5Y Mass Comparators

HRP 200.5Y.KO Mass Comparator
* HRP 200.5Y.KO * Mass Comparator - with self-centring weighing pan
HRP 500.5Y.KO Mass Comparator
* HRP 500.5Y.KO * Mass Comparator - with self-centring weighing pan
HRP 1000.5Y.KO Mass Comparator
* HRP 1000.5Y.KO * Mass Comparator - with self-centring weighing pan
HRP 1000.5Y.KB Mass Comparator
* HRP 1000.5Y.KB * Mass Comparator - with self-centring weighing pan
HRP 2000.5Y.KO Mass Comparator
* HRP 2000.5Y.KO * Mass Comparator - with self-centring weighing pan

USER MANUAL

IMKO-08-08-09-22-ENG

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RADWAG BALANCES AND SCALES
ADVANCED WEIGHING TECHNOLOGIES

If you are reading this, it means that you are bound to achieve success.
You have purchased a device that was designed and manufactured to give you years of service.
Congratulations and thank you for selecting RADWAG product.

September 2022

Contents

1. GENERAL INFORMATION

1.1. Intended Use

5Y mass comparators enable determining difference between mass of a test weight (B) and known reference weight (A) during calibration process.

Mass comparators are widely applied in laboratories and in national metrological institutes for mass standards and weights calibration.

1.2. Precautions

- Prior first use, carefully read this User Manual. Use the comparator only as intended.
- Do not operate the touch panel using sharp-edged tools (knife, screwdriver, etc.).
- While loading the balance make sure that loads are placed in the very centre of the weighing pan.
- Load the weighing pan with loads gross weight of which does not exceed instrument's measuring range (maximum capacity).
- In case of damage, immediately unplug the instrument from the mains.
- Mass comparator to be decommissioned, should be decommissioned in accordance with valid legal regulations.
- Not intended for usage within EX zones. Mass comparator is not designed to operate in EX zones.

1.3. Warranty Conditions

A. RADWAG feels obliged to repair or exchange all elements that appear to be faulty by production or by construction,

B. Defining defects of unclear origin and means of their elimination can only be realized with assistance of manufacturer and user representatives,

C. RADWAG does not bear any responsibility for damage or losses resulting from unauthorized or inadequate performing of production or service processes,

D. Warranty does not cover:
- mechanical damage caused by product exploitation other than intended, defects of thermal and chemical origin, defects caused by lightning, overvoltage in the power network or other random event,
- mechanical damage caused by mass comparator exploitation other than intended,
- mass comparator damage, if service claims removing or destroying protective stickers which secure its housing against unauthorized access,
- damage caused by liquids, water and natural wear,
- mass comparator damage caused by inappropriate setting or by electrical wiring failures,
- damage caused by overloading of the mechanical measuring system,
- maintenance activities (mass comparator cleaning).

E. Loss of warranty takes place if:
- a repair is carried out outside RADWAG authorized service point,
- service claims intrusion into mechanical or electronic construction by unauthorized people,
- other version of the operating system is installed in a mass comparator,
- mass comparator does not bear company protective stickers.

F. Detailed warranty conditions are listed on a service card.

1.4. Supervision over Metrological Parameters

Metrological parameters of mass comparator need to be checked in determined time intervals. Inspection frequency depends on ambient conditions in which the mass comparator is used, types of performed processes and accepted quality management system in organization.

1.5. User Manual Significance

It is very important to read the user manual carefully before switching on and starting up mass comparator operation, even if you are experienced and have worked with this type of comparator

before. This user manual contains crucial information for correct operation of the mass comparator; following the guidelines guarantees trouble-free operation of the comparator.

1.6. Operator Training

Mass comparator has to be utilized and supervised only by operators who are trained and experienced in using such type of weighing instruments.

2. TRANSPORT AND STORAGE

2.1. Delivery Checklist

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

2.2. Packaging

Keep all package elements should your device be transported in the future. Remember that only original packaging can be used for shipping purposes. Prior packing, uncouple any cables, remove any separable components (weighing pan, shields, inserts). The mass comparator components shall be packed into an original packaging, thus being protected against potential damage during transportation.

Caution:
While preparing the mass comparator to be packed, disassemble the comparator in reverse order to the comparator installation presented in section 3. Make sure the mechanism interlocks are reassembled to prevent damage of the comparator.

3. UNPACKING AND INSTALLATION

3.1. Workstation

- Mass comparator has to be stored and used in locations free of vibrations and shakes, free of air movement and dust.
- Ambient air temperature cannot exceed the range of: +15 °C ÷ +30 °C and its change cannot exceed 0.5°C/12h.
- Relative humidity range: 40%÷60% and its change cannot exceed 2%/4h.
- Mass comparator has to be located on the floor that is not affected by vibrations and distant from heat sources.
- Take special precaution when calibrating magnetic weights, as part of the comparator is a strong magnet. Weights magnetic cannot exceed the values presented in the table below:

Susceptibility, χ

Weight class	E_1	E_2	F_1	F_2
m ≤ 1 g	0,25	0,9	10	-
2 g ≤ m ≤ 10 g	0,06	0,18	0,7	4
20 g ≤ m	0,02	0,07	0,2	0,8

3.2. Unpacking

Cut the adhesive tape. Take the device out of the packaging. Open the accessory box, take the device components out of it.

Standard delivery components list

- Mass comparator
- Weighing pan
- Indicator
- Power supply
- Set of screws

Prior mass comparator installation, read this user manual in order to correctly prepare the device for operation. Install the mass comparator at the workstation.
Caution: Be careful so as not to damage the mechanism. At least 2 people are required for mass comparator installation.

3.3. Connectors

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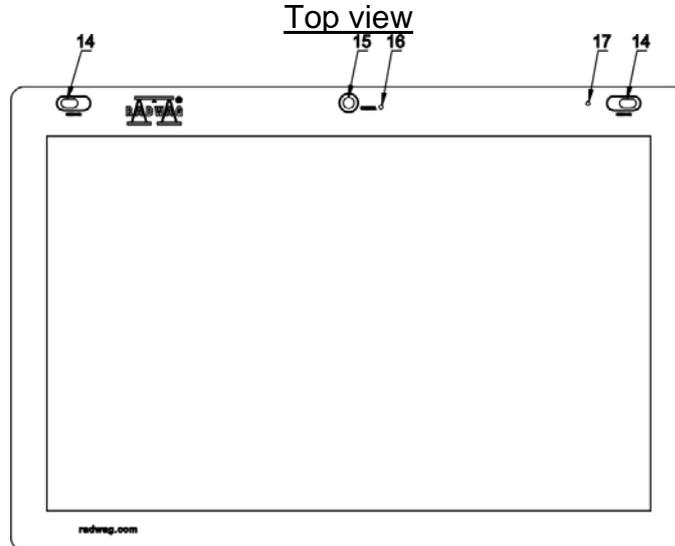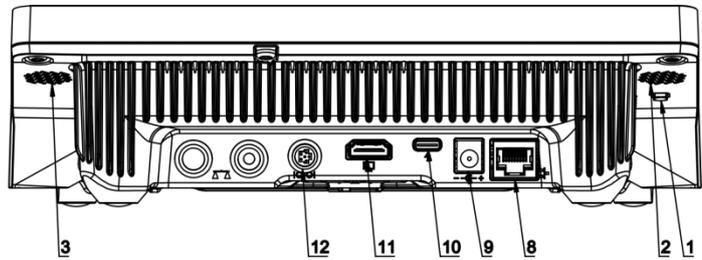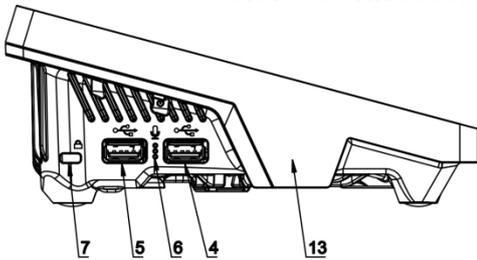
1	Button used to hard restart or to switch the balance off/on.	*10*	Power supply socket – USB type C
2	Left speaker	*11*	HDMI socket
3	Right speaker	*12*	Media box socket
4	USB type A	*13*	RFID sensor
5	USB type A	*14*	Proximity sensors
6	Microphone	*15*	Camera
7	Kensington Lock	*16*	Camera diode
8	Ethernet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

3.3.1. HRP 200 and HRP 500 Mass Comparators Unpacking

1. Take the platform out of the packaging. Hold only the 'EXTERNAL FRAME'.
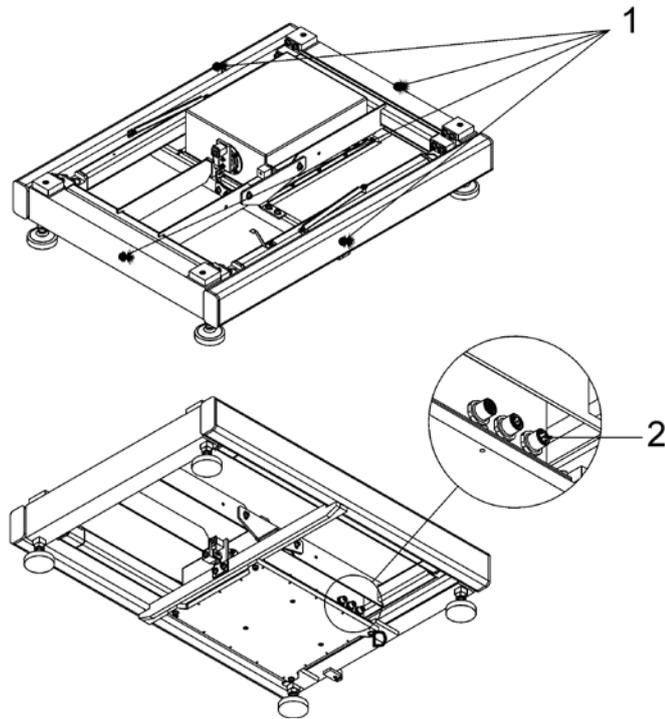
2. Connect the terminal or computer to the weighing module.
3. Install weighing pan receivers, fit them into lever seats.
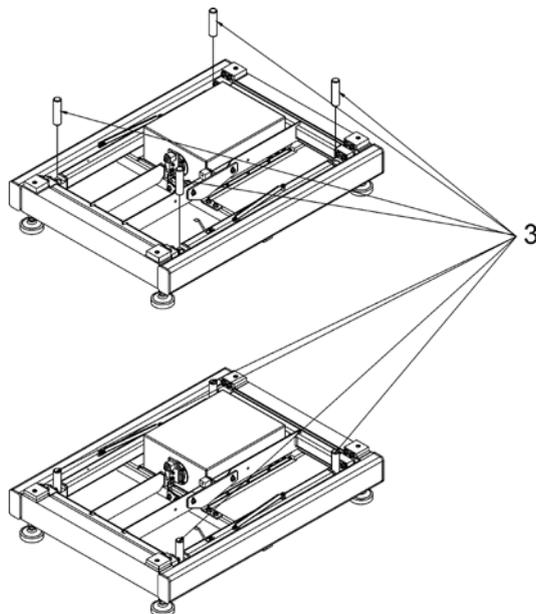
4. Disassemble transport lock by undoing screws and removing fixing washers.
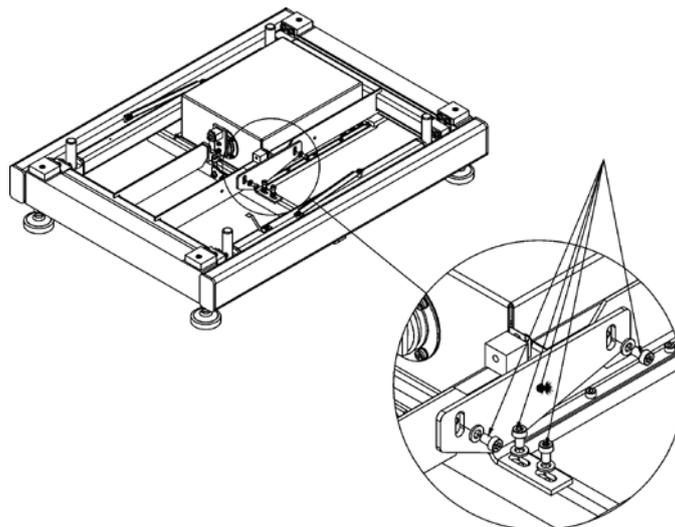
5. Install the weighing pan.
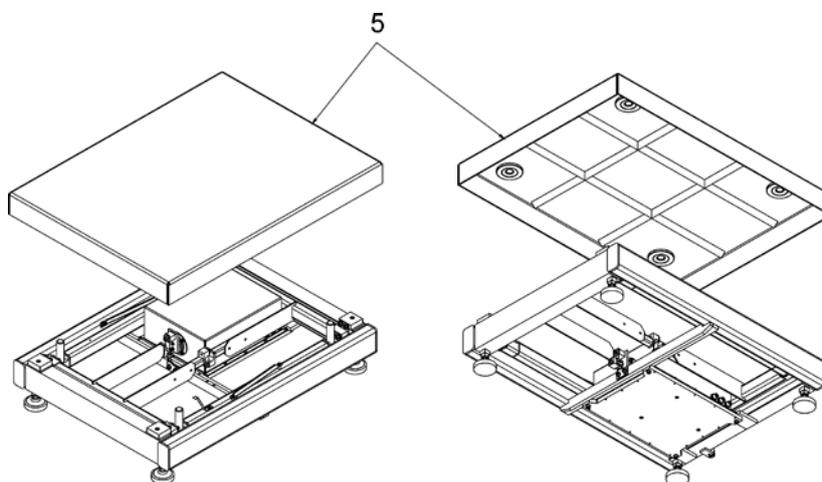
6. Place the device on a flat and even surface. Keep it far away from any sources of heat.

7. Level the device, to do it turn its feet left/right. Keep turning the feet until the air bubble takes central position.

Poziomowanie prawidłowe   Poziomowanie nieprawidłowe

3.3.2. HRP 1000 Mass Comparator Unpacking

1.Take the platform out of the packaging. Hold only the 'EXTERNAL FRAME'.
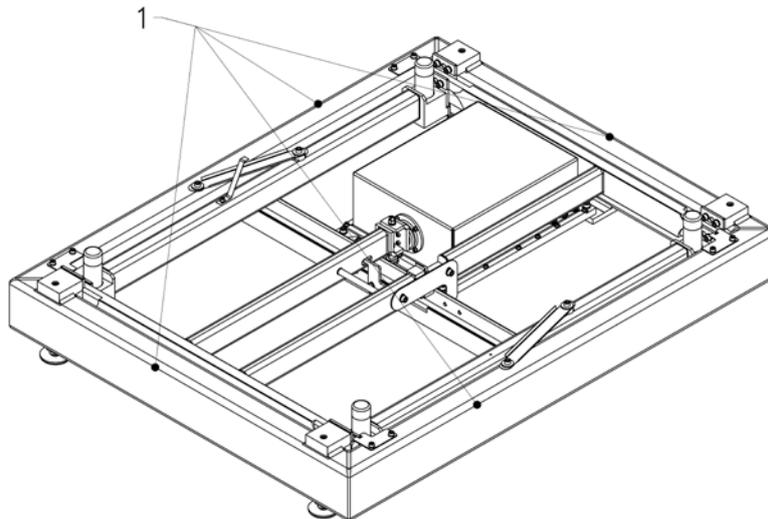
2.Connect the terminal or computer to the weighing module (3).
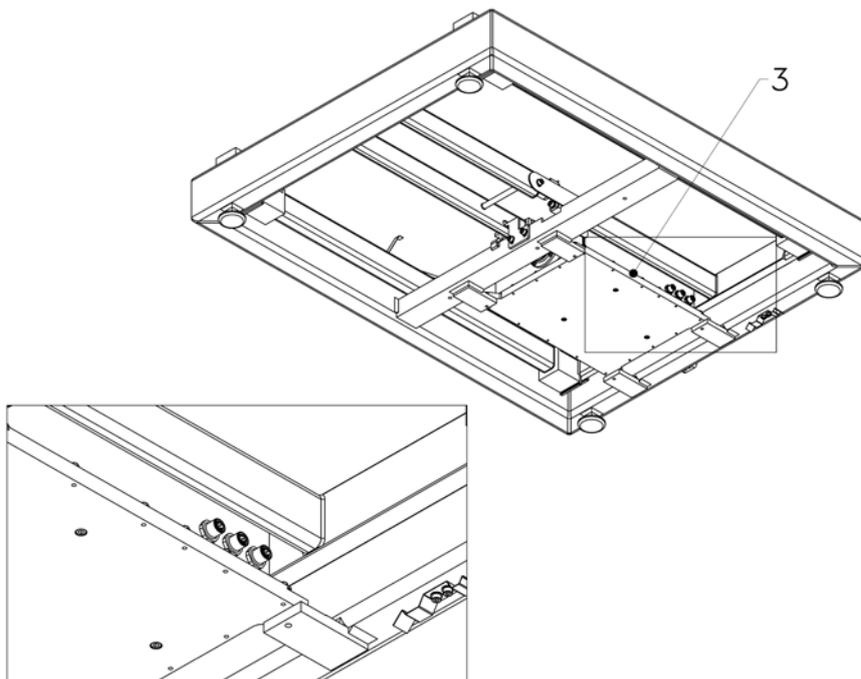
3.Install weighing pan receivers (4), fit them into lever seats (5).
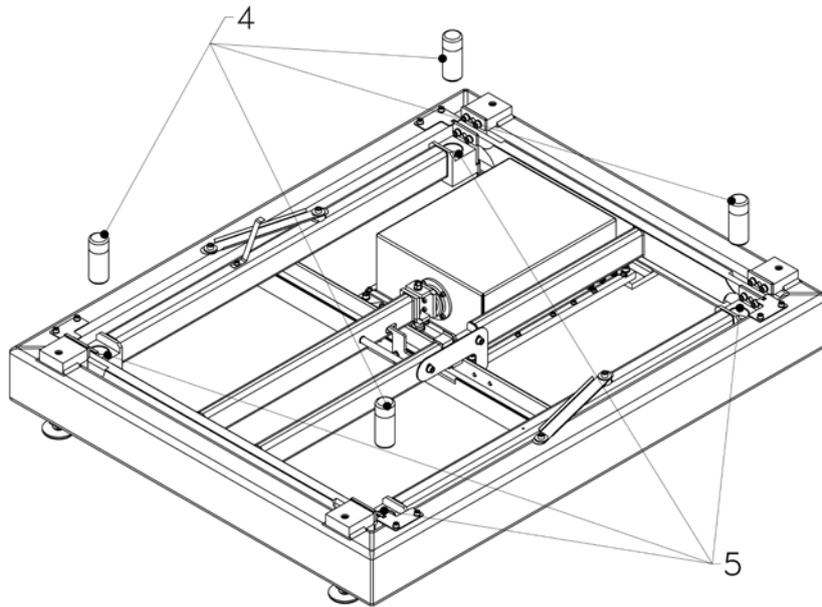
4. Disassemble transport lock by undoing screws and removing fixing washers (6).
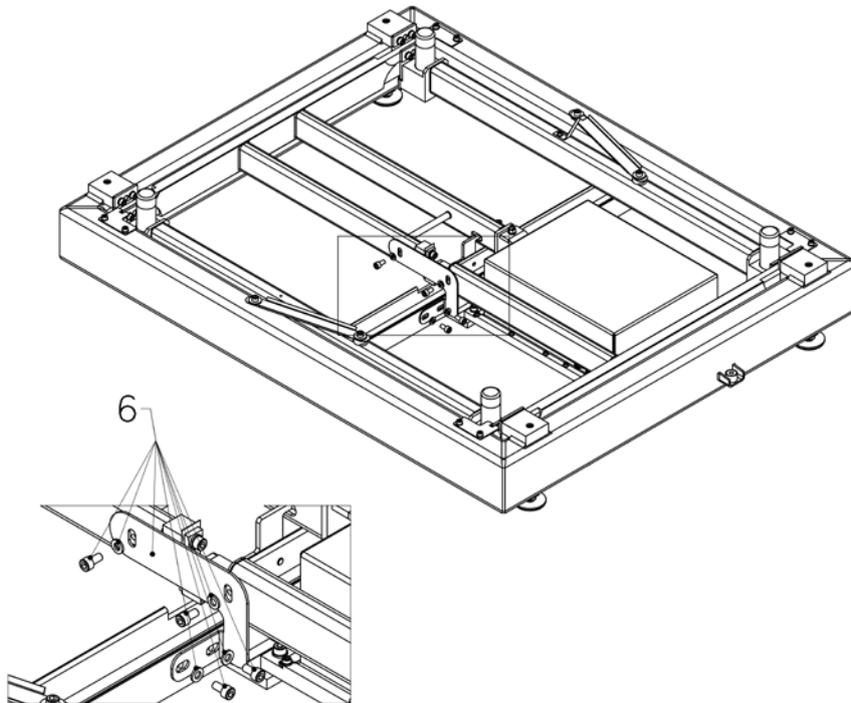
5. Install the weighing pan (7).

6. Place the device on a flat and even surface. Keep it far away from any sources of heat.

7. Level the device, to do it turn its feet left/right. Keep turning the feet until the air bubble takes central position.

Poziomowanie   Poziomowanie
prawidłowe   nieprawidłowe

3.3.3. HRP 2000 Mass Comparator Unpacking

1. Take the mass comparator out of the packaging using hoist. Procedure:
   • Unscrew 4 screws (1) presented in the figure below.
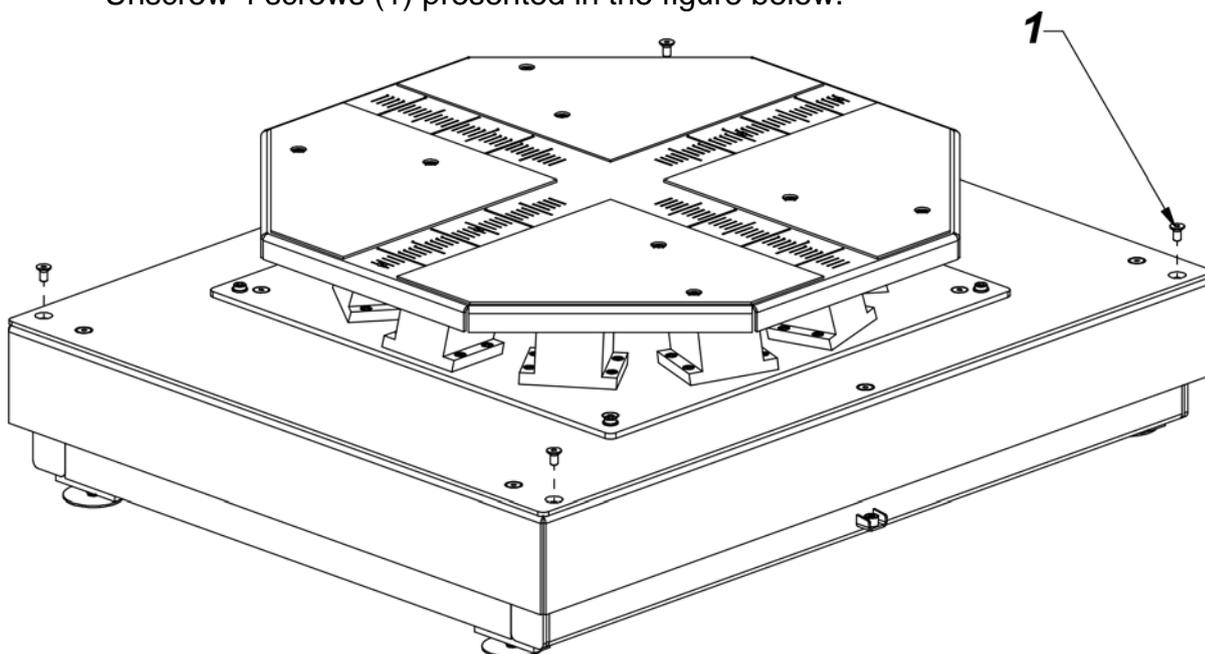
• Screw 4 screws with eyelets (2). Using cords and hoist take the mass comparator out of the packaging and place in the place of use on a flat and even surface. Keep it far away from any sources of heat.
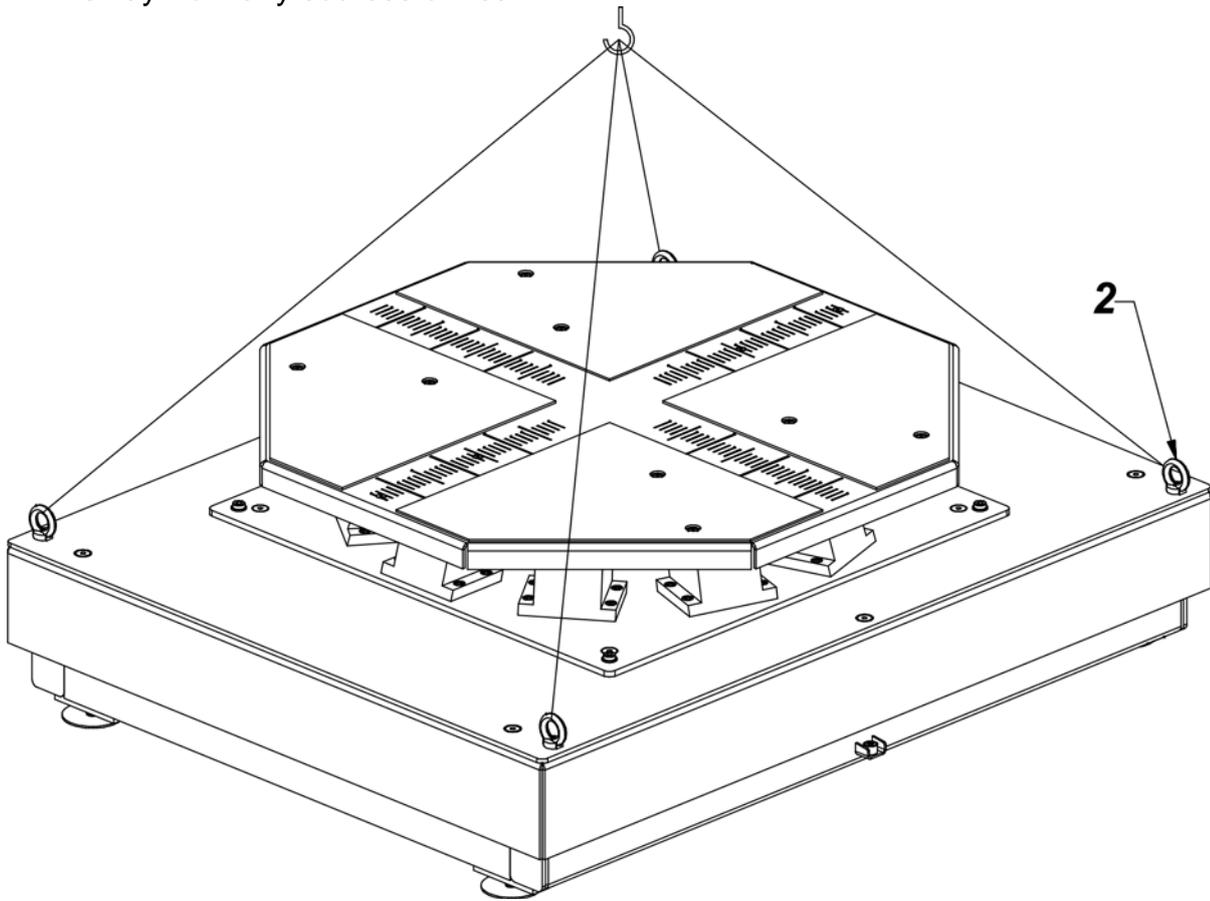
• Upon locating the mass comparator in the place of use, unscrew the screws with eyelets (1), (2) and (3).
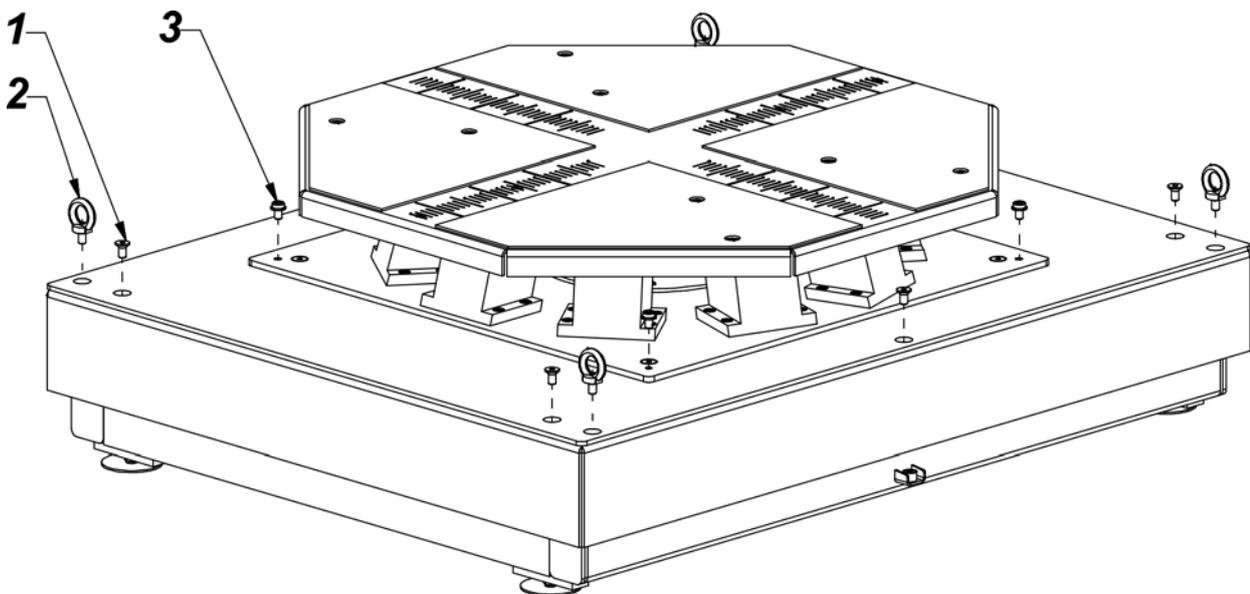
2. Replace the screws (3) with screws with eyelets (2) and using hoist cords disassemble the weighing pan plate (4).

