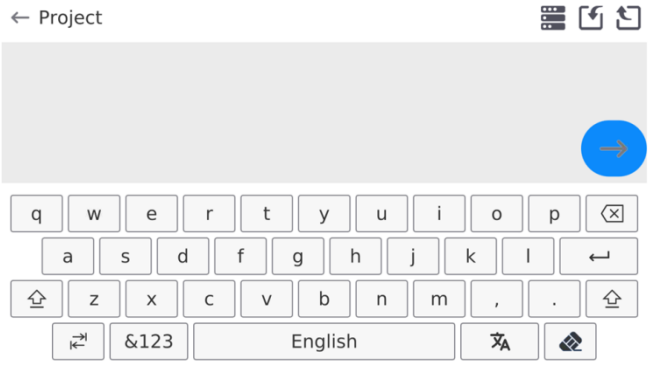
Procedure:

- 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.

- To design a printout, you can use an external USB keyboard connected to the head or a touch keypad that has the same functions as a typical PC keyboard.



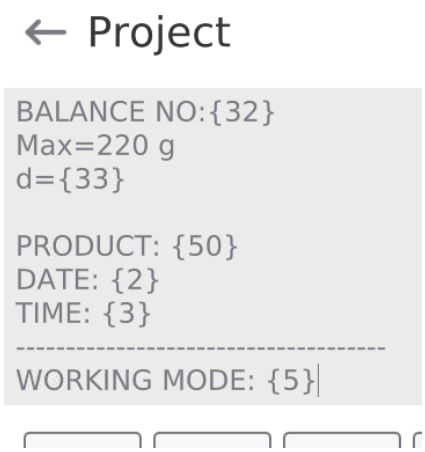
The touch keypad does not have some characters, such as a colon or diacritical letters typical of a specific menu language (menu language is signaled with description on ‘SPACE’ key). To use such characters or letters in the designed printout, press and hold the specific letter on the keyboard. It will cause additional keys with assigned characters to display. Click them to add to text. After entering the character, press ‘X’ to disable displayed characters.

The example of available characters for Polish keyboard.

Letter on the keyboard	Additional characters	Letter on the keyboard	Additional characters	Letter on the keyboard	Additional characters
„t”	€ t y	**„u”**	µ u i	**„a”**	~ a s
„x”	' ` x c	**„c”**	\ | c v	**„v”**	[{ v b
„b”	] } b n	**„,”**	: < = , .	**„.”**	; > .

- 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.

	The user may add printouts from external memory via import of already configured texts, using USB port.
	Printout name is not the content of a printout.
	List of variables intended for printouts is to be found in 'ANNEX 03'.
	Example of how to create and send label template to the balance memory is to be found in 'ANNEX 03'.

19.9 Universal variables

Universal variables are alphanumerical information that can be associated with printouts, products or other weighing information. For each variable, enter name, code and value.

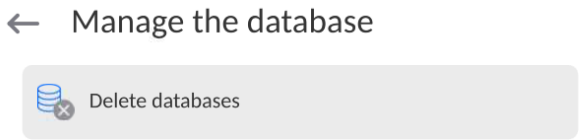
Procedure:

- Enter <Data Bases> submenu and press <Universal variables> field.
- Press <Add> button if you aim to add a new variable.
- If the variable already exists, press the name field and enter relevant modifications to the following fields: code, name, value.

Note: *You can search by name or code.*

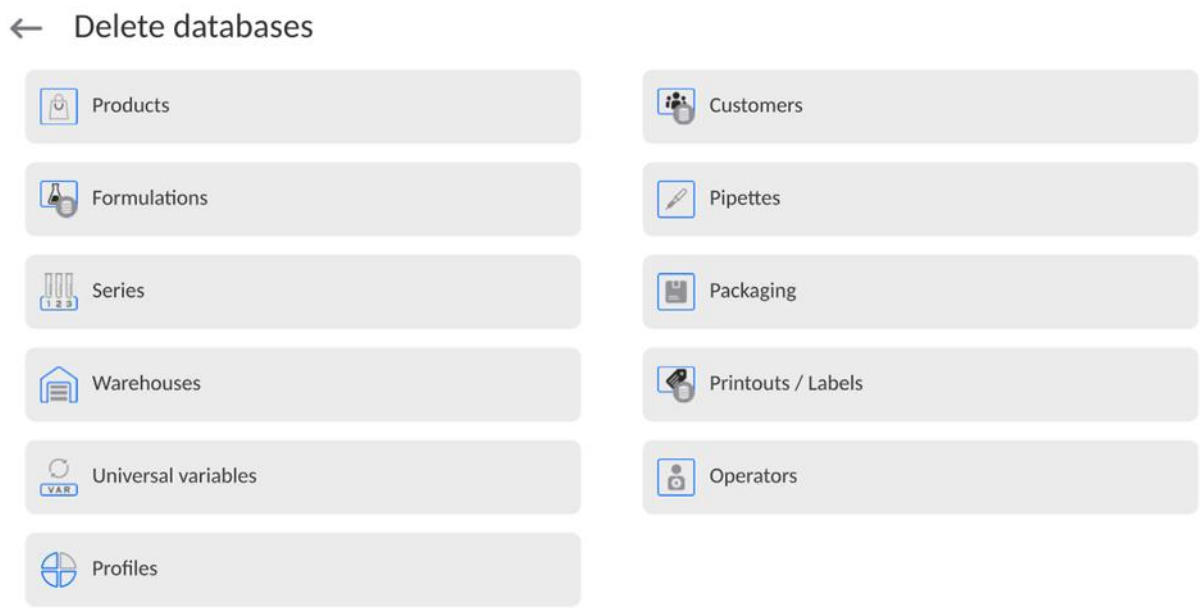
19.10 Database management

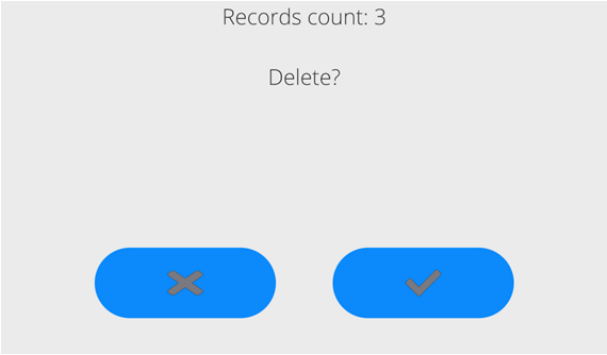
Function allowing to manage databases data. It comprises three options: Export weighing database, Delete databases and Delete weighings and reports.



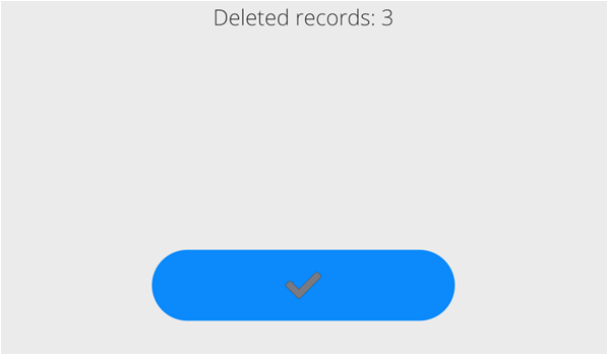
19.10.1 Delete Databases

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.





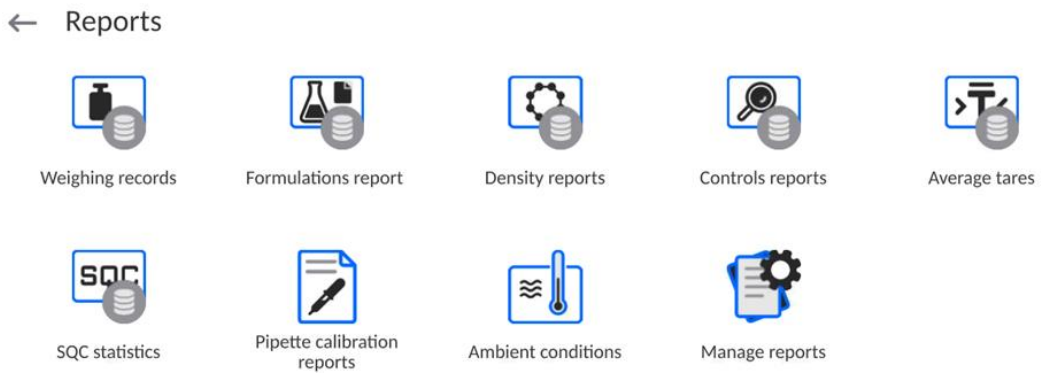
Confirm, data is deleted, the following message is displayed:



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

20. REPORTS

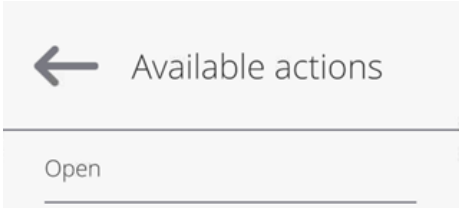
The weighing software offers the following databases:



20.1 Operations to be performed in databases

Operations in databases are available only to the permitted operator. To edit Databases, do as follows:

- Press and hold the database icon field.
- The menu related to this item will be showed in the screen.
- Select one of available options (available options depend on type of database).



Selection of option:

- OPEN – allows you to enter a specific database (identical to single click of the database field).

After entering the specific database, you can perform the following operations (depending on database type):

1. Adding items to database.
2. Searching item in database by name.
3. Searching item in database by code.
4. Searching item in database by date.
5. Exporting data from database into USB mass memory.
6. Printing information on record in database.

The aforesaid actions are triggered through buttons in the top right corner of the screen. Follow messages showed in the screen.

20.2 Weighing records

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

Procedure:

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

A list of information in database for specific weighing record:

1. Weighing date
2. Weighing result
3. Tare value
4. Statement if measurement was stable
5. Product name
6. Operator
7. Client, business partner name
8. Working mode name
9. Warehouse, source warehouse name
10. Packaging, tare name used while weighing product.
11. Result control, information on area of the result:
    MIN – below threshold (possible only when <Result control – NO>)
    OK – between thresholds
    MAX – above threshold (possible only when <Result control – NO>)
12. Platform number, field shows number of the platform (balance) applicable to weighing
13. Leveling, it shows if the balance was level during measurement
14. Ambient conditions alerts show if temperature and humidity were stable during measurement

20.3 Drying reports

They contain information on completed drying procedures. For each report, you can preview, search by date, export and print out.

Procedure:

- Enter <**Reports**> submenu and press <Drying reports>.
- Press specific report field; if it is not visible, scroll the list of reports via navigation buttons.
- Report name is composed of date and time: e.g. 2012.03.12 11:12:15.