4
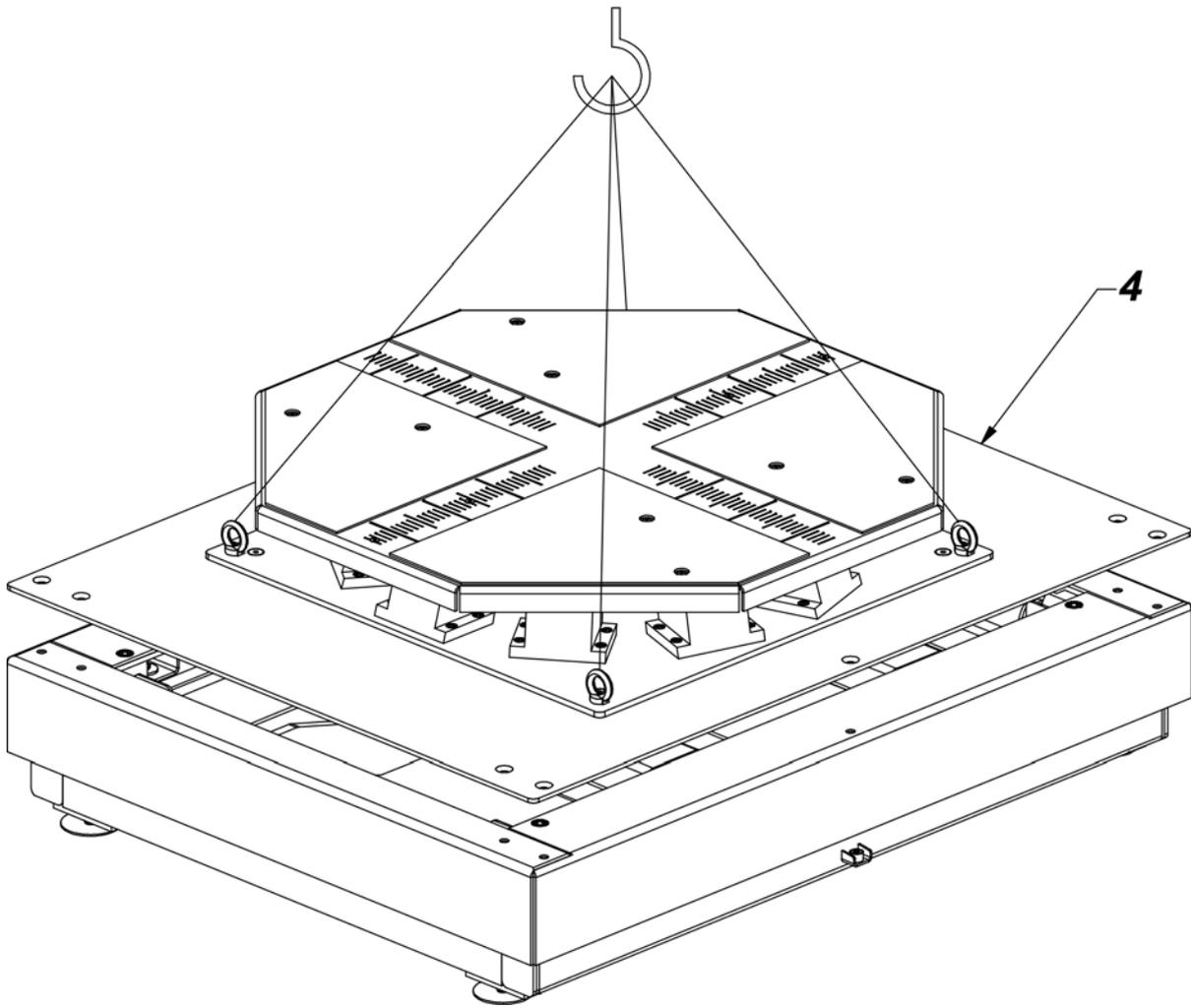
3. Connect an indicator or a computer to the weighing module.
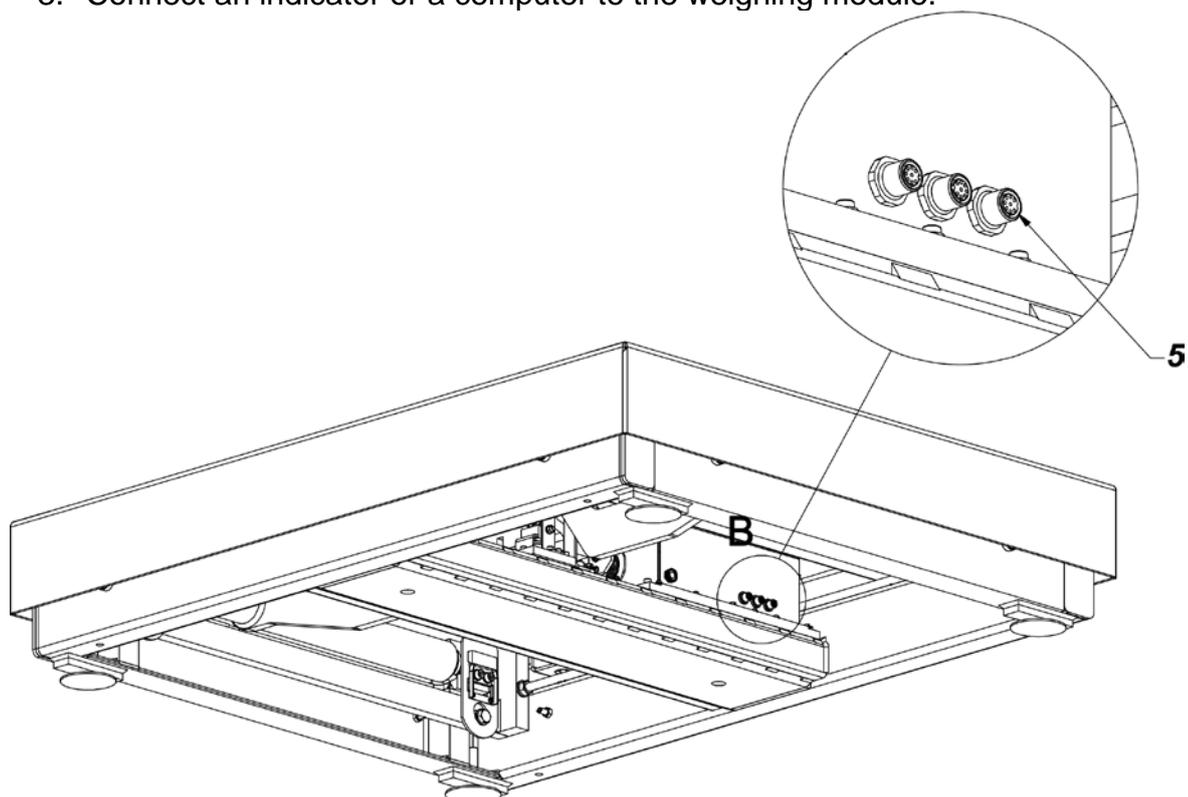
4. Disassemble transport interlocks.
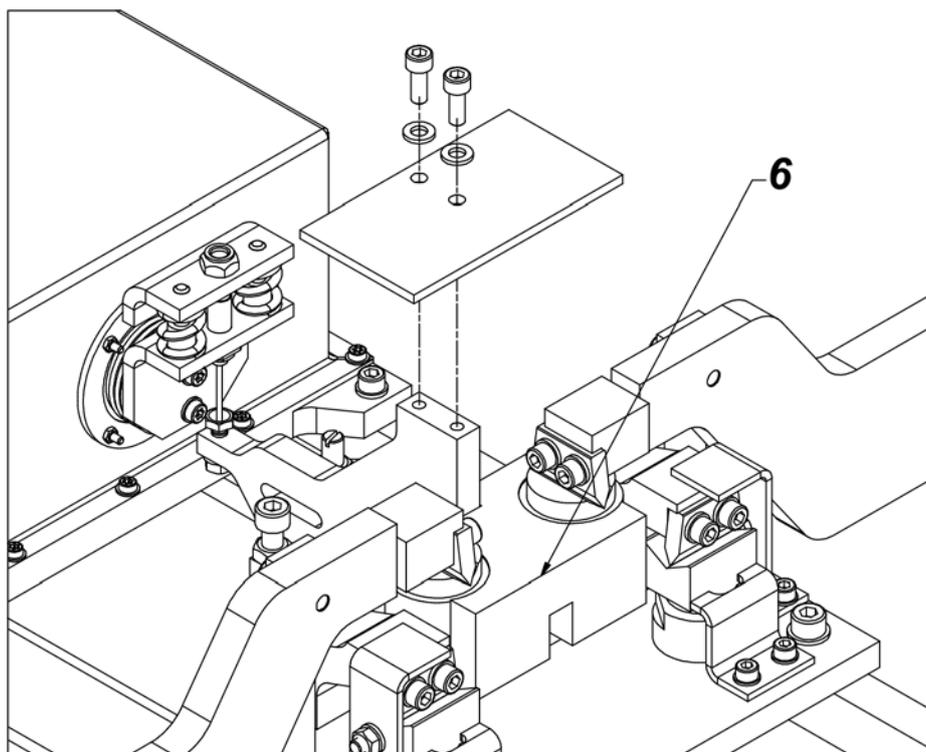
5. Set the bumpers. Loosen the nuts in all four corners. Unscrew the screws and set 1 mm gap. Tighten the nuts.
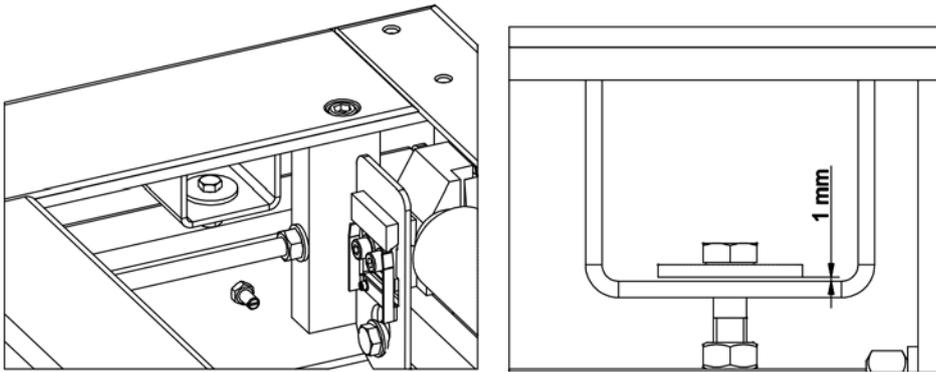
6. Level the mass comparator:
   Screw foot no. 3 so that feet no. 1, 2, 4 form a plain surface on which mass comparator frame is based.
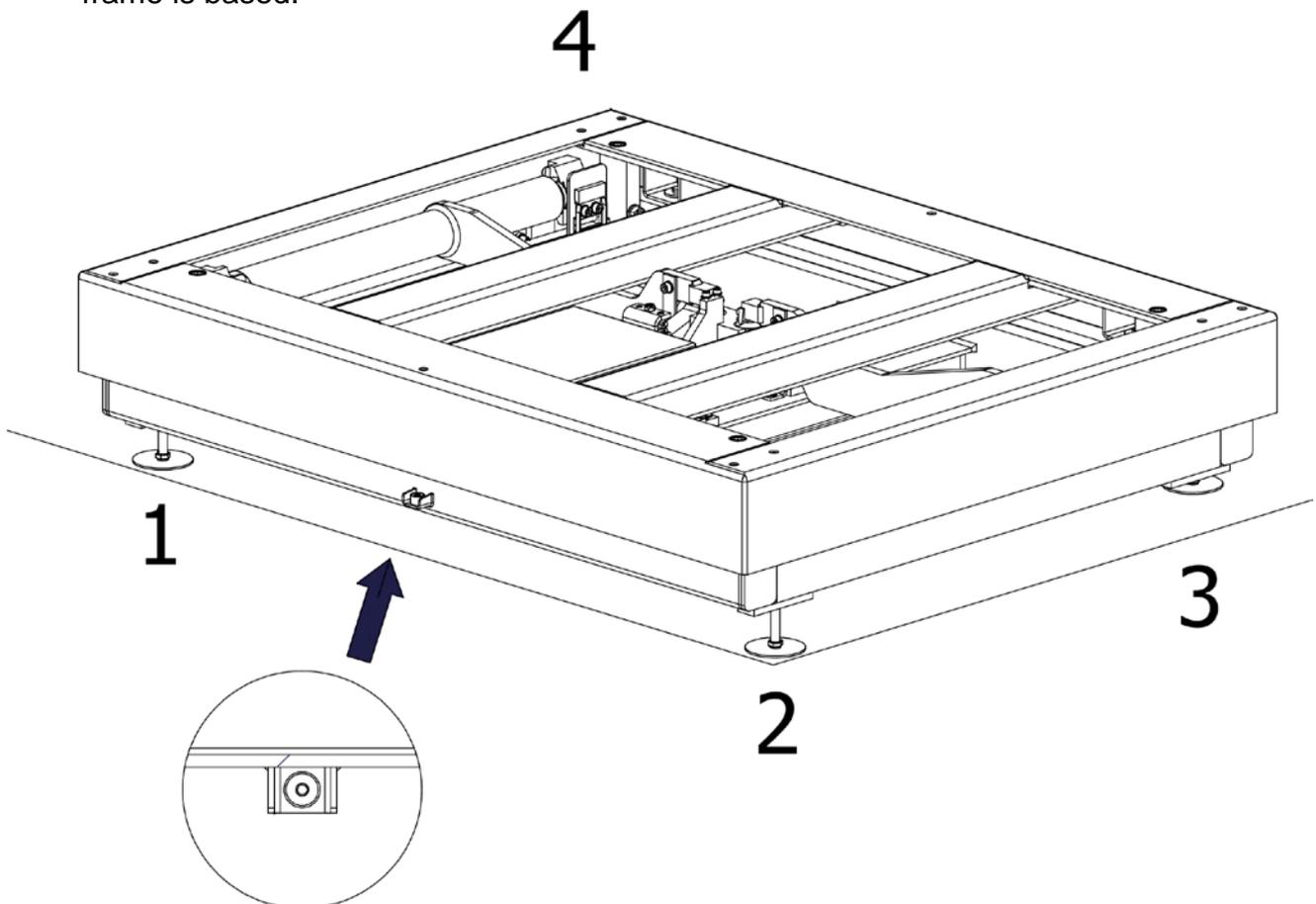
Level the platform using feet no. 1, 2 and 4 until the air bubble takes central position.

Unscrew foot no. 3 so that it rests on the ground. Do not exert stress on platform frame. Do not change the level of the mass comparator (the air bubble has to remain in central position).

7. Install the weighing pan and screw it to the mechanical design.

4
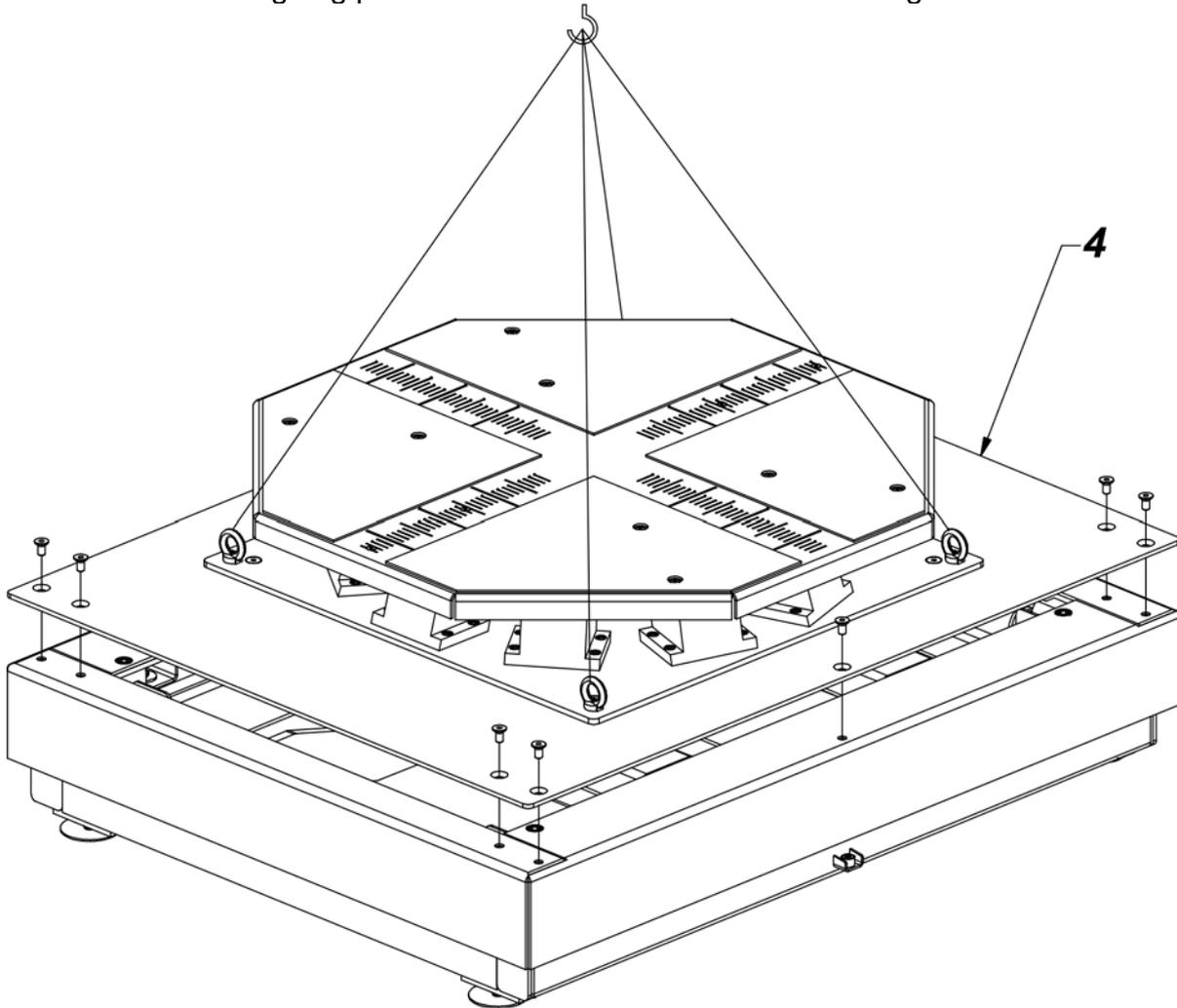
10. Turn on the power.

3.4.   Maintenance Activities

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

1. Disassembly a weighing pan and other detachable components. Be careful so as not to damage the mechanism.
2. Using handheld vacuum cleaner remove dust from the weighing pan.

Cleaning powder-coated components:

For preliminary cleaning stage you need running water or wet sponge featuring large holes, this will help you to remove loose, heavy dirt.

Do not use cleansers containing abrasive substances.

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

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

<u>*Cleaning aluminium components:*</u>

While cleaning aluminium components use products acid by nature, e.g. spirit vinegar, lemon. Do not use abrasive substances. Avoid using hard brush, this may cause scratches. It is recommended to use microfiber cloth.

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

<u>*Cleaning stainless steel components*</u>
When cleaning stainless steel components, the following table should be followed, which lists the types of contamination and ways of removing it.

Fingerprints	Clean with alcohol or dilutant. Rinse with clean water and wipe dry.
Oils, fats, greases	Wash with organic solvents and then clean with warm water with soap or mild detergent. Rinse with clean water and wipe dry.
Temperature stains and discolorations	Wash with a gentle abrasive cleaner, clean lightly according to the direction of the surface structure. Rinse with clean water and wipe dry.
Strong discoloration	Clean lightly according to the direction of the surface structure. Rinse with clean water and wipe dry.
Traces of rust	Moisten with oxalic acid solution and leave for about 15-20 minutes, then wash with warm water with soap or mild detergent. Rinse with clean water and wipe dry.
Paints	Wash with paint solvent and then rinse with warm water with soap or mild detergent. Rinse with clean water and wipe dry.
Scratches on the surface	Gently polish the surface with a non-woven fabric (iron-free) according to the direction of the surface structure. Wash with a gentle abrasive cleaner. Rinse with clean water and wipe dry.

<u>*Cleaning ABS components:*</u>

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

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

3.5. Connecting the Weighing Instrument to the Mains

The mass comparator can be connected to the mains only with a power supply that comes standard with a particular model. Nominal voltage of the power supply (specified on the power supply data plate) has to be compatible with the power from the mains.
Plug the mass comparator to the mains, i.e. connect the power supply to the socket first, next connect its connector to a port located at the back of the comparator housing.

3.6. Temperature Stabilization Time

Before start of the measuring processes, it is necessary to wait until the mass comparator reaches thermal stabilisation.
For mass comparators that were stored in much lower temperatures than the workroom temperature, before being plugged to the mains must be subjected to thermal stabilisation that shall take at least 12 hours. During the thermal stabilization, the indications on the screen can change. Potential workroom temperature change shall occur gradually and slowly in the course of the weighing instrument operation.

3.7. Connecting Additional Hardware

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

4. START-UP

- Power the balance.

CAUTION: There are two sockets on the balance for connecting to the power supply. The indicator has one socket, and the weighing mechanism housing has the other. The balance can be powered from both the indicator and the weighing mechanism, but not simultaneously from both sides, using two power supplies. Such a connection may result in damage to the balance and power supplies.

- After a while, the procedure of loading the operating system with RADWAG software gets started. During start-up, the signalling diodes and LEDs at the front of the indicator start blinking.
- Upon balance start-up, the home screen is displayed
- Upon completed start-up of the remaining balance series, the home screen is displayed automatically.
- The balance runs with no user logged in. In order to start operation, it is necessary to log in (for detailed login procedure, read later sections of this user manual).

Caution: *Prior to the balance start, make sure that there is no load on the weighing pan.*
In accordance with the EN 45501 standard, verified balances cannot display mass value below -20e. If the indication value is below -20e, <Lo mass> information is displayed.

Press ›0‹ *key to zero the balance.*

| If the software crashes during operation, carry out a hard reset. To do this, press and hold for about 5s the button on the indicator. The software will reset and restart. | |

- 21 -
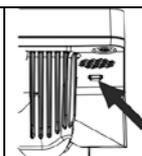
5. OPERATION PANEL

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

5.1. Operation Panel

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.

5.2. Voice Commands

The balance software allows several operations to be performed using voice commands. These are: tare, zero, print/save measurement. The commands must be spoken in English, in the correct sequence. Below is the structure of the individual commands.

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

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

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

How to say the command: black text is mandatory, green - may or may not be spoken, red - one of the texts is mandatory to be spoken
e.g: for Print command: **ellipsis save mass.**

Procedure:

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

9. Press < >.

10. The voice command recognition procedure is initiated and the user is informed about it through the displayed messages.
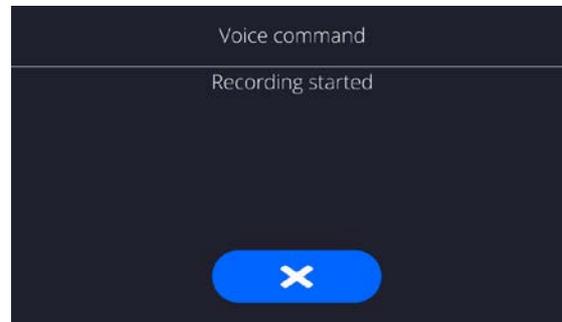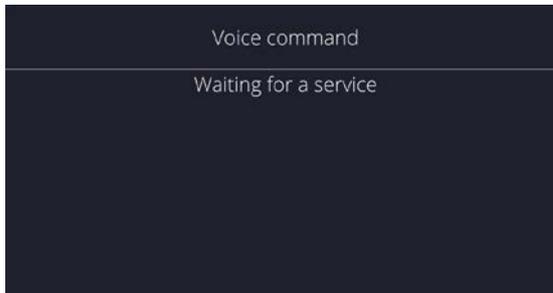
11. Say the command as described above.

12. If the command is spoken correctly and the balance program recognizes the command, a message is displayed and the command is automatically executed.
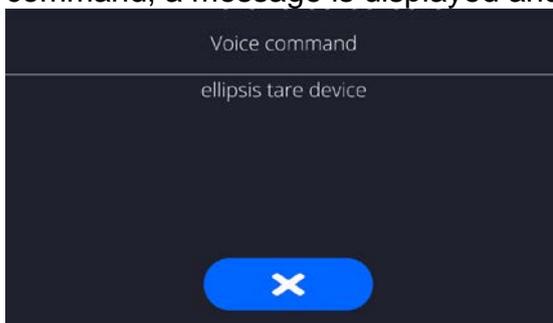
5.3. Return to Weighing

Modifications introduced into balance memory are automatically saved upon return to weighing operation.

Procedure:

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

6. PROGRAM

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

Function groups:

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

The menu comprises parameters related to balance settings, functions and profiles.
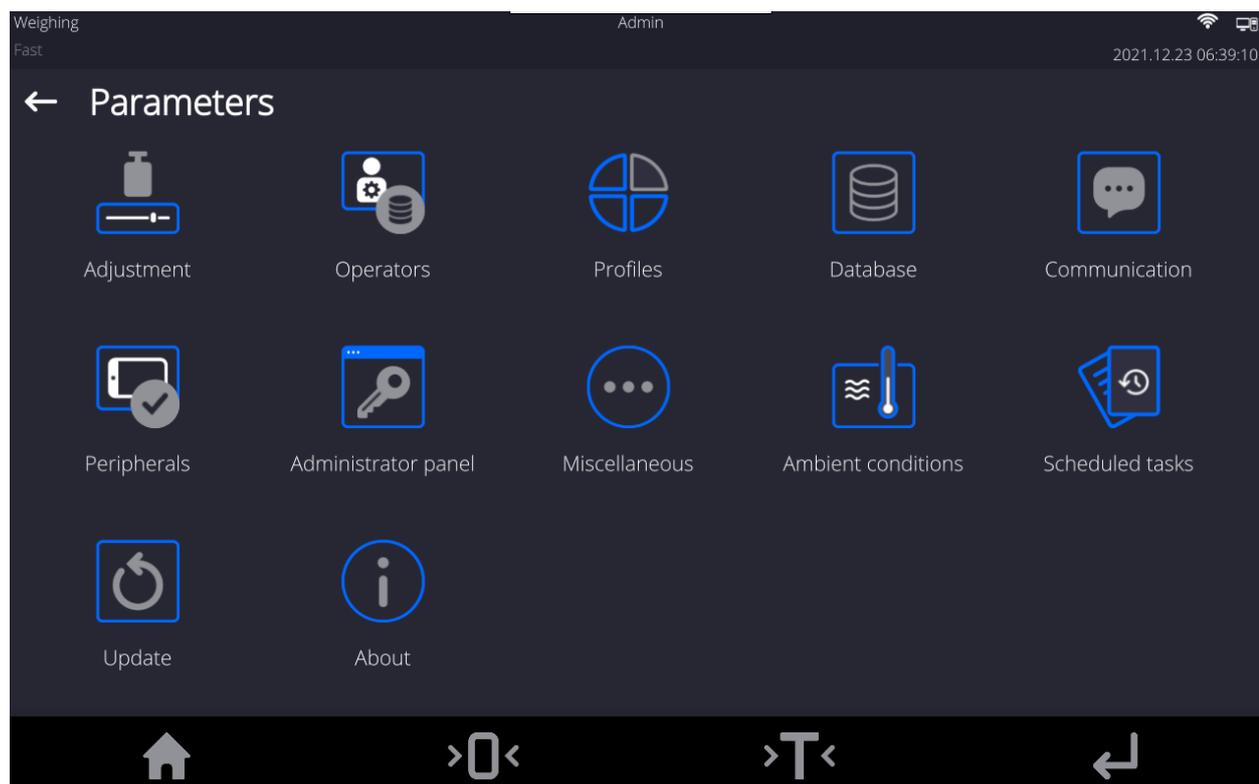
7. WEIGHING RESULT WINDOW

The home screen features 5 sections:
- Top section displaying data on active working mode, logged-in user, date, time, computer connection status.

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

- Section comprising supplementary information on currently performed operations (grey background).
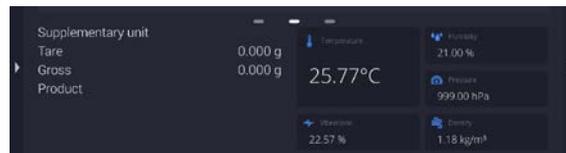
CAUTION:
Data contained in this workspace is freely configurable. For detailed information, read of this user manual.

- Section comprising on-screen function buttons:
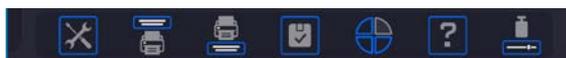
CAUTION:
The operator can define the on-screen function buttons. For detailed information, read of this user manual.

- Section comprising on-screen function buttons:

8. LOG IN OPERATION

In order to access operator-related parameters and edit databases, you need to log in as an operator with **<Administrator>** permission level.
To do this, pull down the menu at the top of the display.
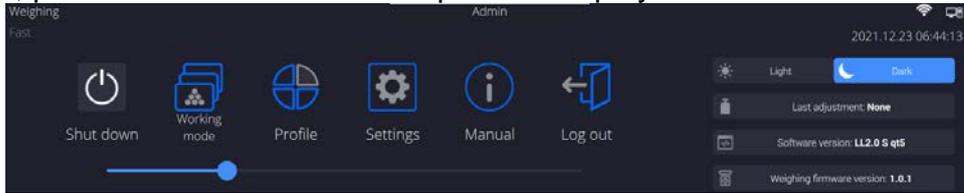
First Log in:
- Pull down the top menu, press **<Log in>** field, operators database window is opened featuring **<Admin>** entry.
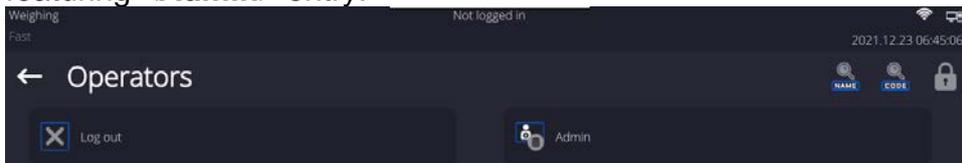
- Press **<Admin>** entry, wait for the on-screen keyboard with a password box to open.
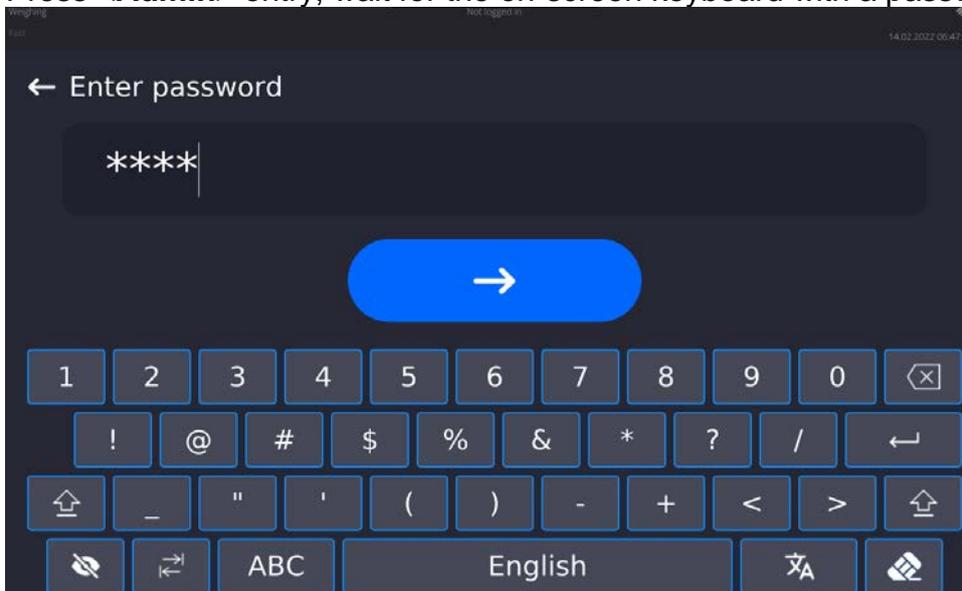
- The default password for <Admin> is **„1111"**.
- Enter the password and press [→] button to confirm.
- Press [👁] button to unmask the entered password.
- The home screen is displayed, **<Not logged in>** sign is replaced by **<Admin>** sign.

CAUTION: After first logging in, enter operators and assign appropriate permission levels and individual access passwords to them (for detailed procedure, read sections 10 and 11). While logging in again, select an operator from the list and enter the password, the program initiates operation with permission level set for the selected operator.

Log out operation:
- Pull down the menu at the top of the display.

- Press <Log out> field.
- The home screen is displayed, logged in operator name is replaced with **<Not logged in>** entry.

9. COMPARISON

Load the weighing pan with test weight. Upon displaying ◣◢ marker on the left, you can read weighing result.

9.1. Selecting Comparison Unit

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

Options:

unit	denotation	unit	denotation
gram	[g]	Taele Singapore	[tls]
milligram	[mg]	Taele Taiwan	[tlt]
carat	[ct]	Taele China	[tlc]
pound	[lb]	Momme	[mom]
ounce	[oz]	Grain	[gr]
ounce Troy	[ozt]	Newton	[N]
pennyweight	[dwt]	Tical	[ti]
Taele Hongkong	[tlh]		

9.2. Correct Comparison Principles

To assure long-term operation and correct comparison of the weights, follow the rules presented below:

- Remember to run the mass comparator with unloaded weighing pan

YES	NO	NO	YES	NO
Avoid applying mechanical shocks to the weighing pan.			Place weighed loads centrally on the weighing pan:	
NO	NO			
Avoid side loading, in particular side shocks:				
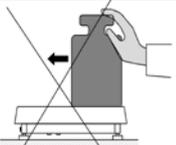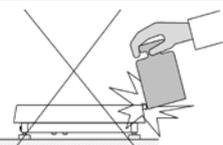
9.3. Mass Comparator Levelling

The mass comparator features AutoLEVEL System, which continuously monitors its level status. The level status is signalled on the top of the display and on detecting any change it indicates appropriate information and/or starts an alarm. As a result, a window for adjusting the level is displayed.