Note: *You can search the report.*

A list of information in the drying report**:**

1. Start date
2. End date
3. Drying time [drying time]
4. Status [information on drying procedure]
5. Start mass [start mass of the sample]
6. End mass [end mass of the sample]
7. Result [final drying result]
8. Measurements [particular intermediate measurements recorded while drying]
9. Operator [name of operator who dries]
10. Product [name of product that was dried]
11. Drying program [name of program as per which drying was performed]

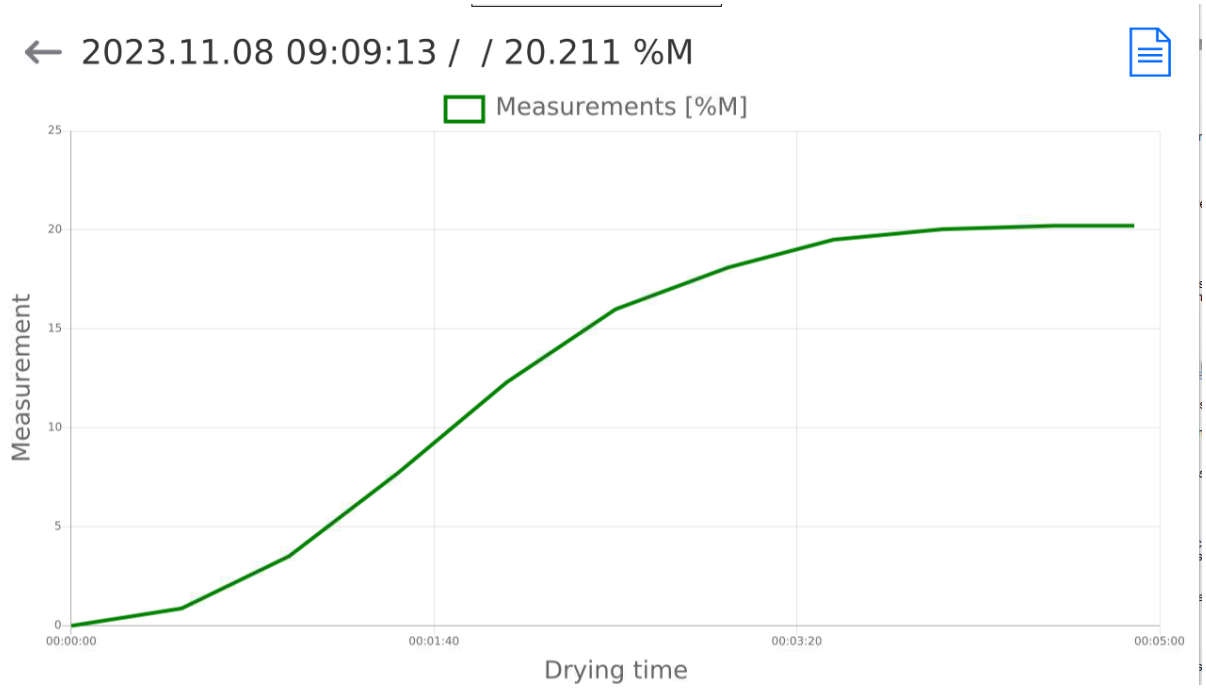
12. Client [name of business partner]
13. Warehouse [name of source warehouse]
14. Measurement diagram [drying image in the form of diagram]

Procedure:

- Enter <Data Bases> submenu.
- Next press <Drying reports> field.
- Select report on process by clicking the name of the report (name comes as a testing date and time).
- Click <Diagram> option.

The program generates and displays drying diagram in the system of coordinates (moisture unit/measurement time for specific moisture testing).

Example diagram showed below:



	Saving diagram as *.png file on an external data carrier connected to USB port.

20.4 Drying report statistics

It allows you to monitor a history of drying procedures for a specific product. For each product, it is possible to preview reports on particular drying procedures, generate diagram that reflects the moisture value for all drying procedures, print out and export data.

Procedure:

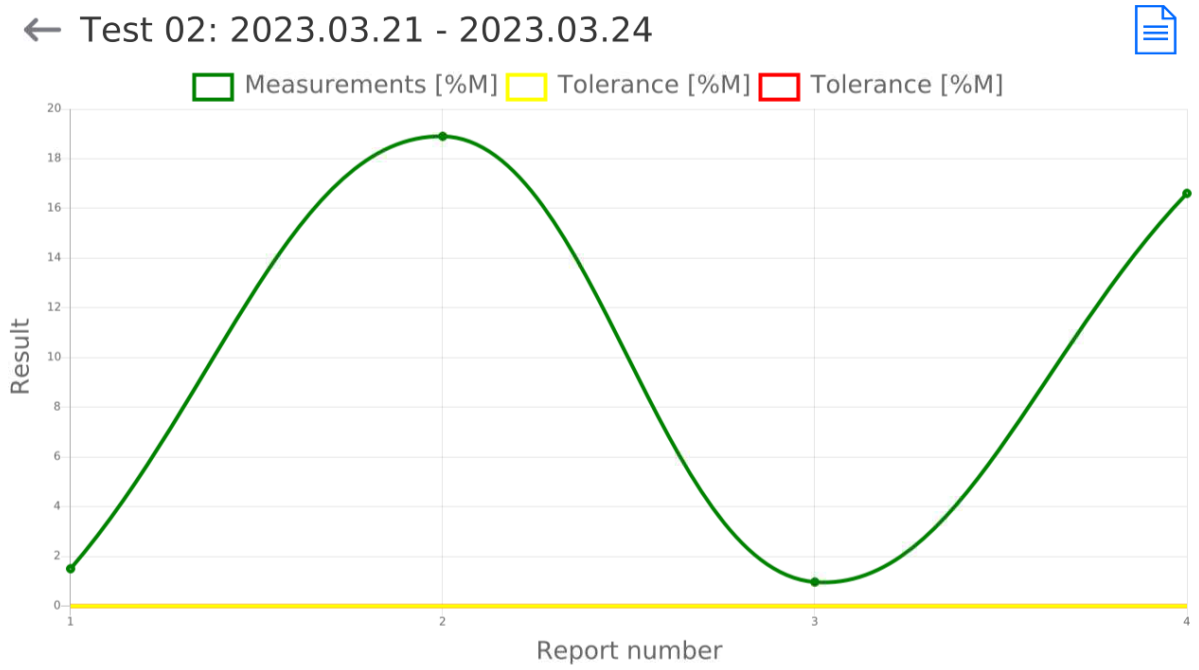
- Enter <**Reports**> submenu and press <Drying report statistics> field.
- Select product which a history of testing is to be generated for.
- Specify the range of data that are to be searched (start and end date).

- Display a list of drying reports that meet assumed criteria (product, testing date): <Drying reports>.
- Generate the drying result diagram: <Measurement diagrams>.

To generate a measurement diagram:

- Enter <Data Bases> submenu.
- Next press <Drying reports statistics>.
- Select product which a history of testing is to be generated for.
- Specify the range of data that are to be searched (start and end date).
- Click <Measurement diagram> option.

The program will generate and display the product drying results diagram in the system of coordinates:
Result/Measurement number.
The example diagram is showed below:



	Saving a diagram as *.png file on the external data carrier, connected to USB port.

20.5 Ambient conditions

It includes information related to environmental parameters. Depending on configuration, such a list may include temperature, humidity, atmospheric pressure value. When a THB module is connected to the device, its reading will also be recorded.

Procedure:

- Enter <**Reports**> submenu and press <Ambient conditions> field.
- Press the report field. If the report is invisible, scroll the list of reports via navigation buttons.
- Name of each record with data consists of date and time.

Note: *You can search data by date.*

20.6 Report management

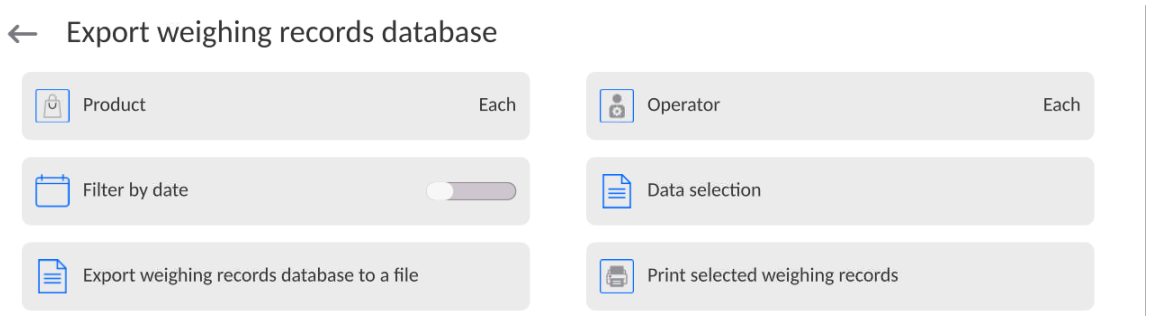
This function allows you to manage data in databases. There are three options: Export weighing record database to file, delete database, and delete weighing records and reports.

20.6.1 Export weighing record database to file

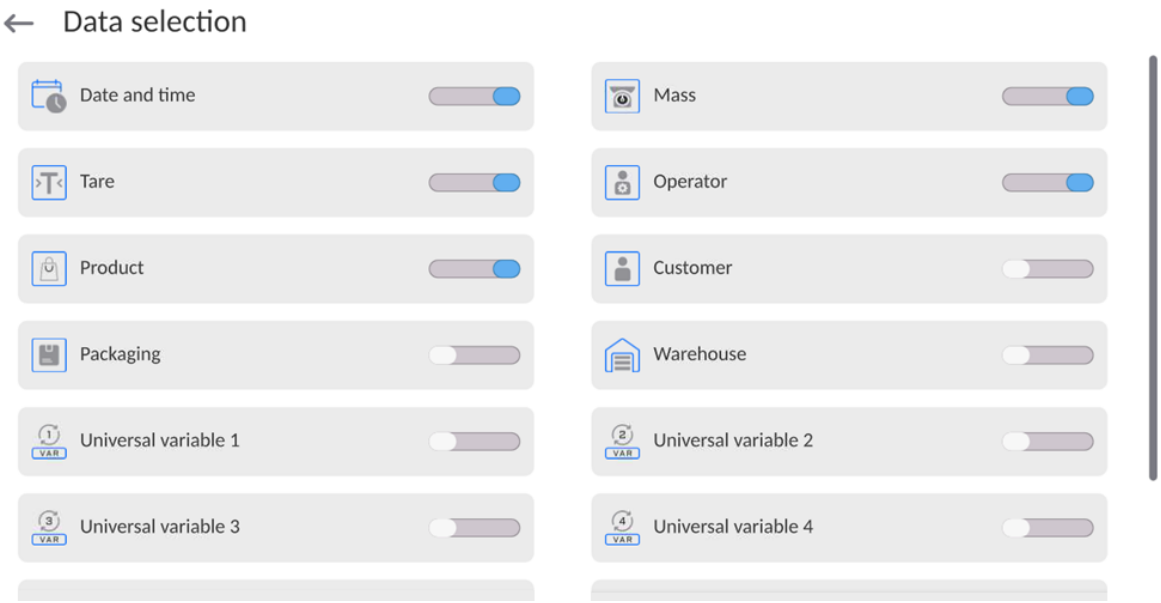
All weighing procedures are saved in the Weighing database. This information can be exported to the file with the use of mass memory devices, e.g. pendrive.

Procedure:

- Connect a pendrive device to the USB port of the balance.
- Press <Export weighing record database to file> field to go to another window in which you need to set exporting options.

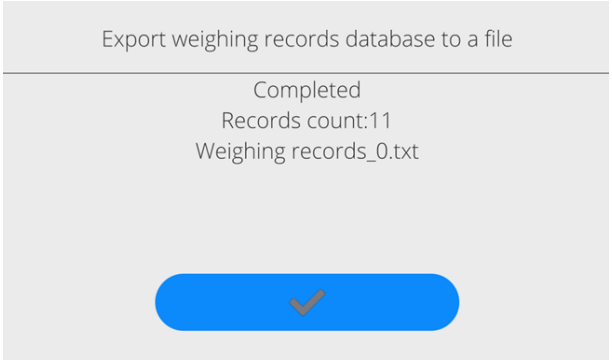


In <Data selection> option, you can define data that are to be exported.



- After setting the option, click <Export weighing record database to file> to automatically trigger exporting weighing records.

- Once the exporting procedure is completed, you will see **<Done>** message together with information on number of data exported and file name (*.txt), and then you will return to the previous box.



- You can go back to weighing or switch into further menu settings.

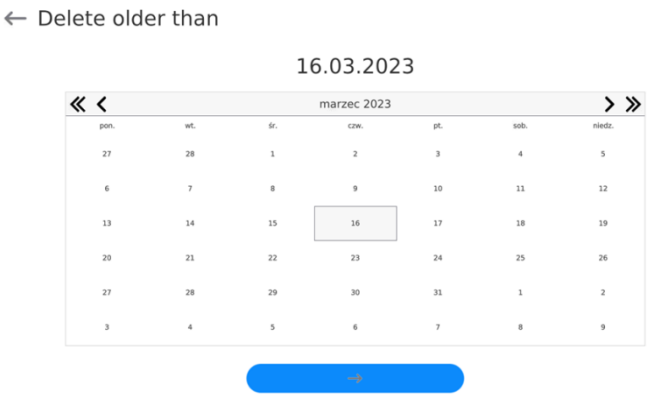
Note: *If the balance fails to recognize the pendrive device, after entering the <Export weighing record database to file> option, the following message will pop up: <Operation error>.*

- Name of file consists of database name and balance serial number, e.g. <Weighing_364080.txt>.
- Disconnect the pendrive device from USB port of the balance.

File template:
The template of the file takes a form of a table whose columns have been separated by <Tab> sign in order to directly export the file into the <Excel> sheet. The table contains all information on weighing, such as data and time, mas and mass unit, tare and tare unit, series number, operator's name, business partner's name, packaging name, source warehouse name, target warehouse name, result control name.

20.6.2 Delete weighing records and reports

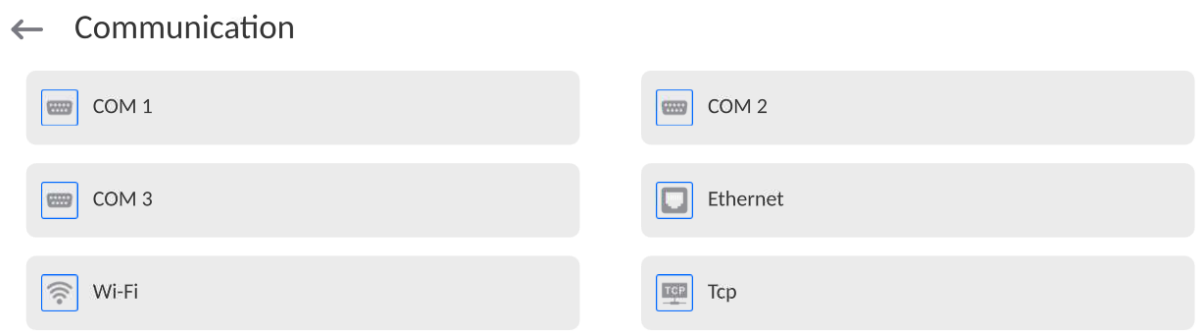
This field is used to clear content of databases of weighing records and reports. After activating the function, a window with numerical keypad will be displayed. You need to enter the ultimate date there. The date specifies data deletion time limit – older than set date. Give year, month, day.



After confirming the data, all weighing records and reports collected in the specific time limits will be deleted. The number of data deleted will be showed.

21. COMMUNICATION

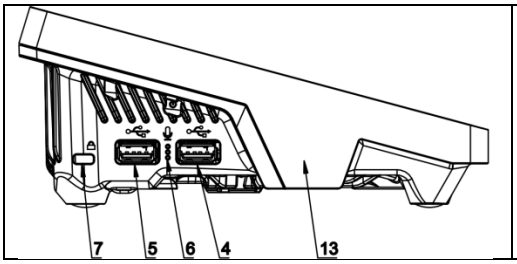
The Communication menu is available in the Parameters menu. To gain access, press <Setup> button or icon. The balance can communicate with an external device via the following ports:



You can configure parameters of all of the aforesaid ports as per you own needs.

21.1 RS 232 port settings

NOTE: to assure correct cooperation with external devices via RS 232 ports, use a USB-to-RS232 converter.

	4 – A-type USB port which after connecting to the converter is detected as RS 232 – COM1 port. 5 – A-type USB port which after connecting to the converter is detected as RS 232 – COM2 port.

Procedure:

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

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

- Transmission speed: 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, Interval

21.2 ETHERNET port settings

Procedure:

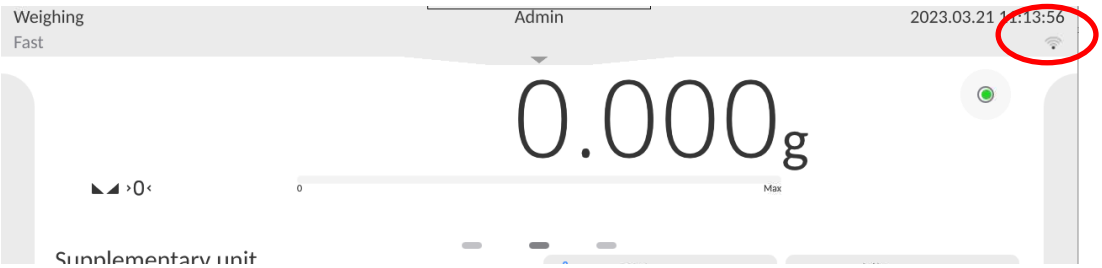
- Select <Ethernet> communication port and then set relevant values:
- DHCP: Yes – No
- IP address: 192.168.0.2
- Subnetwork mask: 255.255.255.0
- Default gateway: 192.168.0.1

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

After making changes, press button to see the following message: *<To apply changes, restart balance>.* Go back to weighing and restart the balance.

21.3 Wi-Fi port settings

If the balance is equipped with a Wi-Fi module, a special icon will be displayed in the home screen in the top bar:



Procedure:

– Select <Wifi> communication port and then set relevant values:

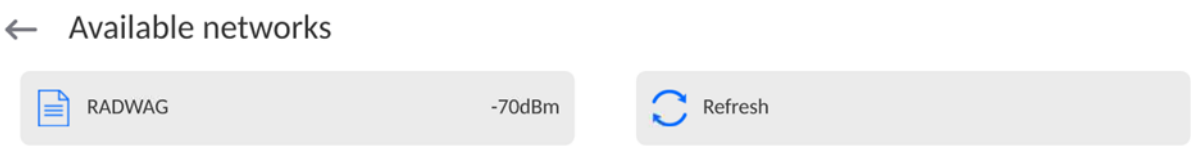
- DHCP: Yes – No
- IP address: 10.10.9.155
- Subnet mask: 255.255.255.0
- Default gateway: 10.10.8.244

Note: *The aforesaid settings are for reference only. Transmission parameters must be selected as per client's local network settings.*

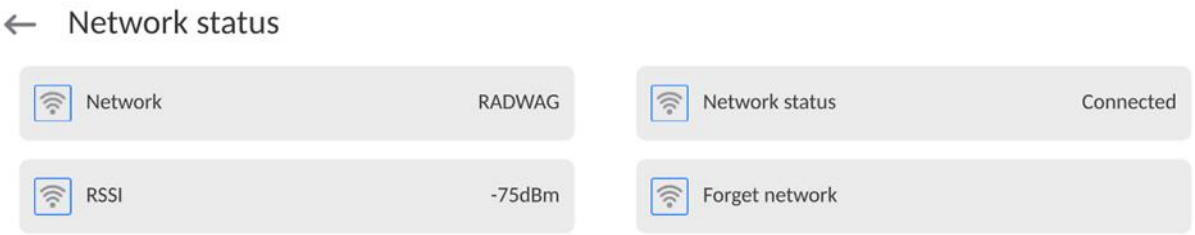
After making changes, press button. The following message will be displayed: *<To apply changes, restart balance>.*

Go back to weighing and restart the device.

Additionally you can check <Available networks> that have been detected by the balance:



The icon next to the network name shows if the network requires password (lock icon). To find available networks, select <Refresh>.
To check parameters of the specific network, click <Network status> field and see network parameters in the window displayed:



The selected network and connection parameters are remembered by the balance and every time the balance activates the program connects to the network as per parameters set. To disable this property, select <Forget network> item. This terminates connection to the specific network.

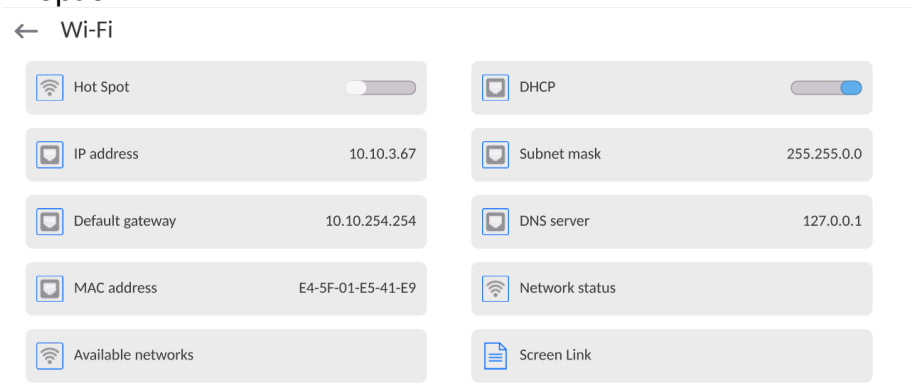
21.3.1 General information on Hot Spot

Hot Spot – open access point that allows wireless connection to the balance via other device, e.g. laptop, table or mobile phone, via wireless network based on Wi-Fi standard.

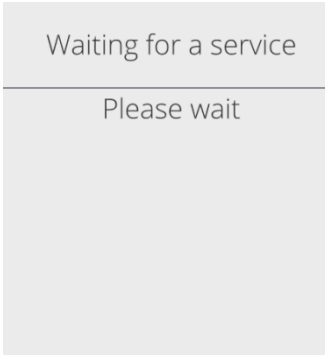
Hot Spot owner decides how, who and on what terms he is going to share its connection by logging which requires a unique user name and password (these data are assigned while starting the service and stored in the memory of the balance).