Procedure:

- Press level status <⊙> pictogram located on the top of the display.
- Control panel of levelling function is displayed. It features level status and an image of mass comparator.
- Level the mass comparator, to do it turn the feet in a way indicated by blinking pictograms on the display – the level point moves towards the centre of the level circle.
- As the level point takes central position, its colour changes from red to green – which is a confirmation for correct level status.

9.4. Zeroing

To zero mass indication, press >0< key. Zero indication and the following pictograms are displayed: ·0· and ◣◢. Zeroing operation means determining a new zero point, recognized by the balance as precise zero. The balance can be zeroed only when the indication is stable.

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

9.5. Taring

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

Caution: *It is impossible to tare negative values. When you try to tare negative values, the weighing instrument responds with an error message. In such a case, zero the indication and repeat taring procedure.*

Entering Tare Value Manually
Procedure:

- Press >T< quick access button. The button is available regardless of the working mode you operate.
- An on-screen numeric keyboard is displayed.
- Enter tare value and press ✓ button.
- The balance returns to weighing mode. Tare value with „–" sign is displayed.

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

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

- Press >0< button,
- the <Net> marker gets deleted, a new zero point is determined.

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

- Press ![button] button,
- the <Net> marker gets deleted, a new zero point is determined.
- when the tare value exceeds 2% of the maximum capacity, -Err- message is displayed in order to inform you about the fact that operation cannot be carried out.

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

- press < ![icon] Deactivate tare> programmable button,
- the NET marker is deleted,
- the display indicates tare value,

- to restore the last tare value press < ![icon] Restore tare> button.

9.6. Running Working Mode

To run working mode other than currently operated one:
- Slide down the menu at the top of the display.
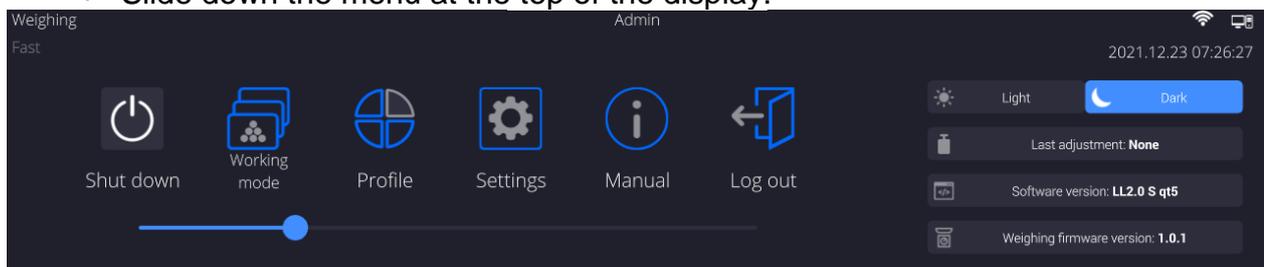
- Press <Working mode> option
- List of all working modes is displayed.
- Select the mode that is to be operated.

To run working mode other than currently operated one:
- Slide down the menu at the top of the display.
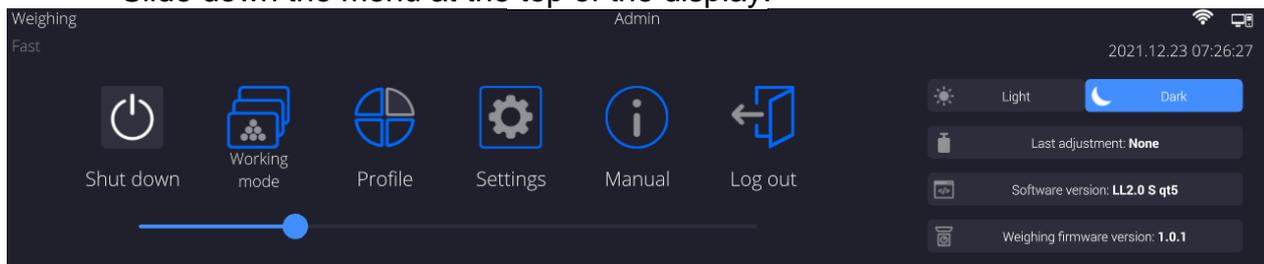
- Press <Working mode> option
- List of all working modes is displayed.
- Select the mode that is to be operated.

9.7. Working Mode Parameters

Each working mode has programmable parameters determining its functioning.
To access particular working mode parameters:

1. Slide out the menu on the left.
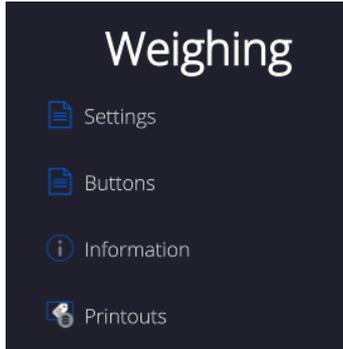
2. The following menu is displayed:
   - <Settings> - additional options.
   - <Buttons> - quick access buttons configuration.
   - <Information> - setting data that is to be displayed in the workspace.
   - <Printouts> - setting printout type and content.
3. Enter particular submenu and select the component that is to be modified.

Description of basic parameters of <Settings> menu is to be found in section 14.7, *Additional Parameters of the Weighing Mode*. For detailed information on all but basic parameters of particular working modes, read given working mode section.

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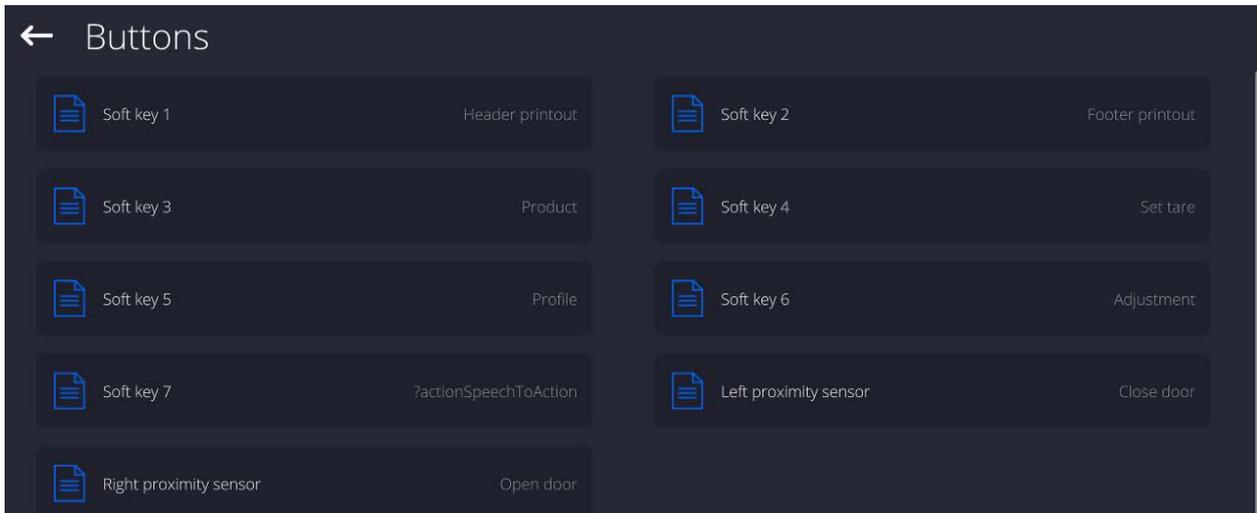
You can define up to 7 quick access buttons, which are to be displayed in the bottom bar. Upon assigning a function to a button a corresponding pictogram is displayed in the bottom navigation bar of the home screen. Each working mode features customized set of buttons. For complete buttons list, read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

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

A window with the available buttons is displayed automatically.
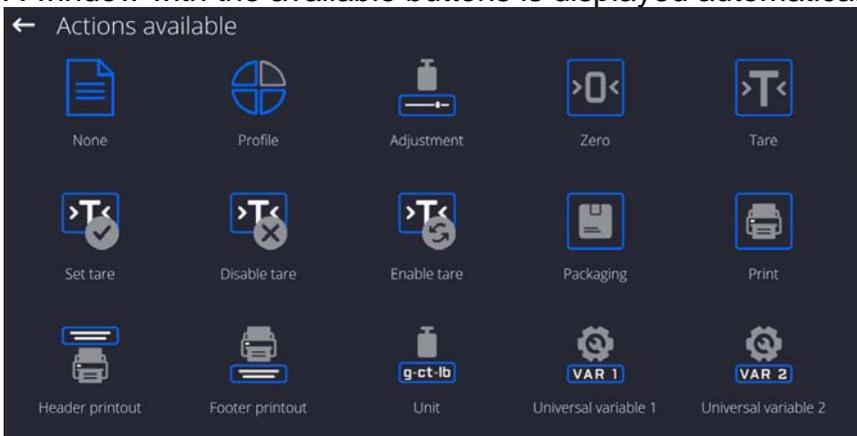
Press the respective button; the software returns to the home screen, and the selected button appears in the place where it was activated.

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

9.8.1. Proximity Sensors

The balance is equipped with two proximity sensors which enable touch free control.
The program detects four motions performed around the sensors:
1. Hand in a close vicinity to the <**Left proximity sensor**>.
2. Hand in a close vicinity to the right sensor <**Right proximity sensor**>.

List of operations to be assigned: None; Profile; Adjustment; Zero; Tare; Set tare; Disable tare; Enable tare; Packaging; Print; Header printout; Footer printout; Unit; Universal variable 1; Universal variable 2; Universal variable 3; Universal variable 4; Universal variable 5; Accept; Abort; Operator; Left door; Right door; Open/close door; Parameters; Product; Warehouse; Customer. Upon completed configuration procedure, the software runs function assigned to a particular proximity sensor, having detected motion around it. To provide correct operation, it is necessary to set respective proximity sensors sensitivity and delay (read section 33 of this user manual).

9.9. Information
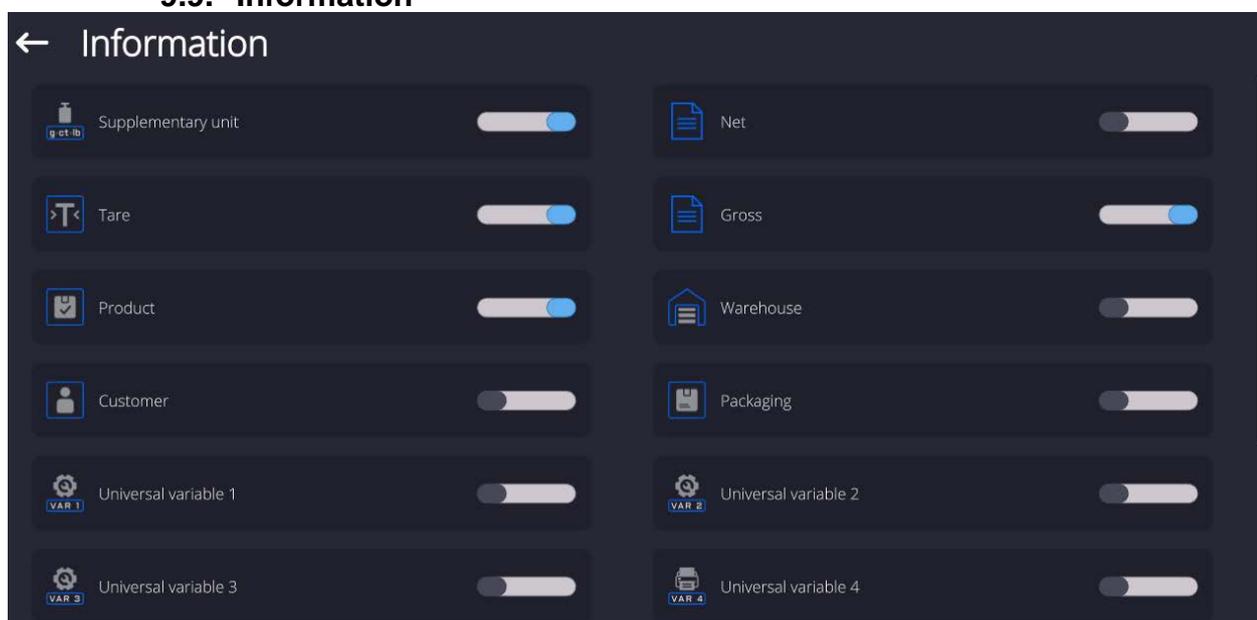
Information related to the weighing process is displayed on the left side of the the display.
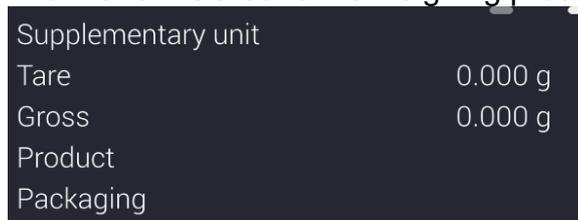
The workspace can contain up to six data. Mind that if you select more, only the first six of them are displayed.Each parameter features two options:
- – data enabled.
- – data disabled.

9.10. Working Mode – Comparator

<**Comparator**> working mode enables determining standard deviation for series of measurements. Standard deviation is determined based on ABBA, ABA or AB series of measurements, where:

A – reference weight
B – test weight

You can determine quantity of measurements in a series and ABBA, ABA or AB method. To do that, enter **<Working modes>** menu and **< Comparator>** submenu.

The results are calculated on the basis of the following tables and formulas:

For ABBA series

No.	A	B	B	A	$D = B_{mean} - A_{mean}$
1					D_1
2					D_2
3					D_3
4					D_4
5					D_5
…..					…
n					D_n

For ABA series

No.	A	B	A	$D = B - A_{mean}$
1				D_1
2				D_2
3				D_3
4				D_4
5				D_5
…..				…
n				D_n

For ABA series

No.	A	B	$D = B - A$
1			D_1
2			D_2
3			D_3
4			D_4
5			D_5
…..			…
n			D_n

Standard deviation is calculated by determining:

- ABBA and ABA differences for each measurement group:

$$D_i = \overline{B} - \overline{A}$$

- Mean value of difference between ABBA and ABA:

$$\overline{DX_i} \frac{1}{n} \sum_{i=1}^{n} D_i$$

- Standard deviation:

$$s = \sqrt{\frac{1}{n} \sum_{i=1}^{n} \left(D_i - \overline{DX_i}\right)^2}$$

9.11. Selecting Measuring Method in Mass Comparator

Particular working modes settings feature specific functions. The functions enable adapting mode operation to your individual needs. Working modes can be configured in **<Working modes>** submenu. Press grey area on the display to enter **<Working modes>** submenu.
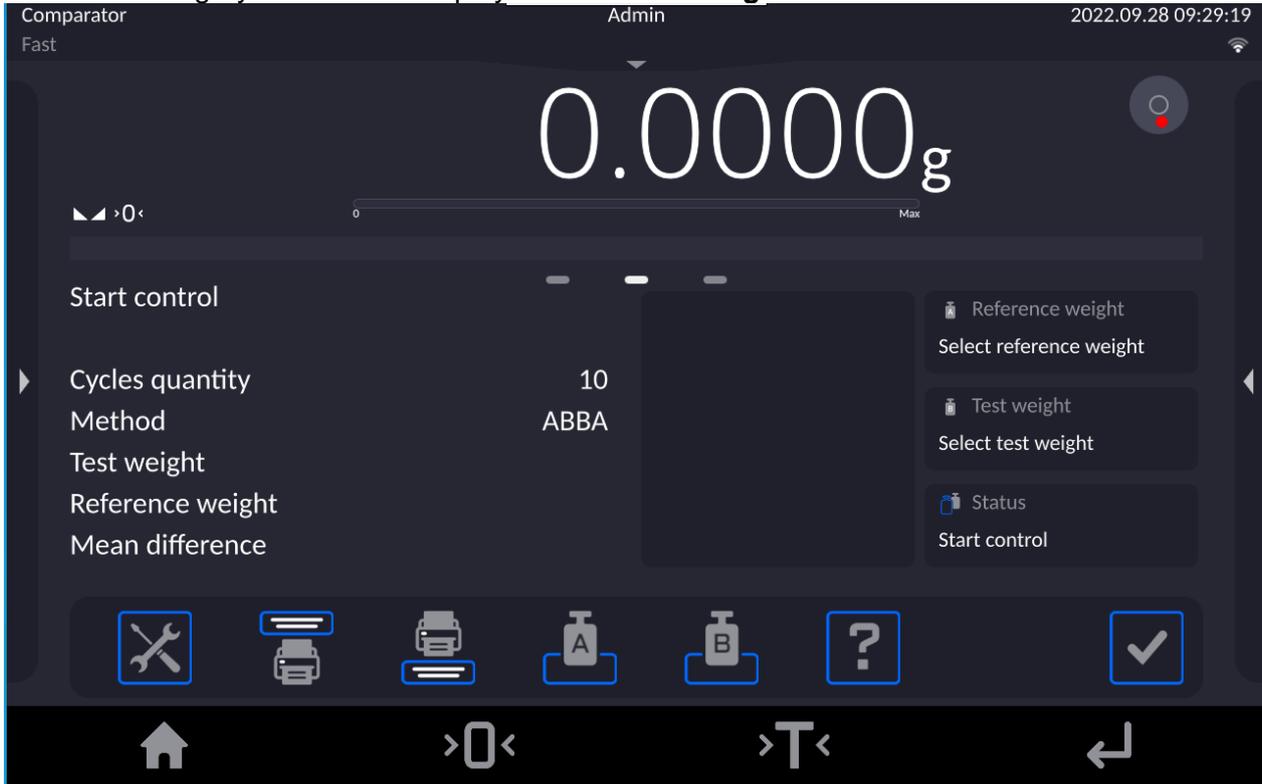
Press **<Settings>** key, working mode edit box is displayed:
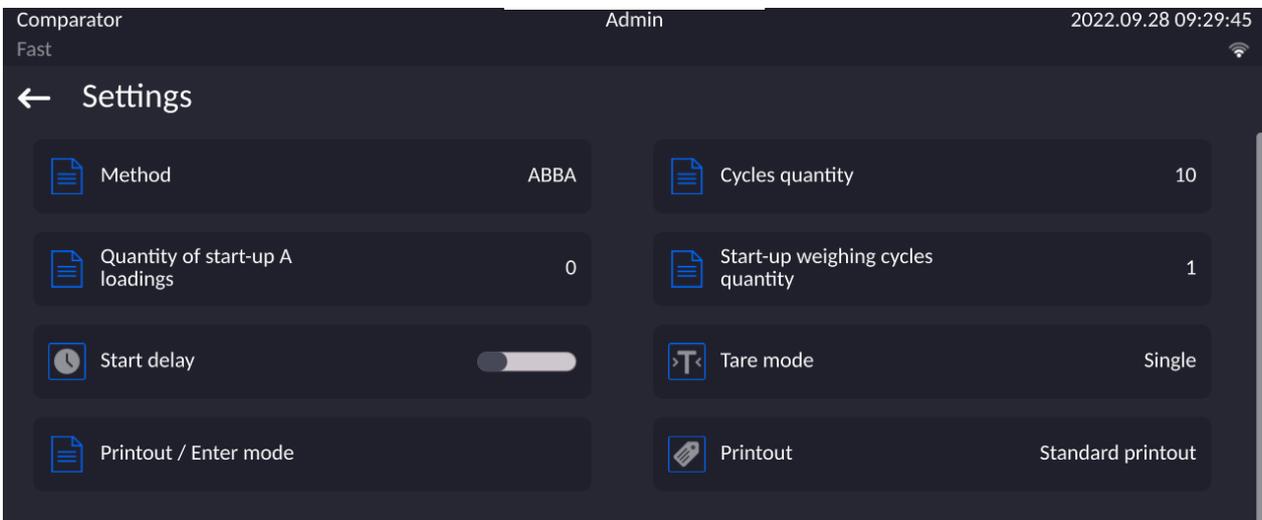
In order to change the method of weights comparison, press **<Method>** and select method from the list:

- ABBA
- ABA
- AB

9.12. Determining Cycles Quantity

Procedure:

- Press <Seyup> key, next select **<Profiles>**

- Enter **<Working modes**> submenu
- Select**< Comparator>** and press **< Settings>**
- Press **< Cycles quantity>** key, enter the quantity of weighing cycles and press [✓] key to confirm.

9.13. Determining Quantity of Start-up Weighing Cycles

Procedure
- Enter **< Working modes>** submenu,
- Select: **< 🔔 Comparator>** , next **< Settings>** and <**Start-up weighing cycles quantity>**. Edit box **<Start-up weighing cycles quantity>** and an on-screen keyboard are displayed,
- Enter respective value and press [→] key to confirm.

9.14. Start Delay

- Enter **< Working modes>** submenu,
- Select: **< Comparator>** , next **< Settings>** and <**Start delay>**. Edit box is displayed.
- Enter respective value:
- YES – during comparison process start, edit box is displayed for entering delay value, after this time comparison process is started automatically,
- NO - procedure starts immediately, without delays. Upon selecting the option, edit box is closed and description next to the parameter changes.

9.15. Tare Mode

- SINGLE,
   mass value saved to mass comparator on single pressing of TARE key. Subsequent pressing of TARE key determines new value of tare. Selecting product or packaging to which tare value is assigned causes automatic deleting of previously assigned tare value.
- SUM OF CURRENT,
   totalizing currently entered tare values for product and packaging (resulting from products and packaging selection out of the database) with possibility to add tare value entered manually. Upon determining tare value for a product or a packaging again, the tare value introduced manually is deactivated.
- SUM OF ALL,
   totalizing of all entered tare values.
- AUTOTARE
   Means of operation:
   Each first stable measurement result is tared. The NET pictogram is displayed. You can now determine net weight. Upon unloading the weighing pan and autozeroing, Tare value is automatically deleted.

9.16. Printout/Enter Mode

- PRINTOUT / ENTER KEY
   Never   –   printout disabled
   First stable   – first stable measurement is recorded
   Each stable   – all stable measurements are recorded
   Each   – printout of all measurements (stable and unstable), for verified mass comparator only stable measurements are printed (as in <Each stable> setting)
- AUTOMATIC MODE
   Never   –   printout disabled
   First stable   - first stable measurement is registered; next stable measurement is registered after unloading the weighing pan, returning the indication to the value below set threshold value and loading the weighing pan again with next weight.

Last stable   - last stable measurement is registered. The record takes place upon unloading the weighing pan and returning the indication to the value below set threshold value.

With interval – interval for
sending the indication to be printed out.

- THRESHOLD
Mass value obligatory for operation of automatic printout, set in grams.
- INTERVAL
Printout interval.
- PRINT REPORT
Yes – automatic printout upon completed calibration procedure
No - printout disabled

9.17. Printouts

Printout menu comprises two separate sections: standard printouts and non-standard printouts.
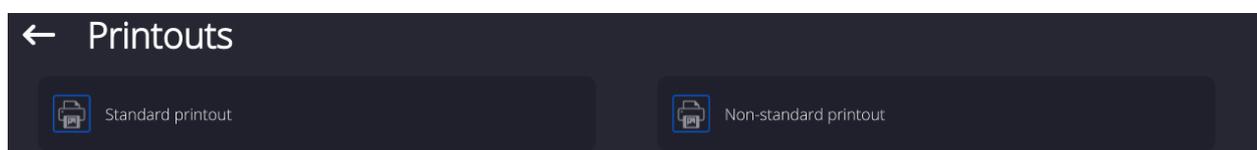
Standard printout
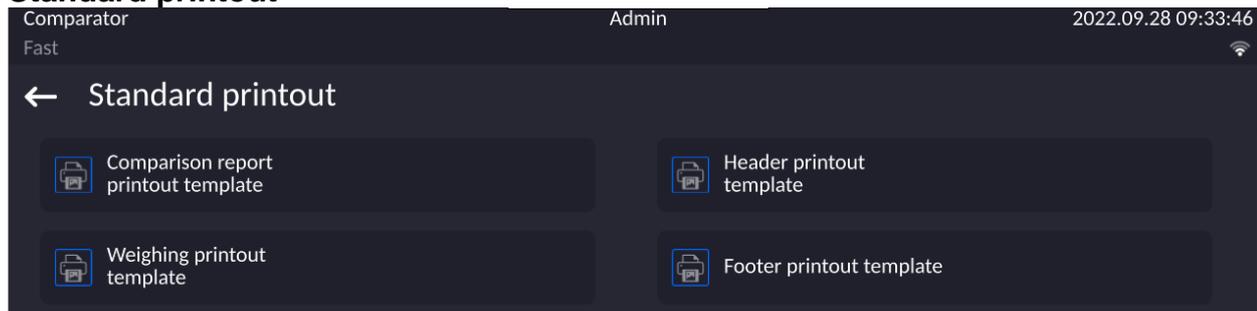
It comprises three internal sections containing different variables. For each variable, set – variable printout enabled or – variable printout disabled.

Procedure:

1. Press name of a selected template (Header – GLP Printout – Footer) and select variables that are to be printed.
    If a printout is a non-standard one, create it.

Printout content:
- Working mode
- Operator
- Report number
- Start date
- End date
- Task
- Order number
- Test weight number
- Reference weight
- Mass
- Weight class
- Measurements
- Mean difference of mass of reference and test

weight
- −Standard deviation
- −Cycles quantity
- −Method
- −Min temperature during process
- −Max temperature during process
- −Min humidity during process
- −Max humidity during process
- −Min pressure during process
- −Max pressure during process
- −Empty line
- −Dashes
- −Signature
- −Non-standard printout

9.18. Completed Comparison Processes Report

Upon each completed comparison process report is generated. The report is saved to **<Comparison reports>** database. The files are named by the date and time (hour) of mass comparison process.

Report template:
> *Report number C/31/10/11/11/43*
> *End date 2017.05.28 11:44:46*
> *n |A |B |A |D*
> *1 |0.000 |0.131 |0.001 |0.1305*
> *2 |0.002 |0.130 |0.003 |0.1275*
> *3 |0.004 |0.131 |0.004 |0.127*
>
> *Mean difference 0.12833 g*
> *Standard deviation 0.00189 g*
>
> *Method   ABA*
> --
>
> Signature
>
> ....

Using information from header and footer.

If this information is to be used:

- Press < Header printout> prior the procedure
- Carry out the procedure
  - Report is printed out automatically upon the last measurement result has been entered

  - The report can be printed out multiple times upon pressing < ⏎ **PRINT** > key.
- Press < Footer printout> upon procedure completion.

9.19. Display Arrangement

You can select information and quick access keys that are to be displayed. In order to arrange the display, press information area:
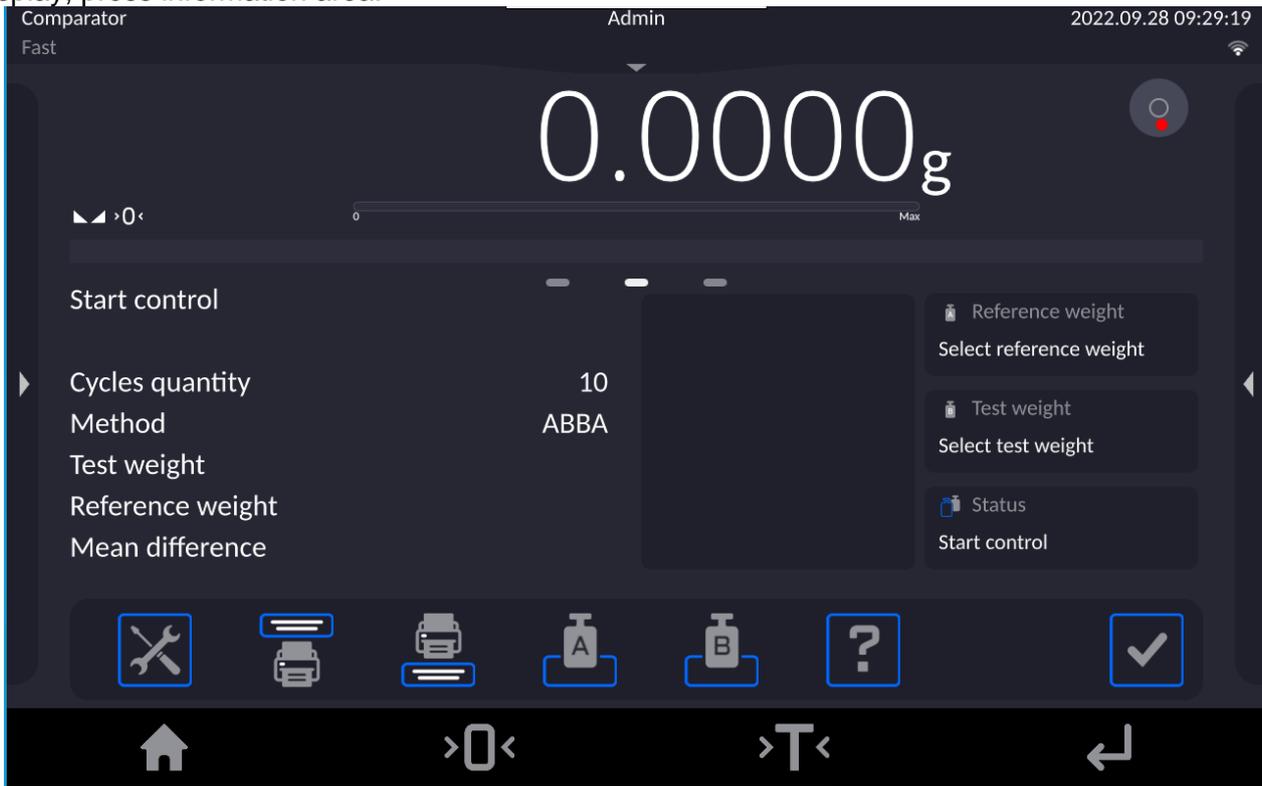
Next press Information or Keys pictogram depending on how you want to configure information or quick access keys. Information to be displayed:
- Cycles quantity
- Method
- Comparison procedure
- Test weight
- Reference weight
- Measurement
- Difference
- Mean difference
- Standard deviation
- Ambient conditions
- Supplementary unit

Press Yes to activate Information selected from displayed edit box.

Follow the same procedure to select quick access keys. Upon selecting access key out of the list displayed in edit box, pictogram of function assigned to the quick access key is displayed next the key number.

9.20. Mass Comparison Process - Basic Procedure

1. Select comparison method and set parameters of mass comparator working mode by pressing grey area on the display and pictogram.

Working Modes - Comparator

Overview	Value
Mass comparator	-
Method	ABBA
Cycles quantity	n

Start-up weighing cycles quantity	2
Start delay	YES/NO
Tare mode	Single
Printout/Enter key	
Printout	Standard printout

2. Press ✓ button located in the bottom part of the display and follow the prompts
3. The following information is displayed:
   <**1/n cycles quantity**> - first cycle out of „**n"** cycles.
   <**Load A1-1**> - load **A1** weight for the first time in the cycle

4. Load the weighing pan with **A1** weight. Upon indication stabilization press ✓ button to confirm.
5. Message <**Load B1-1**> is displayed.
6. Unload **A1** weight.
7. Message <**-Wait-**> is displayed. Mass comparator waits for **B1** weight to be loaded for the first time (description in the information bar)

8. Load the weighing pan with **B1** weight. Upon indication stabilization press ✓ button to confirm.
9. Message <**Load B1-2**> is displayed.
10. Unload **B1** weight.
11. Message <**-Wait-**> is displayed. Mass comparator waits for **B1** weight to be loaded for the second time (description in the information bar) – only when ABBA method is selected

12. Load the weighing pan with **B1** weight. Upon indication stabilization press ✓ button to confirm.
13. Message <**Load A1-2**> is displayed.
14. Unload **B1** weight.
15. Message <**-Wait-**> is displayed. Mass comparator waits for **A1** standard to be loaded for the first time (description in the information bar)

16. Load the weighing pan with **A1** weight. Upon indication stabilization press ✓ button to confirm.
17. Description in the information field changes to <**2/n cycles quantity**> - this is an information about switching to the next cycle
18. Follow the same steps as for the first cycle to complete the procedure.
19. The process is completed automatically by printing out comparison process report. The report is automatically saved to reports database.
You can finish comparison process or repeat it.