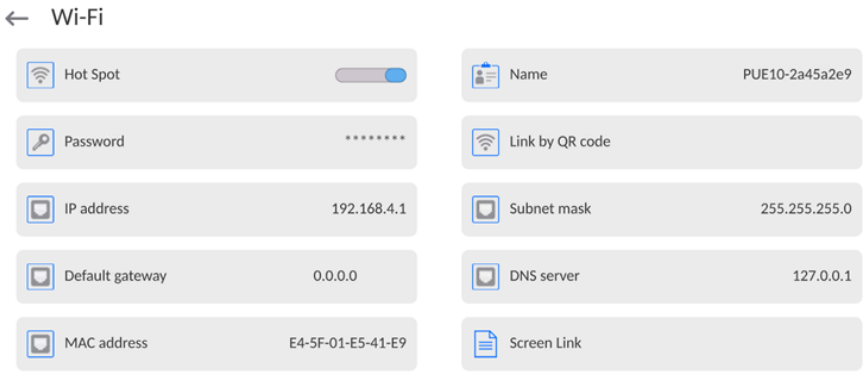
21.3.2 Activation of Hot Spot

1. Enter Wi-Fi option

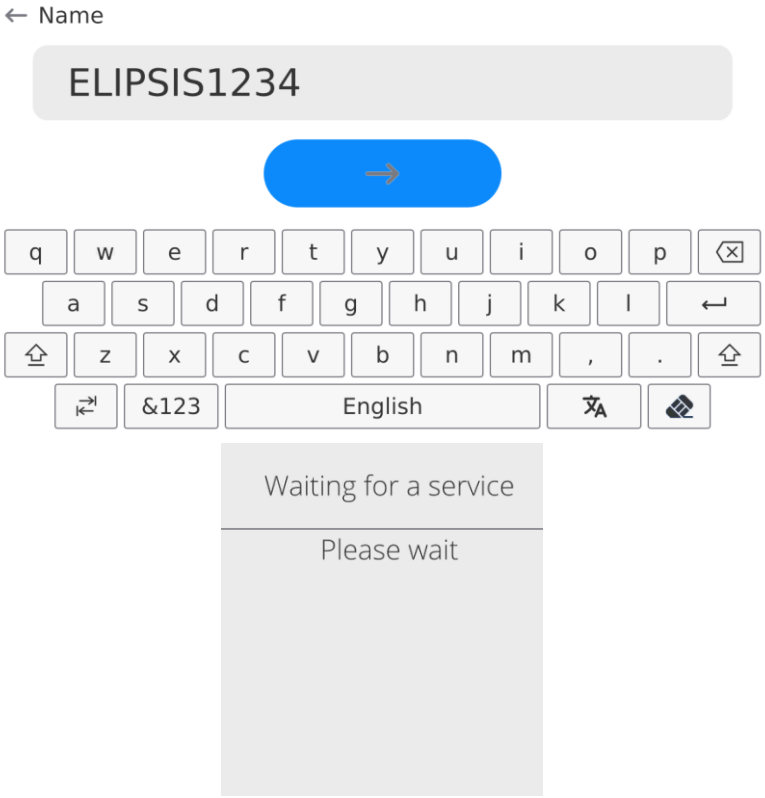


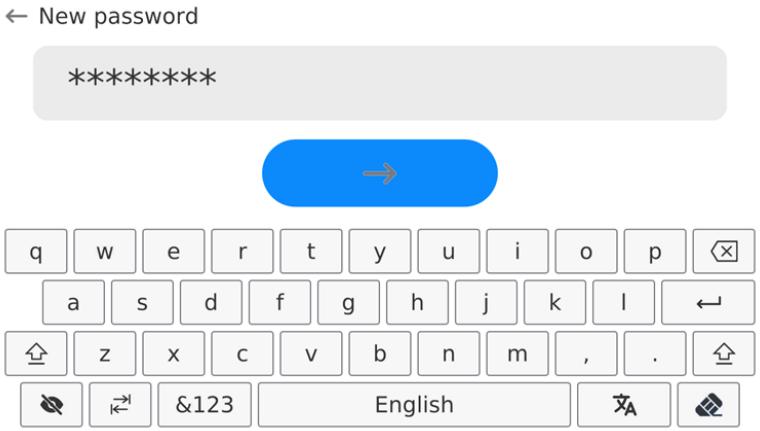
2. Activate Hot Spot, the balance will switch to the service settings after a moment.

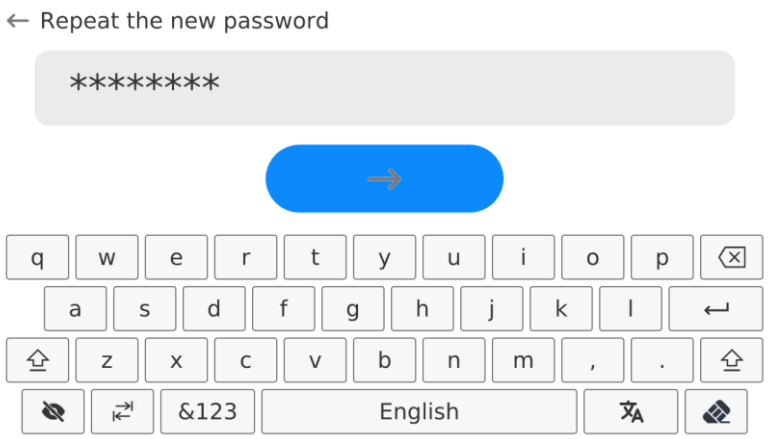


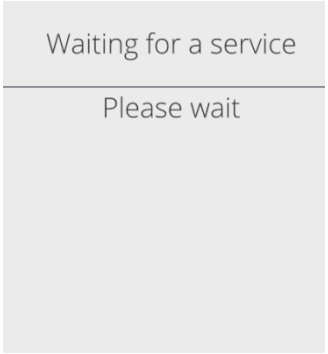


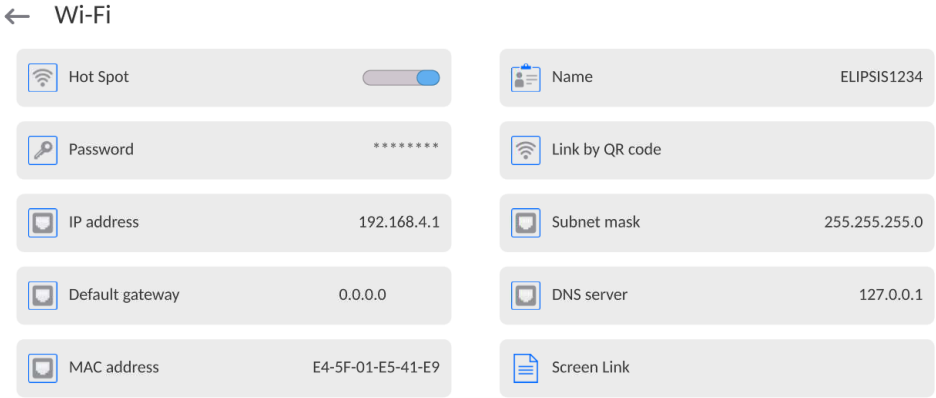
3. Enter an individual name and password for access (password must be at least 8 characters long).











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

21.4 TCP protocol settings

TCP (*Transmission Control Protocol)* – is a streaming communication protocol between two computers. TCP operates in the client-server mode. The server awaits connection to the specific port, while the client initiates connection to the server.

Port number setting procedure for TCP protocol:

- Enter <Communication> parameter group.
- Select <Tcp / Port>, the <Port> window with an on-screen keyboard will be displayed.
- Enter required port number and confirm by pressing .

22. DEVICES

DEVICES menu is included in Parameters menu. To gain access, press <Setup> icon. The menu contains a list of devices that can cooperate with the balance.

22.1 Computer

Active connection **balance – computer** is signaled through icon in the top bar of the home screen.

22.1.1 Computer port

The balance can communicate with the computer via the following ports: COM 1, COM 2, Tcp, USB Free Link*.

Procedure:

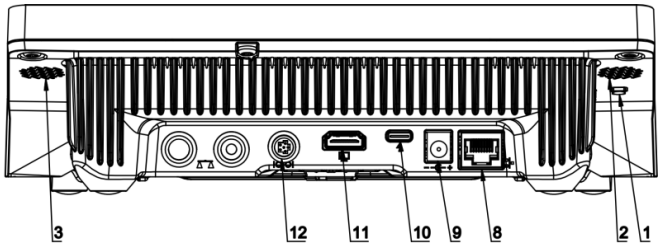
- Enter **<Devices / Computer / Port>** submenu and select port from the list.

*) – Port description can be found in the COMMUNICATION point of the manual.

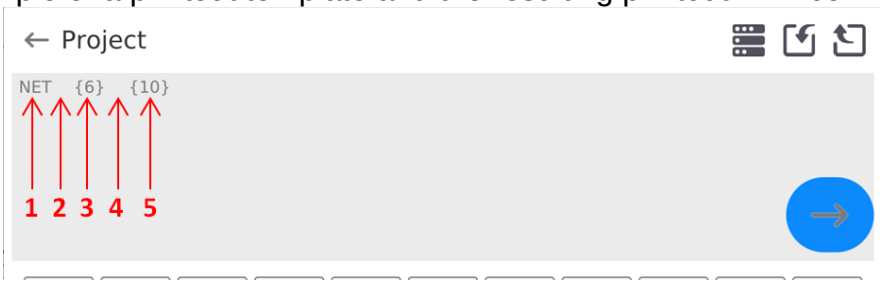
22.1.2 USB Free Link

The tool used to enter data for peripherals that play a role of the keyboard. Thanks to them, after modifying the standard and non-standard printout and sending relevant command to the computer or pressing ENTER key in the balance keyboard, data in non-standard printout are directly entered from the balance to such PC programs as Excel, Word, Notebook, etc.
To assure correct cooperation with Excel program, configure the non-standard printout by putting printout formatting marks into the printout, such as Tab, Enter and diacritic marks typical of the specific language. Please remember to set a correct decimal separator mark (dot or comma) that will be accepted by our Excel program (see submenu: **<** **/ Miscellaneous / Decimal separator>**).

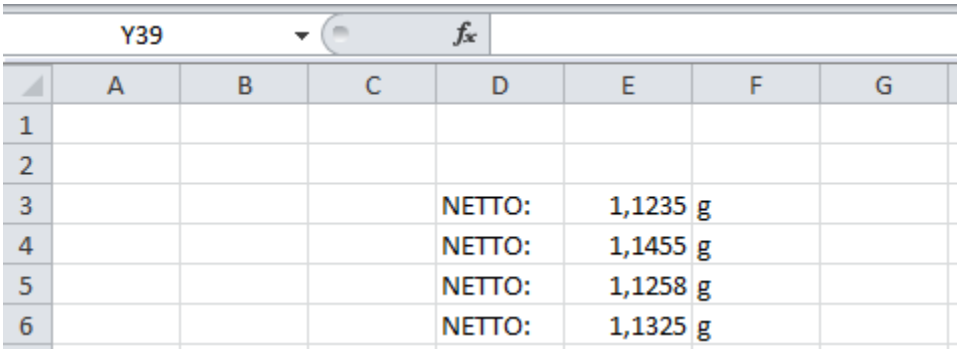
USB Free Link is a C-type USB port (port no. 10 at the back of the reading head) which a PC is connected to via a A-type/C-type USB cable.



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	

22.1.3 Computer address

Setting a balance address which computer is connected to.

Procedure:

- Enter **<Devices / Computer** / **Address>** submenu and you will see **<Address>** box with on-screen keyboard.
- Enter address and press → to confirm changes.

22.1.4 Permanent transmission

Activation of balance-computer permanent transmission. After enabling <**Permanent transmission>** parameter, the content of **<Weighing Printout Template>** is continuously sent to the PC.

Procedure:

- Enter **<Devices / Computer / Permanent transmission>** submenu and set relevant value (- Permanent transmission disabled; - Permanent transmission enabled).

22.1.5 Interval

Setting frequency of **<Weighing Printout Template>** printout for permanent transmission. Printing frequency can be set in seconds, with an accuracy of 0.1sec. and the range from 0.1 to 1000 seconds.

Procedure:

- Enter **<Devices / Computer / Interval>** submenu and you will see **<Interval>** edition window.
- Enter desired value and confirm by pressing →.

22.1.6 Weighing printout template

A unique template for printing from balance to PC.

Procedure:

- Enter **<Devices / Computer / Weighing Printout Template>** submenu. You will see **<Weighing Printout Template>** window with an on-screen keyboard.
- Modify the template and confirm changes by pressing .

22.1.7 Cooperation with E2R System

Activation of cooperation between the balance and **E2R System. E2R System** software is a modular system that comprehensively supports production processes related to weighing at various stages.

⚠	***Only <Administrator> is allowed to activate <E2R> parameter. In case of cooperating with the <E2R System> software, database edition in the balance is blocked.***

Access path: **< / Devices / Computer / E2R System>**.

List of options in <E2R System> submenu:

Active system	Activation of connection to **E2R System**: - connection disabled, - connection enabled. If the connection is enabled, the icon in the top bar of the home screen will be visible.
Block product selection	Activation of product selection lock for balance operator: - lock disabled, - lock enabled.
Databases	Submenu with configuration of databases that cooperate with E2R System.
Info	List of database events that occur during active connection to E2R System.

22.2 Printer

In the <Printer> submenu, the balance operator can:

- set communication port for printer,
- define printout code page (by default: 1250),
- define control codes for PCL6 printer (*Printer Command Language*) or receipt printer,
- Define printout templates.

To assure proper cooperation between the balance and printer (proper printout of letters with diacritic marks for specific interface language), select suitable transmission speed in the balance – the one that applies to the printer (see: Printer settings) and assure compliance of the code page of the printout with the printer code page.

Compliance of the code page can be achieved in two ways:

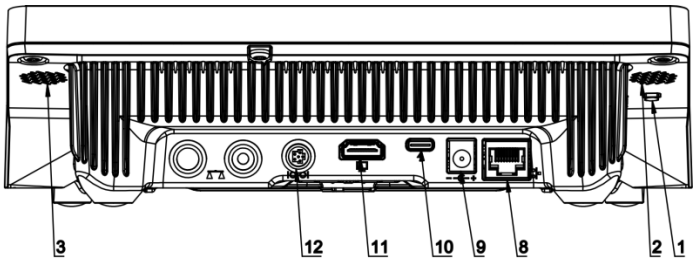
- by setting a suitable code page in printer settings (see: Printer manual) – the same as printout code page in balance,

Code page	Language
1250	Polish, Czech, Hungarian
1252	English, German, Spanish, French, Italian.
1254	Turkish.

- By sending a control code that automatically sets the relevant code page of the printer (identical to printout code page set in the balance) before printing data from the balance (only when it is allowed by the printer).

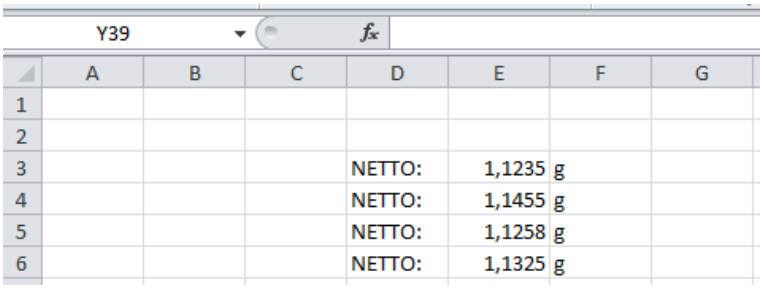
⚠	***Default value of printer code page is 1250 – Central European code page.***
⚠	***Detailed description of balance communication with the receipt printer is available in „ATTACHMENTS 03" of the manual.***

USB FREE LINK – type-C USB port (port no. 10 at the back of the reading head) which the computer is connected to via C-type/A-type USB cable.



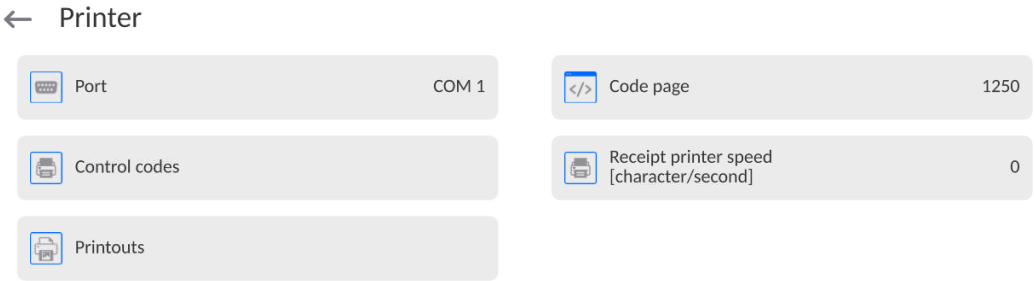
The tool used to enter data for peripherals playing a role of the keyboard. Thanks to this, after modifying standard or non-standard printout and sending a relevant command from the computer or pressing ENTER button on the balance keyboard, data in the non-standard printout are directly sent from the balance to such PC programs as Excel, Word, Notebooks and many other.
To assure proper cooperation with Excel program, configure the non-standard printout by putting printout formatting marks into the printout, such as Tab, Enter and diacritic signs typical of the specific language. Please remember to set a correct decimal separator mark (dot or comma) that is going to be accepted by our Excel program. It can be set in the following parameters: *Setup / Miscellaneous / Decimal separator*.

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 large amount of information are to be printed with the use of Free Link, it is necessary to set 15 in the <Receipt printer speed [characters/second] parameter.***



The printout template describes how information from the database is to be printed out. If it is insufficient, it must be modified. Correctness of the designed template can be checked by printing product-related parameters. This operation can be performed after going into the database: <Products / Product edition> – press the printer icon.

<u>Default values for particular templates:</u>

Product Printout Design:

{50}
{51}

Operator Printout Design:

{75}
{76}

Client Printout Design:

{85}
{86}

Warehouse Printout Design:

{130}
{131}

Packaging Printout Design:

{80}
{81}
{82}

Ambient conditions Printout Design:

{275}
IS T1: {278} ^{o}C
IS T2: {279} ^{o}C
THB T: {276} ^{o}C
THB H: {277} %

Formula Printout Design:

{165}
{169}

Pipette Printout Design:

{310}
{311}

22.3 Barcode scanner

The balance can cooperate with the barcode scanner. The scanner can be used for quick searching of:

- Products,
- Operators,
- Clients,
- Packaging,
- Warehouses,
- Formulas,
- Pipettes,
- Series in differential weighing,
- Universal variables.

⚠	***In <Communication> submenu – set transmission speed that complies with the barcode scanner (by default 9600b/s). A detailed description of communication of the balance with barcode scanners can be found in the „ATTACHMENTS 03" of the manual.***

To configure barcode scanner, go to the following submenu:
„Setup / Devices / Barcode Scanner".

22.3.1 Barcode scanner port

Procedure:

- Enter **<Devices>** parameters group and select **„Barcode Scanner** / **Port",** and then set relevant option.

The balance can communicate with the scanner via the following port USB.

22.3.2 Prefix / Suffix

You can edit value of the **<Prefix>** and **<Suffix>** in order to synchronize the weighing program with the barcode scanner.

Note: *In the standard adopted by RADWAG, the prefix is 01 hexidecimal mark (byte) and suffix is 0D hexidecimal mark (byte). A detailed description of the communication of balance with barcode scanners can be found in the* ***ATTACHMENT E*** *of the manual.*

Procedure:

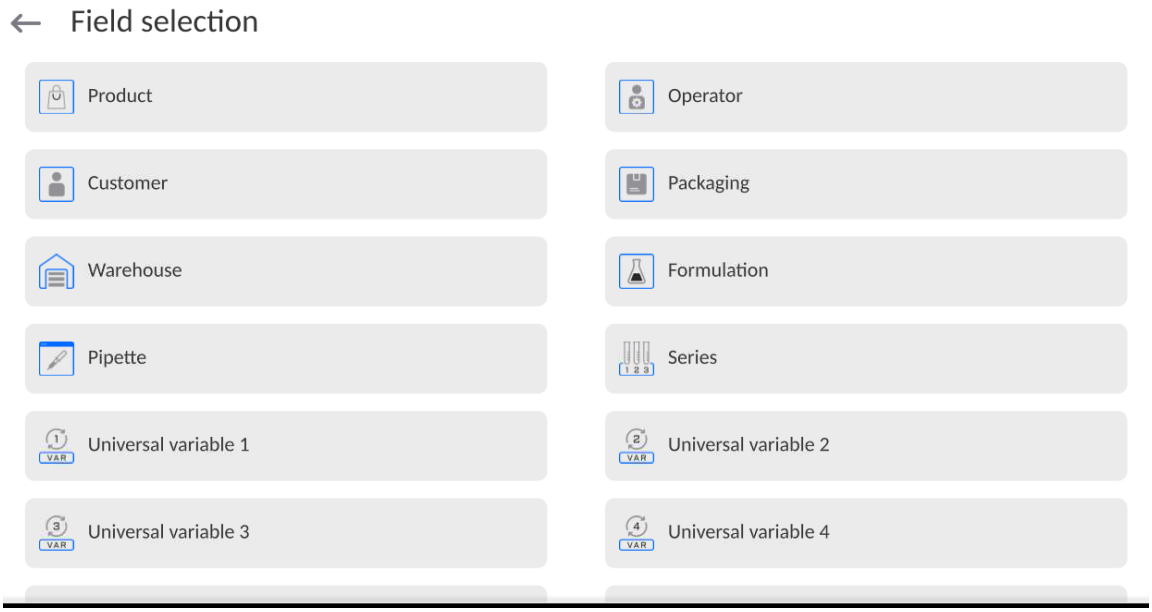
- Enter **<Barcode Scanner>** submenu,
- Go to **<Prefix>** parameter and use an on-screen keyboard to enter value (hexadecimal), and then confirm changes by pressing →.
- Enter **<Suffix>** parameter and use an on-screen keyboard to enter value (hexadecimal) and then confirm changes by pressing →.

22.3.3 Field selection

You can configure the field selection in particular databases in which you are going to search.