10. ADJUSTMENT

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

10.1. Internal Adjustment

Internal adjustment is carried out by means of an internal adjustment weight. <Internal adjustment> button, when pressed, automatically triggers adjustment process. Upon adjustment process completion, a respective message, informing about process end and its status, is displayed.
Each time before the internal adjustment, the balance level is checked. When the balance is not levelled, the internal adjustment takes place only upon prior levelling.

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

10.2. External Adjustment

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

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

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

10.3. Adjustment Test

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

10.4. Automatic Adjustment

Enter this menu to specify conditions initiating an automatic adjustment. Options:
- None – automatic adjustment inactive.
- Time – adjustment takes place in time intervals declared in <Automatic adjustment time> menu
- Temperature – adjustment is triggered by temperature change.
- Both – adjustment is triggered by both, temperature changes and time.

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

10.5. Automatic Adjustment Time

<Automatic adjustment time> parameter determines time interval between successive automatic internal adjustments. The time interval is declared in hours and ranges between 1 and 12 hours.
To set time interval for automatic adjustment:
- enter <Automatic adjustment time> parameter,
- using the displayed menu, select the appropriate time interval (given in hours), which is to elapse between the most recent adjustment and activation of the following automatic internal adjustment.

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

10.6. Report Printout

<Report printout> parameter determines whether or not an adjustment report is to be automatically printed upon adjustment process completion.
To print the report automatically, set the parameter as active.

10.7. GLP Project

GLP is one of many methods for documenting work in accordance with adopted quality system. Data selected for printing is printed on each release of an adjustment report.
Information and signs to be used in a GLP report:

adjustment (adjustment type)	working mode (working mode name)
date	time
balance type	balance S/N
operator	first and last name
level status	nominal mass
current mass	difference
nominal mass 2	current mass 2
difference 2	temperature
dashes	empty line
signature	non-standard printout

10.8. Adjustment History

Adjustment history contains data on all carried out adjustment processes. The record is carried out automatically. Each adjustment record comprises basic data on completed process. This menu enables displaying the list of completed adjustment processes. Each report is printable.

In order to print an adjustment report, enter <Adjustment> submenu, next enter <Adjustment history> parameter, select adjustment to be printed. Record details are displayed, press

 > print button.

Caution: If the balance memory is full, then the oldest record gets automatically deleted.

If internal procedures of an organization require maintaining complete documentation concerning all carried out adjustment processes, then the list with adjustment records has to be printed and archived periodically.

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

press < > button and enter date of an adjustment process that is to be found.

Exporting data on completed adjustment process

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

11. OPERATORS

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

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

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

In order to add an operator:
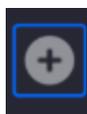
- Enter <Operators> menu, press < > button.
- Define all necessary data.

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

Log in using a transponder card:

Caution: *The RFID reader mounted in the indicator operates at a frequency of 13.56MHz and complies with ISO/IEC 14443 Type A.*
Only cards of this standard will be recognised by the reader.

- Enter Operator settings.
- Select <Card no.>
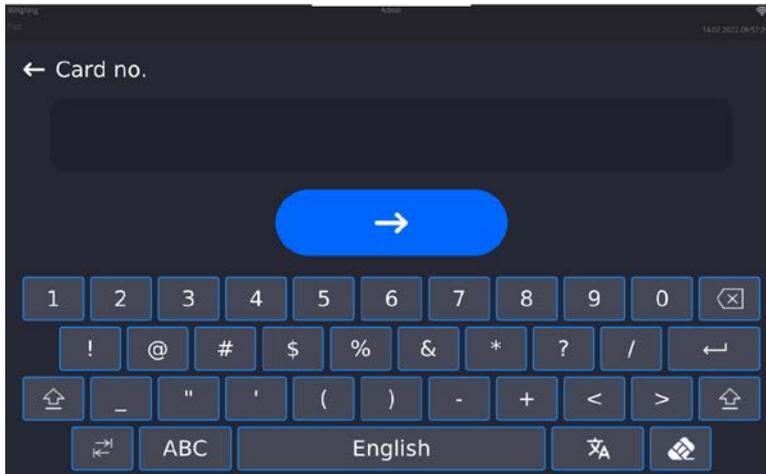
- Apply the card to the RFID reader.
- The card number is automatically entered in the editing field.
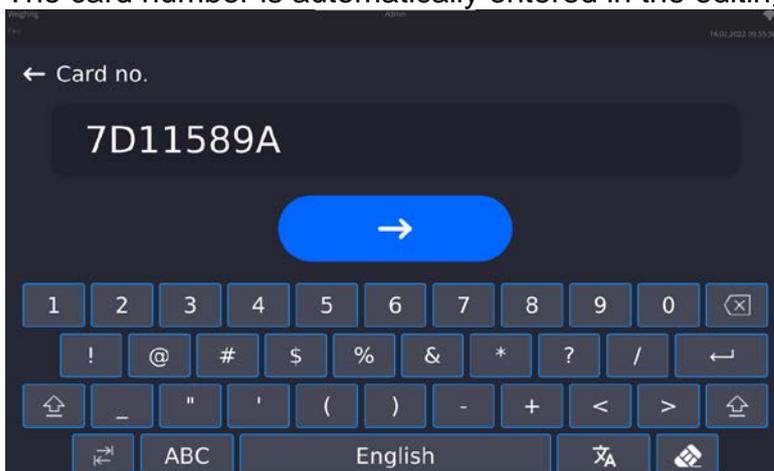
- Press [→] button, the card number is added to the operator settings.
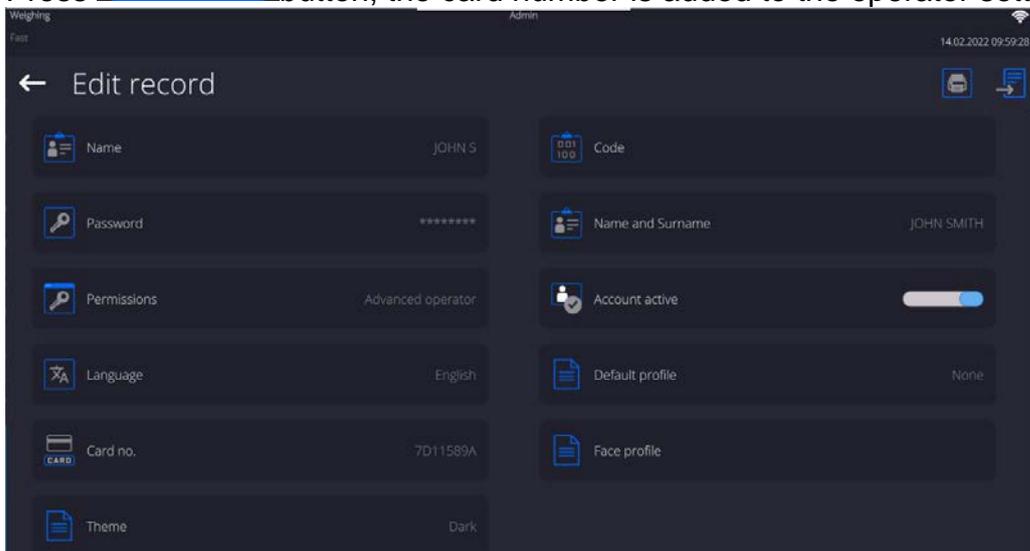
- Exit to the home screen. From now on, applying this card to the RFID reader will automatically log the user in.

Log in using a fingerprint:

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

- When the fingerprint reader is connected to the USB type A socket, the <Fingerprint> option appears in the operator settings menu.
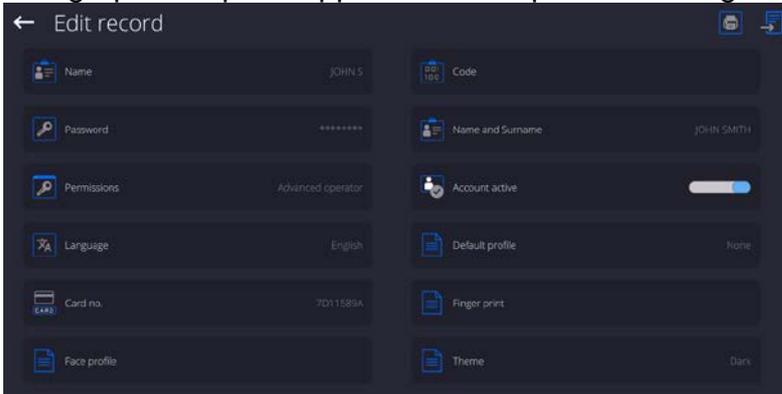
- To add a fingerprint for an operator, enter this option.
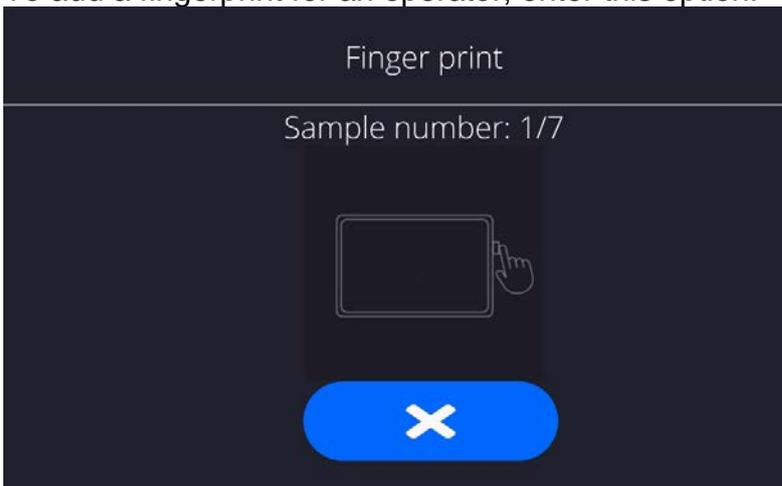
- Scan the fingerprint and repeat the procedure 7 times (as described in the message box).
- When the procedure is completed correctly, a summary window is displayed.
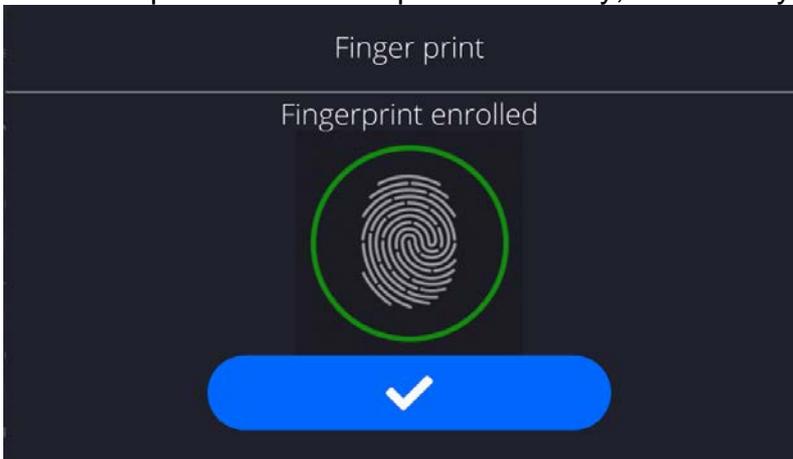
- Confirm the procedure by pressing [→] button.

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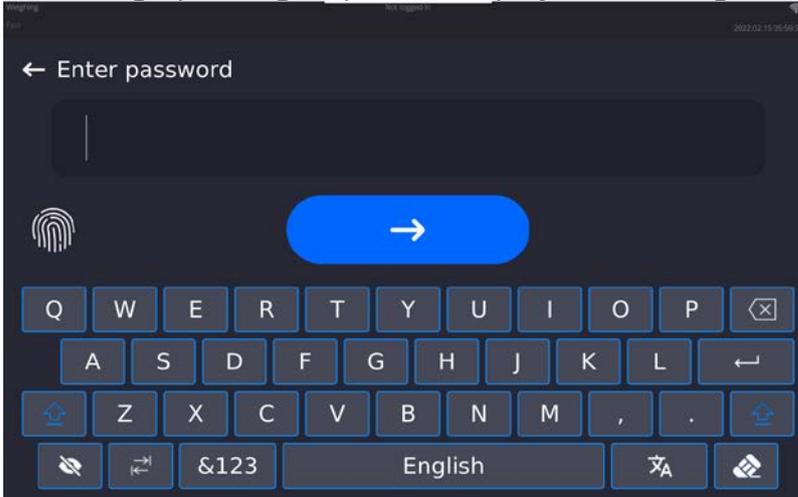
- After placing a finger on the reader and confirming the correctness of the fingerprint with the stored pattern, the pictogram briefly turns green, the user is automatically logged in, and the software switches to the home screen. The name of the logged-in user is displayed in the top bar of the window.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

Log in using a face profile:

- To add a face profile for a user, go to the option presented below
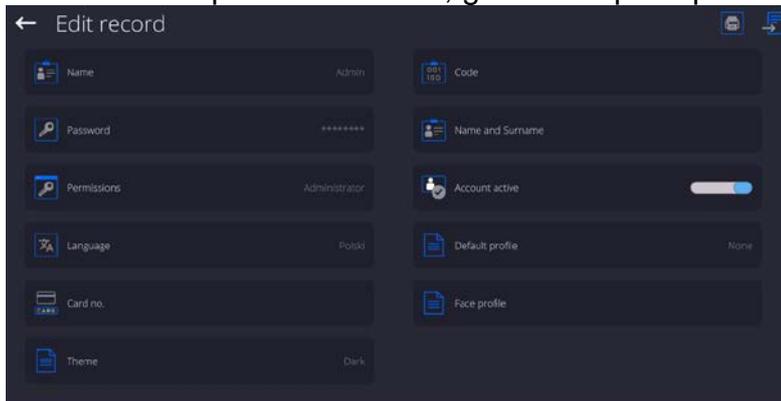
- After starting the option, a message is displayed and the face profile is read; you must position yourself correctly in relation to the camera so that the program can save the profile.
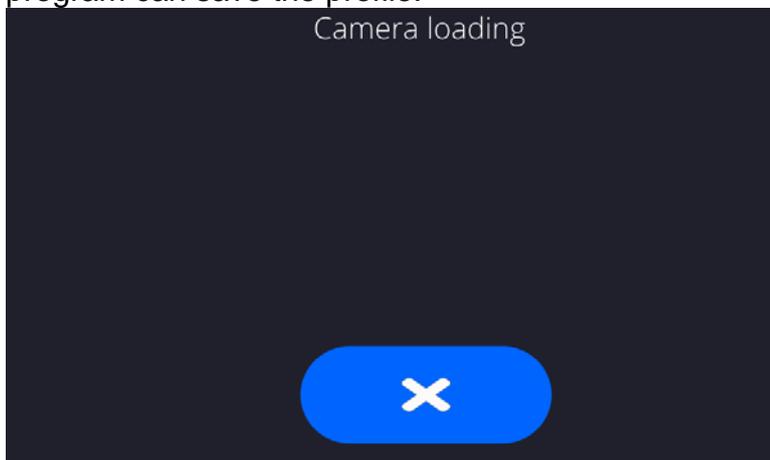
- Once the profile has been saved, a message is displayed along with a picture from the camera.

Face image recorded
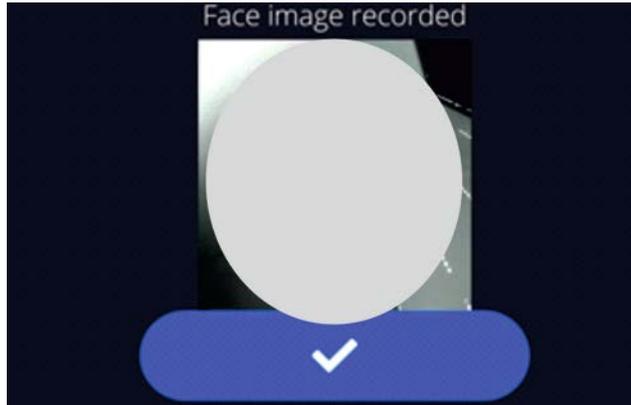
- Press button to close the widow.
- The option description in the user settings changes to <Delete face profile>, indicating that the profile is stored in the balance memory.
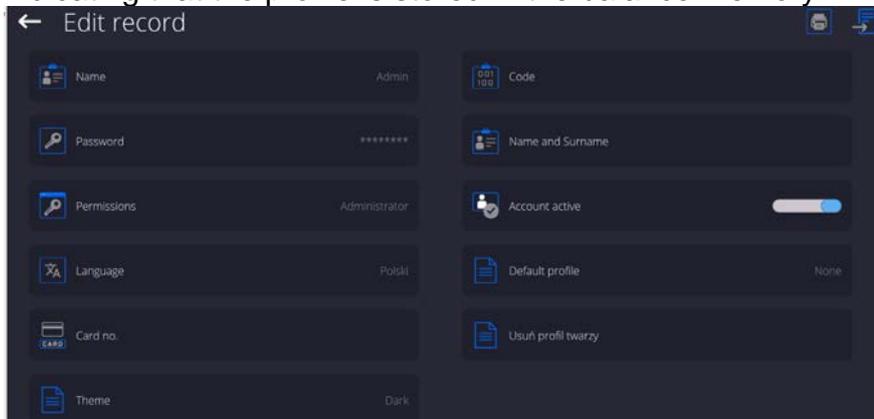
- From now on, if the user for whom the face profile was added logs in, after entering the logging window, the program will automatically read the profile, which will be signalled by the pictogram on the left side of the window
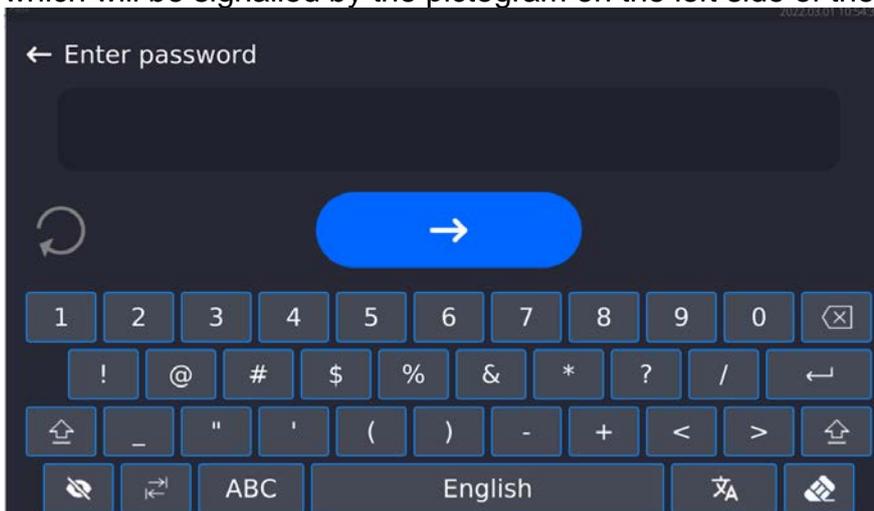
- The program automatically reads a photo of the user's face profile, and after the photo is read, the camera turns on (which is indicated by the lighting of a diode next to the camera) and compares the saved photo with the profile read by the camera. If these images match, the main program window will 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.
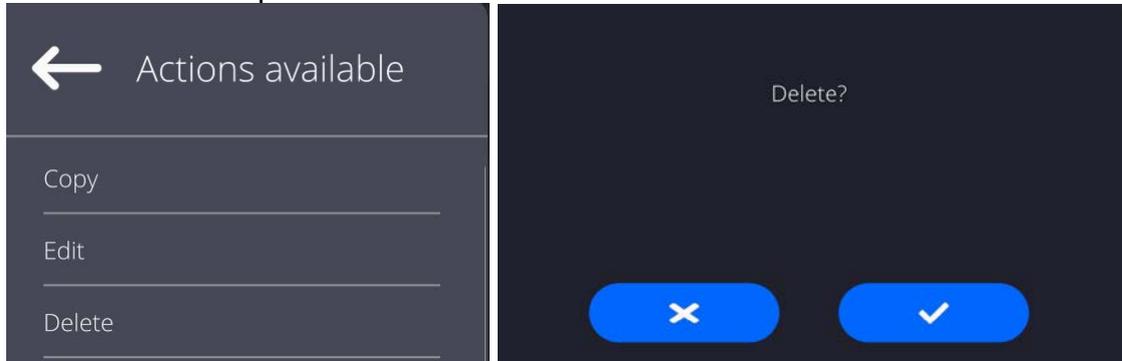
12. ADMINISTRATOR PANEL

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

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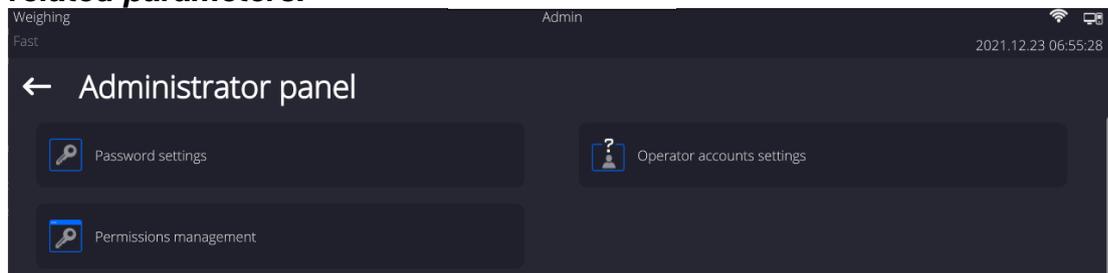
12.1.   Password Settings

This submenu is designed to set password sophistication rate.
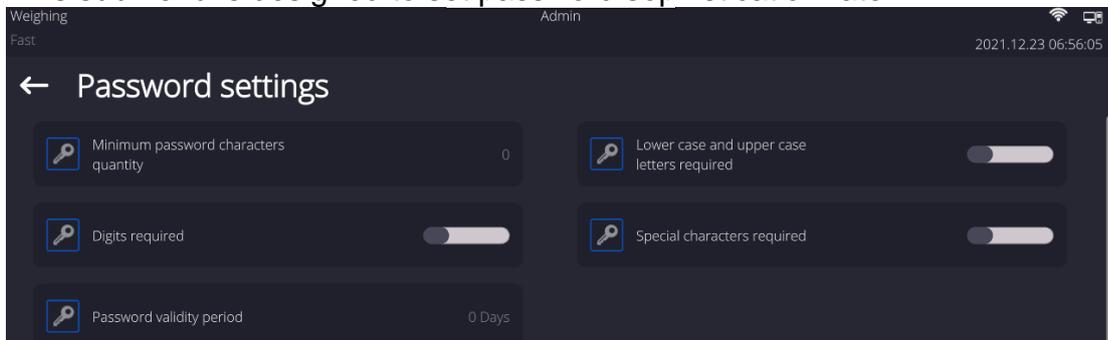
Minimum password characters quantity	Determining quantity of characters in operator's password. For '0' value set any quantity of characters.
Lower case and upper case letters required	Parameters specifying requirements regarding password characters type and format.
Digits required	

Special characters required	
Password validity period	Determining time interval in days after which the password has to be changed. For '0' entry password change is not required.

12.2. Operator Accounts Settings
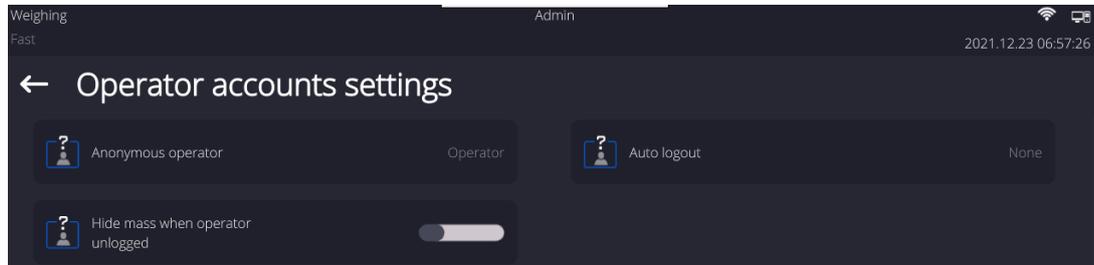
Unlogged operator permissions

Administrator can assign an unlogged balance operator (so called anonymous operator) with permissions level.
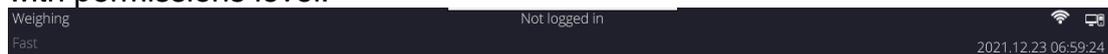
Procedure:
Enter <Operator accounts settings> submenu, select <Anonymous operator> option, next set respective permissions: Guest, Operator, Advanced operator, Administrator.

*Caution: Operator assigned with **<Guest>** permissions level is not allowed to modify program settings.*

Auto logout

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

Procedure:
Enter <Operator accounts settings> submenu, select <Auto logout> parameter, next set respective value: none/3/5/15/30/60. Time given in [min].

Hide mass when operator unlogged

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

Procedure:
Enter <Hide mass when operator unlogged> option and set it to active.
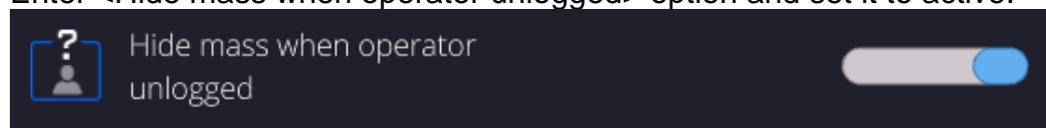
12.3. Permissions Management
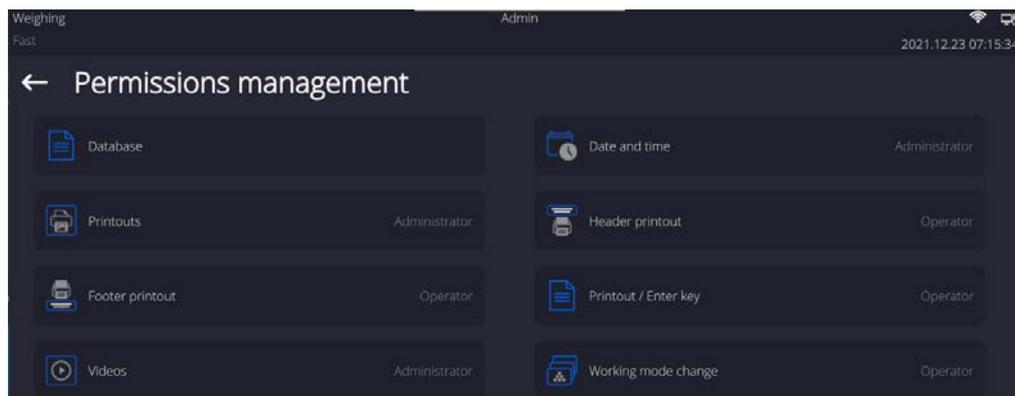
Caution: When the <Guest> option is set for individual parameters, their settings can be freely accessed (there is no need to log in).

Each option can be assigned with a permissions level to edit it.

Parameter values:

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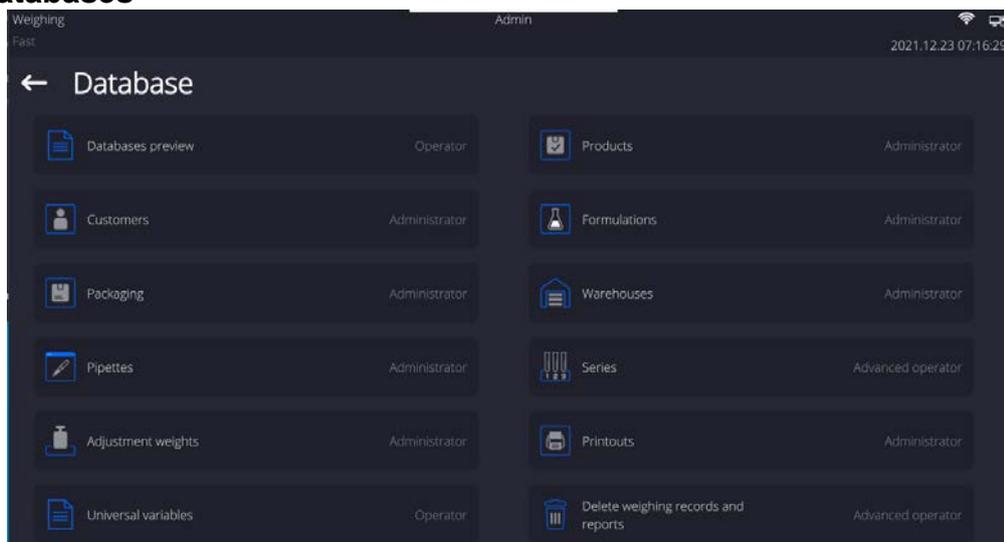
Default balance settings enable an operator who is logged as **Administrator** to modify settings of particular databases. The values can be changed depending on the needs.

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

13. PROFILES

A profile is a data pack that determines:

- particular function operation, e.g. 'Parts counting', 'Percent weighing', etc.,
- data to be displayed during operation,
- function keys to be active,
- measuring units to be accessible,
- criteria determining speed of operation and measurement stability,

Balance software allows you to create numerous profiles, this enables:

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

For ease of operation, 4 default balance profiles have been designed. The profiles settings provide optimal weighing process for particular requirements and conditions.

Profile types:

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

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

13.1. Creating a Profile

The Administrator can create new profiles by:

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

Copying an existing profile

Procedure:

- Enter the main menu, to do it press button.
- Enter < > submenu.
- Press and hold the profile that is to be copied.
- Menu referring to the profile record is displayed. Select <Copy> parameter.

- A new <*Name* copy> profile is created, new profile settings and base profile settings are identical.
- Modify necessary data: (name, etc.).

Adding a new profile

Procedure:

- Enter the main menu, to do it press [home icon] button.

- Enter <[cross icon]> submenu.

- Press [plus icon] button.

- A new profile is added automatically, it is opened in an editing mode.
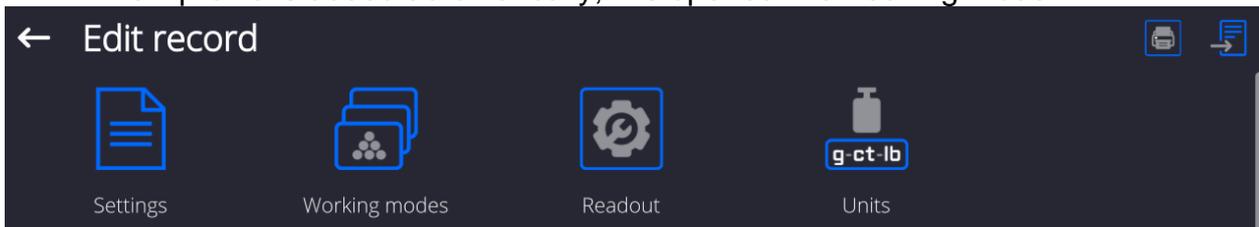
Deleting a profile
Procedure:

- Enter the main menu, to do it press [home icon] button.

- Enter <[cross icon]> submenu.
- Press and hold the profile that is to be deleted.
- Menu referring to a profile record is displayed. Select <Delete> parameter.
- Message box: <Delete?> is displayed.

- Press [checkmark button] button to confirm, the profile gets deleted.

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

13.2. Profile Structure

Profile parameters list:

Settings   Enter this menu to set an individual profile name (an order of alphanumeric characters), and to declare a default working mode (the selected mode is activated as default upon selecting the profile).

Working modes   Option to set specific functions for individual working modes. Mode submenus:
- Mode related settings
- Buttons
- Information
- Printouts

Readout   Readout submenus:
- Filter
- Value release
- Autozero
- Autozero: Dosing
- Last digit

- ▪ Last digits quantity
- ▪ Ambient conditions

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

13.2.1. Settings

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

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

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

13.2.2. Working Modes

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

List of parameters common for each working mode:
- ▪ Settings:
  specific parameters relating to a working mode, and universal settings such as: result control, tare mode, automatic footer printout, printout mode, printout.
- ▪ Functions of quick access buttons:
  declaring quick access buttons to be displayed.
- ▪ Information:
  declaring information to be displayed.
- ▪ Printouts:
  declaring type of a printout or defining a non-standard printout.