Procedure:

- Enter **<Devices>** parameters group,
- After selecting **„Barcode Scanner / Field selection",** the following list will be displayed:



- After entering the desired item, you can edit the following parameters:

Filtering	Declare item by which you are going to search (see table below)
Offset	Set the first significant code character which you are going to start searching from. All preceding characters are omitted
Code Length	Set the number of code characters taken into account while searching
Start Marker	Declare start of the code that is to be taken into account while searching
End Marker	Declared end of the code that is to be taken into account while searching
Skip Marker	Declare if you want to include end and start markers or skip them while comparing the read code with code in the balance

List of filtering items, depending on field selection:

Field selection	**Filtering**
Product	None, Name, Code, EAN code,
Operator	None, Name, Code
Client	None, Name, Code
Packaging	None, Name, Code
Warehouse	None, Name, Code
Formula	None, Name, Code
Pipette	None, Name, Code
Series	None, Name, Code
Universal variables	None, Active

22.3.4 Test

Using **<Test>** function, you can verify correct operation of the barcode scanner connected to the balance.

Procedure:

- Enter **<Barcode Scanner>** submenu,
- After entering **<Test>** parameter, the **<Test>** window with ASCII and HEX fields will be displayed,
- After scanning the code, it will be put into the ASCI and HEX fields, and the test result will be displayed in the lower part of the screen.

When:

- **<Prefix>** and **<Suffix>** declared in the balance settings comply with **<Prefix>** and **<Suffix>** in the read code, the test result will be **<Positive>**,
- **<Prefix>** and **<Suffix>** declared in the balance settings do not comply with **<Prefix>** and **<Suffix>** in the read code, the test result will be **<Negative>**.

22.4 Environmental module

It is possible to connect the THB environmental module to the balance through UDP or USB ports. In order to assure correct cooperation, you need to choose a suitable environmental module connection port.

22.5 IM02 communication module

The IM02 communication module allows the scale to cooperate with such accessories as printers, control keys, stack lights, buzzers, PLC controllers, as well as other control-signaling devices and PCs.

⚠	***The procedure of connecting the IM02 communication module to the supply network and scale has been described in detail in the 'IM02 communication module' manual.***

22.5.1 Activation of IM02-to-scale connection

- Connect the IM02 communication module to the COM3 port of the scale.
- Connect the IM02 communication module to the supply network.
- Enter **<Peripherals / IM02 communication module / Active>** submenu and enable IM02 communication module (- module active, - module inactive).
- Once the IM02 communication module has connected to the scale, the following information will be automatically displayed:

Status	Active connection status, the status takes the following values: Connected, Not connected.
Software rev.	Software version of the IM02 communication module.
Manufacture variant	IM02 communication module manufacture version.

- Simultaneously the scale menu is extended to include **<Inputs / Outputs>** submenu and list of available communication ports in the **<Communication>** submenu.

22.6 Modbus TCP

⚠	***For detailed information regarding Modbus protocol read „MODBUS TCP - Communication Protocol of PUE CY10”.***

Modbus TCP protocol can be used via the Ethernet communication interface. Configuration of Modbus TCP protocol settings can be found herein the **<Devices / Modbus TCP>** submenu.

Submenu structure **<Modbus TCP>**:

Active	Activation/deactivation of the Modbus TCP transmission protocol.
Port	Number of port for transmission protocol (by default **502**).

23. INPUTS / OUTPUTS

Applicable in the case of an active IM02 communication module

The PUE CY10 meter can support **4 inputs / 4 outputs** via connection to the IM02 communication module.

Access path: **<🏠 / Inputs/Outputs>**.

23.1 Input Setup

- Enter **<Inputs/Outputs>** submenu.
- Select **<Inputs>** parameter, list of available inputs is displayed.
- Edit selected input, list of functions to be assigned is displayed. Input functions list is identical like key functions list, read section 21.2.
- Select the function you want to assign to the input, next go back to the home screen.

⚠	***By default all functions are assigned with <None> value.***

23.2 Output Setup

Output gets activated at the moment of assigning it with a given function. Unassigned outputs remain inactive.

Procedure:

- Enter **<Inputs/Outputs>** submenu.
- Select **<Outputs>** parameter, list of available outputs is displayed.
- Edit selected output, list of functions to be assigned is displayed.

None	Output inactive.
Stable	Stable weighing result over LO threshold value.
MIN stable	Stable weighing result below the MIN threshold.

MIN unstable	Unstable weighing result below the MIN threshold.
OK stable	Stable weighing result between MIN and MAX thresholds.
OK unstable	Unstable weighing result between MIN and MAX thresholds.
MAX stable	Stable weighing result over the MAX threshold.
MAX unstable	Unstable weighing result over the MAX threshold.
! OK stable	Stable weighing result out of OK threshold.
! OK unstable	Unstable weighing result out of OK threshold.
MIN	MIN threshold signalling.
OK	OK threshold signalling.
MAX	MAX threshold signalling.
! OK	Signalling of weighing result out of OK threshold.
Zero	Zero weighing result („zero” marker).

- Select the function you want to assign to the output, next go back to the home screen.

⚠	***By default all functions are assigned with <None> value.***

24. OTHER PARAMETERS

This menu contains global information on operation of the balance, such as language, date – time, sound signal, screen calibration, level control. To enter <Miscellaneous> submenu, press Setup and then <Miscellaneous> button.

24.1 Selection of interface language

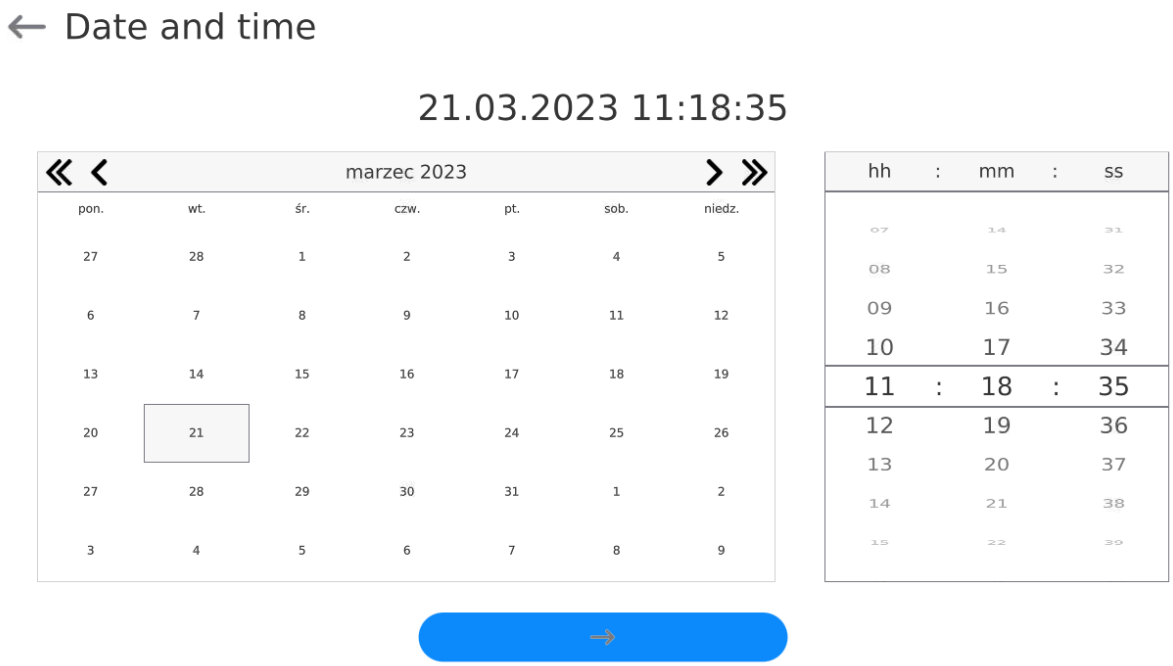
Procedure:
Enter <Miscellaneous> submenu, select <Language> item and choose balance communication interface language.
Available languages: Polish, English, German, French, Spanish, Korean, Turkish, Chinese, Italian, Czech, Romanian, Hungarian, Russian, Serbian.

24.2 Date and time setting

You can set date and time as well as choose format and print these data out.
You can edit date and time settings in two ways:

- press **<Date and time>** directly, see top bar of the home screen,
- enter: **<**Setup **/ Miscellaneous / Date and Time>** submenu.

After entering date and time settings edition, you will see an on-screen keyboard. Set relevant values, i.e. year, month, day, hour, minute and confirm changes.

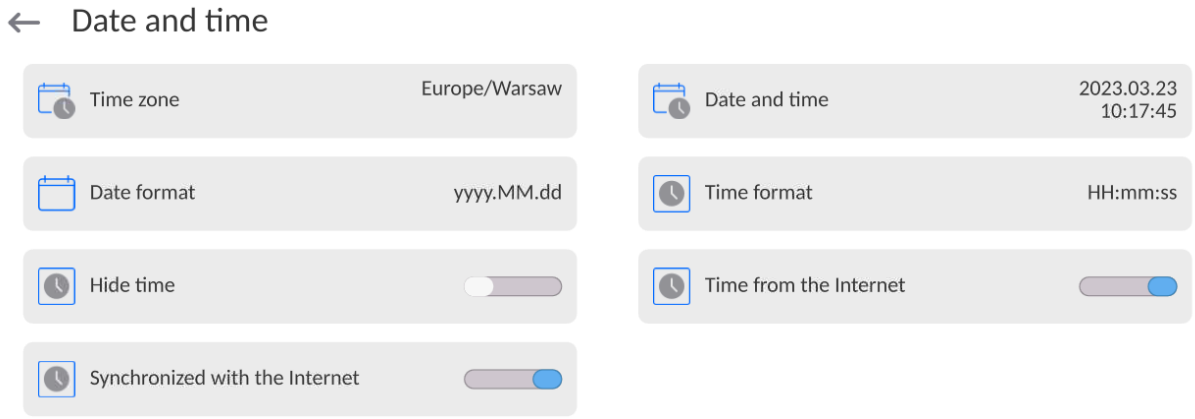


Submenu: **<**Setup **/ Miscellaneous/ Date and Time>** contains additional functions used to define date and time format:

Name	***Value***	***Description***
Time zone	Europe, Warsaw	This parameter comes with the value: zone name / country. A specific zone name/country is related to information if the time changes from winter into summer (and the other way round) and specific day of the year in which it happens.
Date and time	2016.04.04 08:00:00	Set date and time of the balance internal clock
Date format	yyyy.MM.dd *	Date format selection. Available values: ▪ d.M.yy, ▪ d.M.yyyy, ▪ dd.MM.yy, ▪ dd.MM.yyyy, ▪ dd.MMM.yyyy, ▪ yyyy.MM.dd, ▪ yy/MM/dd, ▪ d/M/yy, ▪ dd/MM/yy, ▪ dd/MM/yyyy, ▪ M/d/yy, ▪ M/d/yyyy, ▪ MM/dd/yy, ▪ MM/dd/yyyy. ▪ dd-MM-yy, ▪ dd-MMM-yy, ▪ yy-M-dd, ▪ yy-MM-dd, ▪ yyyy-M-dd, ▪ yyyy-MM-dd,
Time format	HH:mm:ss **	Time format selection. Available values: ▪ H.mm.ss, ▪ HH.mm.ss, ▪ H.mm.ss tt, ▪ HH.mm.ss tt, ▪ h.mm.ss tt, ▪ hh.mm.ss tt, ▪ H:mm:ss, ▪ HH:mm:ss, ▪ H:mm:ss tt, ▪ HH:mm:ss tt, ▪ h:mm:ss tt, ▪ hh:mm:ss tt, ▪ H-mm-ss, ▪ HH-mm-ss, ▪ H-mm-ss tt, ▪ HH-mm-ss tt, ▪ h-mm-ss tt, ▪ hh-mm-ss tt.
Hide hour	No	Enable/disable date and time visibility in the home screen.