13.2.3. Readout

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

FILTER (function disabled for Fast, Fast dosing, Precision profiles)
Each measurement signal, before being displayed, is electronically processed in order to provide correct parameters specific for a stable measurement result (ready to be read).
You can determine signal processing rate, there are five different filters:
Range:
- • very fast, fast, average, slow, very slow.

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

CAUTION:
- ▪ *For precision balances, it is recommended to select very fast, fast or average filter÷,*
- ▪   *For analytical balances and microbalances, it is recommended to select average, slow or very slow filter÷.*

Value release (option disabled for Fast, Fast dosing, Precision profiles)
The parameter has been designed to determine when the stability marker is to be displayed.

There are three different settings:
- fast, fast and reliable, reliable.

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

Autozero function
The function has been designed to enable automatic control and correction of zero indication.
If the function is enabled, the subsequent measurement results are compared to each other in constant time intervals. If the results differ less than declared AUTOZERO range, e.g. 1 division, the balance is automatically zeroed, and the pictograms of stable indication – ◤◢ and precise zero – →0← are displayed. Active Autozero function means, that each measurement starts with the precise zero. There are, however, some cases when this function can be a disturbing factor for the measuring process, e.g. very slow placing of a load on the weighing pan (load adding, e.g. pouring, filling). In such case, the system correcting zero indication may also correct the actual indication of a load placed on the weighing pan.
Values: **NO**   -   autozero function disabled.
                  YES -   autozero function enabled.

Autozero function: Dosing (option disabled for Fast, Fast dosing, Precision)
The function has been designed to enable/disable autozero function for Dosing.
Options:
NO   -   autozero function disabled automatically when Dosing mode is run.
YES -   autozero function enabled automatically when Dosing mode is run.

Last digit
The function has been designed to enable/disable visibility of the last decimal place of measurement result. Values:
- **Always:** all digits are displayed.
- **Never:** last digit disabled.
- **When stable:** last digit displayed only when the result is stable.

Last digits quantity
This function enables declaring the number of hidden last digits of the result. The function has three settings and works in connection with the <Last digit> option:
- **1:** the last digit of the result.
- **2:** the last two digits of the result.
- **3:** the last three digits of the result.

Ambient conditions
Parameter relating to ambient and environmental conditions of the workstation. For unstable ambient conditions, it is advisable to set the parameter to 'Unstable' value. By default, the parameter is set to 'Stable' value.
'Stable' value results with faster operation, i.e. weighing takes much less time than in the case of 'Unstable' value set.
- **Unstable; Stable.**

13.2.4. Units

For a selected profile, you can declare a start unit, supplementary unit and two custom units.
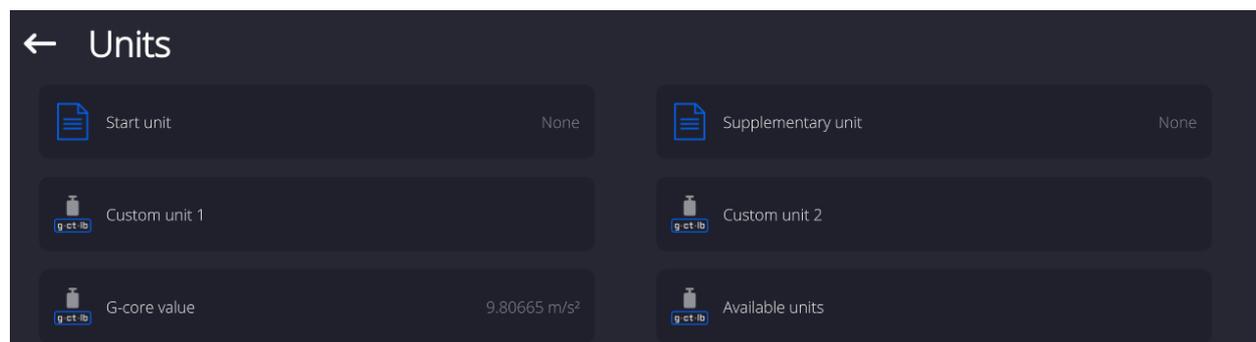
Units menu enables you to enter the value of gravitational acceleration force characteristic for a particular place of use.   It is obligatory should the balance be used to determine mass in [N].

Custom unit features:
- o Formula (*custom unit recalculation formula*): Coefficient * Mass or Coefficient / Mass.
- o Coefficient (*coefficient for custom unit recalculation*)
- o Name (*unique unit name to be displayed next to the result - max 3 characters*)
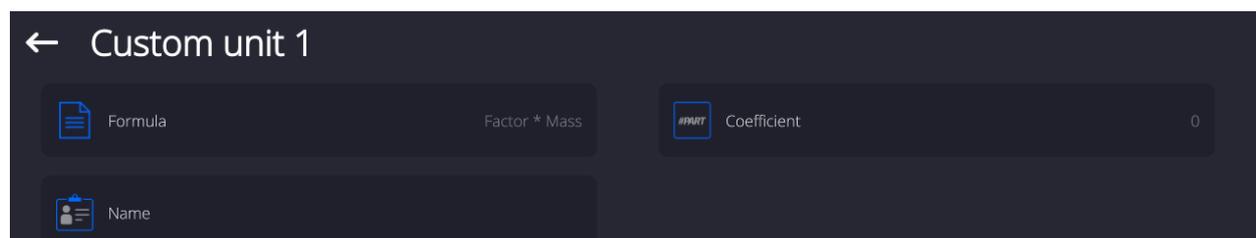
Newly designed custom unit name is added to the list of accessible measuring units (refers to non-verified balances exclusively).

14. DATABASES

The balance features the following databases:
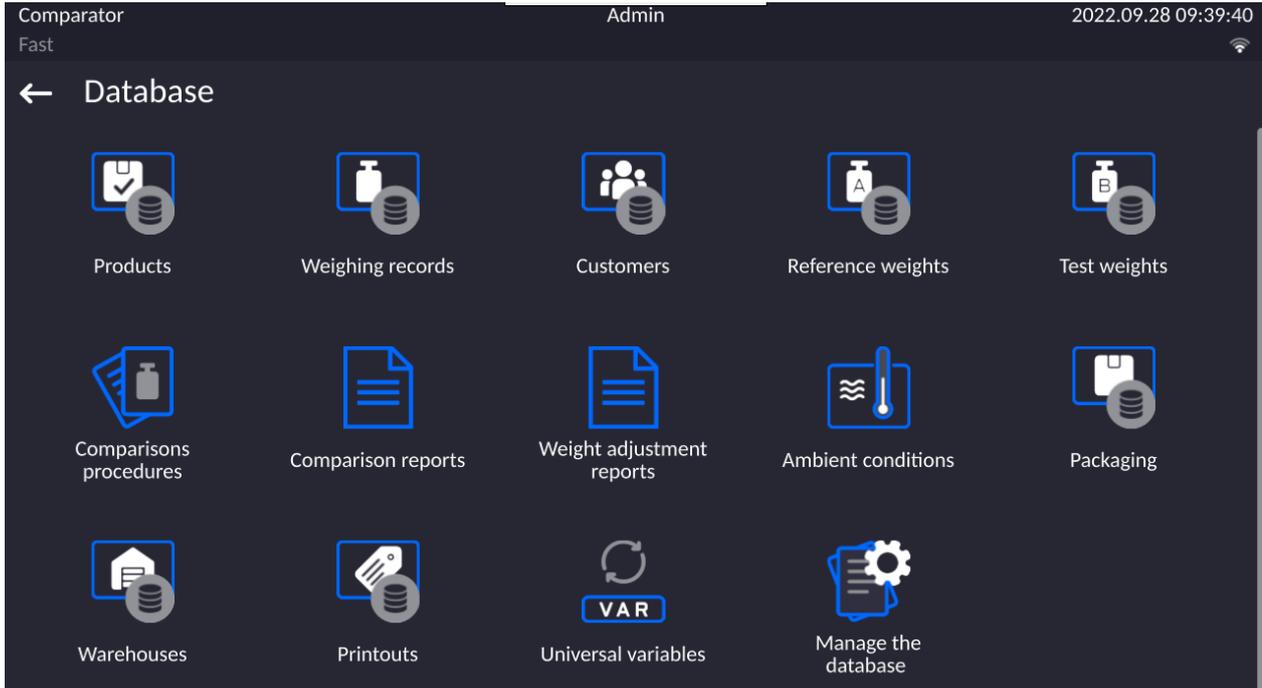
14.1. Processes Carried Out on Databases

Databases can be operated only by an authorized personnel.
Procedure:
- Press and hold a respective database pictogram.
- Database menu is displayed.
- Select one of the available entries (entries set is conditioned by a database).
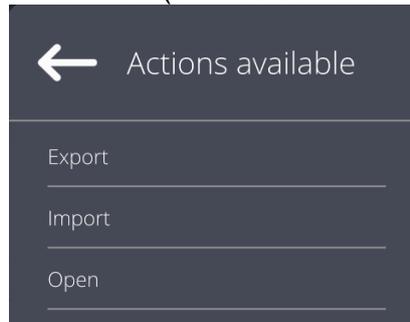
Entries:
- EXPORT - select to export data from a selected database to a USB flash drive. Plug the USB flash drive to a USB port; upon its detection, the software automatically starts a copying process. Upon completion of the copying process, a window with both, a file name to which data have been saved and message: <Completed> is displayed. Confirm completion.
- IMPORT – select to import data from a USB flash drive. Plug the USB flash drive to a USB port; upon its detection, a window with a list of saved files is displayed. Select file with data to be imported. The copying starts automatically. Upon completion of the process, message: <Completed> is displayed. Confirm completion.
- OPEN – select to enter a database (alternative method for database entering: single click on a given database field).

List of typical database operations:
1. Adding entry to a database.
2. Searching for a record in a database by name.
3. Searching for a record in a database by code.
4. Searching for a record in a database by date.
5. Exporting database content to a USB flash drive via USB port.
6. Printing data on a specific record in a database.

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

14.2. Products

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

Procedure:
- Enter <Databases> submenu, and press < Products> field.
- Press < Add> button to add a new product to the database.
- Select one of available options.

List of parameters defined for a product:

1.	Name	[product name]
2.	Description	[product description]
3.	Code	[product code]
4.	EAN code	[product EAN code]
5.	Mass	[Unit mass of a product]
6.	Min	[Minimal mass for weighing the product using result control thresholds – LO. Value of error <T1-> in working mode <Mass control> determined as percent of the nominal mass]
7.	Max	[Maximal mass for weighing the product using result control thresholds – HI. Value of <T1+> error in working mode <Mass control> working mode determined as percent of the nominal mass]
8.	Tolerance	[% value calculated in relation to mass (5) denoting measuring area in which the measurement is recognized as correct.]
9.	Tare	[Product's tare value, set automatically on selecting a product from the database]
10.	Price	[Unit price of a product]
11.	Density	[Product's density, used for compensating air buoyancy, as sample density] - [g/cm^3]
12.	Shelf-life time in days	
13.	Date	[Set product's date (constant)]
14.	VAT	[VAT value related to a product]
15.	Ingredients	[Editing field for inserting names of ingredients used for preparing a product, e.g. if a product is a mixture, or if a product requires additional description of its features or application]
16.	Printout	[Printing a template assigned to a product]

Caution:
Remember to assign products to corresponding functions, as some of data values are attributed according to their modes.

14.3. Weighings

Each measurement result sent from a mass comparator to a printer or a computer is saved to the database of weighing data.
You can preview each weighing record data.

Procedure:
- Enter **<Databases>** submenu.
- Enter **< Weighing data>** database and press respective record.

List of parameters for a weighing record saved to the database:
1. Measurement date.
2. Measurement result.
3. Tare value.
4. Determination of measurement status (stable / unstable).
5. Air buoyancy compensation.
6. Product name.
7. Operator.
8. Customer, customer name.
9. Working mode name.
10. Warehouse, source warehouse name.
11. Packaging, name of tare applied during product weighing.
12. Result control, information on threshold in which the weighed product was placed:
    MIN – below LOW threshold (possible only if <Result control> is set to <NO>),
    OK – between the LOW and HIGH thresholds,
    MAX – above HIGH threshold (possible only if <Result control> is set to <NO>).
13. Weighing platform no., field denoting number of a weighing instrument   using which a measurement was carried out,
14. Levelling, demonstrates if level status was maintained during measurement,
15. Ambient conditions alerts, demonstrates if temperature and humidity were stable during measurement.

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

Procedure:
- Enter<Databases> submenu and press < Customers> field.
- Press < Add> button.
- If a customer already exists in the database of customers, press field with its name.

List of parameters defined for a customer:
1. Customer name
2. Customer code [internal code identifying a customer]
3. NIP
4. Address
5. Postal code
6. City
7. Discount
8. Printout [type of printout, label declared to a customer]

14.5. Reference Weights

<Reference weights> database contains reference weights used for weights comparison. Reference weights are used when determining Comparison procedure.

Procedure:
- Enter <Databases> submenu and press < Reference weights> field.
- Press < Add> button, should a new reference weight be added.
- If reference weight already exists in the database, press field with its name.

Caution:
It is possible to use the following functions: <Search by name>,<Search by code> <Data export>

List of parameters defined for a reference mass standard::
1. Name
2. Code
3. Class
4. Serial number
5. Mass
6. Set no.

14.6. Test Weights

<Test weights> database contains test weights used for weights comparison. Test weights are used when determining Comparison procedure.

Procedure:
- Enter <Databases> submenu and press < Test weights> field.
- Press < Add> button, should a new test weight be added.
- If test weight already exists in the database, press field with its name.

Caution:
It is possible to use the following functions: <Search by name>,<Search by code> <Data export>

List of parameters defined for a reference mass standard::
1. Name
2. Code
3. Class
4. Mass
5. Order number
6. Test weight number

14.7. Comparison Procedures

<Comparison procedures> database contains determined comparison processes. Comparison procedures are designed to carry out automatic comparison processes. Remember to determine reference weights and test weights.

Procedure:
- Enter <Databases> submenu and press <Comparison procedures> field.
- Press < Add> button, should a new comparison procedure be added.
- If comparison procedure already exists in the database, press field with its name.

Caution:
It is possible to use the following functions: <Search by name>,<Search by code> <Data export>

List of parameters defined for Comparison procedures:
1. Name
2. Code
3. Comparison procedure template (always YES if it is to be remembered)
4. Start delay
5. Start time
6. Clear start time
7. Comparisons

Upon completing information in points 1-6 enter Comparisons file, add new comparison and assign the following features:

1. Reference weight
2. Test weight
3. Cycles quantity
4. Method
5. Start-up weighing cycles quantity
6. Repeat quantity

Next, you can analogously assign next comparison to the same comparison procedure. The quantity of comparison processes in one comparison procedure is determined by the quantity of test and reference weights with which the mass comparator operates.

14.8. Comparison Reports

<Comparison reports> database contains information on carried out comparison processes. Each report can be previewed, searched by date or exported and printed out.

Procedure:
- Enter <Databases> submenu and press <Comparison reports> field.
- Press field of a desired report record.

List of parameters on a comparison report:

1. Order number
2. Start date
3. End date
4. Operator
5. Diameter
6. Standard deviation
7. Cycles quantity
8. Reference weight
9. Test weight number
10. Task
11. Method

14.9. Ambient Conditions

<Ambient conditions> database contains parameters related to ambient conditions. Depending on mass comparator's settings, a report may contain data on temperature, humidity and value of atmospheric pressure. If THB ambient conditions module is connected to a mass comparator, its records are also saved.

Procedure:
- Enter <Databases> submenu and press < Ambient conditions> field.
- Press key of a respective report record, unless it is visible on the top of the list, wind the list forward using navigating keys.
- Report's name consists of date and time.

Caution:
It is possible to use an option for searching a report by date or to export a report.

14.10. Packaging

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

Procedure:
- Enter <Databases> submenu and press <Packaging> field.
- Press < Add> button, should a new packaging be designed.
- If a packaging record already exists in the database, press field with its name, and insert data on the packaging.

Caution:
It is possible to use an option for searching a record by name or code.

14.11. Warehouses

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

Procedure:
- Enter <Databases> submenu and press <Warehouses> field.
- Press < Add> button, should a new warehouse be added.
- If a warehouse record already exists in the database, press field with its name, and insert identifying data.

Caution:
It is possible to use an option for searching a record by name or code.

14.12. Printouts

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

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

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

Designing new printout template

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

- Edit box opens, press <Project> entry.
- Respective box with an on-screen keyboard is displayed.
- Use the keyboard and create a printout template.
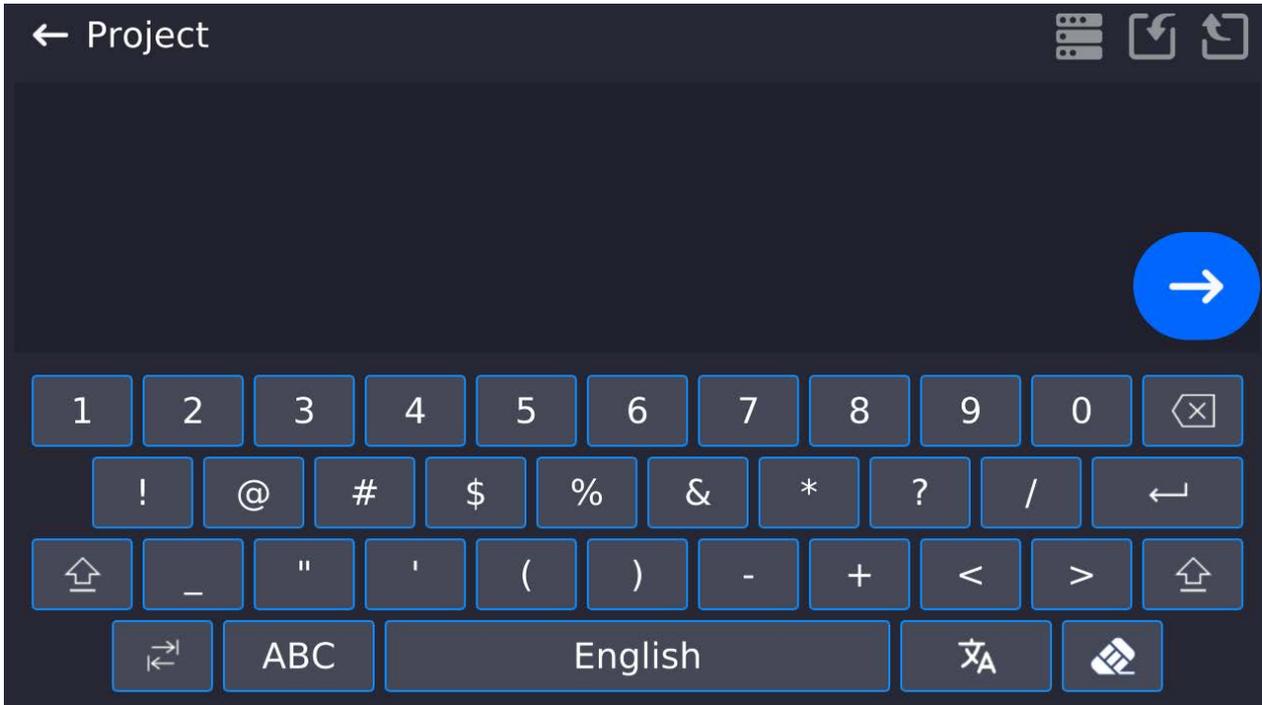
- Save the designed printout.

Example of Printout no. 1 – large edit box
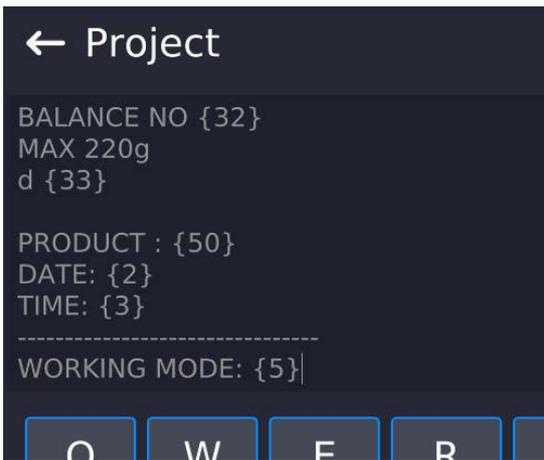
Balance no. 400015
Balance parameters:
Max = 220 g
d= 0.001 g

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

Working mode: Weighing

Net weight: 94.147

Carried out by: Admin

Project   *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.

14.13. Universal Variables

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

Procedure:
- Enter <Databases> submenu and press < Universal variables>.
- Press < Add> button, should a new variable be added.
- If a universal variable already exists in the database, press field with its name, and insert required modifications to the following fields: code, name, value.

Caution:
It is possible to use an option for searching a record by name or code.

14.14. Databases Management

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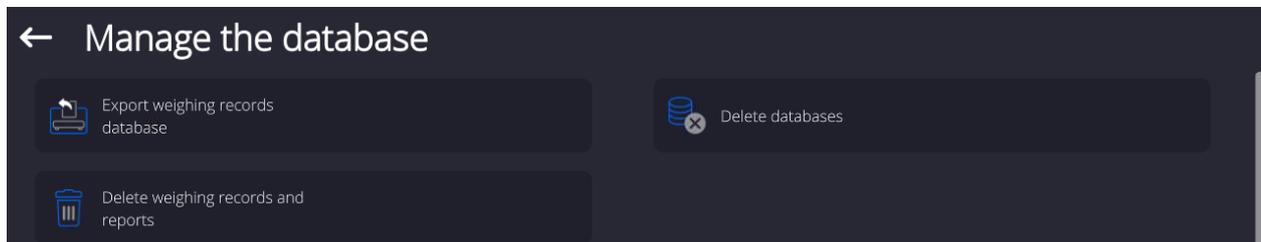
14.14.1. Export Weighing Database to a File

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

Procedure:

- Connect the USB flash drive to the USB port.
- Press <Export weighing records database to a file> entry; a window for setting export options is opened.
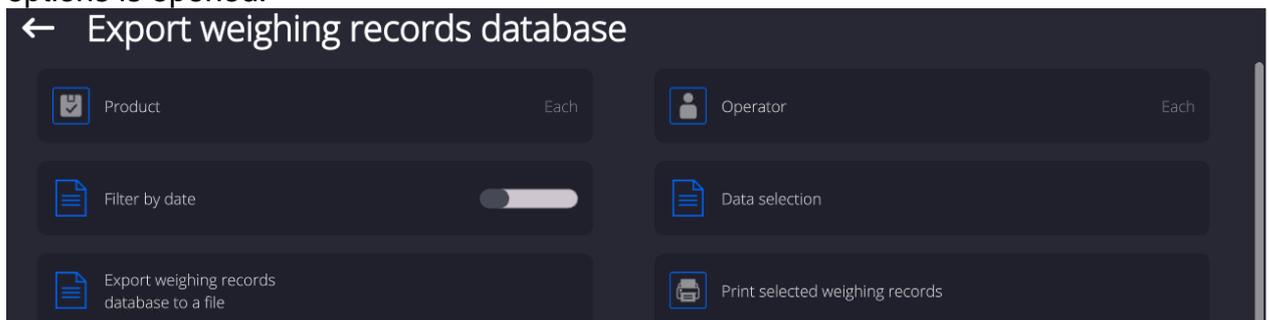
<Data selection> parameter allows you to specify which measurement-related data are to be exported.
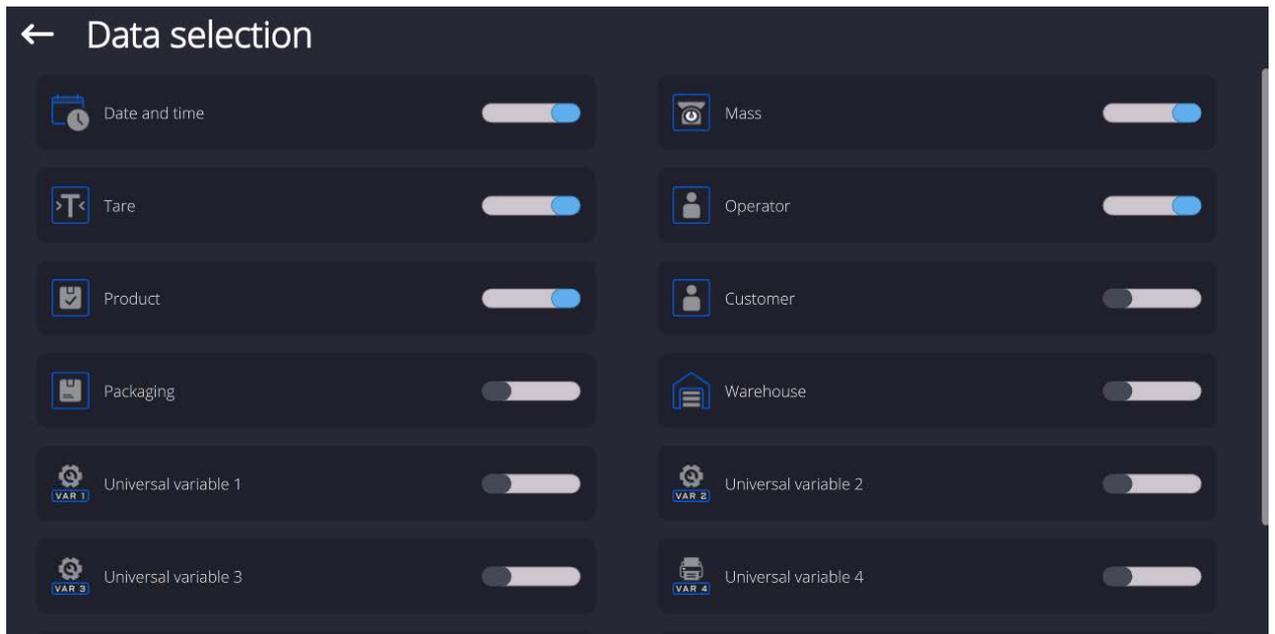
- Set respective data and press <Export weighing records database to a file> entry; weighing database is automatically exported.
  - Upon export completion, the message **<Completed>** is displayed along with information on the number of exported data and with the file name (*.txt extension). Next, previous window is displayed.
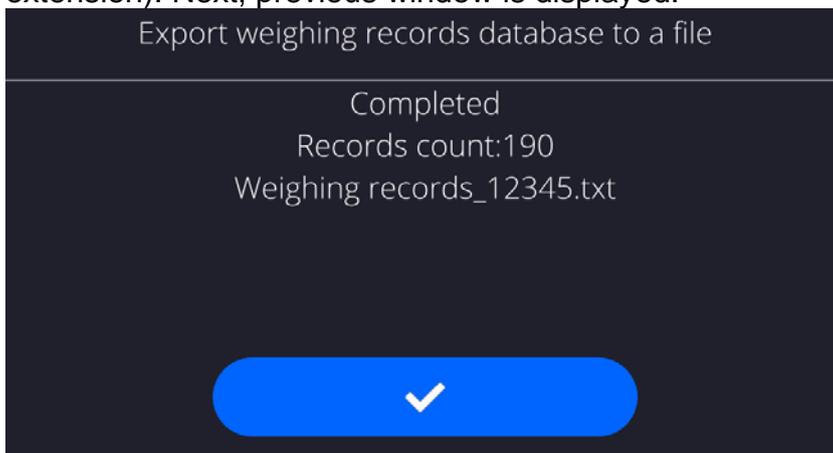
- You may return to the weighing procedure or proceed to other settings.

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

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

Template of a created file:

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

14.14.2. Delete Databases

Function allowing to delete data of selected database. Procedure
Activate <Delete database> function; a window with database list is displayed.
Select a database, delete respective data.
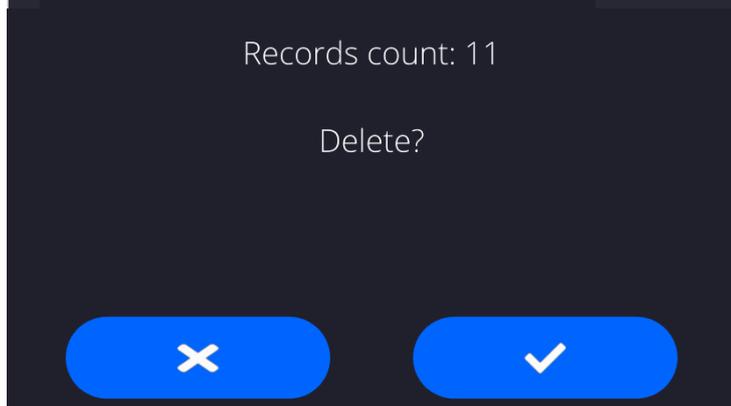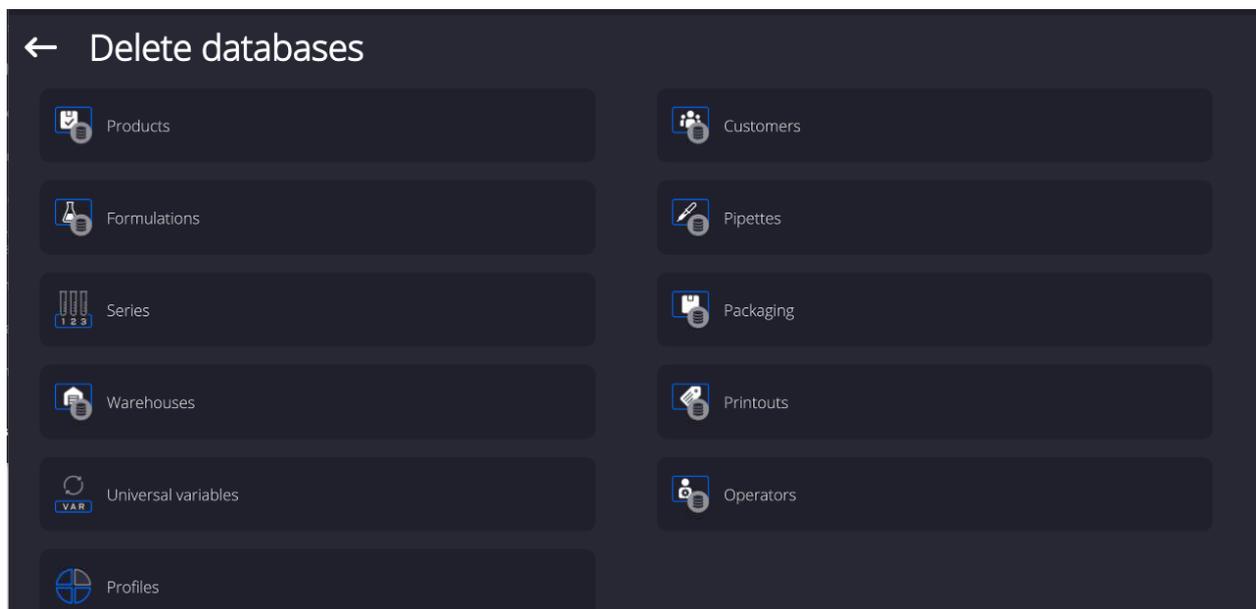
Confirm, data is deleted, the following message is displayed:
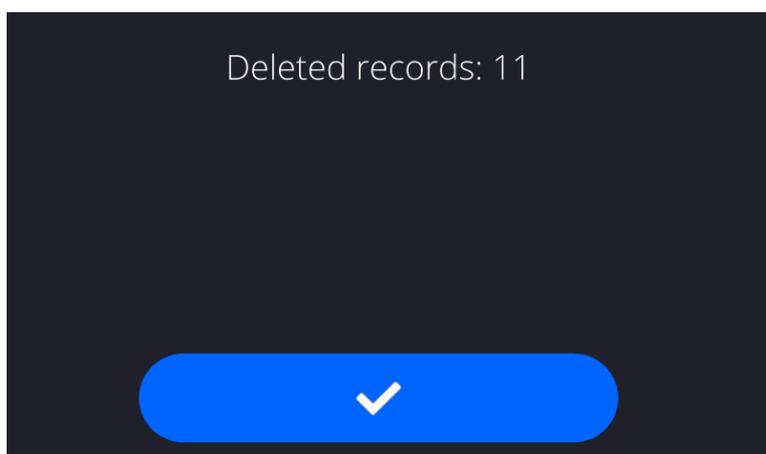
Confirm, a previous window is displayed; you may continue weighing or proceed to other operations.

14.14.3. Delete Weighings and Reports

Function allowing to delete weighings and reports of a given database.
Procedure:
Activate <Delete weighing records and reports> parameter; a window with a numeric keyboard is displayed.
Enter a date specifying which data is to be removed. Date is given in the following form: year-month-day.
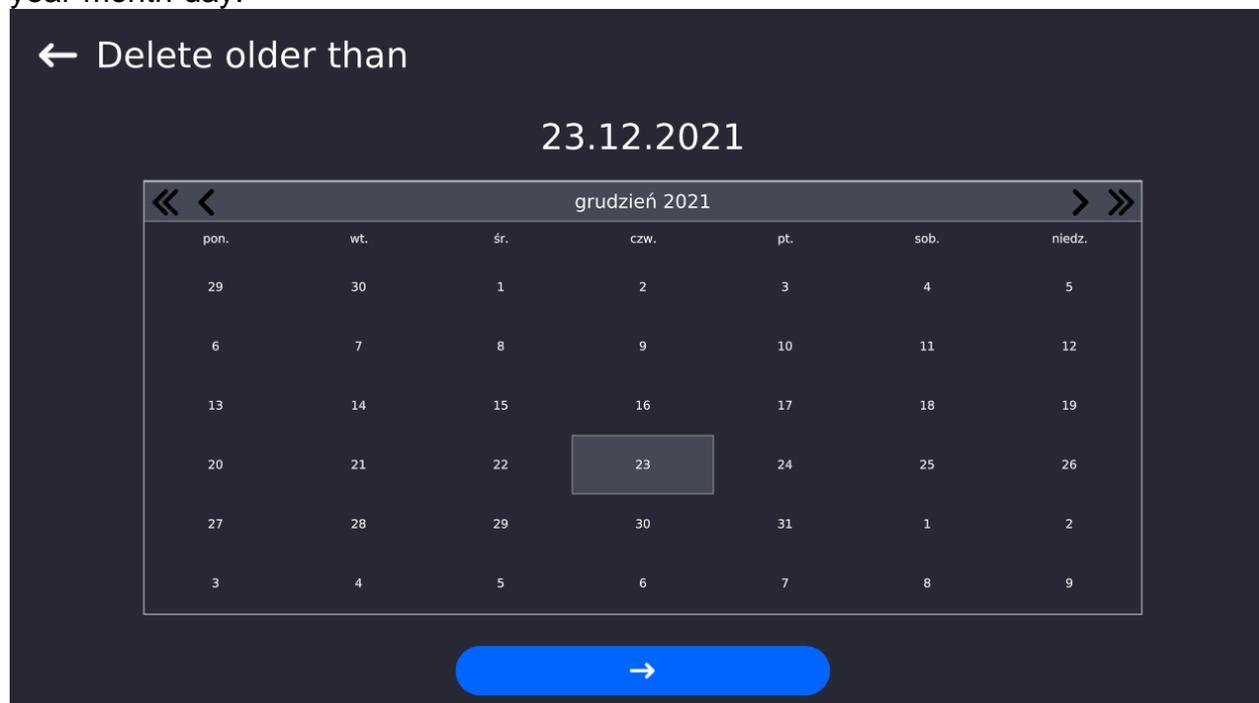
Confirm the date, all weighings and reports older than those specified by the date are removed. Quantity of deleted weighings and reports is displayed.

15. COMMUNICATION

Communication menu is located in theParameters menu. To access Parameters menu, press Setup key or <Setup> quick access button. Communication between the balance and the peripheral devices is established via the following ports:
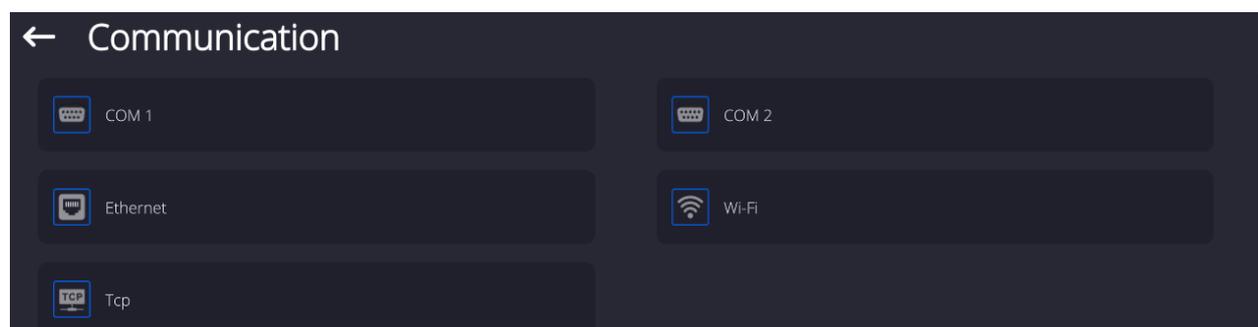
The parameters of each port can be configured depending on the needs.

15.1. RS232 Ports Settings

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

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

5 – USB type A port, which after connecting the converter is seen by the software as RS 232 - COM2
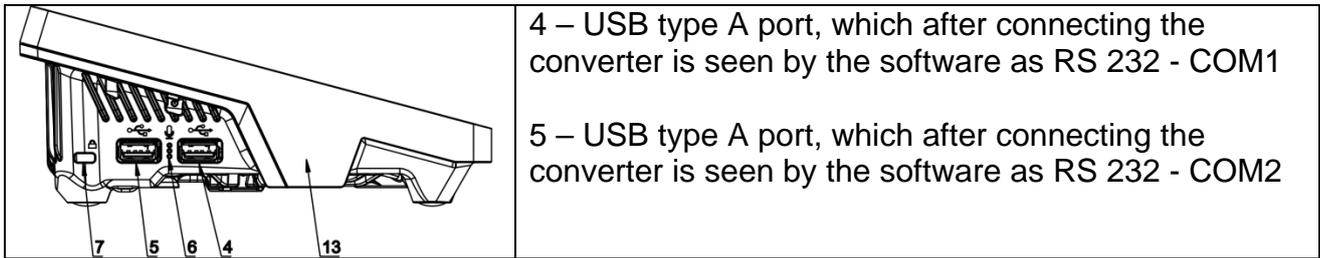
Procedure:
- Select communication port: <COM1> or <COM2>.
- Set respective parameters.

Transmission parameters for RS 232 ports:
- Baud rate: 4800, 9600, 19200, 38400, 57600, 115200 bit/s
- Data bits: 5, 6, 7, 8
- Stop bits: None, 1, 1.5, 2
- Parity: None, Odd, Even, Marker, Space

15.2. ETHERNET Port Settings

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

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

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

15.3. Wi-Fi Settings

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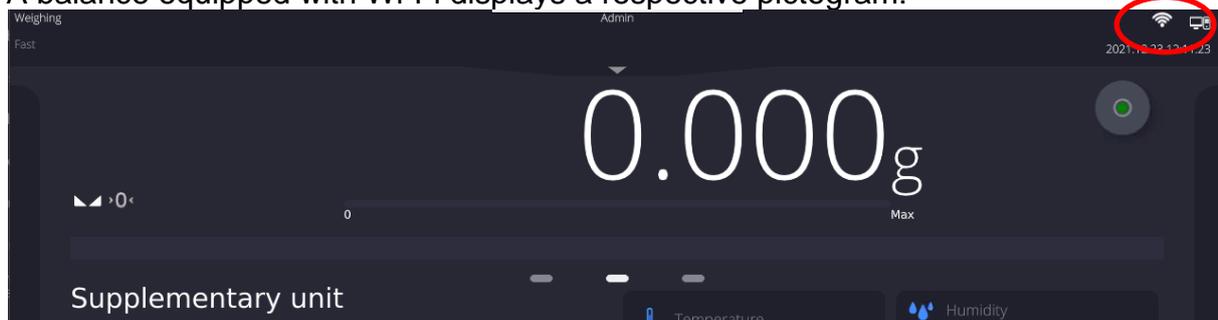
Procedure:

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

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

Press [✓] button, the message *<Restart balance to implement changes> is displayed.*

Return to the weighing procedure and restart the balance.

You may use <Available networks> parameter to view the list of networks detected by the balance:
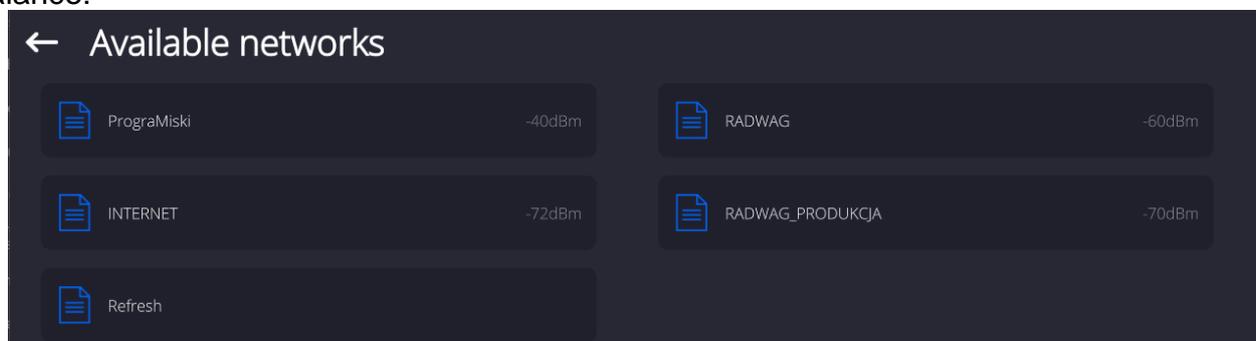
A pictogram with a padlock means that the password is required. Press <Refresh> to search for available networks.
Press <Network status> to check selected network parameters.
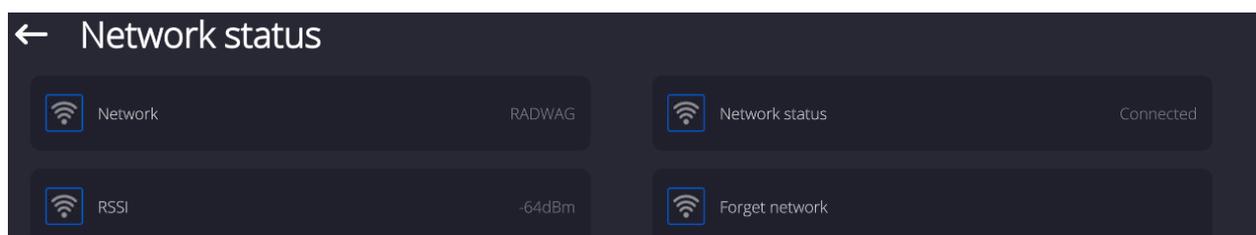
The selected network and connection parameters are saved to the balance memory. The program connects to the network in accordance with the memory-saved parameters each time the balance is switched on. To change this, select <Forget network> option. The previously selected network gets disconnected.

15.3.1.   Hot Spot - General Information

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

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

15.3.2. Hot Spot Activation

1. Enter Wi-Fi option
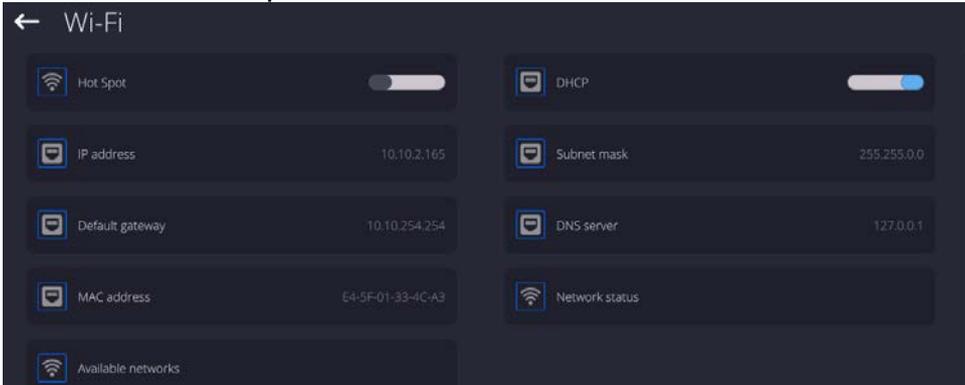
2. Activate Hot Spot, the balance will switch to the service settings after a moment.
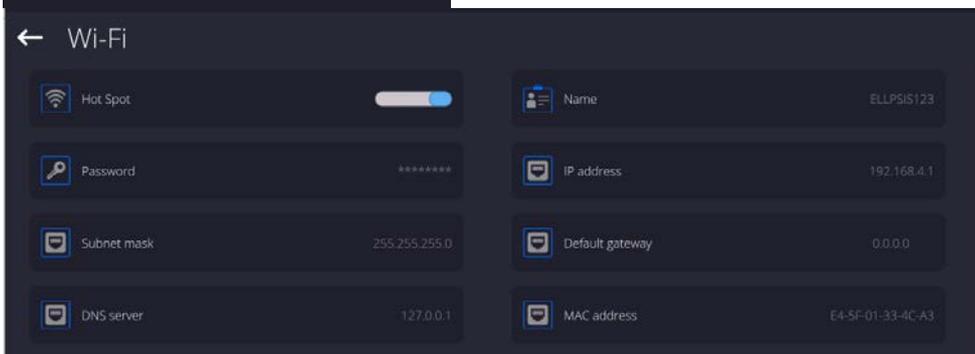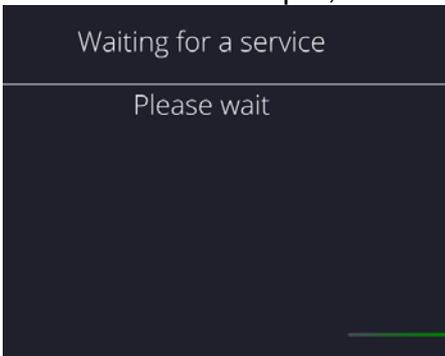
3. Enter an individual name and password for access (password must be at least 8 characters long).

Waiting for a service

Please wait

← New password

****

1 2 3 4 5 6 7 8 9 0

! @ # $ % & * ? /

_ " ' ( ) - + < >

ABC English

← Repeat the new password

****

1 2 3 4 5 6 7 8 9 0

! @ # $ % & * ? /

_ " ' ( ) - + < >

ABC English

Waiting for a service

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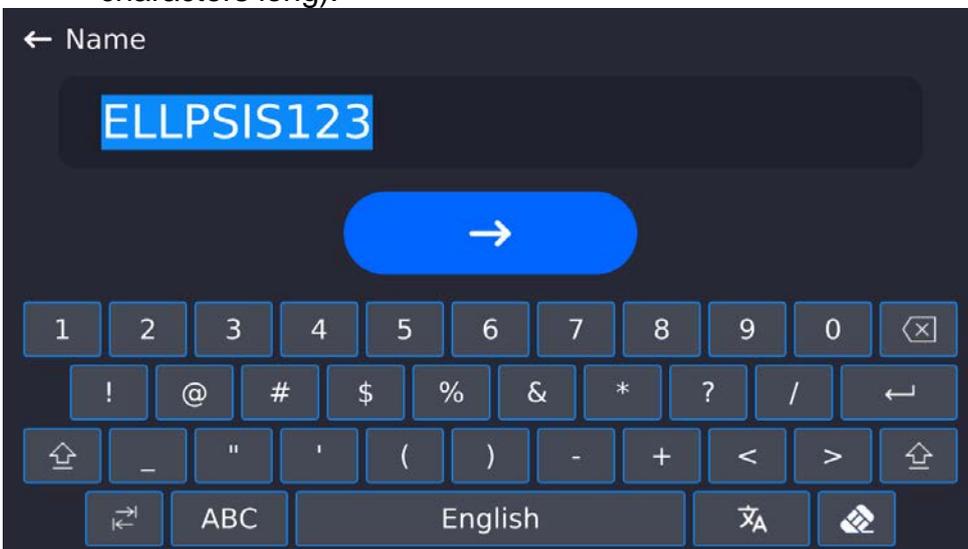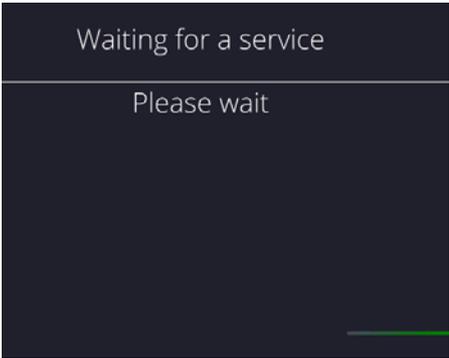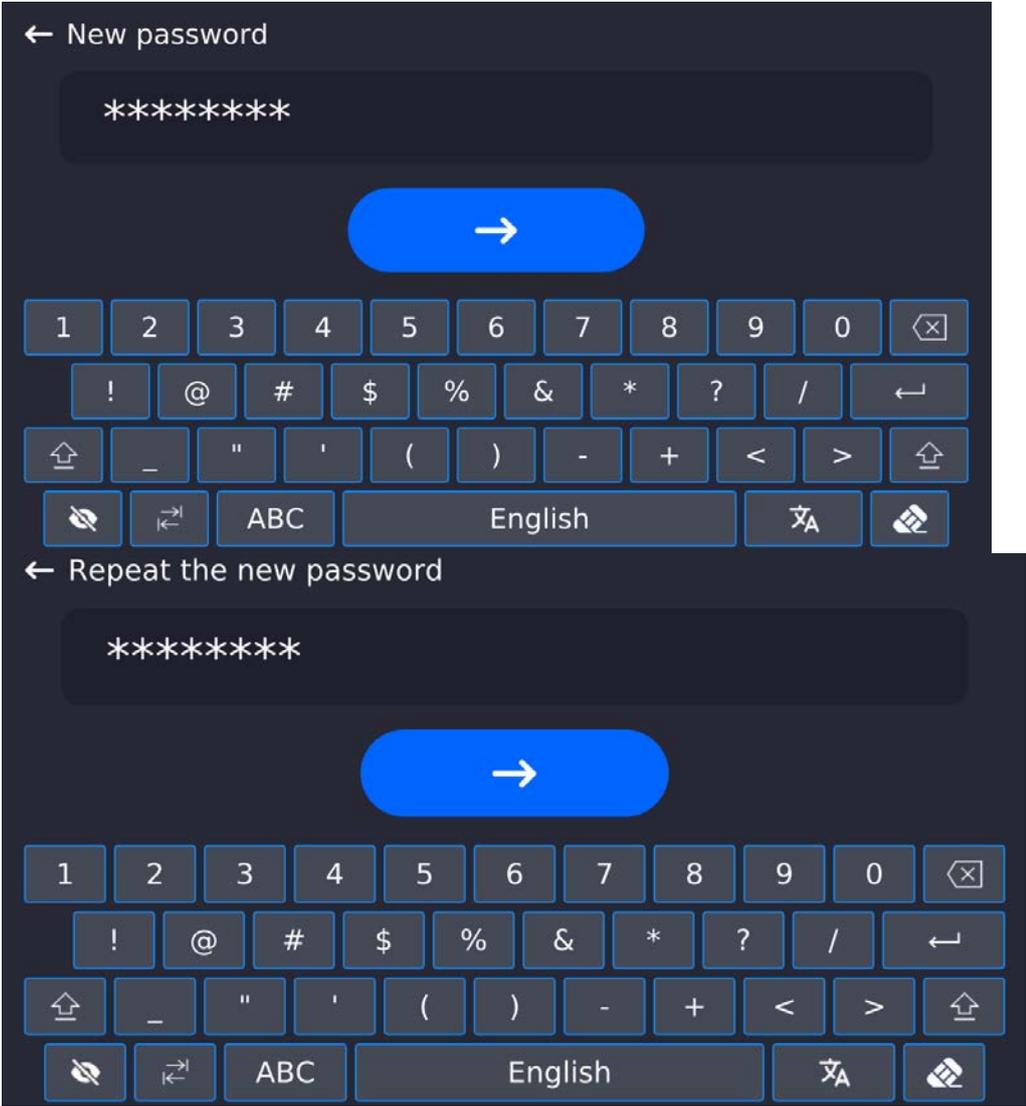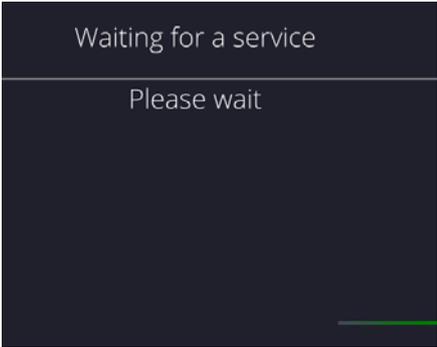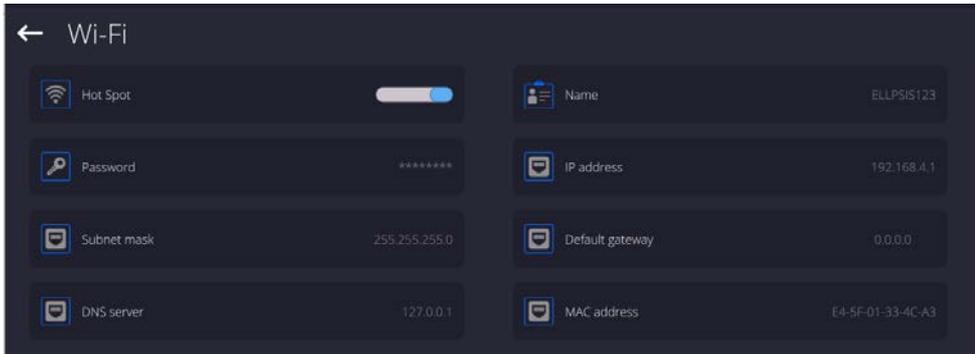
4.From now on, the Hot Spot service will be active and the created subnetwork will be visible by other smartphone devices under the name assigned above and you will be able to connect to it using the assigned password.

15.4. TCP Settings

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

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

16. PERIPHERALS

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

16.1. Computer

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

Procedure:
- Press Setup and select <Peripherals/ Computer>.
- Set balance-computer operation parameters:
  - – <u>Computer port</u>
    Available options: none, COM 1, COM 2, TCP, USB Free Link
  USB FREE LINK - USB type C port (socket no. 10 on the back of the indicator), to which the computer is connected using a USB type A/type C cable.

Tool for entering data, it functions as a keyboard. Upon proper modification of the standard or non-standard printout and sending a proper command from the computer, or

upon pressing ENTER key located on the operation panel, the data from the non-standard printout are entered directly to computer programs, e.g. Excel, Word, Notepad etc.
To ensure proper operation with Excel-type program, the non-standard printout must be properly configured by inserting the print formatting characters, such as Tab, Enter and language-specific diacritics, into the designed printout. Also remember to set the correct decimal separator (full stop or comma) that the Excel-type program will accept. It can be set in: *Setup/Misc./Decimal point*.

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

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

- <u>Address</u>
  give the address of the balance connected to the computer,
- <u>Continuous transmission</u>
  Available options: NO, YES *(printout format is conditioned by the set weighing printout template – see the parameter below)*,
- <u>Interval:</u>
  Parameter for setting the frequency of printouts for continuous transmission. Frequency of printouts is set in seconds, wherein the accuracy is 0.1s. Time values range between 0.1 and 1000 s. Interval setting is valid for continuous transmission activated using balance and computer.
- <u>Weighing printout template</u>

Parameter enables printout customization that is to be carried out in a window with printout template *(for detailed information about creating printouts, refer to section 29.19 of this user manual).*

−   E2R System
    E2R is a supervision and control system designed to monitor all weighing processes carried out on a balance. With E2R system activated, some databases can be operated using a computer exclusively (access to specified functions and options using the balance is not possible).

*Caution: <**E2R System**> can only be activated by the balance manufacturer or by an authorized personnel.*
Turn the continuous transmission off to provide correct cooperation with E2R System.

16.2. Printer

<Printer> submenu allows you to:
−   set port for establishing communication with a printer,
−   define printer's code page (default: 1250),
−   define control codes for PCL printer or EPSON receipt printer.
    Caution: Codes must be entered in a hexadecimal form!
−   define printout templates.

To ensure correct balance – printer operation (correct printout of diacritical signs of a given language), respective baud rate, obligatory for a given printer, must be chosen (see the printer settings). Additionally, the code page of a sent printout must be accordant with the code page of a printer.
There are two methods for obtaining code page accordance:
−   by setting the right code page in printer settings (read the printer manual) – respective to the printout code page set in the balance; or
−   by sending a control code from the balance to the printer, which automatically sets the right code page (respective to the code page set in the balance) before the data printout – it is possible only for printers equipped with this option.

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

1. EPSON TM-U220x Dot matrix printer
Communication parameters for the port to which the printer is connected:
- *baud rate* – *9600 bit/s*
- *data bits* – *8*
- *stop bits* – *1*
- *parity* – *none*

Printer parameters set for PERIPHERALS group:
- *port* – *COM 1 or COM 2 (the one to which the printer is connected)*

- *code page* – ***852***
- *control codes* – ***1B7412***

2. EPSON TM-T20
Communication parameters for the port to which the printer is connected:
- *baud rate* – *38400 bit/s*
- *data bits* – *8*
- *stop bits* – *1*

- parity   – *none*

Printer parameters set for PERIPHERALS group:

- *port*   – *COM 1 or COM 2 (the one to which the printer is connected)*

- *code page*   – *1250*
- *prefix*   – **1B742D**

Printer parameters set for PERIPHERALS group:

- *port*   – *COM 1 or COM 2 (the one to which the printer is connected)*

- *code page*   – **852**
- *control codes*   – **1B7412**

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

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

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

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

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

1 2 3 4 5

NET {6} {10}

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

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

If data with a high information content, such as the SQC report, is to be printed using Free Link, it is imperative that the parameter <Receipt printer speed [character/second]> is set to 15.
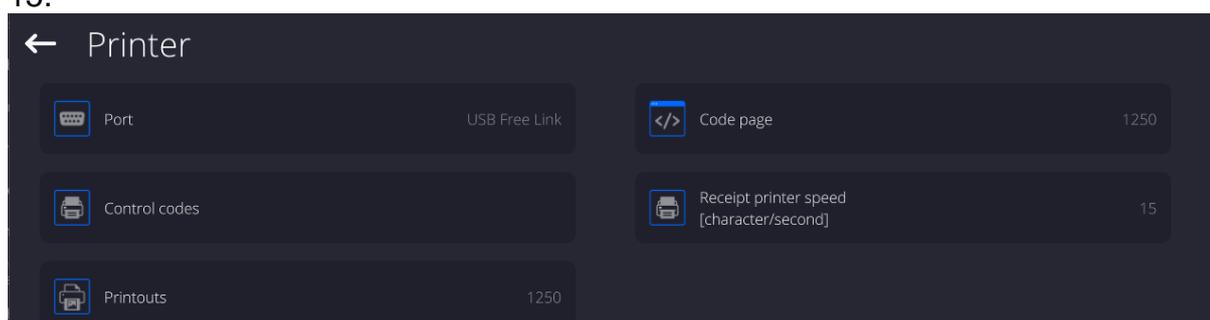
A printout template describes how to print information from databases.
The template can be modified. In order to check the format of a printout template, print the data related to e.g. product parameters. To do it, go to <Products/Edit product> submenu and press printer pictogram.

Default values for particular templates:

Product printout template	{50}	
	{51}	
Operator printout template	{75}	
	{76}	

Customer printout template   {85}
                                                   {86}

Warehouse printout template   {130}
                                                   {131}

Package printout template   {80}
                                                   {81}
                                                   {82}

Ambient conditions printout template

```
----------- AMBIENT CONDITIONS-------------
            {275}
            IS T1:   {278} °C
            IS T2:   {279} °C
            THB T: {276} °C
            THB H: {277} %
---------------------------------
```

Formulation printout template

```
----------- Formulation --------------
Formulation name:      {165}
   Ingredients quantity:  {167}
   Target mass:          {168} g
   Formulation ingredients: {169}
---------------------------------
```

16.3. Barcode Scanner

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

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

To configure the barcode scanner, enter:
„**Setup / Peripherals/ Barcode scanner”**.

Caution: *Enter* ***<Communication>*** *submenu and set baud rate for the barcode scanner (by default 9600b/s). For detailed description of the balance - barcode scanner communication, read* ***ANNEX E*** *of this user manual.*

16.3.1. Barcode Scanner Port

Procedure:
- Enter **<Peripherals>** parameter and go to „**Barcode scanner** / **Port”** parameter. Select respective option.

Ports for balance - scanner communication:
- RS 232 (COM1),
- RS 232 (COM2),

- USB

16.3.2. Prefix/Suffix

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

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

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

16.3.3. Field Selection

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

Procedure:
- Enter **< Peripherals>** submenu,
- **Select „Barcode scanner / Field selection"**. List of fields is displayed:
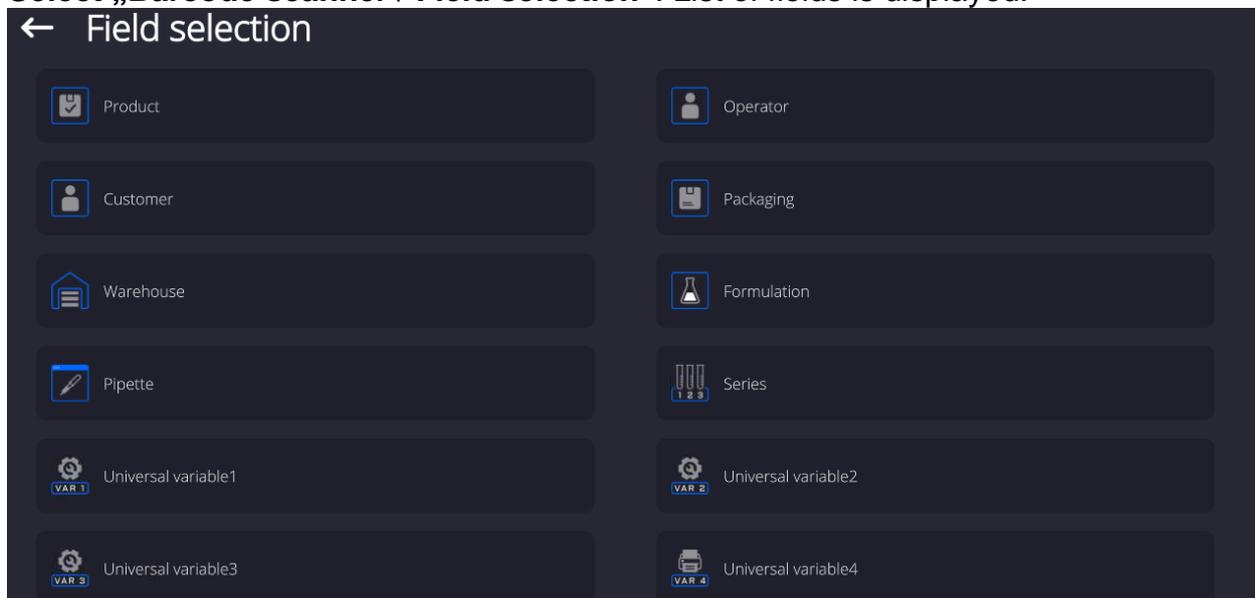
- Select one item from the list. The following parameters may be edited:

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

	procedure.
Start marker	Parameter allowing you to declare the starting point of scanned code, taken into account during the search.
End marker	Parameter allowing you to declare the ending point of scanned code, taken into account during the search.
Ignore marker	Parameter allowing you to determine whether start and end markers are to be referred to or skipped during comparison of a scanned code with the code saved to the balance.

Filtering criteria conditioned by field type:

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

16.3.4.Test

<Test> parameter allowing you to verify if operation of a barcode scanner connected to a balance is correct.

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

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

16.4. Ambient Conditions Module

Ambient conditions module (THB) can be connected to the balance via COM 1, COM 2, UDP or USB ports. In order to provide correct cooperation, enter the module address and baud rate for the port (port settings) to which the ambient conditions module is connected (the address and baud rate are to be found on the module's data plate).