Internet time	Yes	If the balance is connected to the Internet, this option allows updating time and date from the web.
Synchronized with Internet	Yes	Parameter informing the operator if time and date in the balance have been synchronized with data in the Internet network.

*) - For date format: y – Year, M – month, d – day
**) - For time format: H – hour, m – minute, s – second
Preview of date and time with special regard to declared formats is visible in <Date and Time> field.



Note: *Access to <Date and Time> settings is allowed only to the operator with a relevant permission level. Permission level can be changed by the administrator in the <Permission> menu.*

24.3 Extension module

The option allowing you to activate compliance of the device for FDA 21 CFR procedures, extension of the communication protocol in the balance and deactivation of the standard license of the balance (the so-called demo balance).

To activate it, you need to know the license number for particular options. To obtain the number, please contact the device manufacturer.

Procedure:
Enter <Miscellaneous> submenu, select <Extension module> parameter and follow messages displayed.

24.4 Sound

Procedure:
Enter <Miscellaneous> submenu, select <Sound> parameter and set relevant option:

Result approval sound – Yes/No
Touch screen sound – Yes/No
Sensors – Yes/No
Volume – adjustment to 100%

24.5 Visual printout cofirmation

The option that allows you to visually confirm the measurement and record it in the weighing record base. After entering value, every saved measurement will be communicated to the operator through temporary illumination of the mass display in blue.

24.6 Screensaver

You can activate the screensaving procedure.
To do so:
Press Setup button and then: <Miscellaneous/Screensaving>.
While editing, choose one of the following values: [None; 1; 2; 3; 5; 10; 15]. Numbers are set in minutes. Select one of the values to select it and return to previous menu.

Note:
Screensaving occurs only when the balance is not used (no changes to mass in the screen). Return to weighing after screensaving occurs automatically when the program detects any changes to mass or by pressing the screen or button on the wall.

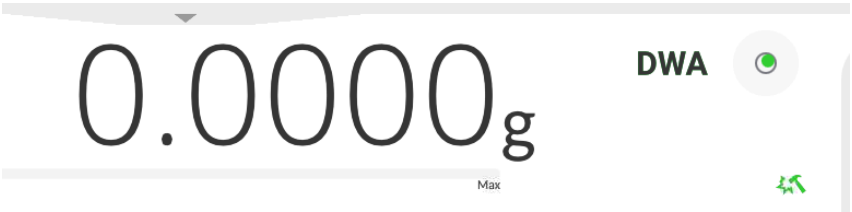
24.7 Brightness

Screen brightness determines how long the balance operates on a battery. If you wish to prolong the interval between subsequent battery charging cycles, you need to lower the brightness.
To do so:
Press Setup button and then: <Other/Screen brightness>.

While editing, enter value: [0% - 100%]. Enter a relevant value to automatically change screen brightness and return to previous menu.

24.8 Vibration detection

The program allows detecting wrong placement of the sample on the weighing pan, which may result in rise in result errors. When the function is enabled, a relevant icon on the mass screen shows up.



If the program detects wrong placement of the sample on the weighing pan, then icon will turn red . It means that the result may be more erroneous.

Procedure:

- Enter <Miscellaneous> submenu.
- Select <Vibration detection> item,
- Select either of the following:
  - Yes – function enabled
  - No – function disabled

24.9 Level control

The balance is supplied with the Automatic Level Control.
In non-verified balances, you can define the mode of operation.
In verified valances, the settings are invisible and act in accordance with factory set values, that is <Enabled with lock>, weighing is allowed only when the balance has been leveled.

Procedure:

- Enter <Miscellaneous> submenu.
- Select <Level control> parameter to see an edition window.
- Select one of the following:
  - None – level indicator is not displayed, balance does not control level,
  - Enabled – level indicator is displayed, balance shows level change through colors (green → level OK, red → level lost),
  - Enabled with lock – level indicator is displayed, balance shows level change through colors (green → level OK, red → level lost; when the indicator is red, the screen shows the following message: no Level. Weighing is not possible in such a case).

Note: *The leveling method is described in the point 15.3 of the manual.*

24.10 Decimal separator

This parameter allows selecting a decimal separator for mass printout.

Procedure:

- Enter <Miscellaneous> submenu.
- Select <Decimal separator> parameter and you will see an edition window.
- Select either of the following:
  - Dot
  - Comma

Select value to return to submenu.

24.11 Sensors sensitivity

This parameter ranges from 0 to 9 and determines the distance of sensor reaction.
By default the value ranges from 5 to 7.

Procedure:

- Enter <Miscellaneous> submenu.
- Select <Sensors sensitivity> parameter and you will see an edition window.
- Select one of the values. Select value to return to menu.

24.12 Start-up logo

(Available to permitted operator only).

This parameter allows you to change the image that shows up in the screen while starting the system.

24.13 System event export

(Available to permitted operator only).

This option allows you to generate a special file saved automatically (after enabling the option) into an external memory (pendrive) inserted in the USB port. This file is used to diagnose potential difficulties in the device operation by RADWAG service technicians.

Procedure:

- Insert the pendrive into USB port.
- Enter <Miscellaneous> submenu.
- Select <System event export> parameter.
- The program will generate a special file and save it automatically on the pendrive.
- Such a file must be sent to RADWAG.

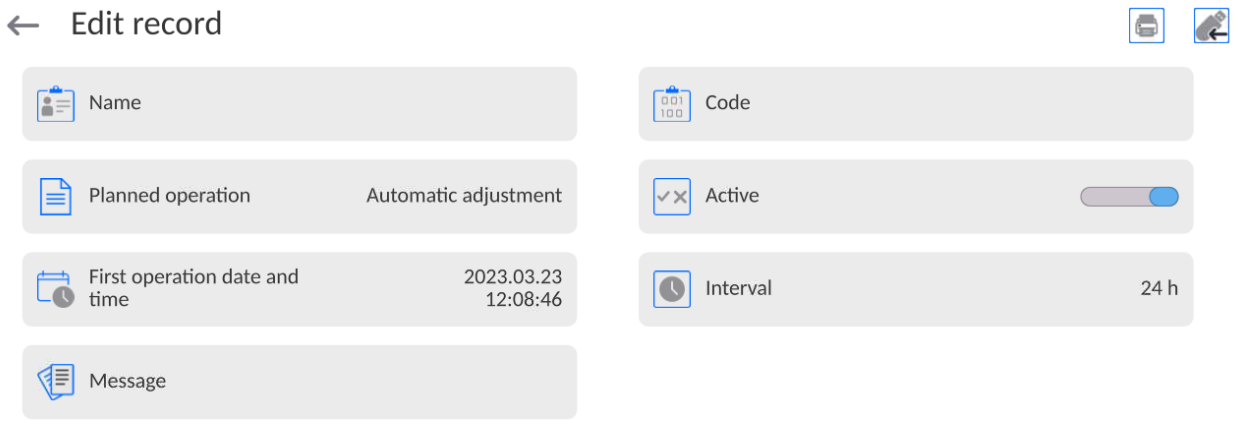
24.14 Text-to-speech shift

This parameter allows you to enable processing names of particular groups and menu parameters into speech emitted from measuring head speakers.
The voice is available in English only.

25. SCHEDULED TASKS

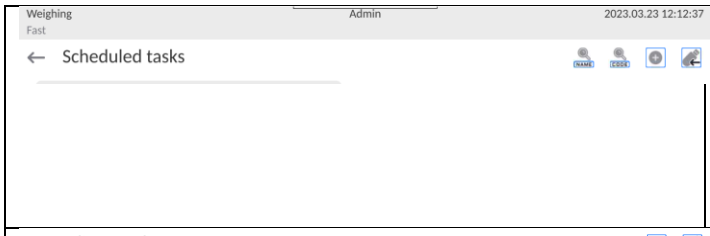
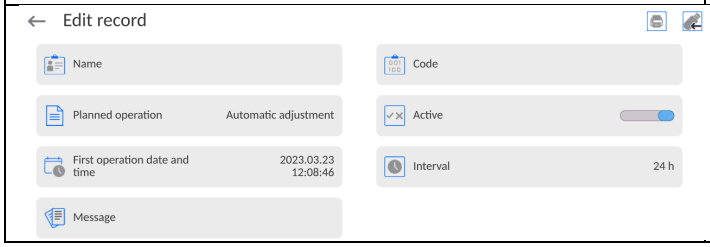
This menu contains settings that allow you to schedule recurring tasks, such as balance adjustment or special message display.

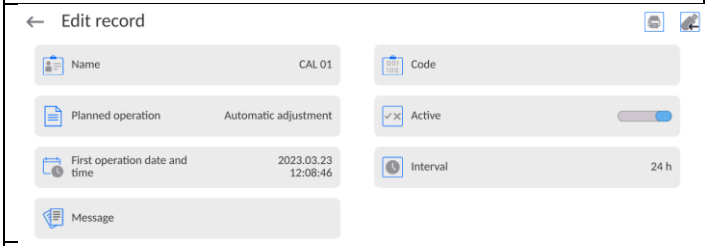
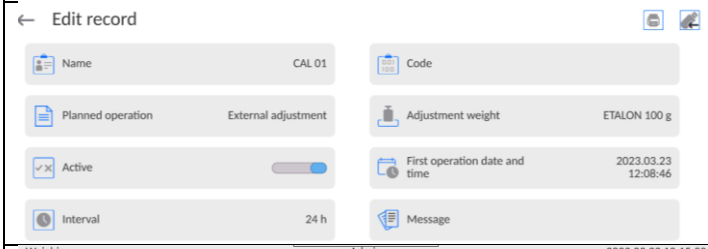
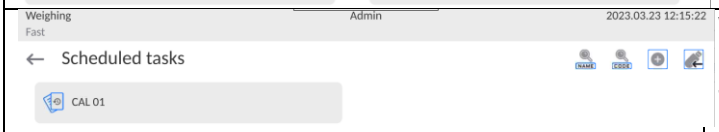
25.1 Balance adjustment



<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 data of mass standards intended for external adjustment performance; to do it:
Enter operator menu, select <Adjustment> submenu and find <Adjustment weights> parameter.

	Enter operator menu, select <Scheduled tasks> parameter. A window opens in which an authorized user (Administrator) can add entries with scheduled adjustments.
	In order to add a new entry, press button, wait for a window with data on the scheduled adjustment to open.