16.5. Automatic Feeder
(function disabled for standard balance models).

Communication between the balance and the automatic feeder can be established via the following ports:
- RS 232 (COM1)
- RS 232 (COM2)
- Com internal.

To ensure correct cooperation with the feeder, set its address (the address and baud rate are to be found on the automatic feeder's data plate).

17. MISCELLANEOUS

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

17.1. Interface Language

Procedure:
Enter <Misc.> submenu.
Select <Language> parameter and set language.
Available languages: Polish, English, German, French, Spanish, Korean, Turkish, Chinese, Italian, Czech, Romanian, Hungarian, Russian, Serbian.

17.2. Date and Time

You can set date, time and their formats.
There are two ways to edit date and time settings:
- Press **<Date and time>** entry (home screen's top bar).
- Go to **<**Setup **/ Misc./ Date and time>**.

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

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

Name	Value	Description
Time zone	Europe, Warsaw	Parameter value: name of time zone/country. Particular name contains information regarding summer/winter time change.
Date and time	2016.04.04 08:00:00	Enter this parameter to set an internal clock and date.
Date format	yyyy.MM.dd *	Enter this parameter to select date format. Options: d.M.yy, d/M/yy, d.M.yyyy, dd.MM.yy, dd/MM/yy, dd-MM-yy, dd.MM.yyyy, dd/MM/yyyy, dd-MMM-yy, dd.MMM.yyyy, M/d/yy, M/d/yyyy, MM/dd/yy, MM/dd/yyyy, yy-M-dd, yy/MM/dd, yy-MM-dd, yyyy-M-dd, yyyy.MM.dd, yyyy-MM-dd.
Time format	HH:mm:ss **	Enter this parameter to select time format. Options: H.mm.ss, H:mm:ss, H-mm-ss, HH.mm.ss, HH:mm:ss, HH-mm-ss, H.mm.ss tt, H:mm:ss tt, H-mm-ss tt, HH.mm.ss tt, HH:mm:ss tt, HH-mm-ss tt, h.mm.ss tt, h:mm:ss tt, h-mm-ss tt, hh.mm.ss tt, hh:mm:ss tt, hh-mm-ss tt
Hide time	No	Enabling/disabling date and time preview on the home screen.
Time from the Internet	Yes	Enter this parameter to update time and date of a network-connected balance with the network time and date.
Synchronized with the Internet	Yes	Parameter informing whether time and date values have been synchronized with the network data.

*) - For date format: y – year, M – month, d – day
**) - For time format: H – hour, m – minute, s – second
<Date and time> parameter enables preview of declared date and time formats.
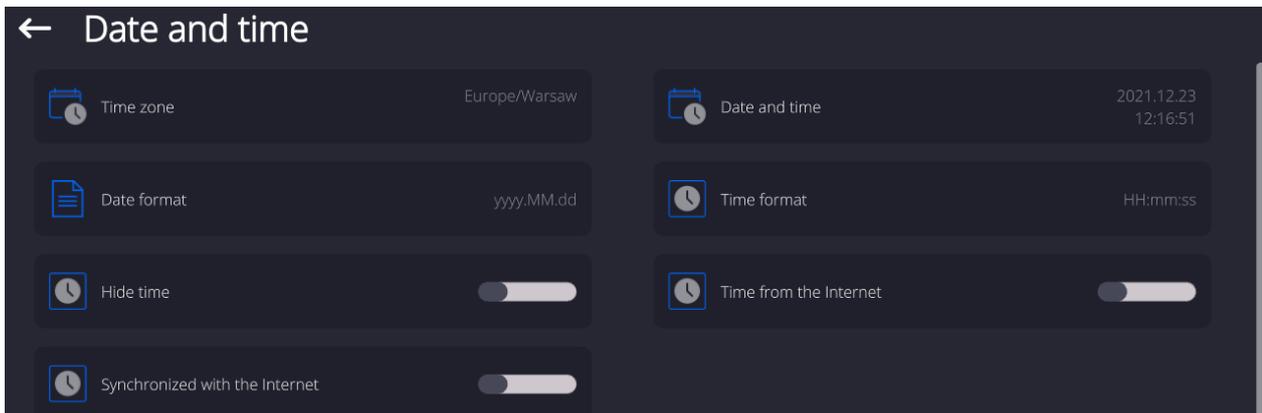
Caution: <Date and time> parameter can be accessed only by an operator with appropriate permissions. Permissions level can be modified by the administrator in <Permissions> menu.

17.3. Extension Module

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

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

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

17.4. Sound

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

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

17.5. Sleep Mode

You can turn on display sleep mode.
Procedure:
Press Setup key, next press: < Misc./Display sleep mode> submenu.
Select one of the following options: [None; 1; 2; 3; 5; 10; 15]. Digits stand for minutes. The software returns to the previous menu.
CAUTION:
The display turns to sleep mode only when the balance is not operated (the indication on the screen remains the same). Upon mass change, or pressing any key on the panel, the balance returns to weighing.

17.6. Display Brightness

Display brightness influences the duration of operation of battery-powered balance. The brighter the screen, the shorter the operation time. To make the balance work longer, reduce screen brightness.
Procedure:
Press Setup, next press: <Misc./Display brightness> submenu.

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

17.7. Vibration Detection

The program detects incorrect loading of the weighing pan with the sample. Incorrect loading can lead to increased indication errors. Activation of 'Vibration detection' function is signalled with display of a respective pictogram in the weighing result window.
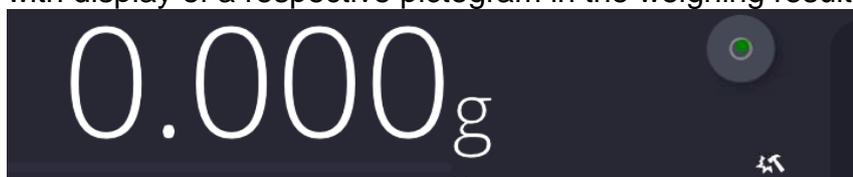
If incorrectly carried out loading is detected, the pictogram turns to red . The measurement result may be affected by a greater error.

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

17.8. Level Control

The balance is equipped with Automatic Level Control mechanism.
You can define its operation for non-verified devices.
In the case of verified instruments, the settings are hidden and the balance operates in accordance with factory settings, i.e. <Active with lock>. The weighing process is possible only if the balance is properly levelled.

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

Caution: For detailed information on levelling, read section 14.3 of this user manual.

17.9. Decimal Point

Parameter allowing to set punctuation mark for a printout.

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

Submenu screen is displayed.

17.10. Proximity Sensors Sensitivity

Parameter allowing you to change sensitivity of the proximity sensors; the values range between 0 - 9.
By default, it is 5 - 7.

Procedure:
- Enter <Misc.> submenu.
- Select <Proximity sensors sensitivity> parameter, an edit box is displayed.
- Select one of available options. Menu screen is displayed.

17.11. Doorway Degree

Parameter for setting how wide the door is to be opened in the case of an automatic operation.
Default value: <100 %> - maximally wide open door.

Procedure:
- Enter <Misc.> submenu.
- Select <Doorway degree> parameter, an edit box is displayed.
- Set <75%> value.
- Confirm. Menu is displayed.

17.12. Automatic Ionization

Parameter for switching the ionization on and setting the ionization state.
Options: None/Low/High.

Procedure:
- Enter <Misc.> submenu.
- Select <Automatic ionization> parameter, settings window is displayed.
- Set <Low> value.
- Confirm. Menu is displayed.

17.13. Autotest

<AUTOTEST> function has been designed to help you assess balance operation and to diagnose the cause of weighing errors (exceeding the maximum permissible values). AUTOTEST facilitates systematic optimisation of balance settings, which is necessary to maintain the best possible repeatability and weighing time at the workstation. The function

allows you to monitor the parameters at an optional moment and save records from carried out tests.

There are two modules:
AUTOTEST FILTER; AUTOTEST GLP.
Prior to each test, the balance controls level status, temperature and humidity.
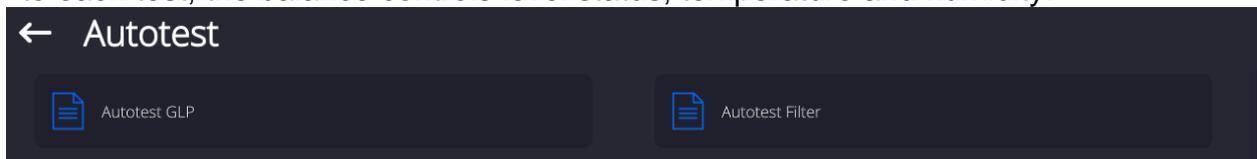
AUTOTEST FILTER

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

The test takes approximately 1 hour. Upon completion, information regarding results is obtained.
Optimal settings for particular ambient conditions are provided.
Autotest Filter enables:
• to obtain the highest measurement repeatability and the shortest measurement time with acceptable value of repeatability;
test results are stored in the balance memory until it is turned off,
• test results printout,
• direct and fast selection of optimal parameters.

Upon completed autotest, a summary with the results is displayed.
Information regarding filter settings is provided automatically via respective pictograms:
- settings providing the fastest measurement (the shortest measurement time).
- settings providing the most accurate measurement (the lowest possible value of deviation for 10 measurements).
- settings providing optimal measurement (the lowest value of time and deviation product).

 - current settings for filters.

Measurement results:
    *Filter type.
    *<Value release> parameter value.
    *Repeatability of indications expressed as standard deviation.
    *Average time of measurement stabilization.

Example:
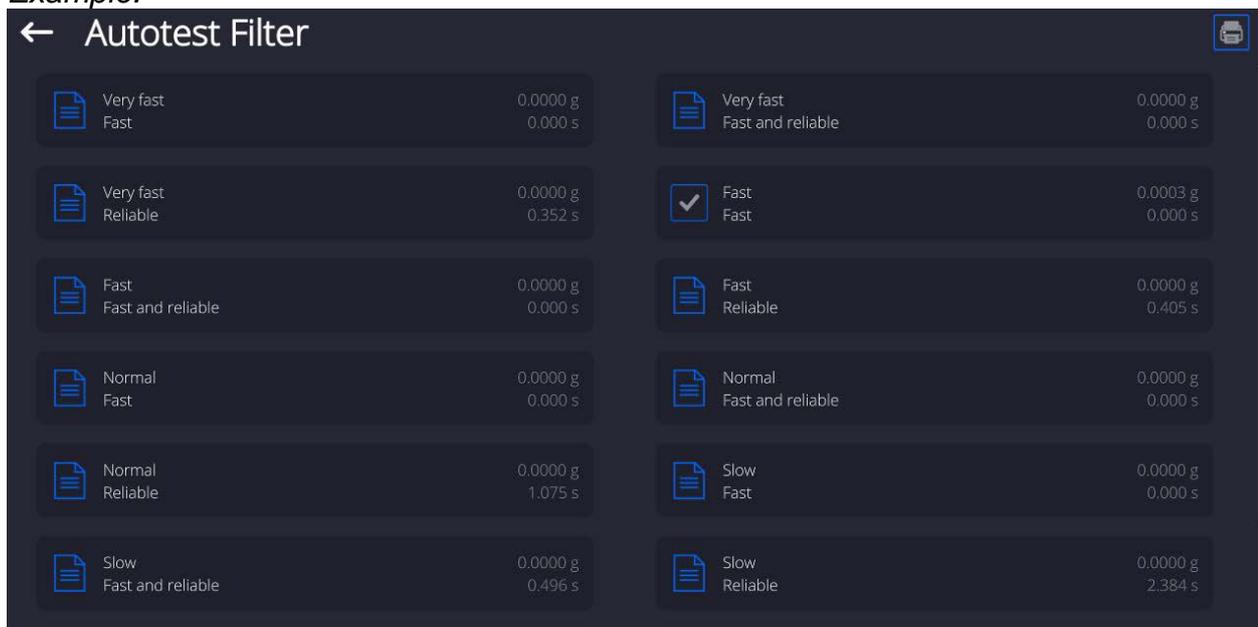
Report example:

-------- Autotest Filter: Report --------
Balance type	*XA 5Y*
Balance S/N	*442566*
Operator	*Hubert*
Software ver.	*NL1.6.5 S*
Date	*2015.05.07*
Time	*09:34:48*

Reading unit	*0.0001/0.0001 g*
Internal weight mass	*148.9390 g*
Temperature: Start	*25.26 ℃*
Temperature: Stop	*25.66 ℃*

Filter	*Very fast*
Value release	*Fast*
Repeatability	*0.0042 g*
Stabilization time	*4.505 s*
.	
Filter	*Very slow*
Value release	*Reliable*
Repeatability	*0.0207 g*
Stabilization time	*5.015 s*

Signature

....

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

Autotest Filter

S 0.000 g
Very fast
Fast

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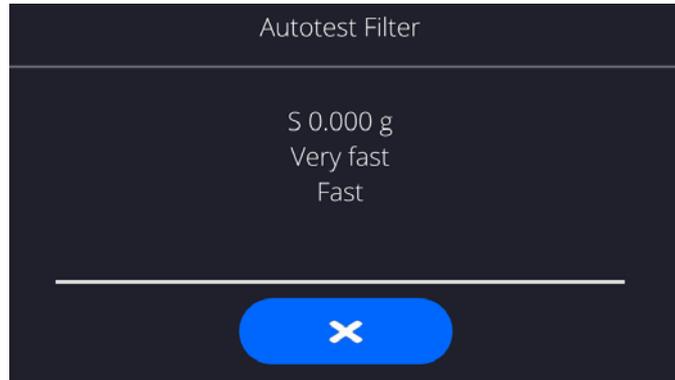
You can abort the process at any moment. To do that, press <X> button.

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

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

Autotest GLP function enables:
Report display and printout,
Record of a report containing basic data, ambient condition values and test results.

Test results:
   *Deviation for maximum capacity.
   *Value of repeatability expressed as standard deviation.
*Door test result (positive / negative).

Report example:
```
...................................................
--------- Autotest GLP: Report ---------
Balance type            XA 5Y
Balance S/N            400010
Operator            Admin
Software ver.            NLx.x S
Date            2012.01.16
Time            09:17:16
----------------------------------------
Measurements quantity    10
Reading unit            0.0001 g
Internal weight mass    140.094 g
Filter            Average
Value release        Fast and precise
----------------------------------------
Deviation for Max.        -0.0118 g
Repeatability        0.00088 g
Signature
........................................
```

Procedure:

Press entry with the test name, a message box is displayed.
Do one of the following:
- Start subsequent AUTOTEST GLP process,
- Preview results of completed autotests, and export all saved test results as a *.csv file,
- Delete all saved test results.

You can abort the process at any moment by pressing <X> button.
Results of carried out autotests are displayed in a table (each line features date and time of autotest procedure and its result).
To preview particular autotest data, press a respective table line.
In order to print a result of a single autotest, enter its details (see above) and generate a printout by pressing <Print> key located on the top of the display.
Autotest results can be exported by pressing <Export> entry in the window with all saved reports. Data is sent to a USB flash drive, connected to the balance USB port, as a *.csv file.

17.14. Start-Up Logo
(option enabled only for authorized operators)

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

17.15. Export of System Events
(option enabled only for authorized operators)

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

Procedure:

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

17.1. Text-to-speech conversion

Parameter for enabling the processing of group names and menu parameters into speech emitted from the indicator speakers. The emitted voice is only in English.

18. SCHEDULED TASKS

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

18.1. Adjustment
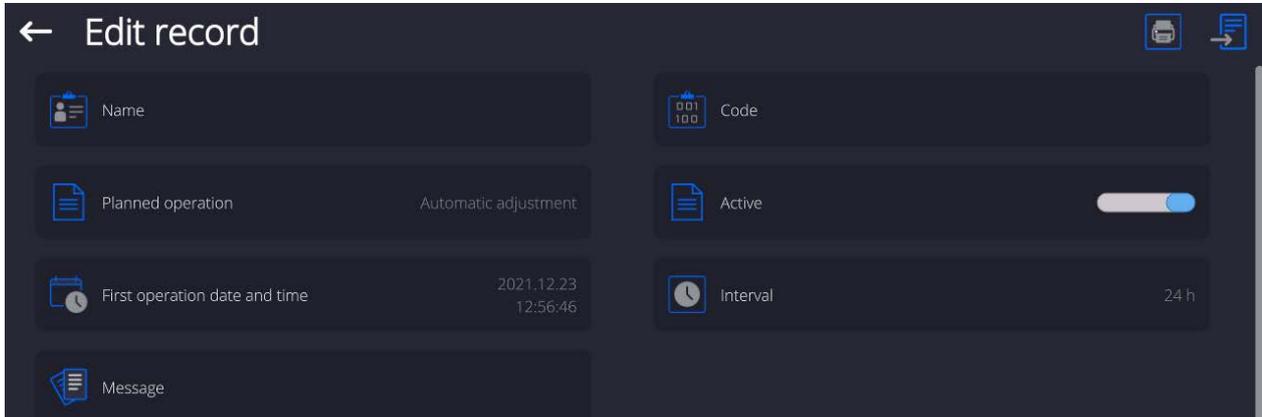
<Scheduled adjustments> parameter allows you to precisely specify the time for adjustment performance and the interval between successive adjustments. The parameter is not connected with automatic adjustment and its criteria (time, temperature). You can schedule when internal and external adjustments 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.
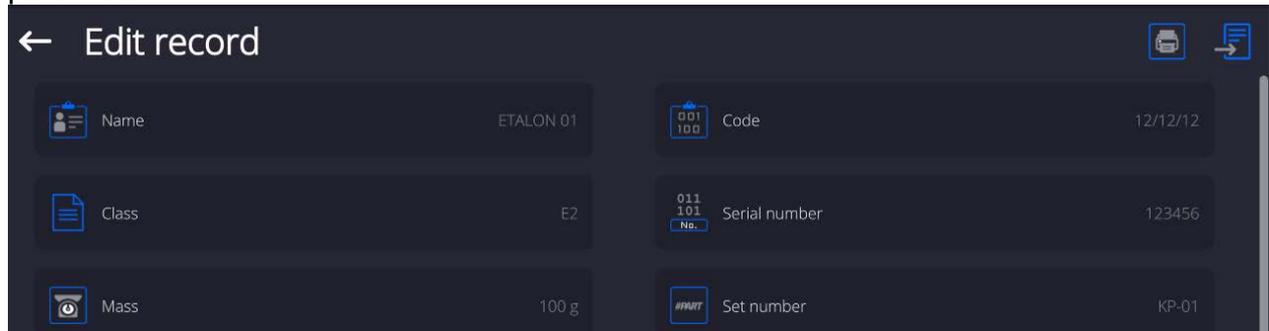
	Enter operator menu, select <Scheduled tasks> parameter. A window opens in which an authorised user (Administrator) can add entries with scheduled adjustments.
	In order to add a new entry, press [+] button, wait for a window with data on the scheduled adjustment to open.
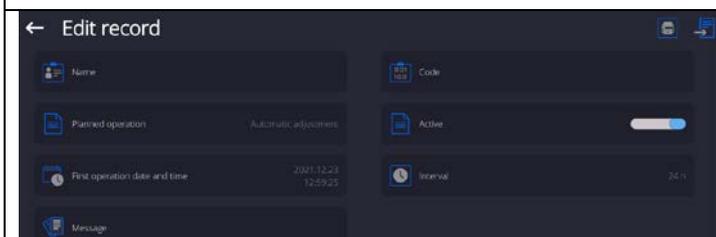
	Select task: automatic adjustment (internal or external).
	For automatic adjustment option, enter data on the adjustment and its schedule.
	For external adjustment option, enter data on the adjustment, mass standard used for the adjustment performance and its schedule.
	When all necessary data has been introduced, return to the previous window. The window features newly added entry.
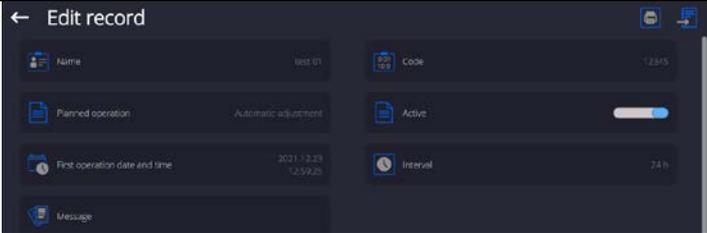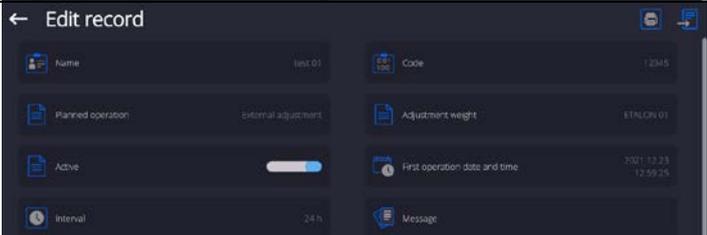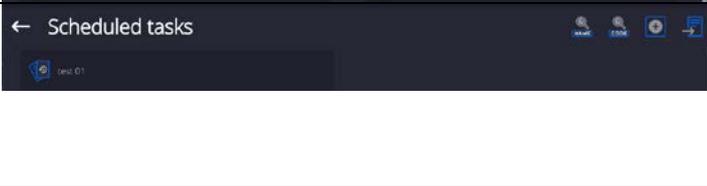
Upon entering all data, exit the menu.

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

18.2. Message

This parameter enables to declare precise time and time interval for display of a special prompt informing the user on the necessity to take up a particular action.
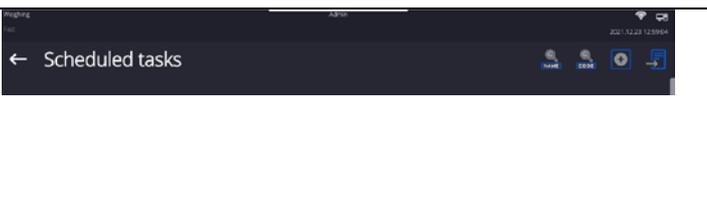
	Enter user menu, next enter <Scheduled tasks> submenu. In order to add an operation, press <⊕> button placed in a toolbar.
	<Edit record> box is displayed, press <Scheduled tasks> field. <Scheduled tasks> box is displayed.
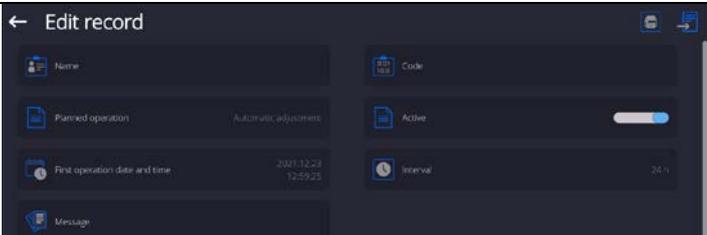
	Select <Message> option.
	Message settings box is displayed. Set message display frequency (first display, time interval), select <Message> parameter and enter message text.
	Press <→> button to confirm.
	A previous window is displayed.
	In <Scheduled tasks> box, a newly added operation is displayed. 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.
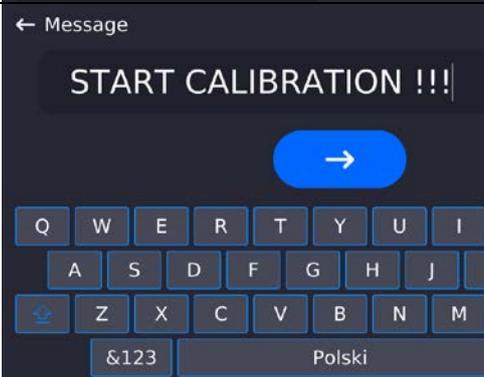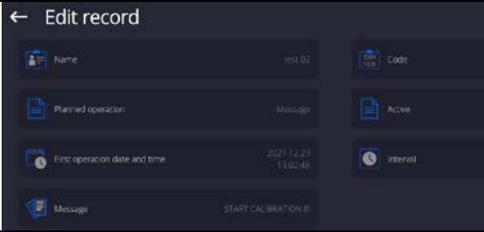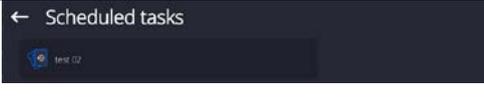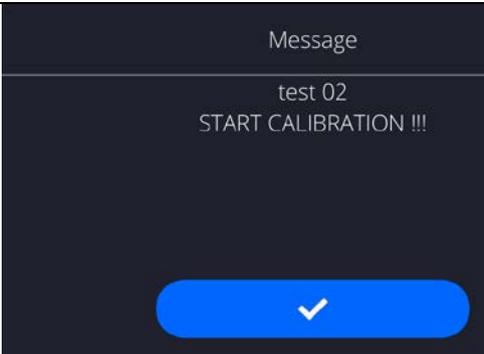
19. UPDATE

Update function enables update of:
- User-related area: APPLICATION.
- Main board (administrator exclusively).

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

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

Update of the main board file is analogous; required file extensions are: *. cm4mbu – main board.

20. ABOUT (system info)

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

Balance S/N	12345	Balance type	XA 5Y
Network balance name	PUE10-e5ea4c94	Software version	LL2.0 P qt5
Product code	036283754326	Weighing firmware version	1.0.1
Product code 2	429848141284	Software rev. MB	1.0.0
System version	LX-21.12.08	CPU Id:	56567173
Licence Id:	E4-5F-01-33-4C-A2	Memory status	FLASH: 66 % RAM: 33 %
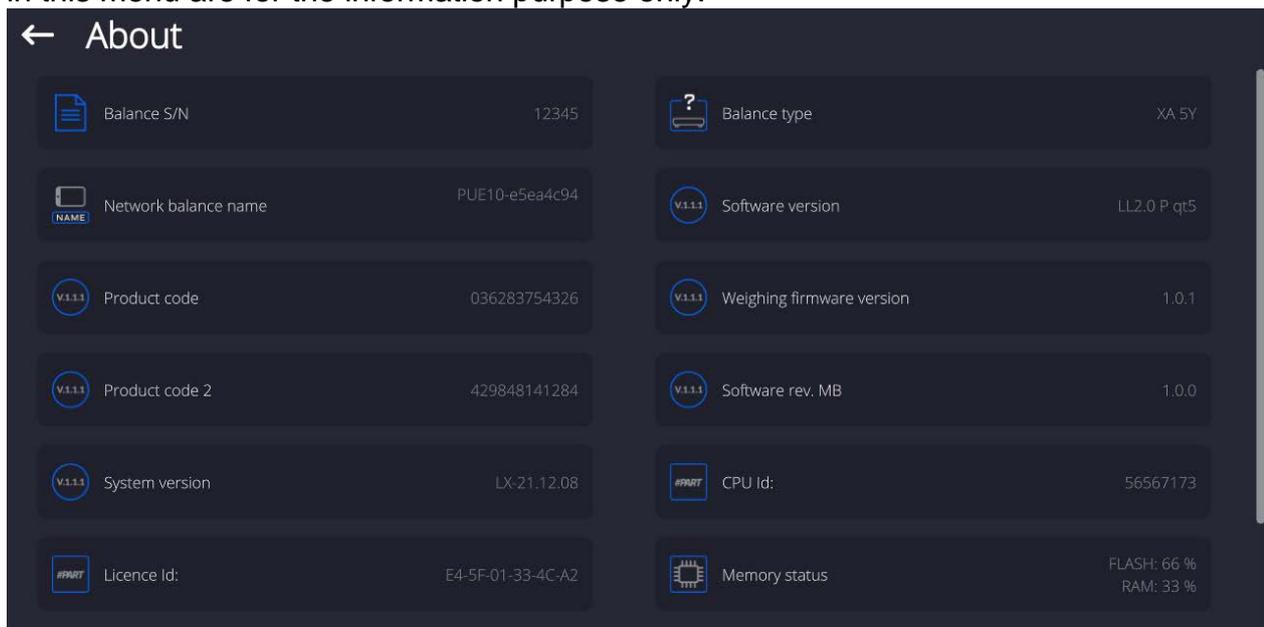
<Ambient conditions> parameter enables preview of current ambient conditions: temperature, humidity, pressure (if the balance features ambient conditions sensors).
<Print settings> parameter enables you to send all parameters to a printer port.

21. COMMUNICATION PROTOCOL

General Information

A. A character based communication protocol mass comparator- indicator is designed for establishing communication between a RADWAG mass comparator and a peripheral device via RS-232C interface.

B. The protocol consists of commands sent from a peripheral device to the weighing device and responses from the weighing device.

C. Responses are sent from the weighing device each time a command is received.

D. Commands, forming the communication protocol, enable obtaining data on weighing device status and facilitate influencing weighing device operation, e.g.: acquiring measurement results from the weighing device, zeroing, etc.

21.1. List of Commands

Command	Command overview
Z	Zeroing
T	Taring
OT	Give tare value
UT	Set tare
S	Send stable measurement result in basic measuring unit
SI	Immediately send measurement result in basic measuring unit
SIA	Immediately give results from all platforms in basic measuring units
SU	Send stable measurement result in current measuring unit
SUI	Immediately send measurement result in current measuring unit
C1	Switch on continuous transmission in basic measuring unit
C0	Switch off continuous transmission in basic measuring unit
CU1	Switch on continuous transmission in current measuring unit
CU0	Switch off continuous transmission in current measuring unit
DH	Set min checkweighing threshold
UH	Set max checkweighing threshold
ODH	Give value of min checkweighing threshold
OUH	Give value of max checkweighing threshold
SM	Set mass value of a single item
TV	Set target mass value
RM	Set reference mass value
NB	Give mass comparator serial number
PROFILES	Set balance profile
LOGIN	Operator logging
LOGOUT	Operator logout
SS	Value release
IC	Internal adjustment performance
IC1	Disable automatic internal adjustment of the mass comparator

IC0	Enable automatic internal adjustment of the mass comparator
K1	Lock mass comparator keypad
K0	Unlock mass comparator keypad
BP	Activate sound signal
OMI	Give available working modes
OMS	Set working mode
OMG	Give current working mode
PC	Send all implemented commands
BN	Give mass comparator type
FS	Give max capacity
RV	Give program version
A	Set AUTOZERO function
EV	Set ambient conditions state
FIS	Set filter
ARS	Set value release
LDS	Set last digit
UI	Give accessible units
US	Set current unit
UG	Give current unit
NT	Cooperation with PUE 7.1, PUE 10 indicator

Caution: *Each command must end with CR LF characters.*

21.2. Response Format

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

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

XX - stands for a name of a sent command

_ - space

COMMANDS OVERVIEW

Zeroing

Format: **Z CR LF**

Response options:

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

Taring

Format: **T CR LF**

Response options:

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

Give tare value

Format: **OT CR LF**

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

Response format:

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

Tare - 9 characters, right justification

Unit - 3 characters, left justification

Caution:
Tare value is always given in adjustment unit.

Set tare

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

Response options:

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

Caution:
Use dot in tare format as decimal point.