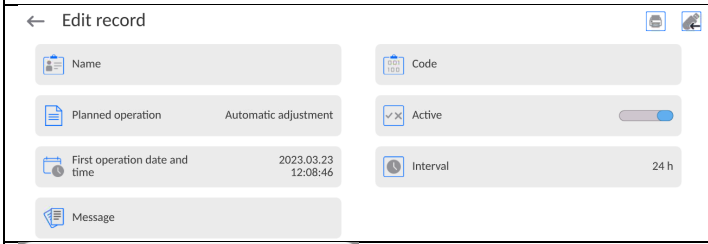
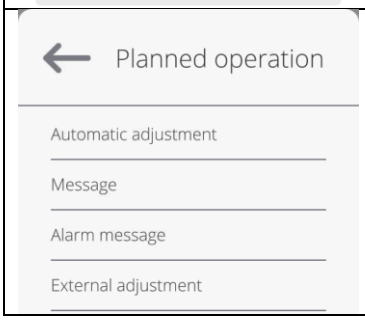
	Select task: automatic adjustment (internal or external).
	For automatic adjustment option, enter data on the adjustment and its schedule.
	For external adjustment option, enter data on the adjustment, mass standard used for the adjustment performance and its schedule.
	When all necessary data has been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

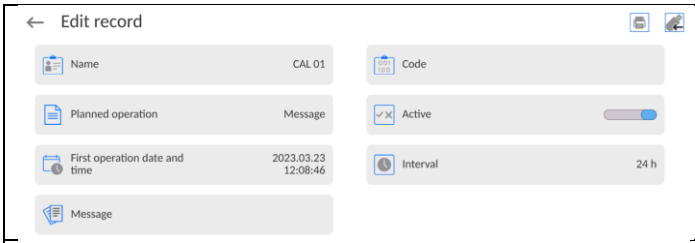
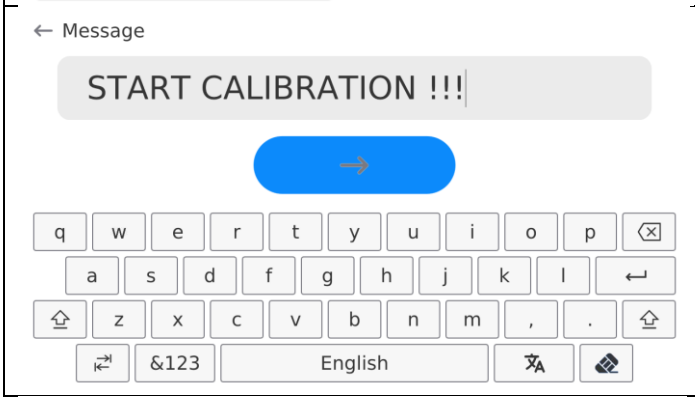
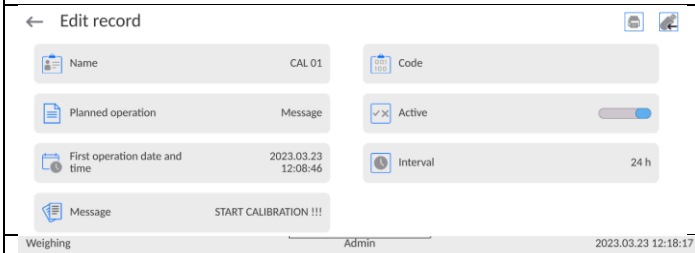
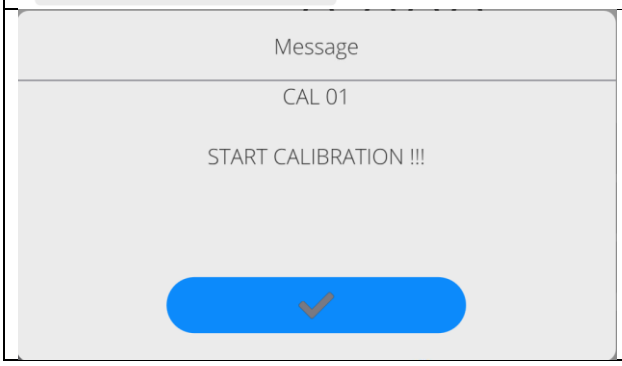
Upon entering all data, exit the menu.

From now on, adjustments will be automatic: as scheduled and with intervals.

25.2 Message

This parameter allows you to declare a specific time and interval for displaying a special message informing the operator about a need to take some action at a specific moment.

	Enter user menu, next enter <Scheduled tasks> submenu. In order to add an operation, press button placed in a toolbar.
	<Edit record> box is displayed, press <Scheduled tasks> field. <Scheduled tasks> box is displayed.
	Select <Message> option.

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

26. UPDATE

It includes the following modules by means of which you can update:

- Operator-related field: APPLICATION.
- Motherboard (administrator only).

Updating is automatic after you have downloaded information from the external USB memory.

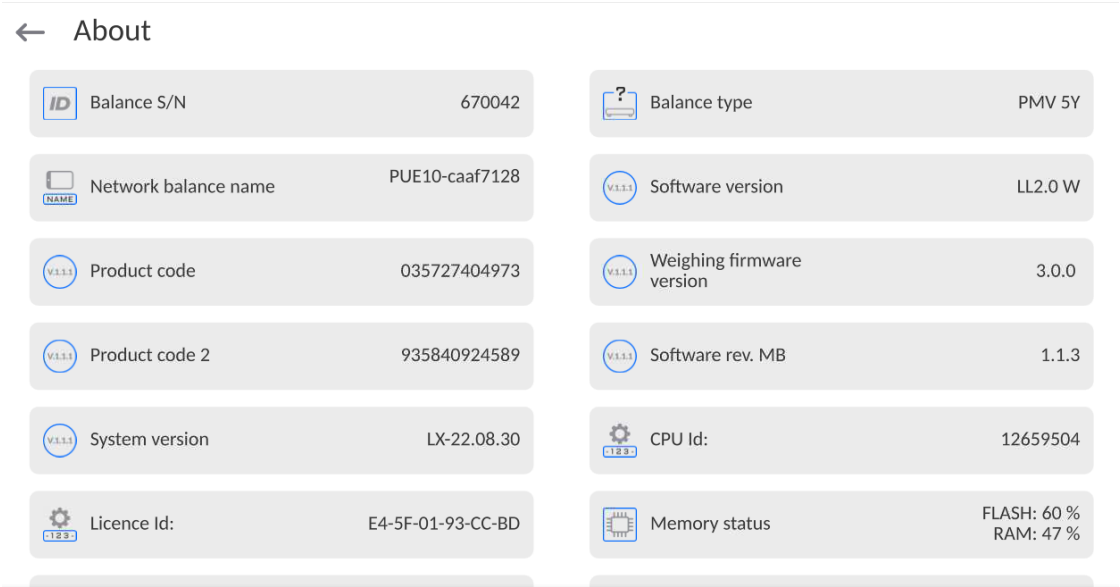
Procedure:

- Prepare Pendrive external memory with an update file, the file should have the following extension: **.lab4.*
- Insert Pendrive into a USB port of the reading head.
- Log in as Administrator.
- Enter balance menu by pressing
- Select < Update>.
- Select <Application>
- The screen will show content of USB memory. Find the update file and click the name field.
- The balance will restart automatically and the balance application will be updated.
- If the balance does not restart, force it by cutting and resupplying the power supply.

Files from the motherboard are updated analogically to Application update. The only difference is the fact that files must come with relevant extension (*.cm4mbu).

27. ABOUT

This menu contains information on the balance and programs installed. Most parameters are for reference only.



In <Environment> parameter, you can see ambient parameters: temperature, humidity, pressure (when balance is equipped with suitable sensors).
After selecting <Printing settings> parameter, the balance settings will be sent to the printer (all settings).

28. COMMUNICATION PROTOCOL

⚠	***A detailed description of the communication between balance and PC can be found in „CBCP-07" manual.***

28.1 Manual printout/automatic printout

You can print items from the moisture analyzer manually or automatically.

- Manual printout: press ↵ button when the result is stable.
- Automatic printout is automatic as per settings for automatic printout (see*: point 14.4*).

The content of printout depends on settings for <Standard printout> - <Weighing printout template> (see: point 14.4).

Mass printout format:

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

Stability mark	[space] if stable
	[?] if unstable
	[!] if air uplift pressure compensation function is enabled
	[^] if + range exceed error occurs
	[v] if – range exceed error occurs
Mark	[space] for positive values or
	[-] for negative values
Mass	9 marks with dot with right alignment
Unit	3 marks with left alignment

Example:

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

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

29. CONNECTION OF PERIPHERALS

The 5Y-series balance can cooperate with the following devices:

- PC,
- receipt printer,
- printer that supports PCL6 (*Printer Command Language*),
- barcode scanner,
- fingerprint reader,
- any peripheral device that supports ASCII protocol.

Note: *Only accessories listed on RADWAG's website can be connected to the balance.*

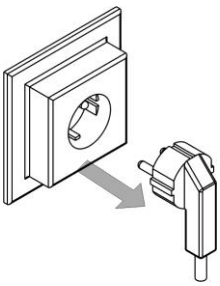
30. ERROR MESSAGES

Start weight range exceeded. Unload the weighing pan.	Tarring out of range. Press zeroing button or restart the balance.
Max weighing threshold exceeded. Unload the weighing pan.	Zeroing/tarring time out of range. Weighing indication unstable.
Min weighing threshold exceeded. Install weighing pan.	Display capacity out of range. Unload the weighing pan.
Zeroing out of range. Press tarring button or restart the balance.	

-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)

31. FUSE REPLACEMENT

If you connect the moisture analyzer to the source of power and a signal LED light on the screen does not go on (no reaction in the screen), it may mean that the fuse has blown.



REMEMBER, before you take any actions related to fuse replacement, switch the moisture analyzer off. Use ON/OFF key on the keyboard and disconnect the feeder cable plug from the socket!

The moisture analyzer is supplied with a **time-delay (T) ceramic fine fuse 5x20, 3.15A 230VAC,** that secures electronics.

NOTE: It is not allowed to use other fuse than specified above.

32. ADDITIONAL EQUIPMENT

Type	Name
EPSON	Receipt printer
	Printers that support PCL6 (*Printer Command Language*) – connected via USB port
LS2208	Barcode scanner
SAL	Anti-vibration table for XA balances
	PC keyboard

PC software:

- **E2R-MOISTURE ANALYZER.**

33. ATTACHMENT B – List of programmable buttons

Symbol	Function	Symbol	Function
	None		Balance adjustment/calibration
	Profile	g-ct-lb	Unit
	Product	LO HI	Checkweighing thresholds
	Packaging		Zero
	Client		Tare
	Operator		Enable tare
	Warehouse		Disable tare
	Parameters		Restore tare
	Confirm		Drying program
	Abort		Emptying/closing the safety chamber cover
	Help		Sample description
	Local parameters	STOP	Stop
	Working modes	1 VAR	Universal variable 1
	Log out	2 VAR	Universal variable 2
	Voice command	3 VAR	Universal variable 3
	Create screenshot	4 VAR	Universal variable 4
	Print out	5 VAR	Universal variable 5
	Print header	0.0	Hide 1 digit
	Print footer / C label	0.00	Disable displaying last two digits
-123-	Series number	0.000	Disable displaying last three digits
-ABC-	Batch number	E-SIGN	E-signature

34. ATTACHMENT H – Manufacturer's address data

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