Send stable measurement result in basic measuring unit

Format: **S CR LF**

Response options:

S _ A CR LF   - command understood and in progress

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

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

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

Response format :

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

Example:

S CR LF   - command sent from a computer

S _ A CR LF   - command understood and in progress

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

where: _ - space

Immediately send measurement result in basic measuring unit

Format: **SI CR LF**

Response options:

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

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

Response format :

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

Example:

S I CR LF   - command sent from a computer

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

where: _ - space

Send stable measurement result in current measuring unit

Format: **SU CR LF**

Response options:

SU_A CR LF   - command understood and in progress

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

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

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

Response format :

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

Example:

S U CR LF   - command sent from a computer

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

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

where: _ - space

Immediately send measurement result in current measuring unit

Format: **SUI CR LF**

Response options:

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

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

Response format:

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

Example:

S U I CR LF   - command sent from a computer

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

where: _ - space

Switch on continuous transmission in basic measuring unit

Format: **C1 CR LF**

Response options:

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

C1_A CR LF   - command understood and in progress

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

Response format:

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

Switch off continuous transmission in basic measuring unit

Format: **C0 CR LF**

Response options:

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

C0_A CR LF   - command understood and carried out

Switch on continuous transmission in current measuring unit

Format: **CU1 CR LF**

Response options:

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

CU1_A CR LF   - command understood and in progress

MASS FRAME   - response: mass value in current measuring unit

Response format :

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

Switch off continuous transmission in current measuring unit

Format: **CU0 CR LF**

Response options:

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

CU0_A CR LF   - command understood and carried out

Set min checkweighing threshold

Format: **DH_XXXXX CR LF**, where: _ - space, **XXXXX** - mass format

Response options:

DH_OK CR LF   - command carried out

ES CR LF   - command not recognised (mass format incorrect)

Set max checkweighing threshold

Format: **UH_XXXXX CR LF**, where: _ - space, **XXXXX** - mass format

Response options:

UH_OK CR LF   - command carried out

ES CR LF   - command not recognised (mass format incorrect)

Give value of min checkweighing threshold

Format: **ODH CR LF**

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

Response format:

1	2	3	4-12	13	14	15	16	17	18	19
D	H	space	mass	space	unit			space	CR	LF

Mass   - 9 characters, right justification

Unit   - 3 characters, left justification

Give value of max checkweighing threshold

Format: **OUH CR LF**

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

Response format :

1	2	3	4-12	13	14	15	16	17	18	19
U	H	space	mass	space	unit			space	CR	LF

Mass   - 9 characters, right justification

Unit   - 3 characters, left justification

Set mass value of a single item (for PARTS COUNTING mode)

Format: **SM_XXXXX CR LF**, where: _ - space, **XXXXX** - mass format

Response options:

SM_OK CR LF   - command carried out

SM_I CR LF   - command understood but not accessible at this moment (e.g. mode other than PARTS COUNTING)

ES CR LF   - command not recognised (mass format incorrect)

Set target mass value (e.g. DOSING mode)

Format: **TV_XXXXX CR LF**, where: _ - space, **XXXXX** - mass format

Response options:

TV_OK CR LF   - command carried out

TV_I CR LF   - command understood but not accessible at this moment (e.g. mode other than DOSING)

ES CR LF   - command not recognised (mass format incorrect)

Set reference mass value (e.g. for PERCENT WEIGHING)

Format: **RM_XXXXX CR LF**, where: _ - space, **XXXXX** - mass format

Response options:

RM_OK CR LF	- command carried out
RM_I CR LF	- command understood but not accessible at this moment (e.g. mode other than PERCENT WEIGHING)
ES CR LF	- command not recognised (mass format incorrect)

Value release

Format: **SS CR LF**

Response options:

SS_OK CR LF   - command understood and in progress

Command's function is similar to function of PRINT key located on the instrument panel,

Internal adjustment

Format: **IC CR LF**

Response options:

IC_A CR LF	- command understood and in progress
IC_D CR LF	- adjustment completed
IC_A CR LF	- command understood and in progress
IC_E CR LF	- time limit exceeded while waiting for a stable measurement result
IC_I CR LF	- command understood but not accessible at this moment

Disable automatic internal adjustment of the mass comparator

Format: **IC1 CR LF**

Response options:

IC1_I CR LF	- command understood but not accessible at this moment
IC1_E CR LF	- operation disabled, e.g. for verified mass comparator
IC1_OK CR LF	- command carried out

Operation is disabled for verified mass comparators.
For non-verified mass comparators the command disables internal adjustment until it is enabled via IC0 command or until the mass comparator is turned off. The command does not modify settings specifying adjustment start.

Enable automatic internal adjustment of the mass comparator

Format: **IC0 CR LF**

Response options:

IC0_I CR LF	- command understood but not accessible at this moment
IC0_OK CR LF	- command carried out

Operation is disabled for verified mass comparators.

Give mass comparator serial number

Format: **NB CR LF**

Response options:

NB_A_"x" CR LF	- command understood, response: serial number
NB_I CR LF	- command understood but not accessible at this moment

x - mass comparator serial number (in between inverted commas)

Example:

Command:	NB CR LF - return serial number
Response:	NB_A_"1234567" - weighing device serial number –-"1234567"

Lock mass comparator keypad

Format: **K1 CR LF**

Response options:

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

K1_OK CR LF   - command carried out

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

Unlock mass comparator keypad

Format: **K0 CR LF**

Response options:

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

K0_OK CR LF   - command carried out

Give available working modes

Command overview:

Command returns accessible working modes.

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

Response options:

OMI <CR><LF>
n_"Mode name" <CR><LF>
:   - command carried out, response: accessible working modes
n_"Mode name" <CR><LF>
OK <CR><LF>
OMI_I <CR><LF>   - command understood but not accessible at this moment

Mode name – parameter, working mode name, inserted in between inverted comas. The name takes form displayed on a particular weighing device screen, it is provided in a currently selected language.
n - parameter, decimal value determining working mode number.

Caution:
Working modes numbering is identical for each kind of weighing instrument. The numbers are assigned to working modes names.
Some balances give only the number as a response.

Example 1:

Command: OMI <CR><LF>   - return accessible working modes

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

Example 2:

Command: OMI <CR><LF>   - return accessible working modes

Response: OMI <CR><LF>
                  2 <CR><LF>
                  4 <CR><LF>   - return accessible working modes and mode number,
                  12 <CR><LF>
                  OK <CR><LF>   - command carried out

Set working mode

Command overview:

Command sets particular working mode.

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

Response options:

OMS_OK<CR><LF>   - command carried out

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

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

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

Example:

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

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

Give current working mode

Command overview:

Command returns accessible working modes.

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

Response options:

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

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

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

Example:

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

Response: OMG_13_OK<CR><LF>   - balance set to STATISTICS mode

---

Give accessible units

Command overview:

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

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

Response options:

UI_"x$_1$,x$_2$, … x$_n$"_OK<CR><LF>   - command carried out, returns accessible units

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

X - unit symbols, separated by means of commas.
x → g, mg, ct, lb, oz, ozt, dwt, tlh, tls, tlt, tlc, mom, gr, ti, N, baht, tola, u1, u2

Example:

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

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

---

Set current unit

Command overview:

Command sets current unit for a particular device.

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

Response options:

US_ x_OK <CR><LF>   - command carried out, returns accessible units

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

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

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

Caution:

If x=next the command swaps to another available unit on the list (it simulates unit button pressing).

Example:

Command:	US_mg<CR><LF>	- set „mg" unit
Response:	US_mg_OK<CR><LF>	- „mg" set as a current unit

Give current unit

Command overview:

Command returns current unit.

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

Response options:

UG_x_OK<CR><LF>   - command carried out, returns accessible units

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

x - parameter, units symbols:

Example:

Command:	UG<CR><LF>	- return current unit
Response:	UG_ct_OK<CR><LF>	- currently set unit is „ct"

Activate sound signal

Command overview:

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

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

Response options:

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

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

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

TIME - parameter, decimal value specifying how long shall the sound last, parameter given in [ms]. Recommended range <50÷ 5000>.

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

Example:

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

Caution:

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

Send all implemented commands

Format: **PC CR LF**

Command:	**PC CR LF**	- send all implemented commands
Response:	**PC_A_"Z,T,S,SI…"**	- command carried out, the terminal displays all implemented commands.

Give mass comparator type

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

Response options:

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

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

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

Example:

Command: BN <CR><LF>   - give mass comparator type

Response: BN_A_"AS"   - mass comparator type - "XA 4Y"

Give max capacity

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

Response options:

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

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

x - Max value of reading units (in between inverted commas)

Example:

Command: FS <CR><LF>   - command understood, response: Max capacity
                                         - max capacity - "220 g"

Response: FS_A_"220.0000"

Give program version

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

Response options:

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

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

x - program version (in between inverted commas)

Example:

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

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

Set AUTOZERO function

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

Response options:

A_OK<CR><LF>   - command carried out

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

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

n - parameter, decimal value determining autozero settings

n →   0 – autozero off
      1 – autozero on

Caution:

Command changes settings for a current working mode.

Example:

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

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

AUTOZERO function operates until it is turned off by A 0 command.

Set ambient conditions state

Format: **EV_n <CR><LF>**

Response options:

EV_OK<CR><LF>   - command carried out

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

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

n - parameter, decimal value determining ambient conditions state

n → 0 – unstable ambient conditions
      1 – stable ambient conditions

Caution:
Command changes settings for a current working mode.
Example:

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

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

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

Set filter

Format: **FIS_n <CR><LF>**

Response options:

FIS_OK<CR><LF>   - command carried out

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

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

n - parameter, decimal value determining filter number.

n → 1 – very fast
      2 – fast
      3 – average
      4 – slow
      5 – very slow

Caution:
The numbering is assigned to a particular filter name and it is identical for all balance types.
The command changes settings for a current working mode if, for a particular mass comparator type, filter settings are assigned to the working mode.
Example:

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

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

Set value release

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

Response options:

ARS_OK<CR><LF>   - command carried out

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

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

n - parameter, decimal value determining value release options

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

Caution:
The numbering is assigned to a particular value release option and it is identical for all balance types.
The command changes settings for a current working mode if, for a particular mass comparator type, filter settings are assigned to the working mode.
Example:

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

Response:	ARS_OK<CR><LF>	- fast+reliable option set

Set last digit

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

Response options:

LDS_OK<CR><LF>	- command carried out
LDS_E <CR><LF>	- error in-course of command execution, no parameter or incorrect format
LDS_I <CR><LF>	- command understood but not accessible at this moment

n - parameter, decimal value determining last digit settings

n → 1 – always
2 – never
3 – when stable

Caution:
The numbering is assigned to a particular last digit option and it is identical for all balance types.
The command changes settings for a current working mode if, for a particular mass comparator type, filter settings are assigned to the working mode.

Example:

Command:	LDS_1<CR><LF>	- set last digit option to value 'always'
Response:	LDS_OK<CR><LF>	- 'always' value set

Operator logging

Format: **LOGIN_*Name, Password* CR LF**

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

Response options:

LOGIN OK CR LF	- command understood, new operator logged in
LOGIN ERROR CR LF	- command understood, an error in name or password occurred, log in failed
ES CR LF	- command not recognized (error in format)

Operator logout

Format: **LOGOUT CR LF**

Response options:

LOGOUT OK CR LF	- command understood, operator is logged out
ES CR LF	- command not recognized (error in format)

Give accessible units

Command overview:

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

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

Response options:

UI_"x$_1$,x$_2$, … x$_n$"_OK<CR><LF>	- command carried out, returns accessible units
UI_I <CR><LF>	- command understood but not accessible at this moment

X - unit symbols, separated by means of commas.
x → g, mg, ct, lb, oz, ozt, dwt, tlh, tls, tlt, tlc, mom, gr, ti, N, baht, tola, u1, u2

Example:

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

Set current unit

Command overview:

Command sets current unit for a particular device.

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

Response options:

US_ x_OK <CR><LF>   - command carried out, returns accessible units

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

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

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

Caution:

If x=next the command swaps to another available unit on the list (it simulates button pressing).

Example:

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

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

Give current unit

Command overview:

Command returns current unit.

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

Response options:

UG_x_OK<CR><LF>   - command carried out, returns accessible units

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

x - parameter, units symbols:

Example:

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

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

Cooperation with PUE 7.1, PUE 10 indicator

Format: **NT CR LF**

Response options:

ES CR LF   - command not recognised (mass format incorrect)

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

Response format :

1	2	3	4	5	6	7	8	9-18	19	20-22	23	24-32	33	34-36	37	38	39	40
N	T	space	Stability marker	Zero marker	Range marker	Digit marker	space	mass	space	Mass unit	space	tare	space	Tare unit	space	hidden digits quantity	CR	LF

NT   - command

Stability marker   - [space] if stable, [?] if unstable

Zero marker   - [space] for any value but zero, [Z] for zero value

Range marker   - marker informing on range within which mass value is comprised: [space] I range balance, [2] II balance, [3] III balance

Digit marker   - [zero] no digit, [1] one digit marker, [2] two digits marker, [3] three digits marker, [4] four digits marker, [5] five digits marker

Mass   - 10 characters for net mass given in adjustment unit (with dot and a floating-point "-" sign) with right justification

Mass unit   - 3 characters, left justification

Tare   - 9 characters with dot - right justification (when floating-point tare gets turned off automatically then zero value is sent)

Tare unit   - 3 characters, left justification

Hidden digits quantity - number specifying quantity of hidden digits: [space] when no digits are hidden, [1] when 1 digit is hidden

Example:

NT CR LF   - command sent from a computer

N T _ ? _ _ 0 _ _ _ _ _ - 5 . 1 1 3 _ g _ _ _ _ _ _ _ 0 . 0 0 0 _ g _ _ _0 CR   LF

- command carried out, response: mass value and remaining data

where: _ - space

21.3. Manual Printout/Automatic Printout

The mass comparator enables generating manual and automatic printouts.

- Manual printout: upon indication stabilization press [⏎] key.
- Automatic printout is generated automatically in accordance with the settings for automatic printout (read section 14.5 of this user manual).

The content of printout depends on settings of <Standard printout> - <Weighing printout template> menu (read: section 14.5 of this user manual).

Mass printout format:

1	2	3	4 -12	13	14	15	16	17	18
stability marker	space	character	mass	space	unit			CR	LF

Stability marker	[space] if stable
	[?] if unstable
	[!] if air buoyancy compensation mode is enabled
	[^] if high limit is out of range
	[v] if low limit is out of range
Character	[space] for positive values
	[-] for negative values
Mass	9 characters with decimal point, right justification
Unit	3 characters, left justification

Example:

_ _ _ _ _ _ **1 8 3 2 . 0** _ **g** _ _ **CR LF** - a printout generated from a mass comparator

upon pressing [⏎] key, according to settings of <Weighing printout template>:

N (measurements quantity)	**NO**	Universal variable 1 … 5	**NO**
Date	**NO**	Net	**NO**
Time	**NO**	Tare	**NO**
Level status	**NO**	Gross	**NO**
Customer	**NO**	Current result	**NO**
Warehouse	**NO**	Supplementary unit	**NO**
Product	**NO**	Mass	**YES**
Packaging	**NO**	Non-standard printout	**NO**

22. PERIPHERAL DEVICES

The 5Y series balance can operate with the following peripheral devices:
- computer,
- EPSON receipt printer,
- PCL6 printer, (*Printer Command Language*),,
- barcode scanner,
- fingerprint reader,
- peripheral device operating in ASCII communication protocol.

Caution: Only accessories listed on the RADWAG website can be connected to the balance.

23. ERROR MESSAGES

Max weighing threshold exceeded
Unload the weighing pan

Min weighing threshold exceeded
Install weighing pan

Zeroing out of range
Press tarring button or restart the balance

Display capacity out of range
Unload the weighing pan

Tarring out of range
Press zeroing button or restart the balance

Start mass out of range
Install weighing pan

Zeroing/tarring time out of range
Weighing indication unstable

-no level-   Balance not levelled
-Err 100-   Weighing module restart
In process   An ongoing process in the course of which the indication may be unstable
             (automatic feeder – the process of feeding a pill, or mass comparator – the
             process of load change)

24. ADDITIONAL EQUIPMENT

Type	Name
EPSON	Dot printer
	PCL6 Printer
LS2208	Barcode scanner
SAL	Anti-vibration table for XA series balances
	PC keyboard

PC software:
- „LABEL EDITOR"

25. APPENDIX A - Variables for Printouts

25.1. Variables List

Caution:
Each defined variable must be inserted in between curly bracket: {x}, where x – variable number.

List of variables defining non-standard printout templates and data displayed within the workspace:

Symbol	Description
{0} [1]	Standard printout in a calibration unit
{1} [1]	Standard printout in a current unit
{2}	Date
{3}	Time
{4}	Date and time
{5}	Working mode
{6}	Net weight in a current unit
{7}	Net weight in adjustment unit
{8}	Gross weight
{9}	Tare
{10}	Current unit
{11}	Adjustment unit
{12}	Low threshold
{13}	High threshold
{15}	Statistics: Number
{16}	Statistics: Sum
{17}	Statistics: Mean
{18}	Statistics: Minimum

{19}	Statistics: Maximum
{20}	Statistics: SDV
{21}	Statistics: D
{22}	Statistics: RDV
{26}	Result control
{27}	Value
{28}	Level status
{30}	Gross
{31}	Weighing platform no.
{32}	Serial number
{33}	Reading unit
{34}	Range
{35}	Parts counting: Reference sample mass
{36}	Percent weighing: Reference mass
{38}	Universal variable: Name
{39}	Universal variable: Value
{43}	Net weight in a supplementary unit
{44}	Supplementary unit
{45}	Target value
{46}	Tolerance
{47}	Difference
{48}	Mass comparator type
{50}	Product: Name
{51}	Product: Code
{52}	Product: EAN code
{53}	Product: Mass
{54}	Product: Tare
{55}	Product: Price
{56}	Product: Minimum
{57}	Product: Maximum
{58} [2]	Product: PGC mode
{59}	Product: Shelf-life time in days
{60}	Product: VAT

{61}	Product: Date
{62}	Product: Expiry date
{63}	Product: Density
{64}	Product: Ingredients
{65}	Product: Overview
{66}	Product: Tolerance
{75}	Operator: Name
{76}	Operator: Code
{77}	Operator: Permissions
{80}	Packaging: Name
{81}	Packaging: Code
{82}	Packaging: Mass
{85}	Customer: Name
{86}	Customer: Code
{87}	Customer: NIP
{88}	Customer: Address
{89}	Customer: Postal code
{90}	Customer: City
{91}	Customer: Discount
{100} [2]	PGC Report: Batch number
{101} [2]	PGC Report: Start date
{102} [2]	PGC Report: End date
{103} [2]	PGC Report: Result
{104} [2]	PGC Report: Batch quantity
{105} [2]	PGC Report: Measurements quantity
{106} [2]	PGC Report: Value of T1 error
{107} [2]	PGC Report: Value of 2T1 error
{108} [2]	PGC Report: T1 errors quantity
{109} [2]	PGC Report: Permissible T1 errors quantity
{110} [2]	PGC Report: 2T1 errors quantity
{111} [2]	PGC Report: Sum
{112} [2]	PGC Report: Min
{113} [2]	PGC Report: Max
{114} [2]	PGC Report: Mean

{115} [2]	PGC Report: Average limit
{116} [2]	PGC Report: Standard deviation
{117} [2]	PGC Report: Measurements
{118} [2]	PGC Report: Unit
{119} [2]	PGC Report: Report no.
{120} [2]	Average Tare Report: Date
{121} [2]	Average Tare Report: Result
{122} [2]	Average Tare Report: Standard deviation
{123} [2]	Average Tare Report: 0.25T1
{124} [2]	Average Tare Report: Measurements quantity
{125} [2]	Average Tare Report: Measurements
{126} [2]	Average Tare Report: Report no.
{130}	Warehouse: Name
{131}	Warehouse: Code
{132}	Warehouse: Overview
{140}	Additional display: WD
{142}	Additional display: WWG
{143}	Hex
{144}	Hex UTF-8
{146}	Gross weight value in current unit
{147}	Tare in current unit
{150}	PCL printer: Form feed
{151}	Epson printer: Paper crop
{155}	Cooperation with RADWAG CONNECT
{190} [2]	Comparator: Report no.
{191} [2]	Comparator: Start date
{192} [2]	Comparator: End date
{193} [2]	Comparator: Order number
{194} [2]	Comparator: Test weight number
{195} [2]	Comparator: Difference
{196} [2]	Comparator: List of measurements
{197} [2]	Comparator: Mean difference
{198} [2]	Comparator: Standard deviation

{199} [2)]	Comparator: Cycles quantity
{200} [2)]	Comparator: Method
{201} [2)]	Comparator: Min temperature
{202} [2)]	Comparator: Max temperature
{203} [2)]	Comparator: Min humidity
{204} [2)]	Comparator: Max humidity
{205} [2)]	Comparator: Min pressure
{206} [2)]	Comparator: Max pressure
{207} [2)]	Comparator: Task
{208} [2)]	Comparator: Selected task
{209} [2)]	Comparator: Measurements
{210}	Adjustment history: Adjustment type
{211}	Adjustment history: Nominal mass
{212}	Adjustment history: Current mass
{213}	Adjustment history: Difference
{214}	Adjustment history: Temperature
{215}	Adjustment history: Level status
{216}	Adjustment history: Weighing platform no.
{219}	Adjustment history: Date and time of recently performed adjustment
{220} [2)]	Mass control: Start date
{221} [2)]	Mass control: End date
{222} [2)]	Mass control: Batch no.
{223} [2)]	Mass control: Mean
{224} [2)]	Mass control: Standard deviation
{225} [2)]	Mass control: Reference sample quantity
{226} [2)]	Mass control: Measurements
{227} [2)]	Mass control: Report no.
{228} [2)]	Mass control: Number of T2M error
{229} [2)]	Mass control: Number of T1M error
{230} [2)]	Mass control: Number of T1P error
{231} [2)]	Mass control: Number of T2P error
{232} [2)]	Mass control: T2- threshold
{233} [2)]	Mass control: T1- threshold
{234} [2)]	Mass control: T1+ threshold
{235} [2)]	Mass control: T2+ threshold

{236} [2]	Mass control: T2- threshold value
{237} [2]	Mass control: T1- threshold value
{238} [2]	Mass control: T1+ threshold value
{239} [2]	Mass control: T2+ threshold value
{240} [2]	Mass control: Average in percent (DX)
{241} [2]	Mass control: Standard deviation in percent
{250}	Density: Start date
{251}	Density: End date
{252}	Density: Procedure
{253}	Density: Standard liquid
{254}	Density of standard liquid
{255}	Density: Temperature of standard liquid
{256}	Density: Sinker volume
{257}	Density: Density determined
{258}	Density: Unit
{259}	Density: Sample no.
{260}	Density: Weighing 1
{261}	Density: Weighing 2
{263}	Density: Volume
{266}	Density: Mass of steel standard
{267}	Density: Mass of aluminium standard
{268}	Density: Density of steel standard
{269}	Density: Density of aluminium standard
{275}	Ambient conditions report: Date and time
{276}	Ambient conditions report: THB Temperature
{277}	Ambient conditions report: THB humidity
{278}	Ambient conditions report: Temperature 1
{279}	Ambient conditions report: Temperature 2
{280}	Ambient conditions report: THB pressure
{281}	Ambient conditions report: Air density
{282}	Ambient conditions report: Humidity
{283}	Ambient conditions report: Pressure
{285} [2]	Mass comparator: Reference weights: Name
{286} [2]	Mass comparator: Reference weights: Code
{287} [2]	Mass comparator: Reference weights: Class

{288} [2]	Mass comparator: Reference weights: Serial number
{289} [2]	Mass comparator: Reference weights: Mass
{290} [2]	Mass comparator: Reference weights: Set no.
{295}	Animal weighing: Threshold
{296}	Animal weighing: Averaging time
{300} [2]	Tasks: Name
{301} [2]	Tasks: Code
{302} [2]	Tasks: Class
{303} [2]	Tasks: Mass
{304} [2]	Tasks: Order number
{305} [2]	Tasks: Test weight number
{310}	Pipettes: Name
{311}	Pipettes: Code
{312}	Pipettes: Model
{313}	Pipettes Tips
{314}	Pipettes: Nominal volume
{315}	Pipettes: Minimum volume
{316}	Pipettes: Channels quantity
{317}	Pipettes: Type
{318}	Pipettes: Volume type
{319}	Pipettes: Tested volumes
{325}	Pipette calibration report: Serial no.
{326}	Pipette calibration report: Start date
{327}	Pipette calibration report: End date
{328}	Pipette calibration report: Measurements quantity
{329}	Pipette calibration report: Cooperation in accordance with ISO 8655
{330}	Pipette calibration report: Status
{331}	Pipette calibration report: Temperature
{332}	Pipette calibration report: Humidity
{333}	Pipette calibration report: Pressure
{334}	Pipette calibration report: Water temperature
{335}	Pipette calibration report: Z coefficient
{336}	Pipette calibration report: Statistics

{337}	Pipette calibration report: Measurements and statistics
{338}	Pipette calibration report: Channel no.
{340}	Pipette calibration report: Average volume
{341}	Pipette calibration report: Systematic error
{342}	Pipette calibration report: Random error
{343}	Pipette calibration report: Tested volume
{344}	Pipette calibration report: Systematic error [%]
{345}	Pipette calibration report: Random error [%}
{350}	Lot: Name
{351}	Lot: Code
{352}	Lot: Samples
{353}	Lot: Samples quantity
{355}	Sample: Name
{356}	Sample: Status
{357}	Sample: Tare
{358}	Sample: Temperature
{359}	Sample: Humidity
{360}	Sample: Pressure
{361}	Sample no.
{365}	Weighing B: Interval
{366}	Weighing B: Difference
{367}	Weighing B: Difference %
{368}	Weighing B: Residue %
{369}	Weighing B: Number
{375}	Differential weighing: Method
{380}[2]	Drying program: Name
{381}[2]	Drying program: Code
{385}[2]	Drying mode
{386}[2]	Drying mode parameters
{387}[2]	Finish mode

{388}[2)]	Finish mode parameters
{389}[2)]	Drying report: Unit
{390}[2)]	Drying report: Printout interval
{395}[2)]	Moisture analyzer: Set temperature
{396}[2)]	Moisture analyzer: Current temperature
{397}[2)]	Moisture analyzer: Drying time
{398}[2)]	Moisture analyzer: Status
{399}[2)]	Moisture analyzer: Drying time and result
{400}[2)]	Moisture analyzer: Humidity content
{401}[2)]	Moisture analyzer: Dry content
{402}[2)]	Moisture analyzer: Humid/Dry ratio
{403}[2)]	Moisture analyzer: Heating source test – Power [%]
{405}	SQC : Batch number
{406}	SQC : Start date
{407}	SQC : End date
{408}	SQC : Batch quantity
{410}	SQC : Mean
{411}	SQC : Standard deviation
{412}	SQC : MIN
{413}	SQC : MAX
{414}	SQC : Difference
{415}	SQC : Measurements
{416}	SQC : Mean [%]
{417}	SQC : Standard deviation [%]
{418}	SQC : T2- errors quantity
{419}	SQC : T1- errors quantity
{420}	SQC : T1+ errors quantity
{421}	SQC : T2+ errors quantity
{422}	SQC : T2- threshold
{423}	SQC : T1- threshold
{424}	SQC : T1+ threshold
{425}	SQC : T2+ threshold
{426}	SQC : T2- threshold value

{427}	SQC : T1- threshold value
{428}	SQC : T1+ threshold value
{429}	SQC : T2+ threshold value
{440}	Minimum sample weight: Name
{441}	Minimum sample weight: Reference tare
{442}	Minimum sample weight
{443}	Minimum sample weight: Status

Caution:

1) *Format of variables {0} and {1} is finished with **CR LF** characters (i.e. switching to a next line is carried out automatically),*

2) *Variables are not operated by software version: **Standard**.*

25.2. Variables Formatting

You can randomly format numerical variables, text variables and date which are dedicated for printing, and which are displayed in the grey workspace of the display.

Formatting types:
- variables with left justification,
- variables with right justification,
- determining quantity of characters for printing / displaying,
- determining quantity of decimal places for numerical variables,
- converting the format of date and hour,
- converting numerical variables into EAN13 code
- converting numerical variables and date into EAN128 code

Special formatting characters:

Character	Overview	Example
,	Sign separating variables for formatting	**{7,10}** - Net weight in adjustment unit with constant length of 10 characters, with right justification
-	Minus sign or left justification	**{7,-10}** - Net mass in adjustment unit with constant length of 10 characters, with left justification
:	Sign proceeding formatting or time separator (i.e. hours, minutes and seconds)	**{7:0.000}** - Net mass in adjustment unit always with three decimal places; **{3:hh:mm:ss}** – Current time in format: hour : minute : second.
.	First detected dot in a digit is recognized as separator of integer and decimal parts. Each following dot is ignored.	**{55:0.00}** - Product's unit price always with two decimal places; **{17:0.0000}** – Measurements average, always with four decimal places;

F	Sign formatting digits to a chain of sign in format "-ddd.ddd…" (where: d stands for a single digit, minus is for digits with negative value only) or determining number of decimal places	**{7:F2}** - Net mass in adjustment unit always with two decimal places; **{7,9:F2}** - Net mass in adjustment unit always with two decimal places and fixed length of 9 characters with right justification;
V	Formatting mass and quantities derivatives of mass in EAN13 code	**{7:V6.3}** - Net mass in a form of EAN13 code (6-character code) with three decimal places

T	Formatting mass and quantities derivatives of mass in EAN128 code	**{7:T6.3}** - Net mass in a form of EAN128 code with three decimal places;
/	Date separator between days, months and years	**{2:yy/MM/dd}** - Current date in format: year - month - day, where **yy** stand for two less meaningful characters of a year;
\	Sign "escape" deleting a formatting function from the following sign, so that it is recognized as text	**{2:yy\MM\dd}** – Current date in format: year / month / day. **{2:yy\:MM\:dd}** - Current date in format: year : month : day. Should „\" be used in literal meaning, insert \\;

Application list of formatted variables:

CODE	OVERVIEW
{7:V6.3}	Net mass in EAN 13 code (6-character code)
{7:V7.3}	Net mass in EAN 13 code (7-character code)
{27:V6.3}	Net value in EAN 13 code (6-character code)
{27:V7.3}	Net value in EAN 13 code (7-character code)
{7:T6.3}	Net mass in EAN 128 code
{8:T6.3}	Gross mass in EAN 128 code
{55:T6.2}	Product price in EAN 128 code
{2:yyMMdd}	Data in EAN 128 code
{61:yyMMdd}	Product data in EAN 128 code
{62:yyMMdd}	Product's shelf-life time in EAN 128 code

26. APPENDIX C - CITIZEN Printer Settings

Baud rate   **9600b/sec**
Parity   **none**
Bits   **8bit**
Stop bits   **1 bit**
Handshake   **none**
IEEE 1284   **ON (enabled)**

Printout data regarding RS232:

[Interface Menu]
RS-232C Baud rate   **9600bps**
RS-232C Parity   **None**
RS-232C Length   **8 bit**
RS-232C Stop bit   **1 bit**
RS-232C X-ON   **No**

IEEE 1284   **On**

For detailed information on activating an information (test) printout and carrying out changes
refer to CITIZEN printer user manual.

27. APPENDIX D - ZEBRA Printer Settings

Baud rate   **9600b/sec**
Parity   **none**
Bits   **8bit**
Stop bits   **1 bit**

Printout data regarding RS232:

Serial port : **96, N, 8, 1**

For detailed information on activating an information (test) printout and carrying out changes
ZEBRA printer user manual.

28. APPENDIX E - Communication with Barcode Scanner

1. For communication with RADWAG barcode scanners use RS232 interfaces and simplex transmission (one -way direction) without handshaking. For this purpose, use of second line of the cable is sufficient. Transmission parameters can be set for both weighing devices and scanners.
2. Both mass comparator and scanners have the possibility of setting of transmission parameters. For both devices the following parameters must comply: baud rate, data bits quantity, parity control, stop bits quantity; e.g. 9600,8,N,1 – baud rate 9600 bit/s, data 8-bits, no parity control, 1 stop bit.
3. Barcode scanners can send additional information apart from the expected barcode; e.g. symbology (type of barcode). Due to the fact that RADWAG devices and software do not use such information, it is advisable to disable it.
4. Some RADWAG systems can omit unnecessary information by using parameters that mark the beginning and the length of the code required to analysis.
5. A special protocol is required in order the code be received by RADWAG equipment. It is required to program an appropriate *prefix* and *suffix*. In RADWAG-adopted standard, the prefix is 01 sign (byte) hexadecimal format, the suffix is 0D sign (byte) hexadecimal format.
6. Most barcode scanners allow to enable/disable different symbologies (barcode types).
7. Programming of scanners is usually performed by reading special barcodes or by using an external software tool.

Barcode with required prefix and suffix in hexadecimal format	Barcode without required – fixes in ASCII format	Code type
01 30 30 32 31 30 31 32 36 0D	00210126	EAN-8
01 30 31 32 33 34 35 36 37 38 39 0D	0123456789	CODE 2 OF 5
01 43 4F 44 45 20 33 39 20 54 45 53 54 0D	CODE 39 TEST	CODE 39
01 31 31 30 31 32 33 34 35 36 37 38 39 31 0D	1101234567891	EAN-13
01 43 6F 64 65 20 31 32 38 20 54 65 73 74 0D	CODE 128 Test	CODE 128